Area and Perimeter

Level: A (GLE 1-4, CCRS A/B)
Anticipated Length of Time: 27 hours (3 hrs/week for 9 weeks)

Stage 1 – Desired Results
Goal/Learner Outcomes: **By the end of this unit, students will be able to <u>apply an understanding of area and perimeter</u> in order to <u>compare apartments</u>.**
CCR Content Standard(s): • Analyze, compare, create, compose shapes (K.G.4) • Reason with shapes and their attributes (1.G.2, 2.G.1, 2.G.3) • Measure lengths in standard units (2.MD.2, 2.MD.4) • Solve problems involving measurement and conversion of measurement from a larger unit to a smaller unit (given area, find length; given area, find possible perimeters) (4.MD.3) • Understand concepts of area and relate to multiplication and addition (3.MD.5-7) • Recognize perimeter as an attribute of plane figures and distinguish between linear and area measures (3.MD.8)
CCR Standard(s) for Mathematical Practice: MP 1 (Make sense and persevere) MP 4 (Modeling) MP 5 (Use appropriate tools, ie, grid paper, rulers, multiplication charts)

Understanding (s)	Essential Question(s) (Big ideas)
Students will understand… (concepts) • The characteristics of rectangles • How to identify applications of area and perimeter • The difference between linear and square units • Why multiplication connects to arrays and therefore area • How to compose and decompose shapes made of rectangles • Why perimeter is linear and additive • How the composition of rectangles affects area and perimeter	What is area and why is it useful? What is perimeter and when is it useful? How are linear and square units similar and different?

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Student Knowledge and Skills

Students will know … (skills)

- How to find the area and perimeter of a rectangle
- How to find the area and perimeter of a shape composed of rectangles

Students will be able to … (application)

- Find the amount of cardboard used to make a box
- Compare two apartments based on their area and cost

Other Integrated Math Content

- Names of common shapes
- Tactile experiences with common shapes
- Measuring to nearest inch and centimeter
- Benchmarks: Half the size / double the size with shapes
- Expressions (Possibly begin to use variables to represent well understood measurements, like l for length or w for width.)
- Number sense: Connection between repeated addition and multiplication
- Number sense: Commutative property of multiplication
- Test Strategies: Using a Process of Elimination
- Test Strategies: Drawing a picture

Stage 2 – Assessment Evidence	
Performance Task(s):	**Other Evidence:**
Students will use grid paper to determine the area of cardboard used in a box.	Class check-ins
Students will find the area of the classroom.	HiSet-like questions
Students will compare several apartment ads and determine which is the best deal, based on the cost and square footage of the apartment.	Informal assessment

Stage 3 – Learning Plan

Learning Activities

EMPower Over, Around, and Within (OAW) Lesson 5 – Line Up by Size
- Students use multiple methods to compare and order basic shapes according to area and perimeter
- Students find examples of area and perimeter in shapes and around the school

Tangram Puzzles (online, store bought)
- Students find which shapes are half or double the area of another shape
- Students use tangrams to solve spatial reasoning puzzles

EMPower OAW Lesson 6 – Combining Rectangles
- Students use arrays to connect multiplication to area of a rectangle
- Students create composite shapes and investigate what happens to area and perimeter.
- Students use grid paper to find the area of cardboard used in a box (pg 67)

Investigations in Number, Data, and Space: Things that Come in Groups
Investigation 3, Sessions 3 and 4: Array games
- Students use arrays to practice finding area of rectangles, to review multiplication facts, and to explore the commutative property of multiplication

EMPower OAW Lesson 7 – Disappearing Grid Lines
- Students explore the relationship between missing dimensions, areas, and perimeters of rectangles

Test Strategies (use questions from pg 69 in *EMPower OAW*)
- Students take notes on using a process of elimination and on questions that use "always" and "not" and practice these strategies with test practice problems about area and perimeter

Teacher generated
- Students find the area of the classroom
- Students compare apartments from simple floor plans and advertisements

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