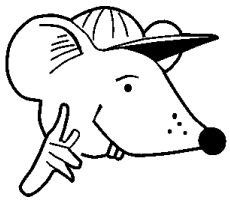
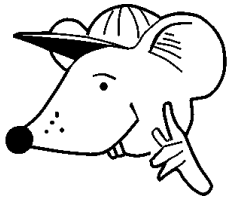
Back to Menu



# MATHEMATICS



## N.S. Yr. 5 P.105

**Making shapes and patterns with increasing accuracy.**

## Equipment

Paper, pencil, card or thick paper, squared paper, range of 3-D shapes, straws and pipe cleaners or 3-D model construction kits, pinboard and elastic bands.

MathSphere

 P.O. Box 1234 Worthing BN13 2UJ www.mathsphere.co.uk

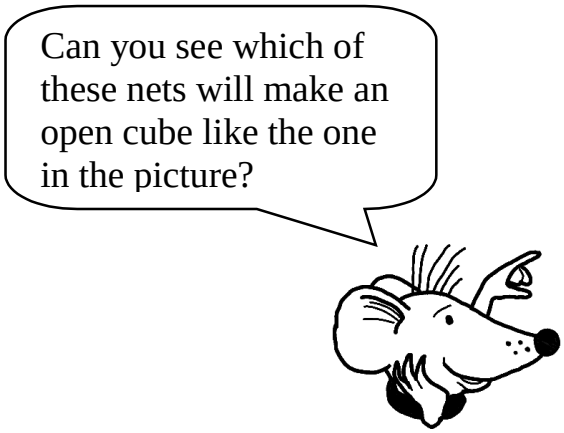
## Concepts

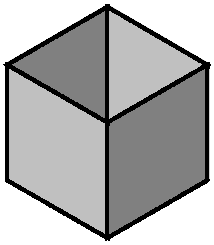
Children should be able to construct 3-D models and draw 2-D shapes more accurately than previously. They will need practice and some help in constructing 3-D shapes and particularly with how and where to position the flaps for joining the edges together when shapes are made from paper or card.

A pinboard is essential for quickly studying the properties of 2-D shapes in this module (see module 4104 for details of how to construct a pinboard). If you are working at home and do not have the materials for a pinboard, the shapes may be drawn on squared paper instead, but this does not give the same flexibility as a pinboard.

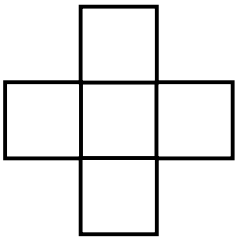
 P.O. Box 1234 Worthing BN13 2UJ www.mathsphere.co.uk

**1.**



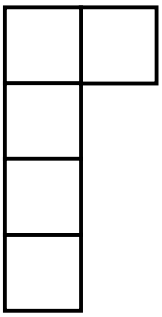



**a.**

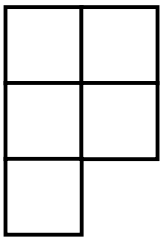


**b.**

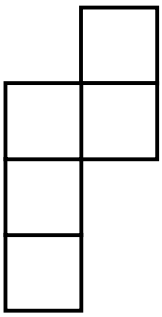
**c.**



**d.**



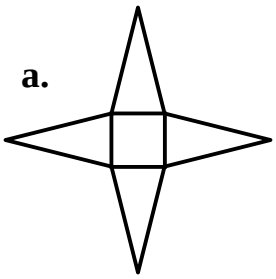
**e.**



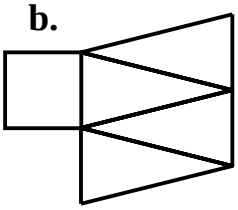
Can you find some more of your own that will make an open cube?

**2.** Which of these nets will **not** make a square based pyramid?

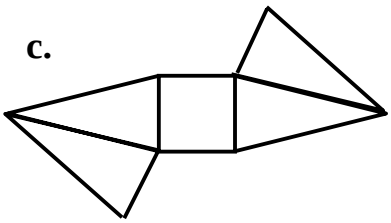
**a.**



**b.**

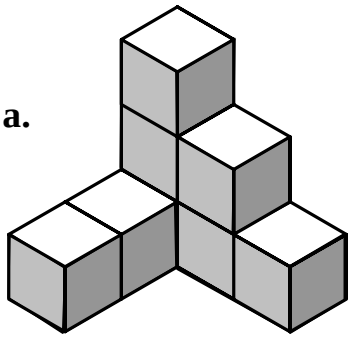


**c.**

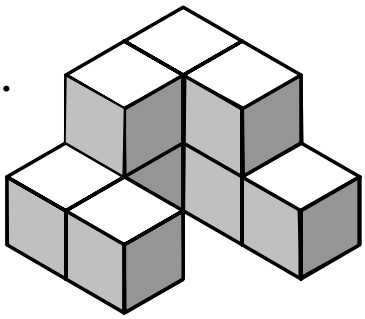


**1.** How many more small cubes do you think are needed to make these shapes into 3 × 3 × 3 cubes ?

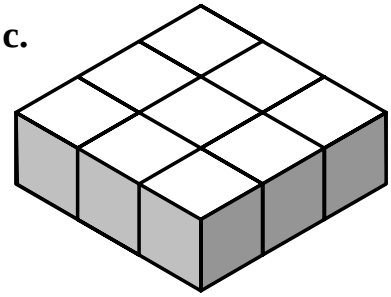
**a.**



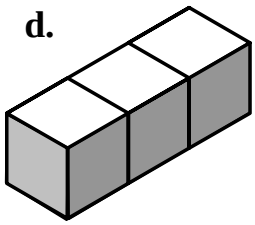
**b.**



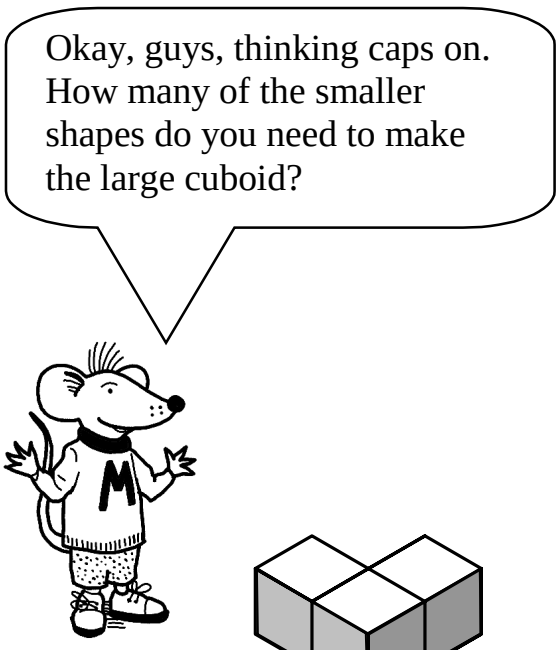
**c.**

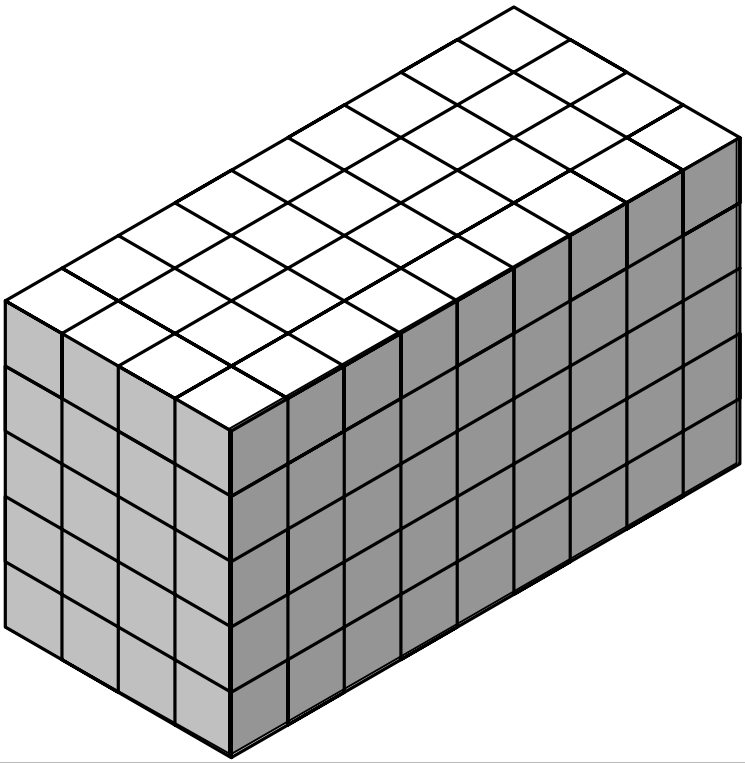


**d.**

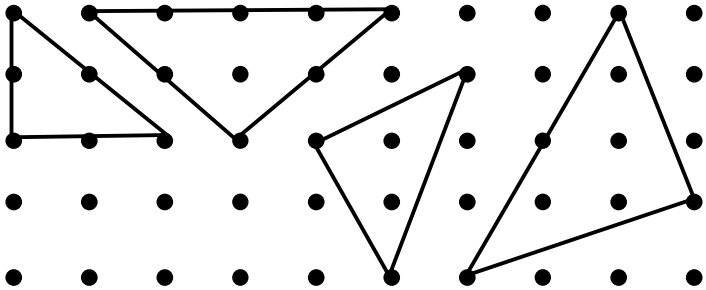


**2.**



**1.** Use a pinboard for this question.



All these triangles have a right angle in them.

Can you make shapes that obey the following rules:

**a.** Shapes that have one line of symmetry.

**b.** Shapes that have two lines of symmetry.

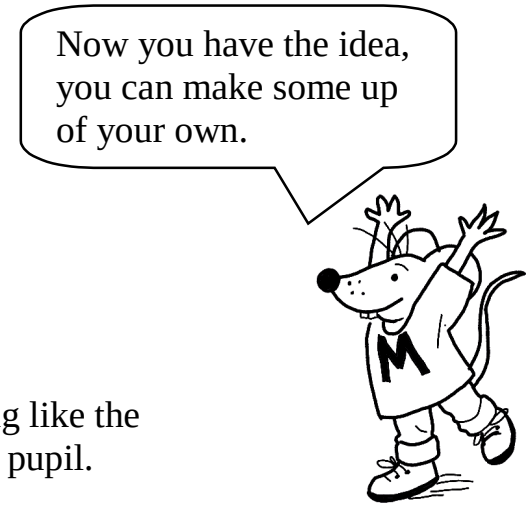
**c.** Shapes that have two right angles.

**d.** Shapes that have at least one pair of parallel sides.

**e.** Shapes that have an area of four squares.

**f.** Shapes that have no angles the same.

**g.** Shapes that have two sides the same length.




**2. Here is a game you can play.**

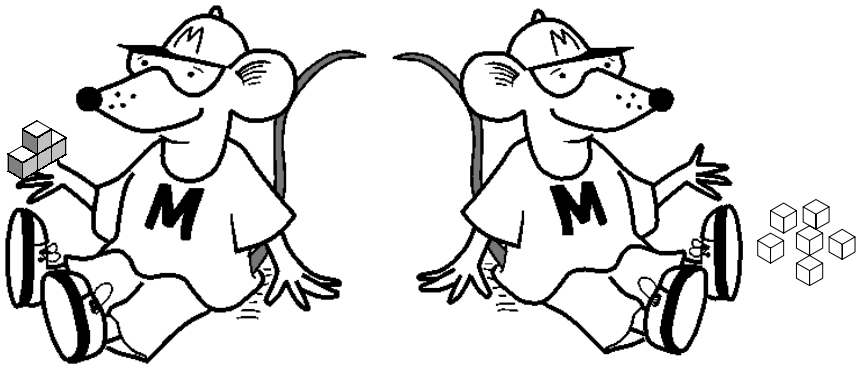
One person thinks of a rule for shapes (something like the ones on question 1). This could be a teacher or a pupil.

Other people have a pinboard and make up some shapes without knowing the rule.

The person who knows the rule tells the others which shapes fit the rule.

The others have to guess the rule. The first one to guess is the winner and has a turn at making up a rule. Keep making shapes until someone guesses the rule!

**1. Here is a game you can play.**

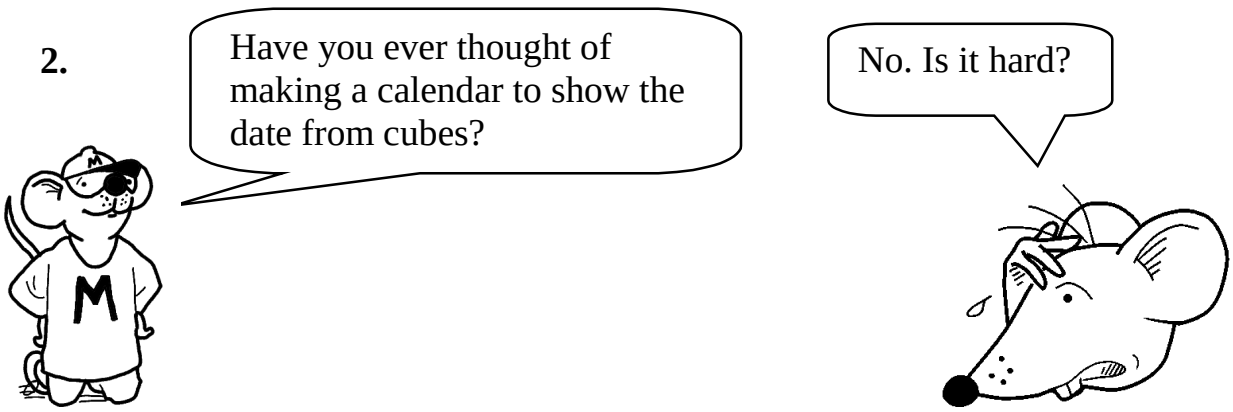


Sit with a partner like Divvy is doing with himself (only Maths Rats can do this!). Look away from each other.

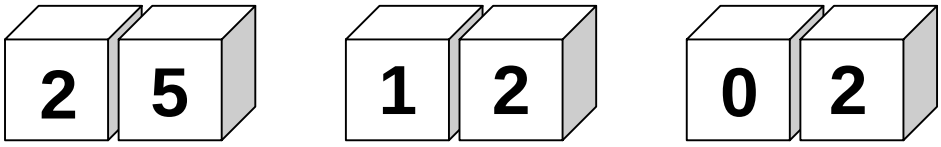
Both partners have a pile of cubes. The first partner makes a shape with some cubes and describes the shape to the second partner. The second partner has to make the same shape with his or her bricks, without looking at the first partner's shapes.

Good luck!

**2.**




Make up some cubes and put a digit on each face. Use six of the cubes to show the date, like this:




Can you work out how many cubes you need?
Remember, you can put six numbers on each cube.

# Answers

**Page 3**

**1.** Nets **a**., **c** and **e** will make an open cube.

**2.** **b.** will not make a square based pyramid.

**Page 4**

**1.** **a.** 19 **b.** 18 **c.** 18 **d.** 24

**2.** 60 (there are 180 cubes altogether $180 \div 3 = 60$)

**Page 5**

**1.** Accept any shapes that obey the rules. Encourage the children to be creative. For example, with rule **e**., encourage shapes that cover a number of part squares such as triangles.

**Page 6**

**1.** This is very good practice at describing shapes. Children can be helped initially by giving them cubes of different colours, but later cubes of the same colour which need more description.

**2.** As a good number of cubes are required, it is probably better to make this a group activity unless the children want a complete set as a present or for their own desk.

By carefully selecting which numbers go on which cubes, it is possible to reduce the number of cubes necessary, but children of this age would not normally be expected to carry out this minimisation, so accept any reasonable solution.