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Lesson Plan: Measuring for Perimeter

State Standard 3.5.3: Find the perimeter of a polygon.

Objective: Students will measure and record the sides of a straight-line object and calculate the perimeter. (Step 1)

Assessment: Using the measurements and perimeter of another group's mystery object, students will try to identify a good candidate for the mystery object, explaining their reasoning in writing. If they suggest an object with measurements that are within a few inches of the correct mystery object, and if they justify their choice of object, they will receive 3 points. If they choose a reasonable object but do not justify their choice, they will receive 2 points. If they propose an unreasonable choice or supply bad reasoning, they will receive 1 point. (Step 4)

Materials: yardstick, enlarged ruler/ruler transparency, measuring worksheet

Introduction
Read *The Straight Line Wonder* by Mem Fox. Discuss some characteristics of a straight line.

Step by Step Instructions
1. Review the procedure for measuring a straight line. (Steps 2, 5)
2. Ask a student to come forward and use an enlarged ruler or a transparency of a ruler to demonstrate how to measure something to the nearest ½ inch. Let the class help guide the review.
3. Divide the class into pairs and give each pair a yardstick.
4. Have students practice measuring a few straight lines to the nearest ½ inch.
5. Review the definition of a polygon.
6. Explain and demonstrate how to find the perimeter of a polygon.
7. Tell students they are going to use the skill of measuring to find the perimeter (to the nearest ½ inch) of three objects of their choice in the classroom. Show them how to fill out the worksheet (measure each side and add sides together to find the perimeter).
    a. *Before*: Anticipate that students might try to measure depth or curves. They might be confused about whether to round before or after adding the sides together. They might try to take a measurement that is smaller than ½ inch. (Step 9)
    b. During group work, observe how students are measuring. If students finish early, ask them to rewrite their answers with different units. Ask them to write a problem that is answered by their measurement of one of the objects. (Step 6)
8. After a few minutes, call the class back together for a discussion. Ask: How hard was it to measure to the ½ inch? Did you round before or after adding the sides together? Ask a person from each pair to write on the board the result of their measuring the common object. Invite students to compare the results? Why might they differ? (Step 7)
9. Ask a person from each pair to write on the board the dimensions and perimeter of a "mystery object" that they measured. Instruct them not to identify the object. Assign each mystery object to a pair of students and instruct them to use their measuring skills to identify the mystery object. Have them write out their guess and the reasoning they used.
10. Bring the class together and help students evaluate each other's methods for identifying the mystery object. Connect this activity with estimation — hopefully the students mentally estimated the size and shape of the mystery object, and only took time to measure objects of roughly that size (i.e., Would it make sense to measure a door when the mystery object's perimeter is 14 inches? No.). Did any pair find the right object? Why or why not? Explore the measurements; maybe a person found an object with the target perimeter but with different individual side lengths or even a different number of sides. Invite students to explain or draw some different possible shapes yielded by the same set of measurements (commutative property). (Steps 8, 10)
11. Collect worksheets.

Closure
Discuss real-life applications of the skills needed to investigate a mystery object (e.g., crime scene).

Adaptations
ADHD—Narrow the choice of objects the students can measure. On the ADHD student's worksheet, write the names of the four objects they should measure and allow them to choose three out of the four.

Physical disability—Ask the physically limited student and his or her partner to discuss which objects they would like to measure, and then have the mobile student bring objects to that student's desk so the students can measure while sitting down.

Reflection
Did students use unexpected methods of measuring, rounding, estimating, or finding perimeter?
How well could students explain their thinking?
How well did the students use their freedom to choose which objects to measure?

Resources
Indiana Science Grade 3 Standards Resource.

Perimeter and the Mystery Object

Measure each side of the objects you choose.

Round to the nearest ½ inch.

Find the perimeter in inches.

Put a star (*) beside your chosen mystery object.

Object	Sides	Perimeter

Another group's mystery object (Copy the measurements that the teacher will write on the board.)

Sides	Perimeter

We think the mystery object could be _____

because: