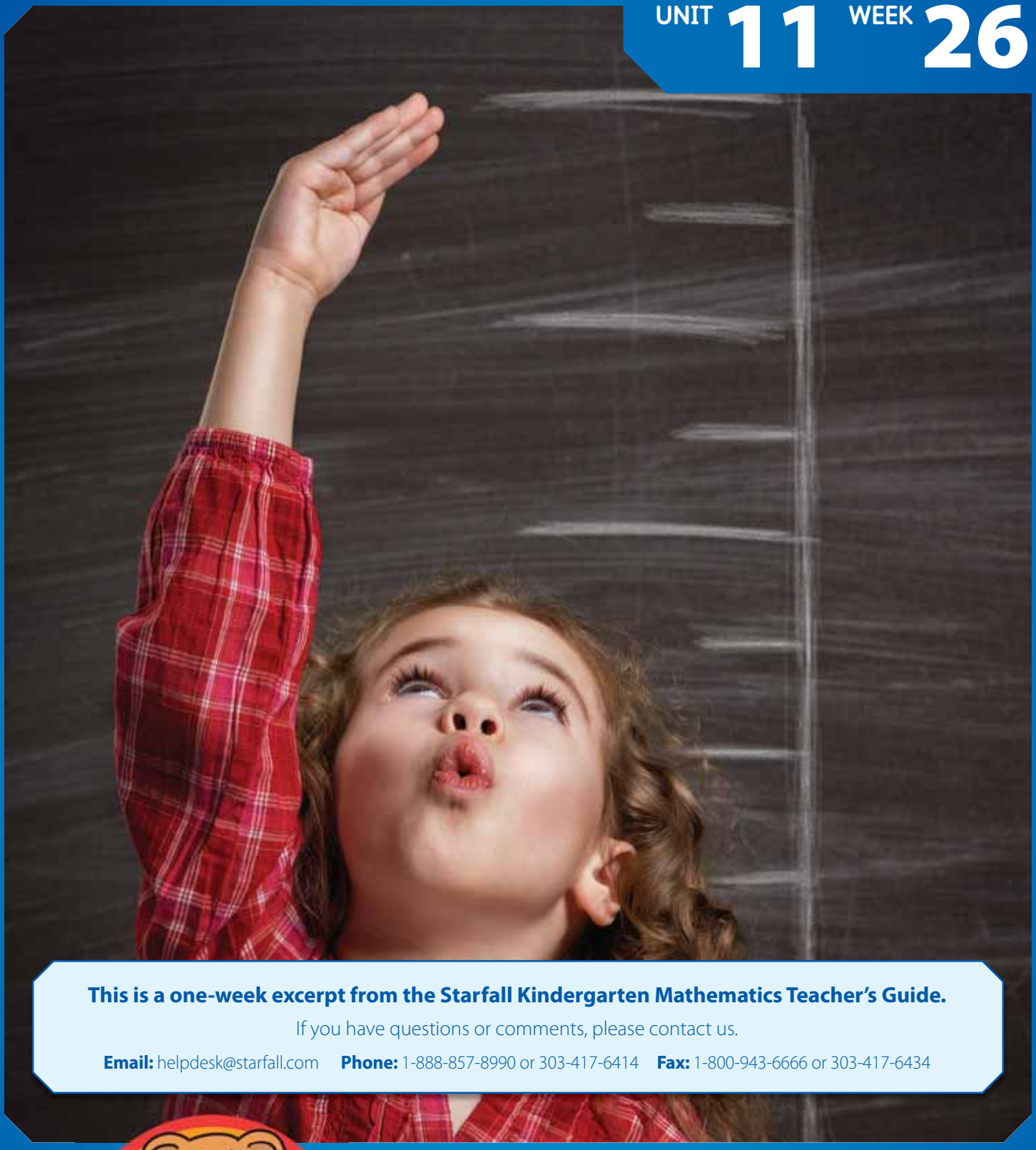
UNIT 11 WEEK 26



This is a one-week excerpt from the Starfall Kindergarten Mathematics Teacher's Guide.

If you have questions or comments, please contact us.

Email: helpdesk@starfall.com **Phone:** 1-888-857-8990 or 303-417-6414 **Fax:** 1-800-943-6666 or 303-417-6434

Starfall Kindergarten MATHEMATICS

Basic Measurement

Starfall Education Foundation
P.O. Box 359, Boulder, CO 80306

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Basic Measurement

Week 26

UNIT 11

WEEK 26

Week 26 Summary

This week the children will be introduced to perimeter and area. They will use their skills to predict whether various areas in their school and other classrooms are larger, smaller or the same size as theirs. They will make smart guesses to estimate area, using children as their units of measure. They will create inclines and experiment to determine what results adjustments to the inclines produce. The children will also:

- Classify measuring tools
- Match measuring tools to the people who use them
- Review subtraction facts
- Estimate surface area

Preparation

DAY 1

You will need a ramp (or a large piece of cardboard and a stack of books to create a ramp) and several toy cars. You will also need a variety of objects for the children to roll down the ramp.

DAY 2

The children will use two yardsticks for today's Magic Math Moment.

You will need a puzzle with enough pieces so that each child or set of partners has one piece.

The children will "tour" several areas or classrooms in your school for the purpose of comparing their areas to that of your classroom. Prepare a sheet of chart paper (to resemble the one pictured) with three columns labeled Area/Room, Prediction and Actual. The children will list the names of the rooms in the first column prior to their tour.

The children predict how each room or area compares with their own, using the words *same, larger,* and *smaller*. They will not actually measure the rooms. As they visit the other rooms they will discuss their findings.

Area/Room	Prediction	Actual
Cafeteria		
Bathroom		
Library		
Office		
Playground		
Gym		

DAY 3

You will need one large sheet of paper or a sticky note, and one small sticky note.

Duplicate a copy of the "Which Window is Bigger?" worksheet for each child. Prepare a set of windows to use for demonstration.

You will also need a set of 24 one-inch tiles, connect cubes or one-inch paper squares for each child.

DAY 4

You will use the Subtraction Equation Cards that are minus 1 in today's Magic Math Moment.

Prepare a "Mystery Box" by placing the Measuring Tools Picture Cards inside.

Prepare 5 sentence strips with the name of one measurement category (length/height, weight, capacity, time, temperature) on each strip.

DAY 5

Activity Center 1 — Navigate classroom computers to *Starfall.com*.

Activity Center 2 — Duplicate a Measuring Tiles worksheet for each child. The children will also use a die and crayons.

Activity Center 3 — The children will use 4 math mats that have been labeled with the measurement categories length/height, weight, capacity, time and temperature, or you may use the prepared sentence strips to label the math mats.

Activity Center 4 — Prepare materials for this week's Teacher's Choice Activity.

Summative Assessment — The children will find the area of a game board by cutting apart the tiles and gluing them on top. They will need pencils, scissors, and glue sticks.

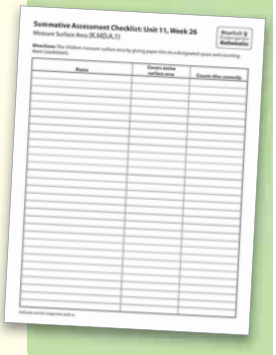
Duplicate a "Measuring Surface Area" worksheet and a Measuring Tiles worksheet (as used previously) for each child.

Prepare a copy of the Summative Assessment Checklist for Unit 11, Week 26.

Which Window Is Bigger? Worksheet

"Measuring Surface Area" Worksheet

Measuring Tiles Worksheet



Summative Assessment Unit 11 - Week 26

UNIT 11

WEEK 26

	DAY 1	DAY 2
Daily Routines	• Calendar • Weather • Number Line • Place Value • Hundreds Chart	
Magic Math Moment	Missing number	Number ranges
Math Concepts	Solve equations by providing the missing number Measure how far toy cars roll down inclines Experiment with height of inclines	Name numbers that come between two other numbers Introduce Perimeter and Area Predict and compare room area (larger, smaller, same)
Formative / Summative Assessment	Create ramps (inclines) and experiment with their heights	Discuss reasons for variations in room areas
Workbooks & Media		

DAY 3	DAY 4	DAY 5
• Calendar • Weather • Number Line	• Place Value • Hundreds Chart	
Estimate surface area	Subtraction flash cards	**Learning Centers** *Starfall.com:* • Monthly Calendar • Geometry & Measurement: "Measurement," Add & Subtract: "Subtraction Practice," and "Make 10" (1)
Review positional words Compare surface area Estimate area of a classroom space (smart guesses)	Review subtraction facts Match measuring tools to their uses Classify measurement tools	Toss and Color (2)
Measure surface area	Match measuring tools to the people who use them	Categorize Measurement Picture Cards (3)
Starfall.com: Geometry & Measurement, "Make Shapes" "Which Window is Bigger?"		Teacher's Choice (4)
		Summative Assessment: Measure the surface area of a game board (5) Grid Paper Worksheet "Measuring Surface Area" Worksheet

Magic Math Moment

Missing Number

Materials
- ☐ None

Write the following equations on a whiteboard. The children recall strategies they can use to determine the missing numbers, then use the strategies to solve the equations.

- 5 + _____ = 9
- 10 = 6 + _____
- 3 + _____ = 8
- _____ + 6 = 6

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.

Measurement & Data

MD.3 - Measure using nonstandard units.

Measure Distance

Materials
- ☐ Toy cars
- ☐ Cardboard and a stack of books (or a ramp)
- ☐ Masking tape
- ☐ Connect cubes
- ☐ Objects to roll down the ramps (marbles, pencils, dice, crayons)

1 How Far Will It Roll?

Say: **Today let's measure how far a toy car will roll down a ramp!**

- Create an incline or ramp using a piece of cardboard and a short stack of books
- Indicate the end of the incline with a strip of masking tape.
- Release a toy car at the top of the incline, and the children watch it roll.
- Mark the car's stopping point with another small piece of masking tape.
- Use connect cubes to measure the distance between the two pieces of masking tape.

Engage the children in a discussion about the demonstration. Ask: **What could we do to cause the toy car to roll farther?**

The children experiment and should realize that if the incline is raised, the car will roll faster and farther.

- **What would happen if we used something other than a toy car?**
- **Do you think it would roll as far? Why or why not?**

Volunteers increase the incline and choose different objects to roll down the ramp. Repeat the above activity then discuss how the results differed from the initial demonstration.

Formative Assessment

Measure in Groups

Divide the class into several small groups.

Provide the groups with materials to build ramps, strips of masking tape, and objects to roll such as balls, pencils, small cars, and dice. The groups each build their own ramps and experiment, rolling various objects down the ramps and measuring how far they roll.

Gather the children to share their experiences.

Magic Math Moment

Number Ranges

Materials
- ☐ 2 yardsticks

Say: **Let's see if you can find a number that is between two other numbers. Use the Classroom Number Line as a strategy to find the answer. Ready? Name a number between:**

- **0 and 10**
- **11 and 20**
- **21 and 30**
- **31 and 40**

If the children need assistance to answer, two classmates point yardsticks at the first and last numbers of each pair to define the range.

Counting & Cardinality

CC.2 - Supply missing number in a sequence.

Measurement & Data

A.2 - Compare two objects with a common measurable attribute.

Estimation

E.1 - Understand the meaning of estimation.

Classroom Size Comparison

Materials
- ☐ Jigsaw puzzle piece for each child or pair of children
- ☐ Paper, pencil
- ☐ Prepared chart paper

Essential Question: *How can we use measurement to describe and compare objects?*

1 Introduce Perimeter and Area

Gather the children in a circle and display pieces of a jigsaw puzzle.

Ask: **Would you like to know a quick way to put together a puzzle? Put all the pieces with flat edges together to make a "frame" for the puzzle first then work to put the inside of the puzzle together.**

Distribute a puzzle piece to each child.

Say: **Children who have a puzzle piece that has at least one flat edge bring it to the center of the circle.** Assist the children in putting together the frame of the puzzle.

Say: **Now we have the frame. Mathematicians call this a *perimeter*. Say, *perimeter*.** (Children repeat, *perimeter*.) **The perimeter is the distance around the outside of a shape.** Indicate the perimeter of the puzzle.

Continue: **If you still have a puzzle piece, place it inside the puzzle.** If there is time, assist the children to put the puzzle together. If you do not have time to complete the puzzle, explain that if all these pieces were put together they would form the inside of the puzzle.

Say: **The *area* is the amount of space inside the shape. Say, *area*.** (Children repeat, *area*.)

2 Room Area

Say: **Long ago children went to school in one-room schoolhouses. It didn't matter what grade the children were in. They could be in kindergarten or fifth grade. There was only one room where all the children learned together. Does our school have just one classroom for all the children?** (Volunteers respond.) **Right, in our school each grade has its own classroom. Why don't we have one-room schoolhouses anymore?** Allow the children to briefly discuss.

Explain: **Our school is divided into many different spaces, or areas. Area means the space of an object or room. Take a look around our classroom. The space inside the walls of our classroom is the area in which we work. I wonder if the other rooms, or areas, in our school are the same size as our classroom, or if they are bigger or smaller than our classroom.**

3 Introduce the Prediction Chart

Indicate the prepared prediction chart and discuss the columns.

Say: **Let's make a list of all the different areas or rooms in our school. Then we will predict if each one is, larger, smaller, or the same size as our classroom.** Write the areas or classrooms, along with predictions as volunteers suggest them. Assist as necessary.

Take the prediction chart and a pencil with you as you lead the children on a tour of the school. Walk outside and visit the playground area if the weather permits.

As you visit each room or area, the children assist to write larger, smaller, or same in the "Actual" column on the prediction chart.

Note: The children do not actually measure the areas of the spaces recorded.

When you return to your classroom, use the chart to recall and discuss the results.

Say: **When someone builds a school, he or she must think about how big each area or space should be.**

Formative Assessment

Size Questions

Ask the following questions to assess whether or not the children understand this lesson.

- **Are all the rooms in our school the same size? How can we tell?**
- **What would happen if all the rooms in our school were the same size?**
- **Why is the cafeteria area larger than our classroom?**
- **Why are the bathrooms smaller than our classroom?**
- **Is there a space or room size you would change? Why or why not?**

Magic Math Moment

Estimating Surface Area

Materials
- ☐ Computer navigated to *Starfall.com*

Navigate a classroom computer with projection capabilities to *Starfall.com*: Geometry and Measurement, "Make Shapes."

Volunteers use this activity to review positional words and to practice using shapes to fill in surface area space. Prior to each online activity, the children estimate how many of the shapes it will take to fill in the surface area.

Note: If you are unable to project *Starfall.com*, gather the children around a classroom computer for this activity.

Measurement & Data

A.2 - Compare two objects with a common measurable attribute.

MD.3 - Measure using nonstandard units.

Geometry

A.1 - Describe objects using shapes and relative positions.

B.6 - Compose simple shapes to form larger shapes.

Comparing Surface Area

Essential Question: *Why is making predictions important?*

Materials
- ☐ Drawing paper
- ☐ Crayons, scissors
- ☐ 1 large sheet of paper or sticky note
- ☐ 1 small sticky note
- ☐ "Which Window is Bigger?" worksheet for each child
- ☐ Prepared set of windows
- ☐ Set of 24 one-inch tiles, connect cubes or one-inch paper squares for each child
- ☐ Area rug or area outlined with masking tape

1 Review Area

Distribute a sheet of drawing paper to each child.

Say: **Use a pencil to draw a circle and a rectangle on your paper. After you have done that, color the space inside the circle and the rectangle with a crayon.** The children do this.

Say: **Point to the circle.** Check to see that the children are pointing correctly to the circle.

Say: **The part you colored is called the area of the circle. Now, point to your rectangle.** Check to see that the children are pointing correctly to the rectangle.

Continue: **The part you colored inside the rectangle is called the area of the rectangle. The space inside a figure is called its *area*. Say, *area*.**

2 Compare Area

Display a large sticky note or sheet of paper and a small sticky note side-by-side.

Ask: **If we want to write a note to the principal, and we have a lot to say, which sticky note should we use?** (Volunteers respond.) **Why?** Discuss the fact that the large sticky note or sheet of paper has a larger surface area—the flat area, which is used for writing. Because the surface area is larger, you can write more on it than on the small sticky note.

3 Measure an Area of the Classroom

Gather the children where they can easily see the rug area or a defined space (outlined with masking tape).

Ask: **How many children lying end-to-end and side-by-side would it take to fill this space? Let's make an estimate. Remember, when we make an estimate, we are making a smart guess.**

- **Would it take 100 children to fill the space?**
- **Would one child fill the space?**

Explain: **No, these are not smart guesses. We know that 100 children would be too many to fit in the space, and 1 child wouldn't be enough. Raise your hand if you can make a smart guess.**

Write several of the children's estimates on the whiteboard. Continue: **Now it's time for us to find out!**

Select a volunteer to make a tally mark on the board to represent each child as he or she lies down. Children lie down one-by-one, end-to-end, and side-by-side to fill the defined space.

Say: **We estimated that it would take about** (children's estimate) **children to fill this area. The actual or real number of children is** (actual count)**. Were our estimates too high or too low?** Discuss.

4 Measure Windows

Indicate the prepared window cutouts. Say: **Look at these two windows. One belongs to Joshua and one belongs to Emily. Which window has the bigger surface area?** Discuss the children's responses, but do not give the answer.

Turn the windows in different directions so the children can see them in various positions. Ask: **Now, which window has the bigger surface area?** Discuss, but do not give or confirm the correct answer.

Distribute a "Which Window is Bigger?" worksheet to each child. The children cut out the two windows. They partner to discuss which window is bigger and why. Gather the children to share their answers.

Say: **If we really want to know which window is bigger, we must figure out which window has the bigger surface area, or inside part. What tools could we use to measure which window has the bigger surface area?**

Formative Assessment

Use Measuring Tools

Distribute twenty-four one-inch tiles, connect cubes or one-inch paper squares (cut from construction paper) to each child.

Say: **You will use your tiles (**connect cubes or paper squares**) to measure the two windows.**

The children use their tools to measure the windows and discover that both shapes have the same surface area.

Ask: **How can both windows have the same surface area when they are not the same shape?** Discuss.

Shape does not affect the total amount of surface area. This is a very difficult concept for many primary learners. This lesson provides concrete, hands-on experiences to introduce this concept

Magic Math Moment

Subtraction Equation Cards

Materials

- ☐ Subtraction Equation Cards, Subtract 1 only (Examples: 6-1=, 8-1=)

Say: **Let's review subtraction facts to see how well you remember them. I will flash Subtraction Equation Cards. As soon as you know the answer, hold up the correct number of fingers. Ready?**

Repeat the Subtraction Equation Cards (-1) as time allows.

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.

Measurement & Data

MD.1 - Identify and use measurement tools.

Measurement Tools

Materials

- ☐ Prepared "Mystery Box"
- ☐ Measurement Tools Picture Cards
- ☐ Pocket chart
- ☐ Prepared sentence strips
- ☐ "People Who Measure" Picture Cards

1 Mystery Box

Gather the children in a circle and indicate the closed "Mystery Box" with the Measurement Tool Picture Cards inside.

Say: **Here is a "Mystery Box." It has pictures of measurement tools in it. We will try to solve the mystery of what each measurement tool is used to measure. Ready?**

Choose volunteers to draw Picture Cards from the mystery box and show them to the class. Discuss their uses then the volunteers place the Picture Cards in a pocket chart.

Continue until all of the cards have been discussed.

2 Classify Measurement Tools

Divide the children into 5 groups.

- Read the sentence strips one at a time and distribute them to the different groups of children.
- Each group reads its sentence strip back to you.
- Indicate a "Measurement Tool Picture Card" and the group to which it belongs stands and holds up its sentence strip.

Repeat for each Measuring Tool Picture Card.

Collect the sentence strips.

Formative Assessment

People Who Measure

Say: **Look at the pictures of measuring tools in the pocket chart. I will hold up pictures of people who use measuring tools. You will partner and discuss which of the tools in the pocket chart each person uses in his or her job.**

Instruct the children to partner and sit knee-to- knee. Show a People Who Measure Picture Card and identify it. Allow time for the partners to discuss. Volunteers raise their hands to share.

Repeat for each People Who Measure Picture Card.

Learning Centers

1 Computer

Materials
- ☐ Computers navigated to *Starfall.com*

The children explore:

- Monthly calendar
- Geometry and Measurement: "Measurement"
- Add & Subtract: "Subtraction Practice"
- Add & Subtract: "Make 10"

Children may navigate to other *Starfall.com* math activities after they have explored those suggested above.

2 Toss and Color

Materials
- ☐ Measuring Tiles worksheet for each child
- ☐ Crayons
- ☐ Dice

The children take turns to toss a die and color the corresponding number of squares on his or her grid paper. Play continues until one child covers the entire area of his or her grid or until each child has colored the entire area.

3 Categorize Measurement Picture Cards

Materials
- ☐ Measurement Tools Picture Cards
- ☐ 5 Math mats labeled with measurement categories: length, height, weight, capacity, time, and temperature

The children place the math mats on the floor and stack the Measurement Tools Picture Cards face down. They take turns to reveal the Picture Cards and identify the pictures. The children explain how the measurement tools could be used, then sort the Picture Cards by placing them on the correct math mats.

4 Teacher's Choice

Review or expand a skill from this unit according to the needs of your students.

5 Summative Assessment: Measure Surface Area

Materials
- ☐ "Measuring Surface Area" worksheet for each child
- ☐ Pencils, scissors, glue
- ☐ Measuring Tiles worksheet for each child
- ☐ Summative Assessment Checklist (Unit 11, Week 26)

Children will find the area of the "Measuring Surface Area" worksheet by cutting apart the tiles and gluing them to the top of the worksheet. After they glue the tiles, they number each tile with a pencil then write the number of tiles it took to cover the game board

Observe and record observations on the Summative Assessment Checklist for Unit 11, Week 26.

Counting & Cardinality

B.4 - Understand the relationship between numbers and quantities.

Operations & Algebraic Thinking

A.1 - Represent addition and subtraction in a variety of ways.

Measurement & Data

MD.1 - Identify and use measurement tools.

MD.3 - Measure using nonstandard units.