2017-2018	Grade 2 Go Math! Quarter 4 Planner Chapter 9 Length in Metric Units	10-11 Days

BIG IDEA: Length is the measurement of distance from one point to another point. More specifically, the length of an object is the distance from one end of the object to the opposite end of the object. Objects can be compared based on their lengths. When two objects are compared, one object is longer, shorter, or the same length as the other object.

The basic unit for the measurement of length in the metric system is the meter. One centimeter, or one-hundredth of a meter, is one way to introduce metric measurement. Children have likely used centimeter cubes in their place-value explorations. This will provide important background experience for them. Centimeter cubes can be put together end-to-end to measure the length of an object in terms of cubes. Children need to realize that there should not be any gaps or overlaps when iterating unit lengths.

"Measurement reasoning involves unit-length iteration, which is, determining the number of fixed unit lengths that fit end-to-end along the object, with no gaps or overlaps." (Battista, 2007, Pg. 894)

Children may overgeneralize and think that the number on a ruler that lines up with the right edge of an object is the length. This is true only when the left edge of the object aligns with the zero mark on the ruler. Lining up centimeter cubes next to the object will reinforce the idea that a ruler is a representation of the units to be counted.

As children progress from measuring with informal units to measuring with formal units, they look for and express regularity in repeated reasoning. Whether they use cubes, paper clips, or rulers, children need to remember that the unit is iterated with no gaps or overlaps. Measurement of any attribute has this in common.

Provide activities to teach students how to choose appropriate tools and units to measure an object in inches and feet or centimeters and meters. Students should experiment with a variety of tools and units to measure objects and things in their classrooms to discover the use of appropriate tools. When measuring a classroom length, for example, if the unit selected to measure the classroom is small such as measuring in inches, the more units it will take to measure the room. Students will notice that a yardstick is a more appropriate tool to measure the classroom's length.

Adapted from Go Math: Teaching for Depth, pg. 441E

Professional Development Videos:
"Explore Length" Measurement and Geometry, Grades K-2, Segment 5

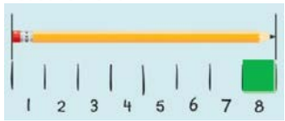
Quarter 3 Fluency Resources:
Fluency Resources in Go Math
Building Fluency Through Word Problems
Building Fluency Through Number Talks

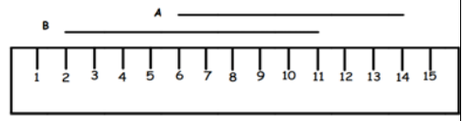
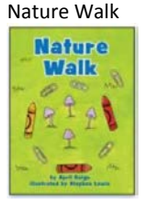
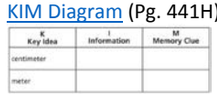
ESSENTIAL QUESTION: What are some of the methods and tools that can be used to estimate and measure length in metric units?
STANDARDS: 2.MD.1, 2.MD.2, 2.MD3, 2.MD.4, 2.MD.5, 2.MD.6

ELD STANDARDS:

ELD.PI.2.1-Exchanging information/ideas via oral communication and conversations.
ELD.PI.2.3-Offering opinions and negotiating with/persuading others.
ELD.PI.2.5-Listening actively and asking/answering questions about what was heard.
ELD.PI.2.9-Expressing information and ideas in oral presentations.
ELD.PI.2.11-Supporting opinions or justifying arguments and evaluating others' opinions or arguments.
ELD.PI.2.12-Selecting and applying varied and precise vocabulary.

Lesson		Standards & Math Practices	Essential Question	Math Content and Strategies	Models/Tools Go Math! Teacher Resources G2	Connections (ENGAGE prior knowledge)	Vocabulary	Academic Language Support	Journal
9.1	Hands On • Measure with a Centimeter Model	2.MD.1 Companion Pg. 144 MP 1 MP 5 MP 6 MP 8	How can you use a centimeter model to measure the lengths of objects?	In this lesson, children use iterations of a unit cube as a step in the conceptual development of measuring lengths in centimeters. For the first cube of the measurement, children place the left edge of a unit cube at the left end of an object, making a mark on both the left and right sides of the unit cube. To determine an accurate measurement, children must understand the importance of aligning the left edge of the cube	Unit cubes, picture models Rulers	Have students play the Estimating Length game on page 444 using centimeter cubes to measure the real objects.	centimeter	**ELD Standards** ELD Standards ELA/ELD Framework ELPD Framework ELL Math Instruction Framework	Measure a pencil. Explain how you used a unit cube to measure the length? Where did you start? How long is the pencil?

				with the left end of the object to be measured. Then, children continue moving the cube so its left edge is aligned with the last mark they drew so that there are no gaps or overlaps. Children count the spaces between the marks to find the number of units (centimeters) for the measurement.  You may wish to have children make and use their own centimeter rulers (similar to the inch rulers made in Lesson 8.2). This provides a bridge between the use of unit cubes and the use of a conventional centimeter ruler to measure lengths.		 After students have played the game, ask students how using the centimeter cubes is the same and different than using a centimeter ruler.		Integrating the ELD standards into Math **Access Strategies** Organizing Learning for Student Access to Challenging Content Student Engagement Strategies Problem Solving Steps and Approaches **Equitable Talk** Accountable Talk Simply Stated Equitable Talk Conversation Prompts Accountable Talk Posters Five Talk Moves Bookmark Effective Math Talks **Cooperative Learning** Cooperative Learning Role Cards Collaborative Learning Table Mats Seating Chart Suggestions **Math Talk:** Estimating Length Game Pg. 444  Have children estimate the length of one of their hands in centimeters. Then have them	
9.2	Estimate Lengths in Centimeters	2.MD.3 Companion Pg. 144 MP 1 MP 6 MP 7	How do you use known lengths to estimate unknown lengths?	Children have measured in inches and centimeters and have estimated the lengths of objects in inches. In this lesson, children estimate the length of an object in centimeters, based on how it compares to another object for which the length is known. In the exercises, children are shown two objects with different lengths. The length of one of the objects is given. Through direct comparison, children first determine whether the object with the unknown length is longer then or shorter than the object with the known length. Then, again using direct comparison, children estimate *how much* longer or shorter the object with the unknown length is than the object with the known length. In this way children are able to reasonably estimate the whole length of the object.	10 cm. paper strips, picture models	 Have students determine which they would measure using centimeters and why. Provide pairs of students with an index card and a 10 centimeter strip. Have them locate something in the classroom that is the same length as the strip, twice the length of the strip and half the length of the strip. Have them write the objects on their index card from shortest to longest.	centimeters		Estimate without measuring: About how long is your crayon in centimeters? How do you know that is a good estimate?
9.3	Hands On • Measure with a Centimeter Ruler	2.MD.1 Companion Pg. 144 MP 1 MP 3 MP 5 MP 6	How do you use a centimeter ruler to measure lengths?	In this lesson, students use centimeter rulers to measure length. They will first measure objects with unit cubes, then transfer that skill to measure picture models with a centimeter ruler. If children mistakenly count all the centimeter marks instead of the 1-cm lengths (they include 0), guide them to count the *spaces* between the marks by referencing back to counting the cubes.	Unit cubes, small classroom objects, centimeter rulers	Have students look at their own inch and centimeter rulers. Then ask them to estimate if a pencil is normally about 7 inches or 7 centimeters. Is a paperclip about 5 inches or 5 centimeters? Is a post-it note about 3 inches or 3 centimeters? Ask students to determine what they would measure in the classroom using centimeters versus meters and why.	centimeters		Measure the length of the top of your desk in centimeters. Describe how you found the length.

				Be sure to connect the number line to metric measurement, as shown below where students are asked to compare these lengths.  				measure the same hand with a centimeter ruler. Talk about the differences between their estimates and the actual length they measured, and have them discuss why there might be a difference.	
9.4	Problem Solving • Add and Subtract Lengths	2.MD 5 Companion Pg. 148 2.MD.6 Companion Pg. 149 MP 1 MP 2 MP 4	How can drawing a diagram help when solving problems about length?	In this lesson, children solve problems involving addition and subtraction of lengths. Children draw a diagram to represent the action in the problem. This diagram can be used to determine the operation needed for writing a number sentence for the problem. The diagram and number sentence are both models that children can use for representing problems. Encourage children to look back at the word problem to check that their models are accurate representations of the problem situation. Have children describe their models. Elicit suggestions for other models and representations that they could use to represent and solve problems.	Number lines	Play "Hop the Line" in Chapter 3, Pg. 117I. This game will help reinforce the skill of counting on and counting back for addition and subtraction facts. This will connect to the use of a centimeter ruler to measure and compare lengths.	centimeters	Have children tell something they would measure in meters and something they would measure in centimeters and explain why. **Literature Connections:** Nature Walk  A Trip to the Pond  **Model and Discuss:**  Should you count the spaces or the marks? **Vocabulary Builder:** vocabulary cards KIM Diagram (Pg. 441H):  	Draw a diagram for two ribbons, 13 centimeters long and 5 centimeters long. How long are the two ribbons?
9.5	Hands On • Centimeters and Meters	2.MD.2 Companion Pg. 145 MP 1 MP 5 MP 6 MP 7	How is measuring in meters different from measuring in centimeters?	To increase children's understanding of the measurement units centimeter and meter, give them opportunities to choose the most appropriate unit to use in various situations. When choosing, children should consider the length to be measured and the level of precision needed. When asking children to choose the best unit to use, you can connect this to the understanding of the inverse relationship between the size of a unit and the number of units used to measure length. For example, when measuring the length of a park or playground, the number of meters would be much less than the number of centimeters. Although both units could be used to describe the length, it is more practical in this example to measure the length in meters.	Making tape, meter-long pieces of yarn, sheets of paper	Have students use centimeter cubes to measure the length of their desk. Ask them to imagine using centimeter cubes to measure a long table in the room. What might be some issues? Through discussion, students should conclude that centimeters are too small of a unit to use efficiently for large measurements.	meter		Would you measure the length of a bench in centimeters or in meters? Explain your choice.
9.6	Estimate Lengths in Meters	2.MD.3 Companion Pg. 146 MP 1 MP 4 MP 5	How do you estimate the lengths of objects in meters?	Because the United States continues to use the customary system of measures, children may be more familiar with measuring and estimating lengths in inches and feet than in centimeters and meters. The best way to help children become accustomed to measuring and estimating	Pre-selected classroom objects in the 10 cm range and the 50 cm range in length/height; pre-	Show children a photograph and ask them to estimate the measurement (for example the teacher's height, student's height or the height of a tree). Ask for two estimates that are too low, two that are too high, and	meter		Choose one object from page 467. Describe how you estimated its length.

		MP 6		with units in the metric system is to provide many measuring experiences. Hold a metric workshop. Gather meter sticks, centimeter rulers, and measurable objects. Have children explore the measuring tools to acquire a sense of what each tool can be used to measure. Then distribute 10-centimeter strips to children, enough so that they can make their own meter sticks by taping 10 strips together. This will help to reinforce the concept that 100 centimeters is the same length as 1 meter. Have children choose objects, estimate their lengths, and then measure and record the lengths.	drawn 10 cm strip and 50 cm strip on display; meter stick	four that are just right. Students place their guesses in order on a clothes line. 		Longer and Shorter: Review the meanings of the words *longer* and *shorter* with children; they are used when comparing the lengths of two objects. Have two volunteers each locate a classroom object that he or she can hold. Have the class compare the lengths of the two objects and determine which one is *longer* and which is *shorter*.	
9.7	Hands On • Measure and Compare Lengths	2.MD.4 Companion Pg. 146 MP 1 MP 2 MP 3 MP 4 MP 6	How do you find the difference between the lengths of two objects?	In this lesson, children measure the lengths of two objects in centimeters. Then they use their measurements to write a number sentence to find the difference between the two lengths. It is important for children to recognize that they must measure the length of each object using the same unit, centimeters, in order to use a number sentence that describes how much longer one object is than the other.	Centimeter rulers Bar model video	Review the meanings of the words longer and shorter with children. Remind children that the words longer and shorter are used when comparing the lengths of two objects. Have two volunteers each locate a classroom object that he or she can hold. Have the class compare the lengths of the two objects and determine which one is longer and which one is shorter. Repeat the activity if time allows.	centimeters		Suppose the lengths of two strings are 10 centimeters and 17 centimeters. Describe how the lengths of these two strings compare.

Assessments:
Chapter 9 Test
Chapter 9 Performance Task: Making a Birdhouse
****Common Assignment:** Critical Area 3 Performance Task: The Museum Store

2017-2018	Grade 2 Go Math! Quarter 4 Planner Chapter 10 Data	9-10 Days

BIG IDEA: Children will encounter problems that can be solved by interpreting information or data and making decisions based on data. Class discussions should focus on the following things that children with a deep understanding of data can do:

- Recognize the titles (what to investigate) and row or column labels (categories) in data displays.
- Describe and interpret information given by a picture graph, bar graph, tallies, etc. For each category or value, find the frequency of occurrence or how many.
- Understand and use the mathematical language in the problem.
- Make sense of the data to determine how it can be used to solve the problem.

"The emphasis should be to help children see that graphs and charts tell about information, that different types of representations tell different things about the same data. The value of having students actually construct their own graphs is not that they learn the techniques but that they are personally invested in the data and that they learn how a graph conveys information. Once a graph is constructed, the most important activity is discussing what it tells the people who see it, especially those who were not involved in making the graph." (Van de Walle, 2006, p. 438)

When dealing with data, children are given two types of information. The first type represents the value, or category. The second one represents the frequency with which those values occur. Consider the different numbers of the labeled values versus the frequency for each value in the example shown at the right.

- Four children chose the number 2 as their favorite number. So, 2 is the value and 4 is the frequency.
- Quantitative data may confuse some students because some numbers represent value and others represent frequency or occurrences.

When working with data, children will interpret information to solve problems. From repeated experiences they learn to understand the language of data analysis: which is the least, which is the same as another. These experiences build a foundation for children learning to look for and express regularity in repeated reasoning (MP 8).

Adapted from Go Math: Teaching for Depth, pg. 477E

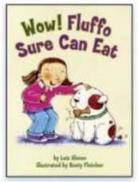
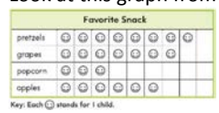
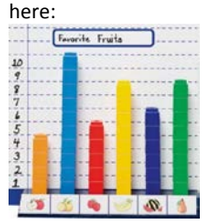
Professional Development Videos: Organize and Analyze Data, Problem Solving, Grades K-6, Segment 6

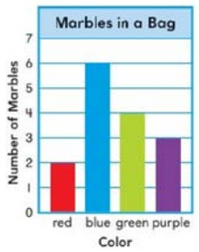
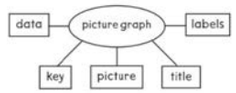
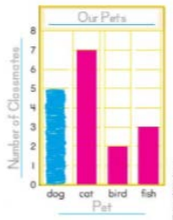
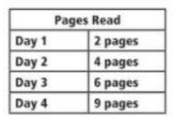
ESSENTIAL QUESTION: How do tally charts, picture graphs, and bar graphs help you solve problems?
STANDARDS: 2.MD.10

ELD STANDARDS:

ELD.PI.2.1-Exchanging information/ideas via oral communication and conversations.
ELD.PI.2.3-Offering opinions and negotiating with/persuading others.
ELD.PI.2.5-Listening actively and asking/answering questions about what was heard.
ELD.PI.2.9-Expressing information and ideas in oral presentations.
ELD.PI.2.11-Supporting opinions or justifying arguments and evaluating others' opinions or arguments.
ELD.PI.2.12-Selecting and applying varied and precise vocabulary.

Lesson		Standards & Math Practices	Essential Question	Math Content and Strategies	Models/Tools Go Math! Teacher Resources G2	Connections (ENGAGE prior knowledge)	Vocabulary	Academic Language Support	Journal
10.1	Collect Data	2.MD.10 Companion Pg. 155 MP 1 MP 3 MP 4 MP 6	Collect data in a survey and record that data in a tally chart.	Record data with tally marks. Every fifth tally mark is made as a diagonal mark over the four preceding marks. This makes it easier to count by fives instead of ones to find a total. Children must also add/subtract to compare data.	Connecting cubes in 3 colors, small opaque bags Survey and Graph Project Trail Mix Graphing Practice	Use "Coins and Tally Marks" to reinforce work with money and connect to tally marks, as they both make groups of five (nickels).	survey, data, tally chart, tally marks	**Math Talk:** Draw a tally chart on the board. Ask children to point on the cart to show each of these words: *tally mark, title, data*. Encourage children to discuss what they know about	Take a survey to find your classmates' favorite shirt colors. Draw a tally chart to represent your data.

10.2	Read Picture Graphs	2.MD.10 Companion Pg. 155 MP 1 MP 2 MP 3 MP 4 MP 6	Interpret data in picture graphs and use that information to solve problems.	Children use a variety of skills as they read and interpret data in a picture graph. They must first be able to read and understand the elements of a picture graph: the title, the categories, the key, and the pictures indicating the data contained in the graph. Once children understand how to read a picture graph, they will then be able to find and use information in the graph to answer questions and solve problems. In this lesson, children will solve problems involving addition and subtraction. In this chapter, the keys for the picture graphs are limited to pictures that represent one unit. The use of a key builds a foundation for using keys in which each picture represents multiple units, which are taught in later grades.	Picture models Picture Graph template	Survey the class and have them create a picture graph with their bodies. Possible survey ideas: favorite color, shirt color, favorite flavor of ice cream.  Copy the data as a picture graph on the board and ask the class questions to interpret the data.	picture graph, key	tally marks. Ask: Why is the title of the tally chart important? How is using tally marks useful? Repeat similarly for picture graphs and bar graphs. Have children share two questions that they could ask all of their classmates, such as "how many siblings do you have?" If time allows, have one or two children survey the class and record the responses. **Literature Connections:** (found in Grab-and-Go): Wow! Fluffo Sure Can Eat  What Do You Like?  **Model and Discuss:**  **Vocabulary Builder:** vocabulary cards	 Label and describe the different parts of this picture graph.
10.3	Make Picture Graphs	2.MD.10 Companion Pg. 155 MP 1 MP 4 MP 6	Make picture graphs to represent data.	In this lesson, children make picture graphs. As an introduction to the lesson, you may wish to have children use connecting cubes to make a graph. This will give children the concrete experience of placing cubes on a grid before they move to the pictorial representation of drawing a smiley face on the grid for each cube. This concrete experience will help children understand that the pictures in a picture graph or the bars in a horizontal bar graph are drawn from the left to right and are aligned on the left. In a vertical graph, they are drawn from bottom to top and are aligned on the bottom. Children will also compare tally charts and picture graphs in order to draw connections between the two representations.	Connecting cubes in 4 colors, small opaque bags Picture Graph template	Look at this graph from 10.2:  Tell the class that three students were absent the day the data was gathered, and when they returned, two said they liked apples and one said they like popcorn. How can we change the picture graph? Have children change the graph.	picture graph, key		 What information is shown on this graph. Describe it using pictures, numbers, and/or words.
10.4	Read Bar Graphs	2.MD.10 Companion Pg. 155 MP 1 MP 2 MP 6	Interpret data in bar graphs and use that information to solve problems.	In this lesson, children's understanding of graphs is extended to include graphs that use bars rather than pictures to show data. Discuss with children how bar graphs and picture graphs compare. Point out that both have a title and categories; are built from left to right (for horizontal graphs); and show data. Also point out differences: a picture graph has pictures or symbols and a bar graph has bars; and a picture graph has a key and a bar graph has a scale. Children can interpret data in bar graphs by comparing the lengths or heights of the bars. For example, if they want to find the category that has the most, they can just look for the longest bar. Children will also need to add/subtract in order to compare data.	Make picture graphs to represent data. Picture models Blank Bar Graph	Collect data in class about students' favorite fruits. Have students display the data by linking cubes vertically as shown here:  Ask: How many students like cherries?	bar graph, data		 What information is shown on this graph. Describe it using pictures, numbers, and/or words.

						How many more children prefer pears than apples? How many did ***not*** prefer watermelon?		word wall: 	
10.5	Make Bar Graphs	2.MD.10 Companion Pg. 155 MP 3 MP 4 MP 6	Make bar graphs to represent data.	In this lesson, children make both horizontal and vertical single-bar graphs. These graphs include a title, a scale, a scale label, categories, a category label, and data. As you teach the lesson, discuss why each of the labels is important and discuss questions that might arise if the labels are missing. Scales should always begin at 0 and end at a number greater than the greatest number in the data. The scale numbers should be equally spaced. After children make the bar graphs, they analyze and interpret data. This gives children an opportunity to use critical thinking skills. They can use the data in the bar graph to answer questions, solve problems, and formulate their own questions about the data. They will also need to add/subtract to compare data.	Picture models Blank Bar Graph	Look at this bar graph from 10.4:  Tell the class that two red marbles were found under the couch. How can we change the picture graph? Have children change the graph.	title, label	Picture Graph and Key: Write the term *picture graph* on the board. Have children name as many words or phrases as they can that relate to picture graph. Write their suggestions on the board. 	 From the graph created on pg. 498. Describe how you shaded bars to show the data.
10.6	Problem Solving • Display Data	2.MD.10 Companion Pg. 155 MP 1 MP 3 MP 4 MP 5	Solve problems involving data by using the strategy make a graph.	For the problems in this lesson, children are given data, make a bar graph to represent that data, and then describe how the data change. Children determine appropriate titles and labels, as well as shade in bars to correctly represent the data. At this point in the chapter, children have learned to "read" a bar in a graph to determine a certain piece of data. In this lesson, as each bar graph is completed, discuss with children the visual aspects of the bar graph. Ask questions such as: What do you know about the data just by comparing the lengths of the bars to each other? What does it mean if bars are almost the same length? What does it mean if one bar is much shorter than another bar? Discuss the importance of accurately labeling and shading bars in the graphs. Have children talk about what would happen if the bars were not the correct lengths, or if the title and labels were unclear or confusing. Children will continue to use addition/subtraction to answer questions about the data.	Bar Model grid Blank Bar Graph Survey and Graph Project Trail Mix Graphing Practice	Write the following information on the board: ***Types of fruit*** ***8 Apples*** ***6 Bananas*** ***4 Oranges*** ***7 Strawberries*** ***Number of Children*** Have children draw a bar graph using the above information. Encourage children to provide a title for the graph. Have students share their bar graphs with the class; be sure to share both vertical and horizontal displays.	Bar graph		 Create a bar graph for the "Pages Read" data.

Assessments:

Chapter 10 Test

Chapter 10 Performance Task: Our Favorites

2017-2018	Grade 2 Go Math! Quarter 4 Planner Chapter 11 Geometry	14-15 Days

BIG IDEA: Children already have substantial experience with plane, or two-dimensional, figures including naming and sorting them by number of sides or angles. This is extended to include three-dimensional figures, as well as other attributes.

- Children develop fluency in vocabulary when they describe attributes of shapes.
- Children can use various attributes to classify shapes. This helps them develop concepts for different types of shapes.
- Children can also investigate shapes by combining or partitioning them to make new shapes.
- Drawing shapes is a way to support children in developing an understanding of shapes and their attributes. Using dot paper or grid paper helps children learn how to draw shapes.

"Teachers must provide materials and structure the environment to encourage students to explore shapes and their attributes. [Students must] analyze characterisitics and properties of two-and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships." (NCTM, 2000, p. 97)

The concept of dividing a whole into equal parts is key to understanding and naming fractions.

- Children encounter many situations where they can develop this understanding. Papers are divided in halves, pizzas are divided into equal parts, or cakes are cut fairly.
- Both geometry and fraction concepts can be strengthened by connecting real objects to fair shares.
- These experiences build the foundation for equivalent fractions and the common denominator algorithm that will be learned in later grades.

Children learn to use appropriate tools strategically to understand and solve problems dealing with geometry and fractions. They may draw lines to divide shapes into equal parts; use dot paper to help them draw figures; use manipulatives to make shapes; and fold paper into equal sections and accurately name the resulting fractions. These are a few examples of how children learn to select and use suitable tools to explore and enhance their understanding.

Focus instructional time and discussions on shapes specifically mentioned in the standard: 2.G.1--triangles, quadrilaterals, pentagons, hexagons, and cubes. 2.G.3—partition circles, squares, rectangles.

Adapted from Go Math: Teaching for Depth, pg. 517E

Professional Development Videos:
"Explore Solid Figures" Measurement and Geometry, Grades K-2, Segment 1
"Explore Plane Figures" Measurement and Geometry, Grades K-2, Segment 2

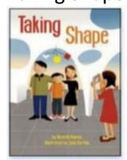
ESSENTIAL QUESTION: What are some two-dimensional shapes and three-dimensional shapes, and how can you show equal parts of shapes?
STANDARDS: 2.G.1, 2.G.2, 2.G.3

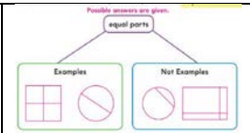
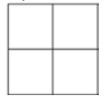
ELD STANDARDS:

ELD.PI.2.1-Exchanging information/ideas via oral communication and conversations.
ELD.PI.2.3-Offering opinions and negotiating with/persuading others.
ELD.PI.2.5-Listening actively and asking/answering questions about what was heard.
ELD.PI.2.9-Expressing information and ideas in oral presentations.
ELD.PI.2.11-Supporting opinions or justifying arguments and evaluating others' opinions or arguments.
ELD.PI.2.12-Selecting and applying varied and precise vocabulary.

Lesson		Standards & Math Practices	Essential Question	Math Content and Strategies	Models/Tools Go Math! Teacher Resources G2	Connections (ENGAGE prior knowledge)	Vocabulary	Academic Language Support	Journal
11.1	Three-Dimensional Shapes **AC option: Skip this	2.G.1 Companion Pg. 186 MP 2 MP 3	Identify three-dimensional shapes.	Identify three-dimensional shapes: sphere, cube, rectangular prism, cone, and cylinder. It is important for children to have experiences with actual three-dimensional shapes—not just pictures of them. If a set of three-dimensional shapes is not available, you can use everyday objects. If you have	quick pictures, picture models 3D Shapes patterns	Show students real-life examples of 3D shapes in the classroom: cube, rectangular prism, sphere, cylinder, and cone. Give students or pairs of students modeling clay to make	three-dimensional shape (solid shape), cube, rectangular	**Math Talk:** Count the Sides Game Pg.520	Describe one way that a cube and a cylinder are alike. Describe one way that they are different.

	lesson--aligns to K.G.2.	MP 6		difficulty finding everyday objects for some of the shapes, you can make the shapes using patterns. Provide opportunities for children to describe the shapes using their own words. Have children discuss how two shapes are alike and how they are different. Ask children to sort the shapes. For example, have them find shapes that can be used to trace a circle and shapes that cannot. Also provide opportunities for children to sort the shapes according to their own rules.		one of each of these shapes. Label the shapes. Have students compare their shapes with others and describe the attributes of each.	prism, sphere, cylinder, cone	 • Have children decide whether a rocket ship is shaped more like a beach ball, a can of soup, or a cardboard box and explain why. • Invite children to describe the shape of a roll of paper towels. • Have children identify objects around the classroom that represent triangles, quadrilaterals, pentagons, and hexagons. Then have them identify which shapes have more than 4 angles. • Write halves, fourths, and eighths on the board, and ask children to discuss their meaning and draw an example. • Have children identify times in their lives where they have divided objects into equal parts, for example, sharing an apple with a friend. **Literature Connections:** Building a Mini-Park  Square Fair	
11.2	Attributes of Three-Dimensional Shapes	2.G.1 Companion Pg. 186 MP 1 MP 4 MP 5 MP 6	Identify and describe three-dimensional shapes according to the number of faces, edges, and vertices.	Identify and count the edges, faces, and vertices of three-dimensional shapes; draw a three-dimensional shape: cube Children may already have words for some parts of three-dimensional shapes. For example, they may call the face a side. They may ask or wonder why they are learning new names for these parts of the shapes. Have children try using different terms (e.g. side vs. face) to talk about the same part of a shape and see why some words may be clearer than others. If children use the word *side* when they are referring to a face, others may think they are talking about the *edge* of a two-dimensional shape. Give children plenty of opportunities to use the vocabulary that they learn in this lesson. Display various classroom objects that are the shape of a rectangular prism or a cube. Have children describe the attributes of the objects.	Picture models Straightedge (ruler) dot paper 3D Shapes patterns 3D shapes using toothpicks and marshmallows: Pg. 1 Pg. 2	Have students reference drawings to build 3D shapes using toothpicks and marshmallows. Examples: Pg. 1 Pg. 2 Have these shapes ready for this lesson to refer to during discussion about vertices and edges (share and show). *Pyramids not needed.	face, edge, vertex (singular), vertices (plural)		Describe a cube. Use the words *faces, edges*, and *vertices* in your description.
11.3	Build Three-Dimensional Shapes **AC option: Skip this lesson--aligns to 5.MD.C	2.G.1 Companion Pg. 186 MP 1 MP 3 MP 4 MP 6 MP 7	Children discuss and model with cubes how you can build a rectangular prism.	In this lesson, children will build a rectangular prism using cubes and record by drawing the top, front, and side views. Building with cubes helps children to develop an understanding that rectangular prisms can be measured using equal units. Students use models and drawings to determine the number of layers, rows and total cubes used in the rectangular prisms. As children compose a three-dimensional shape, they build an understanding of parts that make up a whole, as well as the properties of the three-dimensional shape. They identify a shape's geometric attributes and recognize it from different views and orientations. This helps them to develop the foundation for ideas about properties, such as congruence and symmetry.	Connecting cubes or Unit cubes picture models MathBoard	Give each student 12 linking cubes and have them build a rectangular prism. Look for different solutions and share with the class. Notice how the faces look different from the front, top, sides. Display on Elmo.	face, views (front, top, side), rows, layers		Build a rectangular prism using cubes. Then, draw in your journal the top, side, and bottom views of your prism.
11.4	Two-Dimensional Shapes	2.G.1 Companion Pg. 186 MP 3	Name 3-, 4-, 5-, and 6-sided shapes according to the number of sides and vertices.	Draw shapes with 3, 4, 5, and 6 straight sides; understand that the number of sides equals the number of vertices; name triangle, quadrilateral, pentagon, hexagon.	rulers/straight edge dot paper Assorted Shapes	Use iTools to show children a shape. Have them name it, count the sides, and count the vertices.	two-dimensional shape (also called plane shape), side,		Draw and label a pentagon and a quadrilateral.

		MP 4 MP 7		Children have a variety of experiences with shapes in the real world. Many children may be able to easily identify the names of shapes, but may not understand or be able to verbalize the properties of various shapes. Encourage children to develop a deeper understanding of the properties that make each unique by providing them with opportunities to identify the properties of familiar items. For example, when children are waiting in line with their lunch cards or tickets, ask them to describe the shape of the object by the number of sides and vertices rather than by its name.		Have children draw a triangle and write the name of the shape. Explain that the word *triangle* means "three angles." Repeat this process with the words *quadrilateral, hexagon*, and *pentagon*.	vertex, vertices, triangle, quadrilateral, pentagon, hexagon	 Taking Shape  **Model and Discuss:** Have children look at the rectangles.  Which rectangle shows equal parts? Explain. Have children describe these shapes in their own words.  How are they alike? How are they different? Sort the shapes by various rules. Which blocks can be composed to make a new shape?  **Vocabulary Builder:** vocabulary cards Pg. 519: Draw pictures to complete the graphic organizer.	
11.5	Angles in Two-Dimensional Shapes	2.G.1 Companion Pg. 186 MP 1 MP 4 MP 6 MP 7	Identify angles in two-dimensional shapes	Draw shapes with 3, 4, 5, and 6 straight sides; identify angles; understand that the number of sides and vertices equals the number of angles. Explain to children that angles may have a large impact on how things work in the world around us. For example, the angle of a stair allows for a flat surface on which people can stand. Throughout the school day, discuss different objects with children and talk about why a particular shape, length of side, or angle was used.	rulers/straight edge dot paper	Write the words *Triangle, Tricycle, Triceratops, Triathlon,* and *Triplets* on the board. Discuss with the class, "What do the words have in common?" Tri- means three and a triangle has three angles. Draw a triangle and count the angles.	angle, quadrilateral, pentagon, triangle, rectangle, hexagon		Draw a two-dimensional shape with 4 angles. Circle the angles. Write the name of the two-dimensional shape you drew.
11.6	Sort Two-Dimensional Shapes	2.G.1 Companion Pg. 186 MP 3 MP 4 MP 6	Sort two-dimensional shapes according to their attributes.	Sort two-dimensional shapes by attributes: sides, angles (Note: Teachers may wish to delay the Explore part of this lesson and include in Lesson 11.8, "Equal Parts" where there seems to be a tighter fit) Pattern blocks can be used to help children analyze two-dimensional shapes. Provide opportunities for children to describe the shapes, to tell how two shapes are alike or different, and to sort shapes. Pattern blocks also help children visualize how shapes can be composed or decomposed to make different shapes. For example, 6 green triangles can be put together to form the shape of the yellow hexagon. Understanding how shapes can be composed and decomposed will help lay the foundation for fractions. The blocks help children see the relationship between a whole and parts, or a whole and equal parts.	pattern blocks red, blue, green crayons picture models Assorted Shapes	Play "Guess My Rule." Use a document camera and have a student sort a collection of various two-dimensional shapes by the number of angles. Other students will observe the sorted shapes to determine the sorting rule.	sides, angles		Think about the rule *Shapes that have more than 3 angles*. Draw three shapes that match this rule.
11.7	Partition Rectangles	2.G.2 Companion Pg. 187 MP 3 MP 5 MP 8	Partition rectangles into equal-size squares and find the total number of these squares	In this lesson, children use square color tiles to cover a rectangle. Then they trace around the square color tiles. This helps children build a foundation for determining the area of rectangles in later grades. Using color tiles, model how to partition a rectangle into rows and columns. Point out for children what a row is and what a column is. Then demonstrate how	color tiles picture models Task: Partitioning a Rectangle into Unit Squares	Show video and ask students to talk to one another: What are *rows*? What are *columns*? -or- Fold paper into rows and columns	rectangle, rows, columns		Look at Exercise 3 on page 547. Is there a different-shaped rectangle that you could cover with 6 tiles? Explain.

				to find the total number of square tiles used to cover the rectangle. The standard calls for students to partition rectangles into rows and columns and count the rows/columns/squares, so if further practice is needed, utilize this task.					
11.8	Equal Parts	2.G.3 Companion Pg. 188 MP 1 MP 3 MP 6 MP 8	Identify and name equal parts of circles and rectangles as halves, thirds, or fourths	Divide two-dimensional shapes into 2, 3, and 4 equal parts; identify halves, thirds, and fourths. Children may wonder why they are learning to find equal parts of a whole. They are probably familiar with equal parts from situations such as the following: • Splitting the last piece of dessert into equal parts • Cutting a sandwich into equal parts • Sharing a pizza equally with friends Discuss these examples. Then have children give other examples of how equal parts are used in their lives. Connect the concept of equal parts to measurement. Display an inch ruler and discuss the 12 inches as equal parts of one foot.	pattern blocks picture models	Have students fold a paper down the middle. How many equal parts do we have? What happens if we fold the paper in the middle again? How many parts do we have now? How many parts do we have if we fold the paper down the middle one more time?	halves, thirds, fourths, equal parts, whole	Use iTools to show children a shape. Have them name it, count the sides, and count the vertices. Have children draw a triangle and write the name of the shape. Explain that the word *triangle* means "three angles." Repeat this process with the words *quadrilateral, hexagon*, and *pentagon*. Show children a paper plate with a line drawn on it that divides it into two equal parts. What is the whole? How many equal parts does the plate have? Explain that *halves* are two equal parts of a whole. Repeat with plates for three and four equal parts. Ask children what the name is for parts of a shape divided into: • 2 equal parts • 3 equal parts • 4 equal parts	Look at the shapes in Exercise 14. Describe the shapes that you did not color or draw an X on.
11.9	Show Equal Parts of a Whole	2.G.3 Companion Pg. 188 MP 5 MP 6	Partition shapes to show halves, thirds, or fourths.	It is important for children to build a conceptual foundation about fractions so they can be prepared to use fractions in later grades. In the previous lesson, children identified equal parts of a whole. In this lesson, they apply this knowledge of equal parts as they divide a whole into equal parts of halves, thirds, and fourths. They will draw equal parts of two-dimensional shapes (circles, squares, rectangles) and understand that parts must be equal parts. They must use correct names (halves, thirds, fourths) and recognize partitions that are not equal, and therefore not halves, thirds, fourths. Allow children to use blank fraction strips to model a whole divided into equal parts. Children may cut out the fraction strips that show halves, thirds, and fourths, glue them to a poster board, and label them. Then children can use their posters as a visual aid.	picture models blank fraction strips	Give each student a post-it note. Tell them to imagine it is a sandwich and draw a line where you would cut it in half. Have students share their different results (horizontal, vertical, and diagonal lines). Verify the parts are equal. *Extension—How would you then divide your sandwich into fourths (for four friends)?	divide, equal parts, whole, halves, thirds, fourths		Draw three rectangles. Then draw to show halves, thirds, and fourths. Write about each whole that you have drawn.
11.10	Describe Equal Parts	2.G.3 Companion Pg. 188 MP 3 MP 4 MP 6	Identify and describe one equal part as a half of, a third of, or a fourth of a whole.	This lesson allows children to explore and demonstrate their understanding of *half of*, *a third of*, and *a fourth of*. The term *quarter of* is also introduced in this lesson. Learning this term now builds a foundation for the use of this term in later grades when telling time in different ways. Children construct these parts by dividing and coloring two-dimensional shapes to show a half of, a third of, a fourth of, or one quarter of shapes likes circles, squares, and rectangles.	picture models red/green crayons	Review money; take out quarter manipulatives and ask students to place one quarter in each square.  	half of, third of, fourth of, quarter of		Draw pictures to show a third of a whole and a fourth of a whole. Label each picture.

				• During and after the activity, ask children to describe what they have done for the different exercise sets. • Throughout the school day, model using fraction terms in real-life situations and also give children opportunities to use fraction terms in context.		What is the value of four quarters? Shade in one part of the about square. How much is shaded? One fourth or one quarter.			
11.11	Equal Shares	2.G.3 Companion Pg. 188 MP 1 MP 2 MP 4 MP 6	Solve problems involving wholes divided into equal shares by using the strategy draw a diagram.	Continued use of models while developing fraction concepts helps children have a visual representation to which they can refer. It is very helpful to show through modeling that equal shares of identical wholes do not need to be the same shape. The basic understanding children must acquire is, for example, that when two identical wholes are cut into halves, each half is the same size as all the other halves, even if they are a different shape. First, verify that the two wholes are the same size. Then show the wholes divided into halves in different ways. Demonstrate for children that when either part of equal-sized parts are put together, they make wholes that are the same size. Do this with different equal parts (halves, fourths, and thirds) and repeat the action as many times as necessary for children to understand. Finally, have pairs of children use models to demonstrate to each other their understanding of the concept.	picture models	How do you like your sandwich cut?  Which piece of sandwich is biggest? Your friend cuts a sandwich like this:  Discuss what you see.	halves, thirds, fourths		Draw and write to explain how you can divide a rectangle into thirds in two different ways.
Assessments: Chapter 11 Test Chapter 11 Performance Task: Windows in the City									