

BIG IDEA: In Chapter 11, students reason with shapes and their attributes, including perimeter and area. The standards in this unit strongly support one another because perimeter, like area, is an attribute of a shape. Students will understand that perimeter and area are attributes of plane figures. Students will be able to find the perimeter and area of rectangles to compare rectangles with the same perimeter and different areas or with the same area and different perimeters.

At this level, third graders will recognize area as an attribute of two-dimensional regions. Students will measure the area of a shape by finding the number of square units needed to cover the shape. Students will also connect the concept of area to multiplication by decomposing rectangles into rectangular arrays of squares. Provide numerous opportunities for students to explore the concept of covering a region with unit squares. Start by supplying students with a variety of rectangles in different sizes. Provide experiences for students to develop an understanding of perimeter. Start by having children walk around the perimeter of the school library, cafeteria, or playground.

Adapted from The Common Core Math Companion (Gojak and Miles, 2015, pg. 176) and Go Math: Teaching for Depth, pg. 451E

Quarter 3 Fluency Resources:

- [Fluency Resources in Go Math](#)
- [Building Fluency through Word Problems](#)
- [Building Fluency through Number Talks](#)

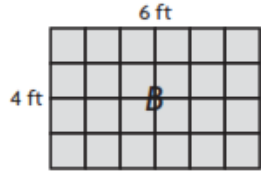
ESSENTIAL QUESTION: How can you solve problems involving perimeter and area?

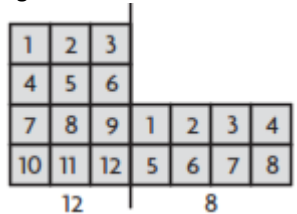
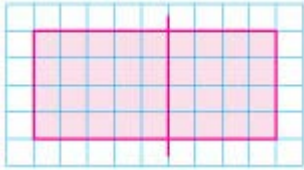

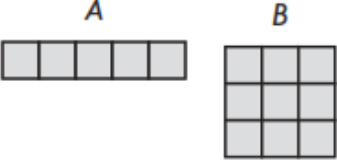
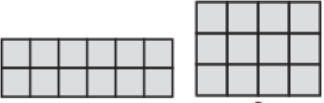

STANDARDS: 3.MD.5a-b, 3.MD.6, 3.MD.7a, 3.MD.8

ELD STANDARDS:

ELD.PI.3.1-Exchanging information/ideas via oral communication and conversations.
ELD.PI.3.3-Offering opinions and negotiating with/persuading others.
ELD.PI.3.5-Listening actively and asking/answering questions about what was heard.

ELD.PI.3.9- Expressing information and ideas in oral presentations.
ELD.PI.3.11- Supporting opinions or justifying arguments and evaluating others’ opinions or arguments.
ELD.PI.3.12-Selecting and applying varied and precise vocabulary.

Lesson	Standards & Math Practices	Essential Question	Math Content and Strategies	Models/Tools Go Math! Teacher Resources G3	Connections	Vocabulary	Academic Language Support	Journal
11.7 Problem Solving Area of Rectangles	3.MD.7b MP 1 MP 2 MP 6 MP 7 Companion pg. 189	How can you use the strategy <i>find a pattern</i> to solve area problems?	Students apply their knowledge of area in real-world multistep problems. For this lesson it is important to have students use grid paper to reason about the area in context and demonstrate how the area changes from one to the other.	Math-board, Grid paper Problem Solving Graphic Organizer	Invite students to tell you what they know about area. What information do you need to find the area of a rectangle? How do you find the area of a rectangle? 	Areas of rectangles, pattern	ELD Standards ELD Standards ELA/ELD Framework ELPD Framework ELL Math Instruction Framework Integrating the ELD standards into Math Access Strategies Organizing Learning	Draw a rectangle using dot paper. Find the area and explain how you found your answer.

11.8	Area of Combined Rectangles	3.MD.7c , 3.MD.7d MP 1 MP 3 MP 4 MP 6 MP 7 Companion pg. 190-191	How can you break apart a figure to find the area?	Students break apart figures that are made up of combined rectangles, find the area of each of the smaller rectangles and add them in order to find the total area of the combined figure. Students use the Distributive Property. You can break apart a figure into rectangles to find the total area of the figure. 	Math-board, Square Tiles Grid paper	Have students draw a rectangle on a grid paper. Draw a vertical line to break apart the model into 2 smaller rectangles. Have students use the distributive property to find the area of the rectangles. Remind them they have used the Distributive Property and the break apart method using an array to find products. 	Distributive property	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	Use grid paper to draw a shape that has the perimeter of 24 units. Label the length of each side. What is the area of the shape?
11.9	Same Perimeter, Different Areas	3.MD.8 MP 1 MP 3 MP 4 MP 7 Companion pg. 193	How can you use area to compare rectangles with the same perimeter?	Students discover that the rectangle with the greatest area is square.  <p>Rectangle A: $3 + 2 + 3 + 2 = 10$ units Rectangle B: $4 + 1 + 4 + 1 = 10$ units Compare: $10 \text{ units} = 10 \text{ units}$</p> So, Rectangle A has the same perimeter as Rectangle B.	Math-board, Square Tiles, Grid paper Grid Paper 1-inch	Ask students the following questions: Can 2 rectangles have different area but the same perimeter? How many rectangles with the same dimension can you make with a perimeter of 12 units? Have students use square tiles and grid paper to complete the task. Find the perimeter and area. Tell which rectangle has the greater area. 	same perimeter, different areas	Five Talk Moves Bookmark Word Wall Cooperative Learning Cooperative Learning Role Cards Collaborative Learning Table Mats Seating Chart Suggestions	Draw 2 different figures that each have a perimeter of 18 units. Which one has the greater area?
11.10	Same Area, Different Perimeters	3.MD.8 MP 2 MP 3 MP 4 Companion pg. 193	How can you use perimeter to compare rectangles with the same area?	Students discover that rectangles with two side lengths of 1 unit have the greatest perimeter of rectangles with the same area.  <p>Rectangle A: $6 + 2 + 6 + 2 = 16$ units Rectangle B: $4 + 3 + 4 + 3 = 14$ units</p>	Math-board, Square Tiles, Grid paper Grid Paper 1-inch	Can two rectangles have the same area but different perimeters? Have students make as many rectangles as they can using 12 square tiles. Remind them that the area for each rectangle is 12. Have them draw the rectangles on grid paper and figure out the perimeter for each rectangle. Have them describe what they notice. Repeat using 18 tiles.	Same area, different perimeter	Literature Connection: Literature  <i>Busy Bees</i>	How is finding the area of a figure different from finding the perimeter of a figure?

So, Rectangle A has a greater perimeter.

**From the Grab-and-Go™
Differentiated Centers Kit**

Students read about the hexagon patterns in honeycombs and other patterns in nature.

**Activities
Hurray for Arrays!**



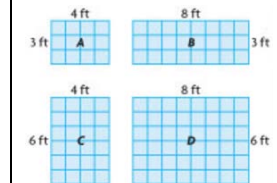
Students complete the blue Activity Card 15 by using arrays to model multiplication.

**Literature
Busy Bees**



Students read about the hexagon pattern in honeycombs and other patterns in nature.

Math Talk:



Use math talk to focus students' understanding of the relationship between doubles and halves.

What if the length of one side is doubled and the

								length of the other side is halved? Explain how this will affect the area.	
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Assessments:
[Go Math Chapter 11 Test](#)
[Go Math Chapter 11 Performance Task](#)
[SBAC Claim 1 Example Stems](#)

BIG IDEA: In Chapter 12, students reason with shapes and their attributes. They will describe, analyze, and compare properties of two-dimensional shapes. Students understand that shapes in different categories (e.g., rhombuses, rectangles, and others) may share attributes (e.g. having four sides) and that the shared attributes can define a larger category (e.g., quadrilaterals). Students recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of those subcategories. A variety of experiences must be provided for students to compare and classify shapes by their sides and angles.

3.G.2: Students partition shapes into parts with equal areas. They express the area of each part as a unit fraction of the whole. They connect fractions to geometry by understanding that the area of a part of a circle, square, or rectangle is a unit fraction of a whole and can be partitioned into equal parts.

Adapted from The Common Core Math Companion (Gojak and Miles, 2015, pg. 228) and Go Math: Teaching for Depth, pg. 503E

Professional Development Videos:

- Algebraic Thinking, Segment 2: [Identify Attributes](#)



Quarter 3 Fluency Resources:

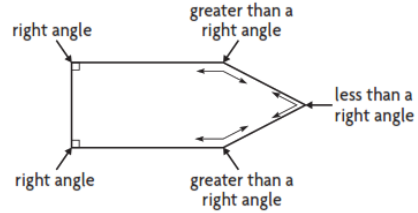
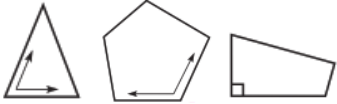

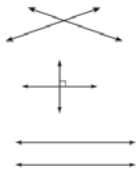

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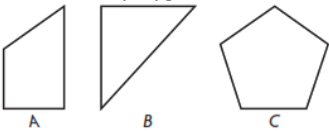
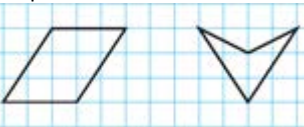

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Lesson	Standards & Math Practices	Essential Question	Math Content and Strategies	Models/Tools Go Math! Teacher Resources G3	Connections	Vocabulary	Academic Language Support	Journal
12.1	Describe Plane Shapes 3.G.1 MP 5 MP 6 MP 7 Companion pg. 233	What are some ways to describe two-dimensional shapes?	This lesson builds geometric vocabulary necessary to build other geometric concepts and terms.	Math-board Assorted Shapes	Have students sort the Assorted Shapes . Have student share their criteria for sorting. Ask students to consider sorting the shapes with straight sides from shapes with curves. Have students describe the similarities and differences between plane shapes.	closed shape, endpoint, line, line segment, open shape, plane shape, point, ray, two-dimensional shape	Literature Connections: 	Draw an open shape and a closed shape. Label your shapes. Name 2 letters of the alphabet that represent a closed shape and 2 letters of the alphabet that represent an open shape.
12.2	Describe Angles in Plane Shapes 3.G.1 MP 2 MP 4 MP 5	How can you describe angles in plane shapes?	This lesson lays the foundation for describing, classifying, and drawing various polygons later in the chapter. It also provides a basis for measuring and classifying angles in future grades.	Math-board, bendable straws, straws, scissors, Dot Paper Assorted Shapes	Invite students to tell what they know about plane shapes. Have students use the corner of a sheet of paper to tell whether a shape is a right angle, , less than a right angle, or greater than a right angle.	angle, right angle, vertex	Activities Classification 	Draw an example of a shape that has at least one square corner or right angle. Use your own words to describe what an angle is.

		Companion pg. 233				 <p>Have students look at various shapes and determine if their angles are greater than, less than or equal to a right angle.</p>		Students complete orange Activity Card 18 by classifying two-dimensional shapes based on their attributes.	
12.3	Identify Polygons	3.G.1 MP 2 MP 6 MP 7 Companion pg. 233	How can you use line segments and angles to make polygons?	This lesson focuses on how line segments and angles make polygons. All polygons are closed shapes. Not all closed shapes are polygons.	Math-board Assorted Shapes	Name some of the shapes in the classroom. What are some ways to describe the shapes you saw? Have students describe shapes in terms of number of line segments, number of vertices, curved or straight, number or types of angles. Sort the shapes by the number of sides and the number of angles. Use this information to help name the polygon. 	decagon, hexagon, octagon, pentagon, polygon, quadrilateral, side, triangle	Math Talk: Use math talk to discuss the difference between angles that are less than right angles and angles that are greater than right angles.	Draw an example of a shape that has at least one right angle and one angle less than a right angle. Label the angles.
12.4	Describe Sides of Polygons	3.G.1 MP 1 MP 4 MP 8 Companion pg. 233	How can you describe line segments that are sides of polygons?	This lesson asks students to identify whether sides of polygons are intersecting, perpendicular, or parallel. Perpendicular lines are always intersecting lines. Intersecting lines are sometimes perpendicular lines. 	Math-board Grid paper Assorted Shapes	Use the following map to discuss parallel, perpendicular and parallel lines.  <p>Have students identify streets that are parallel, perpendicular, and intersecting.</p> <p>Hand out the Assorted Shapes and have students sort shapes with parallel sides.</p>	intersecting lines, parallel lines, perpendicular lines	Use math talk to focus on how perpendicular lines are a special type of intersecting line. Use math talk to focus on properties	Is a circle a polygon? Why or why not?

12.5	Classify Quadrilaterals	3.G.1 MP 2 MP 4 MP 6 Companion pg. 233	How can you use sides and angles to help you describe quadrilaterals?	Students apply knowledge from previous lessons to describe, classify, and compare quadrilaterals. You can classify quadrilaterals by their sides and their angles. Classification of Quadrilaterals  1 pair of opposite sides that are parallel lengths of sides could be the same.	Math-board Assorted Quadrilaterals	What do squares, rectangles, rhombuses, and trapezoids have in common? Look at the 3 polygons below.  1. Which shape or shapes appear to have parallel sides? 2. Which shape or shapes appear to have perpendicular sides? 3. Which shape or shapes appear to have intersecting sides? Have students sort quadrilaterals according to number of equal sides and pairs of parallel lines.	rectangle, rhombus, square, trapezoid	of quadrilaterals and how to classify them.	Display a trapezoid and a rectangle. Have your students write how they are the same and/or different.
12.6	Draw Quadrilaterals	3.G.1 MP 3 MP 6 MP 7 MP 8 Companion pg. 233	How can you draw quadrilaterals?	Students apply knowledge from previous lessons to draw examples and non-examples of quadrilaterals. Students explain how they drew each shape, and why it is correct.	Math-board, ruler, Grid paper	Ask students to use grid paper to draw examples and non-examples of quadrilaterals.  What are the characteristics of a rectangle? Have students walk around and identify the quadrilaterals in the classroom.	Quadrilaterals, rhombus, polygon, trapezoid, rectangle	Literature  The Whole Picture Students read the book and model fractional parts.	Draw a quadrilateral that is NOT a rectangle. Describe your shape and explain why it is not a rectangle.
12.7	Describe Triangles.	3.G.1 MP 4 MP 5 MP 7 MP 8 Companion pg. 233	How can you use sides and angles to help you describe triangles?	Students develop a better understanding of triangles by comparing triangles based on sides and angles. Students form conjectures and articulate clear mathematical arguments about why geometric relationships are true.	Math-board, straws, scissors Assorted Triangles	Triangle Equal Sides Sort Have students sort the triangles according to equal sides. How many have all sides equal, 2 sides equal, no sides equal? Triangle Angle Sort Have students sort the triangles according to angles. How many have a right angle, all angles less than a right angle, one side larger than a right angle?	Right angle, greater than a right angle, less than a right angle, sides of the same length	Students read the book and model fractional parts.	Draw a triangle that has two sides of equal length and one right angle.

12.8	Problem Solving • Classify Plane Shapes	3.G.1 MP 1 MP 2 MP 4 MP 7 Companion pg. 233	How can you use the strategy <i>draw a diagram</i> to classify plane shapes?	Students use a Venn diagram in order to sort quadrilaterals. Students also use the problem solving graphic organizer to help them determine what they need to find and what information to use. 	Problem Solving Graphic Organizer	Invite students to tell you what they know about figures. What figures do you know? What everyday things are quadrilaterals? What everyday things are not quadrilaterals?	Venn diagram, pairs of opposite sides, parallel, sides of equal length, right angles	Draw a Venn diagram with one circle labeled <i>Quadrilaterals</i> and the other circle labeled <i>Polygons with More Than 3 Sides</i> . Draw at least 2 shapes in each section of the diagram. Explain why you drew the shapes you chose in the overlapping section.
12.9	Investigate • Relate Shapes, Fractions, and Area	3.G.2 MP 4 MP 6 MP 7 MP 8 Companion pg. 234	How can you divide shapes into parts with equal areas and write the area as a unit fraction of the whole?	Students decompose shapes into equal parts. They discover that equal parts of a whole have equal area.	Math-board, pattern blocks, color pencils, ruler	Invite students to tell you what they know about kites. Have you ever flown a kite? What shape was your kite?	Divide the shape into equal parts, equal area, combining and separating plane shapes	Have students draw a rectangle and divide it into parts with equal areas. Have them write a unit fraction to describe the area of each part.

Assessments:

[Go Math Chapter 12 Test](#)

Go Math Chapter 12 Performance Assessment Task: [Stained Glass Art](#)

****Common Assignment Go Math Critical Area Performance Task:** [At the Beach](#)

[SBAC Claim 1 Example Stems](#)