Afterschool
MATH CLUB
Achievers

Patsy F. Kanter
Alanna Arenivas
Esta T. Elizondo
Shara S. Hammet
Annette Raphael
Pam Wallace
Dottie Whitlow-Malin

GRADE 5
Credits

Editorial: Carol DeBold, Rick Duthe, Kathy Kellman, Susan Rogalski
Design/Production: Taurins Design, NYC
Technical Art: Taurins Design, NYC
Cover and Package Design: Great Source/Kristen Davis

Copyright © 2002 by Great Source Education Group, a division of Houghton Mifflin Company. All rights reserved.

Permission is hereby granted to the teacher who has purchased the Alterschool Achievers: Math Club Grade 5 kit (ISBN 0-669-48815-1) to reprint or photocopy in a quantity for a single classroom the five Post Tests (pages 218–227) in this work that carry a copyright notice, provided each copy made shows the copyright notice. Such copies may not be sold and further distribution is expressly prohibited. Except as authorized above, prior written permission must be obtained from Great Source Education Group to reproduce or transmit this work or portions thereof in any other form or by any other electronic or mechanical means, including any information storage or retrieval system, unless expressly permitted by federal copyright law. Address inquiries to Great Source Education Group, 181 Ballardvale Street, Wilmington, MA 01887.

Printed in the United States of America

Great Source® and New Ways to Know® are registered trademarks of Houghton Mifflin Company.
International Standard Book Number-10: 0-669-48827-5
6 7 8 9 10 DSHV 09 08
Visit our web site: http://www.greatsource.com/
Program Overview ........................................ iv

Getting Started ........................................ vi

Activities .................................................. 1

Questions and Answers for Math Maze Cards .......... 181

Diagnostic Tests and Activity Correlation .............. 213
What is Afterschool Achievers: Math Club?

Afterschool Achievers: Math Club is a complete, easy-to-use afterschool kit packed with a full year of fun, enriching activities aligned with the NCTM standards. Developed by some of the same authors who brought you Summer Success®: Math and the Every Day Counts® family of resources, each grade-level specific kit, K–8, covers all the major math strands through daily 20–30 minute activities that:

- provide meaningful daily practice that will improve students’ confidence and proficiency with number sense, basic operations, algebra, geometry, measurement, mental math, and problem solving;
- engage students through thought-provoking activities that encourage participation and enjoyment in learning math;
- prepare students for testing by offering consistent, yearlong practice across a variety of math strands;
- help students develop an understanding of how different types of math problems are related and solved through basic problem-solving strategies.

Designed for afterschool programs but ideal for any learning environment including Title I, Intervention, Remediation, and Enrichment programs, Afterschool Achievers: Math Club is an engaging, ready-to-use program that will help all students succeed and enjoy math.

What is included in each Afterschool Achievers: Math Club kit?

Compact, affordable, and ready-to-use, each grade-level specific Afterschool Achievers: Math Club kit provides enough materials for up to 18 students including:

- Instructors’ Guide with step-by-step implementation instructions, detailed lessons, and assessment guidelines;
- Student Book copymaster (also available as consumable Student Books);
- Math Jumble activity poster;
- Digit Cards and Coin Cards for Math Jumble activities;
- 36 decks of Math Maze games (cardstock)

Step-by-step instructions and easy-to-follow guidelines for each of the five groups of activities—Pattern Puzzler, Math Maze, Game Time, Math Jumble, and Rule Out Two—make Afterschool Achievers: Math Club a user-friendly resource for ready-to-use activities that will engage students in math.
How are the lessons organized?

Ideal for whole class and small group learning situations, Afterschool Achievers: Math Club provides reinforcement of key math strands through five different types of activities:

- **Pattern Puzzler** provides a variety of activities designed to help students recognize the different patterns that exist in numbers and geometry, and encourage algebraic thinking.

- **Math Maze** is a fast-paced group activity that challenges students’ mental math and problem-solving skills as questions and answers move quickly from student to student.

- **Game Time** provides practice in critical thinking, computation, number sense, operations, measurement, and geometry through oral and written games that require the process of elimination to arrive at the correct answer.

- **Math Jumble** helps build students’ basic operations and mental-math skills using posters and cards by challenging students to solve problems using only connected numbers.

- **Rule Out Two** offers useful test-taking practice as students rule out incorrect answers to multiple choice problems and explain their reasoning for identifying the correct answers.

Detailed lessons and implementation instructions for each of the five elements are clearly laid out in each Instructor’s Guide so you can implement Afterschool Achievers: Math Club right away. References to the Great Source handbook Math at Hand (MAH)* are provided for each concept of every lesson so your students can get any extra help they need.

How can I assess my students’ progress?

Diagnostic pretests available in the program provide a convenient tool for evaluating students’ strengths and weaknesses in math. Guidelines are provided in the Instructor’s Guide to help instructors implement specific activities that target students’ identified needs for improvement. The included post tests can be used to help judge progress.

Daily assessment tips for evaluating students’ performance are provided for each of the five different activities in Afterschool Achievers: Math Club. Assessment cues, such as “Can students name the addends for 12?” at the end of each Instructor’s Guide lesson page give you basic guidelines for monitoring students’ progress activity by activity.

What kind of preparation do I need to implement the program?

All the planning tools and lessons you need are in the kit.

Flexible enough to be taught in a variety of learning environments by instructors of all levels, Afterschool Achievers: Math Club provides detailed guidelines in each Instructor’s Guide so you can get started right away. From introducing the lesson to explaining “Today’s Challenge” to assessing students’ progress, the Instructor’s Guide offers a scripted, efficient lesson plan that is easy to implement and fun for students. Student Book activities, posters, and activity cards are all provided in one convenient kit.

*Math at Hand* is a mathematics handbook published by Great Source Education Group. For ordering information call 800-289-4490 or visit www.greatsource.com.
What is the best way for me to get started?

To familiarize yourself with the five different types of activities, you may want to read the first week’s activities in the Instructor’s Guide. Then look over the rest of the materials in the kit.

• You may decide to start with Week 1 Activity 1 and work through the activities in order, or give the students some or all of the diagnostic tests to determine their strengths and weaknesses. The diagnostic tests are located on pages 181–190 of the student book. There are five separate two-page tests for the five different mathematics strands — number, operations, geometry, measurement, and algebra. Answers to the tests are found in the Instructor’s Guide, beginning on page 213.

The test items are correlated to the 180 activities in the program. You may decide to pick and choose activities based on specific math strands or concepts.

• Next, remove the Math Jumble activity poster from the kit. Slit the poster along the cut lines indicated on the poster. Insert paper clips and tape the paper clips to the back of the poster. When you do the Math Jumble activities, slide the digit or coin cards under the paper clips to attach them to the poster.

• You will need to punch out the Math Maze cards from the perforated sheets. Each sheet and the individual cards are labeled by week number and activity number. To keep the cards organized in your kit, you may want to bundle together each deck of cards with a rubber band or store them in plastic resealable bags.
Materials
Student page 1
Crayons or markers

Concepts and Handbook References
Explore patterns. (MAH 401)
Review multiples. (MAH 059)
Practice place value. (MAH 004)

Get Started
Draw this table on the board.

<table>
<thead>
<tr>
<th>Multiples of Two</th>
<th>Digit in Tens Place</th>
<th>Digit in Ones Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

Ask students to count by two, starting with zero. (As students call out the numbers, record them in the left side of the table.) They should continue the counting by two until at least 28. After generating the list, have students help you analyze the digits. Look at each number and decide what digit is in the tens place and what digit is in the ones place.

<table>
<thead>
<tr>
<th>Multiples of Two</th>
<th>Digit in Tens Place</th>
<th>Digit in Ones Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>18</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>24</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>26</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>28</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

Ask these questions.
- Can you find a pattern in the tens place? (The pattern is 5 zeros, 5 ones, 5 twos, and so on.)
- Can you find a pattern in the ones place? (The pattern is 0, 2, 4, 6, 8, 0, 2, 4, 6, 8, and so on. Discuss all suggestions about this pattern.)

Today's Challenge
Student page 1 Ask whether anyone can explain multiples of two. Remind students that these values will go in the left column.

Answers for student page 1: 1. 22; 2 2 2; 4 3. 26; 2 4 2; 8 5. 30; 3 0 6. 32; 2 7 3 8 3; 6 9. 38; 3 8 10. 4

Go Further
Student page 1 Ask students to explain the pattern to you and the rest of the group.

Answers for student page 1: 11. tens: 5 fours, 5 fives, and so on; ones: 0, 2, 4, 6, 8, 0, 2, 4, 6, 8, and so on. 12. Check students' work. 13. Check students' work: patterns will be the same as already described. 14. Check students' work: if you have to multiply by two to generate a multiple of two, then you must also be able to divide any multiple of two evenly by two.

Assessment
Student self-assessment page 1 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students readily see and use patterns in tens and ones?
**Materials**
Student page 2
Math Maze cards (Week 1 Activity 2)

**Concept and Handbook Reference**
Review measurement terms and tools.
(MAH 485–487)

**Get Started**
Ask about things we measure (time, temperature, amount, distance, weight) and some tools we use for measuring (measuring spoons and cups, rulers, clocks, scales, thermometers; and so on). Then ask about measurement equivalents.

- How many days are in a week? (7)
- At what temperature, Fahrenheit, does water freeze? (32°)
- How many quarts are in a gallon? (4)
- How many ounces are in a pound? (16)
- How many inches are in a yard? (36)

**Today’s Challenge**
Distribute the 18 Math Maze cards for week 1. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

**Instructions for playing Math Maze** Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 181.

**Student page 2** When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 2 in the student book.

**Answers for student page 2**: 1. pound 2. mile 3. ton 4. ruler 5. cup 6. tape measure 7. month 8. thermometer 9. scale 10. gallon

**Go Further**
**Student page 2** Have students complete this section of the student page.

**Answers for student page 2**: 11. Check students’ work.

**Assessment**
**Student self-assessment page 2** Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students identify units and tools we use for measurement?
Materials
Student page 3
Blank paper

Concept and Handbook Reference
Determine side length of an equilateral triangle when given the perimeter. (MAH 296)

Get Started
Remind students that the perimeter of any polygon is the sum of the lengths of the sides. In an equilateral triangle the sides are equal, so the perimeter can be found by multiplying the length of one side by 3. This means that the perimeter is the product of 3 and one other factor. Ask students how to find the side length of an equilateral triangle if they know the perimeter. Point out that multiplication and division are inverse operations.

Student page 3 Have students use this information to answer the questions in the Get Started section of page 3 in their books.

Answers for student page 3: 1. 12  2. 5

Today's Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and trace one of the equilateral triangles on page 3 of their books. Have students choose a perimeter for this triangle from the numbers 3 to 60 and record their selection by writing “Perimeter = ____ inches” under the traced triangle. Have students determine the side lengths of the triangle for the perimeter they have chosen. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have the students look at their triangles and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is the side length of your triangle an odd number? If yes, score 10 points.
2. Is the side length of your triangle greater than 3 and less than 9 inches? If yes, score 5 points.
3. Is the side length of your triangle greater than 11 and less than 20 inches? If yes, score 9 points.
4. Is the side length of your triangle the same as 3/4 of a foot? If yes, score 15 points.
5. Is the side length of your triangle a multiple of 2? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student draw the triangle on the board and explain how he or she scored the points.

Go Further
Student page 3 Have students solve the riddle, write their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 3: 3. 12 4-5. Students' own riddles will vary. Make sure students include specific linear units, either customary or metric.

Assessment
Student self-assessment page 3 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students know how to determine the side length of an equilateral triangle when given its perimeter?
Materials
Student page 4
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Review sums to 18. (MAH 073-077)

Get Started
Begin by brainstorming addition facts with sums greater than 9 and less than 19. One student calls out an addend. Another student calls out a second addend. Then a third student gives the fact and tells whether the sum is greater than 9 and less than 19. For example, one student calls out 9, the second student calls out 8, and the third student says, "9 + 8 = 17; 17 is greater than 9 and less than 19." If the sum is not greater than 9 and less than 19, the three students try again. As an extension, have students call out three addends and then the sum. Do this until all students have had the opportunity to participate. Ask students to share their strategies for solving addition facts to 18.

Today's Challenge
Using the 0-9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to make as many addition facts as possible with sums greater than 9 and less than 19.

```
  9 9 5 2
  6 7 4 8
  1 8 5 3
  2 6 3 7
```

Fact equations can be made by adding any two adjoining digits (horizontally and/or vertically) on the poster. Students supply the sum to complete the equation. For example, the 9 and 7 from the second column can be used to make the addition fact $9 + 7 = \square$. Digits on the poster can be used more than once, but the sum must be more than 9 and less than 19. Record the addition equations.

Possible answers are given below.

<table>
<thead>
<tr>
<th>sum of 10</th>
<th>sum of 11</th>
<th>sum of 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3 + 7 = 10$</td>
<td>$7 + 4 = 11$</td>
<td>$4 + 8 = 12$</td>
</tr>
<tr>
<td>$2 + 8 = 10$</td>
<td>$8 + 3 = 11$</td>
<td></td>
</tr>
<tr>
<td>sum of 13</td>
<td>sum of 14</td>
<td>sum of 15</td>
</tr>
<tr>
<td>$6 + 7 = 13$</td>
<td>$9 + 5 = 14$</td>
<td>$9 + 6 = 15$</td>
</tr>
<tr>
<td>$8 + 5 = 13$</td>
<td>$8 + 6 = 14$</td>
<td>$7 + 8 = 15$</td>
</tr>
<tr>
<td>sum of 16</td>
<td>sum of 17</td>
<td>sum of 18</td>
</tr>
<tr>
<td>$9 + 7 = 16$</td>
<td>$9 + 8 = 17$</td>
<td>$9 + 9 = 18$</td>
</tr>
</tbody>
</table>

Student page 4 Have students use the Math Jumble on student page 4 to find pairs of digits with sums greater than 9 and less than 19.

Answers for student page 4:

<table>
<thead>
<tr>
<th>sum of 10</th>
<th>sum of 11</th>
<th>sum of 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>$8 + 2 = 10$</td>
<td>$7 + 4 = 11$</td>
<td>$3 + 9 = 12$</td>
</tr>
<tr>
<td>$3 + 7 = 10$</td>
<td>$3 + 8 = 11$</td>
<td></td>
</tr>
<tr>
<td>$9 + 1 = 10$</td>
<td>$6 + 5 = 11$</td>
<td></td>
</tr>
<tr>
<td>$2 + 9 = 11$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sum of 13</td>
<td>sum of 14</td>
<td>sum of 15</td>
</tr>
<tr>
<td>$4 + 9 = 13$</td>
<td>$5 + 9 = 14$</td>
<td>$8 + 7 = 15$</td>
</tr>
<tr>
<td>$8 + 6 = 14$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>sum of 16</td>
<td>sum of 17</td>
<td>sum of 18</td>
</tr>
<tr>
<td>$9 + 7 = 16$</td>
<td>$9 + 8 = 17$</td>
<td>$9 + 9 = 18$</td>
</tr>
</tbody>
</table>

Go Further
Student page 4 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 4: Grids and equations will vary.

Assessment
Student self-assessment page 4 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students recall addition facts to 18?
Materials
Student page 5
Blank paper

Concept and Handbook Reference
Choose the best unit of linear measure in a problem situation. (MAH 294)

Get Started
Draw the following table on the board.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>millimeter</td>
<td>inch</td>
</tr>
<tr>
<td>centimeter</td>
<td>foot</td>
</tr>
<tr>
<td>meter</td>
<td>yard</td>
</tr>
<tr>
<td>kilometer</td>
<td>mile</td>
</tr>
</tbody>
</table>

Discuss the units in both measurement systems. Explain the relationships among the units within the same system and across systems. List or provide concrete benchmarks for each unit of measure. Present different objects or situations that require measurement, and ask the students to suggest the appropriate unit of measurement from both systems.

Student page 5 To introduce the activity, work through the first problem on student page 5. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (millimeters) is wrong because "Millimeters are used for measuring very short distances." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 5 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 5: 1. B 2. A
When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 5 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students choose the most reasonable unit of linear measure in a problem situation?
Materials
Student page 6

Concepts and Handbook References
Explore patterns. (MAH 401)
Work with multiples and divisibility. (MAH 059, 062)

Background
A digit sum is the sum of the digits of a number, taken repeatedly until the sum has only one digit.

Example: Find the digit sum for 99.

\[
\begin{align*}
99 &= 9 + 9 \\
    &= 18 \\
18 &= 1 + 8 \\
    &= 9
\end{align*}
\]

The digit sum for 99 is 9.

When the multiples of three are reduced to digit sums, a pattern emerges. Digit sums for multiples of three greater than zero are always 3, 6, or 9.

Get Started
Draw this T-table on the board, asking students to fill in the left-hand column through 24.

<table>
<thead>
<tr>
<th>Multiples of Three</th>
<th>Digit Sums</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td></td>
</tr>
<tr>
<td>21</td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
</tr>
</tbody>
</table>

After generating the list of multiples, have students help you compute the digit sum for each. Then, ask what they notice about these sums. (They are all 3, 6, or 9.) Discuss whether they think that this pattern will continue for all two-digit numbers. (Yes) What about three-digit numbers? (Yes) Try a few to be sure.

Today's Challenge
Student page 6 Ask whether anyone can explain multiples of three. Remind students that these values will be listed in the left column.

Answers for student page 6: 1. 6 2. 9 3. 1; 8 4. 21 5. 6 6. 27; 2 7. 33; 6

Go Further
Student page 6 Have students consider the digit sum for 39.

Answers for student page 6: 8. 3 + 9 = 12; no; add the digits of 12, 1 + 2 = 3 9. All the digit sums are 3, 6, or 9. 10. Actual wording will vary. If the digit sum is 3, 6, or 9, then the number is a multiple of three. 11. Check students’ work. Suggest that students revise their rules if they do not always work.

Assessment
Student self-assessment page 6 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students have a good rule for divisibility by three?
Materials
Student page 7
Math Maze cards (Week 2 Activity 7)

Concepts and Handbook References
Use the Commutative Property of Multiplication.
(MAH 218)
Understand prime and composite numbers.
(MAH 053-055)
Find prime factors. (MAH 056)

Background
The Commutative Property of Multiplication says that the order in which factors are multiplied makes no difference in the product.

\[ a \times b = b \times a \]

Get Started
Discuss the Commutative Property of Multiplication, then ask the following questions. Encourage students to present more than one solution method.

- What is \(2 \times 2 \times 3?\) (12)
- How did you get your answer? (\(2 \times 2 = 4\) and \(4 \times 3 = 12\) or \(2 \times 3 = 6\) and \(6 \times 2 = 12\))

Now ask students to describe using the Commutative Property of Multiplication to mentally find the product of \(2 \times 2 \times 7 \times 5,\) \((2 \times 5 = 10;\) \(10 \times 7 = 70; 70 \times 2 = 140)\)

Today's Challenge
Distribute the 18 Math Maze cards for week 2. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 182.

Student page 7 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 7 in the student book.

Answers for student page 7: 1. 30 2, 8 3, 98 4, 6 5, 25, 6, 10 7, 350 8, 14, 9, 21 10, 54 11, 6, 8, 10, 14, 21, 25, 30, 54, 98, 350

Go Further
Student page 7 Have students complete this section of the student page.

Answers for student page 7: 12. prime factorization: \(3 \times 3 \times 7\) 13. prime factorization: \(3 \times 3 \times 5\) 14. prime factorization: \(2 \times 2 \times 3\)

Assessment
Student self-assessment page 7 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use the commutative property to make mental multiplication easier?
Materials
Student page 8
Blank paper
Yardstick (optional)

Concepts and Handbook References
Measure length using customary units. 18. (MAH 486)
Express measurement in fraction form. (MAH 032)

Get Started
Review customary units of length with students. Write the following questions on the board and record the answers.

How many inches are in one foot? (12) What part of one foot is one inch? ($\frac{1}{12}$)
How many inches are in one yard? (36) What part of one yard is one inch? ($\frac{1}{36}$)
How many feet are in one yard? (3) What part of one yard is one foot? ($\frac{1}{3}$)

Today's Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have the students use the ruler on the side of page 8 and select one object to measure. Have each student take a blank sheet of paper and draw the object he or she chose and write the measurement. Then ask the students to number their papers from 1 to 4.

As you ask each of four questions, have the students look at their drawings and measurements and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your object more than $\frac{1}{3}$ of a yard long? If yes, score 9 points.
2. Is your object less than $\frac{1}{3}$ of a yard long? If yes, score 5 points.
3. Is your object more than $\frac{1}{3}$ of a yard long? If yes, score 9 points.
4. Is your object more than $\frac{15}{36}$ of a yard long? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student tell which object he or she measured and what the measurement was. Ask the student to explain how he or she scored the points.

Student page 8 Have students find objects in the room to match the clues.

Answers for student page 8: Answers will vary. Possible answers: 1. piece of chalk 2. desktop

Go Further
Student page 8 Have students fill in the blanks to solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 8: 3–4. Check students' riddles.

Assessment
Student self-assessment page 8 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students measure length using customary units? Can students express measurement in fraction form?
Materials
Student page 9
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Review differences between numbers less than 18. (MAH 078–082)

Get Started
Begin by brainstorming subtraction equations. One student calls out any two-digit number less than 18. Another student calls out a second number less than 18. Then a third student tells the difference between the two numbers. For example, one student calls out 17, the second student calls out 8, and the third student says, “The difference between 17 and 8 is 9.” Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make subtraction equations. The answers will not be part of the strings of digits. Students will be subtracting from two-digit numbers less than 18.

Strings of digits are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, the digits at the top of the first three columns could be used to form the string 159, which could be used to make the problem 15 – 9 = □. Students supply the difference to complete the equation. Record the subtraction equations.

Possible subtraction equations: 15 – 8 = 7;
16 – 8 = 8; 16 – 7 = 9; 15 – 9 = 6; 13 – 9 = 4;
14 – 7 = 7; 14 – 8 = 6; 17 – 6 = 11;
15 – 4 = 11; 12 – 9 = 3; 12 – 5 = 7;
13 – 1 = 12; 14 – 5 = 9; 15 – 2 = 13;
17 – 4 = 13; 17 – 9 = 8; 13 – 8 = 5

Student page 9 Have students use the Math Jumble on student page 9 to find more strings. Remind students that the strings must join horizontally and/or vertically.

Possible answers for student page 9: 17 – 9 = 8;
17 – 8 = 9; 16 – 2 = 14; 16 – 8 = 8; 12 – 7 = 5;
12 – 6 = 6; 17 – 5 = 12; 15 – 5 = 10;
15 – 1 = 14; 14 – 9 = 5; 13 – 7 = 6;
11 – 8 = 3; 11 – 5 = 6; 11 – 4 = 7; 11 – 7 = 4;
15 – 7 = 8; 11 – 9 = 2; 13 – 5 = 8

Go Further
Student page 9 Have students complete the subtraction equations in the student book. Have them explain their solving strategies and describe any patterns they see.

Answers for student page 9: 14 – 8 = 6;
24 – 8 = 16; 74 – 8 = 66; 104 – 8 = 96;
18 – 9 = 9; 38 – 9 = 29; 108 – 9 = 99;
308 – 9 = 299. Explanations and patterns will vary.

Assessment
Student self-assessment page 9 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students compute differences between numbers less than 18?
Rule Out Two

Week 2 Activity 10

Materials
Student page 10
Blank paper

Concept and Handbook Reference
Identify the attributes of rectangular prisms and cubes. (MAH 382–384)

Get Started
Display a box (rectangular prism) or other similar object. Introduce and define the term attributes.
Count and list on the board the number of faces, corners, and edges that are found on the rectangular prism. Explain how the base shape of a prism is identified. Explain that the number of faces of a prism is equal to 2 plus the number of sides on the base. The 2 represents the top and base of every prism. The number of corners of a prism is equal to 2 times the number of sides of the base. The number of edges of a prism is equal to 3 times the number of sides on the base. Discuss why each of these formulas is true. Draw a comparison between a rectangular prism and a cube.

Student page 10 To introduce the activity, work through the first problem on student page 10. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (12) is wrong because “A cube has 12 edges, not faces.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 10 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 10: 1. A 2. B
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 10 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify the attributes of rectangular prisms and cubes?
Materials
Student page 11
Crayons or markers

Concepts and Handbook References
Explore patterns in multiples. (MAH 059–060)
Find common multiples. (MAH 061)

Background
Common multiples of two counting numbers are numbers in both lists of multiples. The least common multiple is the least number (other than zero) that satisfies this requirement.

Get Started
Draw this T-table on the board and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Multiples of Two</th>
<th>Multiples of Three</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>12</td>
<td>18</td>
</tr>
<tr>
<td>14</td>
<td>21</td>
</tr>
<tr>
<td>16</td>
<td>24</td>
</tr>
<tr>
<td>18</td>
<td>27</td>
</tr>
<tr>
<td>20</td>
<td>30</td>
</tr>
<tr>
<td>22</td>
<td>33</td>
</tr>
<tr>
<td>24</td>
<td>36</td>
</tr>
</tbody>
</table>

After generating the lists of multiples of two and three, ask students to find the multiples that are in both lists. (0, 6, 12, 18, 24) Ask them what they notice about this list. (All are multiples of six; common multiples of two and three are all multiples of six.)

Today's Challenge
Student page 11 Ask students to extend the list of multiples of two and three.

Answers for student page 11: 1. 39 2. 28 3. 45 4. 32 5. 51 6. 36 7. 57 8. 40 9. 63 10. 44 11. 69 12. 48 13. 75

Go Further
Student page 11 Have students look for patterns on the hundred chart.

Answers for student page 11: 14. Check students' work. 15. Check students' work. Ask them to explain the patterns they see to you and the group. 16. Check students' work. The multiples of three do not form columns; instead they form diagonal lines. Ask students to explain the patterns they see. 17. Possible answers: any multiple of six 18. Check students' work. The twice-marked numbers are multiples of six.

Assessment
Student self-assessment page 11 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand why some numbers are common multiples?
Materials
Student page 12
Math Maze cards (Week 3 Activity 12)

Concept and Handbook Reference
Use correct mathematics terminology.
(MAH 516–538)

Background
Often students are tripped up on standardized tests not by what they do not know mathematically but by the terminology. They may know, for example, how to divide, but not what a quotient is. Encourage students to use proper vocabulary when doing oral practice.

Get Started
Ask students to list all the words they can think of that have to do with addition, subtraction, multiplication and division. Make a master list with examples and keep it where students can see it.

You may wish to begin a class math dictionary with a page for each letter. Enter new math words as they come up.

Today’s Challenge
Distribute the 18 Math Maze cards for week 3. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze
Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 183.

Student page 12
When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 12 in the student book.

Answers for student page 12: 1. sum, subtraction, addend, difference 2. multiply, product, factor 3. quotient, divisor, remainder, dividend 4. denominator, equivalent fraction, numerator, mixed number

Go Further
Student page 12
Have students complete this section of the student page.

Answers for student page 12: 5. Answers will vary. Possible answers may relate to geometry, exponents, statistics, inequality, or measurement. See Math Maze questions and answers for more examples.

Assessment
Student self-assessment page 12
Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip
Do students consistently use the proper terms when discussing mathematical topics?
Materials
Student page 13
Blank paper

Concept and Handbook Reference
Estimate differences in multi-digit subtraction problems. (*MAH 100–105*)

Get Started
Write the following problem on the board.

\[ 135 - 21 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be a three-digit number because 35 is larger than 21; it will be more than 100 because there is no regrouping in the tens place; if the numbers are rounded, the problem is 140 - 20, so the answer is about 120; the difference between 35 and 21 is 14, so the answer is 114. Be sure to accept and welcome all valid strategies for estimating differences.

Today's Challenge
Explain that today you will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and write a problem in which a two-digit number is subtracted from a three-digit number. Have the students write an estimate of the difference and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 360 and less than 420? If yes, score 8 points.
2. Did your strategy involve rounding to the hundreds place? If yes, score 10 points.
3. Did your strategy involve rounding to the tens place? If yes, score 15 points.
4. Is your estimate greater than 160 and less than 250? If yes, score 9 points.
5. Is your estimate greater than 675 and less than 950? If yes, score 7 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 13 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 13: 1. 500 or 490 2. 240 3-4. Students' own riddles will vary.

Assessment
Student self-assessment page 13 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use a variety of strategies to make a good estimate for a multi-digit subtraction problem?
Materials
Student page 14
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add and subtract to get even-number answers. (MAH 063)

Get Started
Begin by brainstorming addition and subtraction equations that have even-number answers. One student calls out any two-digit number. Another student calls out a second two-digit number. Then a third student either adds or subtracts the given numbers to get an even-number answer. For example, one student calls out 26, the second student calls out 38, and the third student says, “26 + 38 = 64,” or “38 − 26 = 12.” As a class, determine if the answers are odd or even. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0-9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make addition or subtraction equations with even-number answers.

Strings of digits are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, all the digits in column one, the 9 from column two, and the 8 from column three could be used to make the equation 64 + 34 = 98. Record the equations.

Possible equations: 64 + 34 = 98; 99 − 25 = 74; 39 + 25 = 64; 57 − 41 = 16

Student page 14 Have students use the Math Jumble on student page 14 to find more strings. Remind students that the strings must join horizontally and/or vertically.

Answers for student page 14: 87 − 35 = 52; 41 + 33 = 74; 78 − 46 = 32; 63 + 22 = 85

Go Further
Student page 14 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 14: Grids and equations will vary.

Assessment
Student self-assessment page 14 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students recognize when there will be an even-number answer when adding or subtracting?
Rule Out Two

Week 3 • Activity 15

Materials
Student page 15
Blank paper

Concept and Handbook Reference
Apply the divisibility law for 2. (MAH 062)

Get Started
Write the equation 16 ÷ 2 = 8 on the board. Explain that the number 16 is evenly divisible by 2 because 2 equal groups of 8 can be made from 16. List one-, two-, and three-digit numbers on the board for students to analyze and classify as evenly divisible by 2. Lead students to the realization that all even numbers are evenly divisible by 2. Ask the students to explain how to identify an even number.

Student page 15 To introduce the activity, work through the first problem on student page 15. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (37) is wrong because "37 is an odd number and cannot be divided evenly in 2 equal groups." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (B). Be sure students understand why B is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 15 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 15: 1. D 2. A

When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 15 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students apply the divisibility law for 2?
Materials
Student page 16
Crayons or markers

Concept and Handbook Reference
Explore patterns in multiples. (MAH 059)

Get Started
Draw this table on the board and ask students to help you fill in the left-hand column through at least 60. After generating the list, have students help you fill in the last two columns.

<table>
<thead>
<tr>
<th>Multiples of Five</th>
<th>Digit in Tens Place</th>
<th>Digit in Ones Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>35</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>45</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>50</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>55</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>60</td>
<td>6</td>
<td>0</td>
</tr>
</tbody>
</table>

Ask these questions.
- Can you find a pattern in the tens place? (2 zeros, 2 ones, 2 twos, 2 threes, and so on.)
- Can you find a pattern in the ones place? (0, 5, 0, 5, 0, 5, and so on.)

Today’s Challenge
Student page 16 Ask students to fill in the table.

Answers for student page 16: 1. 65; 6; 5; 2; 7; 0 3. 75; 5; 4; 80; 8; 0; 5; 8; 5; 6; 90; 9; 0; 7; 95; 9; 5

Go Further
Student page 16 Have students predict a pattern in the places of three-digit numbers.

Answers for student page 16: 8. No; check students’ explanations. 9. Check students’ work. 10. Ask students to explain their patterns.

Assessment
Student self-assessment page 16 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students search for less-obvious patterns?
**Materials**
Student page 17
Math Maze cards (Week 4 Activity 17)

**Concept and Handbook Reference**
Solve for variables in equations. *(MAH 235–243)*

**Background**
A variable is any word, phrase, or symbol that stands in for a number in a mathematical expression or equation. In 3 times my number is 12, the variable is *my number*. Other ways to write the same equation are:

- \(3x = 12\)
- \(3 \times \square = 12\)
- \(3n = 12\)

**Get Started**
Talk with students about variables and equations. Then do a few practice examples.

- 3 times my number is 12. What’s my number? (4)
- \(x - 3 = 10\). What is \(x\)? (13)
- \(n \div 3 = 4\). What is \(n\)? (12)

Often what helps students to solve these problems is working backward. For example, if three *times* \(n = 12\), then \(n = 12\) divided by three because division undoes multiplication. If three *less than* a number is 10, then the number you started with is three *more than* 10.

**Today's Challenge**
Distribute the 18 Math Maze cards for week 4. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

**Instructions for playing Math Maze** Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 184.

**Student page 17** When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 17 in the student book.

**Answers for student page 17:** 1. 6  2. 3  3. 10  4. 11  5. 14  6. 1  7. 12  8. 9  9. 17  10. 7

**Go Further**
**Student page 17** Encourage students to write their *What Is My Number* riddles in several forms.

**Answers for student page 17:** 11. Check students’ work.

**Assessment**
**Student self-assessment page 17** Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students work with given information to find the missing number in an equation in either word form or symbol form?
Materials
Student page 18
Blank paper

Concept and Handbook Reference
Identify patterns in multiples of 6. (MAH 059)

Get Started
Begin by making a two-column table on the board for multiples of 6. Label the columns “tens” and “ones”. Ask students to skip count by 6 through 72. Explain that when we skip count by 6, we are naming the multiples of 6. Record the multiples of 6 on the table. Ask students what patterns they see. For example, all the numbers are even; the digits in the ones place repeat 6, 2, 8, 4, 0; the digits in the tens place repeat except when there is a 4 in the ones place; all the numbers are multiples of both 2 and 3; the sum of the digits in the tens and ones place is divisible by 3.

Today’s Challenge
Explain that today the class will be playing a game called “Fantastic Finalist.” Give each student a piece of paper with one of the multiples of 6 (through 72) written on it.

You do not need to use all the multiples of 6, but be sure that one student receives the number 54, since that number will be the “Fantastic Finalist.”

Have all students hold their numbers and stand in a large circle. Explain that the object of the game is to be the “Fantastic Finalist,” the last student to remain standing.

Read each of the following challenges, one at a time.

- If your number is a one-digit number, sit down.
  (6)
- If your number is greater than or equal to 6 × 10, sit down. (60, 66, 72)
- If the sum of the digits in your number is even, sit down. (24, 42, 48)
- If your number is less than 4 × 6, sit down. (12, 18)
- If the digit in the tens place is equal to 3 × 1, sit down. (30, 36)

At this point, only the student holding the number 54 should still be standing. That student is the “Fantastic Finalist.”

Go Further
Student page 18 Have students complete the activity on the student page.

Answers for student page 18: 1. 36 2. Answers will vary. Possible answers: 36 is equal to 3 dozen. 36 is a square number. There are 36 inches in a yard.

Assessment
Student self-assessment page 18 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students identify multiples of 6? Do students see patterns related to multiples of 6?
Materials
Student page 19
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Use mental math to multiply by 5. (MAH 084)

Get Started
Have students practice using mental math to multiply by 5. One student calls out a number. Another student multiplies that number by 5 and tells the product. For example, one student calls out 9, the second student calls out \(9 \times 5 = 45\). Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with 5 as one of the factors.

\[
\begin{array}{cccc}
5 & 9 & 4 & 5 \\
7 & 7 & 5 & 2 \\
3 & 5 & 1 & 0 \\
5 & 5 & 2 & 5 \\
\end{array}
\]

Fact equations can be made by multiplying any two adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but one of the factors must be 5. For example, the digits in the top row could be used to form the string 5945, which could be used to make the equation \(5 \times 9 = 45\). Record the equations students make.

Possible equations: \(5 \times 9 = 45; 5 \times 7 = 35; 3 \times 5 = 15; 2 \times 5 = 10; 5 \times 5 = 25; 5 \times 1 = 5; 4 \times 5 = 20\)

Student page 19 Have students use the Math Jumble on student page 19 to find multiplication equations with 5 as one of the factors.

Answers for student page 19: \(5 \times 7 = 35; 5 \times 1 = 5; 2 \times 5 = 10; 3 \times 5 = 15; 5 \times 0 = 0; 4 \times 5 = 20; 5 \times 8 = 40\)

Go Further
Student page 19 Have students answer the question in the student book.

Answer for student page 19: When multiplying by 5, the products have either 5 or 0 in the ones place. Explanations will vary.

Assessment
Student self-assessment page 19 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use mental math to multiply by 5?
Rule Out Two

Materials
Student page 20
Blank paper

Concept and Handbook Reference
Order decimals from least to greatest using tenths and hundredths. (MAH 016–018)

Get Started
Write the numbers 0.1, 0.2, 0.3, and 0.4 on the board. Discuss the value of these numbers. Draw a comparison between tenths and dimes. Write 0.11, 0.12, 0.13, and 0.14 on the board. Discuss the value of the decimals. Draw a comparison between hundredths and pennies. Explain that 0.1 can be written as 0.10 since 1 dime is the same as 10 pennies. Write 0.2, 0.02, 0.12, and 0.3 vertically on the board. Model the procedure of changing tenths to hundredths by writing a zero in the hundredths place as shown.
0.20
0.02
0.12
0.30

When all the decimals have an equivalent number of place values, the decimals are ordered from least to greatest in the same way as whole numbers—0.02, 0.12, 0.20, 0.30.

Student page 20 To introduce the activity, work through the first problem on student page 20. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (0.3, 0.04, 0.4, 0.34) is wrong because “0.3 is the same as 0.30, and 0.30 is not less than 0.04.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer

and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 20 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 20: 1. A 2. B
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 20 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students order decimals from least to greatest?
Materials
Student page 21
Optional: calculator

Concepts and Handbook References
Explore patterns in multiples. (MAH 059)
Devise divisibility rules. (MAH 062)

Get Started
Draw this table on the board and ask students to help you fill in the left-hand column through at least 99. After generating the list of multiples, have students help you compute the digit sums.
(Remember, some digit sums are found after two steps.)

<table>
<thead>
<tr>
<th>Multiples of Nine</th>
<th>Digit Sum</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
</tr>
<tr>
<td>18</td>
<td>1 + 8 = 9</td>
</tr>
<tr>
<td>27</td>
<td>2 + 7 = 9</td>
</tr>
<tr>
<td>36</td>
<td>3 + 6 = 9</td>
</tr>
<tr>
<td>45</td>
<td>4 + 5 = 9</td>
</tr>
<tr>
<td>54</td>
<td>5 + 4 = 9</td>
</tr>
<tr>
<td>63</td>
<td>6 + 3 = 9</td>
</tr>
<tr>
<td>72</td>
<td>7 + 2 = 9</td>
</tr>
<tr>
<td>81</td>
<td>8 + 1 = 9</td>
</tr>
<tr>
<td>90</td>
<td>9 + 0 = 9</td>
</tr>
<tr>
<td>99</td>
<td>9 + 9 = 18; 1 + 8 = 9</td>
</tr>
<tr>
<td>108</td>
<td>1 + 0 + 8 = 9</td>
</tr>
</tbody>
</table>

Ask these questions.
• What do you notice about the digit sums? (Except for the first one, 0, they are all 9.)
• Do you think this pattern will continue into three-digit numbers? (Yes; test a few to be sure.)

Today’s Challenge
Student page 21 Ask whether anyone can remind the group how to find a digit sum.

Answers for student page 21: 1–9. 9 10. Check students’ work; digit sum for a multiple of 9 (> 0) is 9. 11. Check students’ work; the rule does hold.
12. Check students’ work. You might wish to allow students to test their work with a calculator.

Go Further
Student page 21 Help students test their rule. You may wish to allow them to use calculators as a check on their conclusions.


<table>
<thead>
<tr>
<th>Numbers</th>
<th>Digit Sum</th>
<th>Multiple of Nine?</th>
</tr>
</thead>
<tbody>
<tr>
<td>126</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>423</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>1187</td>
<td>8</td>
<td>No</td>
</tr>
<tr>
<td>180</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>13,608</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>7856</td>
<td>8</td>
<td>No</td>
</tr>
<tr>
<td>1899</td>
<td>9</td>
<td>Yes</td>
</tr>
<tr>
<td>2468</td>
<td>2</td>
<td>No</td>
</tr>
</tbody>
</table>

14–15. Check students’ work.

Assessment
Student self-assessment page 21 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are the students seeing that use of divisibility rules can save them time?
Materials
Student page 22
Math Maze cards (Week 5 Activity 22)

Concept and Handbook Reference
Review geometry vocabulary. (MAH 516–538)

Background
While there are many two-dimensional figures that are not polygons (for example, circles), much of the study of geometry at this level relates to polygons. Polygons are named using prefixes and suffixes that are clues to their shapes.

tri- three
quad- four
pent- five
hex- six
sept- seven
oct- eight
poly- many
-gon angle
-lateral side

Get Started
Help students define geometry as the study of shapes and space. Specifically define polygon as a two-dimensional (flat) figure made up of line segments that meet only at their endpoints. Draw this table on the board.

<table>
<thead>
<tr>
<th>Polygons</th>
<th>Not Polygons</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Triangle" /></td>
<td><img src="image2" alt="Not Polygon" /></td>
</tr>
<tr>
<td><img src="image3" alt="Quadrilateral" /></td>
<td><img src="image4" alt="Not Polygon" /></td>
</tr>
<tr>
<td><img src="image5" alt="Pentagon" /></td>
<td><img src="image6" alt="Not Polygon" /></td>
</tr>
</tbody>
</table>

Encourage students to add to your table, then ask questions like these.

- What is the name of a polygon with three sides? (triangle)
- What is the name of a polygon with four sides? (accept: quadrilateral, parallelogram, square, rectangle, rhombus, trapezoid)
- What is the name of a polygon with five sides? (pentagon)

Today's Challenge
Distribute the 18 Math Maze cards for week 5. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 185.

Student page 22 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 22 in the student book.

Answers for student page 22: 1. rhombus, parallelogram, trapezoid, square, rectangle 2. hexagon, pentagon, octagon, triangle 3. sphere, cylinder, cube

Go Further
Student page 22 Have students complete this section of the student page.

Answers for student page 22: 4. triangle, trapezoid, pentagon, hexagon, octagon

Assessment
Student self-assessment page 22 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students easily distinguish among quadrilaterals by looking at special side and angle relationships?
Materials
Student page 23
Blank paper

Concept and Handbook Reference
Determine side length of a square when given the perimeter. (MAH 297)

Get Started
Remind students that the perimeter of any polygon is the sum of the lengths of the sides. In a square the sides are equal, so the perimeter can be found by multiplying the length of one side by 4. This means that the perimeter is a product with 4 as one of the factors. Ask students how to find the side length of a square if they know the perimeter. Point out that multiplication and division are inverse operations.

Student page 23 Have students use this information to answer the questions in the Get Started section of page 23 in their books.

Answers for student page 23: 1. 16  2. 11

Today's Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and draw a square near the top of the page. Have students choose a perimeter for this square from the numbers 4 to 100 and record their selection by writing “Perimeter = _____ centimeters” under the square they have drawn. Have students determine the side lengths of the square for the perimeter they have chosen. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have the students look at their squares and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is the side length of your square an odd number? If yes, score 10 points.
2. Is the side length of your square greater than 3 and less than 9 cm? If yes, score 5 points.
3. Is the side length of your square greater than 16 and less than 25 cm? If yes, score 9 points.
4. Is the side length of your square the same as \( \frac{3}{4} \) of a foot? If yes, score 15 points.
5. Is the side length of your square a multiple of 2? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student draw the square on the board and explain how he or she scored the points.

Go Further
Student page 23 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 23: 3. 12  4–5. Students’ own riddles will vary. Make sure students include specific linear units, either customary or metric.

Assessment
Student self-assessment page 23 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students know how to determine the side length of a square when given its perimeter?
Materials
Student page 24
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Use mental math to multiply by 9. (MAH 083–088)

Get Started
Have students practice using mental math to multiply by 9. One student calls out a number. Another student multiplies that number by 9 and tells the product. For example, one student calls out 7, the second student calls out $7 \times 9 = 63$. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with 9 as one of the factors.

```
9 5 4 5
9 0 9 2
1 0 3 9
9 7 6 3
```

Fact equations can be made by multiplying any two adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but one of the factors must be 9. For example, the digits in the top row could be used to form the string 9545, which could be used to make the equation $9 \times 5 = 45$. Record the equations students make.

Possible equations: $9 \times 0 = 0$; $9 \times 1 = 9$; $4 \times 9 = 36$; $9 \times 5 = 45$; $9 \times 7 = 63$

Student page 24 Have students use the Math Jumble on student page 24 to find more strings to make multiplication equations with 9 as one of the factors. Remind students that the strings must join horizontally and/or vertically. Then have them answer the question.

Answers for student page 24: $9 \times 3 = 27$; $9 \times 5 = 45$; $6 \times 9 = 54$; $9 \times 7 = 63$; $9 \times 8 = 72$; $9 \times 9 = 81$. All multiples of 9 have digits with a sum of 9, or have digits with a sum that is also a multiple of 9. Explanations will vary.

Go Further
Student page 24 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 24: Grids and equations will vary.

Assessment
Student self-assessment page 24 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use mental math to multiply by 9?
Materials
Student page 25
Blank paper

Concept and Handbook Reference
Estimate reasonable answers to three-digit addition problems. (MAH 100–105)

Get Started
Write the expression 595 + 312 vertically on the board. Demonstrate the process of rounding both numbers to the nearest hundred before adding. Explain that this process can be performed mentally in a short amount of time in order to get a reasonable answer of about 900. Add to find the exact answer to the problem. Compare the actual answer of 907 to 900. Remind students that if both addends are rounded up the actual answer will be lower and the opposite holds true as well. Discuss the reasoning that may be used if one addend is rounded up and the other is rounded down. Practice several other examples before proceeding with the student page.

Student page 25 To introduce the activity, work through the first problem on student page 25. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (between 500 and 600) is wrong because "When the numbers are rounded, you get 300 + 400, which is 700." (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 25 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 25: 1. C 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 25 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students estimate reasonable answers to three-digit addition problems?
Materials
Student page 26

Concept and Handbook Reference
Find factors. (MAH 051)

Background
One way to find all the factors of a number is to think of the number as a set of items or boxes that form a rectangular array. For example, in how many different ways can you place 12 items in a rectangular array? One rectangle can be long and skinny, 12 items long and one deep. Another would have two rows, with six in each row. Look at the diagrams. When you make all the different rectangular arrays that can be made, you have found all of the factors of that number. 1, 12, 2, 6, 3, 4 are the factors of 12.

Get Started
Ask students to think about how to arrange 12 items or blocks into a rectangular array. Draw or have a student draw that array on the board. Have students count to verify that it contains 12 items and verify its dimensions.

\[ \begin{array}{cccccccccc}
\hline
& & & & & & & & & & \\
\hline
& & & & & & & & & & \\
\hline
& & & & & & & & & & \\
\end{array} \]

1 \times 12

\[ \begin{array}{ccc}
\hline
& & \\
\hline
& & \\
\hline
& & \\
\end{array} \]

2 \times 6

\[ \begin{array}{cc}
\hline
& \\
\hline
& \\
\hline
& \\
\end{array} \]

4 \times 3

Tell students that the dimensions, or lengths of the sides, tell us the factors. Work with students to arrange as many 12-item rectangular arrays as possible. Agree that 3 \times 4 is the same rectangular array as 4 \times 3 for purposes of finding factors. (1 \times 12, 2 \times 6, 3 \times 4) Now list the factors of 12. (1, 12, 2, 6, 3, 4. It may be easier for students to name them in pairs rather than putting them in order at this time.)

Today's Challenge
Student page 26 Help students find factors of 24.

Answers for student page 26: 1. Arrays are 1 \times 24, 2 \times 12, 3 \times 8, 4 \times 6. These arrays may be oriented in different directions but the combinations will be the same. 2-4. Check students' work. 5. In any order: 1, 2, 3, 4, 6, 8, 12, 24

Go Further
Student page 26 Have students find factors of 36.

Answers for student page 26: 6. Arrays are 1 \times 36, 2 \times 18, 3 \times 12, 4 \times 9, and 6 \times 6. 7. In any order: 1, 2, 3, 4, 6, 9, 12, 18, 36

Assessment
Student self-assessment page 26 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students explain why, for 36, one factor (6) doesn’t have a mate?
Materials
Student page 27
Math Maze cards (Week 6 Activity 27)

Concept and Handbook References
Review equivalent fractions and decimals. (MAH 019, 043)

Get Started
Discuss equivalent forms of the same number. Ask students to generate multiple forms of the fraction \(\frac{1}{2}\) (\(\frac{2}{4}, \frac{3}{6}, \frac{4}{8}\), and so on), then ask for decimal equivalents (0.5, 0.50, 0.500, and so on). Compare the decimal equivalent to one of the equivalent fractions (0.5 = \(\frac{5}{10}\)). Next, discuss comparing fractions and decimals by finding equivalents or by using benchmarks of 0, \(\frac{1}{2}\), and 1.

Example Compare \(\frac{1}{2}\) to 0.7.
• You could reason that \(\frac{1}{2}\) is less than half and 0.7 is greater than half, so \(\frac{1}{2} < 0.7\).
• You could write an equivalent decimal for \(\frac{1}{4}\) and compare: 0.25 < 0.7.

Today’s Challenge
Distribute the 18 Math Maze cards for week 6. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 186.

Student page 27 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 27 in the student book.

Answers for student page 27: 1. 0.8 2. \(\frac{1}{4}\) 3. 0.5 4. \(\frac{1}{5}\) 5. \(\frac{3}{5}\) 6. 0.1 7. \(\frac{1}{3}\) 8. 0.6 9. \(\frac{1}{5}\) 10. 0.5

Go Further
Student page 27 Have students complete this section of the student page.

Answers for student page 27: 11. 0.1, \(\frac{1}{5}\), \(\frac{1}{5}\), \(\frac{2}{5}\), 0.5, 0.6, \(\frac{3}{4}\)

Assessment
Student self-assessment page 27 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students have a good sense of the relative value of common decimals and fractions?
Materials
Student page 28
Blank paper
Index cards (optional)

Concept and Handbook References
Review equivalent fractions, decimals, and percents. (MAH 019–020, 043–044)

Get Started
Review the relationships among fractions, decimals, and percents. Explain that equivalent fractions, decimals, and percents are different names for the same amount. Write $\frac{1}{100}$, 0.01, and 1% on the board. Explain that these are three different ways to name the same amount, one hundredth. Ask students how they would write one tenth in fraction, decimal, and percent forms. Write the responses on the board. ($\frac{1}{10}$, 0.10, 0.1, and 10%) Are there other ways we could write one tenth? (Yes, including $\frac{2}{20}$, $\frac{4}{40}$, and $\frac{10}{100}$) Ask the students how they would write one fifth in fraction, decimal, and percent forms. Write the responses on the board. ($\frac{1}{5}$, 0.20, $\frac{2}{10}$, 0.2, and 20%)

Today's Challenge
Student page 28 Have students complete the table on page 28 of their books. Explain that all answers for each numbered problem should be equal to the given word form. Have students fill in the forms that are missing. Review the answers with the class.

Answers for student page 28: 1. $\frac{1}{10}$, $\frac{10}{100}$, 0.1 or 0.10, 10%
2. $\frac{4}{40}$, $\frac{7}{70}$, 0.10, 10%
3. $\frac{1}{5}$, $\frac{2}{10}$, 0.20 or 0.2, 20%
4. $\frac{1}{100}$, $\frac{10}{1000}$, 0.01, 1%

Go Further
Have pairs of students make a set of cards to play the game "Concentration." Each pair of students will need 16 small pieces of paper or 16 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 28. Students should not copy the amounts in the Word Form column. Only the amounts in the Fraction, Decimal, and Percent Form columns should be copied.

Instructions for playing "Concentration" Shuffle the cards and lay them facedown in four equal columns. Each player turns over a card. The player with the greater value goes first. Turn the cards over so that all cards are again facedown. The first player turns over two cards. If the cards match (for example, 20% and 0.2 or $\frac{10}{100}$ and 1%), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards equal in value to one tenth at the end of the game wins.

Assessment
Student self-assessment page 28 Have students circle one of the three choices to describe how they feel about this activity.
Assessment tip Do students recognize different fraction, decimal, and percent names for the same amount?
Materials
Student page 29
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Use mental math to multiply by 9. (MAH 083–088)

Get Started
Have students practice using mental math to multiply by 9. One student calls out a number. Another student multiplies that number by 9 and tells the product. For example, one student calls out 11, the second student calls out $11 \times 9 = 99$. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with 9 as one of the factors.

```
  9  3  2  7
  4  0  9  9
  3  9  1  6
  6  0  8  3
```

Fact equations can be made by multiplying any two adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but one of the factors must be 9. For example, the digits in the top row could be used to form the string 9327, which could be used to make the equation $9 \times 3 = 27$. Record the equations students make.

Possible equations: $0 \times 9 = 0; 9 \times 1 = 9;
2 \times 9 = 18; 9 \times 3 = 27; 9 \times 4 = 36; 7 \times 9 = 63$

Student page 29 Have students use the Math Jumble on student page 29 to find more strings to make multiplication equations with 9 as one of the factors. Remind students that the strings must join horizontally and/or vertically.

Answers for student page 29: $9 \times 12 = 108;
9 \times 11 = 99; 9 \times 10 = 90; 9 \times 9 = 81;
9 \times 1 = 9; 0 \times 9 = 0$

Go Further
Student page 29 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 29: Grids and equations will vary.

Assessment
Student self-assessment page 29 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use mental math to multiply by 9?
Materials
Student page 30
Blank paper

Concept and Handbook Reference
Choose the best unit of measure in problem situations involving capacity. (MAH 313–315)

Get Started
Draw the following table on the board.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td>milliliter</td>
<td>ounce</td>
</tr>
<tr>
<td></td>
<td>cup</td>
</tr>
<tr>
<td></td>
<td>pint</td>
</tr>
<tr>
<td>liter</td>
<td>quart</td>
</tr>
<tr>
<td></td>
<td>gallon</td>
</tr>
</tbody>
</table>

Discuss the units in both measurement systems. Explain the relationships among the units within the same system and across systems. List or provide concrete benchmarks for each unit of measure. Present different objects or situations that require measurement and ask the students to suggest the appropriate unit of measurement from both systems.

Student page 30 To introduce the activity, work through the first problem on student page 30. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say C (liter) is wrong because “A cotton ball could not hold a liter of nail polish remover.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 30 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 30: 1. A 2. B

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 30 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students choose the best unit of measure in problem situations involving capacity?
Materials
Student page 31

Concept and Handbook Reference
Order factors from least to greatest. *(MAH 051)*

Get Started
Review with students ways to find all the factors of a number. Ask them to tell you, again, the factors of 12. Write them on the board.

Factors of 12: 1, 12, 2, 6, 3, 4

Now, help students list these factors in order. Tell them that the standard form for lists of factors is in order from least to greatest.

Factors of 12: 1, 2, 3, 4, 6, 12

Work together to create, on the board, ordered lists of factors of 24 and of 36.

Factors of 24: 1, 2, 3, 4, 6, 8, 12, 24

Factors of 36: 1, 2, 3, 4, 6, 9, 12, 18, 36

Today's Challenge
Student page 31 Have students find factors for four, five, and ten.

Answers for student page 31: 1. Factors of four: 1, 2, 4; Factors of five: 1, 5; Factors of ten: 1, 2, 5, 10

Go Further
Student page 31 Have students find factors of eight, then make a rule for finding all factors of a number.

Answers for student page 31: 2. Rectangular arrays that can be made with eight are 1 \times 8 and 2 \times 4.
3. 1, 2, 4, 8 and 1, 2, 3, 4, 6, 12 4. 1, 2, and 4
5. Check students' work. Start with 1 because 1 is a factor of every whole number. Then, check 2 (Is the number even?). No other factor will be greater than half of the original number, so the factors you should check are limited. 6. Check students' work.

Assessment
Student self-assessment page 31 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students starting to move away from the need to draw rectangular arrays?
Materials
Student page 32
Math Maze cards (Week 7 Activity 32)

Concept and Handbook References
Practice solving word problems involving measurement and the How much more? aspect of subtraction. (MAH 294, 314, 322–325, 023–026)

Get Started
Work with students to create a master list of unit equivalents that can be posted in the classroom. Add to it whenever a new equivalence comes up.

<table>
<thead>
<tr>
<th>1 week</th>
<th>7 days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 hour</td>
<td>60 minutes</td>
</tr>
<tr>
<td>1 minute</td>
<td>60 seconds</td>
</tr>
<tr>
<td>1 yard</td>
<td>3 feet</td>
</tr>
<tr>
<td>1 quart</td>
<td>4 cups</td>
</tr>
<tr>
<td>1 dozen</td>
<td>12 items</td>
</tr>
</tbody>
</table>

Now pose and discuss solution methods for the following problems. You may wish to allow students to use calculators for today’s work.

- You have two weeks for vacation and you have already spent eight days of it. How many more days do you have for your vacation? (6)
- You need 5\(\frac{1}{2}\) yards of ribbon for a costume. You have 22 inches of it. How much more do you need to buy? (4 yards, 32 inches)

Today’s Challenge
Distribute the 18 Math Maze cards for week 7. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 187.

Student page 32 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 32 in the student book.

Answers for student page 32: 1. 3 cups 2. 3:10 p.m. 3. 14 feet or 4 yards, 2 feet 4. 30 or \(2\frac{1}{2}\) dozen 5. 3 hours, 50 minutes 6. $12.64 7. 25 8. $6.91 9. 2 hours, 15 minutes 10. $4.74

Go Further
Student page 32 Have students present their explanations in writing or orally.

Answers for student page 32: 11. Explanations will vary. 14 hours, 45 minutes

Assessment
Student self-assessment page 32 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students automatically look for equivalent measures when different units are used?
Materials
Student page 33
Blank paper

Concept and Handbook Reference
Estimate sums in multi-digit addition problems.
(MAH 100–105)

Get Started
Write the following problem on the board.

4135 + 391 =

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 4600 and less than 5900? If yes, score 8 points.
2. Did your strategy involve rounding to the thousands place? If yes, score 10 points.
3. Did your strategy involve rounding to the hundreds place? If yes, score 15 points.
4. Is your estimate greater than 6000 and less than 7000? If yes, score 9 points.
5. Did your strategy involving rounding up? If yes, score 12 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Today’s Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and create a multi-digit addition problem. The problem should show adding a four-digit number and a three-digit number with a sum between 4000 and 7000. Have the students write an estimate of the sum and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

Go Further
Student page 33 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 33: 1. 4400 2. 6726 3–4. Students’ own riddles will vary.

Assessment
Student self-assessment page 33 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit addition problem?
Materials
Student page 34
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Divide whole numbers. (MAH 146)

Get Started
Have students practice using mental math to divide whole numbers. One student calls out a dividend and a divisor. Another student tells the quotient. For example, one student calls out 30 ÷ 6 and the second student calls out 30 ÷ 6 = 5. Do this until all students have had the opportunity to participate.

Today's Challenge
Using the 0-9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to use strings of digits to make as many division facts as possible. The quotients will not be part of the strings.

Fact equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once. For example, the first three digits in the top row could be used to form the string 455, which could be used to make the equation 45 ÷ 5 = □. Students supply the quotient to complete the equation. Record the equations students make.

Possible answers: 5 ÷ 5 = 1; 5 ÷ 1 = 5;
42 ÷ 7 = 6; 27 ÷ 3 = 9; 35 ÷ 7 = 5; 50 ÷ 2 = 25

Student page 34 Have students use the Math Jumble on student page 34 to find more strings to make division facts. Students must supply the quotients. Remind students that the strings must join horizontally and/or vertically.

Possible answers for student page 34: 36 ÷ 4 = 9;
64 ÷ 8 = 8; 54 ÷ 9 = 6; 81 ÷ 9 = 9; 48 ÷ 6 = 8;
49 ÷ 7 = 7; 35 ÷ 7 = 5; 16 ÷ 4 = 4;
84 ÷ 6 = 14; 78 ÷ 6 = 13

Go Further
Student page 34 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 34: Grids and equations will vary.

Assessment
Student self-assessment page 34 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students divide whole numbers?
Rule Out Two

Week 7 • Activity 35

Materials
Student page 35
Blank paper

Concept and Handbook Reference
Classify triangles by the lengths of their sides.
(MAH 362)

Get Started
Draw the following table on the board.

<table>
<thead>
<tr>
<th>Type of triangle</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>scalene</td>
<td>all sides different lengths;</td>
</tr>
<tr>
<td></td>
<td>all angles different sizes</td>
</tr>
<tr>
<td>isosceles</td>
<td>two congruent sides;</td>
</tr>
<tr>
<td></td>
<td>two congruent angles</td>
</tr>
<tr>
<td>equilateral</td>
<td>all sides congruent;</td>
</tr>
<tr>
<td></td>
<td>all angles congruent</td>
</tr>
</tbody>
</table>

Explain that triangles can be classified by the measurement of their angles and sides. Today’s activity will focus on the lengths of the sides. Draw and label a triangle with two congruent sides of 8 feet and a base of 6 feet. Ask a volunteer to use the table and identify the triangle. Provide other examples if necessary before completing the student page. Allow the students to refer to the table while completing the activity.

Student page 35 To introduce the activity, work through the first problem on student page 35. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (isosceles) is wrong because “An isosceles triangle has two congruent sides.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (B). Be sure students understand why B is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 35 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 35: 1. A 2. D

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 35 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify triangles according to the lengths of their sides?
Materials
Student page 36

Concept and Handbook Reference
Connect the concept of fact with the concept of factor. (MAH 051)

Get Started
Discuss the relationship between the way we often write rectangular dimensions (2 × 4) with the way we write expressions for multiplication facts. Draw this table on the board. Ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Number</th>
<th>Facts</th>
<th>Factors</th>
<th>Factors in Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 × 1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1 × 2</td>
<td>1, 2</td>
<td>1, 2</td>
</tr>
<tr>
<td>3</td>
<td>1 × 3</td>
<td>1, 3</td>
<td>1, 3</td>
</tr>
<tr>
<td>4</td>
<td>1 × 4, 2 × 2</td>
<td>1, 4, 2</td>
<td>1, 2, 4</td>
</tr>
<tr>
<td>5</td>
<td>1 × 5</td>
<td>1, 5</td>
<td>1, 5</td>
</tr>
<tr>
<td>6</td>
<td>1 × 6, 2 × 3</td>
<td>1, 6, 2, 3</td>
<td>1, 2, 3, 6</td>
</tr>
<tr>
<td>7</td>
<td>1 × 7</td>
<td>1, 7</td>
<td>1, 7</td>
</tr>
<tr>
<td>8</td>
<td>1 × 8, 2 × 4</td>
<td>1, 8, 2, 4</td>
<td>1, 2, 4, 8</td>
</tr>
<tr>
<td>9</td>
<td>1 × 9, 3 × 3</td>
<td>1, 9, 3</td>
<td>1, 3, 9</td>
</tr>
<tr>
<td>10</td>
<td>1 × 10, 2 × 5</td>
<td>1, 10, 2, 5</td>
<td>1, 2, 5, 10</td>
</tr>
</tbody>
</table>

Answers for student page 36:
1. Order may vary in columns two and three but not in column four.

<table>
<thead>
<tr>
<th></th>
<th>Facts</th>
<th>Factors</th>
<th>Factors in Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1 × 11</td>
<td>1, 11</td>
<td>1, 11</td>
</tr>
<tr>
<td>12</td>
<td>1 × 12, 2 × 6, 3 × 4</td>
<td>1, 12, 2, 6, 3, 4</td>
<td>1, 2, 3, 4, 6, 12</td>
</tr>
<tr>
<td>13</td>
<td>1 × 13</td>
<td>1, 13</td>
<td>1, 13</td>
</tr>
<tr>
<td>14</td>
<td>1 × 14, 2 × 7</td>
<td>1, 14, 2, 7</td>
<td>1, 2, 7, 14</td>
</tr>
<tr>
<td>15</td>
<td>1 × 15, 3 × 5</td>
<td>1, 15, 3, 5</td>
<td>1, 3, 5, 15</td>
</tr>
<tr>
<td>16</td>
<td>1 × 16, 2 × 8, 4 × 4</td>
<td>1, 16, 2, 8, 4</td>
<td>1, 2, 4, 8, 16</td>
</tr>
<tr>
<td>17</td>
<td>1 × 17</td>
<td>1, 17</td>
<td>1, 17</td>
</tr>
<tr>
<td>18</td>
<td>1 × 18, 2 × 9, 3 × 6</td>
<td>1, 18, 2, 9, 3, 6</td>
<td>1, 2, 3, 6, 9, 18</td>
</tr>
<tr>
<td>19</td>
<td>1 × 19</td>
<td>1, 19</td>
<td>1, 19</td>
</tr>
<tr>
<td>20</td>
<td>1 × 20, 2 × 10, 4 × 5</td>
<td>1, 20, 2, 10, 4, 5</td>
<td>1, 2, 4, 5, 10, 20</td>
</tr>
</tbody>
</table>

Go Further
Student page 36 Have students answer the questions on the student page.

Answers for student page 36: 2. One 3. Check students’ work. 4. One is a factor of every whole number. 5. Check students’ work. Some numbers have a square array, which only provides one factor instead of the usual two.

Assessment
Student self-assessment page 36 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students comfortable finding all the factors of a number?
**Materials**
Student page 37  
Math Maze cards (Week 8 Activity 37)

**Concept and Handbook Reference**
Find least common multiples. *(MAH 061)*

**Background**
There are two ways to find least common multiples.
1. Make a list of multiples for each number. Stop when you find a multiple in one list that matches one in the other list.
2. Use a Venn diagram and prime factors.

**Example 1:**  
- $12 = 2 \times 2 \times 3$  
- $15 = 5 \times 3$

Factors of 12  
\[ \begin{array}{ccc} 2 & 2 & 3 \\ \end{array} \]

Factors of 15  
\[ \begin{array}{ccc} 5 & 3 \\ \end{array} \]

Since three appears once as a prime factor of 12 and 15, it appears in the intersection only once. The product of the factors in the diagram is the least common multiple: $2 \times 2 \times 3 \times 5 = 60$.

**Example 2:**  
- $8 = 2 \times 2 \times 2$  
- $4 = 2 \times 2$

Factors of 8  
\[ \begin{array}{ccc} 2 & 2 & 2 \\ \end{array} \]

Factors of 4  
\[ \begin{array}{ccc} 2 & 2 \\ \end{array} \]

Since two appears three times as a prime factor of eight and twice as a prime factor of four, it appears in the intersection twice. The two that doesn’t have a partner is only a factor of eight. The product of the factors in the diagram is the least common multiple: $2 \times 2 \times 2 = 8$.

**Get Started**
Discuss with students the two methods for finding least common multiples. Ask them to identify their preferred method and to explain their choice.

**Today’s Challenge**
Distribute the 18 Math Maze cards for week 8. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

**Instructions for playing Math Maze**
Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 188.

**Student page 37**
When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 37 in the student book.

**Answers for student page 37:**  
1. 6  
2. 60  
3. 12  
4. 20  
5. 24  
6. 30  
7. 18  
8. 45  
9. 21  
10. 10

**Go Further**
**Student page 37**
Have students think about the three kinds of results of a search for least common multiples as they complete exercises 11–14.

**Answers for student page 37:**  
11. 3, 10  
12. 1, 4, 6, 9, 13, 2, 5, 7, 8, 14. Check students’ work: it should include the fact that when two numbers have no common factors (other than 1), their least common multiple is also their product.

**Assessment**
**Student self-assessment page 37**
Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip**
Can students consistently and efficiently find the least common multiple of two numbers?
Materials
Student page 38
Blank paper (heavyweight if possible) or index cards

Concept and Handbook Reference
Understand ounces as fractional parts of pounds.
(MAH 317)

Get Started
Have students look at the table on student page 38. Explain that each box represents \( \frac{1}{16} \) of a pound, or one ounce. Write the following questions on the board.

- How many ounces are in \( \frac{1}{2} \) pound? (8)
- How many ounces are in \( \frac{1}{4} \) pound? (4)
- How many ounces are in \( \frac{1}{8} \) pound? (2)

Students will use this information to complete Today’s Challenge.

Today’s Challenge
Student page 38 Have students look at page 38 in the student book. Have them fill in the blanks for questions 1 through 8 to create pairs of equivalent measures.

Answers for student page 38: 1. \( \frac{4}{16} \) or \( \frac{1}{4} \) pound
2. 6 ounces 3. \( \frac{12}{16} \) or \( \frac{3}{4} \) pound 4. 4 ounces
5. \( \frac{7}{8} \) or \( \frac{7}{8} \) pound 6. 2 ounces 7. \( \frac{6}{16} \) or \( \frac{3}{8} \) pound
8. 12 ounces

Go over answers with the whole group or check students’ papers individually.

Go Further
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 38.

Instructions for playing “Concentration” Shuffle the cards and lay them facedown in equal columns. The first player turns over two cards. If the cards match (show equivalent units of measure), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 38 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand ounces as fractional parts of pounds?
Materials
Student page 39
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Use mental math to multiply by 4 and 8. *(MAH 083)*

Get Started
Have students practice using mental math to multiply by 4 and 8. One student calls out a number. Another student multiplies that number by 4 and tells the product. A third student multiplies the same number by 8 and tells the product. For example, one student says 6, the second student says, “6 × 4 = 24,” and a third student says, “6 × 8 = 48.” Make sure students notice the relationship between products of 4 and 8. If the product for 4 is known, the product of the same number times 8 will be twice as much. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with 4 or 8 as a factor.

Fact equations can be made by multiplying any two adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but one of the factors must be 4 or 8. For example, the digits in the top row could be used to form the string 4624, which could be used to make the equation 4 × 6 = 24. Record the equations students make.

Possible equations: 4 × 6 = 24; 4 × 9 = 36;
2 × 8 = 16; 6 × 8 = 48; 8 × 9 = 72

Student page 39 Have students use the Math Jumble on student page 39 to find more strings of digits that can be used to make multiplication equations with 4 or 8 as a factor. Then have them list other equations with 4 or 8 as a factor that are not shown on the Math Jumble.

Answers for student page 39: Possible equations with 4 as a factor: 4 × 4 = 16; 6 × 4 = 24;
4 × 8 = 32; 2 × 4 = 8. Possible equations with 8 as a factor: 4 × 8 = 32; 6 × 8 = 48; 8 × 8 = 64;
8 × 9 = 72. Lists of other equations will vary. Check students’ work.

Go Further
Student page 39 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 39: Grids and equations will vary.

Assessment
Student self-assessment page 39 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use mental math to multiply by 4 and 8?
Materials
Student page 40
Blank paper

Concept and Handbook Reference
Interpret variables used in division equations.
(MAH 243)

Get Started
Write $27 \div 9 = \square$ and $27 \div 9 = x$ on the board. Explain that in algebra, or higher-level math, letters or variables are used in place of unknown numbers. Point out that students are used to seeing blanks and boxes to indicate unknown values. Further explain that it is useful to use inverse operations as a strategy for solving equations using variables. For example, it may be helpful to think “9 times what number ($x$) equals 27?”

Student page 40 To introduce the activity, work through the first problem on student page 40. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A ($x = 5$) is wrong because $5 \times 8 = 40$ so $56 \div 8$ cannot be 5.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 40 Have students work through each problem; ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 40: 1. D  2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 40 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students interpret variables used in division equations?
Materials
Student page 41.

Concept and Handbook Reference
Identify prime numbers. (MAH 053–054)

Background
Any number with exactly two factors is a prime number. Those two factors are always one and the number itself.

Get Started
Draw this table on the board. Ask students to help you fill in the columns.

<table>
<thead>
<tr>
<th>Number</th>
<th>Facts</th>
<th>Factors in Order</th>
<th>Number of Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 × 1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1 × 2</td>
<td>1, 2</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>1 × 3</td>
<td>1, 3</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>1 × 4, 2 × 2</td>
<td>1, 2, 4</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>1 × 5</td>
<td>1, 5</td>
<td>2</td>
</tr>
<tr>
<td>6</td>
<td>1 × 6, 2 × 3</td>
<td>1, 2, 3, 6</td>
<td>4</td>
</tr>
<tr>
<td>7</td>
<td>1 × 7</td>
<td>1, 7</td>
<td>2</td>
</tr>
<tr>
<td>8</td>
<td>1 × 8, 2 × 4</td>
<td>1, 2, 4, 8</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>1 × 9, 3 × 3</td>
<td>1, 3, 9</td>
<td>3</td>
</tr>
<tr>
<td>10</td>
<td>1 × 10, 2 × 5</td>
<td>1, 2, 5, 10</td>
<td>4</td>
</tr>
</tbody>
</table>

Discuss the fourth column in the table.
• What is special about most of the two-factor numbers? (All but one (2) are odd.)
• For every fact with exactly two factors, what pattern do you notice about those factors? (The factors are always one and the number itself.)

Define prime number and ask students to identify the prime numbers in the table. (2, 3, 5, 7)

Today's Challenge
Student page 41 Have students complete the table.

Answers for student page 41: 1.

<table>
<thead>
<tr>
<th>Number</th>
<th>Facts</th>
<th>Factors in Order</th>
<th>Number of Factors</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>1 × 11</td>
<td>1, 11</td>
<td>2</td>
</tr>
<tr>
<td>12</td>
<td>1 × 12, 2 × 6, 3 × 4</td>
<td>1, 2, 3, 4, 6, 12</td>
<td>6</td>
</tr>
<tr>
<td>13</td>
<td>1 × 13</td>
<td>1, 13</td>
<td>2</td>
</tr>
<tr>
<td>14</td>
<td>1 × 14, 2 × 7</td>
<td>1, 2, 7, 14</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>1 × 15, 3 × 5</td>
<td>1, 3, 5, 15</td>
<td>4</td>
</tr>
<tr>
<td>16</td>
<td>1 × 16, 2 × 8, 4 × 4</td>
<td>1, 2, 4, 8, 16</td>
<td>5</td>
</tr>
<tr>
<td>17</td>
<td>1 × 17</td>
<td>1, 17</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>1 × 18, 2 × 9, 3 × 6</td>
<td>1, 2, 3, 6, 9, 18</td>
<td>6</td>
</tr>
<tr>
<td>19</td>
<td>1 × 19</td>
<td>1, 19</td>
<td>2</td>
</tr>
<tr>
<td>20</td>
<td>1 × 20, 2 × 10, 4 × 5</td>
<td>1, 2, 4, 5, 10, 20</td>
<td>6</td>
</tr>
</tbody>
</table>

Go Further
Student page 41 Help students explore prime numbers.

Answers for student page 41: 2. 2, 3, 5, 7, 11, 13, 17, 19. 3. Check students’ work: one is a factor of all other numbers. One is also the only number that has only one factor. 4. No; it does not fit the rule for being a prime number. It also stands alone with only one factor. 5. Check students’ work.

Assessment
Student self-assessment page 41 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand why prime numbers are special?
Materials
Student page 42
Math Maze cards (Week 9 Activity 42)

Concept and Handbook References
Use multiplication and division in context. (MAH 137–143, 144–155)

Get Started
Review mental math techniques for multiplying and dividing, but allow students to use paper and pencil if they need the extra confidence. Ask the following questions.
- How many eyes do 16 people have? (32)
- How many cans of soda are in 11 six-packs (66)
- How many days are in 14 weeks? (98)

Today’s Challenge
Distribute the 18 Math Maze cards for week 9. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 189.

Student page 42 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 42 in the student book.

Answers for student page 42: 2. M; 2 × 29; 58
3. M; 25 × 3; 75 4. M and D; 10 × 12 ÷ 6; 20
5. D; $3.30 ÷ 30; 11¢ 6. M; 9 × 2 × 11; 198
7. M; 8 × 3; 24 8. M; 26 × 7; 182
9. D; 190 ÷ 10; 19 10. M; 17 × 6; 102
11. M; 3 × 4; 12

Go Further
Student page 42 Have students write a word problem and share it with a friend.

Answers for student page 42: 12. Check students’ work.

Assessment
Student self-assessment page 42 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students successfully translate words into mathematical expressions?
Materials
Student page 43
Blank paper

Concept and Handbook Reference
Determine side length of a regular hexagon when given the perimeter. (MAH 357)

Get Started
Remind students that the perimeter of any polygon is the sum of the lengths of the sides. In a regular hexagon the sides are equal, so the perimeter can be found by multiplying the length of one side by 6. This means that the perimeter is the product of 6 and one other factor. Ask students how to find the side length of a regular hexagon if they know the perimeter. Point out that multiplication and division are inverse operations.

Student page 43 Have students use this information to answer the questions in the Get Started section of page 43 in their books.

Answers for student page 43: 1. 12 2. 8

Today’s Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and trace one of the regular hexagons on page 43 of their books. Have students choose a perimeter for this hexagon from the numbers 6 to 120 and record their selection by writing “Perimeter = ___ meters” under the traced hexagon. Have students determine the side lengths of the hexagon for the perimeter they have chosen. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their hexagons and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is the side length of your hexagon an odd number? If yes, score 10 points.
2. Is the side length of your hexagon greater than 3 and less than 9 m? If yes, score 5 points.
3. Is the side length of your hexagon greater than 15 and less than 20 m? If yes, score 9 points.
4. Is the side length of your hexagon the same as \( \frac{1}{2} \) of a dozen? If yes, score 15 points.
5. Is the side length of your hexagon a multiple of 2? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student draw the hexagon on the board and explain how he or she scored the points.

Go Further
Student page 43 Have students solve the riddle, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 43: 3. 10 4–5. Students’ own riddles will vary. Make sure students include specific linear units, either customary or metric.

Assessment
Student self-assessment page 43 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students know how to determine the side length of a regular hexagon when given its perimeter?
Materials
Student page 44
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Rewrite fractions as whole or mixed numbers.
(MAH 034)

Background
\( \frac{6}{2} \) is the same as 3. \( \frac{6}{2} = 3 \). Fractions can be written as whole numbers. \( \frac{3}{2} \) is the same as \( 1\frac{1}{2}; \frac{1}{2} = 1\frac{1}{2} \). Fractions can be written as mixed numbers.

Get Started
Have students practice writing fractions as whole or mixed numbers. Write the fraction \( \frac{5}{4} \) on the board. Explain that this fraction can be written as the whole number \( 3; \frac{6}{2} \) = 3. Write the fraction \( \frac{3}{5} \) on the board. Explain that this fraction can be written as the mixed number \( 1\frac{1}{2}; \frac{3}{2} \div 2 = 1 \), remainder 1. The remainder becomes the numerator of the fraction part of the mixed number. The denominator is the divisor.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to make as many fractions equal to or greater than 1 as possible and then to rewrite those fractions as whole and mixed numbers.

Fractions can be made with any two adjoining digits (horizontally and/or vertically) on the poster. A digit can be used as either the numerator or denominator of the fraction, remembering that the fraction must be greater than or equal to 1. Digits on the poster can be used more than once. For example, the first two digits in the second column are 8 and 3. The fractions \( \frac{2}{3} \) and \( \frac{8}{6} \) can be made. Since \( \frac{2}{3} \) is less than 1, use \( \frac{8}{6} \). \( \frac{2}{3} \) can be rewritten as \( 2\frac{2}{3} \). Record the fractions and mixed and whole numbers students make.

Possible answers: \( \frac{5}{4} = 1\frac{1}{4}; \frac{3}{5} = 1; \frac{8}{6} = 2\frac{2}{3}; \frac{2}{3} = 3; \frac{6}{5} = 1\frac{1}{5}; \frac{3}{1} = 3; \frac{7}{2} = 3\frac{1}{2} \)

Student page 44 Have students use the Math Jumble on student page 44 to find fractions equal to or greater than 1. Then have them rewrite the fractions as whole and mixed numbers.

Possible answers for student page 44: \( \frac{7}{1} = 7; \frac{8}{2} = 4; \frac{5}{3} = 1\frac{2}{3}; \frac{9}{4} = 2\frac{1}{4}; \frac{6}{5} = 1; \frac{2}{3} = 2\frac{2}{3}; \frac{4}{3} = 1\frac{1}{3} \)

Go Further
Student page 44 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 44: Grids, fractions, and whole and mixed numbers will vary.

Assessment
Student self-assessment page 44 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students rewrite fractions as whole and mixed numbers?
Materials
Student page 45
Blank paper

Concept and Handbook Reference
Identify common multiples of two numbers.
(MAH 061)

Get Started
Write the number 4 on the board. Explain that the multiples of 4 are found by skip counting. Record 0, 4, 8, 12, . . . on the board. List the first ten multiples of 4 and 6 on the board. Circle the common multiples (see example below). Discuss the concept of common multiples and provide practice with other number pairs before introducing the activity page.

Example:
Multiples of 4: 0, 4, 8, 12, 16, 20, 24, 28, 32, 36
Multiples of 6: 0, 6, 12, 18, 24, 30, 36, 42, 48, 54

Student page 45 To introduce the activity, work through the first problem on student page 45. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (4, 6, 8) is wrong because "4, 6, and 8 are skip counting by 2, not by 4 or by 8." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 45 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 45: 1. D 2. C

When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 45 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip: Can students identify common multiples of two numbers?
Materials
Student page 46

Concept and Handbook Reference
Review patterns in multiplying by 10 and 100. (MAH 085–086)

Get Started
Write the following two columns of numbers on the board. Include the alphabetic labels with them.

| a. 3 | g. 5.25 |
| b. 5\(\frac{1}{2}\) | h. 3.0 |
| c. 7 | i. 9.1 |
| d. 9\(\frac{1}{10}\) | j. 7.00 |
| e. 17 | k. 5.5 |
| f. 5\(\frac{1}{4}\) | l. 17.000 |

Ask students to match each number in the second column with its equivalent from the first column. (a-h; b-k; c-j; d-i; e-l; f-g) Now, erase the table and write a new one in its place, asking students to help you generate the numbers in the third column.

| 3.0 | × 10 | 30 |
| 9.1 | × 10 | 91 |
| 5.5 | × 10 | 55 |
| 7.00 | × 10 | 70.0 |
| 5.25 | × 10 | 52.5 |
| 17.000 | × 10 | 170.00 |

Ask the students to think of a rule that they can apply when a number is multiplied by 10. (The decimal point moves one place to the right.)

Add another × 10 column and ask students to use their rule to generate the new products.

| 3.0 | × 10 | 30 | × 10 | 300 |
| 9.1 | × 10 | 91 | × 10 | 910 |
| 5.5 | × 10 | 55 | × 10 | 550 |
| 7.00 | × 10 | 70.0 | × 10 | 700 |
| 5.25 | × 10 | 52.5 | × 10 | 525 |
| 17.000 | × 10 | 170.00 | × 10 | 1700 |

Discuss the relationship of multiplying by 10, then by 10 again to multiplying by 100. Relate the rule for multiplying by 10 to a rule for multiplying by 100. (The decimal point moves two places to the right.)

Today's Challenge
Student page 46 Have students fill in the table.

Answers for student page 46: 1.

<table>
<thead>
<tr>
<th>Number</th>
<th>× 10</th>
<th>× 100</th>
<th>× 1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1416</td>
<td>31.416</td>
<td>314.16</td>
<td>3141.6</td>
</tr>
<tr>
<td>10</td>
<td>100</td>
<td>1000</td>
<td>10,000</td>
</tr>
<tr>
<td>7.501</td>
<td>75.01</td>
<td>750.1</td>
<td>7501</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>200</td>
<td>2000</td>
</tr>
<tr>
<td>20</td>
<td>200</td>
<td>2000</td>
<td>20,000</td>
</tr>
<tr>
<td>10.01</td>
<td>100.1</td>
<td>1001</td>
<td>10,010</td>
</tr>
<tr>
<td>100</td>
<td>1000</td>
<td>10,000</td>
<td>100,000</td>
</tr>
</tbody>
</table>

Go Further
Student page 46 Help students extend the rules for multiplying by powers of 10 to multiplying by multiples of 10.

Answers for student page 46: 2. Two 3.

<table>
<thead>
<tr>
<th>Number</th>
<th>× 10</th>
<th>× 20</th>
<th>× 30</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>100</td>
<td>200</td>
<td>300</td>
</tr>
<tr>
<td>2</td>
<td>20</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>20</td>
<td>200</td>
<td>400</td>
<td>600</td>
</tr>
<tr>
<td>6</td>
<td>60</td>
<td>120</td>
<td>180</td>
</tr>
<tr>
<td>1.2</td>
<td>12</td>
<td>24</td>
<td>36</td>
</tr>
<tr>
<td>2.5</td>
<td>25</td>
<td>50</td>
<td>75</td>
</tr>
</tbody>
</table>

4–5. Check students' work. Possible answer: multiply by the number of tens, then by 10 (6 × 20 = 6 × 2 × 10).

Assessment
Student self-assessment page 46 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students able to discuss and revise their computation rules?
Materials
Student page 47
Math Maze cards (Week 10 Activity 47)

Concept and Handbook Reference
Add fractions with denominators of 2, 5, and 10.
(MAH 157–161)

Background
Numerator \( \rightarrow \frac{1}{5} = \frac{2}{10} \) Equivalent Fraction
Denominator \( \rightarrow \) Fraction

A common denominator is a common multiple of the original denominators. Often, the least common multiple is used for this purpose.

\[
\frac{1}{5} + \frac{1}{10} =
\frac{2}{10} + \frac{1}{10} = \frac{3}{10}
\]

Sum of Numerators Same Denominator

Get Started
Talk about the role of the numerator and denominator in fractions. Then, discuss the reasons for making sure the denominators are the same before adding. (Adding \( \frac{1}{5} \) to \( \frac{1}{10} \) is like adding apples to oranges, but adding \( \frac{1}{10} \) to \( \frac{1}{10} \) is like adding fruit to fruit.) Pose these problems and ask students to explain their thinking.

- How much is \( \frac{1}{10} + \frac{1}{2} \) \( \left( \frac{1}{5} \text{ or } \frac{2}{10} \right) \)
  When the denominator is the same, add the numerators.

- How much is \( \frac{1}{10} + \frac{1}{5} \) \( \left( \frac{1}{2} \text{ or } \frac{2}{10} \right) \)
  You need to find a common denominator.
  A common denominator is 10, so another way of expressing this problem is \( \frac{1}{10} + \frac{2}{10} \).

\[
\frac{1}{10} + \frac{1}{5} = \frac{1}{10} + \frac{2}{10} = \frac{3}{10}
\]

Today's Challenge
Distribute the 18 Math Maze cards for week 10. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 190.

Student page 47 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 47 in the student book.

Answers for student page 47: 1. \( \frac{7}{10}, \frac{2}{5}, \frac{1}{2}, \frac{1}{10} \)
2. \( \frac{1}{10}, \frac{1}{5}, \frac{1}{2}, \frac{1}{10} \)
3. \( \frac{1}{2}, \frac{1}{5}, \frac{1}{10}, \frac{1}{10} \)
4. \( \frac{1}{2}, \frac{1}{5}, \frac{1}{10}, \frac{1}{10} \)

Go Further
Student page 47 Have students complete this section of the student page.

Answers for student page 47: 4. \( \frac{2}{5}, \frac{1}{2}, \frac{7}{10}, \frac{4}{5}, \frac{9}{10}, \frac{1}{10}, \frac{1}{5}, \frac{1}{2}, \frac{1}{5}, \frac{1}{2} \)

Assessment
Student self-assessment page 47 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students consistently remember to look for a common denominator?
Materials
Student page 48
Blank paper

Concept and Handbook Reference
Identify patterns in multiples of 9. (MAH 059)

Get Started
Begin by making a two-column table on the board for multiples of 9. Label the columns “tens” and “ones”. Ask students to skip count by 9 through 108. Explain that when we skip count by 9, we are naming the multiples of 9. Record the multiples of 9 on the table. Ask students what patterns they see. For example, the digits in the ones place decrease by one; the digits in the tens place increase by one.

Ask students, “What is the sum of the digits in the multiples of 9?” (The sum is always 9, except for 99. However, 9 + 9 = 18, and 1 + 8 = 9.)

Today’s Challenge
Explain that today the class will be playing a game called “Fantastic Finalist.” Give each student a piece of paper with one of the multiples of 9 (through 108) written on it.

You do not have to use all the multiples of 9, but be sure that one student receives the number 45, since that number will be the “Fantastic Finalist.”

Have all students hold their numbers and stand in a large circle. Explain that the object of the game is to be the “Fantastic Finalist,” the last student to remain standing.

Read each of the following challenges, one at a time.

- If your number is a one-digit number, sit down. (9)
- If your number is greater than or equal to 9 × 10, sit down. (90, 99, 108)
- If your number is less than or equal to 9 × 4, sit down. (18, 27, 36)
- If the digit in the ones place is even, sit down. (54, 72)
- If the digit in the tens place is greater than the digit in the ones place, sit down. (63, 81)

At this point, only the student holding the number 45 should still be standing. That student is the “Fantastic Finalist.”

Go Further
Student page 48 Have students complete the activity on the student page.

Answers for student page 48: 1. 48 2. 126, 162 3. Answers will vary. Possible explanation: the sum of the digits in the numbers is 9.

Assessment
Student self-assessment page 48 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students identify multiples of 9? Do students see patterns related to multiples of 9?
Materials
Student page 49
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Name equivalent fractions. (MAH 035)

Get Started
Begin by brainstorming a list of fractions that are equivalent to $\frac{1}{2}$. Have students call out any equivalent fractions they can think of. Repeat this procedure for fractions that are equivalent to $\frac{1}{3}$. Do this until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find as many fractions as possible that are equivalent to $\frac{1}{2}$ or to $\frac{1}{3}$.

Fractions can be made with any two adjoining digits (horizontally and/or vertically) on the poster. A digit can be used as either the numerator or denominator of the fraction, remembering that the fraction must be equivalent to either $\frac{1}{2}$ or to $\frac{1}{3}$. Digits on the poster can be used more than once. For example, the 2 and 6 in the center of the second row can be used to form the fraction $\frac{2}{6}$, which is equivalent to $\frac{1}{3}$. Record the fractions that students make.

Possible answers: $\frac{1}{2} = \frac{2}{4}$, $\frac{3}{6}$, $\frac{5}{10}$, $\frac{1}{3} = \frac{2}{6}$, $\frac{3}{9}$

Student page 49 Have students use the Math Jumble on student page 49 to find more fractions that are equivalent to $\frac{1}{2}$ or to $\frac{1}{3}$.

Answers for student page 49: $\frac{1}{2} = \frac{2}{4}$, $\frac{3}{6}$, $\frac{4}{8}$, $\frac{6}{12}$,
$\frac{1}{3} = \frac{2}{6}$, $\frac{1}{9}$, $\frac{4}{12}$, $\frac{5}{15}$

Go Further
Student page 49 Have students complete the problems in the student book. Have them write down their solution strategies.

Answers for student page 49: $\frac{1}{2} = \frac{2}{4}$, $\frac{8}{16}$, $\frac{50}{100}$, $\frac{1}{3} = \frac{3}{9}$,
$\frac{6}{18}$, $\frac{25}{75}$. Solution strategies will vary.

Assessment
Student self-assessment page 49 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students name fractions that are equivalent to $\frac{1}{2}$ or to $\frac{1}{3}$?
Materials
Student page 50
Blank paper

Concept and Handbook Reference
Solve one-digit by two- or three-digit multiplication problems using partial products. (MAH 137–138)

Get Started
Write the equation $48 \times 9$ and $247 \times 6$ vertically on the board. Demonstrate the algorithm (procedure) of partial products as shown below. Point out the role and pattern of the zero. Practice this algorithm with several different examples before proceeding with the student page.

\[
\begin{align*}
48 & = 40 + 8 \\
\times 9 & = \times 9 \\
72 & = 72 \\
+360 & = +360 \\
432 & = 432 \\
\end{align*}
\]

\[
\begin{align*}
247 & = 200 + 40 + 7 \\
\times 6 & = \times 6 \\
42 & = 42 \\
+1200 & = +1200 \\
1482 & = 1482 \\
\end{align*}
\]

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 50 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 50: 1. D 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 50 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve multi-digit multiplication problems using the partial products algorithm?
Materials
Student page 51

Concept and Handbook Reference
Write an equation for a generalized rule.
(MAH 237–241)

Get Started
Pose this problem.

Lisa's teacher likes to hang up her students' work in the classroom. She hangs them from a clothesline rope in the back of the room. She uses two clips to hang one paper. To hang each additional paper, she uses one more clip.

Now, draw this T-table on the board. Ask students to help you fill in the table.

<table>
<thead>
<tr>
<th>Number of Papers</th>
<th>Number of Clips</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

Today's Challenge
Student page 51 Ask whether anyone can predict, without actually counting or drawing, how many clips the teacher needs to hang 10 papers, or 15 papers, or any number of papers.

Answers for student page 51: 1. 6  2. 7  3. 8  4. 9

Go Further
Student page 51 Have students formulate a rule for the papers and clips problem.

Answers for student page 51: 5. 11, because the number of clips seems to always be one more than the number of papers. 6. 16, because the number of clips is always one more than the number of papers. 7. 24, because it is one more than the 23 papers. 8. The number of clips needed for any number of papers is always one more than the number of papers; c = p + 1.

Assessment
Student self-assessment page 51 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students write a symbolic representation of a general rule?
Materials
Student page 52
Math Maze cards (Week 11 Activity 52)

Concept and Handbook Reference
Review place value and powers of 10.
(MAH 003–010)

Background
Our place value system rests on powers of ten. That is, the ones place is the same as 10^0, the tens place is 10^1, the hundreds place is 10^2, the thousands place is 10^3, the ten thousands place is 10^4, and so on.

Get Started
Review place value and exponential notation, then ask the following questions.
• What is 1993 + 10? (2003) How do you know?
• What is 2 \times 10^3 + 3 \times 10^2 + 7 \times 10^1? (2000 + 300 + 70 = 2370) How do you know?
• What is 10^4 − 10^3? (10,000 − 100 = 9900) How do you know?
• What digit is in the ten thousands place of 9,876,543? (7)
You may wish to provide scratch paper for students to use as they play the Math Maze game.

Today’s Challenge
Distribute the 18 Math Maze cards for week 11. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 190.

Student page 52 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 52 in the student book.

Answers for student page 52: 1. 134,012
2. 133,999 3. 7409 4. 90,000 5. 421,902
6. 134,199 7. 133,199 8. 1014 9. 9,645,292
10. 8004

Go Further
Student page 52 Have students order their answers to exercises 1–10, then write their own problems to share with a friend.

Answers for student page 52: 11. 1014; 7409; 8004; 90,000; 133,199; 133,999; 134,012; 134,199; 421,902; 9,645,292 12. Check students’ work.

Assessment
Student self-assessment page 52 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students comfortable with the relationship between place value and powers of 10?
Materials
Student page 53
Blank paper

Concept and Handbook Reference
Estimate products in multi-digit multiplication problems. (MAH 106–111)

Get Started
Write the following problem on the board.

\[ 85 \times 23 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, when multiplying a two-digit number by a two-digit number, the product is most often a four-digit number; if the numbers are rounded to the tens place, the problem is 90 \( \times \) 20, or about 1800. Be sure to accept and welcome all valid strategies for estimating products.

Today’s Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and create a two-digit number times a two-digit number multiplication problem with a product between 2000 and 5000. Have the students write an estimate of the product and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 2200 and less than 3800? If yes, score 8 points.
2. Did your strategy involve rounding both factors? If yes, score 10 points.
3. Did your strategy involve rounding only one factor? If yes, score 9 points.
4. Is your estimate greater than 4000 and less than 5000? If yes, score 15 points.
5. Did your strategy result in an estimate less than the real product? If yes, score 12 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 53 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 53: 1. 1400
2. 4860 (60 \( \times \) 81) or 4960 (62 \( \times \) 80)
3–4. Students’ own riddles will vary.

Assessment
Student self-assessment page 53 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit multiplication problem?
Materials
Student page 54
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add decimals. (MAH 125–126)

Background
Adding decimal numbers is like adding whole numbers. The digits in the ones place and the decimal points must be lined up to get the correct sum.

Get Started
Have students practice adding decimals. Write the following problem on the board.

\[
\begin{array}{c}
1.25 \\
+2.42 \\
\end{array}
\]

Equations can be made with any four adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once. For example, the digits in the first row form 3653, which can be used to make the equation 0.36 + 0.53 = □. Students then calculate the sum, 0.89. Record the equations students make.

Possible equations: 0.36 + 0.53 = 0.89;
0.27 + 0.37 = 0.64; 0.36 + 0.27 = 0.63;
0.54 + 0.35 = 0.89; 0.27 + 0.15 = 0.42

Student page 54 Have students use the Math Jumble on student page 54 to find strings of digits that can be used to make addition equations for decimals with sums that are equal to or less than 1. Students must supply the zeroes in the ones places and the sum for each equation.

Possible answers for student page 54:
0.46 + 0.28 = 0.74; 0.57 + 0.32 = 0.89;
0.43 + 0.54 = 0.97; 0.26 + 0.36 = 0.62;
0.46 + 0.26 = 0.72; 0.56 + 0.32 = 0.88;
0.32 + 0.36 = 0.68; 0.57 + 0.16 = 0.73;
0.43 + 0.57 = 1; 0.63 + 0.23 = 0.86

Go Further
Student page 54 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 54: Grids and equations will vary.

Assessment
Student self-assessment page 54 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly add decimals?

3653
6244
2737
7158
Materials
Student page 55
Blank paper

Concept and Handbook Reference
Solve problems involving temperature.
(MAH 319–320)

Get Started
Display or draw a thermometer on the board. Discuss the basic function and purpose of the thermometer. Illustrate the concepts of increasing and decreasing temperatures. Model comparing the difference between two temperatures through subtraction.

Student page 55 To introduce the activity, work through the first problem on student page 55. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (54°) is wrong because "the temperatures were added to get 54°. To find a difference, you need to subtract." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 55 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.


When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 55 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve problems involving temperature?
Materials
Student page 56

Concept and Handbook Reference
Write an equation for a generalized rule.
(MAH 237–241)

Get Started
Draw the T-table and one house-shaped pentagon on the board.

<table>
<thead>
<tr>
<th>Number of Pentagons (p)</th>
<th>Number of Straws (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
</tbody>
</table>

Review the definition of pentagon, then pose this problem.

The students in Tony’s group are planning to construct pentagons with straws. They are planning to connect the pentagons to each other.

Attach a second pentagon to the first one, having them share a side, then add a row for this to the T-table.

Ask students to figure out the total number of straws needed for two pentagons. Record the answer in the T-table.

<table>
<thead>
<tr>
<th>Number of Pentagons (p)</th>
<th>Number of Straws (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Today’s Challenge
Student page 56 Have students study the diagram and complete the table.

Answers for student page 56: 1. 13  2. 17  3. 21
4. 6  5. 29  6. 8

Go Further
Student page 56 Help students figure out a rule for finding the number of straws for any number of pentagons.

Answers for student page 56: 7. Check students’ work: four straws are needed for each new pentagon, but the first has five straws. 8. 41; check students’ explanations. 9. 61; check students’ explanations. 10–11. s = 4p + 1; check students’ work.

Assessment
Student self-assessment page 56 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students generalize a rule and write a mathematical equation that describes it?
Materials
Student page 57
Math Maze cards (Week 12 Activity 57)

Concept and Handbook Reference
Find the value of a variable in an equation.
(MAH 242–243)

Get Started
Discuss the use of a variable in an expression or equation. Then ask the following questions.
• If 5x is 15, what is x? (3) How do you know?
• If 10 + x is 16, what is x? (6) How do you know?
• If 4x = 0, what is x? (0) How do you know?

Today’s Challenge
Distribute the 18 Math Maze cards for week 12. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

Note: Some students may need to see these problems written out on the board.

The correct sequence of questions and answers is shown on page 191.

Student page 57 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 57 in the student book.

Answers for student page 57: 1, 10 2, 36 3, 9 4, 63 5, 24 6, 3, 7, 9 8, 12 9, 27 10, 11

Go Further
Student page 57 Have students write their own equations.

Answers for student page 57: 11–15. Check students’ work.

Assessment
Student self-assessment page 57 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students work backward to find the value of the variable in an equation?
Materials
Student page 58
Blank paper
Index cards (optional)

Concept and Handbook References
Review equivalent fractions, decimals, and percents.
(MAH 019–020, 043–044, 189–190)

Get Started
Review the relationships among fractions, decimals, and percents. Explain that equivalent fractions, decimals, and percents are different names for the same amount. Ask students how they would write one fifth in fraction, decimal, and percent forms. Write the responses on the board. \(\frac{1}{2}, 0.2, \frac{2}{10}, 2, \frac{1}{2}, 0.2, \text{ and } 20\%\) Ask students how they would write two fifths in fraction form. \(\frac{2}{5}\) What other fractions are equivalent to \(\frac{2}{5}\) ? \(\frac{4}{10}, \frac{40}{100}\) Ask students how they would write \(\frac{3}{5}\) as a decimal. \(0.60 \text{ or } 0.6\) Ask students how they would write \(\frac{3}{5}\) as a percent. \(80\%\)

Today’s Challenge
Student page 58 Have students complete the table on page 58 of their books. Explain that all answers for each numbered problem should be equal to the given word form. Have students fill in the forms that are missing. Review the answers with the class.

Answers for student page 58: 1. \(\frac{4}{10}, \frac{40}{100}, 0.4 \text{ or } 0.40, 40\%\) 2. \(\frac{3}{7}, \frac{2}{10}, 0.2 \text{ or } 0.20, 20\%\) 3. \(\frac{8}{10}, \frac{80}{100}, 0.8 \text{ or } 80\%\) 4. \(\frac{3}{5}, \frac{60}{100}, 0.6 \text{ or } 0.60, 60\%\)

Go over answers with the whole group or check students’ papers individually.

Go Further
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 16 small pieces of paper or 16 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 58. Students should not copy the amounts in the Word Form column. Only the amounts in the Fraction, Decimal, and Percent Form columns should be copied.

Instructions for playing “Concentration” Shuffle the cards and lay them facedown in equal columns. Each player turns over a card. The player with the greater value goes first. Turn the cards over so that all cards are again facedown. The first player turns over two cards. If the cards match (show different names for equivalent amounts), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 58 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students recognize different fraction, decimal, and percent names for the same amount?
Materials
Student page 59.
Math Jumble activity poster and digit cards

Concept and Handbook References
Multiply to reach a product equal to or less than 100. (MAH 083–088, 106–111)

Background
$3 \times 30 = 5 \times 5 \times 3 =$
Are the products equal to or less than 100?

Get Started
Begin by brainstorming multiplication facts with products equal to or less than 100. One student calls out a two-digit number. Another student calls out a one-digit number. Then a third student gives the fact and tells how close the product is to 100. For example, one student calls out 30, the second student calls out 3, and the third student says, “$30 \times 3 = 90$; 90 is 10 away from 100.” If the product is greater than 100, the students try again. Or three students each call out a single-digit factor with a fourth student stating the product. For example, one student calls out 5, another student calls out 5, and a third student calls out 3. The fourth student says, “$5 \times 5 \times 3 = 75$. 75 is 25 away from 100.” If the product is greater than 100, the students try again. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with products equal to or less than 100. Each equation must include a one-digit and a two-digit factor or three single-digit factors. The product will not appear in the string of digits.

Multiplication equations can be made by connecting adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but the product must be equal to or less than 100. For example, the first three digits in the first column could be used to form the string 166, which can be used to make the multiplication equation $16 \times 6 = □$. Students provide the product for each equation they make.

Possible equations: $16 \times 6 = 96; 6 \times 5 \times 3 = 90; 25 \times 4 = 100; 4 \times 7 \times 3 = 84; 49 \times 2 = 98; 29 \times 3 = 87; 2 \times 38 = 76; 3 \times 8 \times 4 = 96; 4 \times 9 \times 2 = 72$

Student page 59 Have students use the Math Jumble on student page 59 to find more strings of digits.

Possible answers for student page 59: $32 \times 3 = 96; 3 \times 8 \times 4 = 96; 45 \times 2 = 90; 2 \times 5 \times 9 = 90; 4 \times 5 \times 5 = 100; 15 \times 6 = 90; 23 \times 4 = 92; 4 \times 3 \times 7 = 84; 26 \times 3 = 78; 22 \times 3 = 66$

Go Further
Student page 59 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 59: Grids and equations will vary.

Assessment
Student self-assessment page 59 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students multiply to reach a product equal to or less than 100?
**Rule Out Two**

**Materials**
Student page 60
Blank paper

**Concept and Handbook Reference**
Identify prisms by attributes of corners, faces, and edges. (MAH 382–383)

**Get Started**
Display a box (rectangular prism) or other similar object. Introduce and define the term attributes. Count and list on the board the number of faces, corners, and edges that are found on the rectangular prism. Explain how the base shape of a prism is identified. Explain that the number of faces of a prism is equal to 2 plus the number of sides of the base. The 2 represents the top and base of every prism. The number of corners of a prism is equal to 2 times the number of sides of the base. The number of edges of a prism is equal to 3 times the number of sides of the base. Discuss why each of these formulas is true. Draw a comparison between a rectangular prism and a cube. Draw, discuss, and analyze other prisms (triangular, pentagonal, hexagonal, and so on).

**Student page 60** To introduce the activity, work through the first problem on student page 60. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (triangular prism) is wrong because “The three sides of the base triangle plus two for the top and base equals 5 faces.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (B). Be sure students understand why B is correct.

**Today’s Challenge**
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

**Student page 60** Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

**Answers for student page 60:** 1. C 2. D

When all students’ papers have been scored, determine the high scorer(s) for the day.

**Go Further**
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

**Assessment**

**Student self-assessment page 60** Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students identify different prisms by their attributes?
Materials
Student page 61

Concept and Handbook Reference
Use a ratio to write an equation. (MAH 178–180)

Get Started
Draw this T-table on the board and ask students to think about preparing juice or lemonade from a concentrate. Ask them to help you fill in the table.

<table>
<thead>
<tr>
<th>Cans of Concentrate</th>
<th>Cans of Added Water</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>

Talk about how the relationship between the cans of concentrate (1) and the cans of needed water (3) is called a ratio. In a ratio, it is important to remember the order of the items being compared. In this case, the cans of concentrate are mentioned first and then the cans of water. The ratio of concentrate to water is 1 to 3.

Today's Challenge
Student page 61 Have students fill in the table and write some ratios:

Answers for student page 61:

1. Cans of Juice Concentrate (j) | Cans of Added Water (w)
---|---
1 | 4
2 | 8
3 | 12
4 | 16
5 | 20
6 | 24
7 | 28
8 | 32
9 | 36
10 | 40

2. 1 to 4  3. 4 to 1

Go Further
Student page 61 Have students write an equation describing the amount of water in terms of the amount of concentrate.

Answers for student page 61: 4. They are increasing by 1. 5. The numbers increase by 4. 6. The amount of water is four times the amount of the concentrate. 7. Students should explain that each can of concentrate needs four cans of water to go with it. 8–9. Check students' work; w = 4j.

Assessment
Student self-assessment page 61 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand how a ratio can relate to a multiplication equation?
Materials
Student page 62
Math Maze cards (Week 13 Activity 62)

Concept and Handbook Reference
Practice division with whole numbers.
(MAH 144–152)

Get Started
Discuss division quotients between whole numbers.
30 ÷ 5 = 6 and 35 ÷ 5 = 7, so dividends between
30 and 35 with divisors of 5 have quotients
between 6 and 7. Ask, “If the answer is two remain-der two, what could the problem be?” Make a list.

8 ÷ 3 would work
10 ÷ 4 would work
12 ÷ 5 would work
14 ÷ 6 would work
16 ÷ 7 would work
and so forth

Today’s Challenge
Distribute the 18 Math Maze cards for week 13.
Each student should receive at least one card, but
since all cards need to be distributed, some students
may need to get more than one card. Use the cards
to play the Math Maze game.

Instructions for playing Math Maze Ask students to
look at their cards. Ask one student to read the
question that is written on his or her card. Next ask,
“Who has the card with the answer to the question
just read?” Ask that student to read the answer, and
then read the question on his or her card. Play con-
tinues until all questions have been answered. The
last answer to be read should be the answer on the
first student’s card.

The correct sequence of questions and answers is
shown on page 191.

Student page 62 When the group has finished play-
ing the game, have students open their books and
complete the Today’s Challenge activity on page 62
in the student book.

Answers for student page 62: 1. 61 ÷ 8  2. 37 ÷ 9
3. 17 ÷ 8  4. 31 ÷ 5  5. 28 ÷ 5  6. 26 ÷ 3
7. 25 ÷ 5  8. 48 ÷ 8

Go Further
Student page 62 Have students complete this sec-
tion of the student page.

Answers for student page 62: 9–11. Explanations
will vary. 9. 6 cars  10. $5.50  11. 5 notebooks

Assessment
Student self-assessment page 62 Have students cir-
cle one of the three choices to describe how they
feel about this activity.

Assessment tip Do students have a good sense of
the way quotients can fall between whole numbers?
Materials
Student page 63
Blank paper

Concept and Handbook Reference
Determine the side length of a regular octagon when given the perimeter. (MAH 357)

Get Started
Remind students that the perimeter of any polygon is the sum of the lengths of the sides. In a regular octagon the sides are equal, so the perimeter can be found by multiplying the length of one side by 8. This means that the perimeter is a product of 8 and one other factor. Ask students how to find the side length of a regular octagon if they know the perimeter. Point out that multiplication and division are inverse operations.

Student page 63 Have students use this information to answer the questions in the Get Started section of page 43 in their books.

Answers for student page 63: 1. 24 2. 8

Today’s Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and trace one of the regular octagons on page 63 of their books. Have students choose a perimeter for this octagon from the numbers 8 to 160 and record their selection by writing “Perimeter = _____ inches” under the traced octagon. Have students determine the side lengths of the octagon for the perimeter they have chosen. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their octagons and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is the side length of your octagon an odd number? If yes, score 10 points.
2. Is the side length of your octagon greater than 3 and less than 9 in.? If yes, score 5 points.
3. Is the side length of your octagon greater than 15 and less than 20 in.? If yes, score 9 points.
4. Is the side length of your octagon the same as $\frac{1}{3}$ of a foot? If yes, score 15 points.
5. Is the side length of your hexagon a multiple of 2? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student draw the octagon on the board and explain how he or she scored the points.

Go Further
Student page 63 Have students solve the riddle, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 63: 3. 7 4–5. Students’ own riddles will vary. Make sure students include specific linear units, either customary or metric.

Assessment
Student self-assessment page 63 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students know how to determine the side length of a regular octagon when given its perimeter?
Materials
Student page 64
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Divide two-digit numbers by one-digit numbers to get remainders equal to or less than 4 and greater than 0. (MAH 146-149)

Get Started
Have students practice using mental math to divide two-digit by one-digit numbers with remainders equal to or less than 4 and greater than 0. One student calls out a two-digit number, another student calls out a one-digit divisor that will yield a remainder equal to or less than 4 and greater than 0. A third student calls out the quotient and the remainder. If the remainder is greater than 4, or if it is 0, the three students try again. For example, one student calls out 28 and the second student calls out 6. The third student says, "28 ÷ 6 = 4 remainder 4." Continue until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of digits that could be used to make division equations with remainders equal to or less than 4 and greater than 0. Equations must be two-digit numbers divided by one-digit numbers. The quotient and remainder will not appear in the string of digits.

Division equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but the remainder must be equal to or less than 4 and greater than 0. For example, the first three digits in the first row form the string 368, which can be used to make the equation 36 ÷ 8 = □. The quotient is 4 and the remainder is 4. Record the division equations students make.

Possible answers: 39 ÷ 6 = 6 R3; 36 ÷ 8 = 4 R4; 34 ÷ 4 = 8 R2; 65 ÷ 7 = 9 R2; 82 ÷ 8 = 10 R2; 18 ÷ 5 = 3 R3; 28 ÷ 5 = 5 R3; 44 ÷ 7 = 6 R2

Student page 64 Have students use the Math Jumble on student page 64 to find more strings of digits to make similar division equations. Students must supply quotients and remainders.

Possible answers for student page 64:
46 ÷ 6 = 7 R4; 43 ÷ 5 = 8 R3; 65 ÷ 7 = 9 R2; 64 ÷ 9 = 7 R1; 35 ÷ 4 = 8 R3; 57 ÷ 9 = 6 R3; 61 ÷ 6 = 10 R1; 16 ÷ 3 = 5 R1; 66 ÷ 8 = 8 R2; 49 ÷ 6 = 8 R1

Go Further
Student page 64 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 64: Grids and equations will vary.

Assessment
Student self-assessment page 64 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students divide two-digit numbers by one-digit numbers to get remainders equal to or less than 4 and greater than 0?
Materials
Student page 65
Blank paper

Concept and Handbook Reference
Recognize the pattern of equivalent fractions.
(MAH 035)

Get Started

\[
\frac{2}{3} \quad \frac{4}{6}
\]

Draw the fraction strips for \(\frac{2}{3}\) and \(\frac{4}{6}\) on the board. Identify and define the parts of a fraction. Label each fraction strip and discuss the idea of equality. Draw a fraction strip for \(\frac{6}{9}\) on the board. Write the equality \(\frac{2}{3} = \frac{4}{6} = \frac{6}{9}\) on the board. Emphasize that the numerators and denominators of equivalent fractions form a pattern and change in predictable increments. Ask the students to study and explain the patterns created by the numerators and denominators. Ask the students to predict the next equivalent fraction.

Student page 65 To introduce the activity, work through the first problem on student page 65. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (\(\frac{1}{2} = \frac{1}{2} = \frac{1}{2}\)) is wrong because “The shaded part of the fraction strip is \(\frac{1}{2}\), and the fraction strips for \(\frac{1}{2}\) and \(\frac{1}{2}\) are not equal to \(\frac{1}{2}\)” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 65 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 65: 1. A 2. C

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 65 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students recognize patterns of equivalent fractions?
**Materials**
Student page 66

**Concept and Handbook Reference**
Make an organized list to solve a problem.
(MAH 403)

**Get Started**
Draw this table on the board.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Dimes ( (d) )</th>
<th>Nickels ( (n) )</th>
<th>Pennies ( (p) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>25¢</td>
<td>0</td>
<td>0</td>
<td>25</td>
</tr>
</tbody>
</table>

Fill in more rows of the table as you ask these questions.

- If we had one nickel, how many pennies would we need for a total of 25 cents? (20)
- If we had two nickels, how many pennies would we need for a total of 25 cents? (15)
- If we had three nickels, how many pennies would we need for a total of 25 cents? (10)

Discuss the relationship between the number of nickels and the number of pennies. \( (n + 1 \rightarrow p - 5) \)

**Today’s Challenge**
Student page 66 Have students make an organized list to represent all the ways to make 25¢.

**Answers for student page 66:**
1.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Dimes ( (d) )</th>
<th>Nickels ( (n) )</th>
<th>Pennies ( (p) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>25¢</td>
<td>0</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>25¢</td>
<td>0</td>
<td>1</td>
<td>24</td>
</tr>
<tr>
<td>25¢</td>
<td>0</td>
<td>2</td>
<td>23</td>
</tr>
<tr>
<td>25¢</td>
<td>0</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>25¢</td>
<td>0</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>25¢</td>
<td>0</td>
<td>5</td>
<td>18</td>
</tr>
<tr>
<td>25¢</td>
<td>1</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>25¢</td>
<td>1</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>25¢</td>
<td>2</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>25¢</td>
<td>2</td>
<td>1</td>
<td>14</td>
</tr>
<tr>
<td>25¢</td>
<td>2</td>
<td>2</td>
<td>13</td>
</tr>
</tbody>
</table>

2. The number of pennies drops by 10 if no nickels are added.
3. Check students’ work. The organized list should help them be sure they haven’t missed any combinations.

**Go Further**
Student page 66 Have students make and check an organized list of coin combinations for 36¢.

**Answers for student page 66:**
4. In any order, though a good organization should count more than a poor one.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Dimes ( (d) )</th>
<th>Nickels ( (n) )</th>
<th>Pennies ( (p) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>36¢</td>
<td>0</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>5</td>
<td>11</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>2</td>
<td>26</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>1</td>
<td>31</td>
</tr>
<tr>
<td>36¢</td>
<td>0</td>
<td>0</td>
<td>36</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>1</td>
<td>21</td>
</tr>
<tr>
<td>36¢</td>
<td>1</td>
<td>0</td>
<td>26</td>
</tr>
<tr>
<td>36¢</td>
<td>2</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>36¢</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>36¢</td>
<td>2</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>36¢</td>
<td>2</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>36¢</td>
<td>3</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>36¢</td>
<td>3</td>
<td>0</td>
<td>6</td>
</tr>
</tbody>
</table>

5. Check students’ work. There is never a zero in the pennies column because no sum of tens and fives will ever have a six in the ones place.

**Assessment**
Student self-assessment page 66 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students make an organized list to solve a problem?
Materials
Student page 67
Math Maze cards (Week 14 Activity 67)

Concept and Handbook Reference
Identify and recognize prime numbers and prime factors. (MAH 053–056)

Background
Prime numbers are numbers that have exactly two factors: themselves and one. One is neither prime nor composite because it has only one factor. There are 25 primes between 1 and 100.

Get Started
Talk about prime numbers and ways to identify them. Ask students to decide whether these numbers are prime. If not, have them name at least one factor other than one and the number itself.
- 7 (yes)
- 9 (no; 3)
- 12 (no; 2, 3, 4, or 6)
- 31 (yes)
- 99 (no; 3, 9, 11, or 33)

Today’s Challenge
Distribute the 18 Math Maze cards for week 14. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 192.

Student page 67 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 67 in the student book.

Answers for student page 67: 1. 2 2. 5 3. 97 4. 1 5. 7 6. 15 7. 18 8. 3 9. 23 10. 65

Go Further
Student page 67 Have students investigate the primes between 1 and 100. You might suggest students use the sieve method of finding primes, as follows. Circle the 2, then cross out all other even numbers. Circle the 3, and cross out every third number (the multiples of 3). Repeat with 5 and 7. Every remaining number is prime.

Answers for student page 67: 11.

12. Prime numbers with 0 in the ones place: none; 1 in the ones place: 5; 2 in the ones place: 1; 3 in the ones place: 7; 4 in the ones place: none; 5 in the ones place: 1; 6 in the ones place: none; 7 in the ones place: 6; 8 in the ones place: none; 9 in the ones place: 5

Assessment
Student self-assessment page 67 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students able to check quickly to decide whether a number is prime?
Materials
Student page 68
Blank paper

Concept and Handbook Reference
Estimate products in multi-digit multiplication problems. (MAH 106–111)

Get Started
Write the following problem on the board.

\[ 4885 \times 52 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be about 250,000 because 4885 is closer to 5000 than to 4000, and 52 is closer to 50 than to 60; since 5000 \times 100 = 500,000, half of that amount would be a good estimate since 52 is about half of 100. Be sure to accept and welcome all valid strategies for estimating products.

Today's Challenge
Explain that today you will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and create a four-digit number times a two-digit number multiplication problem with a product between 200,000 and 800,000. Have the students write an estimate of the product and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 320,000 and less than 580,000? If yes, score 8 points.
2. Did your strategy involve rounding both factors? If yes, score 10 points.
3. Did your strategy involve rounding only one factor? If yes, score 9 points.
4. Is your estimate greater than 60,000 and less than 75,000? If yes, score 15 points.
5. Did your strategy result in an estimate less than the real product? If yes, score 12 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 68 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 68: 1. 420,000
2. 566,200 3–4. Students' own riddles will vary.

Assessment
Student self-assessment page 68 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit multiplication problem?
**Materials**
Student page 69
Math Jumble activity poster and digit cards

**Concept and Handbook Reference**
Divide two-digit numbers by one-digit numbers to get remainders of 0 or 1. *(MAH 089–090)*

**Get Started**
Have students practice using mental math to divide two-digit by one-digit numbers with remainders of 0 or 1. One student calls out a two-digit number, another student calls out a one-digit divisor that will yield a remainder of 0 or 1. A third student calls out the quotient and the remainder. If the remainder is not 0 or 1, the three students try again. For example, one student calls out 24 and the second student calls out 6. The third student says, “24 ÷ 6 = 4 remainder 0.” Continue until all students have had the opportunity to participate.

**Today’s Challenge**
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make division equations with remainders of 0 or 1. Equations must be two-digit numbers divided by one-digit numbers. The quotient and remainder will not appear in the string of digits.

Division equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but the remainder must be 0 or 1. For example, the first three digits in the first row form the string 254, which can be used to make the equation $254 ÷ 4 = \square$. The quotient is 6 and the remainder is 1. Record the division equations students make.

Possible answers: $254 ÷ 4 = 6 R1$; $21 ÷ 5 = 4 R1$; $12 ÷ 6 = 2 R0$; $55 ÷ 9 = 6 R1$; $42 ÷ 6 = 7 R0$

**Student page 69** Have students use the Math Jumble on student page 69 to find more strings of digits to make similar division equations. Students must supply quotients and remainders.

Possible answers for student page 69:
$12 ÷ 4 = 3 R0$; $14 ÷ 2 = 7 R0$; $56 ÷ 8 = 7 R0$; $24 ÷ 6 = 4 R0$; $42 ÷ 6 = 7 R0$; $16 ÷ 5 = 3 R1$; $17 ÷ 4 = 4 R1$; $64 ÷ 9 = 7 R1$; $49 ÷ 8 = 6 R1$; $64 ÷ 7 = 9 R1$

**Go Further**
**Student page 69** Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 69: Grids and equations will vary.

**Assessment**
**Student self-assessment page 69** Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students divide two-digit numbers by one-digit numbers to get remainders of 0 or 1?
Materials
Student page 70
Blank paper

Concept and Handbook Reference
Recognize and name composite and prime numbers through 50. (MAH 053–055)

Get Started
Write the numbers 11 and 12 on the board. Record the factors of 12 as 1, 2, 3, 4, 6, and 12. Record the factors of 11 as 1 and 11. Define factors as numbers that divide evenly into another number. Explain that numbers that have more than two factors are classified as composite numbers. Numbers with only two factors (1 and the number itself) are classified as prime numbers. Ask students to provide examples of other numbers that fall in these categories before proceeding with the lesson.

Student page 70 To introduce the activity, work through the first problem on student page 70. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (25, 27, and 29 are composite numbers.) is wrong because “29 is not composite; it is prime.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 70 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 70: 1. C 2. B

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 70 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify numbers as either prime or composite?
Materials
Student page 71

Concept and Handbook Reference
Use an organized list to solve problems. (MAH 403)

Get Started
Draw this table on the board. Ask students to help you to fill out the first four rows.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Quarters (q)</th>
<th>Dimes (d)</th>
<th>Nickels (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.00</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
</tbody>
</table>

Discuss the relationship between the number of dimes and the number of nickels. \((d + 1 \rightarrow n - 2)\)

Today's Challenge
Student page 71 Have students complete the table.

Answers for student page 71: 1.

<table>
<thead>
<tr>
<th>Sum</th>
<th>Quarters (q)</th>
<th>Dimes (d)</th>
<th>Nickels (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1.00</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>$1.00</td>
<td>3</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>$1.00</td>
<td>2</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>7</td>
<td>1</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>1</td>
<td>13</td>
</tr>
<tr>
<td>$1.00</td>
<td>1</td>
<td>0</td>
<td>15</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>9</td>
<td>2</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>7</td>
<td>6</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>3</td>
<td>14</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>2</td>
<td>16</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>1</td>
<td>18</td>
</tr>
<tr>
<td>$1.00</td>
<td>0</td>
<td>0</td>
<td>20</td>
</tr>
</tbody>
</table>

Go Further
Student page 71 Help students to apply the Make an Organized List strategy to a different situation.

Answer for student page 71: 4. Check students' work. There will be fifteen different combinations.

<table>
<thead>
<tr>
<th>AB</th>
<th>BC</th>
<th>CD</th>
<th>DE</th>
<th>EF</th>
</tr>
</thead>
<tbody>
<tr>
<td>AC</td>
<td>BD</td>
<td>CE</td>
<td>DF</td>
<td></td>
</tr>
<tr>
<td>AD</td>
<td>BE</td>
<td>CF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AE</td>
<td>BF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AF</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Assessment
Student self-assessment page 71 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students comfortable making organized lists and checking for duplicate entries?
Materials
Student page 72
Math Maze cards (Week 15 Activity 72)

Concept and Handbook Reference
Round numbers to the nearest ten, hundred or thousand. (MAH 095)

Background
There are two good ways to think about rounding.

One, use a number line. If you're rounding to the nearest ten, find the number on the number line and decide whether it is closer to the next or previous ten, then round to that ten. If it's exactly halfway between, round to the next ten.

Two, use an algorithm. If you want to round to the nearest hundred, look at the digit in the hundreds place. Look at the digit immediately to the right of that digit. If the digit is five or greater, round to the next hundred. If the digit is less than five, round to the previous hundred.

Get Started
Review rounding: when and why we use rounded numbers, and how to round. Practice with these examples.
- Round 1267 to the nearest hundred. (1300)
- Round 1267 to the nearest ten. (1270)
- Round 1267 to the nearest thousand. (1000)

Today's Challenge
Distribute the 18 Math Maze cards for week 15. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 193.

Student page 72 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 72 in the student book.

Answers for student page 72: 1. 460; 500 2. 1010; 1000 3. 890; 900 4. 610; 600 5. 450; 400 6. 9500; 9500 7. 15,010; 15,000 8. 4310; 4300 9. 350; 300 10. 17,430; 17,400

Go Further
Student page 72 Help students figure out what needs to be true about the ones and tens digits in order for rounding to tens and to hundreds to have the same result.

Answers for student page 72: 11. Numerical answers will vary; explanations should include the fact that the ones digit must be 5 or greater and the tens digit must be 9.

Assessment
Student self-assessment page 72 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students consistently and efficiently round to a given place?
Materials
Student page 73
Blank paper (heavyweight if possible) or index cards

Concept and Handbook Reference
Understand relationships among gallons, quarts, pints, and cups. (MAH 314)

Get Started
Have students look at the table on student page 73 to see the relationship among gallons, quarts, pints, and cups. Write the following questions on the board.

- How many quarts are in $\frac{1}{2}$ gallon? (2)
- How many pints are in $\frac{1}{4}$ gallon? (4)
- How many cups are in $\frac{1}{3}$ gallon? (8)

Students will use this information to complete Today's Challenge.

Today's Challenge
Student page 73 Have students look at page 73 in the student book. Have them fill in the blanks for questions 1 through 4 to create groups of four equivalent measures.

Answers for student page 73: 1. 2 quarts, 4 pints 2. $\frac{1}{2}$ gallon, 4 cups 3. $\frac{1}{2}$ gallon, 3 quarts 4. 10 quarts, 20 pints, 40 cups

Go over answers with the whole group or check students' papers individually.

Go Further
Have pairs of students make a set of cards to play the game "Concentration." Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 73.

Instructions for playing "Concentration" Shuffle the cards and lay them facedown in equal columns. The first player turns over two cards. If the cards match (show equivalent units of measure), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 73 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand the relationships among gallons, quarts, pints, and cups?
Materials
Student page 74
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Divide two-digit numbers by one-digit numbers to get quotients of 10, 11, or 12. (MAH 112-114)

Background
When dividing, have students estimate the quotient before solving. Students may choose to round the dividend. For example, for $33 \div 3$, a good estimate is $30 \div 3 = 10$. The actual answer is 11.

Get Started
Have students practice using estimation to divide two-digit by one-digit numbers to get quotients of 10, 11, or 12. One student calls out a two-digit number, another student calls out a one-digit divisor that will yield a quotient of 10, 11, or 12. A third student calls out the quotient. If the quotient is not 10, 11, or 12, the three students try again. For example, one student calls out 72 and the second student calls out 6. The third student says, “72 $\div 6 = 12$.” Continue until all students have had the opportunity to participate.

Today's Challenge
Using the 0-9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of digits that could be used to make division equations with quotients of 10, 11, or 12. Equations must be two-digit numbers divided by one-digit numbers. The quotient will not appear in the string of digits.

Division equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but the quotient must be 10, 11, or 12. For example, the first three digits in the first row form the string 968, which can be used to make the equation $96 \div 8 = \Box$. Students estimate and then name the actual quotient. $96 \div 8 = 12$. Record the division equations students make.

Possible answers: $60 \div 5 = 12; 84 \div 7 = 12$; $20 \div 2 = 10; 40 \div 4 = 10; 72 \div 6 = 12$; $60 \div 6 = 10$

Student page 74 Have students use the Math Jumble on student page 74 to find more strings of digits to make similar division equations. Students must supply quotients.

Possible answers for student page 74: $50 \div 5 = 10$; $72 \div 6 = 12; 60 \div 6 = 10; 70 \div 7 = 10$; $55 \div 5 = 11$

Go Further
Student page 74 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 74: Grids and equations will vary.

Assessment
Student self-assessment page 74 Have students circle one of the three choices for describe how they feel about this activity.

Assessment tips Can students divide two-digit numbers by one-digit numbers to get quotients of 10, 11, or 12? Can students use estimation to divide whole numbers?
**Materials**
Student page 75
Blank paper

**Concept and Handbook Reference**
Solve division problems with one-digit divisors and three-digit dividends. (*MAH* 146-152)

**Get Started**

\[
\begin{align*}
157 & \quad R2 \\
4)630 & \\
- 400 & \quad 100 \text{ groups} \\
- 230 & \\
- 200 & \quad 50 \text{ groups} \\
- 30 & \\
- 28 & \quad 7 \text{ groups} \\
2 & 157
\end{align*}
\]

Write the equation 630 ÷ 4 on the board in the form of the example shown. Explain that the equation asks the question: How many groups of 4 can be made from 630? Estimate that 100 groups of 4 can be made. Demonstrate subtracting 100 groups of 4, or 400, from 630, leaving 230 remaining. Estimate that 50 more groups of 4 can be made from the remaining 200. Demonstrate subtracting 7 groups of 4, or 28, from 30, leaving 2 remaining. Explain that since no more groups of 4 can be made, 2 is the remainder. Demonstrate that adding the estimates of 100 + 50 + 7 yields the answer that 157 groups of 4 can be made from 630 with a remainder of 2. Practice this algorithm several more times before proceeding with the student page.

**Student page 75** To introduce the activity, work through the first problem on student page 75. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer, that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (more than 100) is wrong because “Five groups of 100 is 500. 500 is larger than the dividend.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

**Today’s Challenge**
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

**Student page 75** Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

**Answers for student page 75:** 1. A 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

**Go Further**
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

**Assessment**
Student self-assessment page 75 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students divide a three-digit dividend by a one-digit divisor?
Materials
Student page 76

Concept and Handbook Reference
Write an equation for a generalized rule.
(MAH 237–241)

Get Started
Draw this T-table and one square on the board.

<table>
<thead>
<tr>
<th>Number of Squares (n)</th>
<th>Number of Straws (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Review the definition of square, then pose this problem.

The students in Tony’s group are planning to construct squares with straws. They are planning to connect the squares to each other.

Draw a second square just below the first one, attached along one side. Have students tell you how many straws are required for the new figure and record the information in the table. Then, add to both the diagram and the table through seven squares as shown.

<table>
<thead>
<tr>
<th>Number of Squares (n)</th>
<th>Number of Straws (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Squares (n)</th>
<th>Number of Straws (s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>3</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>13</td>
</tr>
<tr>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>7</td>
<td>22</td>
</tr>
</tbody>
</table>

Go Further
Student page 76 Have students generalize a rule about straws and squares.

Answers for student page 76: 3. In each row, the number of straws is one more than three times the number of squares. 4–5. Check students’ work: 

\[ s = 3n + 1 \]

6. \[ s = 2n + 1 \]

Assessment
Student self-assessment page 76 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students comfortable discussing their work and editing it as a result of their discussion?

Today’s Challenge
Student page 76 Have students extend the diagram and the table.

Answers for student page 76: 1. 

\[ \begin{align*} &1 \ 2 \ 3 \ 4 \ 5 \ 6 \ 7 \ 8 \ 9 \ 10 \ 11 \ 12 \end{align*} \]
Materials
Student page 77
Math Maze cards (Week 16 Activity 77)
Index cards

Concept and Handbook References
Review place value of whole numbers and decimals.
(MAH 004, 012)

Get Started
Read these clues aloud. Have volunteers draw conclusions about the identity of the mystery number after each new clue is read. Have one student make notes and record conclusions on the board.
- The mystery number is a decimal number.
- The digit in the ones place is less than the digit in the tenths place.
- No two digits are the same.
- The number is less than the number of years in a century.
- The digit in the tenths place is less than the digit in the thousandths place.
- There are two digits in the whole number part of the number.
- There are five digits all together.
- The sum of the digits is 20.
- No digit is odd.
- The product of the digits in the ones place and the hundredths place is 0.
- The sum of the digits in the ones place and the hundredths place is 2.
- The number is greater than five dozen.
- The sum of the digits in the decimal part of the number is the same as the sum of the digits in the whole number part.
- The product of the digits in the tenths place and the thousandths place is equal to two dozen.
- The product of the digits in the hundredths place and the tens place is 0.

The mystery number may be identified before all clues are read. If so, read the rest of the clues to make sure that the number meets all the requirements. The number is 82.406.

Today's Challenge
Distribute the 18 Math Maze cards for week 16. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 194.

Student page 77 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 77 in the student book.

Answers for student page 77: 1. 90  2. 2 3. hundredths  4. 87.6  5. tens  6. 7  7. 100  8. 3 9. 87.62 10. 88

Go Further
Student page 77 Have students complete this section of the student page.

Answers for student page 77: 11. 88.123 12. 87.603 13. 199.603 14. 199.564 15. 204.564 16. 200

Assessment
Student self-assessment page 77 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students read decimal numbers without stumbling on the place value?
Materials
Student page 78
Blank paper

Concept and Handbook Reference
Estimate differences in multi-digit subtraction problems. (MAH 100–105)

Get Started
Write the following problem on the board.

\[ 7535 - 421 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be a four-digit number because 535 is larger than 421; it will be greater than 7000 because there is no regrouping in the hundreds place; if the numbers are rounded, the problem is 7500 - 400, so the difference is about 7100. Be sure to accept and welcome all valid strategies for estimating differences.

Today's Challenge
Explain that today you will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and create a three-digit number from a four-digit number subtraction problem with a difference between 5000 and 9000. Have the students write an estimate of the difference and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 5000 and less than 7000? If yes, score 8 points.
2. Did your strategy involve rounding to the hundreds place? If yes, score 10 points.
3. Did your strategy involve rounding to the thousands place? If yes, score 15 points.
4. Is your estimate greater than 6200 and less than 8500? If yes, score 9 points.
5. Did your strategy involving rounding up? If yes, score 7 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 78 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 78: 1. 5086 2. 3000 3–4. Students' own riddles will vary.

Assessment
Student self-assessment page 78 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit subtraction problem?
Materials
Student page 79
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Divide two-digit numbers by one-digit numbers to get quotients greater than 20 and less than 30. (MAH 146–152)

Background
When dividing, have students estimate the quotient before solving. Students may choose to round the dividend. For example, for 63 ÷ 3, a good estimate is 60 ÷ 3 = 20. The actual answer is 21.

Get Started
Have students practice using estimation to divide two-digit by one-digit numbers to get quotients greater than 20 and less than 30. One student calls out a two-digit number, another student calls out a one-digit divisor that will yield a quotient greater than 20 and less than 30. A third student calls out the quotient. If the quotient is not greater than 20 and less than 30, the three students try again. For example, one student calls out 92 and the second student calls out 4. The third student says, “92 ÷ 4 = 23.” Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 grid shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make division equations with quotients greater than 20 and less than 30. Equations must be two-digit numbers divided by one-digit numbers. The quotient will not appear in the string of digits.

Division equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once, but the quotient must be greater than 20 and less than 30. For example, the first three digits in the fourth row form the string 924, which can be used to make the equation 92 ÷ 4 = □. Students estimate and then name the actual quotient. 92 ÷ 4 = 23. Record the division equations students make.

Possible answers: 84 ÷ 4 = 21; 75 ÷ 3 = 25; 52 ÷ 2 = 26; 54 ÷ 2 = 27; 78 ÷ 3 = 26

Student page 79 Have students use the Math Jumble on student page 79 to find more strings of digits to make similar division equations. Students must supply quotients.

Possible answers for student page 79: 96 ÷ 4 = 24; 75 ÷ 3 = 25; 72 ÷ 3 = 24; 48 ÷ 2 = 24; 50 ÷ 2 = 25; 46 ÷ 2 = 23

Go Further
Student page 79 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 79: Grids and equations will vary.

Assessment
Student self-assessment page 79 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students divide two-digit numbers by one-digit numbers to get quotients greater than 20 and less than 30? Can students use estimation to divide whole numbers?
Materials
Student page 80
Blank paper

Concept and Handbook Reference
Apply measurement concepts in problem-solving situations. (MAH 326–332)

Get Started
Write the column headings Length, Capacity, Weight, and Temperature on the board. Ask the students to brainstorm units of measure and equivalencies that belong in each category, for example, 12 inches = 1 foot, 16 ounces = 1 pound, and so on. Direct students to use the table that results as they complete the student page.

Student page 80 To introduce the activity, work through the first problem on student page 80. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (an increase of 28°) is wrong because “An increase of 28° would make the temperature 70°, not 81°.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 80 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 80: 1. B 2. C

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 80 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students apply measurement concepts to solve problems?
Materials
Student page 81

Concepts and Handbook References
Write inches as fractions of feet. (MAH 294)
Write fractions in simplest form. (MAH 037)

Get Started
Discuss the relationship between feet and inches.
Write this ratio and these equations on the board.

feet : inches = 1:12

\[
\frac{i}{12} = \frac{1}{12} \cdot f
\]

Draw this T-table and have the students help you fill it in.

\[
\begin{array}{c|c|c|c}
\text{Inches} (i) & \text{Feet} (f) \\
1 & \frac{1}{12} \\
2 & \frac{2}{12} \\
3 & \frac{3}{12} \\
\end{array}
\]

Today's Challenge
Student page 81 Have students write inches as fractions of feet, then simplify the fractions.

Answers for student page 81:

1.

\[
\begin{array}{c|c|c}
\text{Inches} & \text{Fraction of a Foot} & \text{Simplest Form} \\
1 & \frac{1}{12} & \frac{1}{12} \\
6 & \frac{6}{12} & \frac{1}{2} \\
10 & \frac{10}{12} & \frac{5}{6} \\
12 & \frac{12}{12} & 1 \\
16 & \frac{16}{12} & 1\frac{1}{3} \\
17 & \frac{17}{12} & 1\frac{5}{12} \\
18 & \frac{18}{12} & 1\frac{1}{2} \\
\end{array}
\]

Go Further
Student page 81 Have students answer the questions and fill in the table.

Answers for student page 81: 2, 24, 3, 36

4.

<table>
<thead>
<tr>
<th>Inches</th>
<th>Fraction of a Yard</th>
<th>Simplest Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>[\frac{35}{36}]</td>
<td>[\frac{35}{36}]</td>
</tr>
<tr>
<td>30</td>
<td>[\frac{30}{36}]</td>
<td>[\frac{5}{6}]</td>
</tr>
<tr>
<td>24</td>
<td>[\frac{24}{36}]</td>
<td>[\frac{2}{3}]</td>
</tr>
<tr>
<td>18</td>
<td>[\frac{18}{36}]</td>
<td>[\frac{1}{2}]</td>
</tr>
<tr>
<td>14</td>
<td>[\frac{14}{36}]</td>
<td>[\frac{7}{18}]</td>
</tr>
<tr>
<td>12</td>
<td>[\frac{12}{36}]</td>
<td>[\frac{1}{3}]</td>
</tr>
</tbody>
</table>

5. Check students' work. \[\frac{1}{2}\] yard \(\neq\) \[\frac{1}{2}\] foot because the units are not equivalent. 6. Check students' work. \[\frac{3}{2}\] of \[a\] \(\neq\) \[\frac{1}{2}\] of \[b\] if \[a\] and \[b\] do not have equivalent units.

Assessment
Student self-assessment page 81 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students write simplest-form fractions for numbers greater than one?
Materials
Student page 82
Math Maze cards (Week 17 Activity 82)

Concept and Handbook Reference
Understand remainders. (MAH 148–149)

Get Started
Review the terms dividend, divisor, and quotient.

\[ 18 \div 6 = 3 \]

dividend \ divisor \ quotient

Review what happens when a division problem does not have a whole-number quotient. What is left over can be expressed several ways, but today’s emphasis will be on remainders. Ask these questions.

• What is the remainder when you divide 13 by 4? (1)
• What is the remainder when you divide 75 by 8? (3)
• What is the remainder when you divide 56 by 7? (0)

Today’s Challenge
Distribute the 18 Math Maze cards for week 17. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 195.

Student page 82 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 82 in the student book.


Go Further
Student page 82 Help students to think about the greatest possible remainder for a given divisor.

Answers for student page 82: 11. Check students’ work. 12. Yes; the greatest possible remainder is 9, so a remainder of 7 is possible. 13. No; the greatest possible remainder is 4, so a remainder of 7 is not possible.

Assessment
Student self-assessment page 82 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students devise strategies for discovering remainders?
Materials
Student page 83
Blank paper
Index cards (optional)

Concept and Handbook Reference
Determine side length of a rectangle when given one side length and the perimeter. (MAH 297)

Get Started
Remind students that the perimeter of any polygon is the sum of the lengths of the sides. In a rectangle, opposite sides are the same length, so the perimeter of a rectangle is two times the length plus two times the width. In other words, the perimeter is a group of two lengths plus a group of two widths. Draw a rectangle on the board. Label the longer side 5 units and the shorter side 3 units. Demonstrate finding the perimeter by adding the lengths of the sides. \((3 + 5 + 3 + 5 = 16 \text{ units})\)
Demonstrate finding the perimeter by doubling each side length and adding the products. \(((3 \times 2) + (5 \times 2) = 16 \text{ units})\)

Today’s Challenge
Student page 83 Have students look at the completed examples at the top of student page 83. In example 1, the perimeter is 20 meters and one side is 3 meters long. Have students explain how the length of the other side was found. (Multiply the known side length by 2 and subtract the product from the perimeter; then divide that difference by 2.)

For example 1: \((3 \times 2) + (w \times 2) = 20; \) 
\[ w \times 2 = 20 - 6; w \times 2 = 14; w = 14 \div 2; \]
\[ w = 7 \text{ meters}. \]

For example 2: \((6 \times 2) + (w \times 2) = 20; \)
\[ w \times 2 = 20 - 12; w \times 2 = 8; w = 8 \div 2; \]
\[ w = 4 \text{ meters}. \]

Have students complete the table on page 83 of their books. Explain that each row has two rectangles that have the same perimeter but different side lengths. In each case, students are to find the missing side length.

Answers for student page 83: 1. 2 ft  2. 9 ft  
3. 7 cm  4. 9 cm  5. 8 yd  6. 10 yd  7. 5 in.  8. 6 in.  
9. 10 km  10. 12 km  11. 10 ft  12. 8 ft  13. 9 mm  
14. 11 mm  15. 6 miles  16. 9 miles

Go over answers with the whole group or check students’ papers individually.

Go Further
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 16 small pieces of paper or 16 index cards. Have the students use one slip of paper or card to copy the information from each box in the table on student page 83. Students should not copy the two examples at the top of the page, and they should not copy the boxes with the word “perimeter.”

Instructions for playing “Concentration” Shuffle the cards and lay them facedown in four equal columns. Players decide who will go first. The first player turns over two cards. If the cards match (show different side lengths for the same-length perimeter), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 83 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find a missing side length of a rectangle when given the length of one side and the perimeter?
Materials
Student page 84
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Name coins to make 50 cents using nickels, dimes, and quarters. (MAH 023–026)

Background
One way to count money is to count on from the coin or bill with the greatest value. Another way is to group coins and bills.

Get Started
Have students practice naming coins for a given amount using pennies, nickels, dimes, and quarters. One student calls out an amount less than 50 cents. Another student calls out coins that could be used to make that amount. For example, one student calls out 35 cents. The second student says, “3 dimes and 1 nickel make 35 cents.” Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the coin cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of coins that total 50 cents.

Strings of coins are made by joining coins that are inside squares that share a common side, horizontally and/or vertically. For example, the coins in the first row and the last coin in the second row make the string quarter, dime, nickel, nickel, nickel. Point to the coins one at a time to find the total value as you move from left to right and then down. So 25¢, 35¢, 40¢, 45¢, 50¢ is the total value of the coins. Next ask students to find other strings of coins that total 50 cents. One possible string is the first coin in the first row and the first three coins in the second row. Continue until several strings of coins totaling 50 cents have been found.

Student page 84 Have students use the Math Jumble on student page 84 to find strings of coins that total 50 cents.

Possible answers for student page 84: Check students’ work. 50 cents can be made using the four coins in the first column, the four coins in the first row and the last coin in the second row, the four coins in the third column, and so on.

Go Further
Student page 84 Have students answer the question and explain their solution strategies.

Answers for student page 84: $1.75. Explanations will vary but may include counting by 5s and 10s or combining all like coins.

Assessment
Student self-assessment page 84 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students count a variety of coins totaling 50 cents?
Materials
Student page 85
Blank paper

Concept and Handbook Reference
Identify lines as intersecting, parallel, or perpendicular. (MAH 337–342)

Get Started
Draw and label intersecting, parallel, and perpendicular lines on the board. Discuss the definition and characteristics of each. Explain that the angles formed by perpendicular lines are right angles.

Student page 85 To introduce the activity, work through the first problem on student page 85. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (intersecting) is wrong because “The bars on a baby’s crib do not intersect.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (B). Be sure students understand why B is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 85 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 85: 1. A 2. C
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 85 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify intersecting, parallel, and perpendicular lines?
Materials
Student page 86

Concept and Handbook Reference
Write and use ratios. (MAH 178–179)

Get Started
Imagine with students that the group has been asked to make the coffee for a school program. Start a table on the board and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Cups of Coffee Wanted</th>
<th>Cups of Water Needed</th>
<th>Tablespoons of Ground Coffee</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

Discuss the ratio of water to finished coffee (1:1) and the ratio of ground coffee to water (1 tbsp : 2 c). Pay particular attention to why you don’t need units in the ratio of water to finished coffee but you do need them in the ratio of ground coffee to water. With the group, fill in the table at least through 12 cups of coffee.

Today’s Challenge
Student page 86 Have students find ingredient quantities for multiple cups of lemonade.

Answers for student page 86: 1.

<table>
<thead>
<tr>
<th>Cups of Lemonade Wanted (L)</th>
<th>Cups of Water (W)</th>
<th>Tablespoons of Sugar (s)</th>
<th>Cups of Lemon Juice (J)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>10</td>
<td>8</td>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>20</td>
<td>16</td>
<td>40</td>
<td>4</td>
</tr>
<tr>
<td>25</td>
<td>20</td>
<td>50</td>
<td>5</td>
</tr>
<tr>
<td>30</td>
<td>24</td>
<td>60</td>
<td>6</td>
</tr>
</tbody>
</table>

2. Check students’ work. For every five cups of lemonade, you need four cups of water. 3. Check students’ work. For every five cups of lemonade, you need 10 tablespoons of sugar. 4. 1 ÷ 5

Go Further
Student page 86 Have students find ratios to express general relationships.

Answers for student page 86: 5. j : s = 1 cup : 10 tablespoons. 6. 15 tbsp sugar; 7 1/2 c lemonade
7. Answers will vary.

Assessment
Student self-assessment page 86 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand how ratios relate quantities?
Materials
Student page 87
Math Maze cards (Week 18 Activity 87)

Concept and Handbook References
Review fraction-decimal equivalence.
(MAH 019, 043)

Get Started
Discuss equivalence and tie measurement into the concept: six inches is equivalent to \( \frac{6}{12} \) of a foot. It is also equivalent to \( \frac{1}{2} \) of a foot and 0.5 of a foot. Ask about equivalents for the following numbers and measures.

\[ \frac{3}{4} \ (0.75; \frac{3}{8} ; \ 6) \]

1 cup (8 ounces, \( \frac{1}{2} \) pint, \( \frac{1}{4} \) quart, two half-cups, four quarter-cups, 16 tablespoons, and so on)

50 (five tens, two quarters, half of a hundred, the number of centimeters in half of a meter, ten nickels, number of fingers on ten hands, and so on)

Today's Challenge
Distribute the 18 Math Maze cards for week 18. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 196.

Student page 87 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 87 in the student book.

Answers for student page 87: 1. 0.375; \( \frac{3}{8} \); 6
2. 0.2; 12 3. \( \frac{1}{2} \); 6 4. \( \frac{1}{2} \); 1 5. 0.5; 18 6. 0.25; 3
7. \( \frac{3}{4} \); 9 8. 0.75; 45 9. 0.125; 2 10. \( \frac{4}{10} \) or \( \frac{2}{5} \); 4
11. 0.1; 1

Go Further
Student page 87 Have students think about divisibility in order to complete the table.

Answers for student page 87: 12. yes; yes; no; no; yes; no

Assessment
Student self-assessment page 87 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students work comfortably with equivalent fractions and decimals?
Materials
Student page 88
Blank paper
Meterstick (optional)

Concepts and Handbook References
Measure length using metric units. (MAH 294)
Express measurement in fraction and decimal forms. (MAH 019, 043)

Get Started
Review metric units of length with students. Write the following questions on the board and record the answers.

How many centimeters are in one meter? (100)
What part of one meter is one centimeter? \( \frac{1}{100} \) or 0.01
How many centimeters are in one decimeter? (10)
What part of one decimeter is one centimeter? \( \frac{1}{10} \) or 0.1
How many decimeters are in one meter? (10)
What part of one meter is one decimeter? \( \frac{1}{10} \) or 0.10

Today’s Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have the students use the ruler on the side of page 88 and select one object in the room to measure. Have each student take a blank sheet of paper and draw the object he or she chose and write the measurement. Then ask students to number their papers from 1 to 4.

As you ask each of four questions, have students look at their measurement and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your object more than \( \frac{7}{10} \) of a decimeter long? If yes, score 10 points.
2. Is your object more than \( \frac{12}{100} \) of a meter long? If yes, score 5 points.
3. Is your object less than 2 decimeters long? If yes, score 9 points.
4. Is your object more than \( \frac{4}{10} \) of a decimeter long? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student tell which object he or she measured and what the measurement was. Ask the student to explain how he or she scored the points.

Student page 88 Have students find objects in the room to match the clues.

Answers for student page 88: Answers will vary. Possible answers: 1. book 2. used pencil or a piece of chalk

Go Further
Student page 88 Have students fill in the blanks to solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.


Assessment
Student self-assessment page 88 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students measure length using metric units? Can students express measurement in fraction and decimal forms?
Materials
Student page 89
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add fractions with like denominators. (MAH 159)

Background
If fractions have like denominators, just add the numerators. Express the sum in simplest form if necessary.

Get Started
Begin by brainstorming adding fractions with like denominators. One student calls out a fraction. Another student calls out a different fraction with a like denominator. Then a third student gives the sum of the two fractions. For example, one student calls out $\frac{1}{3}$ and the second student calls out $\frac{1}{3}$. The third student says, "$\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$." Do this until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find as many fractions as possible that when added equal 1. Fractions must have like denominators.

Fractions can be made with any two adjoining digits (horizontally and/or vertically) on the poster used as either numerators or denominators. Digits on the poster can be used more than once, but the sum of the fractions must be 1. For example, the 2 and 5 in the first column could be used to form the fraction $\frac{2}{5}$. The 3 and 5 in the third column could be used to form the fraction $\frac{3}{5}$. $\frac{1}{5} + \frac{2}{5} + \frac{5}{5} + \frac{3}{5}$ is the same as 1. Record the equations students make.

Possible answers: $\frac{2}{5} + \frac{3}{5} = \frac{5}{5} = 1$; $\frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$;
$\frac{2}{4} + \frac{2}{4} = \frac{4}{4} = 1$; $\frac{4}{5} + \frac{1}{5} = \frac{5}{5} = 1$; $\frac{1}{6} + \frac{3}{6} = \frac{4}{6} = 1$;
$\frac{1}{2} + \frac{1}{2} = \frac{2}{2} = 1$.

Student page 89 Have students use the Math Jumble on student page 89 to find more fractions that if added equal 1.

Answers for student page 89: $\frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1$;
$\frac{2}{5} + \frac{3}{5} = \frac{5}{5} = 1$; $\frac{1}{6} + \frac{3}{6} = \frac{4}{6} = 1$; $\frac{2}{6} + \frac{4}{6} = \frac{6}{6} = 1$;
$\frac{1}{3} + \frac{2}{3} = \frac{3}{3} = 1$.

Go Further
Student page 89 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 89: Grids and equations will vary.

Assessment
Student self-assessment page 89 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students add fractions with like denominators?
Materials
Student page 90
Blank paper

Concept and Handbook Reference
Identify the commutative property of multiplication. (MAH 218)

Get Started
Write $60 \times 20 = 20 \times 60$ on the board. Discuss the idea of equality in this equation. Emphasize that the numerical values and the operation of multiplication are maintained on both sides of the equation. Point out that the product on both sides of the equation equals 1200. Write $\boxed{40 \times 300} = 40 \times 80$ on the board. Ask a student to provide the value that makes the equation true. Rewrite this same equation using the other operations of addition, subtraction, and division. Analyze all four equations for equality. Point out that changing the order of the factors in multiplication, or of the addends in addition, and still getting the same answer, is called the commutative property.

Student page 90 To introduce the activity, work through the first problem on student page 90. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (75 – 43 = 43 – 75) is wrong because “The two sides of the equation are not equal.” (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2 that was ruled out for a good reason a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 90 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 90: 1. B 2. D
When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 90 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify the commutative property of multiplication?
Materials
Student page 91

Concept and Handbook References
Compare centimeters and meters using fractions and decimals. (MAH 294, 019, 043)

Get Started
Ask a student to explain the relationship between a centimeter and a meter. Encourage the student to give his or her answer as a ratio. (100 cm : 1 m)

Draw this table on the board and have the students help you fill it in.

<table>
<thead>
<tr>
<th>Centimeters</th>
<th>Meters Fraction Form</th>
<th>Meters Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( \frac{1}{100} )</td>
<td>0.01</td>
</tr>
<tr>
<td>2</td>
<td>( \frac{2}{100} )</td>
<td>0.02</td>
</tr>
<tr>
<td>3</td>
<td>( \frac{3}{100} )</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Today's Challenge
Student page 91 Have students write centimeters as meters in fraction and decimal form.

Answers for student page 91: 1.

<table>
<thead>
<tr>
<th>Centimeters</th>
<th>Meters Fraction Form</th>
<th>Meters Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>( \frac{1}{100} )</td>
<td>0.01</td>
</tr>
<tr>
<td>5</td>
<td>( \frac{5}{10} = \frac{50}{100} = \frac{1}{2} )</td>
<td>0.05</td>
</tr>
<tr>
<td>10</td>
<td>( \frac{10}{100} = \frac{1}{10} )</td>
<td>0.1</td>
</tr>
<tr>
<td>25</td>
<td>( \frac{25}{100} = \frac{1}{4} )</td>
<td>0.25</td>
</tr>
<tr>
<td>50</td>
<td>( \frac{50}{100} = \frac{1}{2} )</td>
<td>0.5</td>
</tr>
<tr>
<td>100</td>
<td>( \frac{100}{100} = \frac{1}{1} )</td>
<td>1</td>
</tr>
<tr>
<td>150</td>
<td>( \frac{150}{100} = \frac{3}{2} )</td>
<td>1.5</td>
</tr>
</tbody>
</table>

5. Check students' work. There are 100 centimeters in a meter, but only 10 millimeters in a centimeter.

Go Further
Student page 91 Have students look at the relationship of millimeters to centimeters.

Answers for student page 91: 2. 200 3. 10 4.

<table>
<thead>
<tr>
<th>Millimeters</th>
<th>Centimeters Fraction Form</th>
<th>Centimeters Decimal Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>( \frac{10}{10} = \frac{1}{1} )</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>( \frac{15}{10} = \frac{3}{2} )</td>
<td>1.5</td>
</tr>
<tr>
<td>20</td>
<td>( \frac{20}{10} = \frac{2}{1} )</td>
<td>2</td>
</tr>
<tr>
<td>25</td>
<td>( \frac{25}{10} = \frac{5}{2} )</td>
<td>2.5</td>
</tr>
<tr>
<td>8</td>
<td>( \frac{8}{10} = \frac{4}{5} )</td>
<td>0.8</td>
</tr>
<tr>
<td>5</td>
<td>( \frac{5}{10} = \frac{1}{2} )</td>
<td>0.5</td>
</tr>
<tr>
<td>3</td>
<td>( \frac{3}{10} )</td>
<td>0.3</td>
</tr>
</tbody>
</table>

Assessment
Student self-assessment page 91 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students see the relationships among units in metric measurement?
Math Maze

Week 19 Activity 92

Materials
Student page 92
Math Maze cards (Week 19 Activity 92)

Concept and Handbook References
Recognize symbols and abbreviations frequently used in mathematics. (MAH 514–515, 487)

Background
Expressions combine numbers, variables, and operation symbols.

\[ 2x \]
\[ 3 + 5 \]
\[ (92 \times 4) + 20 \]

Equations relate numbers and expressions with the same value.

\[ 2x = 6 \]
\[ 3 + 5 = 8 \]
\[ (92 \times 4) + 20 = 2n + 368 \]

Inequalities relate numbers and expressions with different values.

\[ 2x > 5 \]
\[ 3 + 5 < 10 \]
\[ (92 \times 4) + 20 \neq 100 \]

Get Started
Write some symbols and abbreviations on the board and ask students to identify what they are and what is expected when the symbol is used. Make a list of all the symbols that students can think of.

Today's Challenge
Distribute the 18 Math Maze cards for week 19. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

Note: The I have portion of each card contains a symbol or abbreviation. You may wish to have students display their symbol in a way that everyone can see.

The correct sequence of questions and answers is shown on page 197:

Student page 92 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 92 in the student book.

Answers for student page 92: 1. \(2 \times, +, \), perhaps \((\) \(3 + 4\) < \(5 \div 7\) \((\) \(8 \leq 9 \geq 10\)

Go Further
Student page 92 Help students to distinguish among expressions, equations, and inequalities.

Answers for student page 92: 11. Possible answers: \(10 + 15, 50 \div 2, 5 \times 5, 26 - 1\) 12. Possible answers: \(1 + 1 + 1 < 62, 100 + 11 \times 4 > 62, 62 + 5 > 62\)

Assessment
Student self-assessment page 92 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students consistently say the appropriate words when reading math symbols?
Materials
Student page 93
Blank paper

Concept and Handbook Reference
Estimate quotients in multi-digit division problems.
(MAH 112–114)

Get Started
Write the following problem on the board.

\[ 75 \div 23 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be about 3 because there are 3 quarters in 75 cents; rounding to the tens place makes the problem 80 \div 20, so the answer is about 4. Write the following problem on the board.

\[ 752 \div 25 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be about 30 because there are 30 quarters in $7.50. Write the following problem on the board.

\[ 7521 \div 250 = \]

Ask the students to describe how they would make a good estimate for the answer. For example, it will be about 30 because rounding the larger number makes the problem 7500 \div 250.

For all of these problems, be sure to accept and welcome all valid strategies for estimating quotients.

Today's Challenge
Explain that today you will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and create a multi-digit division problem. The problem should be a three-digit number divided by a two-digit number with a quotient between 1 and 100. Have the students write an estimate of the quotient and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 60 and less than 100? If yes, score 8 points.
2. Did your strategy involve rounding dividend and divisor to the tens place? If yes, score 10 points.
3. Did your strategy involve rounding only one number? If yes, score 9 points.
4. Is your estimate greater than 20 and less than 50? If yes, score 15 points.
5. Did your strategy result in an estimate less than 10? If yes, score 12 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 93 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 93: 1. 9 2. 30 3–4. Students' own riddles will vary.

Assessment
Student self-assessment page 93 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit division problem?
Materials
Student page 94
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Name coins to make amounts less than 75 cents using pennies, nickels, dimes, and quarters.
(MAH 023-026)

Get Started
Have students practice naming coins for amounts less than 75 cents using pennies, nickels, dimes, and quarters. One students calls out an amount less than 75 cents. Another student calls out coins that could be used to make that amount. For example, one students calls out 48 cents. The second student says, "1 quarter, 2 dimes, and 3 pennies make 48 cents." Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the coin cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of coins that total amounts less than 75 cents.

Strings of coins are made by joining coins that are inside squares that share a common side, either horizontally and/or vertically, on the poster. For example, the coins in the first row and the last coin in the second row make the string dime, penny, quarter, nickel, penny. Point to the coins one at a time to find the total value as you move from left to right and then down. So 10¢, 11¢, 36¢, 41¢, 42¢ is the total value of the coins. Next ask students to find a string of coins that total 51 cents. One possible string is all the coins in the second column plus the last coin in the third column. Ask some students to name amounts less than 75 cents and have other students try to find strings of coins that could be used to make the given amounts. Repeat several times.

Student page 94 Have students complete Today's Challenge on student page 94.

Answers for student page 94: Answers will vary. Possible answers: 1. penny, dime, dime, penny 2. penny, penny, nickel, dime, penny 3. penny, dime, dime, quarter, nickel 4. dime, dime, nickel, penny 5. dime, quarter, penny, penny, penny

Go Further
Student page 94 Have students answer the question and explain their solution strategies.

Answers for student page 94: $1.25. Explanations will vary but may include counting by 5s and 10s or combining all like coins.

Assessment
Student self-assessment page 94 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students count a variety of coins totaling less than 75 cents?
Materials
Student page 95
Blank paper

Concept and Handbook Reference
Identify the expanded form of standard numbers. (MAH 006)

Get Started
On the board, write $428,453 = 400,000 + 20,000 + 8000 + 400 + 50 + 3$. Explain that the number on the left side of the equal sign is written in standard form and that the quantities on the right side of the equal sign express that number in expanded form. Expanded form shows the value of each digit in a number. Suggest that the students think of expanded form as the process of buying each digit separately and paying the amount each digit is worth.

Student page 95 To introduce the activity, work through the first problem on student page 95. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A $(1,000,000 + 1000 + 100 + 1)$ is wrong because “The value of the ten-thousands place is missing.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 95 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.


When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 95 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify the expanded form of standard numbers?
Materials
Student page 96

Concepts and Handbook References
Explore the ratios in cups, pints, and quarts. (MAH 314)
Use common multiples. (MAH 059)

Get Started
Discuss with students the ratios of cups to quarts (4:1), of cups to pints (2:1), and of pints to quarts (2:1). Draw this table on the board and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Cups</th>
<th>Pints</th>
<th>Quarts</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>1/2</td>
</tr>
<tr>
<td>3</td>
<td>1 1/4</td>
<td>1 1/4</td>
</tr>
<tr>
<td>4</td>
<td>1 1/2</td>
<td>1</td>
</tr>
</tbody>
</table>

Ask students to predict the next row of the table that will contain only whole numbers. (8 cups/4 pints/2 quarts) Be sure to have them explain their predictions, then help them see that they’ve just found a use for common multiples.

Today’s Challenge
Student page 96 Have students complete the table and answer the questions.

Answers for student page 96:

1. | Cups | Pints | Quarts |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/2</td>
<td>1/4</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>1/2</td>
</tr>
<tr>
<td>3</td>
<td>1 1/2</td>
<td>1 1/4</td>
</tr>
<tr>
<td>4</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>2 1/2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>6</td>
<td>3</td>
<td>1 1/2</td>
</tr>
<tr>
<td>7</td>
<td>3 1/2</td>
<td>1 3/4</td>
</tr>
<tr>
<td>8</td>
<td>4</td>
<td>2</td>
</tr>
</tbody>
</table>

2. | Cups | Pints | Quarts |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>6</td>
<td>3</td>
</tr>
<tr>
<td>16</td>
<td>8</td>
<td>4</td>
</tr>
<tr>
<td>20</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

Go Further
Student page 96 Help students use ratios to solve problems.

Answers for student page 96: 3. 3 pints, 1 1/2 quarts

4. | Ounces | Tablespoons | Cups |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>1/8</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
<td>1/4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
<td>3/8</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
<td>3/4</td>
</tr>
<tr>
<td>8</td>
<td>16</td>
<td>1</td>
</tr>
</tbody>
</table>

5. Glass A

Assessment
Student self-assessment page 96 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students use ratios to help them compare measures?
Materials
Student page 97
Math Maze cards (Week 20 Activity 97)

Concept and Handbook Reference
Multiply by powers of 10. (MAH 085)

Get Started
Before reviewing rules for multiplying by powers of 10, review ways to estimate a product. One hundred times 0.36 is almost the same as 100 × 0.3 or 30 of a hundred, so the product should be somewhere in the thirties. 100 × 3.6 is less than 100 × 4 but more than 100 × 3, or between 300 and 400.

Ask students to explain how they find the answers to the following problems.
- What is 1/10 of 10? (1)
  1/10 of 100? (10)
  1/100 of 1000? (100)
- What is 10 × 0.45? (4.5)
  10 × 4.5? (45)
  10 × 45? (450)
- What is 100 × 0.36? (36)
  100 × 3.6? (360)
  100 × 36? (3600)

Today's Challenge
Distribute the 18 Math Maze cards for week 20. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze
Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 197.

Student page 97 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 97 in the student book.

Answers for student page 97: 1. 54; 5400; 54,000
2. 0.1013; 10.13; 101.3 3. 6.03; 603; 6030
4. 167; 16,700; 167,000 5. 0.445; 44.5; 445
6. 15; 1500; 15,000 7. 0.15012; 15.012; 150.12
8. 43.12; 4312; 43,120 9. 0.345; 34.5; 345
10. 1743.2; 174,320; 1,743,200

Go Further
Student page 97 Help students find the missing factor.

Answers for student page 97: 11. 0.1 12. 100
13. 100 14. 10 15. 0.1

Assessment
Student self-assessment page 97 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students check their products to be sure they make sense?
Materials
Student page 98.
Blank paper

Concept and Handbook Reference
Compare numbers using dates on a calendar. (MAH 008)

Get Started
Have students practice telling dates that are one week before or one week after a certain date.
Students will add 7 to find one week after the date and subtract 7 to find one week before the date.
Write the following dates on the board and have students tell the date one week before and one week after each date.
January 10th (January 17th, January 3rd)
November 16th (November 23rd, November 9th)
March 23rd (March 16th, March 30th)
Repeat this activity with other dates until all students have had the opportunity to participate.

Today's Challenge
Read each of the following challenges, one at a time.
- If your date is exactly one week after the 8th, sit down. (15)
- If your date is more than one week after the 15th, sit down. (23–31)
- If your date is before the 5th, sit down. (1–4)
- If your date is less than one week after the 7th, sit down. (5–13)
- If your date is the same as or more than one week after the 10th, sit down. (17–22)
- If your date is not exactly one week after the 9th, sit down. (14)

At this point, only the student holding the number 16 should still be standing. That student is the "Fantastic Finalist."

Go Further
Student page 98 Have students complete the activity on the student page and create a "Fantastic Finalist" activity for a friend to solve.

Answers for student page 98: 1. March 18th
2. Students' activities will vary.

Assessment
Student self-assessment page 98 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students follow oral and written directions?
Materials
Student page 99
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Find factors of numbers. (MAH 051)

Background
$3 \times 5 = 15$ and $1 \times 15 = 15$, $1$, $3$, $5$, and $15$ are factors of $15$.

Get Started
Begin by having a student choose any whole number. Ask students for two numbers that, when multiplied, equal that whole number. Explain that these two numbers are factors of the chosen whole number. For example, one student selects the whole number $15$. Other students call out pairs of factors, such as $1$ and $15$, or $3$ and $5$, for the whole number. For each selected whole number, be sure students mention all the factors of the number. Continue brainstorming whole numbers and their factors until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find pairs of one-digit factors for the whole numbers (multiples) $12$, $18$, $24$, $36$, and $48$.

Factor pairs can be made by using any two adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once but the pairs must be factors of the same number. Record student answers on the board for each pair found. Then have students supply any factor pairs for the five whole numbers that are not found on the poster.

Possible answers:

<table>
<thead>
<tr>
<th>Multiple</th>
<th>Factor pairs on the poster</th>
<th>Factor pairs not on the poster</th>
</tr>
</thead>
<tbody>
<tr>
<td>$12$</td>
<td>$2 \times 6, 3 \times 4$</td>
<td>$1 \times 12$</td>
</tr>
<tr>
<td>$18$</td>
<td>$2 \times 9, 3 \times 6$</td>
<td>$1 \times 18$</td>
</tr>
<tr>
<td>$24$</td>
<td>$3 \times 8, 4 \times 6$</td>
<td>$1 \times 24, 2 \times 12$</td>
</tr>
<tr>
<td>$36$</td>
<td>$4 \times 9, 6 \times 6$</td>
<td>$1 \times 36, 2 \times 18, 3 \times 12$</td>
</tr>
<tr>
<td>$48$</td>
<td>$6 \times 8$</td>
<td>$1 \times 48, 2 \times 24, 3 \times 16, 4 \times 12$</td>
</tr>
</tbody>
</table>

Student page 99 Have students use the Math Jumble on student page 99 to find pairs of factors for the given multiples.

Answers for student page 99:

<table>
<thead>
<tr>
<th>Multiple</th>
<th>Factor pairs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$4$</td>
<td>$1 \times 4, 2 \times 2$</td>
</tr>
<tr>
<td>$9$</td>
<td>$3 \times 3$</td>
</tr>
<tr>
<td>$15$</td>
<td>$5 \times 3$</td>
</tr>
<tr>
<td>$20$</td>
<td>$4 \times 5$</td>
</tr>
<tr>
<td>$36$</td>
<td>$6 \times 6, 9 \times 4$</td>
</tr>
<tr>
<td>$45$</td>
<td>$5 \times 9$</td>
</tr>
</tbody>
</table>

Go Further
Student page 99 Have students answer the questions on the student page.

Answers for student page 99: $1$, $1$, $2$, $3$, $4$, $6$, $8$, $12$, $24$, $2$, $1$, $2$, $3$, $4$, $6$, $9$, $12$, $18$, $36$, $3$, $1$, $2$, $3$, $4$, $6$, $12$, $4$, $12$

Assessment
Student self-assessment page 99 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students identify factors of numbers? Can students distinguish between factors and multiples?
Rule Out Two

Week 20: Activity 100

Materials
Student page 100
Blank paper

Concept and Handbook References
Use reasoning to solve multi-digit multiplication problems. (MAH 089–092, 112–114)

Get Started
Write the expression 55 × 31 on the board. Ask the students, “Do you think the answer to this problem is close to 100? To 1000? To 10,000?” Call on volunteers to explain the reasoning that supports their answer choice. Explain that one method of finding an answer is to round both factors to the nearest ten and then multiply. This method can be done mentally to give a good estimate. Compare the estimated product of 1800 to the actual product of 1705. Discuss why the estimate is higher than the actual product. Provide practice with rounding and estimating before proceeding with the student page.

Student page 100 To introduce the activity, work through the first problem on student page 50. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say D (between 100 and 200) is wrong because “10 × 75 is 750 so 62 × 75 is 6 times greater than 750.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (A). Be sure students understand why A is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Answers for student page 100: 1. C 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 100 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve multi-digit multiplication problems using reasoning?
Materials
Student page 101

Concepts and Handbook References
Explore the ratios in cups, quarts, and gallons. (MAH 314)
Use common multiples. (MAH 059)

Get Started
Discuss with students the ratios of cups to quarts (4:1), of quarts to gallons (4:1), and of cups to gallons (16:1). Draw this table on the board and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Cups</th>
<th>Quarts</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>1</td>
<td>1/4</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1/2</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>3/4</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

Ask students to predict the next row that will contain all whole numbers. (32 cups/8 quarts/2 gallons)
Talk about how common multiples are useful in this case.

Today’s Challenge
Student page 101 Have students look for patterns in cup-quart-gallon equivalents.

Answers for student page 101:

1. |

<table>
<thead>
<tr>
<th>Cups</th>
<th>Quarts</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1/2</td>
<td>1/4</td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1/2</td>
</tr>
<tr>
<td>6</td>
<td>1 1/2</td>
<td>1 1/8</td>
</tr>
<tr>
<td>8</td>
<td>2</td>
<td>1 1/2</td>
</tr>
<tr>
<td>10</td>
<td>2 1/2</td>
<td>5/8</td>
</tr>
<tr>
<td>12</td>
<td>3</td>
<td>1 1/4</td>
</tr>
<tr>
<td>14</td>
<td>3 1/2</td>
<td>7/8</td>
</tr>
<tr>
<td>16</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>18</td>
<td>4 1/2</td>
<td>1 1/4</td>
</tr>
<tr>
<td>20</td>
<td>5</td>
<td>1 1/5</td>
</tr>
<tr>
<td>22</td>
<td>5 1/2</td>
<td>1 1/3</td>
</tr>
<tr>
<td>24</td>
<td>6</td>
<td>1 1/2</td>
</tr>
</tbody>
</table>

2. Check students’ work. Possible answer: when the number of cups increases by two, the number of gallons increases by 1/8.

Go Further
Student page 101 Have students look for patterns in cup/gallon equivalents.

Answers for student page 101: 3. 80

4. |

<table>
<thead>
<tr>
<th>Cups</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1/16</td>
</tr>
<tr>
<td>2</td>
<td>1/8</td>
</tr>
<tr>
<td>3</td>
<td>1/16</td>
</tr>
<tr>
<td>4</td>
<td>1/4</td>
</tr>
<tr>
<td>5</td>
<td>5/16</td>
</tr>
<tr>
<td>6</td>
<td>3/8</td>
</tr>
<tr>
<td>7</td>
<td>7/16</td>
</tr>
<tr>
<td>8</td>
<td>1/2</td>
</tr>
</tbody>
</table>

5. Check students’ work. Possible answer: the number of cups describes the number of sixteenths of a gallon.

6. Check students’ work. Possible answer: yes, the number of cups always describes the number of sixteenths of a gallon, but for even numbers of cups, you can simplify the fraction.

Assessment
Student self-assessment page 101 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use a pattern of ratios to find equivalent measures?
Materials
Student page 102
Math Maze cards (Week 21 Activity 102)
Optional: blocks and pictures of polygons

Concept and Handbook Reference
Recognize and be able to draw geometric figures.
(MAH 337–383)

Background
A regular polygon has congruent sides and angles.
For example, a square is a regular rectangle and it is
also a regular parallelogram. A rhombus, even
though its sides are congruent, is not regular
because its angles are not all congruent.

You may want to do something interesting with
angle measurements. For example, 180° is:
• the number of degrees in a straight line.
• the sum of the measures of the interior angles of a
  triangle.
• twice the number of degrees in a right angle.
• called a straight angle.
• the number of degrees in a semicircle.

Get Started
If possible, display three-dimensional geometric
blocks and pictures of polygons. Ask students to
identify them, listing important characteristics.

Today’s Challenge
Distribute the 18 Math Maze cards for week 21.
Each student should receive at least one card, but
since all cards need to be distributed, some students
may need to get more than one card. Use the cards
to play the Math Maze game.

Instructions for playing Math Maze Ask students to
look at their cards. Ask one student to read the
question that is written on his or her card. Next ask,
“Who has the card with the answer to the question
just read?” Ask that student to read the answer, and
then read the question on his or her card. Play con-
tinues until all questions have been answered. The
last answer to be read should be the answer on the
first student’s card.

The correct sequence of questions and answers is
shown on page 198.

Student page 102 When the group has finished
playing the game, have students open their books
and complete the Today’s Challenge activity on
page 102 in the student book.

Answers for student page 102: 1, 2, and 4 may also
be not regular polygons, and may even be concave.

1. \[ \begin{array}{c}
\hline
\hline
\end{array} \]
2. \[ \begin{array}{c}
\hline
\hline
\end{array} \]

3. \[ \begin{array}{c}
\hline
\hline
\end{array} \]
4. \[ \begin{array}{c}
\hline
\hline
\end{array} \]

5. \[ \begin{array}{c}
\hline
\hline
\end{array} \]
6. \[ \begin{array}{c}
\hline
\hline
\end{array} \]

7. \[ \begin{array}{c}
\hline
\hline
\end{array} \]
8. \[ \begin{array}{c}
\hline
\hline
\end{array} \]

9. \[ \begin{array}{c}
\hline
\hline
\end{array} \]
10. \[ \begin{array}{c}
\hline
\hline
\end{array} \]

Go Further
Student page 102 Have students complete this sec-
tion of the student page.

Answers for student page 102: 11. pentagon, octa-
gon, square, hexagon, kite, equilateral triangle
12. Parallel lines are always the same distance apart;
they never intersect. 13. The angles in exercise 9
are less than 90°.

Assessment
Student self-assessment page 102 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tip Do students know the difference
between a regular polygon and one that is not reg-
ular?
Materials
Student page 103
Blank paper
Index cards (optional)

Concept and Handbook Reference
Determine side length of a rectangle when given one side length and the area. (MAH 301)

Get Started
Remind students that the area of a rectangle is the number of square units inside the rectangle. The area is found by multiplying the length times the width. Draw a rectangle on the board. Label the longer side 5 units and the shorter side 3 units. Have the students find the area. (15 square units) Then have them explain how they solved the problem. (Multiply the two side lengths; 3 × 5 = 15.)

Today's Challenge
Student page 103 Have students look at the completed examples at the top of student page 103. In example 1, the area is 10 square centimeters and one side is 2 centimeters long. Have students explain how the length of the other side was found. (Area is the length times the width; divide the area by the known side length to find the length of the other side.)

For example 1: 2 × w = 10; w = 10 ÷ 2; w = 5 centimeters.

For example 2: 1 × w = 10; w = 10 ÷ 1; w = 10 centimeters.

Have students complete the table on page 103 of their books. Explain that each row has two rectangles that have the same area but different side lengths. In each case, students are to find the missing side length.

Answers for student page 103: 1. 10 ft 2. 5 ft 3. 12 cm 4. 4 cm 5. 8 yd 6. 24 yd 7. 7 in. 8. 14 in. 9. 1 km 10. 4 km 11. 6 ft 12. 3 ft 13. 15 mm 14. 30 mm 15. 4 miles 16. 2 miles

Go over answers with the whole group or check students' papers individually.

Go Further
Have pairs of students make a set of cards to play the game "Concentration." Each pair of students will need 16 small pieces of paper or 16 index cards. Have the students use one slip of paper or card to copy the information from each box in the table on student page 103. Students should not copy the two examples at the top of the page, and they should not copy the boxes with the word "area."

Instructions for playing "Concentration" Shuffle the cards and lay them facedown in four equal columns. Players decide who will go first. The first player turns over two cards. If the cards match (show different side lengths for the same area), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 103 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find a missing side length of a rectangle when given the length of one side and the area?
Materials
Student page 104
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Subtract decimals less than 1. (MAH 135)

Get Started
Have students practice subtracting decimals. Write the following problem on the board.

\[
\begin{array}{c}
0.86 \\
-0.63 \\
\end{array}
\]

Explain that the decimal points must line up.
Subtract the hundredths. Subtract the tenths. Be sure to include the decimal point in the difference.
The answer is 0.23. Repeat this process several times with different decimals.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of digits that can be used to make subtraction equations for decimals with differences that are greater than 0.19 and less than 0.27. All numbers used in the equations must be less than 1. Students must supply the zeroes in the ones places.

\[
\begin{array}{cccc}
6 & 8 & 4 & 2 \\
1 & 4 & 6 & 2 \\
6 & 4 & 9 & 2 \\
3 & 8 & 6 & 6 \\
\end{array}
\]

Equations can be made with any four adjoining digits (horizontally and/or vertically) on the poster.
Digits on the poster can be used more than once.
For example, the digits in the first row form 6842, which can be used to make the equation
\[
0.68 - 0.42 = \square.
\]
Students then calculate the difference, 0.26. Record the equations students make.

Possible equations: 0.68 – 0.46 = 0.22;
0.42 – 0.22 = 0.20; 0.69 – 0.46 = 0.23;
0.83 – 0.61 = 0.22

Student page 104 Have students use the Math Jumble on student page 104 to find strings of digits that can be used to make subtraction equations for decimals with differences that are greater than 0.19 and less than 0.27. All the numbers in the equations must be less than 1. Students must supply the zeroes in the ones places and the difference for each equation.

Possible answers for student page 104:
0.97 – 0.75 = 0.22; 0.78 – 0.56 = 0.22;
0.86 – 0.65 = 0.21; 0.75 – 0.53 = 0.22;
0.56 – 0.34 = 0.22; 0.65 – 0.39 = 0.26;
0.56 – 0.36 = 0.20; 0.68 – 0.43 = 0.25;
0.85 – 0.63 = 0.22; 0.68 – 0.46 = 0.22

Go Further
Student page 104 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 104: Grids and equations will vary.

Assessment
Student self-assessment page 104 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly subtract decimals less than 1?
Materials
Student page 105
Blank paper

Concept and Handbook Reference
Solve a word problem involving elapsed time. (MAH 324)

Get Started
Discuss the concept of elapsed time. Model the process of counting by hours, half hours, and minutes from the beginning time of an event to the ending time of the same event. Demonstrate the process of finding elapsed time through an equation by subtracting the beginning time from the ending time. Remind students that regrouping hours involves changing the hour regrouped to 60 minutes.

Student page 105 To introduce the activity, work through the first problem on student page 105. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (2 hours) is wrong because “2 hours would mean he was picked up at 2:30 P.M., not 4:00 P.M.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 105 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 105 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve word problems involving elapsed time?
Materials
Student page 106

Concepts and Handbook References
Explore the ratios in pounds and ounces. (MAH 317)
Use common multiples. (MAH 059)

Get Started
Discuss the ratio of ounces to pounds (16:1). Draw this table on the board and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Ounces</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{1}{16})</td>
</tr>
<tr>
<td>2</td>
<td>(\frac{2}{16} = \frac{1}{8})</td>
</tr>
<tr>
<td>3</td>
<td>(\frac{3}{16})</td>
</tr>
</tbody>
</table>

Ask students to predict the first row that will contain all whole numbers. (16 ounces/1 pound) Discuss their reasoning.

Today's Challenge
Student page 106 Have students use ratios to write ounce/pound equivalents.

Answers for student page 106:

1. 

<table>
<thead>
<tr>
<th>Ounces</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(\frac{1}{16})</td>
</tr>
<tr>
<td>2</td>
<td>(\frac{1}{8})</td>
</tr>
<tr>
<td>3</td>
<td>(\frac{3}{16})</td>
</tr>
<tr>
<td>4</td>
<td>(\frac{1}{4})</td>
</tr>
<tr>
<td>5</td>
<td>(\frac{5}{16})</td>
</tr>
<tr>
<td>6</td>
<td>(\frac{3}{8})</td>
</tr>
<tr>
<td>7</td>
<td>(\frac{7}{16})</td>
</tr>
<tr>
<td>8</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>9</td>
<td>(\frac{9}{16})</td>
</tr>
<tr>
<td>10</td>
<td>(\frac{5}{8})</td>
</tr>
<tr>
<td>11</td>
<td>(\frac{11}{16})</td>
</tr>
<tr>
<td>12</td>
<td>(\frac{3}{4})</td>
</tr>
<tr>
<td>13</td>
<td>(\frac{13}{16})</td>
</tr>
<tr>
<td>14</td>
<td>(\frac{7}{8})</td>
</tr>
<tr>
<td>15</td>
<td>(\frac{15}{16})</td>
</tr>
<tr>
<td>16</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Check students’ work. Possible answer: 16 has no odd factors other than one, so if there is an odd numerator, the fraction can’t be simplified.

Go Further
Student page 106 Have students generalize the equivalents for 16:1 ratios.

Answers for student page 106: 3. Check students’ work. There are 16 tablespoons in a cup and 16 cups in a gallon.

<table>
<thead>
<tr>
<th>Ounces</th>
<th>Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>(\frac{15}{16})</td>
</tr>
<tr>
<td>14</td>
<td>(\frac{7}{8})</td>
</tr>
<tr>
<td>13</td>
<td>(\frac{13}{16})</td>
</tr>
<tr>
<td>12</td>
<td>(\frac{12}{16})</td>
</tr>
<tr>
<td>11</td>
<td>(\frac{11}{16})</td>
</tr>
<tr>
<td>10</td>
<td>(\frac{10}{16})</td>
</tr>
<tr>
<td>9</td>
<td>(\frac{9}{16})</td>
</tr>
<tr>
<td>8</td>
<td>(\frac{8}{16})</td>
</tr>
<tr>
<td>7</td>
<td>(\frac{7}{16})</td>
</tr>
<tr>
<td>6</td>
<td>(\frac{6}{16})</td>
</tr>
<tr>
<td>5</td>
<td>(\frac{5}{16})</td>
</tr>
<tr>
<td>4</td>
<td>(\frac{4}{16})</td>
</tr>
<tr>
<td>3</td>
<td>(\frac{3}{16})</td>
</tr>
<tr>
<td>2</td>
<td>(\frac{2}{16})</td>
</tr>
<tr>
<td>1</td>
<td>(\frac{1}{16})</td>
</tr>
</tbody>
</table>

4. Check students’ and friends’ work. 5. Check students’ work—entries should be the same.

Assessment
Student self-assessment page 106 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students know when a fraction is in simplest form?
Materials
Student page 107
Math Maze cards (Week 22 Activity 107)
Calculator (optional)

Concept and Handbook Reference
Multiply measures. (*MAH 294–332*)

Get Started
Talk about equivalent measures. Consider making a list of common equivalents on the board. Then ask these questions.

- How many inches are in one foot? (12) How many inches are in 5 feet? (60)
- How many eggs are in one dozen? (12) How many eggs are in 7 dozen? (84)
- How many seconds are in one minute? (60) How many seconds are in five minutes? (300)
- How many feet are in one yard? (3) How many feet are in three yards? (9)

Students may use paper and pencil and, at your discretion, a calculator.

Today's Challenge
Distribute the 18 Math Maze cards for week 22. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze
Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 199.

Student page 107 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 107 in the student book.

Answers for student page 107: 1. 21; 4. 2; 10; 3. 8; 7. 48; 8. 5; 8; 1; 6. 9; 2; 7. 36; 6; 8. 18; 3; 9. 50; 9; 10. 32; 5

Go Further
Student page 107 Have students give their problems to a friend to solve.

Answers for student page 107: 11. Answers must be less than 8. 12. Answers must be more than 120.

Assessment
Student self-assessment page 107 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip
Do students know basic measurement equivalents?
**Game Time**

**Week 22 • Activity 108**

**Materials**
Student page 108
Blank paper (heavyweight if possible) or index cards
Clock (optional)

**Concept and Handbook Reference**
Add and subtract minutes from a given time, crossing between A.M. and P.M. **(MAH 324)**

**Background**
The time that passes between 10:00 and 10:30 is called elapsed time. You can find elapsed time by counting on from the start time to the finish time, or by counting back from the finish time to the start time.

**Get Started**
If you do not have a clock that you can manipulate, draw two clocks on the board. Follow the steps to demonstrate the answer to the following question.

Your plane leaves at 11:27 A.M. Your flight lasts 96 minutes. What time will you arrive at your destination?

First step: Convert 96 minutes to hours and minutes. (1 hour, 36 minutes)
Second step: Add one hour past 11:27 A.M. (12:27 P.M.)
Third step: Add the remaining 36 minutes to 12:27 P.M. (1:03 P.M.)

Use the same steps to answer the following question. For steps two and three, count back instead of adding on.

The time is now 1:48 P.M. What time was it 136 minutes ago? (11:32 A.M.)

**Today’s Challenge**
Student page 108: Have students complete the table on page 108 of their books. In each case, students are to write the missing time.

Answers for student page 108: 1. 12:28 P.M.
2. 11:45 P.M. 3. 1:16 A.M. 4. 12:03 P.M.
5. 12:56 P.M. 6. 11:20 P.M. 7. 10:50 A.M.
11. 11:55 A.M. 12. 10:50 A.M. 13. 11:55 A.M.
14. 12:32 A.M. 15. 12:03 P.M. 16. 11:20 P.M.
17. 11:45 P.M. 18. 12:32 A.M. 19. 1:16 A.M.
20. 12:40 A.M.

Go over answers with the whole group or check students’ papers individually.

**Go Further**
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box in the table on student page 108.

**Instructions for playing “Concentration”** Shuffle the cards and lay them facedown in four equal columns. Players decide who will go first. The first player turns over two cards. If the cards match (show the same time), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

**Assessment**
Student self-assessment page 108 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students determine elapsed time ahead and back combining A.M. and P.M.?
Materials
Student page 109
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Make change from $1.00 using different coin combinations. (MAH 026)

Get Started
Have students practice making change from $1.00 using pennies, nickels, dimes, and quarters. One student calls out a purchase amount less than $1.00. Another student calls out the correct amount of change from $1.00 for that amount and names a combination of coins for the change. For example, one student calls out 56 cents. The second student says, “44 cents is the correct change. The amount can be made with 1 quarter, 1 dime, 1 nickel, and 4 pennies.” Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the coin cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of coins that total the change from $1.00 for a given purchase amount.

Strings of coins are made by joining coins that are inside squares that share a common side, either horizontally and/or vertically, on the poster. Ask students to find a string of coins that total the change from $1.00 when the purchase amount is 54 cents. They should look for a string of coins with a value of 46 cents. For example, the coins in the second column and the last coin in the third column make the string quarter, dime, penny, nickel, nickel. Point to the coins one at a time to find the total value as you move down and then to the right. So 25¢, 35¢, 36¢, 41¢, 46¢ is the total value of the coins. Continue by asking some students to name purchase amounts less than $1.00 and have other students try to find strings of coins that could be used to make the correct change from $1.00. Repeat several times. Note that not all change amounts can be made.

Student page 109 Have students complete Today’s Challenge on student page 109.

Answers for student page 109: 1. 75¢ 2. 42¢ 3. 51¢ 4. 37¢ 5. 41¢. Loops of coins will vary. Check students’ work.

Go Further
Student page 109 Have students write a word problem that involves making change from $1.00. Students should have a friend solve the problem.

Answers for student page 109: Word problems and solutions will vary.

Assessment
Student self-assessment page 109 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make change from $1.00 using different coin combinations?
Materials
Student page 110
Blank paper

Concept and Handbook Reference
Identify triangles by their angle measurements. (MAH 361)

Get Started
Draw the following tables on the board.

<table>
<thead>
<tr>
<th>Type of triangle</th>
<th>Attributes</th>
</tr>
</thead>
<tbody>
<tr>
<td>scalene</td>
<td>all sides different lengths;</td>
</tr>
<tr>
<td></td>
<td>all angles different sizes</td>
</tr>
<tr>
<td>isosceles</td>
<td>two congruent sides;</td>
</tr>
<tr>
<td></td>
<td>two congruent angles</td>
</tr>
<tr>
<td>equilateral</td>
<td>all sides congruent;</td>
</tr>
<tr>
<td></td>
<td>all angles congruent</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of angle</th>
<th>Measurement</th>
</tr>
</thead>
<tbody>
<tr>
<td>acute</td>
<td>less than 90°</td>
</tr>
<tr>
<td>right</td>
<td>exactly 90°</td>
</tr>
<tr>
<td>obtuse</td>
<td>greater than 90°</td>
</tr>
<tr>
<td></td>
<td>and less than 180°</td>
</tr>
</tbody>
</table>

Explain that triangles can be classified by the measurement of their angles and sides. Today’s activity will focus on angle measurements. Explain that the sum of the measures of the angles of any triangle is always 180°. Write 50°, 70°, and 60° on the board. Point out that the sum is 180°. According to the first table, the angle measurements indicate that this triangle is scalene. According to the second table, the largest angle, 70°, is acute. The angle measurements indicate the triangle described is an acute scalene triangle. Provide other examples if necessary before proceeding with the student page. Allow students to refer to the tables while completing the activity.

Student page 110 To introduce the activity, work through the first problem on student page 110. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say B (90°, 45°, 45°) is wrong because “An equilateral triangle has three congruent angles, not two.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (A). Be sure students understand why A is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 110 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 110: 1. A  2. D
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 110 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify triangles by their angle measurements?
Materials
Student page 111

Concept and Handbook Reference
Explore and use ratios. (MAH 178–180)

Background
In a recipe, changing the amount of one ingredient requires you to change the amounts of all other ingredients at the same rate. In that case, write a ratio with the initial amount of one ingredient as the numerator and the new amount of the same ingredient as the denominator. The ratio describing the change in amount for any ingredient should be equivalent to the ratio 1:n, where n is the number of full recipes you plan to use. 1:2 doubles the recipe, 1:3 triples it, and so forth.

Get Started
Pretend with the group that you will be making multiple batches of brownies. Start this table on the board. Discuss the table headings and ask students to help you fill in rows 1–5.

<table>
<thead>
<tr>
<th>Boxes of Mix</th>
<th>Eggs</th>
<th>Cups of Water</th>
<th>People Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

Ask students to comment on patterns in the table.
- What do you notice about the number of boxes of brownie mix and the number of eggs? (They are the same.)
- What is the ratio of boxes of mix to eggs? (1 box to 1 egg)
- What do you notice about the number of boxes of brownie mix and the number of cups of water? (The number of cups of water is double the number of boxes.)
- What is the ratio of boxes of mix to cups of water? Remember that the order is important. (1 box to 2 cups)
- Can you describe a relationship between the number of people served and the number of boxes of mix? (The number of people served is 10 times the number of boxes.)

Today's Challenge
Student page 111 Have students complete and analyze the Brownie Batch Table.

Answers for student page 111: 1.

<table>
<thead>
<tr>
<th>Boxes of Mix</th>
<th>Eggs</th>
<th>Cups of Water</th>
<th>People Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>2</td>
<td>10</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>10</td>
<td>50</td>
</tr>
</tbody>
</table>

2. Check students’ work. The number of cups of water needed is double the number of eggs.
3. 2 to 1 4. B; 2 × B; 10 × B

Go Further
Student page 111 Have students think about the ratios in another way.

Answers for student page 111: 5. 1:2 6. 2:4 = 1:2
7. Check students’ work. The ratio a batches : b batches is the same as these ratios: a eggs : b eggs, a water : b water, and a servings : b servings.

Assessment
Student self-assessment page 111 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students write and use ratios?
Materials
Student page 112
Math Maze cards (Week 23 Activity 112)

Concept and Handbook Reference
Solve word problems involving money.
(MAH 023–026)

Get Started
Present this cumulative word problem and help students solve it.

Start with a nickel. Double its value. How much do you have? (10¢)
Take that amount and subtract it from $1.00. What do you have now? (90¢)
Take that amount and add $5.00. What do you have now? ($5.90)
If that amount is change from a ten-dollar bill, how much did you have to pay? ($4.10)

Today's Challenge
Distribute the 18 Math Maze cards for week 23. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 200.

Student page 112 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 112 in the student book.

Answers for student page 112: 1. $60.00 2. $24.00 3. 3 4. $7.50 5. 15¢ 6. 5¢ 7. $7.00 8. 2 9. $2.60 10. $12.00

Go Further
Student page 112 Help students devise ways to keep track as they fill in the table.

Answers for student page 112:

<table>
<thead>
<tr>
<th></th>
<th>50¢</th>
<th>25¢</th>
<th>10¢</th>
<th>5¢</th>
<th>1¢</th>
</tr>
</thead>
<tbody>
<tr>
<td>half-dollar</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>quarter</td>
<td></td>
<td></td>
<td>3</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>dime</td>
<td>2</td>
<td>9</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>nickel</td>
<td>1</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>penny</td>
<td>1</td>
<td>3</td>
<td>2</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Assessment
Student self-assessment page 112 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students keep track of the results in a cumulative problem?
Materials
Student page 113
Blank paper

Concept and Handbook Reference
Make change from $5 using the least number of coins and bills. (MAH 023–026)

Get Started
Write a money amount less than $5 on the board, for example, $3.57. Ask students to determine the least number of coins and bills that can be used to make that amount. (3 one-dollar bills, 2 quarters, 1 nickel, 2 pennies) Next ask students to tell you the amount of change they would receive if they purchased a $3.57 item with a five-dollar bill. ($1.43) Ask students to determine the least number of coins and bills that can be used to make that amount. (1 one-dollar bill, 1 quarter, 1 dime, 1 nickel, 3 pennies) Repeat these steps with two or three other money amounts.

Student page 113 Have students use the same steps to answer the questions in the Get Started section of page 113 in their books.

Answers for student page 113: 1. no 2. no 3. no 4. yes 5. yes 6. yes 7. no 8. yes

Today's Challenge
Explain that today you will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and write any money amount less than $5. Then ask students to number their papers from 1 to 5.

As you ask each of five questions, ask students look at their money amounts and answer the question. Yes answers will score points. Here are the questions to ask:
1. Is your amount less than $1.50? If yes, score 10 points.
2. Is your amount greater than $3.50? If yes, score 5 points.
3. Can your amount be made with less than 5 coins and 2 bills? If yes, score 9 points.
4. Can your amount be made with no nickels? If yes, score 8 points.
5. Can you buy a school lunch with your amount? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her money amount on the board and explain how he or she scored the points.

Go Further
Student page 113 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 113: 9. 1 one-dollar bill, 1 quarter, 1 nickel, 2 pennies. 10. Students' own riddles will vary.

Assessment
Student self-assessment page 113 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make change from $5 using the least number of coins and bills?
Materials  
Student page 114  
Math Jumble activity poster and digit cards

Concept and Handbook Reference  
Find patterns when multiplying by 11 and by 12.  
(MAH 139–141)

Get Started  
Begin by brainstorming multiplication equations that include 11 or 12 as one of the factors. One student calls out any number greater than 2 and less than 12. Another student calls out either 11 or 12. Then a third student multiplies the two numbers and gives the product. For example, one student calls out 6 and the second student calls out 11. The third student says, “6 × 11 = 66.” Continue until all students have had the opportunity to participate.

Today’s Challenge  
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations that have 11 or 12 as one of the factors.

Strings of digits are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, the last three digits in the first row and the digits in the last column form the string 129108, which could be used to make the multiplication equation 12 × 9 = 108.

Possible equations: 11 × 4 = 44; 11 × 5 = 55; 12 × 9 = 108; 12 × 4 = 48

Student page 114 Have students use the Math Jumble on student page 114 to find more strings of digits.

Answers for student page 114: 12 × 6 = 72; 11 × 6 = 66; 11 × 3 = 33; 12 × 5 = 60; 12 × 1 = 12

Go Further  
Student page 114 Have students complete the activity on the student page.


Assessment  
Student self-assessment page 114 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find and describe patterns when multiplying by 11 and by 12?
Materials
Student page 115
Blank paper

Concept and Handbook Reference
Identify quadrilaterals by their attributes. (MAH 364–366)

Get Started
Draw a four-sided polygon on the board and label it quadrilateral. Explain that there are five other shapes in the quadrilateral family: the trapezoid, the parallelogram, the rectangle, the rhombus, and the square. Draw, label, and discuss each shape and its defining attributes. Point out the shapes and the attributes that students tend to confuse, for example, those of the square and the rhombus.

Student page 115 To introduce the activity, work through the first problem on student page 115. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say B (four congruent angles) is wrong because “A parallelogram has 2 acute and 2 obtuse angles.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (A). Be sure students understand why A is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 115 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.


When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 115 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify quadrilaterals by their attributes?
Materials
Student page 116

Concept and Handbook Reference
Practice liter/milliliter equivalents. (MAH 315)

Background
Each kind of metric measure has its own name.

<table>
<thead>
<tr>
<th>Unit</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>meter</td>
<td>distance</td>
</tr>
<tr>
<td>liter</td>
<td>liquid measure</td>
</tr>
<tr>
<td>gram</td>
<td>mass</td>
</tr>
</tbody>
</table>

The units associated with each kind of measure are based on powers of ten.

<table>
<thead>
<tr>
<th>Kilometer</th>
<th>Thousand</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hectometer</td>
<td>Hundred</td>
</tr>
<tr>
<td>Dekameter</td>
<td>Ten</td>
</tr>
<tr>
<td>Decimeter</td>
<td>Tenth</td>
</tr>
<tr>
<td>Centimeter</td>
<td>Hundredth</td>
</tr>
<tr>
<td>Millimeter</td>
<td>Thousandth</td>
</tr>
</tbody>
</table>

To build names of metric measures, start with the basic unit and use one of the prefixes if you need to indicate a larger or smaller unit.

Get Started
Tell students that the metric measurement system is based on tens—just like our number system. Build a metric equivalence table with them.

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Place</th>
<th>Value Compared to Basic Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>kilo-</td>
<td>thousands</td>
<td>× 1000</td>
</tr>
<tr>
<td>hecto-</td>
<td>hundreds</td>
<td>× 100</td>
</tr>
<tr>
<td>deka-</td>
<td>tens</td>
<td>× 10</td>
</tr>
<tr>
<td>(Basic Unit)</td>
<td>ones</td>
<td>× 1</td>
</tr>
<tr>
<td>deci-</td>
<td>tenths</td>
<td>× 0.1</td>
</tr>
<tr>
<td>centi-</td>
<td>hundredths</td>
<td>× 0.01</td>
</tr>
<tr>
<td>milli-</td>
<td>thousandths</td>
<td>× 0.001</td>
</tr>
</tbody>
</table>

Draw this T-table on the board and ask students to help you fill it in. Reinforce the relationship between liters and milliliters by focusing on the prefix and by reading the decimals as fractions (0.001 = one thousandth).

<table>
<thead>
<tr>
<th>Liters</th>
<th>Milliliters</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001</td>
<td>1</td>
</tr>
<tr>
<td>0.002</td>
<td>2</td>
</tr>
<tr>
<td>0.003</td>
<td>3</td>
</tr>
</tbody>
</table>

Today’s Challenge
Student page 116 Have students fill in more of the table you started on the board, then extrapolate from the pattern.

Answers for student page 116:
1. | Liters | Milliliters |
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0.001</td>
<td>1</td>
</tr>
<tr>
<td>0.002</td>
<td>2</td>
</tr>
<tr>
<td>0.003</td>
<td>3</td>
</tr>
<tr>
<td>0.004</td>
<td>4</td>
</tr>
<tr>
<td>0.005</td>
<td>5</td>
</tr>
<tr>
<td>0.006</td>
<td>6</td>
</tr>
<tr>
<td>0.007</td>
<td>7</td>
</tr>
<tr>
<td>0.008</td>
<td>8</td>
</tr>
</tbody>
</table>

2. Check students’ work. Possible answer: 10 mL is more than 9 mL but 0.0010 is less than 0.009.
3. 20 4. 200 5. 2000

Go Further
Student page 116 Have students answer more questions about metric equivalents.

Answer for student page 116:
6. | Prefix  | Place     | Value Compared to Basic Unit |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1 liter</td>
<td>10 deciliters</td>
<td>100 centiliters = 1000 milliliters</td>
</tr>
<tr>
<td>0.25 liter</td>
<td>2.5 deciliters</td>
<td>25 centiliters = 250 milliliters</td>
</tr>
<tr>
<td>0.5 liter</td>
<td>5 deciliters</td>
<td>50 centiliters = 500 milliliters</td>
</tr>
<tr>
<td>0.75 liter</td>
<td>7.5 deciliters</td>
<td>75 centiliters = 750 milliliters</td>
</tr>
</tbody>
</table>

Assessment
Student self-assessment page 116 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students reason carefully about the relative size of units?
Materials
Student page 117
Math Maze cards (Week 24 Activity 117)

Concept and Handbook Reference
Solve multi-step problems. (MAH 072–092)

Get Started
Before playing the Math Maze game, practice a few problems that build on each other. Pause for a few seconds between each operation.
• Start with 5; multiply by 7; add 7 to the result; divide the sum by 6. What do you get? (7)
• Start with 10; divide by 2; multiply the result by 20; subtract 13 from the product. What do you get? (87)
• Start with 30; find \( \frac{1}{2} \) of it; double the result; multiply the result by 5; add 3 to the product. What do you get? (63)

Today’s Challenge
Distribute the 18 Math Maze cards for week 24. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 201.

Student page 117 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 117 in the student book.

Answers for student page 117: 1. 5 2. 17 3. 11 4. 33 5. 7 6. 19 7. 26 8. 13 9. 21 10. 5

Go Further
Student page 117 Help students to construct their own multi-step problem that starts and ends with the same number.

Answers for student page 117: 11. Check students’ work.

Assessment
Student self-assessment page 117 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students quick to recall the numbers associated with groups of a specified size, like duet and dozen?
Materials
Student page 118
Blank paper

Concept and Handbook Reference
Estimate differences in multi-digit subtraction problems. (MAH 100–105)

Get Started
Write the following problem on the board.

57,535 – 8,421 =

Ask the students to describe how they would make a good estimate for the answer. For example, it will be a 5-digit number even if both numbers are rounded to the ten thousands place; it will be about 50,000 because 58,000 minus 8,000 is 50,000. Be sure to accept and welcome all valid strategies for estimating differences.

Today's Challenge
Explain that today you will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and write a problem in which a four-digit number is subtracted from a five-digit number and the difference is between 35,000 and 95,000. Have the students write an estimate of the difference and a strategy sentence explaining how they made the estimate. Then ask the students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their estimates and strategy sentences and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your estimate greater than 50,000 and less than 70,000? If yes, score 8 points.
2. Did your strategy involve rounding to the ten thousands place? If yes, score 10 points.
3. Did your strategy involve rounding to the thousands place? If yes, score 15 points.
4. Is your estimate greater than 62,000 and less than 85,000? If yes, score 9 points.
5. Did your strategy involve adding up? If yes, score 7 points.

Have students find their total scores. Determine which student has the highest score. Have that student write his or her problem on the board, read the strategy sentence, and explain how he or she scored the points.

Go Further
Student page 118 Have students solve the riddles, write and solve their own riddles, and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 118: 1. 54,086 2. 32,000 3–4. Students’ own riddles will vary.

Assessment
Student self-assessment page 118 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a good estimate for a multi-digit subtraction problem?
Materials
Student page 119
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add and subtract to get even-number answers. (MAH 063)

Get Started
Begin by brainstorming addition and subtraction equations that have even-number answers. One student calls out any three-digit number. Another student calls out a second three-digit number. Then a third student either adds or subtracts the given numbers to get an even-number answer. For example, one student calls out 150, the second student calls out 200, and the third student says, “150 + 200 = 350,” or “200 – 150 = 50.” As a class, determine if the answers are odd or even. Do this until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make addition or subtraction equations with even-number answers.

Strings of digits are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, the digits in the first column and the second and third digits in the fourth row form the string 382146, which could be used to make the equations 382 + 146 = 528 or 382 – 146 = 236. Record the equations students make.

Possible equations: 459 + 461 = 920;
810 – 732 = 78; 382 + 146 = 528;
382 – 146 = 236; 461 + 709 = 1170

Student page 119 Have students use the Math Jumble on student page 119 to find more strings.

Answers for student page 119: Possible equations:
471 + 283 = 754; 471 – 283 = 188;
134 + 962 = 1096; 461 + 349 = 810;
461 – 349 = 112; 318 + 120 = 438;
318 – 120 = 198

Go Further
Student page 119 Have students complete the activity on the student page.


Assessment
Student self-assessment page 119 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students recognize when there will be an even-number answer when adding or subtracting?
Materials
Student page 120
Blank paper

Concept and Handbook Reference
Recognize and name composite and prime numbers. (MAH 053–055)

Get Started
Write the numbers 13 and 14 on the board. Record the factors of 14 as 1, 2, 7, and 14. Record the factors of 13 as 1 and 13. Define factors as numbers that divide evenly into another number. Explain that numbers that have more than two factors are classified as composite numbers. Numbers with only two factors (1 and the number itself) are classified as prime numbers. Ask students to provide examples of other numbers that fall into these categories before proceeding with the lesson.

Student page 120 To introduce the activity, work through the first problem on student page 120. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say D (99) is wrong because “99 is a multiple of 9 and 11, so it is not a prime number.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 120 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 120: 1. B 2. D
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 120 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students recognize and name composite and prime numbers?
Materials
Student page 121
Rulers

Concepts and Handbook References
Explore patterns and measurements. (MAH 294)
Compare fractions of an inch and one inch. (MAH 035)

Get Started
Draw a straight, horizontal line segment on the board. Ask students to pretend this line segment is one inch long. Mark the middle of the line segment. Ask these questions.

- What can you say about the segments on either side of my middle mark? (They are the same length.)
- What length does each segment represent? (1/2 inch)

Mark midpoints again to create fourths. Discuss, then mark eighths, then sixteenths.

Today's Challenge
Student page 121 Have students count and mark equal parts.

Answers for student page 121: 1. 4; 1/4 2. 16; 1/16

Go Further
Student page 121 Help students find and mark fractions on a number line.

Answers for student page 121:

5-8.

Assessment
Student self-assessment page 121 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students see tenths and think fifths or halves?
Materials
Student page 122
Math Maze cards (Week 25 Activity 122)

Concept and Handbook Reference
Multiply fractions and whole numbers. (MAH 168)

Background
You can use an area model to find a fraction of a number. If you had a rectangle with the dimensions 7 x 8, each row of seven is \(\frac{1}{8}\) of 56, so \(\frac{3}{8}\) would be three of those rows of 7. Without the model, divide 56 by 8 to get one eighth, then multiply by three since you are looking for three of the eighths.

Get Started
Review finding a fraction of a number.
- How could you figure out \(\frac{4}{5}\) of 35? (\(\frac{4}{5}\) is 7, so \(\frac{4}{5}\) is \(4 \times \frac{7}{5}\), or 28)
- What is \(\frac{5}{6}\) of 600? (500)
- What about \(\frac{2}{3}\) of 12? It is easier if you think of \(\frac{2}{3}\) as \(\frac{1}{3}\) because 12 is evenly divisible by 4, but not by 8. (3)

Next, complete these puzzles with the class. Students will need pencil and paper.
- What is the first \(\frac{5}{8}\) of sleeping? (sleep)
- What is the first \(\frac{2}{3}\) of maybe added to the last \(\frac{3}{5}\) of fifth? (math)

Today's Challenge
Distribute the 18 Math Maze cards for week 25. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 202.

Student page 122 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 122 in the student book.

Answers for student page 122: 1. \(\frac{1}{4}\) of 48; 1
2. \(\frac{1}{3}\) of 36; 2
3. \(\frac{1}{2}\) of 36; 1
4. \(\frac{3}{4}\) of 64; 3
5. \(\frac{3}{4}\) of 56; 1
6. \(\frac{3}{8}\) of 72; 3
7. \(\frac{3}{8}\) of 96; 2
8. \(\frac{1}{7}\) of 49; 4
9. neither
10. \(\frac{2}{5}\) of 30; 2

Go Further
Student page 122 Ask students to make up their own Which Is Greater? problems to share with a friend.

Answers for student page 122: 11. Check students’ work 12. Solution methods will vary; the number is 12 and \(\frac{2}{3}\) of the number is 8.

Assessment
Student self-assessment page 122 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find many of these products using mental math?
**Materials**
Student page 123
Blank paper (heavyweight if possible) or index cards
Protractor (optional)

**Concept and Handbook Reference**
Identify acute, obtuse, and right angles.
(MAH 344–347)

**Get Started**
Explain that two rays that share an endpoint form an angle. A right angle has a measure of exactly 90°, an acute angle has a measure less than 90°, and an obtuse angle has a measure greater than 90° and less than 180°. Draw different angles on the board, such as those shown below. Ask students to name each angle. Then write the name under each angle. Have students draw and label their own angles on the board. Measure each angle with a protractor, if possible.

![Acute, Right, Obtuse Angles](image)

**Answers for student page 123:**
1. obtuse angle
2. acute angle
3. acute angle
4. right angle
5. right angle
6. acute angle
7. acute angle
8. Drawings will vary. Check students' work individually to make sure the angles are correctly drawn and labeled.

**Go Further**
Have pairs of students make a set of cards to play the game "Concentration." Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 123.

**Instructions for playing "Concentration"** Shuffle the cards and lay them facedown in four equal columns. Players decide who will go first. The first player turns over two cards. If the cards match (show an angle and the correct name), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

**Assessment**
Student self-assessment page 123 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students correctly identify acute, obtuse, and right angles?
Materials
Student page 124
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Multiply one- and two-digit numbers.
(MAH 137–141)

Background
When multiplying larger numbers, encourage students to estimate products before solving to determine if their solutions are reasonable.

Get Started
Begin by brainstorming multiplication equations with products greater than 250 and less than 300. One factor must be a one-digit number; the other factor must be a two-digit number. One student calls out a two-digit number. Another student calls out a one-digit number. Then a third student calls out the multiplication equation and tells whether the product is greater than 250 and less than 300. For example, one student calls out 54 and the second student calls out 5. Then the third student says, “54 × 5 is about 250. It is actually 270, which is greater than 250 and less than 300.” If the product is not greater than 250 and less than 300, the three students try again. Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that could be used to make multiplication equations with products greater than 250 and less than 300. Each equation must include a one-digit and a two-digit factor. The product will not be included as part of the string.

Strings of numbers are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, the first digit in the first row and the first two digits in the second column form the string 348, which could be used to make the equation 34 × 8 = 272.

Possible equations: 30 × 9 = 270; 4 × 72 = 288; 34 × 8 = 272; 4 × 71 = 284; 84 × 3 = 252

Student page 124 Have students use the Math Jumble on student page 124 to find more strings of digits.

Possible answers for student page 124: Note that the string of digits includes the product in the activity on the student page. 58 × 5 = 290; 4 × 73 = 292; 28 × 9 = 252; 52 × 5 = 260

Go Further
Student page 124 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 124: Grids and equations will vary.

Assessment
Student self-assessment page 124 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students multiply one- and two-digit numbers?
Materials
Student page 125
Blank paper

Concept and Handbook Reference
Find logical answers to word problems involving the addition of fractions. *(MAH 157–161)*

Get Started
Draw fraction strips for the benchmark fractions of $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, and 1 whole. Discuss the relationship of these fractions to $\frac{1}{2}$ and 1 whole. Use the fraction strip drawings to analyze which fractions when combined are less than, equal to, or greater than 1 whole. For example, $\frac{1}{8}$ plus $\frac{1}{4}$ is less than 1 whole. In fact, $\frac{1}{8}$ plus $\frac{1}{4}$ is less than $\frac{1}{2}$. Provide practice with this concept before proceeding to the student page.

Student page 125 To introduce the activity, work through the first problem on student page 125. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (less than $\frac{1}{4}$ of a pizza) is wrong because “She ate $\frac{1}{2}$ of a pizza and then some more, so she ate more than $\frac{1}{4}$ of a pizza.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 125 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 125: 1. D 2. B
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 125 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find logical answers to word problems involving the addition of fractions?
Materials
Student page 126

Concept and Handbook References
Use the Look for a Pattern and Make a Table problem-solving strategies. (MAH 401–402, 400)

Get Started
Tell students that today you will be solving problems related to a tropical-theme restaurant. Write this list on the board.

Sound Effects Plan
(All clocks start at 8 A.M.)
• Thunderstorm starts every 15 minutes
• Parrots screech every 5 minutes
• Lion roars every 10 minutes
Ask these questions to establish students’ understanding of the schedule.
• At what time will the first thunderstorm start? (8:00 A.M.)
• At what time will the second thunderstorm start? (8:15 A.M.)
• The second time the parrots will screech is ___? (8:05 A.M.)
• The third time the lions will roar is ___? (8:20 A.M.)
• If you arrive for breakfast at 9:02 A.M., what is the first sound effect you will hear? (Parrots screech at 9:05 A.M.)
• How do you know? (Parrots screech every 5 minutes, so they’ll be heard at 8:05, 8:10, 8:15, 8:20, 8:25, 8:30, and so on.)

Draw this table on the board. Discuss with students the times to place in the first column. (Minute-by-minute is not necessary, as everything happens in multiples of five minutes.) Work with the group to fill in the first half-hour of sound effect events.

Ask these questions about the table.
• What effect happens most often? (parrots)
• When are parrots and lions heard at the same time? (8:00, 8:10, 8:20, 8:30)
• When are all three effects happening together? (8:00, 8:30)

Today’s Challenge
Student page 126 Have students complete the table and answer the questions.

Answers for student page 126: 1.

<table>
<thead>
<tr>
<th>Time</th>
<th>Thunderstorm</th>
<th>Parrots</th>
<th>Lion</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:35 A.M.</td>
<td>✔</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>8:40 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>8:45 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>8:50 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>8:55 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:00 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:05 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:10 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:15 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:20 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:25 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>9:30 A.M.</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

2. 1; check students’ explanations—all three start together only on the half hour.

Go Further
Student page 126 Have students introduce another element to the table and re-examine the patterns in the table.

Answers for student page 126: 3–6. Check students’ work.

Assessment
Student self-assessment page 126 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students extrapolate from a pattern?
Materials
Student page 127
Math Maze cards (Week 26 Activity 127)

Concept and Handbook References
Relate side length, perimeter, and area of polygons.
(MAH 295–297, 299–301)

Background
Perimeter of a square: 4s
Area of a square: s²
Perimeter of a rectangle: 2l + 2w
Area of a rectangle: lw

Get Started
· Review perimeter and area. If necessary, generate a
list of formulas for perimeter and area. Keep it
where students can see it and add to it. Ask, “If the
area of a square is four square units, what do you
know about one of the sides?” (It is two units long.)
“What is its perimeter?” (8 units)
Discuss that knowing the area of a figure is not
enough information to find its perimeter unless the
figure is regular.

Today’s Challenge
Distribute the 18 Math Maze cards for week 26.
Each student should receive at least one card, but
since all cards need to be distributed, some students
may need to get more than one card. Use the cards
to play the Math Maze game.

Instructions for playing Math Maze Ask students to
look at their cards. Ask one student to read the
question that is written on his or her card. Next ask,
“Who has the card with the answer to the question
just read?” Ask that student to read the answer, and
then read the question on his or her card. Play con-
tinues until all questions have been answered. The
last answer to be read should be the answer on the
first student’s card.

The correct sequence of questions and answers is
shown on page 203.

Student page 127 When the group has finished
playing the game, have students open their books
and complete the Today’s Challenge activity on
page 127 in the student book.

Answers for student page 127: 1. 154 sq. cm
2. 50 cm 3. 8 in.; 8 in. 4. 32 in. 5. 13 ft; 9 ft
6. 9 yd; 9 yd 7. 81 sq. yd 8. 180 sq. ft
9. 54 ft 10. 10 ft; 10 ft 11. 40 ft 12. 10 in.; 2 in.
13. 80 sq. yd 14. 48 yd

Go Further
Student page 127 Help students relate area, perime-
ter, and whole-number dimensions.

Answers for student page 127: 15. in any order:
18 ft, 24 ft, 42 ft 16. There are three sets of factors
for 20 and they provide possible whole-number
dimensions for a rectangle with an area of 20
square feet: 1 × 20, 2 × 10, 4 × 5. 17. in any
order: 7 sq. ft, 12 sq. ft, 15 sq. ft, 16 sq. ft
18. No; a side-length of 8 feet won’t work and all shorter
whole-number lengths have been used (1 × 7,
2 × 6, 3 × 5, 4 × 4).

Assessment
Student self-assessment page 127 Have students
circle one of the three choices to describe how they
feel about this activity.
Assessment tip Can students reliably extrapolate
missing information from given information?
**Materials**
Student page 128
Blank paper
Protractor (optional)

**Concept and Handbook Reference**
Identify acute, obtuse, and right angles in polygons. *(MAH 347)*

**Get Started**
Draw an acute, a right, and an obtuse angle on the board. Ask students to name each angle. Then write the correct name under each angle. Next, draw a square, a pentagon, a hexagon, and a trapezoid on the board, such as those shown below. Circle the angles in each shape and ask students to name each angle. Label each angle. If possible, show students how to use a protractor to measure each angle.

![Diagrams of angles]

As you ask each of five questions, have students look at their polygons and answer the question. Yes answers will score points. Here are the questions to ask:

1. Does your polygon have any obtuse angles? If yes, score 10 points.
2. Do all sides of your polygon have a different length? If yes, score 5 points.
3. Does your polygon have any acute angles? If yes, score 9 points.
4. Does your polygon have any right angles? If yes, score 8 points.
5. Does your polygon have more sides than a pentagon? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that student draw the polygon on the board and explain how he or she scored the points.

**Go Further**
Student page 128 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

**Answers for student page 128:**
9. rectangle 10. Students’ own riddles will vary.

**Assessment**
Student self-assessment page 128 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students correctly identify acute, obtuse, and right angles in polygons?
Materials
Student page 129
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add decimals. (MAH 125–126)

Get Started
Have students practice adding decimals. Write the following problem on the board.

\[
\begin{align*}
4.53 \\
+ 3.26
\end{align*}
\]

Remind students that the decimal points must line up. Add the hundredths, the tenths, and then the ones. Be sure to include the decimal point in the sum. The answer is 7.79. Repeat this process several times with different decimals.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that can be used to make addition equations for decimals with sums that are greater than 1 and less than 1.50. Students must supply the zeroes in the ones places and the sum for each equation.

![Math Jumble Grid]

Equations can be made with any four adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once. For example, the digits in the first row form the string 4673 which can be used to make the equation \(0.46 + 0.73 = \square\). Students then calculate the sum, 1.19. Record the equations students make.

Possible equations: 0.46 + 0.87 = 1.33;
0.37 + 0.67 = 1.04; 0.56 + 0.74 = 1.30;
0.76 + 0.27 = 1.03; 0.68 + 0.76 = 1.44

Student page 129 Have students use the Math Jumble on student page 129 to find more strings of digits.

Possible answers for student page 129:
0.56 + 0.48 = 1.04; 0.65 + 0.64 = 1.29;
0.63 + 0.82 = 1.45; 0.64 + 0.71 = 1.35;
0.73 + 0.61 = 1.34; 0.56 + 0.47 = 1.03;
0.53 + 0.84 = 1.37; 0.63 + 0.51 = 1.14;
0.73 + 0.54 = 1.27; 0.83 + 0.65 = 1.48

Go Further
Student page 129 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 129: Grids and equations will vary.

Assessment
Student self-assessment page 129 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly add decimals?
Rule Out Two

Materials
Student page 130
Blank paper

Concept and Handbook Reference
Solve word problems involving elapsed time across meridians. (MAH 324)

Get Started
Discuss the concept of time in terms of the number of hours in a day, the division of a day into a.m. and p.m., and elapsed time. Model the process of counting by hours, half hours, and minutes from the time an event begins in the morning until the ending time of the same event in the afternoon. Demonstrate finding elapsed time using an equation by subtracting the beginning time from the ending time. Introduce the idea of military time by adding 12 to the afternoon or evening ending time of an event. Write the following example on the board.

\[
\begin{align*}
7:30 \text{ P.M.} & \quad 7 \text{ hrs } 30 \text{ min} \quad 19 \text{ hrs } 30 \text{ min} \\
- \quad 6:00 \text{ A.M.} & \quad - \quad 6 \text{ hrs } 00 \text{ min} \quad = \quad - \quad 6 \text{ hrs } 00 \text{ min} \\
& \quad 13 \text{ hrs } 30 \text{ min}
\end{align*}
\]

Remind students that regrouping hours involves changing the hour regrouped to 60 minutes. Practice both methods, using one to check the accuracy of the other.

Student page 130 To introduce the activity, work through the first problem on student page 130. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (16 hours and 50 minutes) is wrong because “If you count forward 16 hours from 10:20 A.M., it would be about 2:00 A.M.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 130 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 130: 1. A 2. C

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 130 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve word problems involving elapsed time across meridians?
Pattern Puzzles

Week 27 Activity 131

Materials
Student page 131

Concept and Handbook References
Use the Look for a Pattern and Make a Diagram problem-solving strategies. (MAH 401–402, 398)

Get Started
Tell students that today you will be solving problems related to schedules. Write this schedule on the board.

Route 27 Bus Schedule
6 A.M.–8 A.M.  Every hour
8 A.M.–10 A.M.  Every 15 minutes
10:30 A.M.–4:30 P.M.  Every hour on the half hour
4:30 P.M.–6:30 P.M.  Every 15 minutes
6:30 P.M.–8 P.M.  Every hour

Ask these questions to establish students’ understanding of the schedule.
- Can you expect to catch the Route 27 bus at 6 A.M.? (yes)
- Can you expect to catch it at 6:15 A.M.? (no) Explain. (The bus runs only every half hour this early in the morning.)
- If you get to the bus stop at 8:05 A.M., when should you expect to get on the Route 27 bus? (8:15 A.M.)
- If you get to the bus stop at 10:45 A.M., how long must you wait for the next Route 27 bus? (45 minutes) Why? (Every hour on the half hour means 10:30, 11:30, 12:30, and so on.)

Help students figure out the best increments to use on a timeline that diagrams the bus schedule. (15 minutes) Draw this diagram on the board and ask students to help you fill it in by checking bus arrival times.

Today’s Challenge
Student page 131 Have students complete the diagram and answer the questions.

Answers for student page 131:
1. 6 A.M., 7 A.M., 8 A.M., 9 A.M., 10 A.M., 11 A.M., 12 noon, 1 P.M., 2 P.M., 3 P.M., 4 P.M., 5 P.M., 6 P.M., 7 P.M., 8 P.M.
Materials
Student page 132.
Math Maze cards (Week 27 Activity 132)

Concept and Handbook Reference
Solve simple proportions. (MAH 181–187)

Background
A unit price is a price for one. If you know that three things cost $1.50, the ratio of things to dollars is $\frac{3}{1.50}$. You can think proportionally to find equivalent ratios. $\frac{3}{1.50} = \frac{1}{0.50} = \frac{6}{3.00}$, and so on.

Get Started
Talk about how things are priced at stores. Sometimes the price listed is for more than one of the item. The unit price can help you figure out the price for different multiples, but you don’t always need to find the unit price first. Ask these questions.

- If two stars cost $5.00, how much does one star cost? ($2.50)
- If two stars cost $5.00, how much do three stars cost? ($7.50)
- If two stars cost $5.00, how many can you buy for $15.00? (6)
- If three cubes cost $7.00, which is cheaper, one cube or one star? (Cubes are cheaper because they cost less than $2.50 each.)

A pencil and paper are important. Making drawings is a fine idea.

Today’s Challenge
Distribute the 18 Math Maze cards for week 27. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze
Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 204.

Student page 132
When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 132 in the student book.

Answers for student page 132: 1. $1.00  2. $7.50  3. $1.25  4. $2.00  5. $16.00  6. $3.00  7. $3.50  8. $18.00  9. 40  10. 9

Go Further
Student page 132
Suggest that students look for multiple answers for exercise 14.

Answers for student page 132: 11. 2  12. 8  13. 6  14. One possible answer: 8 rectangles, 3 circles, and 2 ovals. The sum must be $13.75.

Assessment
Student self-assessment page 132
Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip
Do students choose an efficient way to find the cost of multiple items?
Materials
Student page 133
Blank paper

Concept and Handbook Reference
Add fractions with like denominators. (MAH 159)

Get Started
Review addition of fractions with like denominators. Explain that when fractions have like denominators, only the numerators are added. Write the following problems on the board. Have students solve them and record the correct answers on the board.

\[
\frac{1}{3} + \frac{1}{3} = \left(\frac{2}{3}\right) \quad \frac{2}{5} + \frac{2}{5} = \left(\frac{4}{5}\right) \\
\frac{5}{8} + \frac{2}{8} = \left(\frac{7}{8}\right) \quad \frac{3}{9} + \frac{5}{9} = \left(\frac{8}{9}\right)
\]

Repeat the process with other fraction equations.

Today's Challenge
Explain that today the class will be playing a game called “Fantastic Finalist.” Give each student a piece of paper with one of the fractions listed below written on it.

1. \(\frac{1}{2r}, \frac{1}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{2}{3}, \frac{4}{3}, \frac{2}{3}, \frac{3}{3}, \frac{4}{3}, \frac{5}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{3}{5}, \frac{6}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{2}{6}, \frac{3}{6}, \frac{4}{6}, \frac{5}{6}, \frac{6}{6}, \frac{7}{7}, \frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}, \frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \frac{5}{7}, \frac{6}{7}, \frac{7}{7}, \frac{8}{8}, \frac{2}{8}, \frac{3}{8}, \frac{4}{8}, \frac{5}{8}, \frac{6}{8}, \frac{7}{8}, \frac{8}{8}, \frac{9}{9}, \frac{2}{9}, \frac{3}{9}, \frac{4}{9}, \frac{5}{9}, \frac{6}{9}, \frac{7}{9}, \frac{8}{9}, \frac{9}{9}\)

You do not have to use all the fractions, but be sure that one student receives the fraction \(\frac{4}{9}\), since that fraction will be the “Fantastic Finalist.”

Have all students hold their fractions and stand in a large circle. Explain that the object of the game is to be the “Fantastic Finalist,” the last student to remain standing.

Read each of the following challenges, one at a time.
• If your fraction is \(\frac{1}{2}\) or a fraction that is equal to \(\frac{1}{2}\), sit down. \(\frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}\)
• If your fraction is equal to \(\frac{2}{3}\) or \(\frac{3}{3}\), sit down. \(\frac{2}{3}, \frac{3}{3}\)
• If your numerator is equal to \(\frac{5}{6}\), sit down. \(\frac{5}{6}, \frac{5}{6}, \frac{6}{6}, \frac{7}{8}, \frac{8}{8}\)
• If your numerator is less than or equal to \(3\), sit down. \(\frac{2}{3}, \frac{3}{4}, \frac{2}{5}, \frac{3}{5}, \frac{2}{6}, \frac{3}{6}, \frac{2}{7}, \frac{3}{7}, \frac{2}{8}, \frac{3}{8}\)
• If your denominator is an odd number, sit down. \(\frac{4}{5}, \frac{5}{5}\)

At this point, only the student holding the fraction \(\frac{4}{9}\) should still be standing. That student is the “Fantastic Finalist.”

Go Further
Student page 133 Have students complete the activity on the student page.

Answers for student page 133: 1. \(\frac{1}{2}\)
2. Possible answers: \(\frac{3}{7} + \frac{4}{7} = \frac{7}{7}, \frac{5}{7} + \frac{2}{7} = \frac{7}{7}\)
3. Possible answers: \(\frac{3}{9} + \frac{4}{9} = \frac{7}{9}, \frac{2}{9} + \frac{5}{9} = \frac{7}{9}\)

Assessment
Student self-assessment page 133 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip: Can students add fractions with like denominators?
**Materials**
Student page 134
Math Jumble activity poster and digit cards

**Concepts and Handbook References**
Name coins to make amounts up to $2.00.
(MAH 023–025)
Express money amounts in decimal form.
(MAH 012)

**Get Started**
Explain to students that thinking of money amounts can help them understand decimals. Cents are hundredths of dollars. So the 5 in $3.75 has a value of 5 cents or 5 hundredths of a dollar. The 7 has a value of 7 tenths or 70 hundredths. Have students practice thinking of money amounts in terms of decimals. One student calls out a money amount less than $1.00. Another student tells the value of the amount in tenths and hundredths. For example, one student calls out 68 cents. Another student says, “68 cents is 6 tenths and 8 hundredths, or 68 hundredths.” Next, have students call out money amounts less than $2.00 and the coins and bills that can be used to make the amounts. For example, one student calls out $1.45. A second student says, “$1.45 can be made with 1 one-dollar bill, 1 quarter, and 2 dimes.” Continue until all students have had the opportunity to participate.

**Today’s Challenge**
Using the coin and dollar bill cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of coins and bills that total given amounts up to $2.00.

Strings are made by joining coins and bills that are inside squares that share a common side, either horizontally and/or vertically, on the poster. Ask students to find a string of coins and bills that total $1.50. For example, the money amounts in the second column plus the dime at the bottom of the third column make the string dime, nickel, one dollar, quarter, and dime. Point to the coins and bills one at a time to find the total value as you move down and then to the right. So 10¢, 15¢, $1.15, $1.40, $1.50 is the total value. Continue by asking some students to name amounts less than $2.00 and have other students try to find strings of coins and bills to make the given amounts. Repeat several times. Note that not all money amounts can be made.

**Student page 134** Have students complete Today’s Challenge on student page 134.

**Answers for student page 134**: Coin combinations will vary. Check students’ work.

**Go Further**
**Student page 134** Have students use the grid on the student page to create a Math Jumble to share with a friend.

**Answers for student page 134**: Grids and coin combinations will vary.

**Assessment**
**Student self-assessment page 134** Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip**: Can students count bills and coins totaling less than $2.00?
Materials
Student page 135
Blank paper

Concept and Handbook Reference
Identify points on a coordinate grid.
(MAH 265–266)

Get Started
Draw a 5 by 5-coordinate grid on the board. Label the x- and y-axes 0 through 5. Label 4 points on the grid A through D. Explain that in a coordinate system, the points are located by finding the intersection of the two coordinates. The first coordinate is located on the horizontal, or x-, axis. The second coordinate is located on the vertical, or y-, axis. Demonstrate how to find the intersection by moving one hand upward from the horizontal axis and the other hand across the grid from the vertical axis until the two reach a point of intersection. Select students to provide the coordinates for the points A through D. Allow students to find and label other points before proceeding with the student page.

Student page 135 To introduce the activity, work through the first problem on student page 135. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (4, 8) is wrong because “The coordinates are in the wrong order.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 135 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 135 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students locate points on a coordinate grid using ordered pairs?
### Materials
Student page 136

### Concept and Handbook Reference
Use the *Look for a Pattern and Make an Organized List* problem-solving strategies. (MAH 401–403)

### Get Started
Tell students that today you will be solving problems related to combinations. Write this menu on the board. Suggest that it’s for a tuna sandwich shop.

**Tuna Yum-wiches**

Pick one bread and two fillings for $4.95

<table>
<thead>
<tr>
<th>Bread</th>
<th>Filling</th>
</tr>
</thead>
<tbody>
<tr>
<td>white</td>
<td>tomato</td>
</tr>
<tr>
<td>rye</td>
<td>peppers</td>
</tr>
<tr>
<td>sourdough</td>
<td>mayonnaise</td>
</tr>
<tr>
<td></td>
<td>cheese</td>
</tr>
<tr>
<td></td>
<td>lettuce</td>
</tr>
</tbody>
</table>

Ask students to help you decide how many white-bread tuna yum-wiches there are. Start this table and have students help you fill it in. Encourage them to use a pattern to keep track of the items in the list. Here, we have followed the order of the initial list: given filling to bottom of list, then back to top of list.

**with tomato**
- tomato-peppers (T-P)
- T-M
- T-C
- T-L

**with peppers**
- P-M
- P-C
- P-L
- P-T

Ask the group to study your list and decide whether you have too few, too many, or all of the possible tuna yum-wiches listed. (too many) If students don’t notice that there is a repeated sandwich, ask whether the order of the fillings makes a difference. (No, so tomato-peppers is the same as peppers-tomato.) Cross out the duplicate and double-check to be sure the list is now accurate.

### Today’s Challenge
Student page 136 Have students complete the organized list and look for patterns.

**Answers for student page 136: 1–2.**

<table>
<thead>
<tr>
<th>with tomato</th>
<th>with peppers</th>
<th>with mayonnaise</th>
<th>with cheese</th>
<th>with lettuce</th>
</tr>
</thead>
<tbody>
<tr>
<td>T-P</td>
<td>P-M</td>
<td>M-C</td>
<td>C-L</td>
<td></td>
</tr>
<tr>
<td>T-M</td>
<td>P-C</td>
<td>M-L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-C</td>
<td>P-L</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-L</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. 10 4. Check students’ work. For each added ingredient, one more duplicate is crossed off than for the previous ingredient.

### Go Further
Student page 136 Help students extend their work from exercises 1–4.

**Answers for student page 136: 5.** Check students’ work. Give credit for thoughtful reasoning and clear explanation. Answer may be revised for exercise 6, so do not mark it wrong here. 6. Check students’ work. Give credit for correct answer to exercise 5 if it is correct here. There are 15 possible yummy-wiches with six filling choices.

### Assessment
Student self-assessment page 136 Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students organize and check a list to be sure they have covered all possibilities with no duplicates?
Materials
Student page 137
Math Maze cards (Week 28 Activity 137)

Concept and Handbook Reference
Find fractions of measures. (MAH 032)

Background
1 pound = 16 ounces
1 hour = 60 minutes
1 minute = 60 seconds
1 day = 24 hours
1 foot = 12 inches
1 dollar = 100 cents

Get Started
Work with students to create a table of the equivalent measures that will be used today (see above). Keep the table where all students can see it and add to it as needed.

Today's Challenge
Distribute the 18 Math Maze cards for week 28. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 205.

Student page 137 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 137 in the student book.

Answers for student page 137: 1. 6 2. 8 3. 12 4. 30 5. 50 6. 8 7. 16 8. 40 9. 9 10. 12 11. 18 12. 45 13. 75 14. 3 15. 4 16. 6 17. 25 18. 2 19. 3 20. 2 21. 4 22. 10 23. 24 24. 40 25. 4 26. 8 27. 20 28. 10 29. 20 30. 50 31. Check students’ work. The shaded boxes represent fractional parts that are not whole-number answers.

Go Further
Student page 137 Have students complete this section of the student page.

Answers for student page 137: 32. 2640 33. 3520 34. 3960 35. 1320 36. 660 37. 880 38. 2112 39. 1760 40. 4400

Assessment
Student self-assessment page 137 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students able to find fractional parts of whole numbers?
Materials
Student page 138
Blank paper

Concept and Handbook Reference
Identify quadrilaterals by their attributes.
(MAH 364-366)

Get Started
A quadrilateral is a four-sided polygon. Draw these
quadilaterals on the board and discuss their attributes
by having students fill in the table on page 138 in
their books.

As you ask each of five questions, have students
look at their shapes and answer the question. Yes
answers will score points. Here are the questions to
ask:
1. Does your quadrilateral have 4 right angles? If
   yes, score 10 points.
2. Does your quadrilateral have no right angles? If
   yes, score 5 points.
3. Does your quadrilateral have no congruent sides?
   If yes, score 9 points.
4. Does your quadrilateral have 2 pairs of congruent
   sides? If yes, score 8 points.
5. Does your quadrilateral have 1 pair of parallel
   sides, no congruent sides, and no right angle? If
   yes, score 15 points.

Have students find their total scores. Determine
which student has the highest score. Have that stu-
dent draw his or her quadrilateral on the board and
explain how he or she scored the points.

Answers for table on student page 138:

<table>
<thead>
<tr>
<th>Quadrilateral</th>
<th>Pairs of Parallel Sides</th>
<th>Pairs of Congruent Sides</th>
<th>Number of Right Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>trapezoid</td>
<td>1 pair</td>
<td>0 or 1 pair</td>
<td>0 or 2</td>
</tr>
<tr>
<td>parallelogram</td>
<td>2 pairs</td>
<td>2 pairs</td>
<td>0 or 4</td>
</tr>
<tr>
<td>rectangle</td>
<td>2 pairs</td>
<td>2 pairs</td>
<td>4</td>
</tr>
<tr>
<td>rhombus</td>
<td>2 pairs</td>
<td>2 pairs, 4 sides congruent</td>
<td>0 or 4</td>
</tr>
<tr>
<td>square</td>
<td>2 pairs</td>
<td>2 pairs, 4 sides congruent</td>
<td>4</td>
</tr>
</tbody>
</table>

Today’s Challenge
Explain that today the class will be playing a game
called “Who Wants to Be the Top Scorer?” Have
each student take a blank sheet of paper and draw
any quadrilateral he or she chooses. Have students
label the length of each side of their quadrilaterals.
Then ask students to number their papers from
1 to 5.

Go Further
Student page 138 Have students solve the riddle,
write and solve their own riddles, and create anoth-
er riddle for a friend to solve. Have the solver sign
his or her name.

Answers for student page 138: 1. trapezoid
2–3. Students’ own riddles will vary.

Assessment
Student self-assessment page 138 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tip Can students identify quadrilaterals
by their attributes?
Materials
Student page 139
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Multiply fractions by whole numbers.
(MAH 167–168)

Background
Find one-half of the set.

\[
\frac{1}{2} \text{ of } 6 \text{ is } 3. \quad \frac{1}{2} \times 6 = 3.
\]

Get Started
Begin by brainstorming whole numbers that, when multiplied by \(\frac{1}{2}\), equal whole numbers. One student calls out a whole number. Another student calls out \(\frac{1}{2}\). A third student tells the value of one-half of the given whole number and gives the equation. For example, one student calls out 6. The second student calls out \(\frac{1}{2}\). The third student says, “\(\frac{1}{2}\) of 6 is 3, so \(\frac{1}{2} \times 6 = 3\)” Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find two-digit numbers that, when multiplied by \(\frac{1}{2}\), equal whole numbers.

```
2 3 1 4
4 6 8 1
4 8 3 2
6 2 1 0
```

Numbers can be made by using any two adjoining digits (horizontally or vertically) on the poster. For example, the first two digits in the first column make the number 24. Record the facts students find in both word and math symbol forms. For example, one half of 24 is 12, \(\frac{1}{2} \times 24 = 12\).

Possible two-digit numbers: 24, 44, 46, 48, 62, 20, 12, 18, 82, 68

Student page 139 Have students use the Math Jumble on student page 139 to find more whole numbers that, when multiplied by \(\frac{1}{2}\), equal whole numbers.

Answers for student page 139: All even two-digit numbers are correct answers. Answers will vary. Check students’ calculations.

Go Further
Student page 139 Have students use the grid on the student page to create a Math Jumble to share with a friend. Note that students are now using two-digit numbers that yield whole numbers when multiplied by \(\frac{1}{3}\) or \(\frac{1}{4}\).

Answers for student page 139: Grids and equations will vary. Multiples of 3 will yield whole numbers when multiplied by \(\frac{1}{3}\). Multiples of 4 will yield whole numbers when multiplied by \(\frac{1}{4}\). Check students’ work.

Assessment
Student self-assessment page 139 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students multiply fractions by whole numbers?
Materials
Student page 140
Blank paper

Concept and Handbook Reference
Identify triangles by angle and side descriptions.
(MA3 361–362)

Get Started
Draw the following table on the board.

<table>
<thead>
<tr>
<th>Sides</th>
<th>Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>scalene</td>
<td>acute</td>
</tr>
<tr>
<td>isosceles</td>
<td>right</td>
</tr>
<tr>
<td>equilateral</td>
<td>obtuse</td>
</tr>
</tbody>
</table>

Define the terms and draw triangles that illustrate each term and the appropriate combinations of terms, such as right isosceles, obtuse scalene, and so on.

Student page 140 To introduce the activity, work through the first problem on student page 140. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (largest angle right, all sides congruent) is wrong because “An isosceles triangle has only 2 equal sides.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 140 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 140: 1. D 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 140 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify triangle by angle and side descriptions?
Materials
Student page 141

Concepts and Handbook References
Use the Look for a Pattern and Draw a Diagram problem-solving strategies. (MAH 401–402, 398)
Review perimeter. (MAH 295–297)

Background
For a polygon with sides that are all the same length, the perimeter (distance around) is number of sides \times length of one side. If sides are not the same length, perimeter is the sum of the lengths of the sides.

Get Started
Draw an equilateral triangle and a scalene triangle on the board. Label the sides as shown.

Review the meaning of perimeter and talk about how to find it. Be sure you distinguish between equilateral (regular) figures and figures whose sides are not the same length.

Now, draw these three figures and ask students to help you find their perimeters.

Ask students to suggest the shape and dimensions of the next figure in the pattern. (hexagon, \( s = 4 \) units)

Today’s Challenge
Student page 141 Have students further explore the perimeter pattern.

Answers for student page 141:
1. Figure 4: \( P = 24 \text{ cm} \); Figure 5: \( s = 5 \text{ cm}, P = 35 \text{ cm} \); Figure 6: \( s = 6 \text{ cm}, P = 48 \text{ cm} \)
2. 9
3. 7 cm
4. 63 cm

Go Further
Student page 141 Help students to generalize a formula for finding the perimeter of any figure in the pattern.

Answers for student page 141: 5. figure number = length of side 6. Length of a side is two less than the number of sides. 7. length of a side + 2 = number of sides 8. number of sides \(- 2\) = length of a side 9. 120 cm; check students’ explanations. 10. 80 cm; check students’ explanations.

Assessment
Student self-assessment page 141 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students write a word equation to express a generalization?
Materials
Student page 142
Math Maze cards (Week 29 Activity 142)

Concept and Handbook Reference
Write and solve word equations. (MAH 240–243)

Get Started
Discuss writing word equations as symbolic equations, then practice together with these and similar problems.

- What is four more than \(7 \times 8\)?
  \((4 + (7 \times 8)) = 4 + 56 = 60\)

- What is three less than \(4 \times 7\)?
  \(((4 \times 7) - 3) = 28 - 3 = 25\)

Today's Challenge
Distribute the 18 Math Maze cards for week 29. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 206.

Student page 142 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 142 in the student book.

Answers for student page 142: 1. 31 2. 80 3. 36 4. 74 5. 19 6. 0 7. 26 8. 44 9. 38 10. 9 11. 85 12. 8 13. 66 14. 17 15. 74

Go Further
Student page 142 Ask students to pick some word equations to write as symbol equations.

Answers for student page 142: 16. Check students’ work.

Assessment
Student self-assessment page 142 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students’ mental-math skills sharp enough to solve these problems without paper and pencil?
Materials
Student page 143
Blank paper
Ruler (optional)

Concept and Handbook References
Read a ruler to measure fractions of an inch. (MAH 294, 035)

Get Started
On the board, draw a giant inch ruler like the one shown. Do not include the fractions. Together with the students, identify each fractional part of the giant inch and record the fractions on the ruler. Have students record each fraction on the ruler in the Get Started section of student page 143.

<table>
<thead>
<tr>
<th>0</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

As you ask each of four questions, have students look at their drawings and measurements and answer the question. Yes answers will score points. Here are the questions to ask:
1. Is your object less than $\frac{1}{2}$ of an inch long? If yes, score 10 points.
2. Is your object less than $\frac{9}{16}$ of an inch long? If yes, score 5 points.
3. Is your object equivalent to $\frac{12}{16}$ of an inch long? If yes, score 9 points.
4. Is your object between $\frac{1}{2}$ and $\frac{3}{16}$ of an inch long? If yes, score 8 points.

Have students find their total scores. Determine which student has the highest score. Have that student tell which object he or she measured and what the measurement was. Ask the student to explain how he or she scored the points.

Go Further
Student page 143 Have students find objects in the room to match the clues. Then have students fill in the blanks to solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 143: Answers will vary. Possible answers: 1. paper clip 2. width of a pencil eraser 3–4. Students’ own riddles will vary.

Today’s Challenge
Explain that objects can be measured to the nearest inch, $\frac{1}{2}$ inch, $\frac{1}{4}$ inch, $\frac{1}{8}$ inch, or even $\frac{1}{16}$ inch.

Assessment
Student self-assessment page 143 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly use a ruler to measure fractions of an inch?
Materials
Student page 144
Math Jumble activity poster and digit cards

Concept and Handbook References
Add non-equivalent fractions that may have unlike denominators. (MAH 035, 157–160)

Get Started
Have students practice adding fractions that are not equivalent. Write the fraction 2/3 on the board. Ask
students to name fractions that are equivalent to 2/3. Possible responses are 4/6 and 6/9. Then ask students to
name fractions that are not equivalent. Possible responses are 1/3 and 1/2. Demonstrate adding the frac-
tions that are not equivalent.

\[
\frac{2}{3} + \frac{1}{2} = \frac{4}{6} + \frac{3}{6} = \frac{7}{6} = 1 \frac{1}{6}
\]

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4
poster shown. Explain that the object of today’s
Math Jumble is to make non-equivalent fractions
that will be added. Students must supply the sum
for each addition problem they make.

Fractions can be made with any two adjoining dig-
ts, horizontally or vertically, on the poster. The dig-
ts can be used as either numerators or denomin-
ators and can be used more than once. For example,
the first two digits in the first column are 1 and 2,
which can be used to make 1/2. The last two digits in
the first row are 3 and 4, which can be used to
make 3/4. 1/2 + 3/4 = 1 1/4. Record the equations stu-
dents make. Be sure only non-equivalent fractions
are added.

Possible equations: \( \frac{1}{2} + \frac{3}{4} = \frac{5}{4} = 1\frac{1}{4}; \frac{1}{2} + \frac{1}{2} = \frac{4}{2} = 2; \)
\( \frac{1}{3} + \frac{4}{3} = \frac{5}{3} = 1; \frac{1}{4} + \frac{3}{4} = \frac{4}{4} = 1; \frac{1}{5} + \frac{2}{5} = \frac{3}{5} = 1; \)
\( \frac{1}{5} + \frac{3}{5} = \frac{4}{5} \)

Student page 144 Have students use the Math Jumble on student page 144 to find more non-
equivalent fractions to add.

Possible answers for student page 144:
\( \frac{2}{4} + \frac{1}{4} = \frac{3}{4}; \frac{1}{3} + \frac{3}{3} = \frac{4}{3}; \frac{2}{3} + \frac{2}{4} = \frac{5}{6} = 1\frac{3}{6}; \)
\( \frac{2}{3} + \frac{2}{4} = \frac{14}{12} = 1\frac{1}{6}; \frac{1}{5} + \frac{3}{5} = \frac{4}{5} = 1\frac{1}{5}; \frac{3}{5} + \frac{3}{5} = \frac{13}{6} = 2\frac{1}{6} \)

Go Further
Student page 144 Have students use the grid on the
student page to create a Math Jumble to share with
a friend.

Answers for student page 144: Grids and equations
will vary.

Assessment
Student self-assessment page 144 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tips Can students add non-equivalent
fractions? Can students add fractions with unlike
denominators?
Materials
Student page 145
Blank paper

Concept and Handbook References
Recognize decimals and fractions as different names for the same amount. (MAH 019, 043)

Get Started
Write $\frac{1}{10}$ and 0.1 on the board. Represent both quantities by drawing a square, dividing it into tenths, and shading it appropriately. Explain that the fraction and decimal numbers are two different ways of mathematically representing the amount shaded in the drawing. Draw an analogy between the example and writing one’s name in manuscript or cursive letters—the name still represents the same person. Write $\frac{1}{100}$ and 0.01 on the board. Represent both quantities by drawing a square, dividing it into hundredths, and shading it appropriately. Discuss the illustration in relation to the numeric representation.

Student page 145 To introduce the activity, work through the first problem on student page 145. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (0.05, $\frac{1}{2}$) is wrong because “The decimal means 5 hundredths, not 5 tenths.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 145 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 145: 1. C 2. A

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 145 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students identify fractions and decimals as different names for the same amount?
Materials
Student page 146
Graph paper (optional)

Concept and Handbook References
Use the Look for a Pattern problem-solving strategy with the Make an Organized List and Draw a Diagram strategies. (MAH 401, 403, 398)

Get Started
Draw this figure on the board.

![Figure](image)

Ask students to speculate about why it is called a pentomino. (It has five parts and is reminiscent of a domino.) Explain the rules for making a pentomino:
- It is made of five identical squares.
- Each square shares one or more sides with other squares.

Draw these figures and ask students whether they are pentominoes. Have them explain their answers.

- Yes, five identical squares, all sharing at least one side with another square
- No, whole side not shared
- No, not all squares
- No, one square has no shared sides
- No, not all identical squares

Now, draw these pairs of figures and ask whether they are different pentominoes.

- No, you can flip then turn one to make the other
- Yes
- No, you can flip then turn one to make the other
- No, you can flip then turn one to make the other

Today’s Challenge
Student page 146 Have students draw the remaining ten pentominoes. You may wish to let students cut them out of graph paper so they can more easily test for flips and turns.

Answers for student page 146: 1. Check students’ work.

![Images of Pentominoes](image)

Go Further
Student page 146 A net for a cube is an arrangement of six identical squares that can be folded to make a cube. Have students draw the eight true nets for a cube. You may wish to have them cut the nets from graph paper so they can be tested.

Answers for student page 146: 2–4. Check students’ work.

![Images of Nets](image)

Assessment
Student self-assessment page 146 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students visualize different arrangements of squares?
Materials
Student page 147
Math Maze cards (Week 30 Activity 147)

Concept and Handbook Reference
Estimate products and differences. (MAH 100–111)

Background
There are several useful methods for estimating products.

Front end Operate on the left-most digits and arrive at the correct place value by tacking on one zero for every place you didn't use.

Example
$98 \times 220 \rightarrow 9 \times 2 \rightarrow 18,000$

Compatible numbers Think of numbers close to those given that are easy to work with.

Example
$98 \times 220 \rightarrow 100 \times 200 \rightarrow 20,000$

Both 18,000 and 20,000 are reasonable estimates for $98 \times 220$.

Get Started
Review the relationship between basic facts and multiplication with multiples of ten. Ask these questions.

• What is $5 \times 6$? (30)
• What is $50 \times 6$? (300)
• What is $5 \times 60$? (300)
• What is $50 \times 60$? (3000)
• What is $500 \times 60$? (30,000)
• What is $500 \times 6000$? (3,000,000)
• What is $0.5 \times 60$? (30)

On the board, make a table with these column heads: 1–100; 101–1000; 1001–10,000. Encourage students to write expressions with values that would go in each column.

Students may use paper and pencil but not calculators.

Today's Challenge
Distribute the 18 Math Maze cards for week 30. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, "Who has the card with the answer to the question just read?" Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 206.

Student page 147 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 147 in the student book.

Answers for student page 147:
Box 1 6 $\times$ 7; 980 $-$ 971
Box 2 4 $\times$ 26; 760 $-$ 580
Box 3 98 $\times$ 10; 1000 $-$ 308
Box 4 10,000 $-$ 5280; 30 $\times$ 80
Box 5 8 $\times$ 700; 90 $\times$ 90
Box 6 800 $\times$ 70; 9000 $\times$ 2

Go Further
Student page 147 Have students ring the expressions they add to the boxes so that you can distinguish their answers to exercises 1–12 from their Go Further answers.

Answers for student page 147: 13. Check students' ringed expressions to be sure they are in appropriate boxes.

Assessment
Student self-assessment page 147 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip How frequently do students resort to paper and pencil to solve these problems?
Materials
Student page 148
Blank paper

Concept and Handbook References
Estimate differences when subtracting money amounts. (MAH 096, 100–105)

Get Started
Explain that decimal numbers can be rounded in the same way as whole numbers. Write $14.58 on the board. Explain that when rounding to the nearest dollar, look at the digit in the tenths place, in this case, 5. If the digit is 5 or greater, round up to the nearest dollar. If the digit is less than 5, round down. So $14.58 would be rounded to $15.00. Write the following amounts on the board and ask students to round each to the nearest dollar. Record the correct answers.

$14.25 ($14.00) $12.68 ($13.00) $9.85 ($10.00)
$18.34 ($18.00) $1.63 ($2.00) $19.90 ($20.00)

Explain that rounding can be helpful when an exact difference is not needed. Write the following problem on the board.

$16.54 – $4.23 =

Ask students to round both dollar amounts to estimate the difference. Record the rounded money amounts and the estimate.

($17.00 – $4.00 = $13.00)

Write the following problems on the board and have students round to find each difference.

$15.62 – $2.75 = ($13.00)
$10.25 – $8.50 = ($1.00)
$19.85 – $12.78 = ($7.00)

Student page 148 Have students use the information on the board to answer the questions in the Get Started section of page 148 in their books.

Answers for student page 148: 1. no 2. no 3. yes 4. yes 5. no 6. yes 7. no 8. yes

Today’s Challenge
Explain that today the class will be playing a game called "Who Wants to Be the Top Scorer?" Have each student take a blank sheet of paper and write any dollar amount between $1.50 and $20.00 that they choose. Then ask students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their dollar amounts and answer the question. Yes answers will score points. Here are the questions to ask:

1. Does your amount round to $2.00? If yes, score 10 points.
2. Is your amount greater than $15.00? If yes, score 5 points.
3. Does your amount round to $5.00? If yes, score 9 points.
4. Does your amount round to less than $12.00? If yes, score 8 points.
5. Can your amount be made with only quarters and bills? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that student write the amount on the board and explain how he or she scored the points.

Go Further
Student page 148 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 148: 9. $11.79
10. Students’ own riddles will vary.

Assessment
Student self-assessment page 148 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use estimation when subtracting money amounts?
Materials
Student page 149
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Look for number patterns. (MAH 401)

Background
3, 6, 9, 12, . . . is a number pattern. In this pattern, 3 is added each time.

Get Started
Begin by searching for or creating number patterns as a class. Write the following number pattern on the board.

3, 6, 9, 12, . . .

Ask students to explain and extend the pattern. The next three terms are 15, 18, and 21. Then ask students to give other examples of number patterns. Have other students extend each suggested pattern. Continue until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of digits that could be used to make a number pattern.

Strings of numbers are made by connecting adjoining digits (horizontally and/or vertically) on the poster. For example, the first digit in the first column and the first three digits in the second column for the string 2468, which can be used to make the number pattern 2, 4, 6, 8. For each pattern, students should explain how the pattern is extended. In this case, 2 is added each time.

Possible patterns: 2, 4, 6, 8: 2 is added each time; 6, 12, 18, 24: 6 is added each time; 4, 8, 12: 4 is added each time; 1, 4, 8, 13: the number added increases by 1 each time.

Student page 149 Have students use the Math Jumble on student page 149 to find more strings of digits that could be used to make number patterns.

Possible answers for student page 149: 1, 3, 6, 10 (15, 21, 28); 2, 6, 10, 14 (18, 22, 26); 3, 6, 9, 12 (15, 18, 21); 3, 12, 21, 30 (39, 48, 57)

Go Further
Student page 149 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 149: Grids and patterns will vary.

Assessment
Student self-assessment page 149 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students recognize and create number patterns?
Materials
Student page 150
Blank paper

Concept and Handbook Reference
Find equivalent fractions. (MAH 035)

Get Started
Draw the fraction strips for \(\frac{2}{3}\) and \(\frac{4}{6}\) on the board. Identify and define the parts of a fraction. Label each fraction strip and discuss the idea of equality. Demonstrate the process of multiplying \(\frac{2}{3}\) by \(\frac{2}{2}\) to show the equality \(\frac{2}{3} = \frac{4}{6}\). Explain that each third is cut into two smaller sections of equal size, creating sixths. Ask the students to explore what will happen if each third of the first fraction strip is cut into three smaller sections of equal size. Draw or ask a student to draw the resulting fraction of \(\frac{8}{9}\). Write \(\frac{2}{3} = \frac{4}{6} = \frac{8}{9}\) on the board and lead a discussion on the pattern that results in the numerators and denominators.

Student page 150 To introduce the activity, work through the first problem on student page 150. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say C \((\frac{1}{2} \times \frac{2}{3} = \frac{1}{3})\) is wrong because "The shaded part of the second fraction strip has been cut into four smaller pieces, not two." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (A). Be sure students understand why A is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 150 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 150: 1. D 2. C
When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 150 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students find equivalent fractions?
Materials
Student page 151

Concept and Handbook Reference
Understand dependent and independent variables.
(MAH 236)

Background
Variables are generally divided into two categories, dependent and independent. An independent variable (like time) changes value on its own. A dependent variable is influenced by an independent variable. For example, for a constant rate of miles per hour, the number of miles depends on the number of hours, not the other way around. In a graph, we generally place the independent variable on the horizontal (x) axis.

Get Started
Draw this table and ask students to help you fill it in.

<table>
<thead>
<tr>
<th>Number of Haircuts</th>
<th>Amount of Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10</td>
</tr>
<tr>
<td>2</td>
<td>$20</td>
</tr>
<tr>
<td>3</td>
<td>$30</td>
</tr>
<tr>
<td>4</td>
<td>$40</td>
</tr>
<tr>
<td>5</td>
<td>$50</td>
</tr>
</tbody>
</table>

Ask students whether the amount of money you make depends on the number of haircuts you give or if the number of haircuts you give depends on the amount of money you make. Settle on Amount of Money as the dependent variable and graph the data in the table.

<table>
<thead>
<tr>
<th>Time</th>
<th>Number of Haircuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 minutes</td>
<td>1</td>
</tr>
<tr>
<td>40 minutes</td>
<td>2</td>
</tr>
<tr>
<td>60 minutes</td>
<td>3</td>
</tr>
<tr>
<td>2 hours</td>
<td>6</td>
</tr>
<tr>
<td>3 hours</td>
<td>9</td>
</tr>
</tbody>
</table>

Number of haircuts is the dependent variable.

Go Further
Student page 151 Have students recombine the data from exercises 1–3.

Answers for student page 151:

4.

<table>
<thead>
<tr>
<th>Time</th>
<th>Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>20 minutes</td>
<td>$10</td>
</tr>
<tr>
<td>40 minutes</td>
<td>$20</td>
</tr>
<tr>
<td>60 minutes</td>
<td>$30</td>
</tr>
<tr>
<td>2 hours</td>
<td>$60</td>
</tr>
<tr>
<td>3 hours</td>
<td>$90</td>
</tr>
</tbody>
</table>

5. money

Assessment
Student self-assessment page 151 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students reliably identify the dependent variable?
**Math Maze**

**Week 31 • Activity 152**

**Materials**
Student page 152
Math Maze cards (Week 31 Activity 152)

**Concept and Handbook Reference**
Read decimal numbers. (MAH 011–014)

**Background**
To read a decimal number with a value less than one, read as if you were reading a whole number, then say the name of the farthest-right place.

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Read: one hundred twenty-three thousandths.

To read a decimal number with a value greater than one, read the whole-number part first, then say and. Then read the part to the right of the decimal point.

<table>
<thead>
<tr>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
<th>Hundredths</th>
<th>Thousandths</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2</td>
<td>7</td>
<td>0</td>
<td>3</td>
<td>8</td>
</tr>
</tbody>
</table>

Read: twenty-seven and thirty-eight thousandths.

**Today’s Challenge**
Distribute the 18 Math Maze cards for week 31. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

**Instructions for playing Math Maze** Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 207.

**Student page 152** When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 152 in the student book.


**Go Further**
**Student page 152** Have students order, then add, the numbers from exercises 1–10.

**Answers for student page 152:** 11. 0.005; 0.007; 0.02; 0.095; 0.12; 0.53; 0.55; 0.7; 0.95; 1.2 12. 4.177

**Assessment**
**Student self-assessment page 152** Have students circle one of the three choices to describe how they feel about this activity.

**Assessment tip** Can students consistently read decimal numbers without resorting to the point xxx form?
Game Time

Week 31 • Activity 153

Materials
Student page 153
Blank paper

Concept and Handbook Reference
Identify quadrilaterals by their attributes.
(MAH 364–366)

Get Started
A quadrilateral is a four-sided polygon. Draw these
quadrilaterals on the board and discuss their attrib-
utes by having students fill in the table on page 153
in their books.

rectangle  trapezoid  square
rhombus  parallelogram

Answers for table on student page 153

<table>
<thead>
<tr>
<th>Quadrilateral</th>
<th>Pairs of Parallel Sides</th>
<th>Pairs of Congruent Sides</th>
<th>Number of Right Angles</th>
</tr>
</thead>
<tbody>
<tr>
<td>rectangle</td>
<td>2 pairs</td>
<td>2 pairs</td>
<td>4</td>
</tr>
<tr>
<td>trapezoid</td>
<td>1 pair</td>
<td>0 or 1 pair</td>
<td>0 or 2</td>
</tr>
<tr>
<td>square</td>
<td>2 pairs</td>
<td>2 pairs, 4 sides congruent</td>
<td>4</td>
</tr>
<tr>
<td>rhombus</td>
<td>2 pairs</td>
<td>2 pairs, 4 sides congruent</td>
<td>0 or 4</td>
</tr>
<tr>
<td>parallelogram</td>
<td>2 pairs</td>
<td>2 pairs</td>
<td>0 or 4</td>
</tr>
</tbody>
</table>

As you ask each of five questions, have students look at their shapes and answer the question. Yes
answers will score points. Here are the questions to ask:

1. Does your quadrilateral have the same number of right angles as sides? If yes, score 10 points.
2. Does your quadrilateral have no right angles? If yes, score 5 points.
3. Does your quadrilateral have 2 pairs of congruent sides and 4 right angles? If yes, score 9 points.
4. Does your quadrilateral have 2 pairs of congruent sides and no right angles? If yes, score 8 points.
5. Does your quadrilateral have only 1 pair of parallel sides? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that stu-
dent draw his or her quadrilateral on the board and explain how he or she scored the points.

Go Further
Student page 153 Have students solve the riddle,
write and solve their own riddles, and create anoth-
er riddle for a friend to solve. Have the solver sign
his or her name.

Answers for student page 153: 1. rhombus
2–3. Students’ own riddles will vary.

Assessment
Student self-assessment page 153 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tips Can students identify quadrilaterals
according to their attributes? Do students see that a
rhombus is a special kind of parallelogram and/or
rectangle? Can students describe how a rhombus
and square are alike and different?
Materials
Student page 154
Math Jumble activity poster and digit cards

Concepts and Handbook References
Find the value of coin combinations.
(MAH 023-025)
Add the values of mixed coins. (MAH 125-126)

Get Started
Have students practice naming coins for amounts less than $1.00 using pennies, nickels, dimes, and quarters. One student calls out an amount less than $1.00. Another student calls out coins that add up to the given amount. For example, one student calls out 64 cents. The second student says, “64 cents can be made with 2 quarters, 1 dime, and 4 pennies.” Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the coin cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of coins that add up to as close to $1.00 as possible without going over.

Strings of coins are made by joining coins that are inside squares that share a common side, horizontally and/or vertically, on the poster. For example, point to the coins in the first row, the coins in the fourth column, and the coins in the middle of the fourth row, adding the value of each coin as you point to it. So, 25¢, 30¢, 35¢, 60¢, 70¢, 80¢, 85¢, 95¢, $1.00.

Possible answers: quarter, dime, nickel, quarter,
nickel, quarter, penny, penny = 97¢; quarter, nickel, dime, quarter, nickel, nickel, penny, penny, dime,
dime = 97¢

Student page 154 Have students use the Math Jumble on student page 154 to find strings of coins that add up to as close to $1.00 as possible without going over.

Answers for student page 154: Answers will vary. Check students’ work.

Go Further
Student page 154 Have students complete the activity on the student page.

Answers for student page 154: 1. 21¢, 61¢, 50¢, 41¢ 2. $1.73 3. 46¢, 36¢, 31¢, 60¢ 4. $1.73

Assessment
Student self-assessment page 154 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students determine the value of various coin combinations?
Materials
Student page 155
Blank paper

Concept and Handbook Reference
Solve word problems involving the subtraction of fractions with unlike denominators. (MAH 165)

Get Started
Write the equation $\frac{2}{3} - \frac{1}{4} = \square$ on the board. Explain that while the difference between $\frac{2}{3}$ and $\frac{1}{4}$ can be found by comparing the fraction strip for $\frac{2}{3}$ to the fraction strip for $\frac{1}{4}$, mathematically fractions can only be added or subtracted if they have the same, or a common, denominator. Write the following problem on the board.

$$\frac{2}{3} - \frac{1}{4} = \frac{8}{12} - \frac{3}{12}$$

Demonstrate the method of multiplying the two denominators, $3 \times 4$, to find a common denominator, 12. Then explain the next step of finding equivalent fractions for $\frac{2}{3}$ and $\frac{1}{4}$ in twelfths. Conclude that the difference between $\frac{2}{3}$ and $\frac{1}{4}$ is $\frac{5}{12}$. Guide students through the same process with the equation $\frac{2}{5} - \frac{1}{3} = \square$. Provide more examples if necessary before proceeding with the student page.

Student page 155 To introduce the activity, work through the first problem on student page 155. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say B ($\frac{1}{3} - \frac{2}{3} = 7 - 6$) is wrong because “The right side of the equation does not show two fractions with a common denominator.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 155 Have students work through each problem, ruling out two answers; giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 155: 1. D 2. B

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 155 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve word problems involving the subtraction of fractions with unlike denominators?
Materials
Student page 156

Concepts and Handbook References
Make line graphs. (MAH 269–271)
Compare data. (MAH 279)

Get Started
Start these tables and ask students to help you fill them in.

<table>
<thead>
<tr>
<th>Number of Haircuts</th>
<th>Amount of Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$10</td>
</tr>
<tr>
<td>2</td>
<td>$20</td>
</tr>
<tr>
<td>3</td>
<td>$30</td>
</tr>
<tr>
<td>4</td>
<td>$40</td>
</tr>
<tr>
<td>5</td>
<td>$50</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Haircuts</th>
<th>Amount of Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$15</td>
</tr>
<tr>
<td>2</td>
<td>$30</td>
</tr>
<tr>
<td>3</td>
<td>$45</td>
</tr>
<tr>
<td>4</td>
<td>$60</td>
</tr>
<tr>
<td>5</td>
<td>$75</td>
</tr>
</tbody>
</table>

Draw this grid on the board and plot the points from each table.

3. $30; $36  4. $24  5. $10 is probably best; check students’ explanations.

Go Further
Student page 156 Have students complete the table and answer the questions on the student page.

Answer for student page 156: 6. Decisions will vary, so compare decisions with explanations.

Assessment
Student self-assessment page 156 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students understand how to make and read line graphs?

Ask students whether they think it might sometimes be better to charge less in order to make more money. Discuss what sometimes happens when goods or services get more expensive: the number of customers falls.
Materials
Student page 157
Math Maze cards (Week 32 Activity 157)

Concept and Handbook References
Compare two numbers. (MAH 008, 016, 038–040)

Get Started
Review the comparison symbols, <, >, and =. Then
practice a few comparisons. Ask students to explain
their answers.
• Which is greater, \( \frac{2}{3} \) or 0.75? (0.75 = \( \frac{3}{4} \) and
\( \frac{3}{4} > \frac{2}{3} \)—think about a clock)
• Which is greater, \( 5 \times 6 \) or 100 − 72?
(\( 5 \times 6 = 30 \) and 30 > 28)
• Which is greater, 0.901 or 0.910? (0.910. Think
about the fraction equivalents to these decimal
numbers. The denominators are the same, so
compare the numerators: 910 > 901.)
• Which is greater, 10\(^2\) or 50 \times 20? (They have
the same value; 10\(^2\) = 1000 and 50 \times 20 = 1000.)

Today's Challenge
Distribute the 18 Math Maze cards for week 32.
Each student should receive at least one card, but
since all cards need to be distributed, some students
may need to get more than one card. Use the cards
to play the Math Maze game.

Instructions for playing Math Maze Ask students to
look at their cards. Ask one student to read the
question that is written on his or her card. Next ask,
"Who has the card with the answer to the question
just read?" Ask that student to read the answer, and
then read the question on his or her card. Play con-
tinues until all questions have been answered. The
last answer to be read should be the answer on the
first student's card.

The correct sequence of questions and answers is
shown on page 208.

Student page 157 When the group has finished
playing the game, have students open their books
and complete the Today's Challenge activity on
page 157 in the student book.

Answers for student page 157: 1. \( \frac{2}{3} \) of 150 2. one
hundred thousand 3. \( \frac{3}{4} \) 4. 80 \times 11 5. thirty-five
hundredths 6. 50% of 16 7. 68 + 34 8. \( \frac{1}{2} \) of 70
9. seven tenths 10. 70 \times 8 11. = 12. > 13. >
14. > 15. < 16. = 17. < 18. > 19. > 20. =

Go Further
Student page 157 Have students share their own
comparison puzzles with a friend.

Answers for student page 157: 21. Check students’
work.

Assessment
Student self-assessment page 157 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tip Do students read decimal numbers
confidently?
Materials
Student page 158
Blank paper (heavyweight if possible) or index cards

Concept and Handbook Reference
Identify the appropriate customary unit to measure various items. (MAH 486)

Get Started
Write the following items on the board and have students name the appropriate customary unit used to measure the given attribute of each item.

- height of a person (feet)
- weight of a cookie (ounces)
- length of a stapler (inches)
- time of a commercial (seconds or minutes)

Have some students name additional items and attributes while other students give the appropriate unit. Continue until all students have had the opportunity to participate.

Today's Challenge
Student page 158 Have students look at page 158 in the student book. Have students use words from the Word Bank to complete the table.


Go over answers with the whole group or check students’ papers individually.

Go Further
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 158.

Instructions for playing “Concentration” Shuffle the cards and lay them facedown in four equal columns. The first player turns over two cards. If the cards match (show an item and the correct unit used to measure it), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 158 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students name the appropriate customary unit used to measure various attributes?
Materials
Student page 159
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Multiply fractions. (MAH 167–170)

Get Started
Begin by brainstorming fractions that are equivalent to $\frac{1}{10}$. Write $\frac{1}{10}$ on the board and have students call out fractions that are equivalent, such as $\frac{2}{20}, \frac{3}{30}, \frac{10}{100}$, and so on. Continue until all students have had the opportunity to participate.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find fractions that, when multiplied, equal $\frac{1}{10}$.

<table>
<thead>
<tr>
<th>4</th>
<th>1</th>
<th>6</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>1</td>
<td>0</td>
</tr>
</tbody>
</table>

Fractions can be made with any two or three adjoining digits, horizontally and/or vertically, on the poster. The digits can be used as either numerators or denominators and can be used more than once, but the product must always be $\frac{1}{10}$. For example, the first two digits in the second column can be used to make $\frac{1}{5}$. The middle digits in the third column can be used to make $\frac{1}{2}, \frac{1}{3} \times \frac{1}{2} = \frac{1}{10}$. Record the equations students make.

Possible equations: $\frac{1}{5} \times \frac{1}{2} = \frac{1}{10}$,
$\frac{5}{25} \times \frac{2}{4} = \frac{10}{100} = \frac{1}{10}$, $\frac{1}{4} \times \frac{2}{5} = \frac{2}{20} = \frac{1}{10}$,
$\frac{1}{6} \times \frac{2}{3} = \frac{3}{30} = \frac{1}{10}$, $\frac{1}{2} \times \frac{25}{50} = \frac{5}{10} \times \frac{2}{8} = \frac{8}{80} = \frac{1}{10}$

Possible answers for student page 159: $\frac{1}{5} \times \frac{1}{2} = \frac{1}{10}$,
$\frac{1}{5} \times \frac{2}{6} = \frac{3}{30} = \frac{1}{10}$, $\frac{1}{4} \times \frac{2}{5} = \frac{2}{20} = \frac{1}{10}$, $\frac{1}{2} \times \frac{1}{5} = \frac{2}{20} = \frac{1}{10}$,
$\frac{3}{5} \times \frac{1}{3} = \frac{1}{10}$

Go Further
Student page 159 Have students use the Math Jumble on student page 159 to find more fractions that, when multiplied, equal $\frac{1}{10}$.

Answers for student page 159: Grids and equations will vary.

Assessment
Student self-assessment page 159 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students multiply fractions?
Rule Out Two

Materials
Student page 160
Blank paper

Concept and Handbook Reference
Solve word problems involving the subtraction of fractions with unlike denominators. (MAH 165)

Get Started
Write the equation \(\frac{2}{5} - \frac{3}{8} = \square\) on the board. Explain that while the difference between \(\frac{2}{5}\) and \(\frac{3}{8}\) can be found by comparing the fraction strip for \(\frac{2}{5}\) to the fraction strip for \(\frac{3}{8}\), mathematically fractions can only be added or subtracted if they have a common denominator. Write the following problem on the board.

\[
\frac{2}{5} \times \frac{3}{8} = \frac{16}{40} - \frac{15}{40}
\]

Demonstrate the method of multiplying the two denominators, \(5 \times 8\), to find a common denominator, 40. Then explain the next step of finding equivalent fractions for \(\frac{2}{5}\) and \(\frac{3}{8}\) in fortieths. Conclude that the difference between \(\frac{2}{5}\) and \(\frac{3}{8}\) is \(\frac{1}{40}\). Guide the students through the same process with the equation \(\frac{7}{9} - \frac{3}{10} = \square\). Provide more examples if necessary before proceeding with the student page.

Student page 160 To introduce the activity, work through the first problem on student page 160. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (\(\frac{7}{9}\) of a tank) is wrong because “7 is not a common denominator of 9 and 2.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (D). Be sure students understand why D is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 160 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 160 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve word problems involving the subtraction of fractions with unlike denominators?
Materials
Student page 161
Blank paper

Concepts and Handbook References
Choose intervals for pictographs. (MAH 271)
Construct pictographs. (MAH 275)

Background
In a pictograph, each symbol stands for more than one piece of data. The symbols are arranged to look like a bar graph.

Get Started
Discuss the idea of collecting data and then finding a way to display it. Be sure to cover these points.
• You can do a survey to collect data: ask questions, look for items, or count events.
• You can do an experiment to collect data.
• Your display needs to make sense of your data.
• Your display needs to be easy to read and interpret.

Write this survey data on the board.

Favorite Flower Survey

<table>
<thead>
<tr>
<th>Kind of Flower</th>
<th>Number of Votes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daisy</td>
<td>14</td>
</tr>
<tr>
<td>Poppy</td>
<td>6</td>
</tr>
<tr>
<td>Rose</td>
<td>27</td>
</tr>
<tr>
<td>Lily</td>
<td>3</td>
</tr>
<tr>
<td>Pansy</td>
<td>12</td>
</tr>
</tbody>
</table>

Now talk about making a pictograph with the data. Students should know that each symbol, or picture, in a pictograph represents more than one piece of data. Be sure all students know this, then work with them to decide how many pieces of data each picture should represent in the Favorite Flower Graph. (A good number is three because most numbers in the table are divisible by three. The Daisy entry will require four symbols and a little more than half of a fifth symbol. Demonstrate how to do this.)

Today's Challenge
Student page 161 Have students create a graph from given data, then collect and graph their own data.

Answers for student page 161: 1. Check students' work. 2. 9
3.

<table>
<thead>
<tr>
<th>Daisy</th>
<th>Poppy</th>
<th>Rose</th>
<th>Lily</th>
<th>Pansy</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>2</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
</tbody>
</table>

Key □ = 3 votes

4. Rose 5. Lily

Go Further
Student page 161 Have students conduct a quiet survey and graph the data they collect.

Answers for student page 161: 6. Check students’ work—not all students will get the same number.

7–8. Check students’ work.

Assessment
Student self-assessment page 161 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students choose and use an appropriate value for each symbol in their pictographs?
Materials
Student page 162
Math Maze cards (Week 33 Activity 162)

Concept and Handbook Reference
Practice order of operations. (MAH 212–214)

Background
The order of operations is the standard method for evaluating an expression with more than one operation. For example, think about $2 \times 3 - 6 \times 0.5$. This expression has a value of zero if operations are completed left to right. However, the order of operations says that all multiplication in an expression should be done before any subtraction. The one exception is when parentheses are used to indicate an operation that takes precedence. So, $2 \times 3 - 6 \times 0.5$ should be completed in this order:

1. $\frac{2 \times 3}{6} = 6$
2. $\frac{6 \times 0.5}{3} = 3$
3. $\frac{6}{3} = 3$

The full order of operations follows.
1. Do operations in parentheses or other grouping symbols.
2. Find powers or roots.
3. Multiply or divide left to right.
4. Add or subtract left to right.

Today's Challenge
Distribute the 18 Math Maze cards for week 33. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student's card.

The correct sequence of questions and answers is shown on page 209.

Student page 162 When the group has finished playing the game, have students open their books and complete the Today's Challenge activity on page 162 in the student book.

Answers for student page 162: 1–10. Check students’ work.

Go Further
Student page 162 Exercises 11–18 ask students to fulfill specific requirements as they write expressions with a value of 40.

Answers for student page 162: 11–18. Check students’ work.

Assessment
Student self-assessment page 162 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students remember to follow the order of operations when writing and evaluating expressions?
Materials
Student page 163
Blank paper

Concept and Handbook Reference
Use rounding to estimate products when multiplying by thousands. (MAH 107)

Get Started
Write the number 1246 on the board. Explain that when rounding to the nearest thousand, look at the digit in the hundreds place, in this case, 2. If the digit is 5 or greater, round up to the nearest thousand. If the digit is less than 5, round down. So 1246 would be rounded to 1000. Write the following numbers on the board and ask students to round each to the nearest thousand. Record the correct answers.

1548 (2000)  980 (1000)
3275 (3000)  5862 (6000)

Explain that rounding can be helpful when an exact product is not needed. Write the following problem on the board.

1892 \times 5 =

Ask students to round 1892 to the nearest thousand. (2000) Ask, “What is 2000 \times 5?” (10,000) Point out that only the larger factor is rounded. Write the following problems on the board and have students round to find each product.

1236 \times 2 = (1000 \times 2 = 2000)
3925 \times 4 = (4000 \times 4 = 16,000)
975 \times 6 = (1000 \times 6 = 6000)

Student page 163 Have students use the information on the board to answer the questions in the Get Started section of page 163 in their books.

Answers for student page 163: 1. no 2. no 3. yes 4. yes 5. yes 6. no 7. yes 8. no

Today’s Challenge
Explain that today the class will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and write any number between 500 and 5000 he or she chooses. Then ask students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their numbers and answer the question. Yes answers will score points. Here are the questions to ask:

1. Does your number round to 3000? If yes, score 10 points.
2. Does your number have four digits? If yes, score 5 points.
3. Is your number greater than 4575? If yes, score 9 points.
4. Is your number less than 1000? If yes, score 8 points.
5. Does your number round to 1000? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that student write the number on the board and explain how he or she scored the points.

Go Further
Student page 163 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 163: 9. 5000 10. Students’ own riddles will vary.

Assessment
Student self-assessment page 163 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make a reasonable estimate for a product when multiplying by thousands?
Materials
Student page 164
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Multiply decimals. (MAH 142–143)

Background
When multiplying decimals, use the same method as when multiplying whole numbers. Be sure the decimal point is in the correct place in the product.

Get Started
Have students multiply decimals. Write the following problem on the board.

\[
\begin{array}{c}
0.23 \\
\times 0.4 \\
\end{array}
\]

Multiply using the same method as when multiplying whole numbers. To determine where the decimal point goes in the product, count the places to the right of the decimal point in both factors. In the example above, there are two places to the right of the decimal point in one factor and one in the other factor, for a total of three. This is the number of places to the right of the decimal point in the product. The answer is 0.092. Repeat this process several times with different decimals.

Today’s Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today’s Math Jumble is to find strings of digits that can be used to make multiplication equations for decimal factors less than 1. One factor must be a decimal to the hundredths place. The other factor must be a decimal to the tenths place. The product is given. Students must supply the zeroes in the ones places of both factors.

Equations can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once. For example, the first three digits in the first row form the string 425, which can be used to make the equation \(0.42 \times 0.5 = \square\). The product is 0.210.

Since students will be given the products in these multiplication equations, encourage them to estimate to help them find the right factors. Have students find strings of digits to make decimals that have the following products.

0.639 (0.71 \(\times\) 0.9); 0.174 (0.58 \(\times\) 0.3);
0.282 (0.47 \(\times\) 0.6); 0.064 (0.16 \(\times\) 0.4)

Student page 164 Have students use the Math Jumble on student page 164 to find strings of digits that can be used to make multiplication equations for decimal factors less than 1. One factor must be a decimal to the hundredths place. The other factor must be a decimal to the tenths place. The product is given. Students must supply the zeroes in the ones places of both factors.

Answers for student page 164: 1. 0.17 \(\times\) 0.8
2. 0.43 \(\times\) 0.5 3. 0.29 \(\times\) 0.5 4. 0.72 \(\times\) 0.3
5. 0.64 \(\times\) 0.2, or 0.32 \(\times\) 0.4

Go Further
Student page 164 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 164: Grids, products, and equations will vary. Check students’ work.

Assessment
Student self-assessment page 164 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly multiply decimals?
Materials
Student page 165
Blank paper

Concept and Handbook Reference
Use patterns to solve problems. (MAH 401)

Get Started
List the following equations on the board:
5 \times 10 = 50
5 \times 100 = 500
5 \times 1000 = 5000

Ask students to explain the pattern that is found in these equations. Ask them to predict what will be the next equation in the sequence. Continue the activity by listing the following equations on the board.
600,000 \div 60 = 10,000
60,000 \div 60 = 1000
6000 \div 60 = 100

Repeat the same line of questioning used with the multiplication example. Provide another example, if necessary, before proceeding with the student page.

Student page 165 To introduce the activity, work through the first problem on student page 165. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (8 \times 10 = 80) is wrong because “This equation does not have 80 as its first factor.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 165 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 165: 1. C 2. B

When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 165 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use the strategy of patterns to solve equations and make predictions?
Materials
Student page 166

Concept and Handbook Reference
Make and interpret line plots. (MAH 282)

Background
A line plot marks each data point with an X on a number line.

Get Started
Draw a number line on the board.

Do a quick survey of students, asking each, “How many pets are in your family?” Place an X above the number on the number line that matches each response.

Discuss line plots. Be sure to cover these points.
- There is one X for each piece of data.
- Each X goes above a number on the number line.
- Choose numbers for the number line that work with the data.
- The heights of the columns of Xs let you compare data quickly.

Today’s Challenge
Student page 166 Have students make and interpret line plots from unorganized data.

Answers for student page 166: 1. 8:00 P.M., 9:00 P.M. 2. 15 minutes

3.

4. 8:30 P.M., 9:00 P.M.

Go Further
Student page 166 Have students create their own line plots.

Answers for student page 166: 5–6. Check students’ work.

Assessment
Student self-assessment page 166 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students accurately record data on a line plot?

© Great Source. Copying is prohibited.
Materials
Student page 167
Math Maze cards (Week 34 Activity 167)

Concept and Handbook References
Use vocabulary clues to solve problems.
(MAH 395, 410)

Get Started
Practice careful listening and note-taking with these examples.
- Find a three-digit number with digits whose sum is 27. (999)
- What is the least three-digit number you can make with three different digits? (102)
- Find a two-digit number with digits whose sum is two. (20 or 11)
- Find a three-digit number less than 250 whose digits have a sum of eight. (107, 116, 125, 134, 143, 152, 161, 170, 206, 215, 224, 233, 242)
- What is the greatest two-digit prime number? (97)

Today’s Challenge
Distribute the 18 Math Maze cards for week 34. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 210.

Student page 167 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 167 in the student book.

Answers for student page 167: 1. $\frac{2}{5}$ 2. 36 3. 47 4. 0.25 5. 84 6. 2643 7. 900 8. 24 9. $\frac{15}{16}$ 10. 110

Go Further
Student page 167 Have students refer to the numbers in the box to answer exercises 11–14.

Answers for student page 167: 11. 0.25; 12. 36; 13. 900; 14. 2643 12. 2642.75
13. 110 + 92 + 24 14. Check students’ work; two possible answers are 36 = 24 $\times$ 0.25 and $84 \times 0.25 + 36 \times 0.25$.

Assessment
Student self-assessment page 167 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students listen carefully and write useful notes?
Materials
Student page 168
Blank paper

Concept and Handbook Reference
Identify prime numbers between 50 and 100. (MAH 053)

Get Started
Explain that a prime number has exactly two factors, 1 and itself. The number one is not prime because it doesn't have exactly two factors. A composite number has more than two factors.

Draw two columns on the board. One column is labeled “Composite Numbers” and the other column is labeled “Prime Numbers.” Have students describe numbers that are composite numbers, based on patterns of multiples. Discuss the following statements about composite numbers.

- Even numbers are composite because they are multiples of 2.
- Numbers with digits that have a sum of 9 are composite because they are multiples of 9.
- Numbers with digits that have a sum that is evenly divisible by 3 are composite because they are multiples of 3.
- Numbers with a 5 or 0 in the ones place are composite because they are multiples of 5.

Have students list prime numbers between 50 and 100 by ruling out composite numbers. Record prime numbers on the board in the “Prime Number” column. Answers: 53, 59, 61, 67, 71, 73, 79, 83, 89, 97.

Student page 168 Have students use the information on the board to answer the questions in the Get Started section of page 168 in their books.

Answers for student page 168: 1. no 2. no 3. yes 4. no 5. no 6. no 7. no 8. yes

Today’s Challenge
Explain that today the class will be playing a game called “Who Wants to Be the Top Scorer?” Have each student take a blank sheet of paper and write any prime number between 50 and 100 he or she chooses. Then ask students to number their papers from 1 to 5.

As you ask each of five questions, have students look at their numbers and answer the question. Yes answers will score points. Here are the questions to ask:

1. Is your number greater than 65? If yes, score 10 points.
2. Do the digits in your number have a sum of 9? If yes, score 5 points.
3. Is your number an even number? If yes, score 9 points.
4. Is the digit in the ones place larger than the digit in the tens place? If yes, score 8 points.
5. Is your number a multiple of 10? If yes, score 15 points.

Have students find their total scores. Determine which student has the highest score. Have that student write the number on the board and explain how he or she scored the points.

Go Further
Student page 168 Have students solve the riddle and create another riddle for a friend to solve. Have the solver sign his or her name.

Answers for student page 168: 9, 67 10. Students’ own riddles will vary.

Assessment
Student self-assessment page 168 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students use number patterns to identify prime numbers between 50 and 100?
Materials
Student page 169
Math Jumble activity poster and digit cards

Concept and Handbook References
Add proper and improper fractions with like denominators. (MAH 034, 159)

Background
\[
\frac{4}{3} + \frac{1}{3} = \frac{5}{3}
\]
\[
\frac{5}{3} \text{ is the same as } 1 \frac{2}{3}
\]

Get Started
Begin by brainstorming proper and improper fractions with like denominators. One student calls out an improper fraction. Another student calls out a proper fraction with a like denominator. A third student gives the sum of the two fractions. As a class, determine if the fraction is in simplest form. For example, one student calls out \(\frac{3}{4}\) and the second student calls out \(\frac{2}{4}\). The third student says, "\(\frac{3}{4} + \frac{2}{4} = \frac{5}{4}\)." The class determines that \(\frac{5}{4}\) in simplest form is \(1 \frac{1}{4}\). Do this until all students have had the opportunity to participate.

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 digit cards shown. Explain that the object of today's Math Jumble is to find one proper and one improper fraction that, when added, yield a sum greater than 1 and less than 2. Fractions must have like denominators.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>7</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>6</td>
<td>4</td>
<td>1</td>
<td>2</td>
</tr>
</tbody>
</table>

Fractions are made with any two adjoining digits (horizontally or vertically) on the poster. Digits can be used as either numerators or denominators and can be used more than once. For example, the first two digits in the first column can be used to make \(\frac{2}{3}\). The first two digits in the second row can be used to make \(\frac{3}{4}\). \(\frac{3}{4} + \frac{2}{3} = \frac{5}{3} = 1 \frac{2}{3}\). Record the equations students make.

Possible equations: \(\frac{2}{3} + \frac{3}{3} = \frac{5}{3} = 1 \frac{2}{3}\); \(\frac{3}{4} + \frac{2}{4} = \frac{5}{4} = 1 \frac{1}{4}\);
\(\frac{1}{2} + \frac{3}{6} = \frac{1}{2}\); \(\frac{1}{2} + \frac{6}{3} = \frac{9}{3} = 3\)

Student page 169 Have students use the Math Jumble on student page 169 to find one proper and one improper fraction that, when added, yield a sum greater than 1 and less than 2. Fractions must have like denominators.

Possible answers for student page 169:
\(\frac{1}{4} + \frac{6}{4} = \frac{7}{4} = 1 \frac{3}{4}\); \(\frac{2}{4} + \frac{5}{4} = \frac{7}{4} = 1 \frac{3}{4}\); \(\frac{1}{4} + \frac{5}{4} = \frac{6}{4} = 1 \frac{1}{4}\); \(\frac{1}{3} + \frac{5}{3} = \frac{6}{3} = 2\); \(\frac{2}{6} + \frac{2}{6} = \frac{4}{6} = 1 \frac{1}{3}\)

Go Further
Student page 169 Have students use the grid on the student page to create a Math Jumble to share with a friend. Note that sums must be greater than 1 and less than 2 in this activity.

Answers for student page 169: Grids and equations will vary. Check students' work.

Assessment
Student self-assessment page 169 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students add proper and improper fractions with like denominators?
Rule Out Two

Materials
Student page 170
Meter stick
Blank paper

Concept and Handbook Reference
Solve problems of length using meter and centimeters. (MAH 294)

Get Started
Display a meter stick if available. State that a meter is comprised of 100 centimeters, and 1 centimeter is $\frac{1}{100}$ or 0.01 of a meter. Measure different objects in the room and record their lengths in terms of centimeters and in terms of meters using a decimal. For example, list an object with a length of 65 centimeters as 0.65 meters.

Student page 170 To introduce the activity, work through the first problem on student page 170. Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can "rule out" some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (0.28 meter) is wrong because "If one sheet is 0.26 meters long, another sheet would mean the number doubled." (If members of the class do not agree with the volunteer's response or reason, discuss until a consensus is reached.) Have each student cross out the volunteer's choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (C). Be sure students understand why C is correct.

Today's Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.

Then explain how points will be scored in today's activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 170 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 170: Answers will vary, depending upon questions and answer choices written by each student. Check students' work.

When all students' papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 170 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students solve problems of length using meter and centimeters?
2, 4, 6, 8

Pattern Quizzler

Week 35 • Activity 171

Materials
Student page 171

Concept and Handbook Reference
Explore ratios and relationships. (MAH 178–179)

Get Started
Sketch this diagram on the board.

5¢ 5¢ 5¢ 5¢ 5¢ 25¢

Ask these questions.
• How many nickels are worth the same as a quarter? (5)
• If the values are equal, what is the ratio of nickels to quarters? (5:1)
• If the values are equal, what is the ratio of quarters to nickels? (1:5)
• If the values are equal, what is the ratio of quarters to dollars? (4:1)
• If the values are equal, what is the ratio of nickels to dimes? (2:1)
• If the values are equal, what is the ratio of dimes to nickels? (1:2)

Emphasize the importance of order in a ratio.

Today's Challenge
Student page 171 Have students write ratios for common bills and coins with equal value.

Answers for student page 171: 1. 5:1; 1:5 2. 10:1; 1:10 3. 10:1; 1:10

4.  

<table>
<thead>
<tr>
<th>Half-dollars</th>
<th>$5-bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>2</td>
</tr>
<tr>
<td>30</td>
<td>3</td>
</tr>
<tr>
<td>40</td>
<td>4</td>
</tr>
</tbody>
</table>

Go Further
Student page 171 Have students write and use ratios.

Answer for student page 171: 5.

<table>
<thead>
<tr>
<th>Ratio</th>
<th>With Colon</th>
<th>Simplest Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>pennies to dollar bills</td>
<td>3:6</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>nickels to quarters</td>
<td>5:4</td>
<td>$\frac{5}{4}$</td>
</tr>
<tr>
<td>pennies to nickels</td>
<td>3:5</td>
<td>$\frac{3}{5}$</td>
</tr>
<tr>
<td>quarters to half-dollars</td>
<td>4:2</td>
<td>$\frac{2}{3}$ or 2:3</td>
</tr>
<tr>
<td>half-dollars to dollar bills</td>
<td>2:6</td>
<td>$\frac{1}{3}$</td>
</tr>
</tbody>
</table>

Assessment
Student self-assessment page 171 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Are students careful about the order of terms in a ratio?
Materials
Student page 172
Math Maze cards (Week 35 Activity 172)
Markers or colored pencils

Concept and Handbook Reference
Practice number sense with decimal numbers.
(MAH 011–026)

Get Started
Talk about how placement of the decimal point affects the value of a number. Ask students to make these statements make sense by adding a decimal point.
• An average height for teachers is roughly 655 inches. Where should the decimal point go to make this make sense? (65.5)
• The cost of broccoli went up to $139 a pound this week. ($1.39)
• In order to have enough to give everyone roughly a quarter of pound of candy for Halloween, you’d have to bring in 45 pounds for 18 children. (4.5)

Today’s Challenge
Distribute the 18 Math Maze cards for week 35. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 211.

Student page 172 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 172 in the student book.

Answers for student page 172: 1. .500 2. 1.40 3. 1.50 4. 6.25 5. 8.50 6. 62.5 7. 5.50 8. 35.0 9. 14.0 10. 17.5

Go Further
Student page 172 Have students think about making sense of the numbers.

Answers for student page 172: 11. 81.45 12. 2.06 13. $3.50 14. 2.5 15. Check students’ work.

Assessment
Student self-assessment page 173 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Do students make sensible choices for decimal placement?
Materials
Student page 173
Blank paper (heavyweight if possible) or index cards

Concept and Handbook Reference
Write improper fractions as mixed numbers.
(MAH 034)

Get Started
Have students practice rewriting improper fractions as mixed numbers. Write the improper fraction $\frac{7}{2}$ on the board. Explain that this improper fraction can be written as a mixed number. Divide the numerator by the denominator, or $5 \div 2 = 2$, remainder 1. Use the remainder to write the fraction part of the quotient. So $\frac{7}{2} = 2\frac{1}{2}$. Write these improper fractions on the board.

\[
\frac{7}{2} (2\frac{1}{2}) \quad \frac{5}{4} (1\frac{2}{4} \text{ or } 1\frac{1}{2})
\]

Have the students practice rewriting these fractions as mixed numbers. Record the correct answers.

Next, explain that mixed numbers can be rewritten as improper fractions. Write the mixed number $2\frac{1}{3}$ on the board. Multiply the denominator by the whole number, then add the numerator, or $(3 \times 2) + 1 = \frac{7}{3}$. Write these mixed numbers on the board.

\[
1\frac{2}{3} (\frac{7}{3}) \quad 2\frac{2}{3} (\frac{11}{3})
\]

Have the students practice rewriting these mixed numbers as improper fractions. Record the correct answers.

Today’s Challenge
Student page 173 Have students look at page 173 in the student book. Have students fill in the improper fractions or mixed numbers that are missing.

Answers for student page 173: 1. $1\frac{5}{3}$ 2. $\frac{5}{3}$ 3. $1\frac{2}{3}$
4. $\frac{14}{5}$ 5. $2\frac{1}{4}$ 6. $\frac{11}{5}$ 7. $1\frac{1}{5}$ 8. $\frac{10}{7}$ 9. $1\frac{3}{4}$ 10. $\frac{15}{7}$

Go over answers with the whole group or check students’ papers individually.

Go Further
Have pairs of students make a set of cards to play the game “Concentration.” Each pair of students will need 20 small pieces of paper or 20 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 173.

Instructions for playing “Concentration” Shuffle the cards and lay them facedown in four equal columns. Each player turns over a card. The player with the higher value goes first. Turn the cards over so that all cards are again facedown. The first player turns over two cards. If the cards match (show an improper fraction and the equivalent mixed number), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 173 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tips Can students write improper fractions as mixed numbers? Can students write mixed numbers as improper fractions?
Materials
Student page 174
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Add decimals. (MAH 125–126)

Get Started
Have students practice adding decimals. Write the following problem on the board.

\[
\begin{align*}
5.26 & \\
+4.37 & \\
\end{align*}
\]

Decimals and sums can be made with any three adjoining digits (horizontally and/or vertically) on the poster. Digits on the poster can be used more than once. For example, the first three digits in the first row, 425, can be used to make the decimal 4.25. The first three digits in the second row, 267, can be used to make 2.67. The sum of these two decimals, 6.92, is found in the first three digits in the third row. Record the equations students make.

Possible equations: 
\[
\begin{align*}
2.67 + 6.92 & = 9.59; \\
2.51 + 6.72 & = 9.23
\end{align*}
\]

Student page 174 Have students use the Math Jumble on student page 174 to find strings of digits that can be used to make addition equations for decimals. Each addend and the sum will have its own string of digits.

Possible answers for student page 174:
\[
\begin{align*}
3.54 + 2.13 & = 5.67; \\
5.46 + 1.31 & = 6.77; \\
2.13 + 5.67 & = 7.80; \\
1.31 + 6.77 & = 8.08
\end{align*}
\]

Today's Challenge
Using the 0–9 digit cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of digits that can be used to make addition equations for decimals. Each addend and the sum will have its own string of three digits.

\[
\begin{array}{cccc}
4 & 2 & 5 & 1 \\
2 & 6 & 7 & 2 \\
6 & 9 & 2 & 3 \\
8 & 5 & 9 & 6 \\
\end{array}
\]

Remind students that the decimal points must line up. Add the hundredths, the tenths, and then the ones. As always, regroup whenever necessary. Be sure to include the decimal point in the sum. The answer is 9.63. Repeat this process several times with different decimals.

Go Further
Student page 174 Have students use the grid on the student page to create a Math Jumble to share with a friend.

Answers for student page 174: Grids and equations will vary. Check students’ work.

Assessment
Student self-assessment page 174 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students correctly add decimals?
Materials
Student page 175
Blank paper

Concept and Handbook References
Solve problems involving area and perimeter.
(MAH 301, 297)

Get Started
Draw and label two congruent rectangles, similar to those found on the student page, on the board.
Label the length and width of one of the rectangles.
Ask students: If these rectangles are congruent, what is the length and width of the second rectangle? Compute the perimeter and area of both rectangles to prove that if the shapes are congruent, their perimeters and areas will also be congruent.
Provide another example using two congruent squares before proceeding with the student page.

Student page 175 To introduce the activity, work through the first problem on student page 165.
Read or ask a student to read the problem. Next explain that when you have a problem and you are given several answers to choose from, it helps if you can “rule out” some of the answers. Ask for a volunteer to choose an answer that he or she knows is wrong and tell why the answer is wrong. For example, a student might say A (9 square inches) is wrong because “The area of a rectangle is found by multiplying the length times the width, not by adding the length plus the width.” (If members of the class do not agree with the volunteer’s response or reason, discuss until a consensus is reached.)
Have each student cross out the volunteer’s choice and write the reason on the line next to the incorrect answer. Ask for a second volunteer to rule out another answer and proceed in the same way. Then ask students to choose the correct answer from the remaining two choices and fill in the circle that shows the letter of the correct answer (B). Be sure students understand why B is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students will be able to consult with members of the group, but each student will complete the page and will receive an individual score.
Then explain how points will be scored in today’s activity. Each student will receive 10 points for each answer (up to 2) that was ruled out for a good reason (a maximum of 20 points) and 10 points for choosing the correct answer. So, the maximum number of points for each question is 30 and the maximum number of points for the day is 60.

Student page 175 Have students work through each problem, ruling out two answers, giving reasons, and then choosing the correct answer. When a group has completed both problems, the members should bring you their papers for scoring. Discuss errors with individuals or the group if necessary.

Answers for student page 175: Answers will vary, depending upon questions and answer choices written by each student. Check students’ work.
When all students’ papers have been scored, determine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student write his or her name and then create a multiple-choice problem similar to the problems just solved. Ask each to share the problem with another student. The second student solves the problem and signs his or her name.

Assessment
Student self-assessment page 175 Have students circle one of the three choices to describe how they feel about this activity.
Assessment tip Can students solve problems involving area and perimeter?
Materials
Student page 176
Graph paper

Concept and Handbook References
Explore ratios as linear relationships. (MAH 178–180, 265–266)

Background
A linear relationship is one which graphs a straight line.

Get Started
Start the table and graph on the board and ask students to help you complete them.

\[ y = x + 3 \] (the ratio of \( x:y \) is constant)

<table>
<thead>
<tr>
<th>( x )</th>
<th>( y )</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>8</td>
<td>12</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
</tbody>
</table>

- Do you think points between ours are also in the ratio of 2:3? (yes) Try a few. For example, \( 3:4 \frac{1}{2} = \frac{6}{9} = \frac{2}{3} \).
- Do you think points to the right will still be in the ratio 2:3? (yes) Use a straightedge to extend the graph and check.
- What about points to the left? (Yes, except when \( x = 0 \) the only possible value for \( y \) is also 0.)

Emphasize that when you can graph points from a table into a straight line, the relationship is linear.

Today's Challenge
Student page 176 Have students identify whether relationships are linear.

Answers for student page 176:
1. Yes; check students' work.

<table>
<thead>
<tr>
<th>Weeks</th>
<th>Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>2</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>28</td>
</tr>
</tbody>
</table>

2. Yes; check students' work. 3. No; check students' explanations. Leap years are different from regular years.

Go Further
Student page 176 Have students describe linear relationships, then trade with a friend before writing tables of values and graphing.

Answer for student page 176: 4. Check students' work.

Assessment
Student self-assessment page 176 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students distinguish between linear and non-linear relationships?
Materials
Student page 177
Math Maze cards (Week 36 Activity 177)

Concept and Handbook Reference
Solve multi-step problems mentally. (MAH 072–092)

Get Started
Practice solving multi-step puzzle problems by reading these problems slowly but steadily, asking students to compute as you go.
- Start with 72; subtract a dozen; divide the result by 5; find half of what you have left. (6)
- Start with the number of days in a week; multiply by the number of legs on a spider; add the two digits in the result. (11)
- Start with five less than 100; subtract 30; subtract from the result the number of thumbs the average person has; divide the difference by 9. (7)

Today’s Challenge
Distribute the 18 Math Maze cards for week 36. Each student should receive at least one card, but since all cards need to be distributed, some students may need to get more than one card. Use the cards to play the Math Maze game.

Instructions for playing Math Maze Ask students to look at their cards. Ask one student to read the question that is written on his or her card. Next ask, “Who has the card with the answer to the question just read?” Ask that student to read the answer, and then read the question on his or her card. Play continues until all questions have been answered. The last answer to be read should be the answer on the first student’s card.

The correct sequence of questions and answers is shown on page 212.

Student page 177 When the group has finished playing the game, have students open their books and complete the Today’s Challenge activity on page 177 in the student book.

Answers for student page 177: 1, 12, 2, 4, 3, 24, 4, 19, 5, 16, 6, 13, 7, 25, 8, 50, 9, 22, 10, 34

Go Further
Student page 177 Have students share completed puzzles with a friend.

Answers for student page 177: 11–12. Check students’ work.

Assessment
Student self-assessment page 177 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students supply needed information and compute mentally?
Materials
Student page 178
Blank paper
Index cards (optional)

Concept and Handbook References
Write equivalent fractions and decimals.
(MAH 019, 043)

Get Started
A fraction is a way of representing part of a whole group by telling the number of equal parts in the whole group and the number of those parts you are describing. Equivalent fractions and decimals are different names for the same amount.

Review the relationship between fractions and decimals. Write on the board:
\[
\frac{1}{100} \quad 0.01 \quad \text{one hundredth}
\]

Explain that these are three different names for the same amount, using fraction, decimal, and word forms. Ask students how they would write one tenth as a fraction and as a decimal. Write the responses on the board. (\(\frac{1}{10}, 0.1, 0.1\)) Are there any other ways we could represent one tenth? (Suggest \(\frac{2}{20}, \frac{4}{40}, \frac{10}{100}\), and so on.)

Ask students how they would write one fifth in fraction and decimal forms. Write the responses on the board. (\(\frac{1}{5}, 0.2, \frac{2}{10}, 0.2\)) Ask students how they would write one third in fraction and decimal forms. Write the responses on the board. (\(\frac{1}{3}, 0.3\)) Explain that the bar or line above the three means that this is a repeating decimal.

Today's Challenge
Student page 178 Have students look at page 178 in the student book. Explain to the students that all answers for each numbered problem should be equal to the given fraction. Have students fill in the forms that are missing.

Answers for student page 178:
1. \(\frac{2}{4}, \frac{50}{100}, \frac{5}{10}\) or 0.5
2. \(\frac{25}{100}, \frac{2}{8}, \frac{16}{64}, 0.25\)
3. \(\frac{7}{15}, \frac{20}{100}, \frac{4}{20}\), 0.20 or 0.2
4. \(\frac{8}{50}, \frac{40}{200}, \frac{8}{40}, 0.40\) or 0.4
5. Answers will vary. Possibilities include \(\frac{8}{16}, \frac{3}{6}, \frac{12}{24}\). All answers should have a denominator that is twice as large as the numerator.

Go over answers with the whole group or check students' papers individually.

Go Further
Have pairs of students make a set of cards to play the game "Concentration." Each pair of students will need 16 small pieces of paper or 16 index cards. Have the students use one slip of paper or card to copy the information from each box on student page 178. DO NOT copy the given fraction column, only copy the other fraction and decimal boxes.

Instructions for playing "Concentration" Shuffle the cards and lay them facedown in four equal columns. Each player turns over a card. The player with the higher value goes first. Turn the cards over so that all cards are again facedown. The first player turns over two cards. If the cards match (show different names for the same amount), the player keeps the cards and goes again. If the cards do not match, the player turns the cards back over and the other player takes a turn. Play continues until all cards have been taken. The player with more cards at the end of the game wins.

Assessment
Student self-assessment page 178 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students write equivalent fractions and decimals?
Materials
Student page 179
Math Jumble activity poster and digit cards

Concept and Handbook Reference
Make correct change from $5.00. (MAH 026)

Get Started
Have students practice making change from $5.00 using coins and bills. One student calls out a purchase amount less than $5.00. Another student calls out the correct amount of change from $5.00 for that amount and names a combination of coins and/or bills for the change. For example, one student calls out $3.26. The second student says, "$1.74 is the correct change. The amount can be made with 1 one-dollar bill, 2 quarters, 2 dimes, and 4 pennies." Continue until all students have had the opportunity to participate.

Today's Challenge
Using the coin and bill cards, construct the 4 by 4 poster shown. Explain that the object of today's Math Jumble is to find strings of coins and bills that add up to the change from $5.00 for a given purchase amount.

Strings of coins and bills are made by joining coins and bills that are inside squares that share a common side, either horizontally and/or vertically, on the poster. Ask students to find a string of coins and bills that add up to the change from $5.00 when the purchase amount is $3.59. They should look for a string with a value of $1.41. For example, the coins and bills in the first column and the last coin in the second column make the string quarter, dime, dollar, nickel, penny. Point to these coins and bills one at a time to find the total value as you move down and then to the right. So, 25¢, 35¢, $1.35, $1.40, $1.41 is the total value of the coins and the bill. Continue by asking some students to name purchase amounts less than $5.00 and have other students try to find strings of coins and bills that could be used to make the correct change from $5.00. Repeat several times. Note that not all change amounts can be made.

Student page 179 Have students complete Today's Challenge on student page 179.

Answers for student page 179: 1. $2.15  2. $1.27  3. $2.37  4. $2.31  5. $3.48. Loops of coins and bills will vary. Check students' work.

Go Further
Student page 179 Have students answer the question on the student page.

Answers for student page 179: One way to make change is to count up from the purchase amount. Another way is to subtract the purchase amount from the amount given to the cashier. Explanations will vary.

Assessment
Student self-assessment page 179 Have students circle one of the three choices to describe how they feel about this activity.

Assessment tip Can students make correct change from $5.00?
Materials
Student page 180
Blank paper

Concept and Handbook Reference
Identify composite and prime numbers.
(MAH 053–055)

Get Started
Write the numbers 29 and 30 on the board. Record
the factors of 30 as 1, 2, 3, 5, 6, 10, 15, and 30.
Record the factors of 29 as 1 and 29. Define factors
as numbers that divide evenly into another number.
Explain that numbers that have more than two fac-
tors are classified as composite numbers. Numbers
with only two factors, 1 and the number itself, are
classified as prime numbers. Ask students to provide
examples of other numbers that fall in these cate-
gories before proceeding with the lesson.

Student page 180 To introduce the activity, work
through the first problem on student page 180.
Read or ask a student to read the problem. Next
explain that when you have a problem and you are
given several answers to choose from, it helps if you
can “rule out” some of the answers. Ask for a volun-
teer to choose an answer that he or she knows is
wrong and tell why the answer is wrong. For exam-
ple, a student might say A (1, 2, 3, 5) is wrong
because “1 is not a prime number.” (If members of
the class do not agree with the volunteer’s response
or reason, discuss until a consensus is reached.)
Have each student cross out the volunteer’s choice
and write the reason on the line next to the incor-
correct answer. Ask for a second volunteer to rule out
another answer and proceed in the same way. Then
ask students to choose the correct answer from the
remaining two choices and fill in the circle that
shows the letter of the correct answer (C). Be sure
students understand why C is correct.

Today’s Challenge
Divide students into groups of 2, 3, or 4. Students
will be able to consult with members of the group,
but each student will complete the page and will
receive an individual score.

Then explain how points will be scored in today’s
activity. Each student will receive 10 points for each
answer (up to 2) that was ruled out for a good rea-
son (a maximum of 20 points) and 10 points for
choosing the correct answer. So, the maximum
number of points for each question is 30 and the
maximum number of points for the day is 60.

Student page 180 Have students work through each
problem, ruling out two answers, giving reasons,
and then choosing the correct answer. When a
group has completed both problems, the members
should bring you their papers for scoring. Discuss
errors with individuals or the group if necessary.

Answers for student page 180: Answers will vary.
Depending upon questions and answer choices writ-
ten by each student. Check students’ work.

When all students’ papers have been scored, deter-
mine the high scorer(s) for the day.

Go Further
On a separate sheet of paper, have each student
write his or her name and then create a multiple-
choice problem similar to the problems just solved.
Ask each to share the problem with another stu-
dent. The second student solves the problem and
signs his or her name.

Assessment
Student self-assessment page 180 Have students
circle one of the three choices to describe how they
feel about this activity.

Assessment tip Can students classify numbers as
prime or composite?
Questions and Answers for Math Maze Cards

The tables below show the sequence that the questions and answers should follow. Find the starting question, look across the row for the correct answer. Then go on to the next question below and continue until you reach the end of the table. Then go to the top of the table and read down until you reach the starting question again.

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has a unit for measuring weight? One of these equals 16 ounces.</td>
<td>I have a pound.</td>
</tr>
<tr>
<td>Who has a unit for measuring distance? When you drive around the United States, you use this unit.</td>
<td>I have a mile.</td>
</tr>
<tr>
<td>Who has the number of seasons in one year?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has a unit that names 2000 pounds?</td>
<td>I have a ton.</td>
</tr>
<tr>
<td>Who has a tool you use to measure a line on a piece of paper? You can’t bend this easily.</td>
<td>I have a ruler.</td>
</tr>
<tr>
<td>Who has a unit that names eight fluid ounces? There are four in a quart.</td>
<td>I have a cup.</td>
</tr>
<tr>
<td>Who has the number of minutes in a half-hour?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has a measuring tool that bends easily? You can use this tool to measure around your waist or around your head.</td>
<td>I have a tape measure.</td>
</tr>
<tr>
<td>Who has a name for 28 to 31 days?</td>
<td>I have a month.</td>
</tr>
<tr>
<td>Who has a tool to measure temperature?</td>
<td>I have a thermometer.</td>
</tr>
<tr>
<td>Who has a tool for finding out how much you weigh?</td>
<td>I have a scale.</td>
</tr>
<tr>
<td>Who has the number of inches in one yard?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has another name for four quarts?</td>
<td>I have a gallon.</td>
</tr>
<tr>
<td>Who has a metric unit for measuring liquid?</td>
<td>I have a liter.</td>
</tr>
<tr>
<td>Who has another name for seven days?</td>
<td>I have a week.</td>
</tr>
<tr>
<td>Who has a group of 12? Eggs or pencils are often sold this way.</td>
<td>I have a dozen.</td>
</tr>
<tr>
<td>Who has a name for $\frac{1}{60}$ of a minute?</td>
<td>I have a second.</td>
</tr>
<tr>
<td>Who has another name for 52 weeks or 365 days?</td>
<td>I have a year.</td>
</tr>
</tbody>
</table>
## Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has $2 \times 2 \times 3$?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has $5 \times 5 \times 7$?</td>
<td>I have 175.</td>
</tr>
<tr>
<td>Who has $5 \times 3$?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has $2 \times 3 \times 5$?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has $2 \times 2 \times 2$?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has $2 \times 7 \times 7$?</td>
<td>I have 98.</td>
</tr>
<tr>
<td>Who has $2 \times 3$?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has $5 \times 5$?</td>
<td>I have 25.</td>
</tr>
<tr>
<td>Who has $2 \times 5$?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has $7 \times 5 \times 5 \times 2$?</td>
<td>I have 350.</td>
</tr>
<tr>
<td>Who has $2 \times 7$?</td>
<td>I have 14.</td>
</tr>
<tr>
<td>Who has $3 \times 7$?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has $2 \times 3 \times 3 \times 3$?</td>
<td>I have 54.</td>
</tr>
<tr>
<td>Who has $2 \times 2 \times 5$?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has $3 \times 3 \times 5$?</td>
<td>I have 45.</td>
</tr>
<tr>
<td>Who has $2 \times 2 \times 7 \times 7$?</td>
<td>I have 196.</td>
</tr>
<tr>
<td>Who has $3 \times 3 \times 7$?</td>
<td>I have 63.</td>
</tr>
<tr>
<td>Who has $2 \times 3 \times 5 \times 7$?</td>
<td>I have 210.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Who has the name of the answer to an addition problem?</td>
<td>I have sum.</td>
</tr>
<tr>
<td>Who has the name of the study of how likely it is that something will happen?</td>
<td>I have probability.</td>
</tr>
<tr>
<td>Who has the word for a number that has more than two different factors?</td>
<td>I have composite number.</td>
</tr>
<tr>
<td>Who has the name of the operation you use to take away a quantity?</td>
<td>I have subtraction.</td>
</tr>
<tr>
<td>Who has the comparison of numerator to denominator in a fraction with a value greater than one?</td>
<td>I have greater than.</td>
</tr>
<tr>
<td>Who has the name of the number that you divide by in a division problem?</td>
<td>I have divisor.</td>
</tr>
<tr>
<td>Who has the name of a number like $\frac{2}{3}$ or $\frac{3}{2}$?</td>
<td>I have fraction.</td>
</tr>
<tr>
<td>Who has the name of the operation used to find the number of things in five groups of 20?</td>
<td>I have multiplication.</td>
</tr>
<tr>
<td>Who has what we call the study of shapes?</td>
<td>I have geometry.</td>
</tr>
<tr>
<td>Who has the special name given to leftovers in division?</td>
<td>I have remainder.</td>
</tr>
<tr>
<td>Who has the name of the top number in a fraction?</td>
<td>I have numerator.</td>
</tr>
<tr>
<td>Who has the comparison of $\frac{1}{4}$ to $\frac{1}{2}$?</td>
<td>I have less than.</td>
</tr>
<tr>
<td>Who has the word that tells that two numbers or expressions have the same value?</td>
<td>I have equivalent.</td>
</tr>
<tr>
<td>Who has the name of a number that is part whole number and part fraction, like $1\frac{1}{2}$ or $3\frac{1}{2}$?</td>
<td>I have mixed number.</td>
</tr>
<tr>
<td>Who has the name of the symbol that separates ones from tenths?</td>
<td>I have decimal point.</td>
</tr>
<tr>
<td>Who has the name of the answer to a multiplication problem?</td>
<td>I have product.</td>
</tr>
<tr>
<td>Who has the name for a number that can only be divided evenly by one and itself?</td>
<td>I have prime number.</td>
</tr>
<tr>
<td>Who has the name of the answer to a division problem?</td>
<td>I have quotient.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Who has ( n ) if ( 5n = 10 )?</td>
<td>I have 2.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 15 ÷ n = 3 )?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n - 9 = 4 )?</td>
<td>I have 13.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n - 2 = 4 )?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n \times 4 = 12 )?</td>
<td>I have 3.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 2n = 20 )?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has ( n ) if ( \frac{1}{3} ) of 22 is ( n )?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 3n = 42 )?</td>
<td>I have 14.</td>
</tr>
<tr>
<td>Who has ( n ) if I can divide any number by ( n ) and the quotient will be the number I started with?</td>
<td>I have 1.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 5n = 60 )?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has ( n ) if ( \frac{1}{3} ) of 45 is ( n )?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has ( n ) if ( \frac{1}{3} ) of 51 is ( n )?</td>
<td>I have 17.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n \times n = 49 )?</td>
<td>I have 7.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 40 - n = 25 )?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n = 2 \times 9 ) and ( n = \frac{1}{3} ) of 36?</td>
<td>I have 18.</td>
</tr>
<tr>
<td>Who has ( n ) if ( \frac{1}{2} ) of 8 is ( n )?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has ( n ) if ( 3n = 48 )?</td>
<td>I have 16.</td>
</tr>
<tr>
<td>Who has ( n ) if ( n = 2 \times 2 \times 2 )?</td>
<td>I have 8.</td>
</tr>
<tr>
<td><strong>Who has</strong></td>
<td><strong>I have</strong></td>
</tr>
<tr>
<td>------------</td>
<td>------------</td>
</tr>
<tr>
<td>the word describing the study of space and shapes?</td>
<td>geometry.</td>
</tr>
<tr>
<td>the number of faces on a cube?</td>
<td>6.</td>
</tr>
<tr>
<td>a polygon with six sides?</td>
<td>hexagon.</td>
</tr>
<tr>
<td>the distance around a circle?</td>
<td>circumference.</td>
</tr>
<tr>
<td>the shape of one base on a can?</td>
<td>circle.</td>
</tr>
<tr>
<td>the name of a quadrilateral with four equal angles?</td>
<td>rectangle.</td>
</tr>
<tr>
<td>the name of a five-sided polygon?</td>
<td>pentagon.</td>
</tr>
<tr>
<td>the name of a three-sided polygon?</td>
<td>triangle.</td>
</tr>
<tr>
<td>a figure shaped like a can?</td>
<td>cylinder.</td>
</tr>
<tr>
<td>a three-dimensional figure shaped like a ball?</td>
<td>sphere.</td>
</tr>
<tr>
<td>two lines that are always the same distance apart?</td>
<td>parallel lines.</td>
</tr>
<tr>
<td>the word describing the shape of a stop sign?</td>
<td>octagon.</td>
</tr>
<tr>
<td>a three-dimensional figure with six square faces?</td>
<td>cube.</td>
</tr>
<tr>
<td>the line segment from one corner of a rectangle to the opposite corner?</td>
<td>diagonal.</td>
</tr>
<tr>
<td>the name of a square corner?</td>
<td>right angle.</td>
</tr>
<tr>
<td>any four-sided polygon?</td>
<td>quadrilateral.</td>
</tr>
<tr>
<td>two lines crossing each other?</td>
<td>intersecting lines.</td>
</tr>
<tr>
<td>a quadrilateral that has four equal sides but might not have four equal angles? (Some people call it a diamond.)</td>
<td>rhombus.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.25?</td>
<td>I have 0.25.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to $\frac{3}{10}$?</td>
<td>I have $0.3$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.5?</td>
<td>I have $0.5$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.125?</td>
<td>I have $0.125$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.375?</td>
<td>I have $0.375$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{2}$?</td>
<td>I have $0.5$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{4}$?</td>
<td>I have $0.25$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{8}$?</td>
<td>I have $0.125$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.7?</td>
<td>I have $\frac{7}{10}$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{10}$?</td>
<td>I have $0.1$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to $\frac{3}{5}$?</td>
<td>I have $0.6$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to $\frac{2}{5}$?</td>
<td>I have $0.4$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.75?</td>
<td>I have $0.75$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.3?</td>
<td>I have $0.3$.</td>
</tr>
<tr>
<td>Who has the fraction equivalent to 0.25?</td>
<td>I have $0.25$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{2}$?</td>
<td>I have $0.5$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{10}$?</td>
<td>I have $0.1$.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
</tr>
<tr>
<td>Who has the answer to my problem? How much more do I need</td>
<td></td>
</tr>
<tr>
<td>if I want $1.15 and I have 25¢?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? It is 11:00 A.M. now and I need</td>
<td></td>
</tr>
<tr>
<td>to go out at 5:00 P.M. How long until I go out?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I ran 1 1/2 miles and I want</td>
<td></td>
</tr>
<tr>
<td>to run two miles. How much farther must I run?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I poured one cup of milk into</td>
<td></td>
</tr>
<tr>
<td>my cake batter and I need one quart. How much more milk do I need?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I put a cake in the oven at 2:25 P.M.</td>
<td></td>
</tr>
<tr>
<td>and it needs to bake for 45 minutes. What time will it be done?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I have 1 yard, 2 feet of ribbon but</td>
<td></td>
</tr>
<tr>
<td>I need a total of 6 yards, 1 foot. How much more do I need?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? How much time have I worked on my</td>
<td></td>
</tr>
<tr>
<td>project if I worked for 1/2 of an hour today, an hour and a half</td>
<td></td>
</tr>
<tr>
<td>yesterday, and two hours the day before?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? It is now 9:12 A.M. and the plane</td>
<td></td>
</tr>
<tr>
<td>lands at 1:02 P.M. We don’t change time zones. How long until the plane</td>
<td></td>
</tr>
<tr>
<td>lands?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? A video game costs $19.47 and</td>
<td></td>
</tr>
<tr>
<td>I have saved $6.83. How much more do I need?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? Today is May 18. My birthday is June</td>
<td></td>
</tr>
<tr>
<td>How many more days (not including today) are there until my birthday?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? How much change should I give</td>
<td></td>
</tr>
<tr>
<td>a customer who paid for a $3.09 item with a $10.00 bill?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? How much longer will I have to</td>
<td></td>
</tr>
<tr>
<td>wait for a movie that starts at 7:30 P.M. if it is 5:15 P.M. right</td>
<td></td>
</tr>
<tr>
<td>now?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? To fly to Australia takes 36 hours.</td>
<td></td>
</tr>
<tr>
<td>If I leave home at 4:00 P.M. on a Tuesday, what time will it be at</td>
<td></td>
</tr>
<tr>
<td>home when I arrive in Australia?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I want to make five dozen cookies.</td>
<td></td>
</tr>
<tr>
<td>I have already made 30 cookies. How many more cookies do I need to</td>
<td></td>
</tr>
<tr>
<td>make?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I measured 2 1/2 cups of flour. The</td>
<td></td>
</tr>
<tr>
<td>recipe calls for 3 1/2 cups. How much more flour do I need to measure?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? It takes about five minutes to deal</td>
<td></td>
</tr>
<tr>
<td>with each person in line. I am standing in a line with 12 people in</td>
<td></td>
</tr>
<tr>
<td>front of me. It is 9:00 A.M. When will it be my turn?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I have five dollar bills, twelve</td>
<td></td>
</tr>
<tr>
<td>quarters, two dimes, and one nickel. I want to buy a CD for $12.99.</td>
<td></td>
</tr>
<tr>
<td>How much more do I need?</td>
<td></td>
</tr>
<tr>
<td>Who has the answer to my problem? I am trying to not watch TV. The</td>
<td></td>
</tr>
<tr>
<td>first time I went a week and four days without watching TV. The second</td>
<td></td>
</tr>
<tr>
<td>time I went a week and six days not watching TV. How many days is that</td>
<td></td>
</tr>
<tr>
<td>altogether?</td>
<td></td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the least common multiple of 12 and 15?</td>
<td>I have 60.</td>
</tr>
<tr>
<td>Who has the least common multiple of 2 and 3?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has the least common multiple of 4 and 8?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has the least common multiple of 10 and 15?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has the least common multiple of 6 and 12?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has the least common multiple of 4 and 5?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has the least common multiple of 8 and 12?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has the least common multiple of 35 and 7?</td>
<td>I have 35.</td>
</tr>
<tr>
<td>Who has the least common multiple of 2 and 5?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has the least common multiple of 9 and 12?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has the least common multiple of 7 and 4?</td>
<td>I have 28.</td>
</tr>
<tr>
<td>Who has the least common multiple of 5 and 3?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has the least common multiple of 9 and 6?</td>
<td>I have 18.</td>
</tr>
<tr>
<td>Who has the least common multiple of 15 and 9?</td>
<td>I have 45.</td>
</tr>
<tr>
<td>Who has the least common multiple of 7 and 3?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has the least common multiple of 10 and 25?</td>
<td>I have 50.</td>
</tr>
<tr>
<td>Who has the least common multiple of 16 and 32?</td>
<td>I have 32.</td>
</tr>
<tr>
<td>Who has the least common multiple of 8 and 10?</td>
<td>I have 40.</td>
</tr>
</tbody>
</table>

### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the number of legs on 11 cats?</td>
<td>I have 44.</td>
</tr>
<tr>
<td>Who has the number of days in 15 weeks?</td>
<td>I have 105.</td>
</tr>
<tr>
<td>Who has the number of school days in 18 weeks (no vacations)?</td>
<td>I have 90.</td>
</tr>
<tr>
<td>Who has the number of sodas in 17 six-packs?</td>
<td>I have 102.</td>
</tr>
<tr>
<td>Who has the number of hot dogs in a dozen eight-packs?</td>
<td>I have 96.</td>
</tr>
<tr>
<td>Who has the answer to my problem? There are 22 slices of bread in a loaf of bread. How many sandwiches can you make from three loaves?</td>
<td>I have 33.</td>
</tr>
<tr>
<td>Who has the number of ears on 29 children?</td>
<td>I have 58.</td>
</tr>
<tr>
<td>Who has the number of bulbs on 25 stoplights?</td>
<td>I have 75.</td>
</tr>
<tr>
<td>Who has the answer to my problem? Take 10 dozen marbles and divide them evenly among five friends and yourself. How many does each person get?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has one share of three dollars, one quarter, and one nickel equally shared by 30 students?</td>
<td>I have 11¢.</td>
</tr>
<tr>
<td>Who has the number of baseball players needed for 11 games? (Remember there are nine players on a team and two teams at each game!)</td>
<td>I have 198.</td>
</tr>
<tr>
<td>Who has the number of musicians in three octets? (Remember that oct- means 8!)</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has the number of days in 26 weeks?</td>
<td>I have 182.</td>
</tr>
<tr>
<td>Who has the number of dimes in $1.90?</td>
<td>I have 19.</td>
</tr>
<tr>
<td>Who has the number of quarts of liquid in three gallons?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has the number of tricycles you can build with 96 wheels?</td>
<td>I have 32.</td>
</tr>
<tr>
<td>Who has the number of weeks 147 days make?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has the number of eggs in 15 dozen?</td>
<td>I have 180.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the sum of $\frac{3}{5}$ and $\frac{3}{10}$?</td>
<td>I have $\frac{7}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $1\frac{3}{4}$ and $\frac{1}{2}$?</td>
<td>I have $1\frac{3}{2}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{3}{5}$ and $\frac{1}{2}$?</td>
<td>I have $\frac{11}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{5}{6}$ and $\frac{3}{6}$?</td>
<td>I have $\frac{2}{3}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{3}{5}$ and $\frac{2}{10}$?</td>
<td>I have $\frac{7}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{1}{10}$ and $\frac{1}{2}$?</td>
<td>I have $\frac{11}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{4}{5}$ and $\frac{1}{10}$?</td>
<td>I have $\frac{9}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $1\frac{5}{2}$ and $1\frac{3}{2}$?</td>
<td>I have $2\frac{3}{2}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{1}{10}$ and $\frac{1}{2}$?</td>
<td>I have $\frac{11}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{5}{6}$ and $\frac{3}{5}$?</td>
<td>I have $\frac{7}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{1}{10}$ and $\frac{2}{10}$?</td>
<td>I have $\frac{3}{10}$.</td>
</tr>
<tr>
<td>Who has the sum of $2\frac{1}{2}$ and $2\frac{1}{2}$?</td>
<td>I have $4\frac{1}{2}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{1}{10}$ and $\frac{3}{10}$?</td>
<td>I have $\frac{1}{5}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{2}{1}$ and $\frac{3}{5}$?</td>
<td>I have $\frac{1}{2}$.</td>
</tr>
<tr>
<td>Who has the sum of $\frac{1}{10}$ and $\frac{3}{10}$ and $\frac{7}{10}$?</td>
<td>I have $2\frac{3}{10}$.</td>
</tr>
</tbody>
</table>

### Week 11 • Activity 52

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has $(1 \times 10^3) + (2 \times 10^3) + (5 \times 10)$?</td>
<td>I have 1250.</td>
</tr>
<tr>
<td>Who has 10,000 more than 124,012?</td>
<td>I have 134,012.</td>
</tr>
<tr>
<td>Who has 100 less than 134,099?</td>
<td>I have 133,999.</td>
</tr>
<tr>
<td>Who has $(7 \times 10^3) + (4 \times 10^3) + 9$?</td>
<td>I have 7409.</td>
</tr>
<tr>
<td>Who has the digit in the hundred-thousands place of 9,645,302?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has 10,000 less than 100,000?</td>
<td>I have 90,000.</td>
</tr>
<tr>
<td>Who has 412,902 + 9000?</td>
<td>I have 421,902.</td>
</tr>
<tr>
<td>Who has the digit in the thousands place of 9,645,302?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has 100 greater than 134,099?</td>
<td>I have 134,199.</td>
</tr>
<tr>
<td>Who has 900 less than 134,099?</td>
<td>I have 133,199.</td>
</tr>
<tr>
<td>Who has 100 greater than 914?</td>
<td>I have 1014.</td>
</tr>
<tr>
<td>Who has 10 less than 9,645,302?</td>
<td>I have 9,645,292.</td>
</tr>
<tr>
<td>Who has $10^2$ more than 7904?</td>
<td>I have 8004.</td>
</tr>
<tr>
<td>Who has 100 less than 4603?</td>
<td>I have 4503.</td>
</tr>
<tr>
<td>Who has $(6 \times 10^3) + (4 \times 10^3)$?</td>
<td>I have 6400.</td>
</tr>
<tr>
<td>Who has the digit in the tens place of 9,645,302?</td>
<td>I have 0.</td>
</tr>
<tr>
<td>Who has 100,000 less than 1,000,000?</td>
<td>I have 900,000.</td>
</tr>
<tr>
<td>Who has the digit in the millions place of 9,645,302?</td>
<td>I have 9.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>My Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has ( x ) if ( 3x = 45 )?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 4x = 87 )?</td>
<td>I have 2.</td>
</tr>
<tr>
<td>Who has ( x ) if ( x - 3 = 7 )?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has ( 4x ) if ( x = 9 )?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 9x = 45 )?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 12 + x = 75 )?</td>
<td>I have 63.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 120 ) divided by ( 5 = x )?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has ( x ) if ( (10 + x) ) is 9 less than 22?</td>
<td>I have 3.</td>
</tr>
<tr>
<td>Who has ( x ) if ( x^2 = 81 )?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 12x = 144 )?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 54 + 2 = x )?</td>
<td>I have 27.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 10x + 35 = 145 )?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 8x = 112 )?</td>
<td>I have 14.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 2x + 3x = 40 )?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 12 + x = 34 )?</td>
<td>I have 22.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 150 \div 5 = x )?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 20 ) more than ( 4x ) is ( 100 )?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has ( x ) if ( 19x = 19 )?</td>
<td>I have 1.</td>
</tr>
</tbody>
</table>

### Week 13•Activity 69

<table>
<thead>
<tr>
<th>Question</th>
<th>My Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has a multiplication problem with a product of 150?</td>
<td>I have ( 2 \times 3 \times 5 \times 5 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 6 and 7?</td>
<td>I have ( 27 \div 5 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 66?</td>
<td>I have ( 3 \times 2 \times 11 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 4 and 5?</td>
<td>I have ( 37 \div 9 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 28?</td>
<td>I have ( 2 \times 2 \times 7 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 2 and 3?</td>
<td>I have ( 17 \div 8 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 30?</td>
<td>I have ( 2 \times 3 \times 5 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 7 and 8?</td>
<td>I have ( 61 \div 8 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 105?</td>
<td>I have ( 3 \times 5 \times 7 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 5 and 6?</td>
<td>I have ( 28 \div 5 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 44?</td>
<td>I have ( 2 \times 2 \times 11 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 8 and 9?</td>
<td>I have ( 26 \div 3 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 75?</td>
<td>I have ( 3 \times 5 \times 5 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient of 6?</td>
<td>I have ( 48 \div 8 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 98?</td>
<td>I have ( 2 \times 7 \times 7 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient of 5?</td>
<td>I have ( 25 \div 5 ).</td>
</tr>
<tr>
<td>Who has a multiplication problem with a product of 63?</td>
<td>I have ( 3 \times 3 \times 7 ).</td>
</tr>
<tr>
<td>Who has a division problem with a quotient between 9 and 10?</td>
<td>I have ( 19 \div 2 ).</td>
</tr>
</tbody>
</table>
Questions and Answers for Math Maze Cards

| Who has the only even prime number? | I have 2. |
| Who has a prime number between 40 and 50? The sum of the digits is 5. | I have 41. |
| Who has a composite number whose factors are 1, 5, 11, and the number itself? | I have 55. |
| Who has the largest two-digit prime number? (It is the only prime number between 90 and 100.) | I have 97. |
| Who has the largest two-digit multiple of 3? | I have 99. |
| Who has the only counting number that is neither prime nor composite? | I have 1. |
| Who has a number with these prime factors: 2, 2, 3, and 5? | I have 60. |
| Who has a square number between 50 and 80? | I have 64. |
| Who has a number whose factors are 1, 3, 17, and the number itself? | I have 51. |
| Who has the largest one-digit prime number? | I have 7. |
| Who has the only odd number between 10 and 20 that is not prime? | I have 15. |
| Who has the smallest two-digit multiple of 4? | I have 12. |
| Who has the smallest number that is divisible by both 6 and 9? | I have 18. |
| Who has the prime number that comes between 11 and 17? | I have 13. |
| Who has a prime number between 20 and 30 whose digits have a sum of 5? | I have 23. |
| Who has the smallest odd prime number? | I have 3. |
| Who has a multiple of five? The sum of its digits is 11. | I have 65. |
| Who has the largest prime number under 40? | I have 37. |
Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has 460 rounded to the nearest hundred?</td>
<td>I have 500.</td>
</tr>
<tr>
<td>Who has 1013 rounded to the nearest ten?</td>
<td>I have 1010.</td>
</tr>
<tr>
<td>Who has 892 rounded to the nearest thousand?</td>
<td>I have 1000.</td>
</tr>
<tr>
<td>Who has 612 rounded to the nearest hundred?</td>
<td>I have 600.</td>
</tr>
<tr>
<td>Who has 445 rounded to the nearest ten?</td>
<td>I have 450.</td>
</tr>
<tr>
<td>Who has 9492 rounded to the nearest thousand?</td>
<td>I have 9000.</td>
</tr>
<tr>
<td>Who has 9492 rounded to the nearest hundred?</td>
<td>I have 9500.</td>
</tr>
<tr>
<td>Who has 9492 rounded to the nearest ten?</td>
<td>I have 9490.</td>
</tr>
<tr>
<td>Who has 15,012 rounded to the nearest hundred?</td>
<td>I have 15,000.</td>
</tr>
<tr>
<td>Who has 4312 rounded to the nearest thousand?</td>
<td>I have 4000.</td>
</tr>
<tr>
<td>Who has 676 rounded to the nearest ten?</td>
<td>I have 680.</td>
</tr>
<tr>
<td>Who has 345 rounded to the nearest hundred?</td>
<td>I have 300.</td>
</tr>
<tr>
<td>Who has 345 rounded to the nearest ten?</td>
<td>I have 350.</td>
</tr>
<tr>
<td>Who has 908 rounded to the nearest ten?</td>
<td>I have 910.</td>
</tr>
<tr>
<td>Who has 849 rounded to the nearest hundred?</td>
<td>I have 800.</td>
</tr>
<tr>
<td>Who has 1956 rounded to the nearest ten?</td>
<td>I have 1960.</td>
</tr>
<tr>
<td>Who has 72 rounded to the nearest ten?</td>
<td>I have 70.</td>
</tr>
<tr>
<td>Who has 756 rounded to the nearest ten?</td>
<td>I have 760.</td>
</tr>
</tbody>
</table>
## Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the digit in the tenths place of 87.623?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has 87.623 rounded to the tens place?</td>
<td>I have 90.</td>
</tr>
<tr>
<td>Who has the digit in the thousandths place of 87.623?</td>
<td>I have 3.</td>
</tr>
<tr>
<td>Who has the sum of the digits of the whole number part of 87.623?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has the place value for the 2 in 87.623?</td>
<td>I have hundredths.</td>
</tr>
<tr>
<td>Who has the place value for the 7 in 87.623?</td>
<td>I have ones.</td>
</tr>
<tr>
<td>Who has 87.623 rounded to the nearest tenth?</td>
<td>I have 87.6.</td>
</tr>
<tr>
<td>Who has the place value for the 8 in 87.623?</td>
<td>I have tens.</td>
</tr>
<tr>
<td>Who has the digit in the hundredths place of 87.623?</td>
<td>I have 2.</td>
</tr>
<tr>
<td>Who has 87.623 rounded to the nearest hundred?</td>
<td>I have 100.</td>
</tr>
<tr>
<td>Who has the digit in the tens place of 87.623?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has the decimal portion of 87.623?</td>
<td>I have 0.623.</td>
</tr>
<tr>
<td>Who has the place value for the 6 in 87.623?</td>
<td>I have tenths.</td>
</tr>
<tr>
<td>Who has 87.623 rounded to the nearest hundredth?</td>
<td>I have 87.62.</td>
</tr>
<tr>
<td>Who has the digit in the ones place of 87.623?</td>
<td>I have 7.</td>
</tr>
<tr>
<td>Who has 87.623 rounded to the nearest whole number?</td>
<td>I have 88.</td>
</tr>
<tr>
<td>Who has the place value for the 3 in 87.623?</td>
<td>I have thousandths.</td>
</tr>
<tr>
<td>Who has the number 0.5 less than 87.623?</td>
<td>I have 87.123.</td>
</tr>
</tbody>
</table>

© Great Source. Copying is prohibited.
# Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the remainder when 82 is divided by 9?</td>
<td>I have 1.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor and the quotient are both 5 and there is no remainder?</td>
<td>I have 25.</td>
</tr>
<tr>
<td>Who has the remainder when 39 is divided by 5?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has the remainder when 55 is divided by 7?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has the remainder when 62 is divided by 9?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor is 7, the quotient is 7, and the remainder is 1?</td>
<td>I have 50.</td>
</tr>
<tr>
<td>Who has the remainder when 58 is divided by 7?</td>
<td>I have 2.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor is 5, the quotient is 2, and the remainder is 2?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has the remainder when 99 is divided by 10?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor is 6, the quotient is 3, and the remainder is 2?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has the remainder when 47 is divided by 6?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has the remainder when 23 is divided by 12?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has the remainder when 55 is divided by 8?</td>
<td>I have 7.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor is 3, the quotient is 25, and there is no remainder?</td>
<td>I have 75.</td>
</tr>
<tr>
<td>Who has the dividend when the divisor and the quotient are both 10 and there is no remainder?</td>
<td>I have 100.</td>
</tr>
<tr>
<td>Who has the remainder when 18 is divided by 5?</td>
<td>I have 3.</td>
</tr>
<tr>
<td>Who has the remainder when 56 is divided by 7?</td>
<td>I have 0.</td>
</tr>
<tr>
<td>Who has the remainder when 50 is divided by 20?</td>
<td>I have 10.</td>
</tr>
</tbody>
</table>
## Math Maze

**Questions and Answers for Math Maze Cards**

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has a fraction equivalent to $\frac{1}{2}$?</td>
<td>I have $\frac{6}{12}$.</td>
</tr>
<tr>
<td>Who has the number of inches in one foot?</td>
<td>I have 12 inches.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{1}{4}$?</td>
<td>I have 0.25.</td>
</tr>
<tr>
<td>Who has the number of cups in one quart?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has a fraction equivalent to $\frac{2}{3}$?</td>
<td>I have $\frac{20}{30}$.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{2}{3}$?</td>
<td>I have 0.8.</td>
</tr>
<tr>
<td>Who has the number of seconds in one minute?</td>
<td>I have 60.</td>
</tr>
<tr>
<td>Who has the number of dimes in one dollar?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has the number of years in one century?</td>
<td>I have 100.</td>
</tr>
<tr>
<td>Who has a fraction equivalent to $\frac{1}{10}$?</td>
<td>I have $\frac{5}{50}$.</td>
</tr>
<tr>
<td>Who has the number of nickels in one quarter?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has the decimal equivalent to $\frac{3}{4}$?</td>
<td>I have 0.75.</td>
</tr>
<tr>
<td>Who has the number of ounces in one pound?</td>
<td>I have 16.</td>
</tr>
<tr>
<td>Who has the number of grams in one kilogram?</td>
<td>I have 1000.</td>
</tr>
<tr>
<td>Who has a fraction equivalent to $\frac{1}{3}$?</td>
<td>I have $\frac{4}{12}$.</td>
</tr>
<tr>
<td>Who has the number of quarters in a five-dollar bill?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has the number of hours in one complete day?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has a fraction equal to $\frac{1}{8}$?</td>
<td>I have $\frac{5}{40}$.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the symbol for is greater than?</td>
<td>I have &gt;</td>
</tr>
<tr>
<td>Who has the abbreviation for pound?</td>
<td>I have lb</td>
</tr>
<tr>
<td>Who has the symbol for is equal to?</td>
<td>I have =</td>
</tr>
<tr>
<td>Who has symbols for multiplication?</td>
<td>I have ( \times ) or ( \bullet )</td>
</tr>
<tr>
<td>Who has the symbol for is less than or equal to?</td>
<td>I have ( \leq )</td>
</tr>
<tr>
<td>Who has the symbol for percent?</td>
<td>I have %</td>
</tr>
<tr>
<td>Who has the symbol for subtraction?</td>
<td>I have −</td>
</tr>
<tr>
<td>Who has a decimal point?</td>
<td>I have .</td>
</tr>
<tr>
<td>Who has grouping symbols?</td>
<td>I have ( )</td>
</tr>
<tr>
<td>Who has the symbol for cents?</td>
<td>I have €</td>
</tr>
<tr>
<td>Who has the symbol for is not equal to?</td>
<td>I have ≠</td>
</tr>
<tr>
<td>Who has a way to show the square of any number?</td>
<td>I have ( n^2 )</td>
</tr>
<tr>
<td>Who has the symbol for dollars?</td>
<td>I have $</td>
</tr>
<tr>
<td>Who has the symbol for is less than?</td>
<td>I have &lt;</td>
</tr>
<tr>
<td>Who has the abbreviation for ounce?</td>
<td>I have oz</td>
</tr>
<tr>
<td>Who has a symbol for division?</td>
<td>I have ÷</td>
</tr>
<tr>
<td>Who has the symbol for degrees Fahrenheit?</td>
<td>I have °F</td>
</tr>
<tr>
<td>Who has the symbol for addition?</td>
<td>I have +</td>
</tr>
</tbody>
</table>

### Week 20•Activity 97

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has 540 multiplied by 10?</td>
<td>I have 5400.</td>
</tr>
<tr>
<td>Who has 540 multiplied by 100?</td>
<td>I have 54,000.</td>
</tr>
<tr>
<td>Who has 603 multiplied by 0.1?</td>
<td>I have 60.3</td>
</tr>
<tr>
<td>Who has 150 multiplied by 100?</td>
<td>I have 15,000.</td>
</tr>
<tr>
<td>Who has 90 multiplied by 0.1?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has 1070 multiplied by 10?</td>
<td>I have 10,700.</td>
</tr>
<tr>
<td>Who has 150 multiplied by 0.1?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has 303 multiplied by 100?</td>
<td>I have 30,300.</td>
</tr>
<tr>
<td>Who has 1070 multiplied by 100?</td>
<td>I have 107,000.</td>
</tr>
<tr>
<td>Who has 540 multiplied by 0.1?</td>
<td>I have 54.</td>
</tr>
<tr>
<td>Who has 90 multiplied by 10?</td>
<td>I have 900.</td>
</tr>
<tr>
<td>Who has 303 multiplied by 0.1?</td>
<td>I have 30.3</td>
</tr>
<tr>
<td>Who has 603 multiplied by 10?</td>
<td>I have 6030.</td>
</tr>
<tr>
<td>Who has 450 multiplied by 1000?</td>
<td>I have 450,000.</td>
</tr>
<tr>
<td>Who has 1670 multiplied by 0.1?</td>
<td>I have 167.</td>
</tr>
<tr>
<td>Who has 1670 multiplied by 10?</td>
<td>I have 16,700.</td>
</tr>
<tr>
<td>Who has 1070 multiplied by 0.1?</td>
<td>I have 107.</td>
</tr>
<tr>
<td>Who has 603 multiplied by 100?</td>
<td>I have 60,300.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------</td>
</tr>
<tr>
<td>Who has a five-sided polygon?</td>
<td>I have a pentagon.</td>
</tr>
<tr>
<td>Who has the tool used to measure an angle?</td>
<td>I have a protractor.</td>
</tr>
<tr>
<td>Who has the type of angle with more than 90° but less than 180°?</td>
<td>I have an obtuse angle.</td>
</tr>
<tr>
<td>Who has an eight-sided polygon?</td>
<td>I have an octagon.</td>
</tr>
<tr>
<td>Who has a rectangle with four congruent sides?</td>
<td>I have a square.</td>
</tr>
<tr>
<td>Who has a polygon with six sides?</td>
<td>I have a hexagon.</td>
</tr>
<tr>
<td>Who has lines that will never cross because they are always the same distance apart?</td>
<td>I have parallel lines.</td>
</tr>
<tr>
<td>Who has a four-sided figure with no parallel sides, but two sets of congruent sides?</td>
<td>I have a kite.</td>
</tr>
<tr>
<td>Who has a three-dimensional figure with six square faces?</td>
<td>I have a cube.</td>
</tr>
<tr>
<td>Who has the name of the point where two rays meet to form an angle?</td>
<td>I have vertex.</td>
</tr>
<tr>
<td>Who has the type of angle that measures between 0 and 90 degrees?</td>
<td>I have acute angle.</td>
</tr>
<tr>
<td>Who has the word that means that two figures are the same size and shape?</td>
<td>I have congruent.</td>
</tr>
<tr>
<td>Who has the sum of the measures of the interior angles of any triangle?</td>
<td>I have 180°.</td>
</tr>
<tr>
<td>Who has the number of degrees in a circle?</td>
<td>I have 360°.</td>
</tr>
<tr>
<td>Who has the name for any closed figure? Its sides are made up of line segments that only meet at their endpoints.</td>
<td>I have polygon.</td>
</tr>
<tr>
<td>Who has the name of a three-sided polygon?</td>
<td>I have triangle.</td>
</tr>
<tr>
<td>Who has the name of any four-sided polygon?</td>
<td>I have quadrilateral.</td>
</tr>
<tr>
<td>Who has the name of an angle that measures exactly 90°?</td>
<td>I have right angle.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>---------------------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>Who has the number of days in two regular years?</td>
<td>I have 730.</td>
</tr>
<tr>
<td>Who has the number of days in three weeks?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has the number of minutes in two hours?</td>
<td>I have 120.</td>
</tr>
<tr>
<td>Who has ten less than the number of inches in four feet?</td>
<td>I have 38.</td>
</tr>
<tr>
<td>Who has the number of months in four years?</td>
<td>I have 48.</td>
</tr>
<tr>
<td>Who has the number of seasons in two years?</td>
<td>I have 8.</td>
</tr>
<tr>
<td>Who has half of the number of degrees in a right angle?</td>
<td>I have 45.</td>
</tr>
<tr>
<td>Who has the number of faces on six cubes?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has the number of eggs in a dozen and a half?</td>
<td>I have 18.</td>
</tr>
<tr>
<td>Who has the number of pennies with the same value as five dimes?</td>
<td>I have 50.</td>
</tr>
<tr>
<td>Who has the number of feet in a mile?</td>
<td>I have 5280.</td>
</tr>
<tr>
<td>Who has the number of ounces in ten pounds?</td>
<td>I have 160.</td>
</tr>
<tr>
<td>Who has the number of ounces in a quart?</td>
<td>I have 32.</td>
</tr>
<tr>
<td>Who has the value of five quarters?</td>
<td>I have $1.25.</td>
</tr>
<tr>
<td>Who has the number of inches in two yards?</td>
<td>I have 72.</td>
</tr>
<tr>
<td>Who has the number of seconds in five minutes?</td>
<td>I have 300.</td>
</tr>
<tr>
<td>Who has the number of school days in eight weeks with no holidays?</td>
<td>I have 40.</td>
</tr>
<tr>
<td>Who has the number of days in four weeks?</td>
<td>I have 28.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Who has the answer to my problem? I bought a candy bar for 59¢. How much change did I get from three quarters?</strong></td>
<td>I have 16¢.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I put 16¢ in my piggy bank and the next time I checked it I had three times as much saved. How much did I have then?</strong></td>
<td>I have 48¢.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? What is the least number of coins I can use to make 48¢?</strong></td>
<td>I have 6.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I bought six pounds of candy at $1.99 a pound. About how many dollars did I spend?</strong></td>
<td>I have $12.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I have five times $12.00. How much do I have?</strong></td>
<td>I have $60.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I spent 60% of $60.00. How much did I have left?</strong></td>
<td>I have $24.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? If tax is included, how many $8.00 books can I buy with $24.00?</strong></td>
<td>I have 3.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I have saved my $2.50 allowance for three weeks. How much do I have now?</strong></td>
<td>I have $7.50.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I start with $7.50. I spend a five-dollar bill, two one-dollar bills, a quarter, and a dime. How much do I have left?</strong></td>
<td>I have 15¢.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I made 15¢ with seven coins. Two of the coins were the same. What's the value of each of these two coins?</strong></td>
<td>I have 5¢.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? If I have a collection of 140 nickels, how much is my collection worth?</strong></td>
<td>I have $7.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? If a magazine costs $3.50, how many can I buy with $7.00?</strong></td>
<td>I have 2.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I want to buy two bags of chips at 80¢ each and a bottle of soda for $1. How much do I need?</strong></td>
<td>I have $2.60.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I got 10 times $2.00 for my birthday. How much was that?</strong></td>
<td>I have $20.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I traded $20.00 for dimes. How many dimes did I get?</strong></td>
<td>I have 200.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I have 200 baseball cards. I paid $1.00 for each pack of eight cards. How much did I pay for my collection?</strong></td>
<td>I have $25.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? If $25.00 is the cost of five CDs, how much will six CDs cost?</strong></td>
<td>I have $30.00.</td>
</tr>
<tr>
<td><strong>Who has the answer to my problem? I had $30.00. I spent all but 75¢ and then needed to pay 16¢ for tax. How much was left?</strong></td>
<td>I have 59¢.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Who has half of ten?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has five more than the number of eggs in a dozen?</td>
<td>I have 17.</td>
</tr>
<tr>
<td>Who has 17 minus the number of sides on a hexagon?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has 11 times the number of things in a trio?</td>
<td>I have 33.</td>
</tr>
<tr>
<td>Who has 33 minus the number of letters in the alphabet?</td>
<td>I have 7.</td>
</tr>
<tr>
<td>Who has seven plus the number of inches in a foot?</td>
<td>I have 19.</td>
</tr>
<tr>
<td>Who has 19 plus the number of days in a week?</td>
<td>I have 26.</td>
</tr>
<tr>
<td>Who has half of 26?</td>
<td>I have 13.</td>
</tr>
<tr>
<td>Who has 13 plus half of sixteen?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has $21 - \frac{21}{3}$?</td>
<td>I have 14.</td>
</tr>
<tr>
<td>Who has the number of fingers and toes that one person has plus 14?</td>
<td>I have 34.</td>
</tr>
<tr>
<td>Who has 34 plus the number of singers in a duet?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has $36 \div 9$?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has 4?</td>
<td>I have 16.</td>
</tr>
<tr>
<td>Who has 16 plus the number of minutes in a half hour?</td>
<td>I have 46.</td>
</tr>
<tr>
<td>Who has 46 minus the number of days in three weeks?</td>
<td>I have 25.</td>
</tr>
<tr>
<td>Who has 25 plus the number of sides on a pentagon?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has 30 minus $2 \times 2 \times 5$?</td>
<td>I have 10.</td>
</tr>
</tbody>
</table>

© Great Source. Copying is prohibited.
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has $\frac{2}{3}$ of 30?</td>
<td>I have 20.</td>
</tr>
<tr>
<td>Who has $\frac{3}{5}$ of 15?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has $\frac{2}{5}$ of 56?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has $\frac{2}{9}$ of 81?</td>
<td>I have 18.</td>
</tr>
<tr>
<td>Who has $\frac{1}{3}$ of 200?</td>
<td>I have 40.</td>
</tr>
<tr>
<td>Who has $\frac{1}{4}$ of 180?</td>
<td>I have 45.</td>
</tr>
<tr>
<td>Who has $\frac{1}{6}$ of 102?</td>
<td>I have 17.</td>
</tr>
<tr>
<td>Who has $\frac{1}{3}$ of 99?</td>
<td>I have 33.</td>
</tr>
<tr>
<td>Who has $\frac{3}{9}$ of 63?</td>
<td>I have 27.</td>
</tr>
<tr>
<td>Who has $\frac{1}{3}$ of 33?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has $\frac{3}{5}$ of 500?</td>
<td>I have 200.</td>
</tr>
<tr>
<td>Who has $\frac{5}{8}$ of 96?</td>
<td>I have 60.</td>
</tr>
<tr>
<td>Who has $\frac{1}{2}$ of 174?</td>
<td>I have 87.</td>
</tr>
<tr>
<td>Who has $\frac{2}{9}$ of 72?</td>
<td>I have 63.</td>
</tr>
<tr>
<td>Who has $\frac{1}{8}$ of 96?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has $\frac{2}{7}$ of 35?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has $\frac{1}{4}$ of 64?</td>
<td>I have 48.</td>
</tr>
<tr>
<td>Who has $\frac{4}{5}$ of 30?</td>
<td>I have 24.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Who has the area of a square with a seven-inch side?</strong></td>
<td><strong>I have 49 square inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the perimeter of a square with four-inch sides?</strong></td>
<td><strong>I have 16 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the area of my rectangle? One side is two inches long. The other side is twice as long.</strong></td>
<td><strong>I have 8 square inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the perimeter of my rectangle? One side is seven inches long. The other side is two inches long.</strong></td>
<td><strong>I have 18 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the length of a side of a square with an area of 49 square inches?</strong></td>
<td><strong>I have 7 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the length of each of the sides of my equilateral triangle? Its perimeter is 12 inches.</strong></td>
<td><strong>I have 4 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the width of my rectangle? Its length is seven inches. Its area is 21 square inches.</strong></td>
<td><strong>I have 3 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the lengths of the congruent sides of my isosceles triangle? Its perimeter is 15 inches. Its non-congruent side is three inches long.</strong></td>
<td><strong>I have 6 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the area of a rectangle that is 21 centimeters long and $\frac{1}{2}$ as wide?</strong></td>
<td><strong>I have 63 square centimeters.</strong></td>
</tr>
<tr>
<td><strong>Who has the perimeter of my right triangle? The shortest side is three inches long. The middle side is one inch longer than the shortest side. The longest side is two inches longer than the shortest side.</strong></td>
<td><strong>I have 12 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the area of a square with sides that are the length of the smallest two-digit prime number?</strong></td>
<td><strong>I have 121 square inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the width of a rectangle that is a foot long and has an area of 12 square inches?</strong></td>
<td><strong>I have 1 inch.</strong></td>
</tr>
<tr>
<td><strong>Who has the length of the third side of my triangle? Its perimeter is one yard. One side is one foot long. One side is two inches less than a foot long.</strong></td>
<td><strong>I have 1 foot, 2 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the length of the short side of my rectangle? The long side is only one inch longer than the short side and the area is 30 square inches.</strong></td>
<td><strong>I have 5 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the perimeter of an equilateral triangle with sides each 11 inches long?</strong></td>
<td><strong>I have 33 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the width of my rectangle? Its length is four inches. Its area is eight square inches.</strong></td>
<td><strong>I have 2 inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the area of a square with sides that are the length of the third prime number?</strong></td>
<td><strong>I have 25 square inches.</strong></td>
</tr>
<tr>
<td><strong>Who has the perimeter of a square with an area of 81 square centimeters?</strong></td>
<td><strong>I have 36 centimeters.</strong></td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the answer to my problem? If five stars cost $10.00, what is the cost of two stars?</td>
<td>I have $4.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If a triangle costs $0.50, what is the cost of 16 triangles?</td>
<td>I have $8.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If three circles cost $1.50, what is the cost of two circles?</td>
<td>I have $1.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If two rectangles cost $3.00, what is the cost of five rectangles?</td>
<td>I have $7.50.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If two ovals cost $0.25, what is the cost of ten ovals?</td>
<td>I have $1.25.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If three balls cost $0.50, what is the cost of twelve balls?</td>
<td>I have $2.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If five stars cost $10.00 what is the cost of eight stars?</td>
<td>I have $16.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If a triangle costs $0.50, what is the cost of a half dozen triangles?</td>
<td>I have $3.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If three circles cost $1.50, what is the cost of seven circles?</td>
<td>I have $3.50.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If two rectangles cost $3.00 what is the cost of a dozen rectangles?</td>
<td>I have $18.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If two ovals cost $0.25 how many could you buy for five dollars?</td>
<td>I have 40.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If three balls cost $0.50 and two ovals cost $0.25, how many balls would cost the same as a dozen ovals?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If four cubes cost $0.60 what is the cost of three cubes?</td>
<td>I have $0.45.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If four cubes cost $0.60 and three balls cost $0.50, what is the cost of six cubes and six balls?</td>
<td>I have $1.90.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If five stars cost $10.00 how much would you save if you bought five rectangles instead? Rectangles are two for $3.00.</td>
<td>I have $2.50.</td>
</tr>
<tr>
<td>Who has the answer to my problem? If three circles cost $1.50 what is the cost of ten circles?</td>
<td>I have $5.00.</td>
</tr>
<tr>
<td>Who has the answer to my problem? How many ovals, at two for $0.25, could you buy for $10.00?</td>
<td>I have 80.</td>
</tr>
<tr>
<td>Who has the answer to my problem? How much would 27 balls cost if you could buy three for $0.50?</td>
<td>I have $4.50.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is one ounce?</td>
<td>I have $\frac{1}{16}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is 18 ounces?</td>
<td>I have $\frac{13}{8}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is three ounces?</td>
<td>I have $\frac{3}{16}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a foot is 10 inches?</td>
<td>I have $\frac{5}{6}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is eight ounces?</td>
<td>I have $\frac{1}{2}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a dollar is a dime?</td>
<td>I have $\frac{1}{10}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a foot is eight inches?</td>
<td>I have $\frac{2}{3}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is two ounces?</td>
<td>I have $\frac{1}{8}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a dollar is four nickels?</td>
<td>I have $\frac{1}{5}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a dollar is two quarters and a dime?</td>
<td>I have $\frac{3}{5}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is six ounces?</td>
<td>I have $\frac{3}{8}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a dollar is three quarters and a nickel?</td>
<td>I have $\frac{4}{5}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is seven ounces?</td>
<td>I have $\frac{7}{16}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a dollar is a quarter and nickel?</td>
<td>I have $\frac{3}{10}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is four ounces?</td>
<td>I have $\frac{1}{4}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a foot is nine inches?</td>
<td>I have $\frac{3}{4}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is 14 ounces?</td>
<td>I have $\frac{7}{8}$</td>
</tr>
<tr>
<td>Who has the answer to my problem? What fraction of a pound is five ounces?</td>
<td>I have $\frac{5}{16}$</td>
</tr>
</tbody>
</table>
# Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has three more than $6 \times 8$?</td>
<td>I have 51.</td>
</tr>
<tr>
<td>Who has five more than $3 \times 4$?</td>
<td>I have 17.</td>
</tr>
<tr>
<td>Who has five more than $9 \times 8$?</td>
<td>I have 77.</td>
</tr>
<tr>
<td>Who has two more than $5 \times 9$?</td>
<td>I have 47.</td>
</tr>
<tr>
<td>Who has seven more than $3 \times 8$?</td>
<td>I have 31.</td>
</tr>
<tr>
<td>Who has four more than $9 \times 9$?</td>
<td>I have 85.</td>
</tr>
<tr>
<td>Who has six more than $6 \times 5$?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has two more than $8 \times 8$?</td>
<td>I have 66.</td>
</tr>
<tr>
<td>Who has five more than $2 \times 7$?</td>
<td>I have 19.</td>
</tr>
<tr>
<td>Who has seven less than $9 \times 9$?</td>
<td>I have 74.</td>
</tr>
<tr>
<td>Who has six more than $4 \times 5$?</td>
<td>I have 26.</td>
</tr>
<tr>
<td>Who has two more than $6 \times 7$?</td>
<td>I have 44.</td>
</tr>
<tr>
<td>Who has six more than $4 \times 8$?</td>
<td>I have 38.</td>
</tr>
<tr>
<td>Who has six less than $3 \times 5$?</td>
<td>I have 9.</td>
</tr>
<tr>
<td>Who has seven more than $4 \times 7$?</td>
<td>I have 35.</td>
</tr>
<tr>
<td>Who has eight more than $6 \times 9$?</td>
<td>I have 62.</td>
</tr>
<tr>
<td>Who has two more than $4 \times 9$?</td>
<td>I have 34.</td>
</tr>
<tr>
<td>Who has three less than $7 \times 8$?</td>
<td>I have 53.</td>
</tr>
</tbody>
</table>

# Week 30 • Activity 147

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has a problem with a product between 200 and 300?</td>
<td>I have $23 \times 10$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 30,000 and 40,000?</td>
<td>I have $80 \times 400$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 500 and 600?</td>
<td>I have $30 \times 19$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 10,000 and 20,000?</td>
<td>I have $9000 \times 2$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 40,000 and 50,000?</td>
<td>I have $600 \times 70$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 0 and 100?</td>
<td>I have $3 \times 32$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 70,000 and 80,000?</td>
<td>I have $90 \times 800$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 900 and 1000?</td>
<td>I have $98 \times 10$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 400 and 500?</td>
<td>I have $20 \times 23$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 600 and 700?</td>
<td>I have $20 \times 32$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 800 and 900?</td>
<td>I have $44 \times 20$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 50,000 and 60,000?</td>
<td>I have $800 \times 70$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 20,000 and 30,000?</td>
<td>I have $50 \times 500$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 60,000 and 70,000?</td>
<td>I have $70 \times 900$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 100 and 200?</td>
<td>I have $17 \times 10$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 700 and 800?</td>
<td>I have $8 \times 90$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 80,000 and 100,000?</td>
<td>I have $900 \times 90$.</td>
</tr>
<tr>
<td>Who has a problem with a product between 300 and 400?</td>
<td>I have $20 \times 18$.</td>
</tr>
</tbody>
</table>
## Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has forty-six hundredths?</td>
<td>I have 0.46.</td>
</tr>
<tr>
<td>Who has eight tenths?</td>
<td>I have 0.8.</td>
</tr>
<tr>
<td>Who has five hundredths?</td>
<td>I have 0.05.</td>
</tr>
<tr>
<td>Who has forty-eight thousandths?</td>
<td>I have 0.048.</td>
</tr>
<tr>
<td>Who has two hundredths?</td>
<td>I have 0.02.</td>
</tr>
<tr>
<td>Who has fifty-five hundredths?</td>
<td>I have 0.55.</td>
</tr>
<tr>
<td>Who has one and two tenths?</td>
<td>I have 1.2.</td>
</tr>
<tr>
<td>Who has ninety-five thousandths?</td>
<td>I have 0.095.</td>
</tr>
<tr>
<td>Who has ninety-five hundredths?</td>
<td>I have 0.95.</td>
</tr>
<tr>
<td>Who has seven tenths?</td>
<td>I have 0.7.</td>
</tr>
<tr>
<td>Who has seven thousandths?</td>
<td>I have 0.007.</td>
</tr>
<tr>
<td>Who has twelve hundredths?</td>
<td>I have 0.12.</td>
</tr>
<tr>
<td>Who has fifty-three hundredths?</td>
<td>I have 0.53.</td>
</tr>
<tr>
<td>Who has five thousandths?</td>
<td>I have 0.005.</td>
</tr>
<tr>
<td>Who has seven hundredths?</td>
<td>I have 0.07.</td>
</tr>
<tr>
<td>Who has one and forty-eight hundredths?</td>
<td>I have 1.48.</td>
</tr>
<tr>
<td>Who has fifty-five thousandths?</td>
<td>I have 0.055.</td>
</tr>
<tr>
<td>Who has eighty-eight thousandths?</td>
<td>I have 0.088.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has the greater number, 0.46 or 0.046?</td>
<td>I have 0.46.</td>
</tr>
<tr>
<td>Who has the greater number, (3 \times 10 \times 10 \times 10) or 100,000?</td>
<td>I have 100,000.</td>
</tr>
<tr>
<td>Who has the greater number, (100 - \frac{1}{2}) or 98 + (\frac{1}{4})?</td>
<td>I have 100 - (\frac{1}{2}).</td>
</tr>
<tr>
<td>Who has the greater number, 0.48 or 0.4?</td>
<td>I have 0.48.</td>
</tr>
<tr>
<td>Who has the greater number, 0.7 or 0.68?</td>
<td>I have 0.7.</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{3}{4}) or (\frac{7}{8})?</td>
<td>I have (\frac{1}{4}).</td>
</tr>
<tr>
<td>Who has the greater number, 20 (\times) 42 or 80 (\times) 11?</td>
<td>I have 80 (\times) 11.</td>
</tr>
<tr>
<td>Who has the greater number, 100 - 56 or 1000 - 560?</td>
<td>I have 1000 - 560.</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{5}{6}) or (\frac{7}{8})?</td>
<td>I have (\frac{7}{8}).</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{3}{5}) or 0.5?</td>
<td>I have (\frac{1}{2}).</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{1}{3}) or 0.35?</td>
<td>I have 0.35.</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{3}{9}) of 48 or 50% of 48?</td>
<td>I have 50% of 48.</td>
</tr>
<tr>
<td>Who has the greater number, 68 + 34 or 10²?</td>
<td>I have 68 + 34.</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{5}{8}) or (\frac{3}{4})?</td>
<td>I have (\frac{3}{4}).</td>
</tr>
<tr>
<td>Who has the greater number, 2100 (\div) 70 or (\frac{1}{2}) of 70?</td>
<td>I have (\frac{1}{2}) of 70.</td>
</tr>
<tr>
<td>Who has the greater number, 0.9 or 0.98?</td>
<td>I have 0.98.</td>
</tr>
<tr>
<td>Who has the greater number, 70 (\times) 8 or 80 (\times) 6?</td>
<td>I have 70 (\times) 8.</td>
</tr>
<tr>
<td>Who has the greater number, (\frac{2}{3}) of 150 or 3 (\times) 33?</td>
<td>I have (\frac{2}{3}) of 150.</td>
</tr>
<tr>
<td>Question</td>
<td>Answer</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Who has $3^2 + 9^2 + 10$?</td>
<td>I have 100.</td>
</tr>
<tr>
<td>Who has $100 - (7 \times 10)$?</td>
<td>I have 30.</td>
</tr>
<tr>
<td>Who has $5^2 \div \frac{3}{2}$?</td>
<td>I have 25.</td>
</tr>
<tr>
<td>Who has $3^2 + 3$?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has $3 \times 4 \times 5$?</td>
<td>I have 60.</td>
</tr>
<tr>
<td>Who has $5^2 \div 5$?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has $9^2 - 9$?</td>
<td>I have 72.</td>
</tr>
<tr>
<td>Who has $1 + 2 + 3$?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has $3 \times 5^2$?</td>
<td>I have 75.</td>
</tr>
<tr>
<td>Who has $2 \times 3 \times 4$?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has $4^2 \div 8$?</td>
<td>I have 2.</td>
</tr>
<tr>
<td>Who has $2 \times 5^2 + 6$?</td>
<td>I have 56.</td>
</tr>
<tr>
<td>Who has $25^2 \div 25$?</td>
<td>I have 1.</td>
</tr>
<tr>
<td>Who has $5^2 - (5 \times 2)$?</td>
<td>I have 15.</td>
</tr>
<tr>
<td>Who has $6^2 + 2$?</td>
<td>I have 40.</td>
</tr>
<tr>
<td>Who has $2^1 \times 2^1 + 8$?</td>
<td>I have 80.</td>
</tr>
<tr>
<td>Who has $10^2 \div 10$?</td>
<td>I have 10.</td>
</tr>
<tr>
<td>Who has $10^2 \div 2$?</td>
<td>I have 50.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has a number between 600 and 1400 that is a multiple of 500?</td>
<td>I have 1000.</td>
</tr>
<tr>
<td>Who has my fraction? Its numerator is the only even prime number and its denominator is three times the numerator.</td>
<td>I have ( \frac{2}{6} ).</td>
</tr>
<tr>
<td>Who has a square number between 26 and 48?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has a prime number very near 48?</td>
<td>I have 47.</td>
</tr>
<tr>
<td>Who has a decimal number that is equivalent to half of a half?</td>
<td>I have 0.25.</td>
</tr>
<tr>
<td>Who has my two-digit number greater than 50? Its digits are different and even, and their sum is 12.</td>
<td>I have 84.</td>
</tr>
<tr>
<td>Who has three more than the number of feet in a half mile?</td>
<td>I have 2643.</td>
</tr>
<tr>
<td>Who has a three-digit multiple of 100?</td>
<td>I have 900.</td>
</tr>
<tr>
<td>Who has a two-digit number between 15 and 35 that can be evenly divided by two, three, and four?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has the sum of ( \frac{1}{2} + \frac{1}{4} + \frac{1}{8} )?</td>
<td>I have ( \frac{15}{16} ).</td>
</tr>
<tr>
<td>Who has my three-digit even number? The sum of its digits is two.</td>
<td>I have 110.</td>
</tr>
<tr>
<td>Who has the number of sides of a triangle multiplied by the largest one-digit prime number?</td>
<td>I have 21.</td>
</tr>
<tr>
<td>Who has the least multiple of 20 and 30?</td>
<td>I have 60.</td>
</tr>
<tr>
<td>Who has the greatest common factor of 12 and 16?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has my two-digit number? The sum of its digits is a dozen and the difference between its digits is a pair.</td>
<td>I have 75.</td>
</tr>
<tr>
<td>Who has the fewest coins that will make 77¢?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has my two-digit number? Its digits are even and the same. Their sum is a dozen.</td>
<td>I have 66.</td>
</tr>
<tr>
<td>Who has a number whose digits are the first three odd numbers?</td>
<td>I have 351.</td>
</tr>
</tbody>
</table>
### Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has half of 9? The digits are four and five.</td>
<td>4.5</td>
</tr>
<tr>
<td><strong>Who has a decimal equivalent of (1\frac{1}{2})? The digits are one, five, and zero.</strong></td>
<td>1.50</td>
</tr>
<tr>
<td><strong>Who has (\frac{1}{3}) of 45? The digits are one, five, and zero.</strong></td>
<td>15.0</td>
</tr>
<tr>
<td><strong>Who has 0.5 of 300? The digits are one, five, and zero.</strong></td>
<td>150.0</td>
</tr>
<tr>
<td><strong>Who has 25 \times 0.25? The digits are six, two, and five.</strong></td>
<td>6.25</td>
</tr>
<tr>
<td><strong>Who has a number between 10 and 11? The digits are one, zero, six, and seven.</strong></td>
<td>10.67</td>
</tr>
<tr>
<td><strong>Who has 12 \div 0.55? The digits are two ones, a four, and a five.</strong></td>
<td>11.45</td>
</tr>
<tr>
<td><strong>Who has reasonable weight in pounds for a first-grader? The digits are six, two, and five.</strong></td>
<td>62.5</td>
</tr>
<tr>
<td><strong>Who has 0.7 \times 5? The digits are three and five.</strong></td>
<td>3.5</td>
</tr>
<tr>
<td><strong>Who has (\frac{1}{3}) of 70? The digits are one, four, and zero.</strong></td>
<td>14.0</td>
</tr>
<tr>
<td><strong>Who has the number halfway between 17 and 18? The digits are one, seven, and five.</strong></td>
<td>17.5</td>
</tr>
<tr>
<td><strong>Who has the number of dollars made by seven quarters? The digits are one, seven, and five.</strong></td>
<td>1.75</td>
</tr>
<tr>
<td><strong>Who has half of 70? The digits are three and five.</strong></td>
<td>35.0</td>
</tr>
<tr>
<td><strong>Who has the number of books in a small library? The digits are six, two, and five.</strong></td>
<td>625.0</td>
</tr>
<tr>
<td><strong>Who has the number of hours from 8 A.M. to 4:30 P.M.? The digits are eight and five.</strong></td>
<td>8.5</td>
</tr>
<tr>
<td><strong>Who has half of four and a half? The digits are two 2s and a five.</strong></td>
<td>2.25</td>
</tr>
<tr>
<td><strong>Who has 64.25 + 50.25? The digits are two 1s, a four, and a five.</strong></td>
<td>114.5</td>
</tr>
<tr>
<td><strong>Who has a number a bit less than the number of hours in a day? The digits are two 2s and a five.</strong></td>
<td>22.5</td>
</tr>
</tbody>
</table>
Math Maze
Week 36 • Activity 177

Questions and Answers for Math Maze Cards

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Who has zero plus the number of months in a year?</td>
<td>I have 12.</td>
</tr>
<tr>
<td>Who has 12 ÷ 3?</td>
<td>I have 4.</td>
</tr>
<tr>
<td>Who has four multiplied by a half-dozen?</td>
<td>I have 24.</td>
</tr>
<tr>
<td>Who has 24 minus the number of pennies in a nickel?</td>
<td>I have 19.</td>
</tr>
<tr>
<td>Who has 19 minus ½?</td>
<td>I have 17.</td>
</tr>
<tr>
<td>Who has 17 minus the number of sides on a triangle?</td>
<td>I have 14.</td>
</tr>
<tr>
<td>Who has 14 minus the number of feet in a yard?</td>
<td>I have 11.</td>
</tr>
<tr>
<td>Who has 11 plus two plus the number of inches in a foot?</td>
<td>I have 25.</td>
</tr>
<tr>
<td>Who has double 25?</td>
<td>I have 50.</td>
</tr>
<tr>
<td>Who has 50 minus the number of days in most Februaries?</td>
<td>I have 22.</td>
</tr>
<tr>
<td>Who has 22 plus a dozen?</td>
<td>I have 34.</td>
</tr>
<tr>
<td>Who has 34 plus the number of thumbs on one hand?</td>
<td>I have 35.</td>
</tr>
<tr>
<td>Who has 35 divided by the number of days in a week?</td>
<td>I have 5.</td>
</tr>
<tr>
<td>Who has 5 multiplied by 9?</td>
<td>I have 45.</td>
</tr>
<tr>
<td>Who has 45 minus the sum of its digits?</td>
<td>I have 36.</td>
</tr>
<tr>
<td>Who has 36 divided by the digit in its ones place?</td>
<td>I have 6.</td>
</tr>
<tr>
<td>Who has six plus the number of seconds in a minute?</td>
<td>I have 66.</td>
</tr>
<tr>
<td>Who has a number multiplied by zero?</td>
<td>I have 0.</td>
</tr>
</tbody>
</table>
Activity Correlation

<table>
<thead>
<tr>
<th>Concepts (and diagnostic item numbers)</th>
<th>Activity Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Place value: whole numbers, decimals, powers of ten, expanded form (1, 5)</td>
<td>1, 52, 77, 95, 97, 152</td>
</tr>
<tr>
<td>Rounding whole numbers and decimals (3, 4)</td>
<td>72, 148, 163</td>
</tr>
<tr>
<td>Ordering whole numbers and decimals (14, 15)</td>
<td>20, 31, 157</td>
</tr>
<tr>
<td>Equivalent fractions, decimals, and percents (2, 6, 9, 10, 11, 12, 13)</td>
<td>8, 27, 28, 49, 58, 65, 87, 88, 91, 116, 121, 137, 145, 150, 178</td>
</tr>
<tr>
<td>Fractions, improper fractions, mixed numbers, simplest form (6)</td>
<td>44, 81, 169, 173</td>
</tr>
<tr>
<td>Estimation and number sense (8)</td>
<td>167, 172</td>
</tr>
<tr>
<td>Multiples, common multiples, LCM (16, 17, 18, 19, 23)</td>
<td>1, 11, 37, 45, 96, 101, 106</td>
</tr>
<tr>
<td>Prime, composite, factors, multiples, divisibility (7, 20, 21, 22)</td>
<td>6, 7, 15, 16, 18, 21, 26, 31, 36, 37, 41, 62, 67, 70, 99, 120, 168, 180</td>
</tr>
</tbody>
</table>
Basic Operations
Diagnostic Test #2

Choose the best answer or fill in the blank for each question.
Use each number once to write two different multiplication facts.
1. \(2 \times 9 = 18\)
2. \(5 \times 7 = 35\)
Use each number once to write two different addition facts.
3. \(5 + 8 = 13\)
4. \(7 + 9 = 16\)

Follow the directions and write the answers in the blanks.
Pick any even number between 1 and 10:
5. Then multiply it by 5:
6. Add 20 to that product:
7. Divide that sum by 10:
8. Subtract 2 from that quotient:
9. Double that answer:

Multiply:
10. \(3.45 \times 0.01\)

Divide:
12. \(27 \div 3\)

Activity Correlation

<table>
<thead>
<tr>
<th>Concepts (and diagnostic item numbers)</th>
<th>Activity Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addition and subtraction: whole numbers and decimals (3, 4, 16, 17, 18, 19, 28)</td>
<td>4, 9, 14, 32, 33, 54, 104, 119, 129, 174</td>
</tr>
<tr>
<td>Addition and subtraction: fractions with like and unlike denominators (15, 20, 21, 22, 23, 26, 27)</td>
<td>47, 89, 125, 133, 144, 155, 160, 169</td>
</tr>
<tr>
<td>Multiplication and division: whole numbers and decimals (1, 2, 5, 7, 9, 10, 11, 12, 13)</td>
<td>7, 19, 24, 29, 34, 39, 42, 48, 50, 53, 59, 64, 69, 74, 75, 79, 82, 93, 97, 107, 114, 122, 124, 139, 164</td>
</tr>
<tr>
<td>Multiplication: fractions (24, 25)</td>
<td>122, 139, 159</td>
</tr>
<tr>
<td>Estimation and mental math (14)</td>
<td>13, 19, 24, 25, 29, 33, 39, 53, 59, 62, 68, 78, 100, 118, 147, 148, 163</td>
</tr>
<tr>
<td>Terminology (6, 8)</td>
<td>12</td>
</tr>
<tr>
<td>Solving multi-step problems (5–9)</td>
<td>117, 17</td>
</tr>
</tbody>
</table>

214 Afterschool Achievers: Math Club
Loop each shape that is a quadrilateral.
1.  
   a. parallelogram
   b. rectangle
   c. trapezoid
   d. hexagon

Match. Write the letter of the correct name for each shape.
2.  
3.  
4.  
5.  
6. Loop the rectangular prism.
7. Loop the figure that is not a pyramid.
8. Loop the obtuse isosceles triangle.

Name  

Date

9. The area of this floor is _8_ square yards.
   2 yards 4 yards
   The perimeter of this floor is _12_ yards.
10. The area of this floor is _63_ square feet.
    7 feet 9 feet
    The perimeter of this floor is _22_ feet.

Use the words obtuse, acute, and right to label the angles below.
11.  
12.  
13.  
14. Which line is perpendicular to line AC?
    A  line AE
    B  line OF
    C  line BE
    D  line DC

15. Which point is at (2, 2)? _A_
16. Which point is at (5, 3)? _B_
17. What is the location of point C? _(7, 7)_

Activity Correlation

<table>
<thead>
<tr>
<th>Concepts (and diagnostic item numbers)</th>
<th>Activity Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attributes of two-dimensional figures (1, 2, 3, 4, 5, 8)</td>
<td>3, 22, 23, 35, 43, 63, 83, 102, 103, 110, 115, 127, 128, 138, 140, 146, 153</td>
</tr>
<tr>
<td>Attributes of three-dimensional figures (6, 7)</td>
<td>10, 60</td>
</tr>
<tr>
<td>Area and perimeter (9, 10)</td>
<td>3, 23, 43, 63, 83, 103, 127, 141, 175</td>
</tr>
<tr>
<td>Lines and angles (8, 11, 12, 13, 14)</td>
<td>85, 102, 110, 123, 128, 140</td>
</tr>
<tr>
<td>Coordinate graphing (15, 16, 17)</td>
<td>135, 156, 161, 166, 176</td>
</tr>
</tbody>
</table>

Grade 5
Activity Correlation

<table>
<thead>
<tr>
<th>Concepts (and diagnostic item numbers)</th>
<th>Activity Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement tools (5, 21)</td>
<td>2, 32, 80, 107, 121, 137, 158</td>
</tr>
<tr>
<td>Length (3, 6, 7, 15, 16, 18)</td>
<td>5, 8, 81, 88, 91, 143, 170</td>
</tr>
<tr>
<td>Weight and mass (1, 2, 12)</td>
<td>38, 106</td>
</tr>
<tr>
<td>Capacity (13, 17)</td>
<td>30, 73, 96, 101, 116</td>
</tr>
<tr>
<td>Temperature (4, 14)</td>
<td>55</td>
</tr>
<tr>
<td>Time (8, 9, 19, 20)</td>
<td>98, 105, 108, 130</td>
</tr>
<tr>
<td>Money (10, 11)</td>
<td>84, 94, 109, 112, 113, 134, 148, 154, 179</td>
</tr>
</tbody>
</table>
Continue each pattern. Then write the rule for the pattern.

1. 2020, 2040, 2080, 2100, 2120
   Rule: ____________________________________________________________
   Add 20 each time.

2. 4, 6, 9, 13, 18
   Rule: ____________________________________________________________
   Add one to the numerator and three to the denominator each time.

3. 7, 8, 14, 16, 22, 24, 30
   Rule: ____________________________________________________________
   Subtract 0, 3 each time.

4. Look at the two sets of numbers. Then write the number 18 in the ring where it belongs.
   
   14   28 
   77   35 
   27   41 
   63   45 
   72

5. Look at the two sets of numbers. Then write the number 24 in the ring where it belongs.
   
   14   28 
   35   49 
   42   24 
   68   12

6. Loop the expression that shows the number of legs on d dogs.
   
   axd + a - d

7. Loop the expression that shows the number of yards in 3 feet.
   
   3
   3
   3

Find the value of the expression b + 5.

8. If b = 13, ________
9. If b = 112, ________

10. Complete the table and write the rule.
    Rule: ____________________________________________________________
    Multiply the number in the left column by itself to get the number in the right column.
    
    | a | b |
    |---|---|
    | 2 | 4 |
    | 3 | 9 |
    | 4 | 16 |
    | 5 | 25 |
    | 6 | 36 |
    | 7 | 49 |

11. Complete the table and write the rule.
    Rule: ____________________________________________________________
    Multiply the number in the left column by 7 to get the number in the right column.
    
    | a | b |
    |---|---|
    | 0 | 0 |
    | 2 | 14 |
    | 3 | 21 |
    | 5 | 35 |
    | 8 | 56 |
    | 9 | 63 |

Match. Write the letter of the expression with the same value.

12. a. (7 + 8) x 10
    b. 671 + 394
    c. 5 x 19 x 3
    d. 876 x 0
    e. 75 x 10
    f. 5 x 19 x 3 + 1
    g. 394 x 671

**Activity Correlation**

<table>
<thead>
<tr>
<th>Concepts (and diagnostic item numbers)</th>
<th>Activity Numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divisibility laws, multiples, equivalent fractions (4, 5)</td>
<td>1, 6, 11, 16, 18, 21, 46, 48, 65, 114</td>
</tr>
<tr>
<td>Identify linear and overlapping patterns; write rules (1, 2, 3)</td>
<td>126, 131, 136, 141, 147, 149, 165</td>
</tr>
<tr>
<td>Variables and symbols (8, 9)</td>
<td>17, 40, 57, 92</td>
</tr>
<tr>
<td>Properties, order of operations (12, 13, 14, 15, 16, 17, 18)</td>
<td>7, 90, 162</td>
</tr>
<tr>
<td>Expressions and equations (8, 9)</td>
<td>42, 51, 56, 57, 76, 142</td>
</tr>
<tr>
<td>Ratio, proportion (6, 7)</td>
<td>61, 86, 96, 101, 106, 111, 132, 171</td>
</tr>
<tr>
<td>Relations, functions, dependent and independent variables (10, 11)</td>
<td>151, 171, 176</td>
</tr>
<tr>
<td>Make organized lists (4, 5)</td>
<td>66, 71, 136, 146</td>
</tr>
</tbody>
</table>

Grade 5
Fill in the circle for the best answer.

1. \[4,000,000 + 500,000 + 8000 + 400 + 1 =\]
   \(\text{A}\) 4,058,041
   \(\text{B}\) 45,841
   \(\text{C}\) 45,8041
   \(\text{D}\) 4,508,401

2. Which is not a way to write one tenth?
   \(\text{A}\) .110
   \(\text{B}\) 10%
   \(\text{C}\) 0.1
   \(\text{D}\) 0.10

3. Round 1359 to the nearest hundred.
   \(\text{A}\) 1.39
   \(\text{B}\) 1300
   \(\text{C}\) 1400
   \(\text{D}\) 300

4. Round 52.01 to the nearest tenth.
   \(\text{A}\) 52.01
   \(\text{B}\) 52.02
   \(\text{C}\) 50
   \(\text{D}\) 52.0

5. Which number has a 0 in the thousandths place?
   \(\text{A}\) 1.360
   \(\text{B}\) 6.103
   \(\text{C}\) 3.061
   \(\text{D}\) 0.631

6. Shade in \(\frac{2}{3}\) of this box.

7. Which answer choice shows a list of prime numbers?
   \(\text{A}\) 11, 13, 15
   \(\text{B}\) 1, 2, 5
   \(\text{C}\) 2, 5, 9
   \(\text{D}\) 5, 7, 11

8. The school store just received 5 cases of ballpoint pens. Each case holds 144 pens. Which number is a good estimate of how many pens there are altogether?
   \(\text{A}\) 700
   \(\text{B}\) 500
   \(\text{C}\) 1500
   \(\text{D}\) 1000
Match. Write the correct letter in the blank.

9. _____ \(\frac{1}{2}\)  
   a. \(\frac{21}{10}\)  
10. _____ 0.75  
   b. \(\frac{1}{4}\)  
11. _____ 2.1  
   c. 0.5  
12. _____ \(\frac{25}{100}\)  
   d. \(\frac{3}{4}\)

13. Loop the two fractions that name the same amount.
   \(\frac{2}{5}\)  \(\frac{5}{10}\)  \(\frac{5}{2}\)  \(\frac{10}{4}\)

Write these numbers in order from least to greatest.

14. 0.3  0.03  0.13  0.31  
15. 7.8  0.78  780  0.08  0.7

16. Write the first five multiples of 4 other than 0. 
17. Write the first five multiples of 7 other than 0.
18. What is the least common multiple of 3 and 9?
19. What is the least common multiple of 8 and 6?

\[
\begin{array}{ccccccc}
11 & 12 & 13 & 14 & 15 & 16 & \\
17 & 18 & 19 & 20 & & & \\
\end{array}
\]

20. List the numbers from the box above that are evenly divisible by 4.

21. List the numbers from the box above that are evenly divisible by 3.

22. List the numbers from the box above that are evenly divisible by both 2 and 5.

23. List the numbers from the box above that are composite.
Choose the best answer or fill in the blank for each question.

Use each number once to write two different multiplication facts.

3  4  6  9  18  36
1. _____ × _____ = _____
2. _____ × _____ = _____

Use each number once to write two different addition facts.

6  7  8  9  13  17
3. _____ + _____ = _____
4. _____ + _____ = _____

Follow the directions and write the answers in the blanks.

Pick any odd number between 1 and 10: _____
5. Then multiply it by 5: _____
6. Add 15 to that product: _____
7. Divide that sum by 10: _____
8. Subtract 2 from that quotient: _____
9. Double that answer: _____

Multiply.

10. \[ \begin{array}{c}
\text{514} \\
\times 0.01 \\
\end{array} \]

11. \[ \begin{array}{c}
\text{236} \\
\times 25 \\
\end{array} \]

Divide.

12. \[ \begin{array}{c}
9\overline{174} \\
\end{array} \]

13. \[ \begin{array}{c}
6\overline{361} \\
\end{array} \]
14. Loop the problem that will have the greatest answer.
   \[189 \times 2 \quad 89 \times 3\]
   \[25 \times 10 \quad 897 \times 0\]

15. Loop all the numbers that represent an amount equal to five tenths.
   \[
   \begin{array}{cccccccc}
   \frac{1}{2} & 5\% & 50\% & 0.10 & 0.5 & 0.05 & 0.50 \\
   \frac{3}{6} & \frac{4}{5} & \frac{50}{100} & \frac{5}{10} & 1.5 & 0.2 & \frac{5}{10}\% \\
   \end{array}
   \]

Fill in the circle for the best answer.

16. \(7 + 2.5 =\)
   \[\begin{array}{c}
   \text{A} \quad 3.2 \\
   \text{B} \quad 9.5 \\
   \text{C} \quad 32 \\
   \text{D} \quad 72.5 \\
   \end{array}\]

17. \(32 - 2.75 =\)
   \[\begin{array}{c}
   \text{A} \quad 29.25 \\
   \text{B} \quad 14.5 \\
   \text{C} \quad 30.25 \\
   \text{D} \quad 29.75 \\
   \end{array}\]

18. \(27 + 0.25 =\)
   \[\begin{array}{c}
   \text{A} \quad 27.25 \\
   \text{B} \quad 52 \\
   \text{C} \quad 0.52 \\
   \text{D} \quad 29.5 \\
   \end{array}\]

19. \(0.33 + 0.68 =\)
   \[\begin{array}{c}
   \text{A} \quad 1.01 \\
   \text{B} \quad 1.01 \\
   \text{C} \quad 0.99 \\
   \text{D} \quad 1.00 \\
   \end{array}\]

20. \(\frac{2}{7} + \frac{2}{7} =\)

21. \(\frac{1}{6} + \frac{1}{3} =\)

22. \(\frac{1}{3} + \frac{1}{4} =\)

23. \(\frac{4}{6} + \frac{5}{6} =\)

24. \(\frac{1}{2} \times \frac{1}{5} =\)

25. \(\frac{1}{4} \times 80 =\)

26. \(\frac{2}{3} - \frac{2}{4} =\)

27. \(\frac{9}{8} - \frac{5}{8} =\)

28. Kayla bought a comic book that cost $2.55. She paid with a $5.00 bill. How much change will she get back?
   
   \[\text{_________} \]

Name ____________________________ Date ___________
Loop each shape that is a quadrilateral.

1. 

Match. Write the letter of the correct name for each shape.

2. 
   - a. triangle
3. 
   - b. rectangle
4. 
   - c. trapezoid
5. 
   - d. hexagon

6. Loop the triangular prism.

7. Loop the figure that is *not* a cylinder.

8. Loop the right triangle.
9. The area of this floor is _______ square yards.

4 yards

8 yards

The perimeter of this floor is _______ yards.

10. The area of this floor is _______ square feet.

8 feet

12 feet

The perimeter of this floor is _______ feet.

Use the words obtuse, acute, and right to label the angles below.

11. _______

12. _______

13. _______

14. Which line is perpendicular to line DF?
   A  line AD
   B  line DF
   C  line BE
   D  line DC

15. Which point is at (7, 7)? _______
16. Which point is at (10, 2)? _______
17. What is the location of point A?
   _______
Fill in the circle for the best answer.

1. Which might weigh about 1 gram?
   A  a pen        C  a desk
   B  a pea        D  a car

2. Which might weigh about 1 pound?
   A  a pea        C  a loaf of bread
   B  an apple     D  a gallon of milk

3. Which might be the length of a comb?
   A  18 millimeters  C  18 meters
   B  18 inches      D  18 centimeters

4. Which might be the temperature of a cool fall day?
   A  0° Celsius     C  50° Fahrenheit
   B  50° Celsius    D  32° Fahrenheit

5. Which tool would you use to measure a softball toss?
   A  a meter stick  C  a measuring cup
   B  a thermometer  D  a stopwatch

6. How long is this pencil?

7. Draw a pencil \( 4 \frac{1}{4} \) inches long.
8. If school starts at 7:45 and ends at 2:00, how many hours and minutes does one school day last? _______________

9. If you begin your car trip at the time shown on the first clock, and end the car trip on the same day at the time shown on the second clock, how long did the trip last?

The total cost of a purchase is $3.18, and you pay with a $5.00 bill.

10. How much money should you get back in change? ____________

11. List the coins you would expect to get. ______________

Loop the best answer.

12. inches in a yard  12  36  100
13. milliliters in a liter  10  100  1000
14. hours in a day  10  24  48
15. days in a year  365  440  1000
16. ounces in a pound  4  12  16
17. degrees Fahrenheit water freezes  0  12  32
18. centimeters in a meter  210  100  1000
19. feet in a mile  36  365  5280
20. cups in a quart  2  4  8

21. Write each word from the box in the correct column in the table.

<table>
<thead>
<tr>
<th>thermometer</th>
<th>pounds</th>
<th>centimeters</th>
<th>meters</th>
<th>ounces</th>
<th>hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>minutes</td>
<td>quarts</td>
<td>gallons</td>
<td>Celsius</td>
<td>tons</td>
<td>yards</td>
</tr>
<tr>
<td>degrees</td>
<td>clock</td>
<td>decades</td>
<td>miles</td>
<td>cups</td>
<td>scale</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Capacity</th>
<th>Time</th>
<th>Weight</th>
<th>Length/distance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Name  
Date
Continue each pattern. Then write the rule for the pattern.

1. 1220, 1240, 1260, ________, ________, ________
   Rule: __________________________

2. $\frac{1}{4}$, $\frac{2}{8}$, $\frac{3}{12}$, $\frac{4}{16}$, ________, ________, ________
   Rule: __________________________

3. 6.7, 6.4, 6.1, 5.8, ________, ________, ________
   Rule: __________________________

4. Look at the two sets of numbers. Then write the number 27 in the ring where it belongs.
   
   $\begin{array}{c}
   14 \\
   77 \\
   35 \\
   \end{array}$ $\begin{array}{c}
   28 \\
   28 \\
   28 \\
   \end{array}$ $\begin{array}{c}
   18 \\
   63 \\
   72 \\
   \end{array}$ $\begin{array}{c}
   45 \\
   45 \\
   45 \\
   \end{array}$

5. Look at the two sets of numbers. Then write the number 42 in the ring where it belongs.
   
   $\begin{array}{c}
   15 \\
   35 \\
   25 \\
   \end{array}$ $\begin{array}{c}
   40 \\
   40 \\
   40 \\
   \end{array}$ $\begin{array}{c}
   30 \\
   48 \\
   12 \\
   \end{array}$ $\begin{array}{c}
   6 \\
   6 \\
   6 \\
   \end{array}$

6. Loop the expression that shows the number of legs on $c$ cats.
   $4 \times c$, $4 + c$, $4 - c$, $\frac{4}{c}$

7. Loop the expression that shows the number of feet in $y$ yards.
   $\frac{y}{12}$, $\frac{y}{36}$, $\frac{y}{3}$, $y \times 3$

© Great Source. Permission is granted to copy this page.
Find the value of the expression \( h + 5 \)

8. if \( h = 12. \) ______

9. if \( h = 112. \) ______

10. Complete the table and write the rule.
    Rule: __________________________
    \[
    \begin{array}{|c|c|}
    \hline
    2 & 4 \\
    3 & 6 \\
    4 & 8 \\
    5 & \\
    6 & 14 \\
    \hline
    \end{array}
    \]

11. Complete the table and write the rule.
    Rule: __________________________
    \[
    \begin{array}{|c|c|}
    \hline
    0 & 0 \\
    2 & \\
    3 & 12 \\
    5 & 20 \\
    8 & 36 \\
    \hline
    \end{array}
    \]

Match. Write the letter of the expression with the same value.

12. ____ \( 5 \times 19 \times 3 \times 1 \)  
   a. \( 671 + 394 \)

13. ____ \( 394 + 671 \)  
   b. \( (25 \times 4) \times 7 \)

14. ____ \( 5 \times 19 \times 3 \times 0 \)  
   c. \( 5 \times 19 \times 3 \)

15. ____ \( (7 + 8) \times 10 \)  
   d. \( 876 \times 0 \)

16. ____ \( 671 \times 394 \)  
   e. \( 15 \times 10 \)

17. ____ \( 15 \times 19 + 1 \)  
   f. \( 5 \times 19 \times 3 + 1 \)

18. ____ \( 25 \times (4 \times 7) \)  
   g. \( 394 \times 671 \)
Fill in the circle for the best answer.

1. $4,000,000 + 500,000 + 8000 + 400 + 1 = \boxed{4,580,401}$
   - A. 4,058,041
   - B. 45,841
   - C. 45,8041
   - D. 4,580,401

2. Which is not a way to write one tenth?
   - A. 1.10
   - B. 1.0
   - C. 0.1
   - D. 0.10

3. Round 1259 to the nearest hundred.
   - A. 1.39
   - B. 1300
   - C. 1400
   - D. 300

4. Round 52.01 to the nearest tenth.
   - A. 52.01
   - B. 52.02
   - C. 50
   - D. 52.0

5. Which number has a 0 in the thousandths place?
   - A. 1.360
   - B. 6.103
   - C. 3.061
   - D. 0.631

6. Shade in $\frac{3}{4}$ of the box.

7. Which answer choice shows a list of prime numbers?
   - A. 11, 13, 15
   - B. 1, 2, 3
   - C. 2, 5, 9
   - D. 3, 7, 11

8. The school store just received 5 cases of ballpoint pens. Each case holds 144 pens. Which number is a good estimate of how many pens there are altogether?
   - A. 700
   - B. 500
   - C. 1500
   - D. 1000

Match. Write the correct letter in the blank.

9. $\frac{1}{3} \ldots \boxed{a. \frac{1}{3}}$

10. ___________ 0.75
    - A. $\frac{3}{4}$
    - B. $\frac{3}{4}$
    - C. $\frac{3}{4}$

11. ___________ 2.1
    - A. $\frac{3}{4}$
    - B. $\frac{3}{4}$
    - C. $\frac{3}{4}$

12. ___________ 100
    - A. $\frac{3}{4}$
    - B. $\frac{3}{4}$
    - C. $\frac{3}{4}$

13. Loop the two fractions that name the same amount.

Write these numbers in order from least to greatest.

14. 0.1, 0.03, 0.13, 0.31, 0.03, 0.13, 0.31

15. 7.8, 0.78, 0.78, 0.08, 0.78, 7.8, 7.8, 7.8

16. Write the first five multiples of 4 other than 0.
    - A. 4, 8, 12, 16, 20
    - B. 4, 8, 12, 16, 20
    - C. 4, 8, 12, 16, 20

17. Write the first five multiples of 7 other than 0.
    - A. 7, 14, 21, 28, 35
    - B. 7, 14, 21, 28, 35
    - C. 7, 14, 21, 28, 35

18. What is the least common multiple of 3 and 97? 97

19. What is the least common multiple of 8 and 7? 56

20. List the numbers from the box above that are evenly divisible by 4.
    - A. 12, 16, 20
    - B. 12, 16, 20
    - C. 12, 16, 20

21. List the numbers from the box above that are evenly divisible by 3.
    - A. 12, 15, 18
    - B. 12, 15, 18
    - C. 12, 15, 18

22. List the numbers from the box above that are evenly divisible by both 2 and 3.
    - A. 12, 15, 18
    - B. 12, 15, 18
    - C. 12, 15, 18

23. List the numbers from the box above that are composite.
    - A. 12, 14, 15, 16, 18, 20
    - B. 12, 14, 15, 16, 18, 20
    - C. 12, 14, 15, 16, 18, 20

Afterschool Achievers: Math Club
Basic Operations

Post Test #2

Choose the best answer or fill in the blank for each question.
Use each number once to write two different multiplication facts.

1. 3 x 6 = 18
2. 4 x 9 = 36

Use each number once to write two different addition facts.

3. 6 + 7 = 13
4. 8 + 9 = 17

Follow the directions and write the answers in the blanks.
Pick any odd number between 1 and 10:

5. Then multiply it by 5:
6. Add 15 to that product:
7. Divide that sum by 10:
8. Subtract 2 from that quotient:
9. Double that answer:

Multiply:

10. 8 x 9

11. 2 x 36

12. 2 x 5

Divide:

13. 60 ÷ 10 or 60 ÷ 10

14. Loop the problem that will have the greatest answer:

15. Loop all the numbers that represent an amount equal to five tenths.

16. 7 x 2.5 =

17. 32 - 2.75 =

18. 27 x 0.25 =

19. 0.33 x 0.68 =

20. \( \frac{3}{4} \) + \( \frac{1}{2} \) =

21. \( \frac{1}{3} \) + \( \frac{1}{4} \) =

22. \( \frac{1}{2} \) - \( \frac{1}{3} \) =

23. \( \frac{1}{4} \) - \( \frac{1}{5} \) =

24. \( \frac{1}{2} \) x \( \frac{1}{3} \) =

25. \( \frac{1}{2} \) x \( \frac{1}{4} \) =

26. \( \frac{1}{2} \) + \( \frac{1}{3} \) =

27. \( \frac{1}{2} \) - \( \frac{1}{3} \) =

28. Kayla bought a comic book that cost $2.55. She paid with a $5.00 bill. How much change will she get back?

Name
Date
Loop each shape that is a quadrilateral.

1. 
2. Match. Write the letter of the correct name for each shape.

   a. triangle  
   b. rectangle  
   c. trapezoid  
   d. hexagon  

6. Loop the triangular prism.

7. Loop the figure that is not a cylinder.

8. Loop the right triangle.

9. The area of this floor is \( \frac{32}{6} \) square yards.

10. The area of this floor is \( \frac{96}{6} \) square feet.

4 yards  
8 yards  
The perimeter of this floor is \( 24 \) yards.

8 feet  
12 feet  
The perimeter of this floor is \( 40 \) feet.

Use the words obtuse, acute, and right to label the angles below.

11. obtuse  
12. right  
13. acute

14. Which line is perpendicular to line \( \overline{EF} \)?

   A. line \( \overline{AD} \)  
   B. line \( \overline{DF} \)  
   C. line \( \overline{BE} \)  
   D. line \( \overline{DC} \)

15. Which point is at \( (2, 7) \)?

16. Which point is at \( (10, 2) \)?

17. What is the location of point \( A \)?

\( (2, 3) \)
Measurement
Post Test #4

1. Which might weigh about 1 gram?
   A. a pen  C. a desk  D. a car
   B. a pea

2. Which might weigh about 1 pound?
   A. a pea  B. an apple  C. a loaf of bread  D. a gallon of milk

3. Which might be the length of a comb?
   A. 18 millimeters  B. 18 centimeters  C. 18 meters  D. 18 inches

4. Which might be the temperature of a cool fall day?
   A. 0°C Celsius  B. 50°F Fahrenheit  C. 50°C Celsius  D. 32°F Fahrenheit

5. Which tool would you use to measure a softball toss?
   A. a meter stick  B. a temperature  C. a measuring cup  D. a stopwatch

6. How long is this pencil? __________ inches

7. Draw a pencil  4  1/4 inches long.

8. If school starts at 7:45 and ends at 2:00, how many hours and minutes does one school day last? ________ hr _______ min

9. If you begin your car trip at the time shown on the first clock, and end the car trip on the same day at the time shown on the second clock, how long did the trip last? ________ hr _______ min

The total cost of a purchase is $3.18, and you pay with a $5.00 bill.

10. How much money should you get back in change? ________

11. List the coins you would expect to get. 3 quarters, 1 nickel, 2 pennies

Loop the best answer.

12. inches in a yard ________ 12  36  100
   13. millimeters in a liter ________ 10  100  1000
   14. hours in a day ________ 10  24  48
   15. days in a year ________ 120  360  1000
   16. ounces in a pound ________ 4  12  10
   17. degrees Fahrenheit water freezes ________ 0  12  24
   18. centimeters in a meter ________ 100  120  210
   19. feet in a mile ________ 36  365  1000
   20. cups in a quart ________ 8  2  36

21. Write each word from the box in the correct column in the table.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Capacity</th>
<th>Time</th>
<th>Weight</th>
<th>Length/Distance</th>
</tr>
</thead>
<tbody>
<tr>
<td>thermometer</td>
<td>degrees</td>
<td>months</td>
<td>pounds</td>
<td>centimeters</td>
</tr>
<tr>
<td>degrees</td>
<td>gallons</td>
<td>minutes</td>
<td>inches</td>
<td>meters</td>
</tr>
<tr>
<td>Celsius</td>
<td>cups</td>
<td>decades</td>
<td>tons</td>
<td>miles</td>
</tr>
<tr>
<td>Celsius</td>
<td>hours</td>
<td>scale</td>
<td>yards</td>
<td>scale</td>
</tr>
</tbody>
</table>

Name __________________________ Date ____________
Contour each pattern. Then write the rule for the pattern.

1. 1230, 1240, 1260, 1290
   Rule: __________
   Add 30 each time.

2. $\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}$
   Rule: __________
   Write fractions equal to $\frac{1}{2}$, numerator increasing by 1.

3. 67, 64, 61, 58, 55, 52, 49
   Rule: __________
   Subtract 3 each time.

4. Look at the two sets of numbers. Then write the number 27 in the row where it belongs.
   
<table>
<thead>
<tr>
<th>14</th>
<th>28</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>16</td>
<td>31</td>
</tr>
<tr>
<td>17</td>
<td>32</td>
</tr>
</tbody>
</table>

5. Look at the two sets of numbers. Then write the number 42 in the row where it belongs.
   
<table>
<thead>
<tr>
<th>15</th>
<th>40</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>41</td>
</tr>
<tr>
<td>17</td>
<td>42</td>
</tr>
<tr>
<td>18</td>
<td>43</td>
</tr>
</tbody>
</table>

6. Loop the expression that shows the number of legs on $c$ cats.
   $4 + c$
   $4 = c$
   $c = c$

7. Loop the expression that shows the number of test in $y$ years.
   $\frac{2}{x}$
   $\frac{2}{x}$
   $\frac{2}{x}$

Find the value of the expression $x + y$.

8. If $b = 12$, __________
6. $9 + b = 112$, __________

10. Complete the table and write the rule.
   Rule: Multiply by 2

<table>
<thead>
<tr>
<th>2</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>6</td>
<td>12</td>
</tr>
<tr>
<td>7</td>
<td>14</td>
</tr>
</tbody>
</table>

11. Complete the table and write the rule.
   Rule: Multiply by 4

<table>
<thead>
<tr>
<th>2</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>6</td>
<td>24</td>
</tr>
<tr>
<td>7</td>
<td>28</td>
</tr>
<tr>
<td>8</td>
<td>32</td>
</tr>
<tr>
<td>9</td>
<td>36</td>
</tr>
</tbody>
</table>

Match the index of the expression with the same value.

<table>
<thead>
<tr>
<th>12</th>
<th>$1 \times 15 \times 3 \times 1$</th>
</tr>
</thead>
<tbody>
<tr>
<td>13</td>
<td>$3 + 3 + 5$</td>
</tr>
<tr>
<td>14</td>
<td>$5 \times 19 \times 1 \times 0$</td>
</tr>
<tr>
<td>15</td>
<td>$(7 - 8) \times 10$</td>
</tr>
<tr>
<td>16</td>
<td>$6 \times 6 \times 3$</td>
</tr>
<tr>
<td>17</td>
<td>$15 \times 10 \times 1$</td>
</tr>
<tr>
<td>18</td>
<td>$25 \times (4 \times 7)$</td>
</tr>
<tr>
<td>19</td>
<td>$3 \times 3 \times 3 \times 1$</td>
</tr>
<tr>
<td>20</td>
<td>$9 \times 3 \times 3$</td>
</tr>
</tbody>
</table>

Name __________________________
Date __________________________