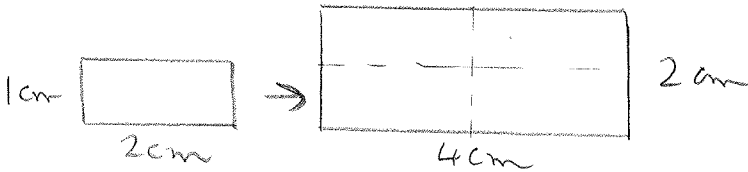# Activity: Scaling

1. Draw a rectangle on a piece of graph paper, then scale it up by a factor of 2.

2. Measure the perimeter of the two rectangles. How do they relate?

Larger one has double the perimeter.

3. Calculate the area of the two and compare by taking the ratio between the two numbers.

$$A = 1 \, cm \times 2 \, cm = 2 \, cm^2$$
$$A' = 2 \, cm \times 4 \, cm = 8 \, cm^2$$

} *factor 4*

4. Convince yourself that this is correct by counting the number of squares in the small and big rectangles and comparing them by finding their ratio.

✓

5. If the linear scaling factor would be 1.5 instead of two, by what factor does the area change?

$$f^2 = 1.5^2 = 2.25$$

6. An artists want to cast a bronze statue, and makes a model that is half the intended size. As he scales up the statue, he needs to know how the model sizes relate to the actual sizes of the bronze version.

If the linear dimensions are doubled, by what factor will the size of the following go up?

a. the circumference of the arm 2

b. the cross-sectional area of the arm $2^2 = 4$

c. the total surface area of the statue $2^2 = 4$

d. volume of the required material for the cast? $2^3 = 8$