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Resources are included for Chapters 7, 8, 10, 13, and 14.

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7.6-1  Fractions on a Number Line ................................................................. CC 2

Chapter 8  Charts and Graphs
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Chapter 10  Length, Area, and Volume
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Think Math! Common Core Resource Guide

This guide is your Think Math! road map for meeting the Common Core State Standards for Mathematics for your grade. It contains teaching resources that extend existing Think Math! chapters, deepening the program’s coverage of Common Core concepts and skills.

Think Math! and the Common Core State Standards

Think Math! is a comprehensive K–5 core curriculum created by Education Development Center (EDC) that builds strong computational skills, engages students and teachers in understanding mathematics, and prepares all learners to use mathematics to make sense of the world.

The Common Core State Standards for Mathematics provide clear statements of purpose, set high expectations for students, and emphasize mathematical habits of mind. This focus on mathematical ways of thinking fits EDC’s research-based approach to mathematics education. Members of EDC’s Science and Mathematics Programs staff craft their curriculum and professional development work accordingly, while establishing connections between topics and promoting multiple approaches to topics.

The authors of Think Math!, along with other EDC staff, provided commentary during the development of the Common Core State Standards and continue to be involved in identifying and addressing issues of curriculum design to support improved teaching and learning across the country.

Common Core Standards for Mathematical Content

Think Math! balances skill practice with developing conceptual understanding in the five Common Core domains:

• Operations and Algebraic Thinking
• Number and Operations in Base Ten
• Number and Operations—Fractions
• Measurement and Data
• Geometry

Common Core Standards for Mathematical Practice

Think Math! emphasizes problem solving and reasoning, supporting the Common Core practices:

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.
Using This Guide

Whenever you begin a new chapter in *Think Math!*, turn to the table of contents of this Common Core Resource Guide to see if additional teaching resources have been provided for that chapter. As necessary, familiarize yourself with those pages as you plan your lessons.

Teaching Resources pages in this guide always begin with a Lesson Planner page. This page includes Lesson Notes that tell you exactly how to use the Common Core teaching resource with your *Think Math!* teacher guide.

Two types of teaching resources are provided:

- **Extended lessons** include either an added or an extended Teach and Practice Activity and may include Activity and/or Explore masters.

- **Added lessons** contain all the features of existing *Think Math!* lessons, including student pages.

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### Extended Lesson — Lesson Planner Page

#### Chapter 8 • Lesson 13

**Comparing Lengths and Measuring Our Shoes**

#### Lesson Planner

- **STUDENT OBJECTIVES**
  - To describe several measurable attributes of a single object

- **MATERIALS**
  - Flip Chart p. 52

#### Lesson Notes

- **About the Activity**
  - This is the current Whole Class Math Activity, “Comparing Rectangles,” in Lesson 8.13 and the extended activity.

#### Teach and Practice Activities

- **Extended Activity**
  - Replace the current Whole Class Math Activity “Comparing Rectangles” in Lesson 8.13 with this extended activity.

### Added Lesson — Lesson Planner Page

#### Chapter 1 • Lesson 13

**Ten and Some Ones**

#### Lesson Planner

- **STUDENT OBJECTIVES**
  - To know the names and values of numbers 11 to 19
  - To understand and write numbers 11 to 19 as ten and some ones.

#### Lesson Notes

- **About the Lesson**
  - In this lesson, children will recognize, name, and write numbers 11 to 19. Children should be comfortable recognizing, naming, and writing numbers 1 to 10 before learning numbers 11 to 19.

- **About the Mathematics**
  - Ten is an important benchmark in our number system. By thinking of the numbers 11 to 19 as ten and some ones, children are introduced to the place-value structure of our base-ten number system.

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Overview

Common Core Resource Guide
Use the following Teaching Resources pages in conjunction with your Think Math! teacher guide. Be sure to refer to the Lesson Planner page at the start of each resource for important information about how and when to use it.
Lesson Notes

Lesson 7.6-1 has been added. Use Lesson 7.6-1 after Lesson 7.6. Alternatively, you might introduce this lesson and use Activities A and B after Lesson 7.1, and Activity C after Lesson 7.3.

About the Lesson
In previous lessons, students have been thinking about a fraction as a part of a whole. This lesson presents another way to think about a fraction—as a number on a number line. For example, \( \frac{1}{2} \) is a number halfway between 0 and 1.

Students will see that, when talking about fractions as numbers, equivalent fractions are at the same location on the number line.

About the Mathematics
The number line includes positive and negative numbers, whole numbers, fractions, and decimals. Because the number line extends beyond the numbers we choose to label it, the line is intentionally extended past the first and last number labeled on the line.

Number lines appear in many areas of mathematics and in everyday life. Rulers, thermometers, measuring cups, and clocks are all examples of number lines.
Developing Mathematical Language

Vocabulary: *fraction, number line*

A *number line* is a line that shows numbers as points on a line. A *number line* is usually horizontal with smaller numbers to the left and greater numbers to the right.

**ELL**

Review the term *number line* with students.

**Beginning** Draw a *number line* on the board, label it with whole numbers from 0 to 10 and write the term *number line*. Have students identify the line and the numbers that make up the *number line*.

**Intermediate** On the board draw a *number line* and draw tick marks at intervals of 1, starting at 0. Label the 0 and have volunteers come to the board to label the remaining tick marks with the numbers 1 to 9.

**Advanced** Draw a *number line* on the board. Have students draw tick marks at intervals of 1 and label the tick marks from 0 to 10.

---

**Daily Activities**

**Open-Ended Problem Solving**

Write the following story on the board. If students have difficulty getting started, suggest that they draw pictures or use objects.

### Headline Story

Some children shared 12 stickers equally. What fraction of the total number of stickers might each child get? How many stickers would that be?

Possible responses:

If 2 children shared the stickers, they would each get $\frac{1}{2}$ of the stickers, or 6 stickers. If 6 children shared the stickers, they would each get $\frac{1}{6}$ of the stickers, or 2 stickers.

---

**Skills Practice and Review**

### Comparing to $\frac{1}{2}$

Write three headings on the board as shown below. Ask volunteers to think of fractions and write them in the appropriate categories. If one category is underrepresented, you may want to specify the type of fraction you would like.
Connecting Pieces of a Fraction Bar to Number Line Locations

Purpose  To represent fractions as locations on a number line

Introduce  Draw a fraction bar on the board and draw the same bar cut into 2 equal pieces. Ask a volunteer to label each piece of the bar with a fraction.

Tell students that fractions can also be thought of as numbers on a number line.

Task  Draw a number line on the board directly underneath the fraction bars. Remind students that a number line shows numbers as points on a line. Tell students that you will use tick marks instead of points to locate the numbers. Draw tick marks and label them 0 and 1. Then draw another tick mark at \( \frac{1}{2} \).

Talk Math

- Are there numbers between 0 and 1? What kinds of numbers?
  Possible answers: Yes; fractions and decimals
- Point to the tick mark at \( \frac{1}{2} \). What fraction should I write to label this point?
  How do you know? Possible answer: \( \frac{1}{2} \). It is halfway between 0 and 1.
  Point out that you divided the number line from 0 to 1 into 2 equal parts.
  If you count off one of the parts, the fraction you get to is \( \frac{1}{2} \).

Now sketch the following number line. Tell students you are going to divide the line between 0 and 1 into 3 equal parts. Label the line as students answer the following questions.

Talk Math

- Point to the tick mark at \( \frac{1}{3} \). What fraction is shown at this point? \( \frac{1}{3} \)
- Point to the tick mark at \( \frac{2}{3} \). What fraction is shown at this point? \( \frac{2}{3} \)
- Point to the tick mark at 1. What fraction is shown at this point? \( \frac{3}{3} \)

Practice  Draw another number line and partition it into eighths. With the class, count the number of parts the line is divided into. Ask volunteers to come to the board and locate \( \frac{1}{8} \), \( \frac{3}{8} \), \( \frac{4}{8} \), and \( \frac{7}{8} \) on the line.
Fractions on a Number Line

LAB Masters, CCRG, pp. CC 8–CC 9

Purpose To recognize fractions as numbers on a line

Write the missing numbers.

1. [ ] 2. [ ] 3. [ ] 4. [ ] 5. [ ]

Write the fractions for the shaded shapes. The denominators should show the total number of pieces.

6. [ ] 7. [ ] 8. [ ]

9. [ ] 10. [ ] 11. [ ]

Write the fractions from Problems 6–11 at their locations on the number line.

12. [ ] 13. [ ]

Challenge Problem In this problem, students must draw the tick marks themselves to locate the given fractions. They should recognize that $\frac{1}{3}$ is equivalent to $\frac{2}{6}$.

Teaching Notes for LAB Master, CCRG p. CC 8

On this page, students label points on a number line between 0 and 1. They should start by identifying the total number of equal parts the number line has been divided into.

Ongoing Assessment Help children who are having difficulty writing a fraction by asking them to identify how many parts the line has been divided into to find the denominator. Then, have them identify how many tick marks over from 0 the number is to find the numerator.

Teaching Notes for LAB Master, CCRG p. CC 9

Students connect a fraction as part of a whole to a fraction on a number line.

Challenge Problem In this problem, students must draw the tick marks themselves to locate the given fractions. They should recognize that $\frac{1}{3}$ is equivalent to $\frac{2}{6}$.

Reflect and Summarize the Lesson

Write the fractions that are shown at the tick marks on the number line. Explain how you decided.

Possible answer: The line from 0 to 1 is divided into 6 equal parts so the denominator of each fraction must be 6.
**Fraction Match**

**Purpose** To match fractions with their locations on a number line

**Introduce** Tell children that they will work with a partner to locate fractions on number lines. Give each pair a copy of Activity Master: Fractions on a Number Line and cards cut from Activity Master: Fraction Cards. Go through the instructions for the page with the class.

**Task** Match each fraction card with a location on a number line. Each pair places cards face down in a pile. One partner selects a card. Pairs work to determine which number line shows that kind of fraction. The other partner writes the fraction to show its location on the appropriate number line.

When pairs have located each fraction on the number lines, bring the class together and discuss the following.

**Talk Math**

1. Look at your number lines. What fractions are equivalent to $\frac{1}{2}$?
   - $\frac{2}{4}$, $\frac{3}{6}$, and $\frac{4}{8}$

2. What fractions are equivalent to $\frac{1}{3}$? To $\frac{2}{3}$? To $\frac{3}{6}$? $\frac{4}{6}$?

3. Can you find other fractions that are equivalent? Possible answers: $\frac{1}{4}$ is equivalent to $\frac{2}{8}$; $\frac{3}{6}$ is equivalent to $\frac{6}{8}$

**Extend** Discuss the relative size of the fractions. Students should recognize that, for example, $\frac{5}{8}$ is between $\frac{1}{2}$ and 1 and that $\frac{7}{8}$ is greater than $\frac{1}{2}$. They should also be able to identify fractions that are close to 0, close to $\frac{1}{2}$, or close to 1.
### Leveled Problem Solving

**Lee is thinking of a number between 0 and 1.**

**Basic Level**
- Her number is to the left of \(\frac{1}{2}\) on the number line. Lee could be thinking of a fraction. She could be thinking of \(\frac{1}{4}\) or \(\frac{1}{3}\). She could also be thinking of \(\frac{1}{6}\) or \(\frac{1}{8}\).

**On Level**
- Her number is equivalent to \(\frac{1}{2}\). Lee could be thinking of \(\frac{2}{4}\). She could also be thinking of \(\frac{3}{6}\) or \(\frac{4}{8}\).

**Above Level**
- Her number is between \(\frac{1}{2}\) and \(\frac{7}{8}\) on the number line. Lee could be thinking of \(\frac{2}{3}\) or \(\frac{3}{4}\). She could be thinking of \(\frac{5}{6}\) or \(\frac{6}{8}\). There are many other numbers Lee could be thinking of.

---

### Practice Master, CCRG p. CC 10

**Fractions on a Number Line**

Write the missing numbers.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

**Test Prep**

5. Point A is shown on the number line below.

Which fraction best names Point A on the number line?

- A. \(\frac{1}{2}\)
- B. \(\frac{2}{3}\)
- C. \(\frac{3}{4}\)
- D. \(\frac{5}{6}\)

---

### Extension Master, CCRG p. CC 11

**Fractions on a Number Line**

For each problem, shade the figure to show a fraction. Then draw a number line model to show the fraction.

1.  

2.  

3.  

4.  

Shadings and number lines will vary.

---

### Intervention Activity

**Number Line Labels**

On the board, draw a number line from 0 to 1 showing fourths. Ask students to talk you through the steps they would take to label the number line with fractions. Write these steps on the board. Have students copy the steps onto index cards. Then draw a number line showing sixths. Discuss whether the same steps can be used to label this line.

---

### Extension Activity

**Comparing Fractions**

Challenge pairs of students to give examples of each of the following:

- When two fractions have the same numerator, the fraction with the smaller denominator is larger.
- When two fractions have the same denominator, the fraction with the larger numerator is larger.

After students have provided examples for each statement, have them explain their thinking.
NOTE: Your child is learning to solve story problems involving comparisons. Play a game where you and your child guess numbers from clues, such as, "My number is 18 more than 53."

CC 8 Common Core Resource Guide
Write the fractions for the shaded shapes. The denominators should show the total number of pieces.

6. \[ \frac{1}{4} \]
7. \[ \frac{2}{6} \]
8. \[ \frac{5}{6} \]
9. \[ \frac{2}{6} \]
10. \[ \frac{3}{6} \]
11. \[ \frac{5}{6} \]

Write the fractions from Problems 6–11 at their locations on the number line.

12. 

Challenge

13. Show each number’s location on the number line.

\[ \frac{1}{3}, \frac{1}{4}, \frac{2}{6}, \frac{2}{3}, \frac{5}{6} \]
Fractions on a Number Line

Write the missing numbers.

1. 

2. 

3. 

4. 

Test Prep

5. Point A is shown on the number line below.

Which fraction best names Point A on the number line?

A. \( \frac{1}{4} \)  
B. \( \frac{3}{4} \)  
C. \( \frac{2}{3} \)  
D. \( \frac{2}{2} \)
Fractions on a Number Line

For each problem, shade the figure to show a fraction. Then draw a number line model to show the fraction.

1.

2.

3.

4.
<table>
<thead>
<tr>
<th>Fraction Cards</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/3</td>
</tr>
<tr>
<td>1/8</td>
</tr>
<tr>
<td>1/6</td>
</tr>
<tr>
<td>1/4</td>
</tr>
<tr>
<td>1/3</td>
</tr>
<tr>
<td>1/2</td>
</tr>
</tbody>
</table>
Fractions on a Number Line

© School Specialty

Common Core Resource Guide  CC 13
Lesson Planner

STUDENT OBJECTIVES
- To use the information presented on a scaled bar graph to solve problems
- To solve one- and two-step “how many more” and “how many less” problems

Teach and Practice

A. Comparing Pictographs (TG pp. 612–613)
B. Making Bar Graphs (CCRG pp. CC 15–CC 16)
C. Interpreting Bar Graphs (TG p. 616)

MATERIALS
- TR: Activity Master, AM84
- transparency of AM84 (optional)
- SH p. 122

Lesson Notes
Replace the current Teach and Practice Activity B in Lesson 8.3 with this extended activity.

About the Lesson
In Activity B, students make a bar graph from survey data and use the information from the graph to solve one- and two-step word problems.
Making Bar Graphs

Purpose: To make a bar graph.

Introduce: Point out that creating a pictograph for a large amount of data involves drawing many pictures or performing many calculations. Also, a value needs to be selected for a symbol, and each amount needs to be rounded to the nearest multiple of that value. Explain that there is another kind of graph which avoids these difficulties: the bar graph.

Task: Have students make a bar graph using the survey data from Explore: Different Pictographs, Same Data. Display (or sketch on the board) Activity Master 84: Bar Graph. Write the five food choices from the Explore along the horizontal axis. Ask students to write the five choices below the horizontal axis on their own copy of Activity Master 84.

Explain that you need to choose a scale for the vertical axis—in other words, you need to decide how much each space should be worth. Tell students you need to show values up to 72, so it might be best to make each space worth 10. Then show students how to label the vertical axis by beginning at the bottom with 0 and writing multiples of 10 up the side.

Now students are ready to draw the bars representing the responses in each category. Since 33 students chose hamburger or cheeseburger as their favorite lunch, this bar should have a height of 33. Ask a student to show where that would be on your graph (between 30 and 40, but closer to 30).

Have students draw the bar on their graphs. If they seem ready, have them complete their graphs on their own or with a partner. Otherwise, you may want to draw more bars together as a class.
Share  When the graphs are complete, ask students to compare the process of making a bar graph with making a pictograph. Ask them to share what was easier and what was more difficult. Students may respond that it was more fun to draw pictures than to shade a bar. They may have found the computation easier on the bar graph and say something such as, “You just have to find the height on the scale, like on a number line. There’s no rounding and there’s no division.”

Talk Math  Present some problems to students that involve reading the bar graph such as:

1. How many more students chose pizza and chicken tenders than chose macaroni and cheese?
   
   \[
   72 + 66 = 138
   \]
   \[
   138 - 48 = 90 \text{ more students}
   \]

2. How many fewer students chose a tuna sandwich than chose a hamburger?
   
   \[
   33 - 24 = 9 \text{ fewer students}
   \]
Lesson Planner

STUDENT OBJECTIVE

• To make a line plot of measurement data

Teach and Practice

MATERIALS

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Investigating Heights (TG p. 756)</td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Measuring Standing and Seated Heights (TG pp. 757–758)</td>
<td>TR: Activity Master, AM105</td>
</tr>
<tr>
<td>C</td>
<td>Changing Measurements (TG p. 759)</td>
<td>grid paper</td>
</tr>
<tr>
<td>D</td>
<td>Making a Line Plot (CCRG p. CC 19)</td>
<td></td>
</tr>
</tbody>
</table>

Lesson Notes

Activity D has been added to Lesson 10.2. Use Activity D after students complete Activity B and Activity C.

About the Activity

In Activity D, students are introduced to line plots, and use the data collected about their standing and seated heights to draw a line plot. This lays the foundation for students’ study of bar graphs in Lesson 10.3.
### Making a Line Plot

**Purpose** To make a line plot of students’ standing heights

**Introduce** Explain to students that a line plot is a number line that shows how a set of measurement data is grouped. Ask students to share their seated heights that they recorded on Activity Master 105, and write them on the board. Draw a number line that includes all of the measurements, starting with the least number and ending with the greatest number. Draw an X above each number on the number line that represents a student’s seated height. You may want to cross students’ seated heights off the list on the board as you add Xs to the line plot. Title the line plot *Our Class’s Seated Heights (in inches)*, as shown below.

#### Talk Math

- **What information does this line plot help to show?** Possible answers:
  - The most common seated height. The least common seated height. The greatest height measured. The least seated height measured.
- **Why is it helpful to draw Xs on a line plot that are the same size?** If the Xs are the same size, you can quickly tell which measurements are most common or least common.

**Task** Have students make a line plot that shows the class’s standing heights.

Ask students to share their standing heights from Activity Master 105 and record them on the board. Give each student a sheet of grid paper.

#### Talk Math

Discuss making a line plot with the class to guide students through the process.

- **What is the first step?** The first step is drawing a number line that includes the number of inches that is the least measurement and the greatest measurement and includes all of the numbers in between.
- **Where do you draw Xs?** I draw Xs above the numbers on the number line that are in the list of standing heights.
- **What is the title of this line plot?** *Our Class’s Standing Heights (in inches)*
- **What is the most common standing height in our class? What is the least common standing height in our class?** Answers will vary depending on the class’s measurements.
Measuring Mass in Grams and Kilograms

In previous lessons, students have explored weight in ounces, pounds, and tons. This lesson focuses on using the metric units of grams and kilograms to measure mass.

Students learn benchmarks for these units and recognize that a kilogram is a lot heavier than a gram. They learn that 1 kilogram is equal to 1,000 grams.

Mass and weight are often used interchangeably. Although there is a distinction between weight and mass, that distinction may not be easy for students to understand. Mass is a measure of how much matter an object contains. Weight is a measure of the force of gravity acting on an object. An object takes its mass with it wherever it goes. An object’s weight, however, depends on where an object is—its altitude above the earth, or what planet it is on.
Developing Mathematical Language

**Vocabulary:** mass, gram, kilogram

Ounces, pounds, and tons are U.S. customary measures of weight. The metric units of grams and kilograms are measures of mass. (See About the Mathematics for a discussion of the difference between mass and weight.)

**ELL**

Familiarize students with the terms gram and kilogram. Help children understand that kilograms are heavier than grams.

**Beginning** On the board, write the terms gram and kilogram relative to their sizes. Write gram in small letters and kilogram in large letters. Say the words and have students repeat them after you in an appropriate volume to reflect the relative sizes of the units.

**Intermediate** Write gram and kilogram on the board. Choose objects in the classroom and tells them, for example, that a paperclip has a mass of about 1 gram and that a book has a mass of about 1 kilogram.

**Advanced** Display different objects and ask students to decide on the unit, gram or kilogram, they would use to measure the object.

---

**1 Daily Activities**

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**Open-Ended Problem Solving**

Read the Headline Story to the students. Encourage them to think of interesting ways to complete the sentences.

**Headline Story**

Nina has a pet ________. Her pet weighs ________.
José has a pet ________. His pet weighs ________.

Possible responses: Nina has a pet dog. Her pet weighs 25 pounds. José has a pet cat. His pet weighs 15 pounds.

---

**Skills Practice and Review**

**Setting the Clock**

Continue to have students practice telling time and using time intervals as in Lessons 13.4 and 13.5. For example, you might set the demonstration clock to 9:30 and ask students to read the time. Then ask, “What time is 1 hour and 15 minutes later?” When students answer, move the hands of your clock through the time interval so they can check. Repeat with different starting times such as 8:15 and 10:45 and using different time intervals.
A Weight Versus Mass

Purpose  To distinguish between weight and mass

Introduce  Tell students that an average size golden retriever would only weigh about 10 pounds on the moon. Say that they are going to learn why.

Task  Ask students if they have seen pictures or videos of astronauts walking on the moon. Discuss what students may have noticed, for example, how the astronauts seemed to bounce around. Guide students to suggest that the astronauts might weigh less on the moon than on Earth. Point out that the astronauts are still made of the same stuff on the moon as on Earth—they still have the same mass. An object’s weight depends on the force exerted on it by gravity. The moon is much smaller than Earth and has only about one sixth of Earth’s gravitational pull. So on the moon, an object weighs only one sixth of its weight on Earth. A golden retriever that weighs about 60 pounds on Earth will weigh about 10 pounds on the moon. The dog has the same mass in both places but the weights are different. Mass, which is the amount of stuff that makes up an object, stays the same, no matter where it is.

Talk Math

1. Suppose a person weighs 120 pounds on Earth. How much would that person weigh on the moon? about 20 pounds

2. Would that person’s mass be any different on the moon? Explain.
   Possible answer: No; The person would still be made up of the same stuff on the moon as on Earth.
Introducing Grams and Kilograms

Purpose To introduce two metric units of mass.

Introduce Show students a large paper clip and explain that it has a mass of about 1 gram. Display a book and explain that it has a mass of about 1 kilogram. Write the units of mass on the board along with their abbreviations. Tell students that there are 1,000 grams in 1 kilogram.

Task Have students form small groups. Distribute a copy of Activity Master: Gram and Kilogram Hunt to each student. Pass a paper clip around in each group so that students can develop a benchmark value for 1 gram and then pass out an object in your room that has a mass of about 1 kilogram, such as a book.

Have students hold each of the objects and estimate its mass. Ask students to record their estimates on Activity Master: Gram and Kilogram Hunt. Then, have students measure the mass of each object with a pan balance and weights. Students can use paper clips and books in place of weights. If you do not have a pan balance, have students measure the objects by holding a paper clip or a book in one hand and the object in the other hand, determining how many paper clips or books are equal in mass to the object. Have students record the weight of each object on the Activity Master.

Talk Math

How did you decide on your estimate? Possible answers: I held a paper clip in one hand and the object in my other hand; I held a book in one hand and the object in the other hand.

Can two objects that are the same size have a different mass? Explain. Possible answer: Yes. It depends on what they’re made of. A balloon and a ball could be the same size but the ball would have a greater mass.

Ongoing Assessment

Observe children as they complete Activity Master: Gram and Kilogram Hunt.

- Do they understand that a heavier object is measured in kilograms and a lighter object is measured in grams?
- Do they choose appropriate objects to measure with each unit?
Reflect and Summarize the Lesson

How do you decide whether to measure an object using grams or kilograms?

Possible answer: If the object is lighter than a book, I would use grams. If it is heavier than a book, I would use kilograms.
**Leveled Problem Solving**

Meg's baby brother has a mass of 4 kilograms.

1. **Basic Level**
   Her kitten has a mass of 520 grams. Who has the greater mass? Meg's baby brother; 1 kilogram is 1,000 grams so 4 kilograms is a lot more than 520 grams.

2. **On Level**
   Her cat has a mass of 4,250 grams. Who has the greater mass? Meg's cat; 4 kilograms is 4,000 grams. 4,250 is greater than 4,000.

3. **Above Level**
   Her puppy has a mass of 3,870 grams. Whose mass is greater? How much greater? Meg's baby brother's mass is 130 grams more; 4 kilograms is 4,000 grams; 4,000 is greater than 3,870; 4,000 – 3,870 = 130.

---

**Practice Master, CCRG p. CC 28**

**Measuring Mass in Grams and Kilograms**

Which is the better estimate?

- Dog: 5 kg or 5 kg
- Magazine: 80 g or 80 kg
- Refrigerator: 160 g or 160 kg
- Leaf: 5 g or 1 kg
- Nickel: 5 g or 5 kg

Test Prep:

- Which unit can Maya use to measure how much her backpack weighs?
  - A. gallon
  - B. gram
  - C. pound
  - D. ounces

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**Extension Master, CCRG p. CC 29**

**Measuring Mass in Grams and Kilograms**

There are 1,000 grams in 1 kilogram.

- There are 3,000 grams in 3 kilograms.
- There are 5 kilograms in 5,000 grams.
- 5,300 grams plus 700 grams equals ____ kilograms.
- 6,000 grams minus 2 kilograms equals ____ kilograms.

Is the mass reasonable? Circle yes or no. If you circle no, give a reasonable mass.

Answers will vary

- 100 kilograms
  - Yes or no
  - Reasonable mass
  - 1 kilogram
  - Yes or no
  - Reasonable mass
  - 1 gram

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**Intervention Activity**

**How Heavy?**

On the board, make three columns labeled *Less Than 1 Kilogram*, *About 1 Kilogram*, and *More than 1 Kilogram*. Ask students to name objects in the classroom that correspond to each category. Write the name of the object in the appropriate column. If you have a pan balance, have students check that the objects are classified correctly by comparing the object to a 1-kilogram mass.

**Extension Activity**

**Kilograms to Grams**

Have students work in teams. Point out that to convert from a larger unit to a smaller unit, you multiply, and to convert from a smaller unit to a larger unit, you divide. Remind students that there are 1,000 grams in 1 kilogram. Write a number on the board and have students convert that many kilograms to grams. The first student who makes the conversion correctly wins a point for his or her team. Play until one team wins 5 points.
Draw a line to match each object with its mass.

1. 1 bicycle 100 grams
   ![Bicycle]

2. 1 dollar bill 100 grams
   ![Dollar Bill]

3. 1 elephant 400 grams
   ![Elephant]

4. 1 bag of oranges 4 kilograms
   ![Bag of Oranges]

5. 1 knitted hat 12 kilograms
   ![Knitted Hat]

6. 1 lion 180 kilograms
   ![Lion]

7. 1 football 4,000 kilograms
   ![Football]
What is missing? Complete the table.

<table>
<thead>
<tr>
<th>Object</th>
<th>More than or less than 1 gram?</th>
<th>More than or less than 1 kilogram?</th>
</tr>
</thead>
<tbody>
<tr>
<td>chicken</td>
<td>more than</td>
<td></td>
</tr>
<tr>
<td>stamp</td>
<td></td>
<td></td>
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<tr>
<td>Crayon</td>
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<tr>
<td><strong>Drawings may vary. One possible answer is a mitten.</strong></td>
<td>more than</td>
<td>less than</td>
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<tr>
<td><strong>Drawings may vary. One possible answer is a desk.</strong></td>
<td>more than</td>
<td>more than</td>
</tr>
<tr>
<td><strong>Drawings may vary. One possible answer is a cotton ball.</strong></td>
<td>less than</td>
<td>less than</td>
</tr>
</tbody>
</table>

**Problem Solving** The mass of Adam’s cat is 5 kilograms. Lara’s cat is 3 kilograms more than Adam’s. What is the mass of Lara’s cat? Tell how you know.
Measuring Mass in Grams and Kilograms

Which is the better estimate?

1. dog
   - 5 g or 5 kg

2. mittens
   - 80 g or 80 kg

3. magazine
   - 160 g or 160 kg

4. truck
   - 2,000 g or 2,000 kg

5. refrigerator
   - 110 g or 110 kg

6. bird
   - 50 g or 50 kg

7. leaf
   - 1 g or 1 kg

8. nickel
   - 5 g or 5 kg

Test Prep

9. Which unit can Maya use to measure how much her backpack weighs?
   A. gallon
   B. gram
   C. pound
   D. ounce

10. The clock below shows Avi’s bedtime. His younger sister’s bedtime is 45 minutes earlier. What is his sister’s bedtime?
    A. 8:45
    B. 8:00
    C. 7:45
    D. 7:15
Measuring Mass in Grams and Kilograms

There are 1,000 grams in 1 kilogram.

1. There are _______ grams in 3 kilograms.

2. There are ______ kilograms in 5,000 grams.

3. 5,300 grams plus 700 grams equals ______ kilograms.

4. 6,000 grams minus 2 kilograms equals ______ kilograms.

5. Is the mass reasonable? Circle yes or no.
   If you circle no, give a reasonable mass.

   - 400 kilograms
     yes or no
     Reasonable mass _______

   - 1 kilogram
     yes or no
     Reasonable mass _______

   - 10 grams
     yes or no
     Reasonable mass _______

   - 150 grams
     yes or no
     Reasonable mass _______
## Gram Hunt

<table>
<thead>
<tr>
<th>Object</th>
<th>Estimated Weight (g)</th>
<th>Actual Weight (g)</th>
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</thead>
<tbody>
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</table>

## Kilogram Hunt

<table>
<thead>
<tr>
<th>Object</th>
<th>Estimated Weight (kg)</th>
<th>Actual Weight (kg)</th>
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</table>
Teacher's Notes

Daily Notes . . .

More Ideas

Quick Notes
## Lesson Planner

<table>
<thead>
<tr>
<th>2 Teach and Practice</th>
<th>MATERIALS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A</strong> Measuring with Cups, Pints, Quarts, and Gallons (TG pp. 1018–1019)</td>
<td>• a 1-liter container</td>
</tr>
<tr>
<td><strong>B</strong> Measuring with Liters (CCRG p. CC 33)</td>
<td>• a 1-quart container</td>
</tr>
<tr>
<td><strong>C</strong> Comparing Capacities (TG p. 1020)</td>
<td>• water</td>
</tr>
<tr>
<td><strong>D</strong> Measuring Capacity (TG p. 1021)</td>
<td>• 3–6 containers of different sizes</td>
</tr>
</tbody>
</table>

### Student Objective
- To estimate and measure liquid volume in liters

### Materials
- a 1-liter container
- a 1-quart container
- water
- 3–6 containers of different sizes

### Lesson Notes

Activity A-1 has been added to Lesson 13.6. Use Activity A-1 after Activity A and before Activity B.

### About the Activity

In Activity A-1, students are introduced to the liter. Then, students estimate and measure liquid volumes in liters.
Purpose  To estimate and measure liquid volumes in liters

Introduce  Discuss the term liter with students. If students are familiar with the term, ask them to describe where they have seen or heard it. Some students may have seen the term on a soda-bottle label, while others might have heard it in science class.

Show students a 1-liter bottle, and explain that 1 liter of water fills this bottle. Show students a 1-quart container. Tell them that 1 quart of water fills this container. Fill the quart container with water and pour it into the 1-liter bottle.

Talk Math

Does the water from the 1-quart container fill the 1-liter bottle? Explain. Possible answer: Almost. It comes very close to the top of the 1-liter bottle.

What unit of measure is almost the same as a liter? A quart

Task  Students will estimate and measure liquid volumes in liters. Fill the 1-liter bottle with water and ask students to think about the amount of water in the 1-liter bottle. Show students 3 to 6 containers of different sizes such as a fishbowl, a pail, and a coffee mug. Ask students to estimate how many liters of water you need to fill each container. Sort the containers into the following groups based on students’ estimates: more than 1 liter, less than 1 liter, and about 1 liter. Pour water into each container to check students’ estimates. You may want to perform this part of the activity yourself or choose a student to assist you.

Talk Math

How can you tell how many liters fill each container? You can count the number of times you pour all of the water out of the 1-liter bottle and into the container.
Lesson Planner

STUDENT OBJECTIVES:

- To solve two-step word problems using the four operations
- To represent these problems using equations with a letter standing for the unknown quantity

Teach and Practice

<table>
<thead>
<tr>
<th>MATERIALS</th>
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<tbody>
<tr>
<td>Exploring Situations (TG p. 1100–1101)</td>
</tr>
<tr>
<td>Addition and Subtraction Situations (TG p. 1102)</td>
</tr>
<tr>
<td>Playing a Game: Least to Greatest (TG p. 1103–1104)</td>
</tr>
</tbody>
</table>

Activity D has been added to Lesson 14.6. Use Activity D after students have completed Activity C. Alternatively, you can use Activity D before students complete the LAB pages, so that they have an opportunity to use this strategy to solve the problems.

About the Activity

Activity D has students solve a two-step word problem by writing an equation with a letter standing for the unknown quantity. Students have seen letters used to represent numbers in Lesson 6.2.
**2 Teach and Practice**

**Writing Equations With Letters for the Unknown Quantity**

**Purpose** To write equations with a letter standing for an unknown quantity when solving two-step word problems.

**Introduce** Write the following word problem on the board:

Casey has 153 football cards and 238 baseball cards. He gives 78 of his cards to Sam. How many cards does Casey have now?

**Task** Discuss with students the first step in solving this problem. Students should say that the first step is to find the total number of cards that Casey has. Write a sentence on the board that shows how to find the total number of cards, such as the one below.

- Football cards + baseball cards = Total cards

Prompt students to identify the quantities they know. Write a number sentence on the board that shows the known quantities.

- 153 + 238 = Total cards

**Talk Math**

- Why weren’t the words ‘total cards’ replaced with a number? Possible answer: Because the problem doesn’t give us that number.

- Since the problem doesn’t tell you the total number of cards, how can you write a number sentence for this situation? Possible answer: You could use a box or a question mark to stand for ‘Total cards.’

You may wish to write number sentences that use students’ suggestions on the board, for example, 153 + 238 = ? or 153 + 238 + □

Tell students that instead of words, an empty box, or a question mark, a letter can stand for the unknown quantity in a number sentence. Write a number sentence with a t standing for the total number of cards, such as the one below.

- 153 + 238 = t

**Talk Math**

- What is the value of t? Explain how you know. Possible answer: t = 391; I added 153 and 238.

Ask students to identify the second step of the word problem. Students should say that the second step is finding the number of cards that Casey has left. Invite volunteers to the board to write number sentences for the second step of this problem. Have students follow the same sequence as above, writing first a sentence with words, then filling in the known quantities, and finally, using a letter to stand for the unknown quantity.

**Ongoing Assessment**

- Can students identify the steps needed to solve the problem?
- Do students know what the letter stands for in each step?
2 Teach and Practice

D Writing Equations With Letters for the Unknown Quantity

Purpose To write equations with a letter standing for an unknown quantity when solving two-step word problems.

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