07 / STUDENT ACTIVITY

Does doubling length double everything?

Suggested MYP Years 2-4 | 40 minutes | Similarity and measurement

Name: _____ Class: _____ Date: _____

Inquiry question

When a design is enlarged, what happens to perimeter and area?

A rectangular logo is 3 cm wide and 2 cm high. Create similar copies using scale factors 2, 3 and 4. Every length is multiplied by the same factor.

You need: Squared paper; ruler

1. Predict the new perimeters and areas before calculating.

2. Draw or tabulate the copies and compare length, perimeter and area ratios.

3. State and explain general rules for positive scale factor k.

4. A client wants twice the area. Find the scale factor and justify why doubling the lengths would not work.

Record your investigation

Use the space below and extra paper for diagrams, tables, calculations and your conclusion.

Exit response: What did you revise, and what evidence changed your mind?

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Teaching purpose

A concrete enlargement makes it possible to confront a common misconception using both diagrams and algebra.

Expected findings / checked solution

The original perimeter is 10 cm and area is 6 cm². At k = 2, 3, 4 the perimeters are 20, 30, 40 cm and areas are 24, 54, 96 cm². Perimeter scales by k; area by k². Twice the area needs k = square root of 2, about 1.414, giving dimensions about 4.243 cm by 2.828 cm.

Neutral teacher prompt

Can your diagram explain why there are two factors of k in the area?

Support

Use unit squares at k = 2 before making a table.

Extension

For similar boxes, compare volume and surface-area scale factors and discuss packaging material.

Suggested lesson rhythm

Launch for 5 minutes; explore for 25 minutes; compare approaches for 7 minutes; finish with a 3-minute exit response.

Formative evidence

Look for chosen methods, defined variables, independent checks and explanations. These are teaching activities, not IB-issued assessments or automatic criterion scores. Use current school assessment guidance for summative work.

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