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# Hands-On Standards®

TEACHING MATH WITH MANIPULATIVES

# SAMPLE
# LESSON BROCHURE

Grades
**PreK–2**

*"Manipulatives are powerful representation tools. Their use has the potential to help learners develop mathematics concepts, understand procedures, and engage in the mathematics they are learning"*

— Frances "Skip" Fennell,
Former NCTM President

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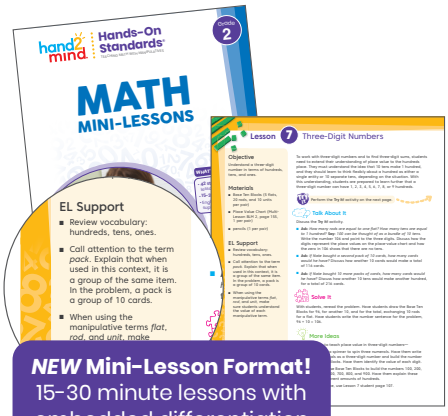
# Confidently Teach Math with Manipulatives to Build Problem-Solving Skills!

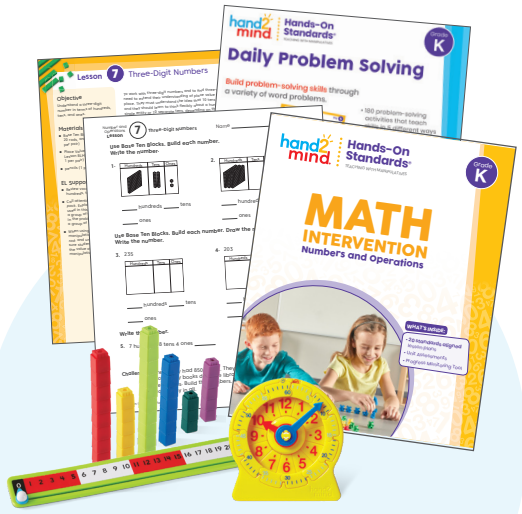
***Now Available!***

**Grades K–2**

Hands-On Standards is designed to deepen understanding of key math concepts using manipulatives and scaffolded lessons to seamlessly transition from the concrete to the abstract.




***NEW* Mini-Lesson Format!**
15–30 minute lessons with embedded differentiation and EL support.

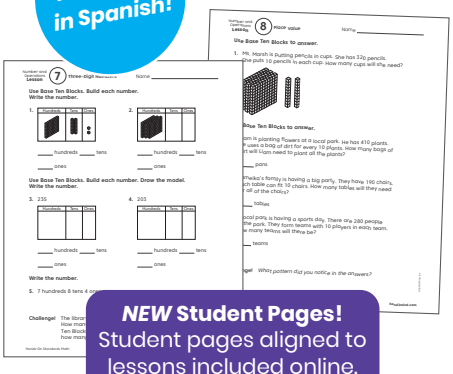



***A New and Improved Hands-On Standards***


***NEW* Problem-Solving Routine!**
A progressing series of problem types focused around key grade-level skills.

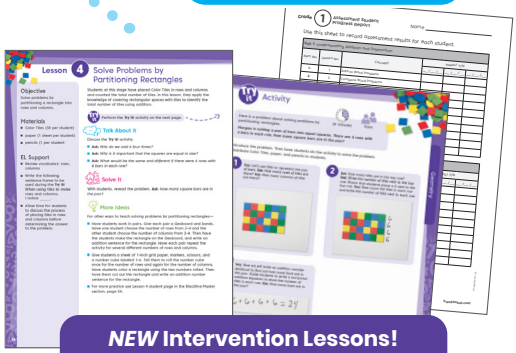

***NEW* Manipulatives Added!**
NEW manipulatives like the NumberLine™ Clock help students master rigorous standards.

**Available in Spanish!**



***NEW* Student Pages!**
Student pages aligned to lessons included online.

***Available in Two Topics: Numbers and Operations and Geometry Measurement, and Data***



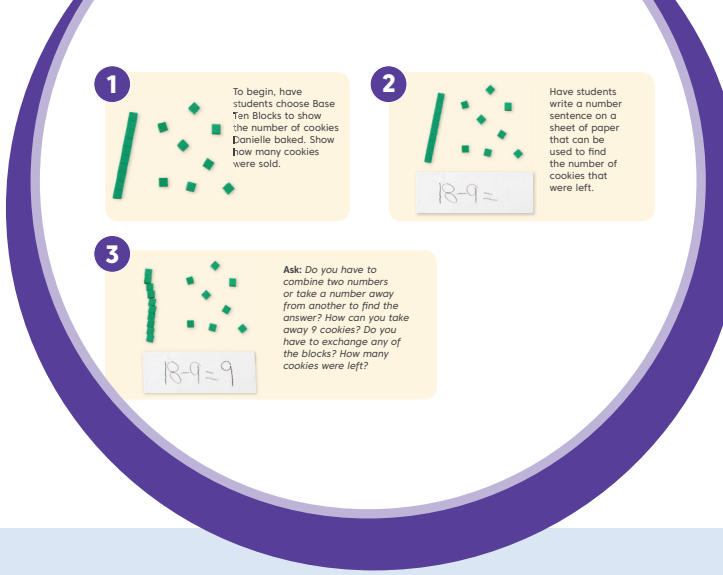

***NEW* Intervention Lessons!**
20 targeted lessons that match the mini-lesson format and include assessment and progress monitoring tools.

**Connect with us.**

800.445.5985

Don't forget to share these exciting updates with your principal!
Visit **www.hand2mind.com/brands/hands-on-standards today!**

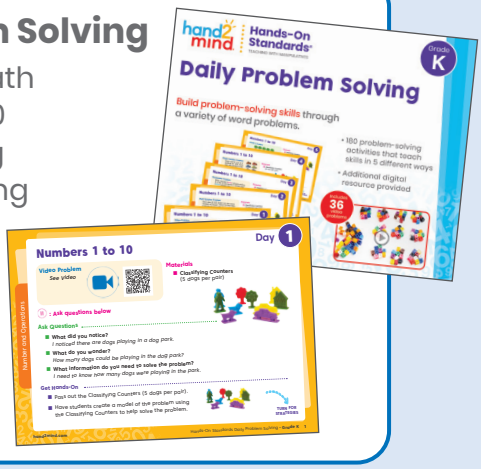
# Featuring photo-illustrated, step-by-step, guided lessons!




**Hands-On Standards®** reinforces key, grade-level math concepts and helps students deepen their understanding with hands-on manipulatives and activities.

## Daily Problem Solving

Provide daily math practice with 180 problem-solving activities covering 36 skills.




**Grades K–5**

## Math Mini-Lessons

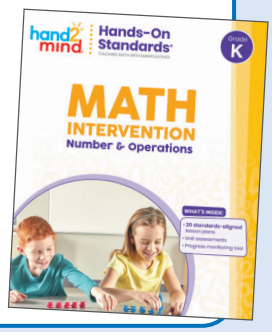
Supplement your math curriculum with 15–30 minute hands-on lessons that incorporate manipulatives.


**Grades PreK–8, Algebra**

## Math Intervention

- **Number & Operations**
- **Geometry, Measurement & Data**

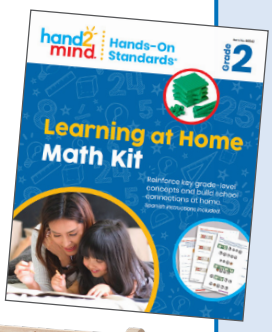
Target challenging math concepts with hands-on math lessons.




**Grades K–5**

## Learning at Home

Provide fun, engaging math practice that extends the learning and makes understanding math accessible for all students.




**Grades K–5**

Learn more about the Hands-On Standards line of products at **hand2mind.com/hos**

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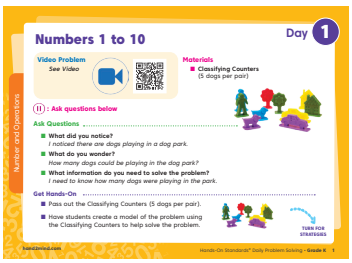
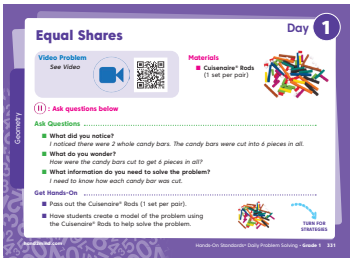
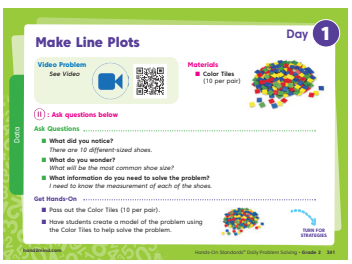
# DAILY PROBLEM SOLVING

## Day 1 Problem-Solving Video Examples

| Grade | Strand | QR Code | Question |
|---|---|---|---|
| K |  | | How many dogs could there be in all? |
| 1 |  | | How were the candy bars cut to get 6 pieces in all? |
| 2 |  | | What will be the most common shoe size? |

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# MATH MINI-LESSONS

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# Hands-On Standards®

TEACHING MATH WITH MANIPULATIVES

## PreK TOC

### Number and Operations



### Measurement



### Data



### Geometry



## Kindergarten TOC

### Number and Operations



### Measurement



### Data



### Geometry

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# Hands-On Standards®

TEACHING MATH WITH MANIPULATIVES

## First Grade TOC

### Number and Operations

- Solve Addition Sentences
- Solve Subtraction Sentences
- Explore Counting On
- Explore Counting Back
- Communicative Property
- Associative Property
- Make 10 to Add
- Make 10 to Subtract
- Add Doubles
- Add Three Numbers
- Find Missing Addends
- Find Missing Subtraheads
- Connect Addition to Subtraction
- Comparison Problems
- Understanding the Equal Sign
- True and False Equations
- Read and Write Numbers to 120
- Write Numbers to 100
- Write Numbers to 120
- Explore Place Value
- Compare Two-Digit Numbers
- Order Numbers
- 10 More, 10 Less
- Add Two-Digit Numbers
- Add Two-Digit and One-Digit Numbers
- Subtract 6 Multiple of 10
- Subtract Tens from a Two-Digit Number

### Measurement

- Compare Lengths
- Sort Objects Longest to Shortest
- Sort Objects Shortest to Longest
- Estimate and Measure
- Measure Length
- Time to the Hour
- Tell Digital Time in Hours
- Tell Time in Half Hour
- Analog and Digital Time to the Half Hour
- Spatial Relationships
- Shapes in Different Perspectives
- Geometry and Numbers

### Data

- Bar Graphs
- Pictographs
- Interpret Pictographs

### Geometry

- Build Shapes
- Combine Shapes
- Compose Three-Dimensional Shapes
- Equal Shares of Rectangles

## Second Grade TOC

### Number and Operations

- Addition and Subtraction
- Write Number Sentences
- Use Double Facts
- Make a Ten
- Identify Even and Odd Numbers
- Even and Odd Number Patterns
- Three-Digit Numbers
- Place Value
- Skip Counting by 10s and 100s
- Represent Numbers
- Numbers in Different Forms
- Compare Three-Digit Numbers
- Compare and Order Three-Digit Numbers Add 10 or 100
- Subtract 10 or 100
- Add or Subtract Within 100
- Add Two-Digit Numbers
- Add Three or More Two-Digit Numbers
- Add or Subtract Within 100
- Add or Subtract Within 1000
- Explain Addition and Subtraction Strategies
- Write Repeated Addition Sentences
- Repeated Addition of Groups of Numbers
- Subtract Tens from a Two-Digit Number

### Measurement

- Choosing a Unit
- Standard Units
- Inches and Feet
- Estimate and Measure
- Compare and Measure
- Solve Word Problems Using Length
- Whole Numbers as Lengths on a Number Line
- Time to 5 Minutes
- Tell Time to the Minute
- Penny, Nickel, and Dime
- Understand Quarters
- Solve Problems Involving Coins

### Data

- Use Plots
- Make Picture and Bar Graphs
- Use Graphs to Solve Problems

### Geometry

- Identify Shapes

# Lesson 5 Measure Length

## Objective

Understand that the length measurement of an object is the number of same-size length units that span it with no gaps or overlaps.

## Materials

- Color Tiles (1 set per pair)
- book (1 per pair)

## EL Support

- Introduce vocabulary: unit, nonstandard units, gaps, overlaps.
- Review vocabulary: length.
- Demonstrate leaving gaps between the Color Tiles and overlapping the Color Tiles. Review with students that the Color Tiles should be touching but not overlapping.
- Write the following sentence frame to be used during the **Try It!** _____ is as long as _____ Color Tiles.

Students learn about the meaning of measurement with hands-on activities. In this lesson, students use nonstandard objects to measure other objects. However, it is important to learn to measure correctly. Measuring skills will help students as they move to standard units of measurement.

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

## Talk About It

- Discuss with students the need to line the first Color Tile up with the edge of the notebook. **Ask:** *What would happen if I did not start the first tile at the edge of the notebook?*
- Arrange several Color Tiles along the length of the notebook so that two Color Tiles overlap and the rest do not touch each other. **Ask:** *Do you think this will give an accurate measurement of the length of the notebook? What should I change to get the correct measurement?*
- Have students list other items they could use to measure length. You may want to suggest erasers, Pattern Blocks, or paper clips. **Ask:** *Do you think we would get the same measurement if we used different objects to measure?*

## Solve It

With students, reread the problem. Ask students to explain using the Color Tiles how they will know if the notebook will fit on the shelf. Summarize that the notebook will fit on the shelf if the shelf is the same length or longer than the notebook.

## More Ideas

For other ways to teach about using nonstandard units of measurement—

- Have students use the white or red Cuisenaire® Rods to measure a classroom object, such as a book or pencil case. Have students place the first Cuisenaire® Rod at the edge of the object and then line up the Cuisenaire® Rods so they touch each other.
- Distribute UniLink® Cubes to pairs of students. Have each pair use them to measure the length of a book or a desk. Remind students to line up the first UniLink® Cube with the edge of the item being measured. Have them write the length of the objects they measured.
- For more practice, use Lesson 5 student page 133.

# Try it Activity

30 minutes

Pairs

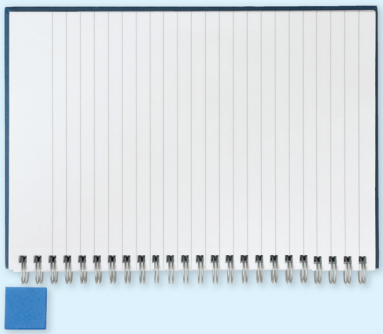
Here is a problem about measuring objects using nonstandard units.

***Hannah wants to put her notebook on a shelf. How can she find out if the notebook will fit on the shelf?***

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

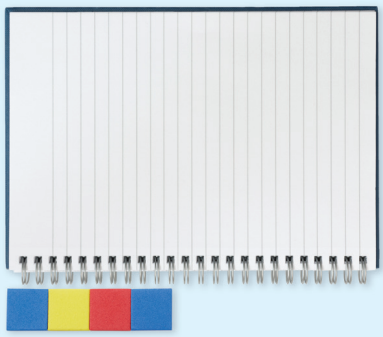
Have each pair select a notebook to measure. You may want to have all students use the same size notebook. Make sure the length of the notebook is a whole number of inches. Distribute Color Tiles to each pair.

## 1



**Say:** *We are going to measure one side of the notebook using Color Tiles. Place the first Color Tile at the left edge of the notebook.*

## 2



Have students place more Color Tiles along the side of the notebook. **Ask:** *How close should you place the Color Tiles? Why?* Make sure students understand that the Color Tiles have to be touching each other but not overlapping.

## 3

Have students place Color Tiles along the entire side of the notebook. Then have students write how many Color Tiles they used. **Ask:** *What does the number of Color Tiles tell you?*


## Look Out!

Watch for students who do not line the first Color Tile up with the edge of the notebook. Explain that they will not get an accurate measurement. Also watch for students who leave space between the Color Tiles. Remind students to slide the Color Tiles next to each other.

## Formative Assessment

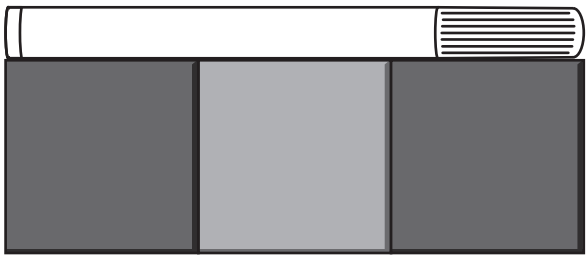
Have students try the following problem.

*Use Color Tiles to measure a crayon. Write your answer.*

Name _____

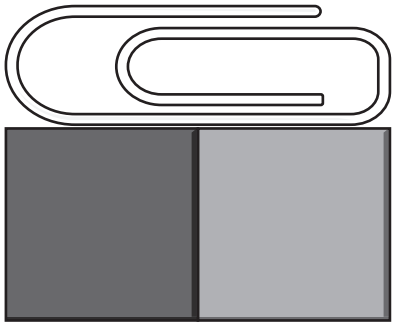
**Use Color Tiles to measure each length.**

**1.**



_____ Color Tiles

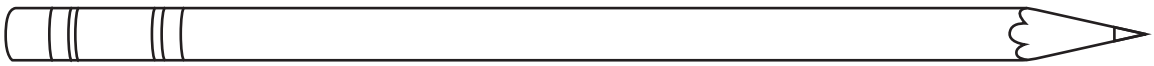
**2.**



_____ Color Tiles

**Use Color Tiles to measure each length.**

**3.**



_____ Color Tiles

**4.**

_____ Color Tiles

**Challenge!** Lee said that the length of his book is 12 units. Carly said the length of the same book is 16 units. Both say they started at the left edge and did not have any gaps or overlaps in their measurements. How can this be?

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# MATH INTERVENTION

## Geometry, Measurement & Data

# Lesson 4 Determine Length of Objects

## Objective

Express the length of an object as a whole number of units.

## Materials

- Color Tiles (1 set per pair)
- Measuring Objects Recording Sheet (Lesson 4, page 62, 1 per pair)
- pencil (1 per pair)

## EL Support

- Review vocabulary: longest, shortest, longer, shorter.
- Draw three relatively short lines on the board, aligned left, in size order from shortest on top to longest on bottom. Discuss the terms *short, shorter,* and *shortest* in relationship to the lines.
- Draw three longer lines on the board, again left aligned and arranged from shortest to longest from top to bottom. Have students describe these lines using the terms *long, longer*, and *longest*.

Students have had hands-on experience in comparing objects using both direct and indirect comparisons. Students will now use Color Tiles to measure an object to find its length. Using a nonstandard unit, such as Color Tiles, provides a simple way to introduce to students how to measure an object. Measuring with nonstandard units first will provide a solid building block for later on when they will be introduced to standard units.

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

## Talk About It

Discuss the **Try It!** activity.

- Tell students that they will use Color Tiles to measure the objects. Point out that all the tiles are the same size. **Say:** *The number of tiles used is how long the object is.*
- **Say:** *When you place the tiles, they must be touching each other side by side.* Explain the importance of placing the tiles side by side by demonstrating how leaving gaps or overlapping will not give an accurate measurement.
- **Ask:** *How do you know when to stop adding tiles?* Elicit that they should stop when the end of the tile is exactly above the end of the object they are measuring.

## Solve It

With students, reread the problem. **Ask:** *How many Color Tiles long is each item he found?* Have students use their tiles to explain.

## More Ideas

For other ways to teach determining the length of objects—

- Have students measure objects using white Cuisenaire® Rods. Choose objects ahead of time that are whole numbers of white rods long. You may also wish to draw objects of whole unit lengths for students to measure, such as a ribbon exactly 9 rods long. Remind students to place the rods side by side with no overlapping or gaps.
- Have students work in pairs. Each partner draws an object. Then have them switch papers and measure how long the drawing is using white Cuisenaire® Rods or Color Tiles. If needed, tell them to choose the number of rods or tiles it is closer to the end of the object.
- For more practice, use Lesson 4 student page 63.

# Try it Activity

30 minutes

Pairs

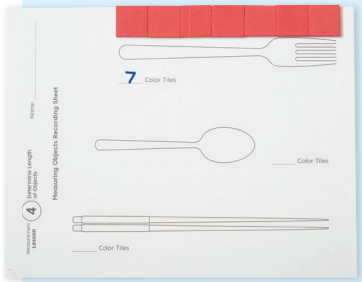
Here is a problem about determining the length of objects.

***Alex wants to measure some objects he found in his kitchen. How many Color Tiles long is each item he found?***

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

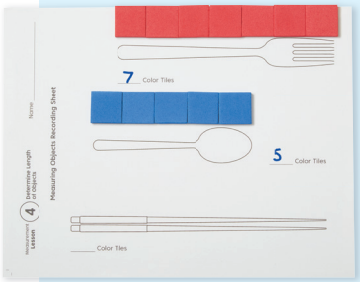
Distribute Color Tiles, recording sheets, and pencils to student pairs.

## 1




**Say:** *Let's measure the fork. Place one color tile above the left edge of the fork. Place another so that its edge touches the edge of the first tile.* Have students continue placing tiles. **Ask:** *How many tiles long is the fork?* Have students write the number of tiles on the recording sheet.

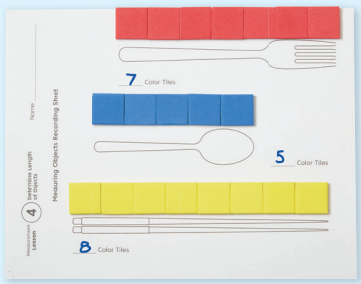
## 2




**Say:** *Now measure the spoon.* **Ask:** *What should you do first?* Guide students to start measuring by placing a tile above the left edge of the spoon. **Say:** *Continue placing tiles to measure the spoon.* **Ask:** *How many tiles long is the spoon?* Have students write the number of tiles on the recording sheet.

## 3

**Say:** *Now measure the chopsticks.* Have students place tiles to measure the length **Ask:** *How many tiles long are the chopsticks?* Have students write the number of tiles on the recording sheet.



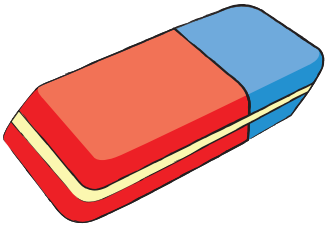

## Look Out!

Watch for students who line up the tiles correctly but miscount. Demonstrate how to start at one end and suggest they touch or point to each tile as they count across until they get to the last tile.

## Formative Assessment

Display an eraser. Have students try the following problem.

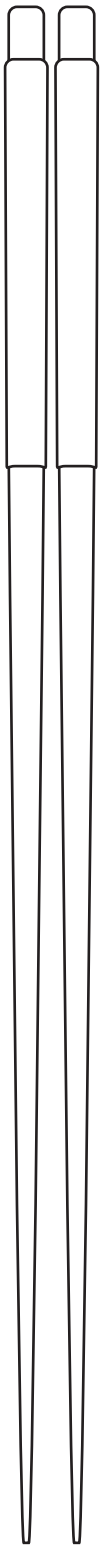
*How many Color Tiles long is the eraser? Write your answer.*



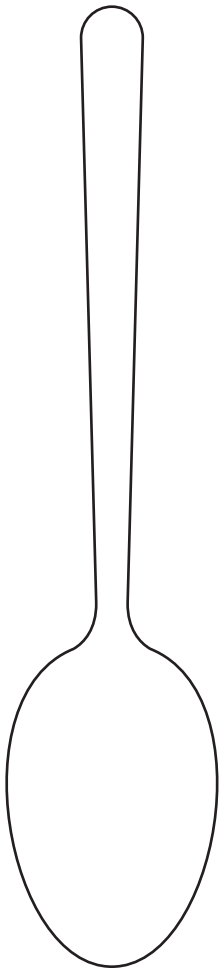
Name _____

## Measuring Objects Recording Sheet

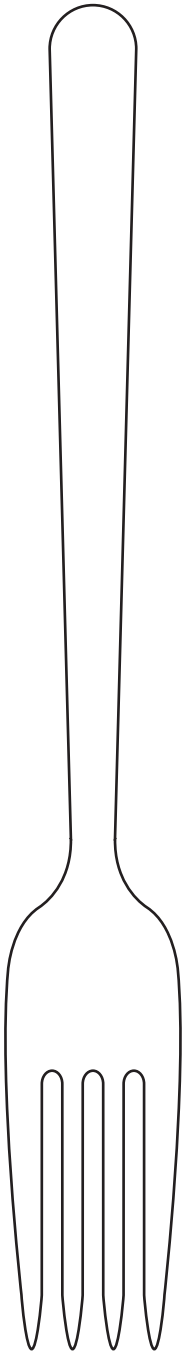
_____ Color Tiles



_____ Color Tiles



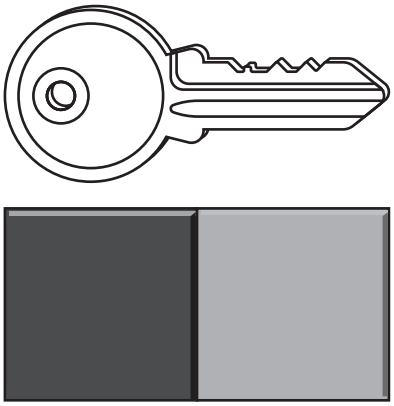
_____ Color Tiles



Name _____

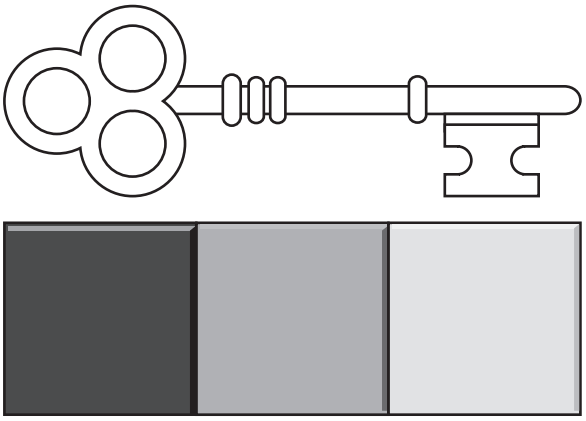
**Use Color Tiles to measure the length of each key.**

**1.**



_____ Color Tiles

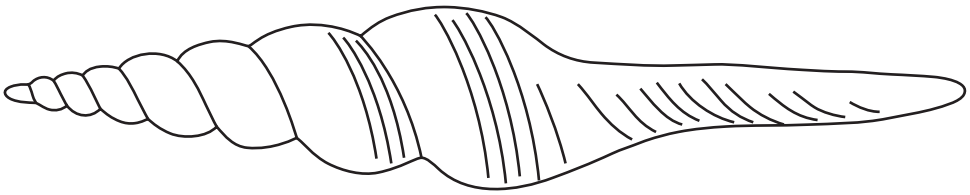
**2.**



_____ Color Tiles

**Use Color Tiles to measure the length of each shell.**

**3.**



_____ Color Tiles

**4.**

_____ Color Tiles

**Challenge!** Lynn measured the length of a bracelet and said it was 5 Color Tiles long. It was actually 8 Color Tiles long. What could she have done wrong?

# Grade 1 Assessment Student Progress Report

Name _____

Use this sheet to record assessment results for each student.

Easily track student progress at the Beginning, Middle, and End of the year!

| **Unit 1:** Geometry | | | | | |
|---|---|---|---|---|---|
| Item No. | Lesson No. | Concept | Meets | | |
| | | | __ /__ /__ | __ /__ /__ | |
| **1.** | 1 | Two-dimensional shapes and attributes. | | | |
| **2.** | 1 | Three-dimensional shapes and attributes. | | | |
| **3.** | 4 | Compose 3-D shapes using cubes. | | | |
| **4.** | 6 | Partition rectangles into fourths. | | | |
| **5.** | 2 | Create shapes based on attributes. | | | |
| **6.** | 3 | Compose 2-D shapes to build a composite shape. | | | |
| **7.** | 5 | Identify fourths and halves. | | | |
| **8.** | 4 | Compose 3-D shapes using cubes. | | | |
| **9.** | 6 | Understand that more equal shares means smaller pieces of a whole. | | | |
| **10.** | 2 | Create shapes based on attributes. | | | |

| **Unit 2:** Measurement | | | | | |
|---|---|---|---|---|---|
| Item No. | Lesson No. | Concept | Meets? Y/N | | |
| | | | __ /__ /__ | __ /__ /__ | __ /__ /__ |
| **1.** | 1 | Order three objects by length. | | | |
| **2.** | 2 | Use objects to show lengths between two objects. | | | |
| **3.** | 3 | Determine if a object is longer or shorter. | | | |
| **4.** | 4 | Measure the length of an object. | | | |
| **5.** | 5 | Use different-size units to measure length. | | | |
| **6.** | 6 | Tell time to the hour. | | | |
| **7.** | 7 | Tell time to the half hour. | | | |
| **8.** | 8 | Tell and write time to the half hour using analog and digital clocks. | | | |
| **9.** | 8 | Tell and write time to the hour using analog and digital clocks. | | | |
| **10.** | 5 | Use different-size units to measure length. | | | |

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# Hands-On Standards®

TEACHING MATH WITH MANIPULATIVES

## Kindergarten TOC

### Geometry



### Measurement



### Data



## First Grade TOC

### Geometry



### Measurement



### Data



## Second Grade TOC

### Geometry



### Measurement



### Data

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TEACHING MATH WITH MANIPULATIVES

# MATH INTERVENTION

## Number & Operations

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# Hands-On Standards®

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## Kindergarten TOC

### Numbers to 5

- Read and Write Numbers to 5
- Count Objects to 5
- Count Sets of Objects to 5
- Make a Set with One or More up to 5

### Numbers to 20 and Beyond

- Read and Write Numbers 6 to 10
- Count Objects to 10
- Make a Set with 1 More
- Compose and Decompose Numbers to 10
- Find Ways to Make 10
- Read and Write Numbers to 20
- Count Objects to 20
- Compose and Decompose Numbers to 20
- Count Objects to 100

### Comparing Numbers

- Make a Set of 1 or More and Compare
- Compare Sets of Objects to 10
- Compare Numbers to 10
- Adding and Subtracting
- Add and Subtract Using + or -
- Add or Subtract with Number Sentences
- Make 10 Using Number Sentences

## First Grade TOC

### Understanding Addition and Subtraction

- Solve Add-to and Take-from Word Problems
- Solve Put-Together and Take-Apart Word Problems
- Solve Compare Word Problems
- Solve Word Problems with Addends

### Using Strategies to Add and Subtract

- Related Facts
- Group to Add
- Think Addition
- Count On and Count Back
- Make 10 to Add or Subtract
- Use Doubles to Add or Subtract
- Equal Sign

### Creating, Comparing, and Place Value

- Teen Numbers
- Represent Two-Digit Numbers
- Read, Write, and Represent Numbers to 100
- Decompose Numbers
- Compare Numbers

### Adding and Subtracting Beyond 20

- Add a Two-Digit and One-Digit Number
- 10 More or 10 Less
- Add a Multiple of 10
- Subtract a Multiple of 10

## Second Grade TOC

### Adding and Subtracting Within 1000

- Use Strategies to Add and Subtract
- Explain Addition and Subtraction Strategies
- Solve One-Step Add-to Problems
- Solve One-Step Take-from Problems
- Solve Two-Step Word Problems

### Place Value, Counting, and Comparing

- Three-Digit Numbers and Their Values
- Explore Three-Digit Numbers
- Writing Numbers in Different Forms
- Greater Than, Less Than, Equal to

### Foundations of Multiplication

- Odd or Even
- Odd or Even and Doubles
- Skip-Count by 5s, 10s, or 100s
- Build Arrays

### Adding and Subtracting Beyond 100

- Use Mental Math to Add and Subtract
- Use Place Value to Add Three or More Numbers
- Use Properties to Add
- Add Hundreds, Tens, Ones
- Subtract Hundreds, Tens, Ones
- Addition to 1000

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***— Skip Fennell***

Skip Fennell is an industry-leading author, speaker, and educator who has dedicated his professional life to mathematics and has greatly influenced what and how math is taught in today's classroom. Fennell served as President of the National Council for the Teaching of Mathematics (NCTM) from 2006-2008 and was a founding member of the Association of Mathematics Teacher Educators.

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