Topic E

Problem Solving with Perimeter and Area

3.MD.8, 3.G.1

Focus Standards:		3.MD.8	Solve real world and mathematical problems involving perimeters of polygons, including finding the perimeter given the side lengths, finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or with the same area and different perimeters.
		3.G.1	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). Recognize rhombuses, rectangles, and squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of these subcategories.
Instructional Days:		8	
Coherence	**-Links from:**	G2–M6	Foundations of Multiplication and Division
		G3–M3	Multiplication and Division with Units of 0, 1, 6–9, and Multiples of 10
		G3–M4	Multiplication and Area
	-Links to:	G4–M3	Multi-Digit Multiplication and Division

In Topic E, students solve problems with perimeter and area. Lesson 23 focuses on solving a variety of word problems involving perimeter. This provides students an opportunity to use multiplication and division strategies to solve problems about perimeter.

Students use rectangles and circles to create robots and environments for the robots using specified perimeter measurements in Lessons 24 through 27. They reason about the different whole number side lengths that may be produced for a given perimeter. For example, when given the requirement that the perimeter of the arms of the robot must be 14 inches, students experiment and draw different possibilities for rectangles to determine which ones they prefer for the robot's arms. Students cut out and assemble the parts of the robot from grid or construction paper and compare their robots with those of their peers. This comparison leads to a discussion about the different areas that are generated for their classmates' robot bodies, despite the fact that they have the same given perimeter. The final lesson in this sequence provides an opportunity for peer review and critique.

Students return to problem solving in Lessons 28 and 29, this time working with a variety of word problems involving both area and perimeter. For example, if students are given both the length and the width of a rectangular football field, they should be able to determine both the perimeter and the area of the field. In these lessons, students explore and develop strategies for solving a sequence of increasingly complex problems. In Lesson 30, students further develop analyzing and critiquing skills. They initially discuss anonymous student work samples before sharing their own work and receiving feedback in small groups.

A Teaching Sequence Toward Mastery of Problem Solving with Perimeter and Area	
Objective 1:	**Solve a variety of word problems with perimeter. (Lesson 23)**
Objective 2:	**Use rectangles to draw a robot with specified perimeter measurements, and reason about the different areas that may be produced. (Lessons 24–27)**
Objective 3:	**Solve a variety of word problems involving area and perimeter using all four operations. (Lessons 28–29)**
Objective 4:	**Share and critique peer strategies for problem solving. (Lesson 30)**