

Activity 8.10A

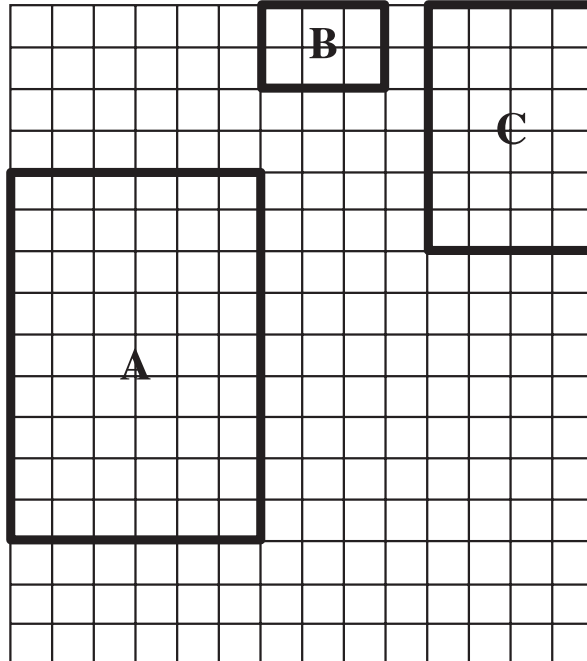
Connections to the mathematics TEKS

(8.10) The student describes how changes in dimensions affect linear, area, and volume measures.

The student is expected to:

- (A) describe the resulting effects on perimeter and area when dimensions of a shape are changed proportionally.

Given the following grid with shapes that have proportionally changed lengths and widths, students find the perimeter and area for each shape and organize the data in a table. Students are then instructed to look for and list patterns that describe the relationship between the changes in the shapes' dimensions of the shapes and the changes in the shapes' perimeters and areas (e.g., halving the length and width of a rectangle gives $\frac{1}{2}$ of its original perimeter, but gives only $\frac{1}{4}$ as much area).



Questioning...

Open with...

What is the relationship between the perimeter and area of these figures?

Probe further with...

- Can you use a formula to find the perimeter?
- Can you use a formula to find the area?
- What is the relationship between corresponding sides of any two figures in the grid?
- What is the relationship between the areas of any two figures in the grid?
- What is the relationship between the perimeters of any two figures in the grid?
- If you draw a figure with sides that are four times the length of the sides of figure A, what would you expect the perimeter of the new figure to be?
- If you draw a figure with sides that are four times the length of the sides of figure A, what would you expect the area of the new figure to be?

Listen for....

- Does the student recognize patterns in the table?
- Does the student communicate using the properties of proportionality?
- Does the student correctly describe perimeter and area?
- Does the student express an understanding that perimeter increases by the scale factor in similar figures?
- Does the student express an understanding that area increases by the scale factor squared in similar figures?

Look for....

- Can the student organize a table?
- How does the student organize the information?
- Does the student correctly compute the perimeter and area?
- Does the student use appropriate formulas to find the perimeter and area?
- Does the student distinguish between the perimeter units and the area units of measure?

TAKS Connection

Released TAKS items related to this activity can be found at the Texas Education Agency website (www.tea.state.tx.us):

- Spring 2004, grade 8, item 28