



**Hands-On
Standards®**

TEACHING MATH WITH MANIPULATIVES

MATH

MINI LESSONS



Pre-K Mini Lessons TOC

Number and Operations

Groups of 0-5
Groups of 6-10
Compare Groups
Count On
Part-Part-Whole
Use the Plus Sign
Decompose Numbers
Use the Minus Sign
Position of Objects
Represent Numbers with Objects
Addition: Sums to 10
Difference from 10
Sums and Differences
Identify Halves
Sort by One Attribute
Sort by Two Attributes
Determine the Sorting Rule
Extend Color Patterns
Extend Shape Patterns
Extend Growing Patterns

Measurement

Nonstandard Measurement of Height
Use Words to Compare Attributes
Sort by Height and Length
Estimate and Measure Length
Explore Area

Data

Explore Pictographs
Explore Bar Graphs
Cube Tallies
Spinner Probabilities

Geometry

Attributes of Plane Shapes
Plane Shapes and Real-Life Objects
Shape Attributes of Solid Shapes
Geometric Figures and Designs
Transformations
Spatial Relationships
Shapes in Different Perspectives
Geometry and Numbers

Kindergarten Mini Lessons TOC

Number and Operations

Count On
Groups of 0 to 10
Number Shapes
Count to 5 and Back
Estimate and Check
Arrange Sets of Objects
Represent Numbers with Objects
Compare Groups
Equal Groups
More and Fewer
More Than, Less Than, Same As
Order of Numbers
Groups 11 to 29
Count to 100 by Ones
Count to 100 by Tens
Solve Joining Problems
Use the Addition Symbol
Sums to 10
Differences to 10
Part-Part-Whole
Decompose Numbers
Make 10
Compose and Decompose Numbers to 10

Measurement

Measure Height
Sort by Height
Estimate and Measure Length
Sort by Length

Data

Sort by One Attribute
Sort by Two Attributes
Determine the Sorting Rule
Classify Objects

Geometry

Left and Right
Plane Shapes and Real-Life Objects
Create Geometric Pictures
Attributes of Plane Shapes
Cubes and Spheres
Explore Shape Attributes
Shape Attribute Riddles
Compose New Plane Shapes



Hands-On Standards®

TEACHING MATH WITH MANIPULATIVES

1st Grade Mini Lessons 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 Subtrahends
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 8 Multiples of 10
Subtract Tens from a Two-Digit Numbers

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

2nd Grade Mini Lessons 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 1,000
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 Two Lengths
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
Partition Rectangles
Recognize Fractions
Identify Unit Fractions

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.



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 touching 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.



Activity



30 minutes



Pairs

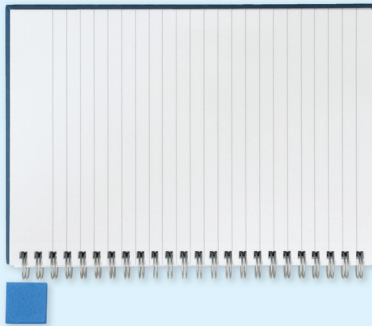
Here is a problem about measuring objects using nonstandard units.

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.

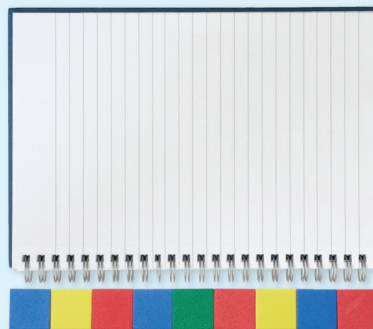
2



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?



9 Color Tiles

Formative Assessment Embedded!



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.

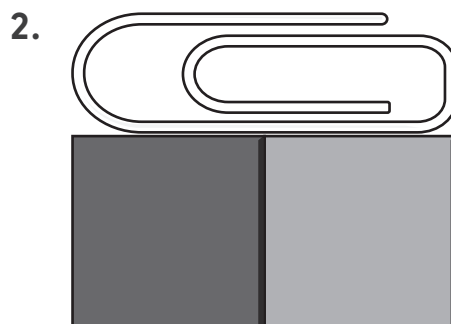
Use Color Tiles to measure a crayon. Write your answer.



Use Color Tiles to measure each length.

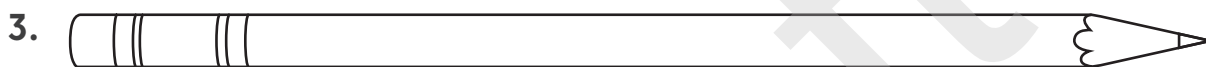


_____ Color Tiles



_____ Color Tiles

Use Color Tiles to measure each length.



_____ Color Tiles



_____ 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?