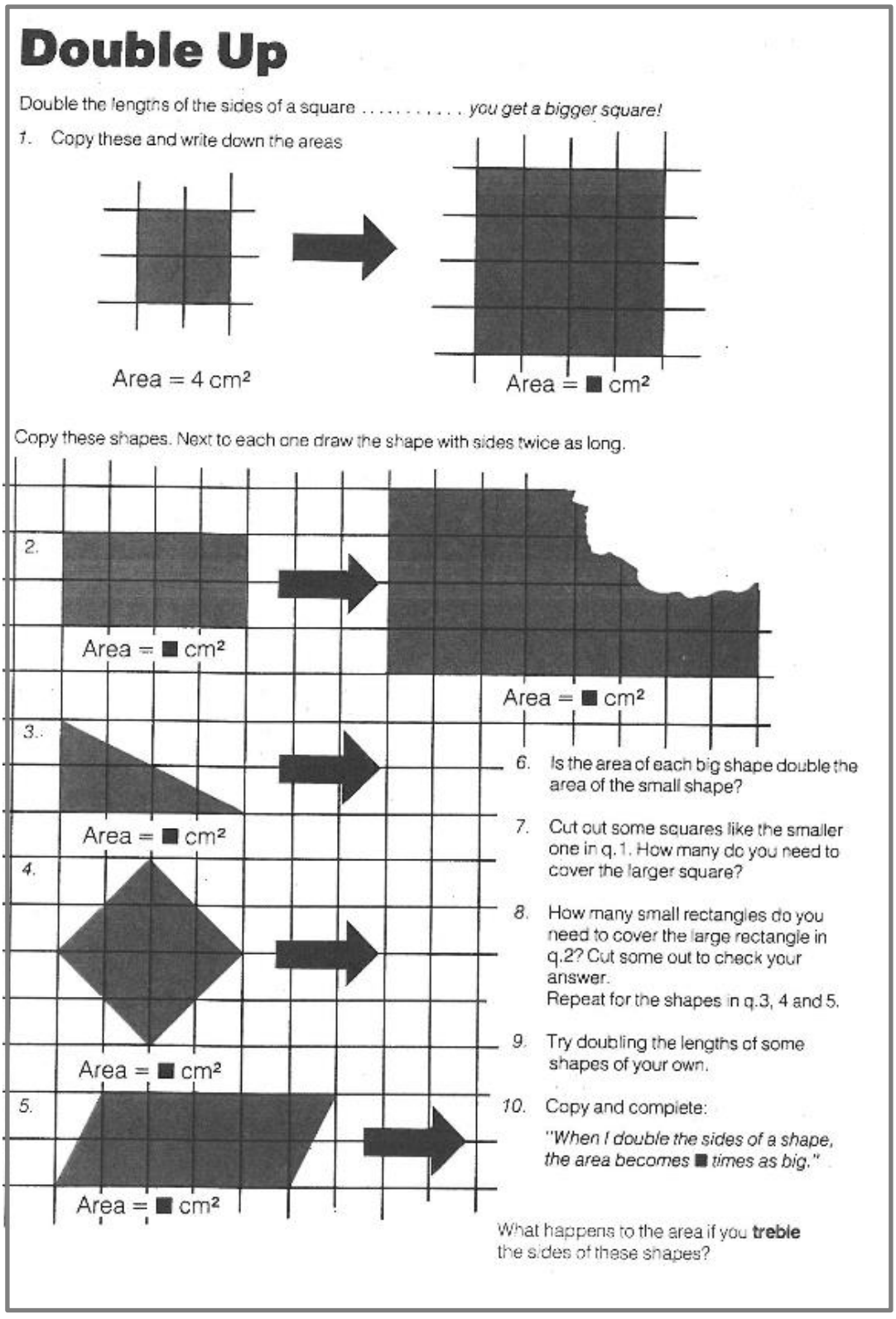
Similarity and Enlargement

Whether you are a parent, teacher or home school educator, we've compiled examples of activities, games and puzzles which can be used to support the learning of shape and space.

These examples are taken from the 'Similarity and Enlargement' packs found in our SMILE resource collection. The mathematical demand increases as you work through the packs. There are lots more ideas in the complete packs, which can be downloaded at https://www.stem.org.uk/rxzfg

Answers to cards can be found at https://www.stem.org.uk/rxxo5



Double Up

Double the lengths of the sides of a square ..... *you get a bigger square!*

1. Copy these and write down the areas

Area = 4 cm²

Area = ■ cm²

Copy these shapes. Next to each one draw the shape with sides twice as long.

2.

Area = ■ cm²

Area = ■ cm²

3.

Area = ■ cm²

4.

Area = ■ cm²

5.

Area = ■ cm²

6. Is the area of each big shape double the area of the small shape?

7. Cut out some squares like the smaller one in q.1. How many do you need to cover the larger square?

8. How many small rectangles do you need to cover the large rectangle in q.2? Cut some out to check your answer.
Repeat for the shapes in q.3, 4 and 5.

9. Try doubling the lengths of some shapes of your own.

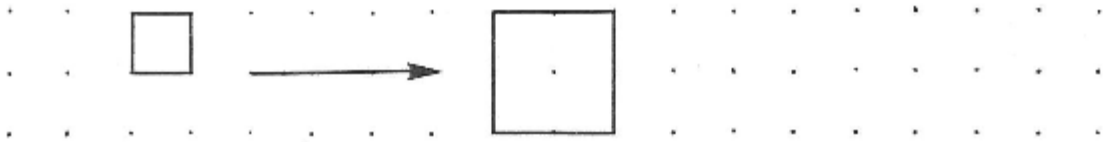
10. Copy and complete:

"When I double the sides of a shape, the area becomes ■ times as big."

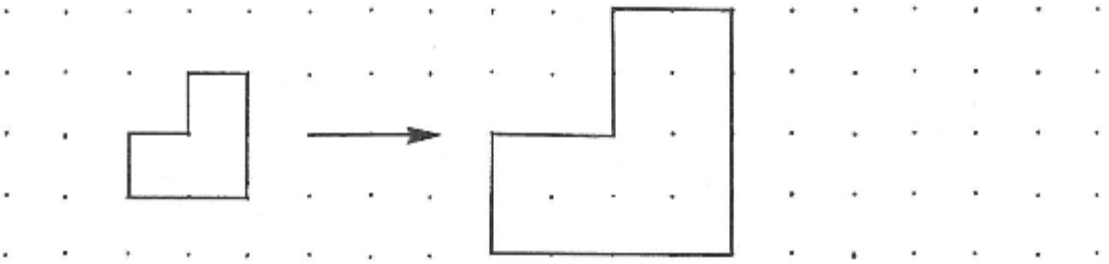
What happens to the area if you **treble** the sides of these shapes?

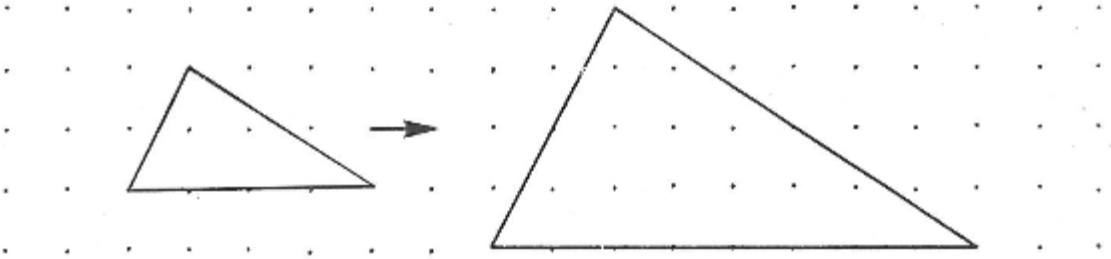
Shapes that can grow

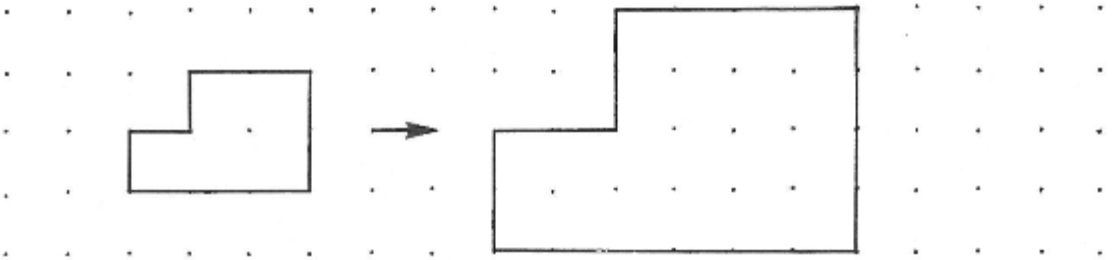
Putting four small squares together to make a large square is easy.

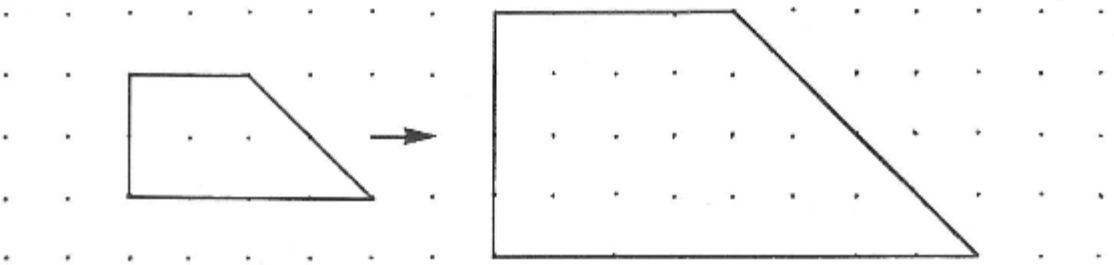


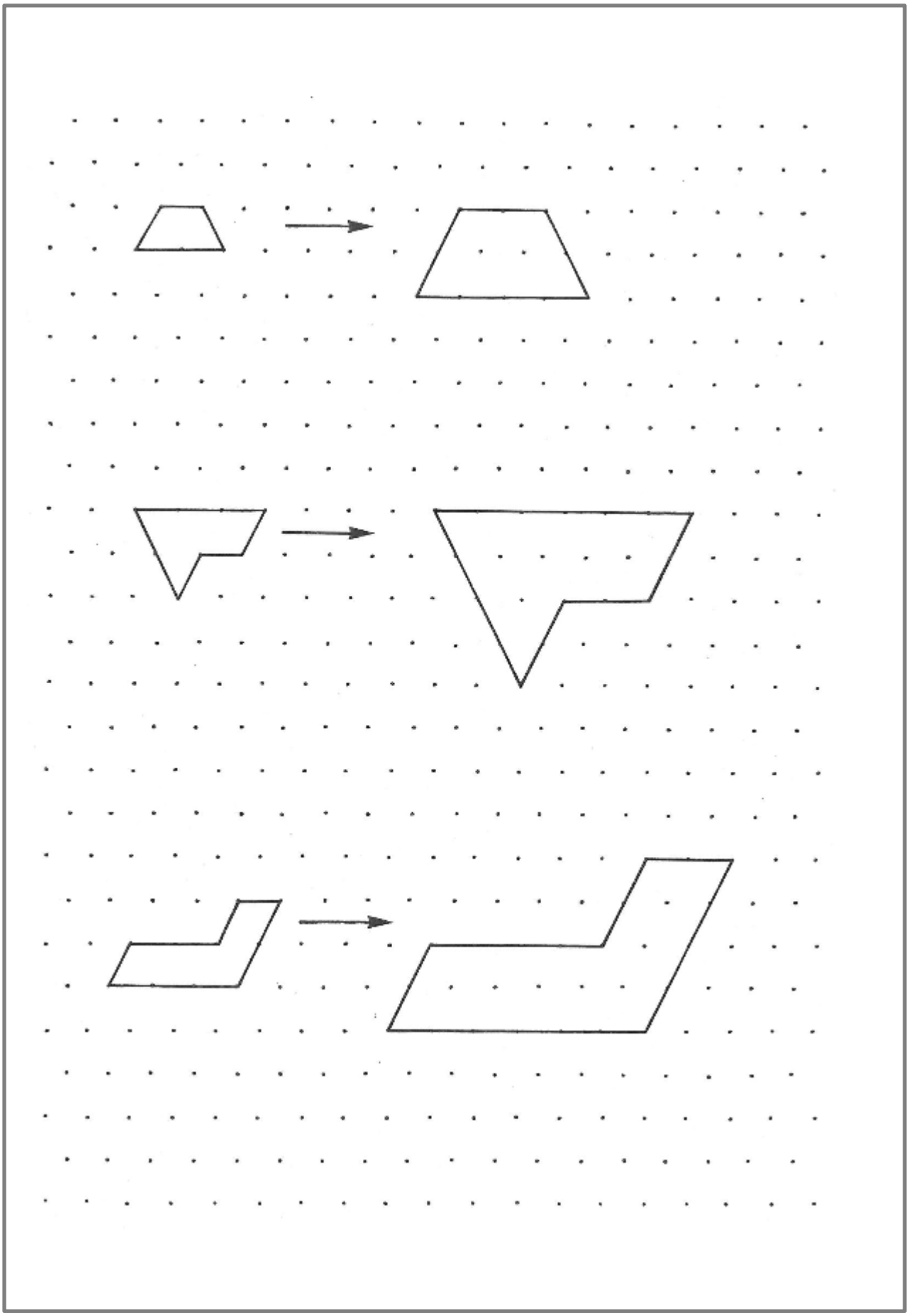
Try these:











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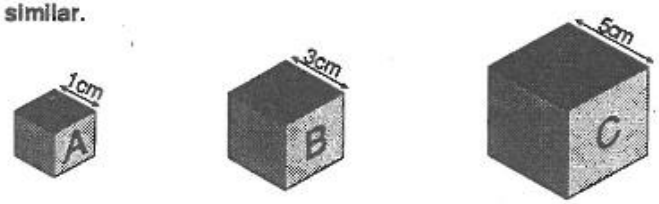
Volumes of Similar Objects

All cubes are **similar**.



1. Copy and complete the table for cubes **A**, **B** and **C**.

	Side Length	Surface Area	Volume
A	1cm		
B	3cm		
C	5cm		

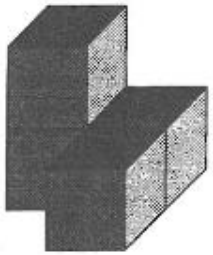
2. Copy and complete the table of ratios of measurements.

	Side Length	Surface Area	Volume
A to B	1:3		
A to C		1:25	
C to B			125:27

3. Write down the ratios of side length, surface area and volume for cubes **D** and **E**.

Calculate the surface areas and volumes to check whether you were correct.

Make a solid with four cubes.



Make a **similar** solid which is an enlargement of scale factor **2**.

- How many cubes did you use?

The ratio of the corresponding side lengths is 1: 2.

- What is the ratio of the corresponding surface areas?
- What is the ratio of the corresponding volumes?

If you made a **similar** solid which is an enlargement scale factor **3**.

- What would be the ratio of the corresponding side lengths?
- What would be the ratio of the corresponding surface areas?
- What would be the ratio of the corresponding volumes?

Make solids with different numbers of cubes.

- Enlarge them by different scale factors to give similar solids.
- For each enlargement record the ratio of corresponding
  - side lengths,
  - surface areas,
  - volumes.

Generalise your results for **similar** solids.

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