Measurement and Data

In second grade, children build upon their nonstandard measurement experiences by measuring in standard units. They use *customary* (inches, feet, etc.) and *metric* (centimeters, meters, etc.) units to measure lengths of objects by selecting appropriate tools. They select an attribute to be measured, choose an appropriate unit of measurement, and determine the number of units.

In second grade, children also measure an object using two units of different lengths (e.g., a desk measured in inches and in feet). Doing so helps children realize that the unit used and the attribute being measured are both important. They estimate lengths using inches, feet, centimeters, and meters, which helps them become more familiar with unit sizes. Children make connections between number lines and rulers. They use length to solve addition and subtraction word problems and create number lines with equally spaced points corresponding to whole numbers to solve problems to 100.

Children extend skip-counting by 5s to tell and write time from analog and digital clocks to the nearest five minutes. Children solve word problems involving dollar bills, quarters, dimes, nickels, and pennies. They use measurement data as they pose questions, collect, analyze, and represent data, and interpret the results. They represent the lengths of several objects by making a line plot, where the horizontal scale is marked off in whole-number units. They draw picture graphs and bar graphs to represent data sets with up to four categories, and they solve simple problems using information presented in bar graphs.

The Grade 2 Common Core State Standards for Measurement and Data specify that children should–

- Measure and estimate lengths in standard units.
- Relate addition and subtraction to length.
- Work with time and money.
- Represent and interpret data.

The following hands-on activities provide children necessary experiences measuring, working with time and money, and representing and interpreting data. Using concrete materials prior to predicting, estimating, comparing, and solving problems enables children to acquire foundational concepts and gives them the confidence necessary to solve more difficult problems.

Measurement and Data

Contents

LESSON 1

Measurement and Data

Standard Units

Objective

Estimate and measure length using standard units.

Common Core State Standards

- **2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- **2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

When children have had many opportunities to measure using nonstandard units, the transition to standard units is much easier. For less confusion, children should begin measuring in inches, using a ruler without smaller divisions. Estimating lengths can be difficult for children who have little experience measuring because it is hard for them to visualize. However, when children can use a benchmark to base their estimates, the process becomes less abstract.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *Did all your measurements come out pretty close?*
- **Say:** *Suppose some groups used Pattern Blocks, some used Snap Cubes®, and others used Inchworms™.* **Ask:** *Would the measurements come out just as close as when we all used Inchworms? Why or why not?*
- Discuss the importance of measuring using standard units. **Ask:** *Why might it be important that people all measure things using the same units?* Discuss what would happen if people did not have standard units with which to measure.

Solve It

With children, reread the problem. Have children write Dana a letter telling her how to find out which eraser is longer. Have children discuss using standard units or inches as units in their letters.

More Ideas

For other ways to teach about estimating and measuring length in standard units—

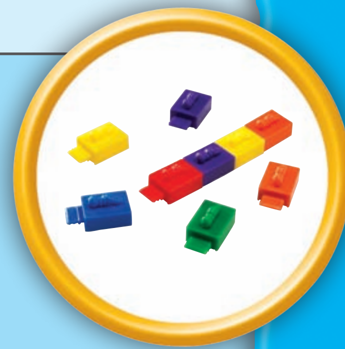
- Have pairs of children estimate the length of a desk in Color Tiles and Inchworms. Then have children measure the desk with both kinds of manipulatives, compare their estimates with the measurements, and compare the measurements.
- Have children use Snap Cubes and Inchworms to measure various classroom objects. Have them first estimate the lengths of the objects and then use the manipulatives to measure them. Have children compare their measurements using the different manipulatives. (Children should conclude that cubes are smaller units than Inchworms.)

Formative Assessment

Have children try the following problem.

How many Inchworms does this string measure?

A. 6 Inchworms **B.** 3 Inchworms **C.** 5 Inchworms



Try It!

30 Minutes | Groups of 3

Here is a problem about estimating and measuring lengths using standard units.

Dana's class is measuring things they find in the classroom. Dana tells her friend Steve that she thinks the board eraser in her room is longer than the eraser in his room. How can she find out if she is right?

Introduce the problem. Then have children do the activity to solve the problem.

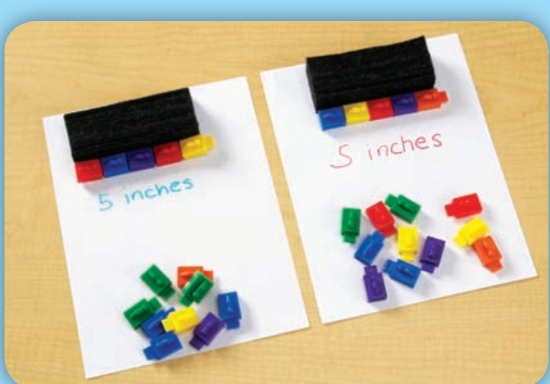
Distribute Inchworms, paper, and crayons to children.

Materials

- Inchworms™ (12 per group)
- paper (1 sheet per child)
- crayons (1 per child)

1. Have children hold and carefully examine some Inchworms. **Ask:** *How many Inchworms long do you think the classroom eraser is?* Then have group members discuss their estimates.

2. Next have groups of children take turns using Inchworms to measure the classroom eraser. Have each group member write down his or her measurement.



3. Have children compare their estimates to their actual measurements. Then ask each group to tell their actual measurements. Have children clarify that Inchworms, or inches, are being used as units.

⚠ Look Out!

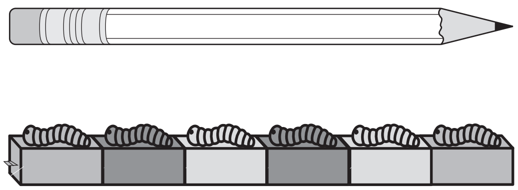
Children might not take care in lining up the Inchworms with the ends of the erasers. Make sure that the Inchworms reach the ends and that they are linked together. Guide children to see how not having the Inchworms or measurement tool aligned will cause inaccurate measurement.

Answer Key

Use Inchworms. Measure each item.

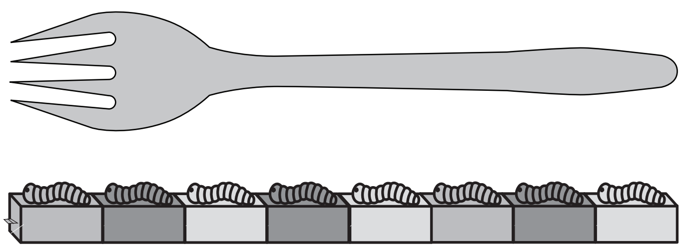
(Check students' work.)

1.



6 inches

2.



8 inches

Find each item. Estimate the length. Use Inchworms to measure the length.

Answers will vary.

3. one side of a book

Estimate: ________ inches

Actual: ________ inches

4. straw

Estimate: ________ inches

Actual: ________ inches

5. crayon

Estimate: ________ inches

Actual: ________ inches

6. dollar

Estimate: ________ inches

Actual: ________ inches

Answer Key

Challenge! How is measuring with Inchworms like measuring with a ruler? How is it different?

Challenge: (Sample) An Inchworm is 1 inch long. Putting 12 Inchworms together end to end is the same as having a 12-inch ruler.

LESSON 2

Objective

Recognize the relationship between inches and feet.

Common Core State Standards

- **2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- **2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

Measurement and Data

Inches and Feet

As an important application of mathematics, measurement needs careful attention. Children must understand the need for standard units of measure and that inches and feet are customary units that are used in the United States. The relationship between inches and feet needs to be explored with children as they discover how many inches comprise one foot and how to measure the length of different objects.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How long is one Inchworm?* Guide children to use the word *inch* to describe the length.
- **Say:** *One Inchworm is 1 inch long.* **Ask:** *How many inches long is the Inchworms™ Ruler?*
- **Say:** *The ruler is 12 inches long.* **Ask:** *What is another word for something that is 12 inches long?* Guide children to use the word *foot* to describe the length of the ruler.
- **Ask:** *How many inches long is your desk? Is your desk more than a foot long? How does this compare with your estimate?* Ask children to describe the length of their desk in feet and inches.

Solve It

With children, reread the problem. Have children act out the problem, using the measurements of their desks. Tell them that their desks must be at least 2 feet long for the model to fit on it. Have children figure out whether or not the model would fit.

More Ideas

For other ways to teach about the relationship between inches and feet—

- Children can trace their partner's body on butcher paper and then measure the tracing of their own body. First have them estimate their height to the nearest foot. Then have them draw one straight line from head to toe on the tracing and use an Inchworms Ruler to measure the length of the line.
- Have children use the Inchworms and Inchworms Ruler to measure other objects in the classroom. Ask them to make an estimate in inches or feet, measure, and compare estimates and actual measurements.

Formative Assessment

Have children try the following problem.

Which is the most likely measurement for the length of a baseball bat?

A. 6 inches **B.** 10 feet **C.** 3 feet

Try It! 30 minutes | Pairs

Here is a problem about recognizing the relationship between inches and feet.

Billy wants to bring his plane model for show-and-tell. He wants to put it on his desk, but he doesn't want anyone to walk into it and knock it down. He knows that his model is 2 feet long. How can Billy figure out if his model will fit on his desk?

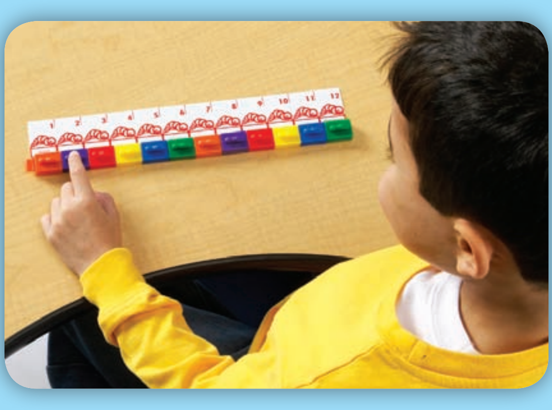
Introduce the problem. Then have children do the activity to solve the problem.

Distribute 12 Inchworms and 1 Inchworms Ruler to each pair of children.

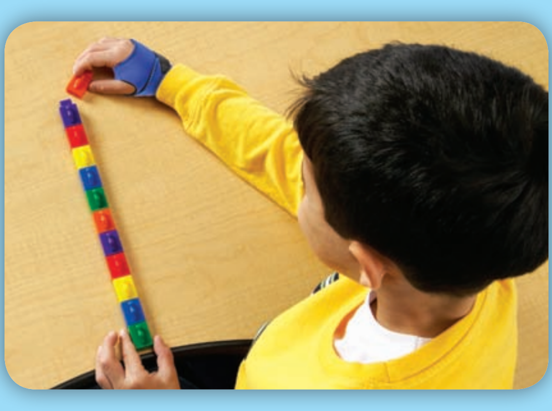
Materials

- Inchworms™ (12 per pair)
- Inchworms Ruler (1 per pair)

1. Ask children to compare the length of one Inchworm to the length of one Inchworms Ruler. Guide them to notice that one Inchworm is the same length as one numbered space on the Inchworms Ruler.



2. Have children explore how many Inchworms equal the length of the Inchworms Ruler. Ask children to make an Inchworms train that is the same length as the Inchworms Ruler. Then have them count the number of Inchworms used. Introduce *foot* as being equal to 12 inches.



3. Ask children to estimate the length of their desks using Inchworms. Ask children to measure the length of their desk or table using the Inchworms Ruler. They should first measure across from left to right. Then have children measure from bottom to top.

Look Out!

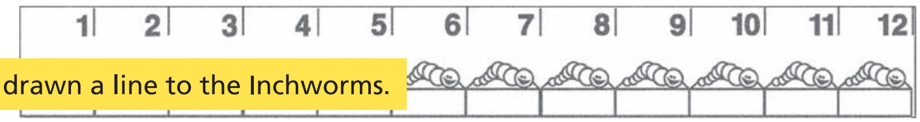
Children may not have a great deal of practice using rulers. Because of this, they may make errors while measuring. Remind children that they need to make sure that the zero mark of the Inchworms Ruler lines up with the end of the object. If an object is more than 12 inches long, emphasize that they must measure part and then move the Inchworms Ruler, being careful not to measure the same area twice. They can make a mark or put an object, such as a pencil point, at the end of the Inchworms Ruler to mark its place.

Answer Key

Use Inchworms and an Inchworms Ruler. Draw a line to match the measuring tool with the unit it measures.

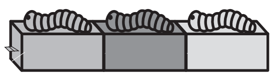
(Check students' work.)

1. inch



Check that students have drawn a line to the Inchworms.

2. foot



Check that students have drawn a line to the Inchworms Ruler.

Estimate the length of each. Use Inchworms and an Inchworms Ruler to measure each item in your class.

Answers will vary.

3. width of door

Estimate	Actual
________ feet	________ feet
________ inches	________ inches

4. table

Estimate	Actual
________ feet	________ feet
________ inches	________ inches

Answer Key

Challenge! Name something that is about 1 inch long. Name something that is about 1 foot long.

Challenge: Answers will vary.

LESSON 3

Objective

Choose the appropriate unit to measure length.

Common Core State Standards

- **2.MD.1** Measure the length of an object by selecting and using appropriate tools such as rulers, yardsticks, meter sticks, and measuring tapes.
- **2.MD.2** Measure the length of an object twice, using length units of different lengths for the two measurements; describe how the two measurements relate to the size of the unit chosen.

Choosing a Unit

Choosing the appropriate unit requires children to use judgment in terms of the length of the object before they measure it. This judgment will improve as children gain experience with length. Another important part of cultivating judgment about units is exploring and understanding the relationship between units.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *What units would you use to measure a classroom eraser? Why? What units would you use to measure a chair? Why?* Allow volunteers to measure both an eraser and a chair using the appropriate units.
- **Say:** *You can often decide before you measure an object which units to use.* **Ask:** *Which units would you use to measure the height of the door?*
- Ask children to think of examples of things at home or in school that they might measure using inches. Then have them think of things they might use feet to measure.

Solve It

With children, reread the problem. Have children identify the correct units for measuring the box for paper clips and the poster. Children may practice using Inchworms™ to measure a paper clip and the Inchworms Ruler to measure a piece of poster board. Then on one side they can make their own posters with drawings of things that can be measured with inches, and on the other side things that can be measured with feet.

More Ideas

For other ways to teach about choosing units to measure length—

- Have children think of classroom objects that are best measured using a combination of both feet and inches. Then have groups use Inchworms and the Inchworms Ruler to take measurements and compare data for accuracy.
- Ask children to compare the Inchworms Ruler to the lengths of their own feet. Have children see if real feet like theirs are 12 inches long like the measurement unit called *foot*. Children should conclude that their feet vary in size and are usually less than 12 inches, or 1 foot, long.

Formative Assessment

Have children try the following problem.

Which unit is best to measure your bed?

A. Inches **B.** Feet **C.** Snap Cubes®

Try It! 30 minutes | Pairs

Here is a problem about choosing the appropriate unit.

Bryan wants to see if he can fit paper clips into a small box. He also wants to find out if a rolled-up poster will fit in his desk. He needs to measure the length of both the paper clips and the poster to see if they will fit where he wants to put them. What units should he choose to measure these objects?

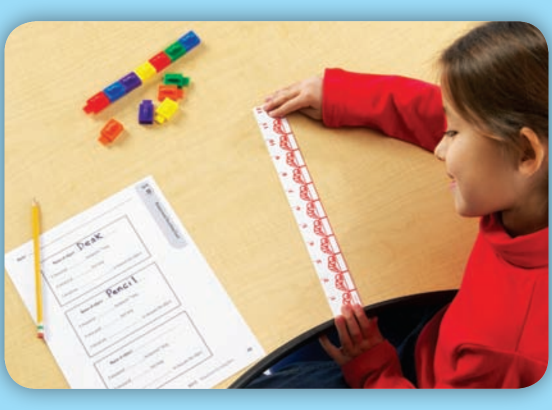
Introduce the problem. Then have children do the activity to solve the problem.

Distribute Inchworms, Inchworms Rulers, recording sheets, and pencils. Remind children that each Inchworm is 1 inch long and each Inchworms Ruler is 12 inches, or 1 foot, long.

Materials

- Inchworms™ (12 per pair)
- Inchworms Ruler (1 per pair)
- Measurement Recording Sheet 1 (BLM 9; 1 per pair)
- pencil, 6–8 inches long (1 per pair)

1. Have partners use one Inchworms piece to measure the length of the teacher's desk, turning the Inchworms piece from head to toe as they measure. Have one partner record their measurement in the first box on the recording sheet.



2. Have partners use the Inchworms Ruler to remeasure the desk. Have them record the measurement in feet on their recording sheet. When they have finished recording, **ask:** *When we measure a long object, is it better to use inches or feet?*

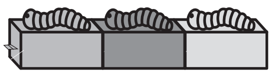
3. Have children measure the pencil in inches and feet. **Ask:** *When we measure a short object, is it better to use inches or feet?*

⚠ Look Out!

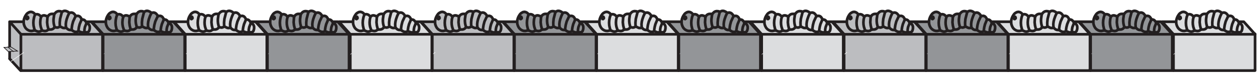
Children may have trouble choosing the appropriate unit. Remind children to consider whether the object they want to measure is less than or greater than a foot. If the object is less than a foot, they should use inches. If the object is greater than a foot, they may want to use feet or a combination of feet and inches.

Use Inchworms and an Inchworms Ruler. Make each Inchworms train.

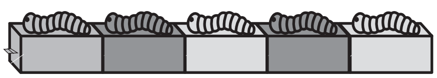
(Check students' work.)

1. 

Is the train longer than 1 foot? no

2. 

Is the train longer than 1 foot? yes

3. 

Is the train longer than 1 foot? no

Use an Inchworms Ruler. Answer each question.

4. Is your book shorter than 1 foot? (sample) no

5. Is your classroom wider than 1 foot? yes

Which unit would you use to measure each item? Circle your answer.

6. pencil

inch foot

inch

7. school bus

inch foot

foot

8. lunch box

inch foot

inch

Answer Key

Challenge! A book is 12 Inchworms long. Write its length two ways.

Challenge: (Sample) 12 inches and 1 foot

LESSON 4

Objective

Estimate and measure in customary and metric units.

Common Core State Standards

- **2.MD.3** Estimate lengths using units of inches, feet, centimeters, and meters.

Measurement and Data

Estimating and Measuring

Measurement encompasses several areas of math. By this age, children will have experienced measuring objects with standard units. This exposure has formed a foundation of reference points that children can draw upon to make logical estimates and pick the best tools for measuring.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How many inches long did you estimate that the pencil would be? How many inches was it when you measured with Color Tiles?*
- **Ask:** *What was your estimate of the length of the pencil in centimeters? How many centimeters was it when you measured it with the unit cubes?*
- **Ask:** *How did you use the measurement of the pencil to help you estimate the length of the piece of paper? Did you use the measurements of the paper or pencil to help you estimate the length of the eraser? Why or why not?*
- Discuss with children the similarities and differences between inches and centimeters. Emphasize that inches and centimeters are both accurate ways to measure because they are both standard units.

Solve It

With children, reread the problem. Have children write a letter to Clyde explaining how he can measure in inches the same way he would measure using centimeters. They should tell Clyde how inches and centimeters are similar and different.

More Ideas

For other ways to teach about measuring in customary and metric units—

- Have children work in groups to trace outlines of their bodies on large sheets of paper and then measure from their feet to the top of their heads using both Color Tiles and Base Ten units.
- Have one child look around the room and select an object, estimating how long it is in inches or centimeters. Then have the child tell the class the estimate, using only the number and not the unit. The class then guesses the unit. Children then measure the object using Color Tiles and Base Ten units to find how close the estimate was.

Formative Assessment

Have children try the following problem.

Which is a good estimate of the length of your thumb?

A. 1 cm   **B.** 4 cm   **C.** 6 inches

Try It! 35 Minutes | Pairs

Here is a problem about measuring in customary and metric units.

Mr. Rossi asked his students to measure objects in inches. Clyde is a new student in Mr. Rossi's class. He is from England. He told Mr. Rossi that people use centimeters to measure in England. Mr. Rossi told Clyde to measure the objects with Centimeter Cubes while his partner measured with 1-inch Color Tiles. Who used more units to measure?

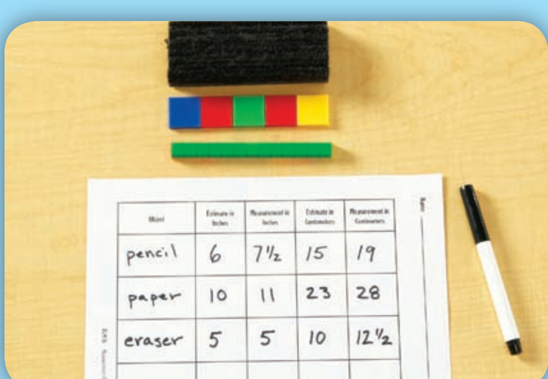
Introduce the problem. Then have children do the activity to solve the problem. Distribute Base Ten units, Color Tiles, recording sheets, pencils, and paper to children. Tell children that a tile is 1 inch long and a unit cube is 1 centimeter long. Explain that in the United States, we usually measure with customary units, such as inches and feet, but most other countries in the world use metric units, such as centimeters and meters.

Materials

- Base Ten Blocks (30 units per pair)
- Color Tiles (15 per pair)
- Measurement Recording Sheet 2 (BLM 10; 1 per pair)
- unsharpened pencil (1 per pair)
- $8\frac{1}{2}$" × 11" sheet of paper (1 per pair)

1. Have children estimate the length of the unsharpened pencil in tiles, then measure. Children should record the estimate and measurement on the recording sheet. They should then repeat the process with cubes.

2. Have children use their measurement of the pencil to estimate the length of a sheet of paper in inches. Children should measure with tiles and record the numbers. Have children repeat the activity for centimeters.



3. Have children repeat the steps of the activity to estimate and measure the length of a classroom eraser, and record their measurements.

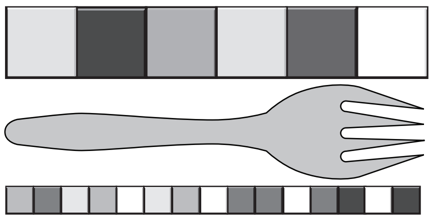
⚠ Look Out!

Some children may have trouble measuring accurately using cubes and tiles. Make sure children are lining up manipulatives correctly with the objects being measured. They should be careful not to leave gaps between the units of measure. Demonstrate for children that they will get a more accurate answer if the tiles and cubes are lined up correctly.

Answer Key

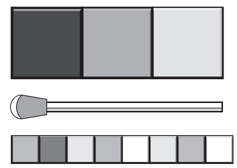
Use Unit Cubes and Color Tiles to model the length of each item. Tell the length.

(Check students' work.)

1. 

6 inches

15 centimeters

2. 

3 inches

8 centimeters

Using Unit Cubes and Color Tiles, model the length of each line. Tell the length.

3. ______________________________

4 inches   10 centimeters

4. ____

6 inches   15 centimeters

5. ______________________

3 inches   7 or 8 centimeters

Find each item. Estimate its length.

For 6–8, answers will vary. Sample answers are given.

6. pencil

6 inches

15 centimeters

7. eraser

1 inch(es)

3 centimeters

8. paper clip

2 inches

5 centimeters

Answer Key

Challenge! When you measure the same object in inches and then centimeters, why is the number of centimeters always greater than the number of inches? Draw models of the units to help.

Challenge: (Sample) One inch equals about 2.5 centimeters. Because an inch is a longer distance, when a length is measured in both inches and centimeters, the number of inches will be a lesser number.

LESSON 5

Measurement and Data

Comparing Two Lengths

Objective

Measure differences in length.

Common Core State Standards

- **2.MD.4** Measure to determine how much longer one object is than another, expressing the length difference in terms of a standard length unit.

Measuring and comparing the lengths of two different objects builds children's concept of size and helps prepare them to work with perimeter, area, and distance. In this activity, children will use Inchworms™ and the Inchworms Ruler to determine how many inches longer one object is than another. They will use their subtraction skills to find the difference.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How long is the marker? How long is the crayon? How can Darlene find out how much longer the marker is than the crayon?* **Say:** *To find out how much longer one object is than another, we can measure both objects. Then we subtract the shorter length from the longer length.* **Ask:** *How much longer is the marker than the crayon?*
- **Say:** *When we compare the lengths of two objects, we must use the same unit of measurement for both objects. Let's say we compare two pieces of string and one piece is 1 foot long and the other piece is 9 inches long.* **Ask:** *Which piece is longer? How many inches are in a foot? How much longer is the string that is a foot, or 12 inches, than the one that is 9 inches?*

Solve It

With children, reread the problem. Have children measure each item with the Inchworms Ruler. Have them express their findings in a sentence, such as, "The marker is 2 inches longer than the crayon."

More Ideas

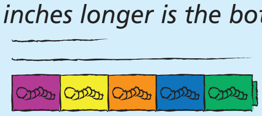
For other ways to teach about differences in length—

- Have pairs find five small objects around the room or in their desks to measure. Have one child pick two of the objects to compare. Have each child measure one of the objects using Inchworms and compare their measurements. Then have them complete the sentence: The _________ is _____ inches longer than the ________. Have children take turns picking two of the objects to measure.
- Have pairs use the Inchworms Ruler to measure two large objects in the room and compare the two lengths in feet.

Formative Assessment

Have children try the following problem.

How many inches longer is the bottom line than the top line?



A. 2 inches **B.** 3 inches **C.** 4 inches

Try It! 25 minutes | Pairs

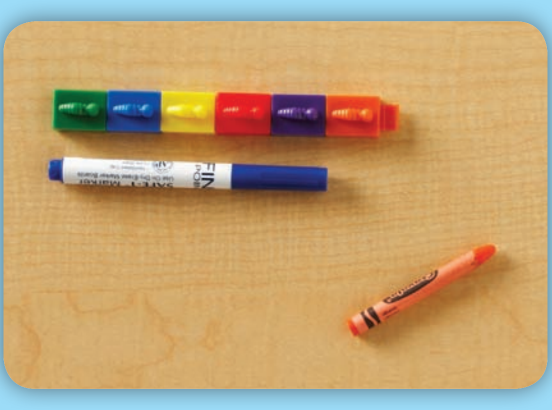
Here is a problem about finding the difference between the lengths of two objects.

Darlene knows that her markers are longer than her crayons, but she wants to know how much longer. How can she find out?

Introduce the problem. Then have children do the activity to solve the problem. Distribute Inchworms, Inchworms Rulers, markers, crayons, paper, and pencils to children.

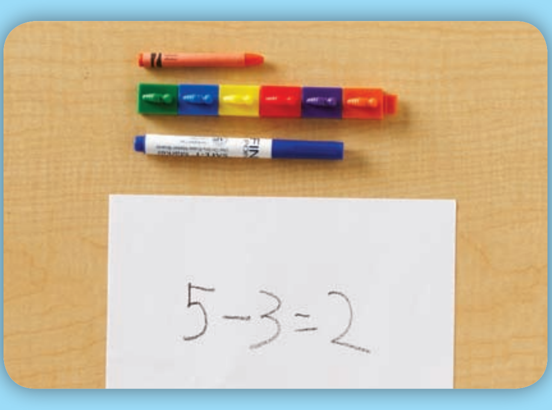
Materials

- Inchworms™ (12 per pair)
- Inchworms Ruler (1 per pair)
- markers (1 per pair)
- crayons (1 per pair)
- paper (1 sheet per pair)
- pencils (1 per child)



1. Say: *First we need to measure the marker using the Inchworms and the ruler. Remember that Inchworms are an inch long, so our unit of measurement is inches.* **Ask:** *How many Inchworms, or inches, long is the marker?*

2. Say: *Now we need to measure the crayon. Place your crayon so that its flat end lines up with the left end of the marker and Inchworms.* **Ask:** *How many Inchworms, or inches, long is the crayon?*



3. Say: *Now you can compare. You can count the number of Inchworms between the right end of the crayon and the right end of the marker. You also can subtract the length of the crayon from the length of the marker.* **Ask:** *How many inches longer is the marker than the crayon?*

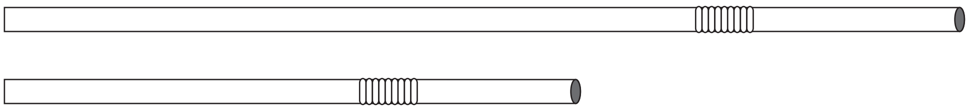
⚠ Look Out!

Watch for children who aren't aligning the starting edges. It is easy for children to forget to keep things aligned. These children may benefit from having a book or notepad on the left to define the starting edge; children can place their items and Inchworms against it.

Use Inchworms. Measure each item. Write how many inches longer one item is than the other.

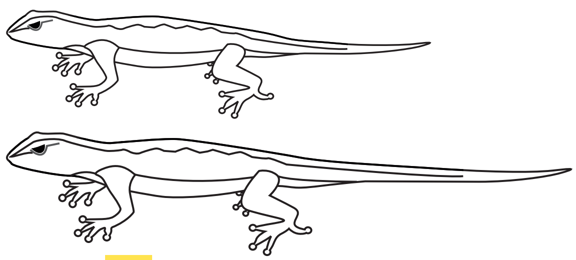
(Check students' work.)

1.



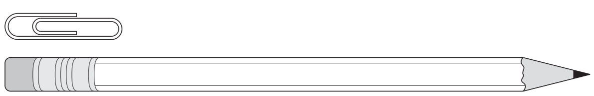
2 inches longer

2.



1 inch(es) longer

3.



4 inches longer

Use an Inchworms Ruler. Measure the items. Answer the question.

Answers will vary.

4. How much longer is one side of a book than the other side?

one side ____ inches
other side ____ inches

______ inches longer

5. How much longer is one side of your desk than the other side?

one side ____ inches
other side ____ inches

______ inches longer

Answer Key

Challenge! Draw two items from your room. Measure each item. Write the lengths. Write how much longer one item is than the other.

Challenge: Answers will vary. Check that children subtract correctly.

LESSON 6

Measurement and Data

Whole Numbers as Lengths on a Number Line

Objective

Represent whole numbers as lengths on a number line.

Common Core State Standards

- **2.MD.6** Represent whole numbers as lengths from 0 on a number line diagram with equally spaced points corresponding to the numbers 0, 1, 2, ..., and represent whole-number sums and differences within 100 on a number line diagram.

As children continue to become familiar with the units and processes of measuring length, they can begin to see a ruler as a number line and a number line as a ruler. By using rods of various lengths on a number line, they also can see units on the number line as whole numbers and whole numbers as lengths. Building trains of rods on a number line will help children understand how to add using a number line.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Say:** *Every space between ticks on the number line represents one.* **Ask:** *How many spaces do the 2 white rods cover?* **Say:** *So on this number line, one space equals the length of 1 white rod.*
- **Ask:** *What is the value of the purple rod? Where did we place the purple rod on the number line? Starting at 2 and adding 4 using the purple rod, where do we end up?*
- **Ask:** *What is the value of the dark green rod? Where did we place it on the number line? Starting at 6 and adding 6 using the dark green rod, where do we end up? What is the length of the train?*
- **Ask:** *How is the number line like a ruler? How is it different?*

Solve It

With children, reread the problem. Have children draw the rods on the number lines. Have them write number sentences that represent the value of the train and its length.

More Ideas

For another way to teach about representing whole numbers as lengths—

- For children who are having trouble, use 1-Inch Number Lines (BLM 12) and Inchworms™ to find various lengths of 1 through 8 inches. The larger unit and the ability to snap the Inchworms together might help children who are struggling.

Formative Assessment

Have children try the following problem.

How long is a train of 3 white rods, 2 red rods, and 1 light green rod on a centimeter number line?

A. 3 **B.** 7 **C.** 10

Try It! 25 minutes | Pairs

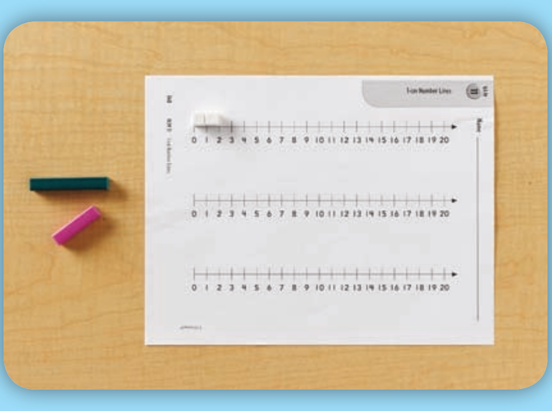
Here is a problem about representing whole numbers as lengths.

Ryan made a train of Cuisenaire Rods. He used 2 white rods, 1 purple rod, and 1 dark green rod. He built the train on a centimeter number line, starting at zero. At what number on the number line does the train end? What is the length of the train?

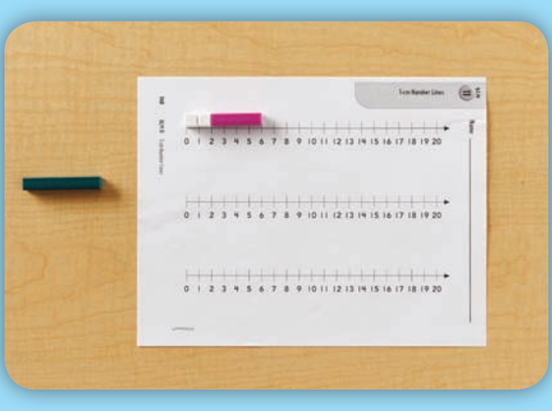
Introduce the problem. Then have children do the activity to solve the problem. Distribute Cuisenaire Rods, 1-cm Number Lines (BLM 11), crayons, paper, and pencils to children.

Materials

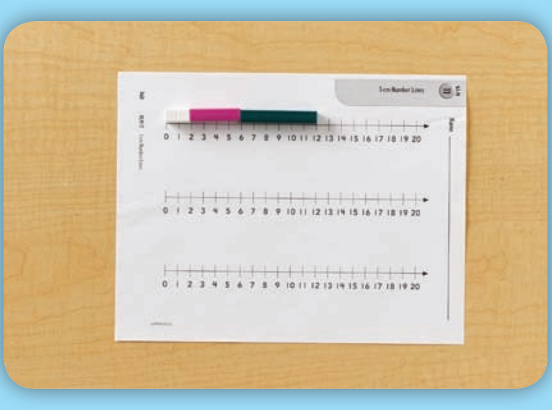
- Cuisenaire® Rods ($\frac{1}{2}$ set per pair)
- 1-cm Number Lines (BLM 11; 1 per pair)
- crayons (1 set per pair)
- paper (1 sheet per pair)
- pencils (1 per child)



1. Ask: *Where should we start our train on the number line?* Remind children to start at zero and build the train to the right. **Ask:** *What is the value of the 2 white rods? What number does the second white rod end at?*



2. Say: *Now place the purple rod at the end of the white rods.* **Ask:** *How much more does the purple rod add? Where does the train end?* **Say:** *We can show this using a number sentence.* Write *2 + 4 = 6* on the board.



3. Say: *Now add the dark green rod at the end of the purple rod.* **Ask:** *How much does the dark green rod add to the train? Where does the train end? What is the length of the train?* **Say:** *You can show this using a number sentence, too.* Write *6 + 6 = 12*.

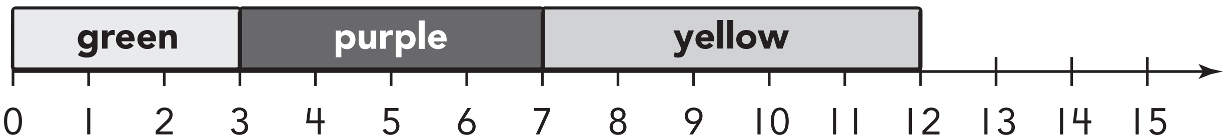
Look Out!

Watch for children who don't keep the train together. They might allow space between rods or allow the rods to move from zero. Explain that using a number line is like using a ruler. The left side of the train must align with 0.

Answer Key

Use Cuisenaire Rods. Build the model. Write a number sentence for the lengths.

1.

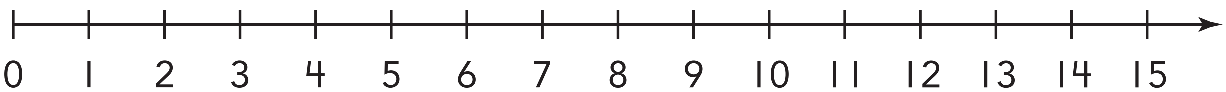


3 + 4 + 5 = 12

Use two or three Cuisenaire Rods. Build the length. Draw the model. Write a number sentence.

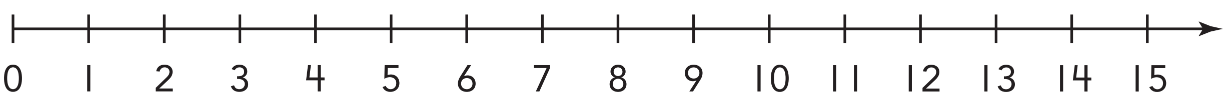
(Check students' models.)

2. 9 cm, two rods



check work + ______ = ______

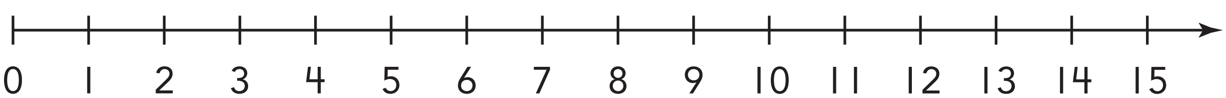
3. 13 cm, three rods



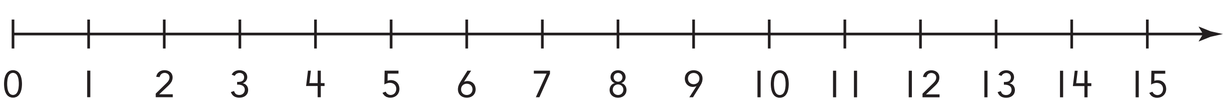
check work + ______ + ______ = ______

Show the total length on the number line.

4. 4 + 5 + 2 + 3 = 14



5. 3 + 3 + 5 + 2 = 13



Answer Key

Challenge! Nora and John are trying to find rods that would end at 19 on a number line. Nora says that 3 yellow rods and a purple rod would work. John says an orange and a blue rod would work. Who is correct, and why? Use words or drawings to explain.

Challenge: (Sample) Both are correct, because both total 19. Children may draw 2 number lines to show each set of rods. As long as both sets of rods are shown or described, it is correct.

LESSON 7

Objective

Tell time in 5-minute intervals before and after the hour.

Common Core State Standards

- **2.MD.7** Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.

Measurement and Data

Time to 5 Minutes

Telling time is an important measurement skill that most young children are excited to learn. There are many real-life applications and repeated opportunities to reinforce this skill throughout the day. Making the most of these opportunities will give meaning to the concept of telling time and allow children to master the skill through repeated practice.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- Display a Geared Mini-Clock. **Say:** *The big numbers on a clock mark every 5 minutes when we look at the minute hand. The big numbers also mean hours when we look at the hour hand. Let's look how the minute hand moves as we count together by 5s.* Point to the small numbers on the clock as you count together from 5 to 60.
- **Ask:** *If the minute hand is pointing to the 4, how many minutes after the hour is it? What if the minute hand is pointing to the 7?*
- **Ask:** *If the time is 6:15, what number is the minute hand pointing to? If it is 45 minutes after the hour, what number is the minute hand pointing to?*

Solve It

With children, reread the problem. Then have children draw clocks to show 11:25 A.M. **Say:** *Dominic's class has to be in art class 5 minutes later. Draw another clock that shows what the time will be then.*

More Ideas

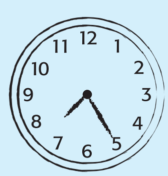
For other ways to teach about telling time to 5 minutes—

- Use Geared Mini-Clocks to display important times each morning. Ask volunteers to set one clock for music time, lunch, math, clean-up time, and so on. Display the clocks in a visible place in the room. Ask volunteers to write the event and the time on a sentence strip or construction paper to display with the clocks.
- Have children use Snap Cubes® to make 12 trains of 5 cubes. Use these to practice counting by 5s to 60.

Formative Assessment

Have children try the following problem.

Circle the time that the clock shows.



A. 5:35 P.M.

B. 7:25 P.M.

C. 7:45 P.M.

Try It! 20 minutes | Groups of 4

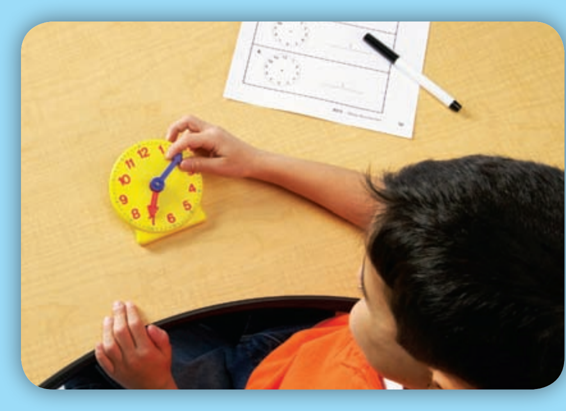
Here is a problem about telling time to 5 minutes.

Mr. Welch is reading a story to the class before they go to art. He asked Dominic to tell him when it is 11:25 A.M. so he can stop reading. How will Dominic know when it is 11:25 A.M. so the class is not late for art?

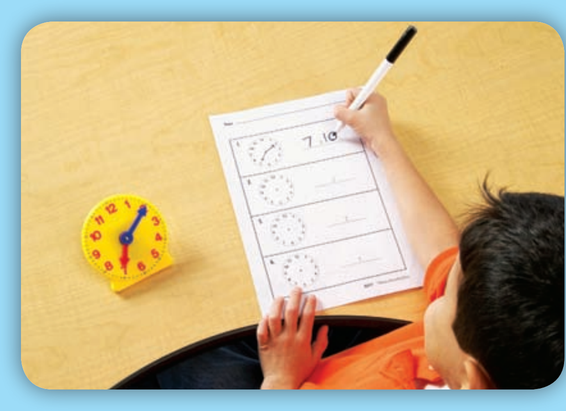
Introduce the problem. Then have children do the activity to solve the problem.

Distribute Geared Mini-Clocks, recording sheets, and pencils to children. **Say:** *The clocks have big red numbers and small blue numbers. Between the numbers are dots.* Start with the minute hand on the 12. Move the hand along the blue minute dots one by one and have the class count together. Stop at 5, write the time on the board, and discuss. **Ask:** *What do the dots stand for?*

Materials
- Geared Mini-Clock (1 per group)
- 5 Minutes Recording Sheet (BLM 13; 1 per child)
- pencils (1 per child)



1. Say: *Joshua woke up at 7:10 A.M.* Have children work together to model the time on their clocks.



2. Instruct children to draw the clock hands on Clock 1 on their 5 Minutes Recording Sheets and record the time.

3. Say: *Miss Green's class eats lunch at 12:25 P.M. each day.* Have children show this time on the clock and draw the hands on Clock 2. **Say:** *Use skip-counting to find how many minutes after 12 this is.* Repeat using other scenarios for Clocks 3 and 4.

⚠ Look Out!

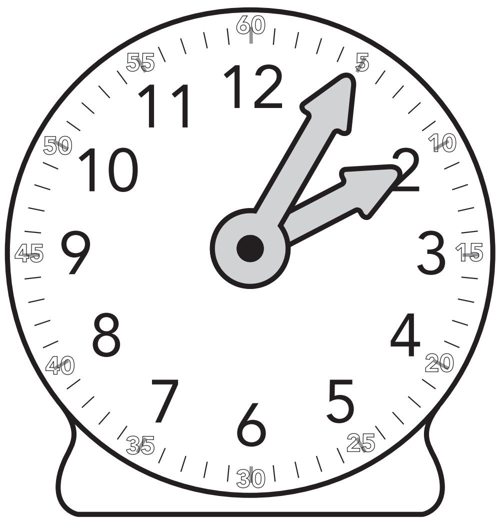
Children may believe that 7:10 means the minute hand is on the big red 10. Reinforce the fact that children must count by 5s (or observe the small blue numbers) to find the correct placement for the minute hand. Remind children that the large numbers on the clock mark the hours, not the minutes.

Answer Key

Use a Geared Clock. Model the time shown. Write the time.

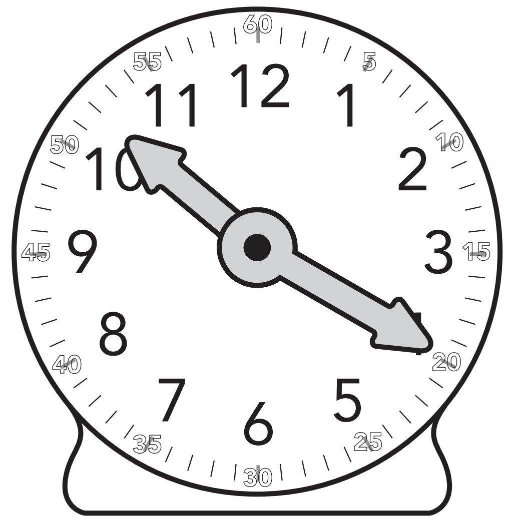
(Check students' work.)

1.



2:05

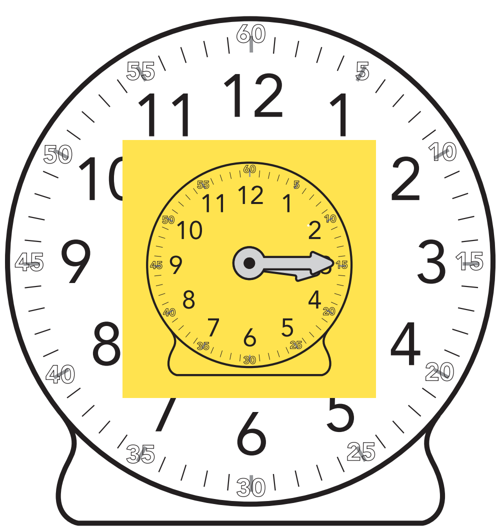
2.



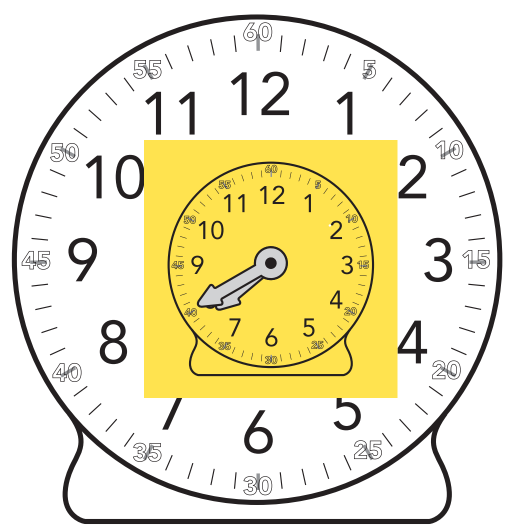
10:20

Use a Geared Clock. Model each time. Draw the hands on the clock.

3. 3:15



4. 7:40



Answer Key

Challenge! When the minute hand points to an hour number on the clock face, how do you know the number of minutes the time is?

Challenge: (Sample) Multiply that number by 5.

LESSON

8

Objective

Know the relationship between the penny and the nickel.

Common Core State Standards

- **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Measurement and Data

The Penny and Nickel

An understanding of money is an important life skill, as it is essential in paying for goods and services, making change, and checking that correct change has been received. Coin Tiles can help children visualize the relationships between coins and help children build a foundation for deeper work with money, such as performing operations with money amounts.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How much does the toy car cost? How much money does Jared have? Which is greater, 22 or 20? Does Jared have enough money? How much more money does Jared need?*
- **Say:** *Place the 3 nickel tiles and the 5 penny tiles on the Hundred Board starting at 1.* **Ask:** *How many pennies would you need to reach 22?* On the board, write *22 – 20 = 2*.
- **Say:** *Let's say Jared's grandma gives him another nickel.* **Ask:** *How much money would he have? Would he have enough money to buy the toy car?* Have children put another nickel tile with their Coin Tiles and count the coins, or add 20 + 5.

Solve It

With children, reread the problem. Have children draw the coins and write a number sentence showing how much money Jared has. Have them write a sentence telling whether or not Jared can buy the car.

More Ideas

For other ways to teach about the relationship between pennies and nickels—

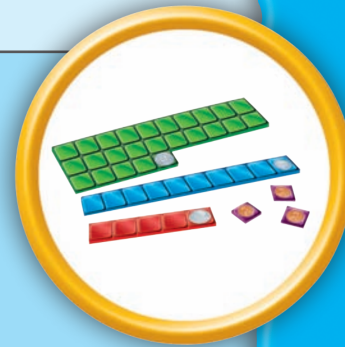
- Have children work in pairs. Have one child pick a handful of penny tiles out of a bag. Have that child trade in as many pennies as possible for nickels and give the coins to the other child. Have the second child place the tiles on a Hundred Board and tell how much money it is. Switch roles.
- Have children work in pairs. Have one child roll a number cube and take that many nickel tiles. Have the other child roll the number cube and take that many penny tiles. Have the two work together to add the values of the coins.

Formative Assessment

Have children try the following problem.

How many nickels equal 30 pennies?

A. 4 **B.** 5 **C.** 6



Try It! 30 minutes | Pairs

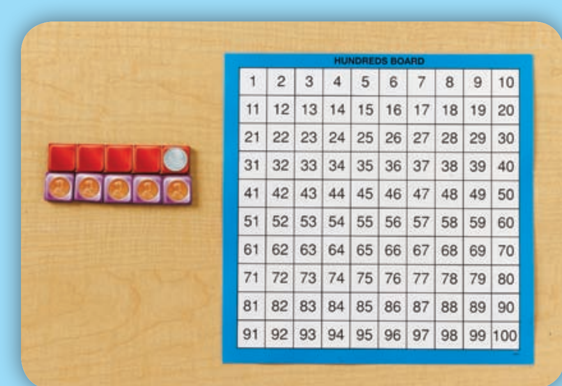
Here is a problem about the relationship between pennies and nickels.

Jared wants to buy a toy car that costs 22 cents. He has 3 nickels and 5 pennies. Does he have enough money to buy the toy car?

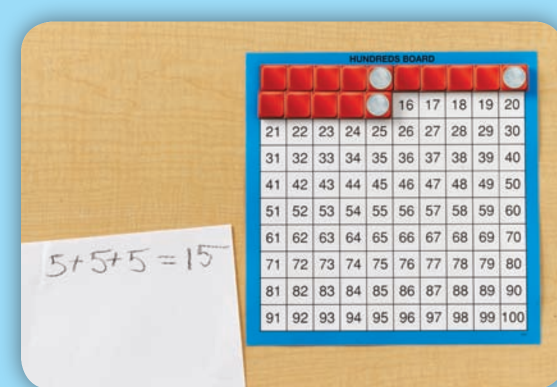
Introduce the problem. Then have children do the activity to solve the problem. Distribute Coin Tiles, Hundred Boards, paper, pencils, and crayons to children.

Materials

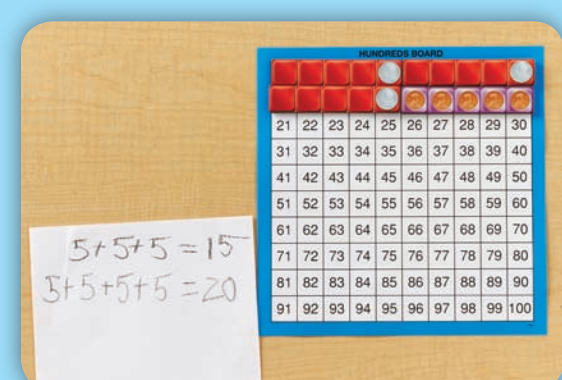
- Coin Tiles (1 set per pair)
- Hundred Boards (1 per pair)
- paper (1 sheet per pair)
- pencils (1 per child)
- crayons (1 set per pair)



1. Ask: *What do we know about pennies and nickels? How much is 1 penny worth? How much is 1 nickel worth? How many pennies are worth 1 nickel?* **Say:** *Show how many pennies equal 1 nickel by placing penny tiles next to a nickel tile.*



2. Say: *Jared has 3 nickels. We know that 1 nickel equals 5 pennies, or 5 cents.* **Ask:** *How much are 3 nickels worth?* Have children lay out 3 nickel tiles and count by 5s, or place the tiles on the Hundred Board to demonstrate the value. Have children write 5 + 5 + 5 = 15. Then have them practice making the cent sign and write 15¢.



3. Ask: *How many pennies does Jared have?* **Say:** *Put 5 penny tiles with your 3 nickel tiles.* **Ask:** *How much are the 3 nickels worth? How much is 15 cents plus 5 cents? Does Jared have enough money to buy the toy car?*

⚠ Look Out!

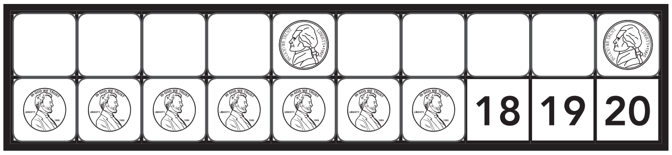
Watch for children who have difficulty knowing where to start placing tiles on the Hundred Board or how to position the tiles. Explain that they should start at 1 and build their amounts horizontally without skipping any spaces.

Answer Key

Use Coin Tiles and a Hundred Board. Build the model. Write the total amount of money.

(Check students' work.)

1.



17¢

Use Coin Tiles and a Hundred Board. Build a model. Draw the model. Write the total amount of money.

2.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

22¢

3.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

25¢

Use Coin Tiles. Show the amount two ways using nickels and pennies. Draw the coins using red for nickels and purple for pennies.

4. 16¢

3 nickels and 1 penny,
2 nickels and 6 pennies,
1 nickel and 11 pennies

5. 25¢

4 nickels and 5 pennies,
3 nickels and 10 pennies,
2 nickels and 15 pennies,
1 nickel and 20 pennies

Answer Key

Challenge! Thad has money for games at the fair. He has 27¢ in pennies. He wants to play at least 10 games of penny toss and some nickel races. How many nickel races can he play and keep at least 10¢ for penny toss? Draw or use words to explain.

Challenge: (Sample) He could use 3 nickels for the nickel race and have 12 pennies for the penny toss.

LESSON 9

Objective

Know the relationships between the penny, nickel, and dime.

Common Core State Standards

- **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Measurement and Data

Penny, Nickel, and Dime

With an understanding of the penny and the nickel and the relationship between them, children expand their work with money to include the dime. They perform counting, exchanging, and adding operations with all three coins. Coin Tiles can help children visualize these operations.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How many pennies equal a dime? How many dime tiles do we have on the Hundred Board?* On the board, write *10 + 10 + 10 + 10 = 40*.
- **Ask:** *How many pennies equal a nickel? How many nickel tiles do we have on the Hundred Board?* On the board, write *40 + 5 = 45*.
- **Ask:** *How many penny tiles do we have on the Hundred Board? Can you trade 3 pennies in for any other coin?* On the board, write *45 + 3 = 48¢*.

Solve It

With children, reread the problem. Have children use dime, nickel, and penny tiles to find a different way to make 48¢, and draw the coins that Chelsea can trade her pennies for. Have children write the value of the coins as a number sentence.

More Ideas

For other ways to teach about the relationships between pennies, nickels, and dimes—

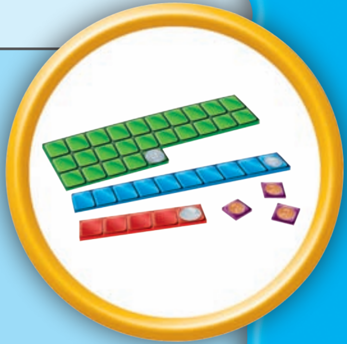
- Give pairs an assortment of Coin Tiles. Have one child take the penny tiles and trade as many as possible for nickel tiles. Have the other child take the remaining nickel tiles and trade as many as possible for dime tiles. Have the pair determine the combined value of their tiles.
- Have pairs number a Four-Section Spinner (BLM 14) 1–4. Have them spin it three times to determine the numbers of penny, nickel, and dime Coin Tiles to take from a pile. Then have children place the tiles on a Hundred Board and tell how much money they have. Have them write a number sentence to represent the coins.

Formative Assessment

Have children try the following problem.

How many dimes can be traded for 6 nickels?

A. 2 **B.** 3 **C.** 12



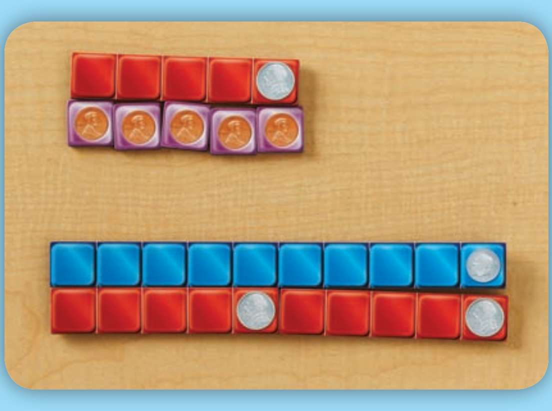
Try It! 30 minutes | Pairs

Here is a problem about the relationships between pennies, nickels, and dimes.

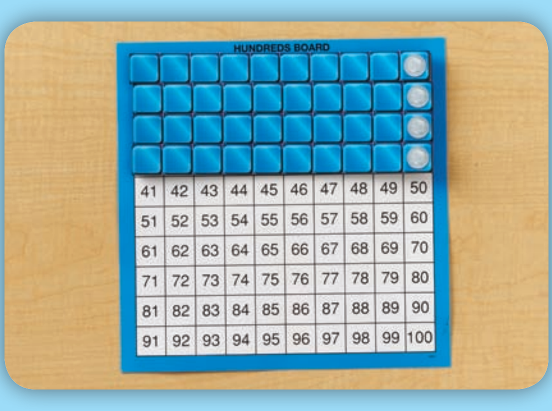
Chelsea emptied her coin bank and sorted the coins. She had 48 pennies. She wants to exchange the pennies for nickels and dimes so she will have fewer coins. How many pennies will she have after the trade? If she wants the least possible number of coins, how many nickels and dimes will she get in the trade?

Introduce the problem. Then have children do the activity to solve the problem. Distribute Coin Tiles, Hundred Boards, paper, pencils, and crayons to children.

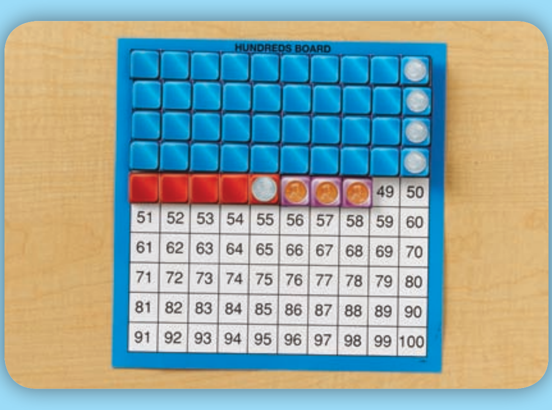
Materials
- Coin Tiles (1 set per pair)
- Hundred Boards (1 per pair)
- paper (1 sheet per pair)
- pencils (1 per child)
- crayons (1 set per pair)



1. Say: *We know that there are 5 pennies in 1 nickel.* **Ask:** *How much is 1 dime worth?* **Say:** *Show how many pennies equal 1 dime by placing penny tiles next to a dime tile. Show how many nickels equal 1 dime by placing nickel tiles next to a dime tile.*



2. Say: *Chelsea wants to trade 48 pennies for nickels and dimes. Find 48 on the Hundred Board. Pretend that each square is a penny.* **Ask:** *How many pennies can Chelsea trade for a dime?* **Say:** *Take 1 dime tile and place it over 10 pennies. Repeat this until you don't have enough pennies to trade for another dime.*



3. Ask: *How many pennies are left? Can you trade any pennies for a nickel?* **Say:** *Place a nickel tile and penny tiles on the spaces that are left.* **Ask:** *How many pennies, nickels, and dimes can Chelsea trade her 48 pennies for?*

⚠ Look Out!

Watch for children who are struggling with seeing the type of coin that pennies can be traded for. Explain that trading for the greatest coins possible makes carrying and counting the coins easier. Remind them that each row on the Hundred Board is worth 10 cents and that counting dimes is like counting by tens.

Answer Key

Use Coin Tiles and a Hundred Board. Build the model. Circle the coins you can trade for.

(Check students' work.)

1. 35 pennies

3 dimes, 1 nickel

					36	37	38	39	40

Use Coin Tiles and a Hundred Board. Build a model. Draw the model. Circle the coins you can trade for.

2. 3 nickels and 12 pennies

2 dimes, 1 nickel

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

Circle the coins you would use to pay for the item.

3. an apple that costs 34¢

3 dimes and 4 pennies, or 2 dimes, 2 nickels, and 4 pennies

4. a cookie that costs 27¢

2 dimes, 1 nickel, and 2 pennies

Write the total amount.

5.

= 32¢ ¢

6.

= 26¢ ¢

Answer Key

Challenge! Hoda has 8 coins that equal 43 cents. She has 3 pennies. What are her other coins? Use the Hundred Board and Coin Tiles. Draw or write the 8 coins she has.

Challenge: 3 dimes, 2 nickels, and 3 pennies

LESSON 10

Objective

Know the quarter.

Common Core State Standards

- **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Measurement and Data

Understanding Quarters

When they're ready, children will relate their knowledge of the penny, nickel, and dime to the quarter. Since there are various coin combinations that are equivalent to a quarter, children will need to have a good understanding of the previous coins before advancing to the quarter. With the quarter being $\frac{1}{4}$, or 0.25, of a dollar, children will be able to carry their understanding of quarters into their study of fractions and decimals.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How many spaces do the 3 quarter tiles cover on the Hundred Board? How much are 3 quarters worth? Where should you place the 4 dime tiles? How many rows do the 4 dimes cover?* **Say:** *Now you need to decide how many nickels you can trade for the amount that is left.*
- **Ask:** *How much of the 75¢ is left? How many nickels can be traded for 35 cents?* **Say:** *Place 7 nickel tiles on the remaining quarter tiles.* **Ask:** *Is there any part of the 75¢ left?* **Say:** *Sophie should give the boy 4 dimes and 7 nickels for his 3 quarters.*

Solve It

With children, reread the problem. **Ask:** *What if the boy asked for 3 dimes and the rest nickels? How many dimes and nickels would Sophie give the boy?* Have children use Coin Tiles on the Hundred Board to show the change and write or draw the number of dimes and nickels.

More Ideas

For other ways to teach about quarters—

- Have pairs use the Four-Section Spinner (BLM 14) and draw a penny (purple circle), a nickel (red circle), a dime (blue circle), and a quarter (green circle) in the 4 sections. Have one child spin 4 times and show the coins with tiles on the Hundred Board. Have the second child tell the amount of the coins and tell another way to show the same amount. Switch roles and repeat.
- Have partners pick a number (25¢–99¢) from a bag. Have one child show that amount using penny, nickel, and dime tiles. Have the other child show the amount using penny, nickel, dime, and quarter tiles. Switch roles and repeat.

Formative Assessment

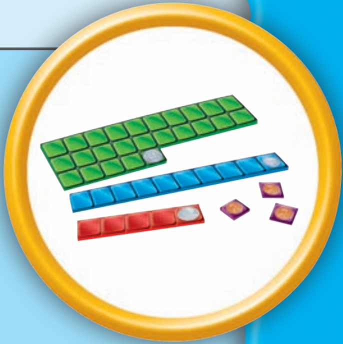
Have children try the following problem.

Which coins equal 2 quarters?

A. 2 dimes, 2 nickels, 10 pennies

B. 3 dimes, 1 nickel, 10 pennies

C. 3 dimes, 2 nickels, 10 pennies



Try It! 30 minutes | Pairs

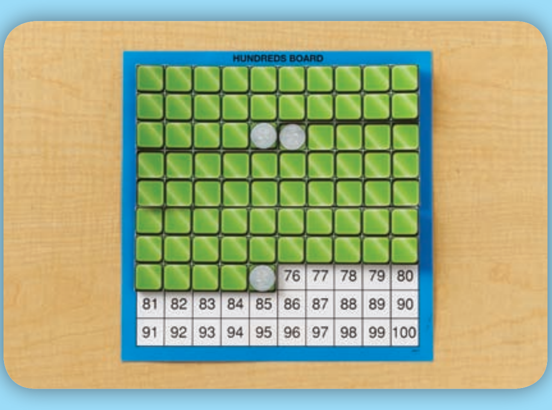
Here is a problem about understanding quarters.

Sophie was helping make change at the school fair. Children were using coins to play the games. Different games cost different amounts. Many of the children came with quarters and wanted change for the nickel and dime games. One boy gave Sophie 3 quarters and asked for 4 dimes and the rest nickels. How many dimes and nickels should Sophie give the boy?

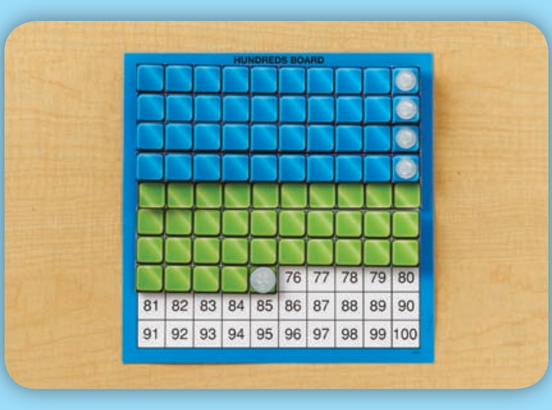
Introduce the problem. Then have children do the activity to solve the problem. Distribute Coin Tiles, Hundred Boards, paper, pencils, and crayons to children.

Materials

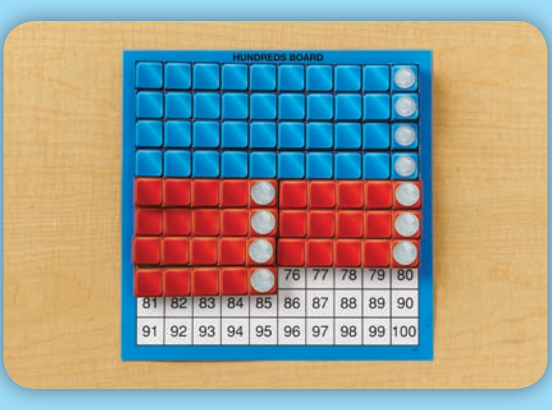
- Coin Tiles (1 set per pair)
- Hundred Boards (1 per pair)
- paper (1 sheet per pair)
- pencils (1 per child)
- crayons (1 set per pair)



1. Ask: *How much is a quarter worth?* Have children place dime, nickel, and penny tiles on top of a quarter tile to explore which coins equal a quarter. **Say:** *Since the boy gave Sophie 3 quarters, place 3 quarter tiles on the Hundred Board.* **Ask:** *How much are 3 quarters worth?*



2. Ask: *How many dimes did the boy ask for?* **Say:** *Use 4 dime tiles to cover part of the quarters on the Hundred Board.*



3. Ask: *How much is left of the 75 cents we started with? How many nickels can you make with the amount left?* **Say:** *Place nickel tiles on the remaining spaces to cover a total of 75 cents.*

⚠ Look Out!

Watch for children who are having difficulty trading coins for quarters. Since a quarter's value does not end in 0, this may be confusing for some children. Provide these children more time to place dime, nickel, and penny tiles on top of the quarter tiles.

Answer Key

Use Coin Tiles and a Hundred Board. Find the value of the coins.

(Check students' work.)

1.

= 60¢

2.

= 48¢

3.

= 69¢

4.

= 96¢

Draw the coins you would use to pay for the item.

5. a puzzle that costs 67¢

Possible answer:
2 quarters, 1 dime,
1 nickel, 2 pennies

6. a comic book that costs 88¢

Possible answer:
3 quarters, 1 dime,
3 pennies

Answer Key

Challenge! Josh has 6 coins in his pocket. The coins total 56¢. Draw the coins that are in his pocket.

Challenge: 1 quarter, 2 dimes, 2 nickels, and 1 penny

LESSON 11

Objective

Solve problems involving pennies, nickels, dimes, and quarters.

Common Core State Standards

- **2.MD.8** Solve word problems involving dollar bills, quarters, dimes, nickels, and pennies, using $ and ¢ symbols appropriately. *Example: If you have 2 dimes and 3 pennies, how many cents do you have?*

Solve Problems Involving Coins

An understanding of the relationships between pennies, nickels, dimes, and quarters is essential to solving problems involving coins, such as the problems that children will encounter in real life. Practice with Coin Tiles can help children build confidence in handling money. And with sufficient confidence, children will be able to use mental math to find solutions to problems involving coins.

Try It! *Perform the Try It! activity on the next page.*

Talk About It

Discuss the Try It! activity.

- **Ask:** *How much money did Jextin pay with? How can you find the total without using the Hundred Board? How much are 2 quarters worth? 4 dimes?* **Say:** *We can write this as 50 + 40 = 90¢.*
- **Ask:** *How much did the card cost? How much change did Jextin get?*
- **Say:** *When you find change, you are finding the difference between what is paid and the cost. You can "count up" from the cost to the amount paid to find the change. Jextin paid 90¢, and his card cost 83¢. To find his change, you count up from 83 to 90: 84, 85, 86, 87, 88, 89, 90. Since you counted out 7 ones, or pennies, the change is 7¢.*
- **Say:** *We also can find the amount of change by subtracting.* **Ask:** *How much is 90 minus 83? What coins can you use to make 7¢ change?*

Solve It

With children, reread the problem. Have children draw the coins Jextin started with and write the total amount. Then have them draw and write how much change Jextin received.

More Ideas

For another way to teach solving problems involving pennies, nickels, dimes, and quarters—

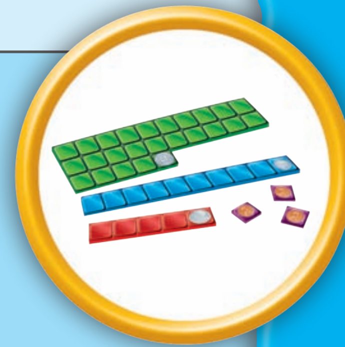
- Have pairs use Coin Tiles with the blank side of the Hundred Board. One child places Coin Tiles on the board. The other tells how many cents there are. The first child checks his/her partner's answer. Partners can double-check by placing the same Coin Tiles on the other side of the Hundred Board.

Formative Assessment

Have children try the following problem.

If you have 2 quarters, 2 dimes, 2 nickels, and 2 pennies, how much money do you have?

A. 72¢ **B.** 82¢ **C.** 87¢



Try It! 30 minutes | Pairs

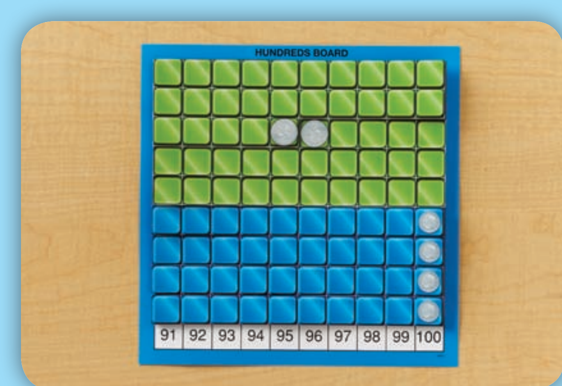
Here is a problem involving pennies, nickels, dimes, and quarters.

Jextin went to the card store. He found a card that cost 83¢. He paid for the card using 2 quarters and 4 dimes. How much change did Jextin receive?

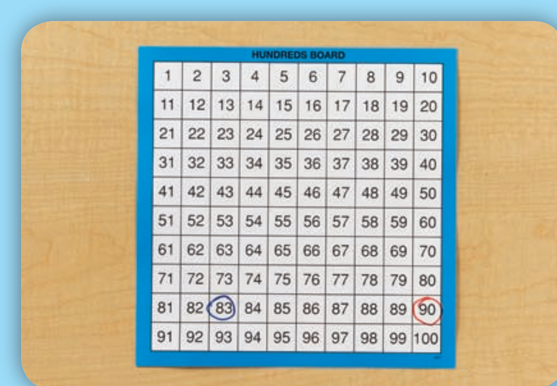
Introduce the problem. Then have children do the activity to solve the problem. Distribute Coin Tiles, Hundred Boards, paper, pencils, crayons, and markers to children.

Materials

- Coin Tiles (1 set per pair)
- Hundred Boards (1 per pair)
- paper (1 sheet per pair)
- pencils (1 per child)
- crayons (1 set per pair)
- dry erase markers (1 set per pair)



1. Say: *First let's put all the coins Jextin paid with on the Hundred Board. Start with the quarters, then add the dimes.* **Ask:** *How much money did Jextin pay?* Have children remove the tiles and circle 90 using a red crayon or dry erase marker.



2. Ask: *How much did Jextin's card cost?* Have children circle 83 on the Hundred Board using a blue crayon or dry erase marker.

3. Say: *The change Jextin received is the difference between the amount he paid and the cost. You need to count from the cost, 83¢, to the amount Jextin paid, 90¢. This is called "counting up." Find out how much change Jextin received.*

Look Out!

Watch for children who don't count the number of squares past the cost of the card. Remind them that the change is the extra that was paid, which is represented on the Hundred Board by the distance from the cost to the amount paid.

Answer Key

Use Coin Tiles and a Hundred Board. (Check students' work.)

1. Devin and Kevin want to buy a gift for their dad. Devin has 3 dimes, 1 nickel, and 3 pennies. Kevin has 1 quarter, 1 dime, 3 nickels, and 4 pennies. How much do they have together for the gift?

__38__ + __54__ = __92¢__

Circle the price. Color the amount paid. Find the change.

2. Price 57¢; amount paid 75¢.

57 circled, 75 colored, change: 18¢

change: ______¢

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

3. Price 72¢; amount paid 80¢.

72 circled, 80 colored, change: 8¢

change: ______¢

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

4. Write the change for each row.

Price	Paid	Change
55¢		20¢
63¢		7¢
94¢		1¢
33¢		17¢

Answer Key

Challenge! Phillip has 2 dimes, 4 nickels, and 3 pennies. Lauren has 1 quarter, 1 nickel, and 9 pennies. How much does each person have? Who has more money?

Challenge: Phillip: 43¢, Lauren: 39¢; Phillip has more money than Lauren.