

SMILE WORKCARDS

3-D Pack Two

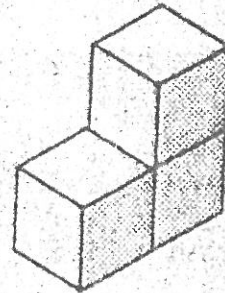
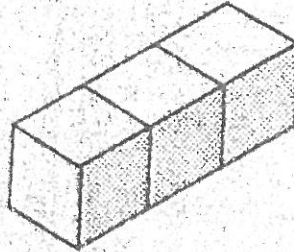
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You will need unit cubes or centicubes.

4 Cube Solids

With 3 cubes it is only possible to make 2 different solids:



There are 8 different solids using 4 cubes.

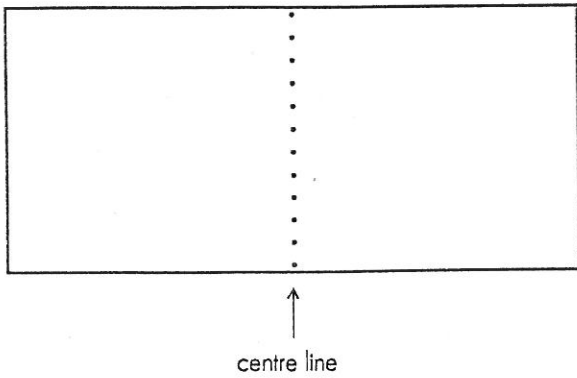
Find them.

Some people think there are only 7. What do you think?

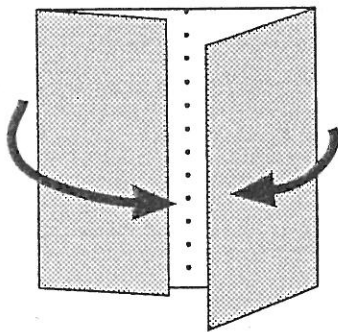
Origami Cube

You will need worksheet 2219a.

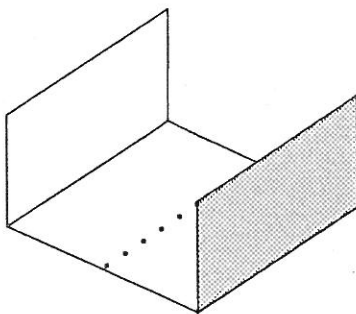
Cut out the six pieces.



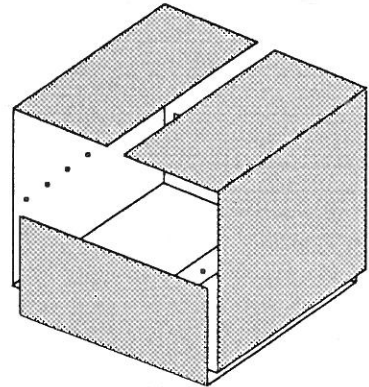
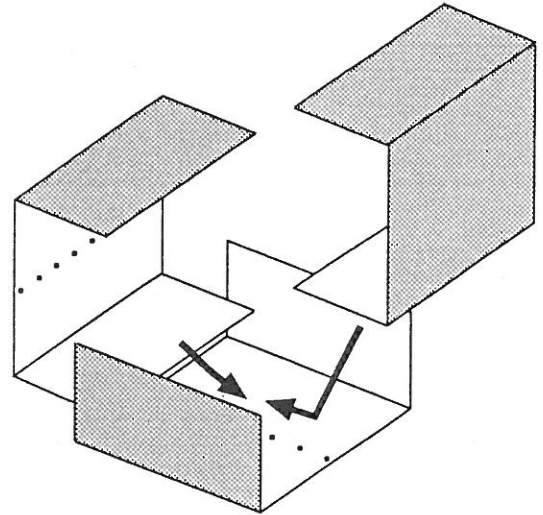
Fold the sides of each piece to meet the centre-line ...



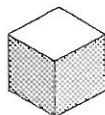
... and open out.



Place three pieces together.

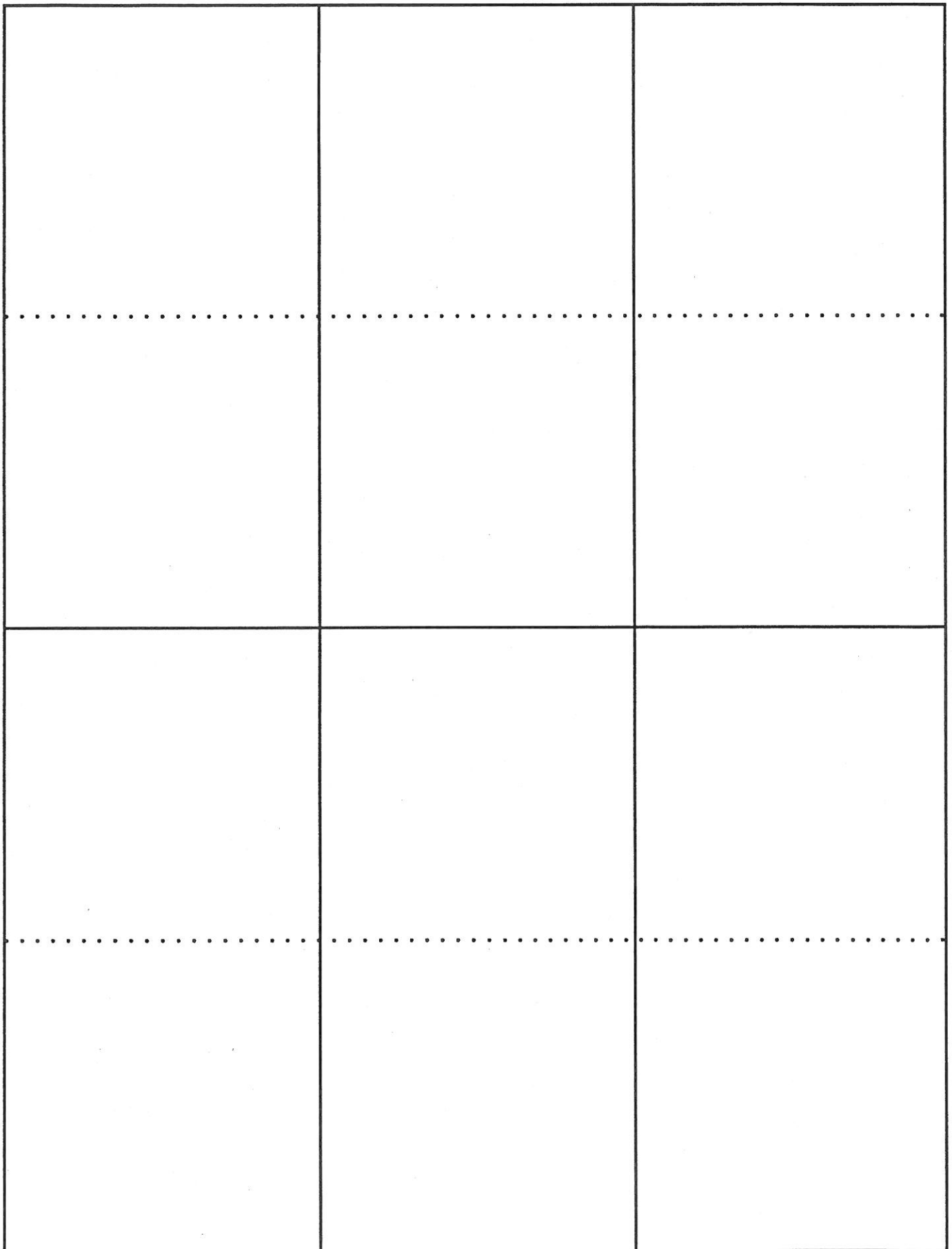


Fit the six pieces together to make a cube.



If you need a hint turn over.

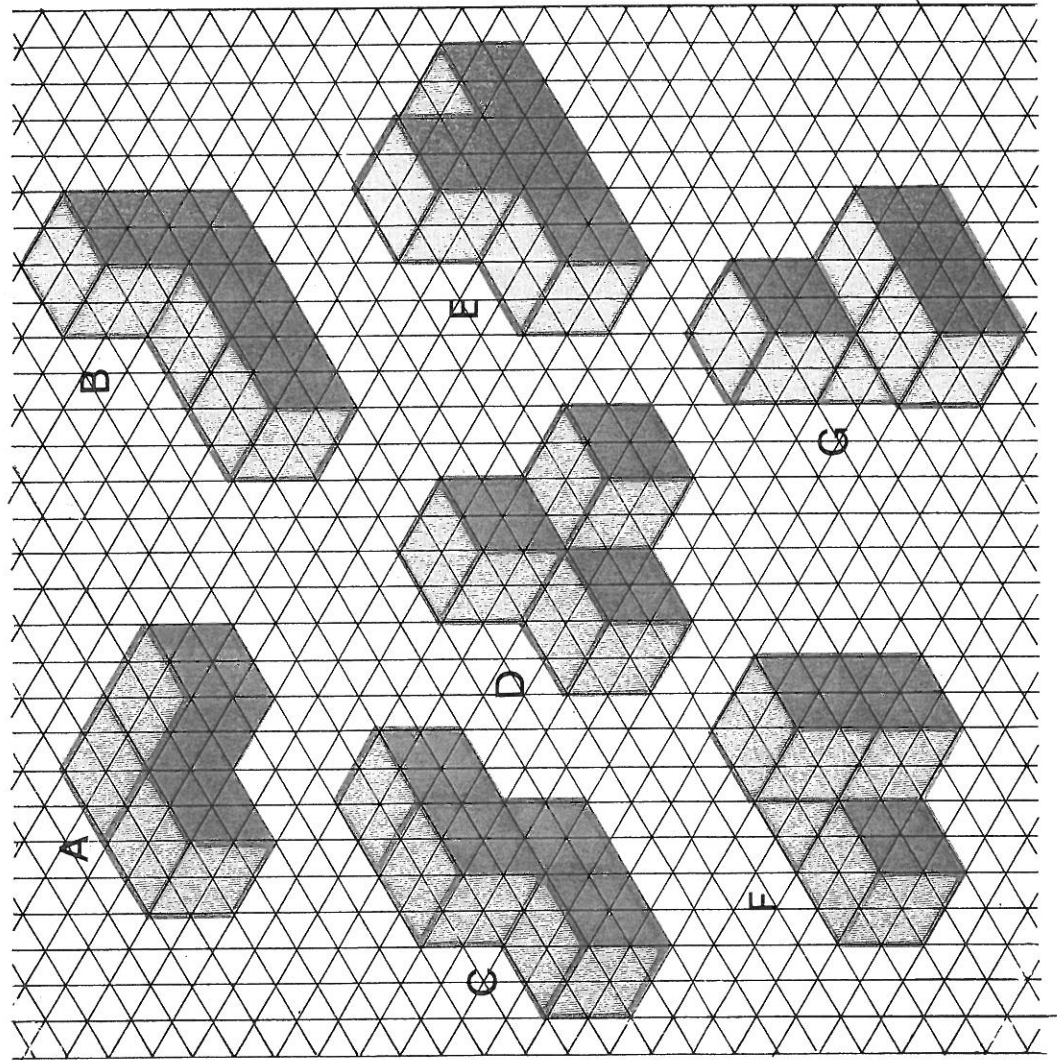




SOMA SOLIDS

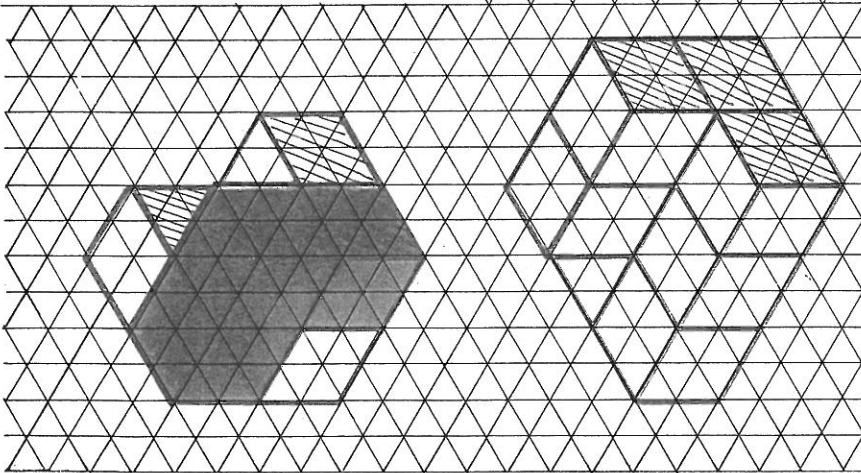
The Soma Cube Puzzle has 7 pieces.

1. Sketch each piece on isometric paper.

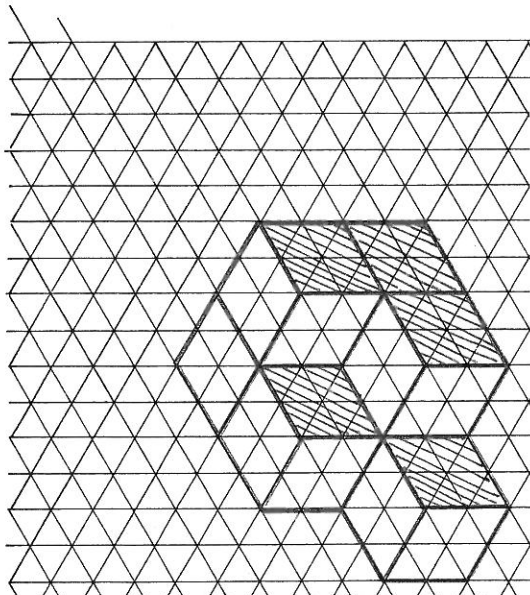


Pieces A and D can be placed together to make this solid.

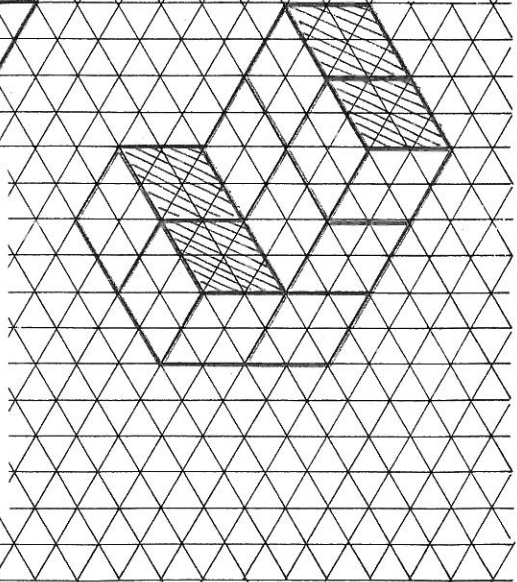
2. Copy and shade these diagrams to show how the solids can be built from



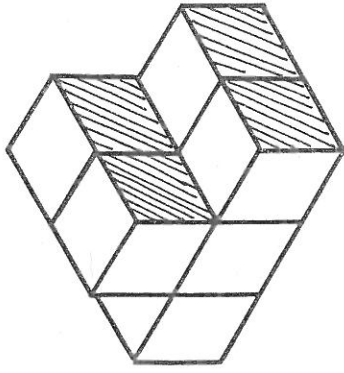
. . . pieces **B** and **C**



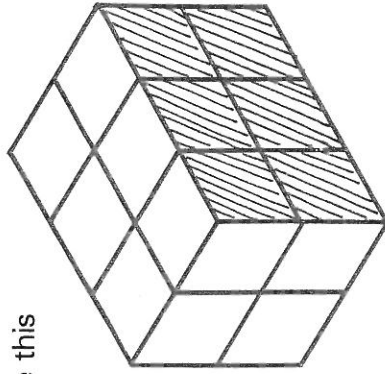
. . . pieces **E** and **F**



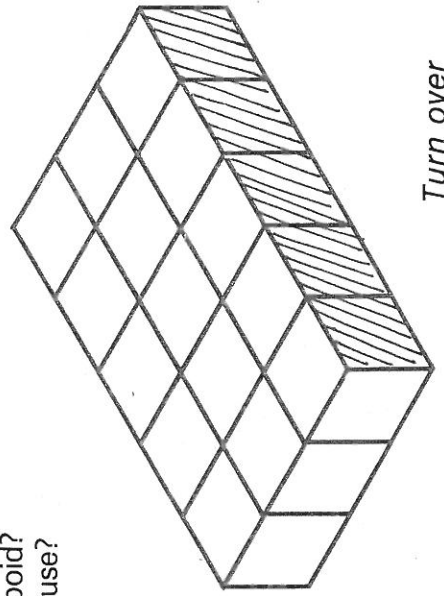
. . . pieces **B** and **G**



3. Which two pieces can be put together to make this solid?
Sketch your answer.



4. Use pieces D, E and F to make this cuboid.



5. Can you make this cuboid?
Which pieces did you use?

Turn over

All seven pieces of the Soma Puzzle fit together to build a cube.

6. Can you build a Soma Cube?
Sketch your solution to show how the pieces fit together.

There are, in fact, hundreds of different ways to build the Soma Cube. There are also many other shapes that can be made with the Soma set. You can find out more about these in

More Mathematical Puzzles and Diversions

Martin Gardner (Penguin)

ISBN 0 14020748 1

Creative Puzzles of the World

Pieter Van Delf & Jack Botermans

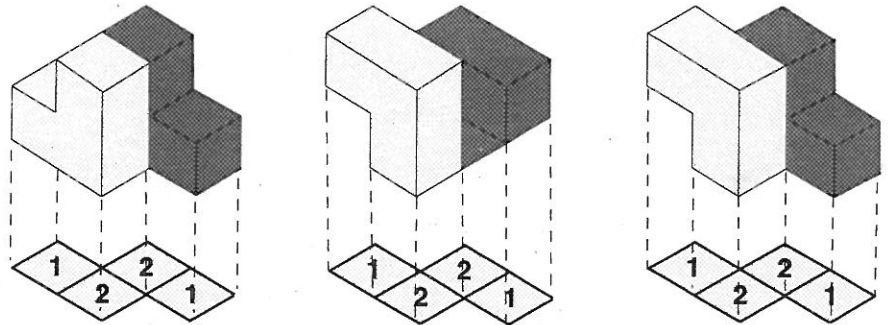
(Cassell) ISBN 0 30430300 3

Tricube Codes

A **tricube** is made of 3 cubes.

These 3 different solids are made by joining 2 tricubes.

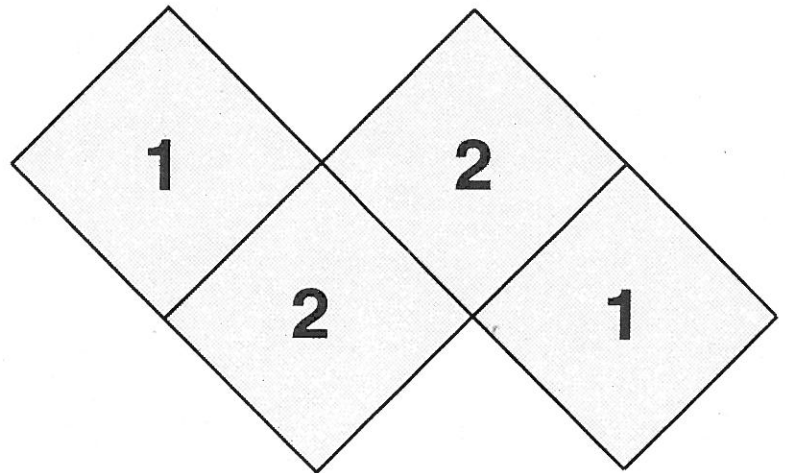
They all have the same coded plan.



Use your 2 tricubes to make the 3 solids.

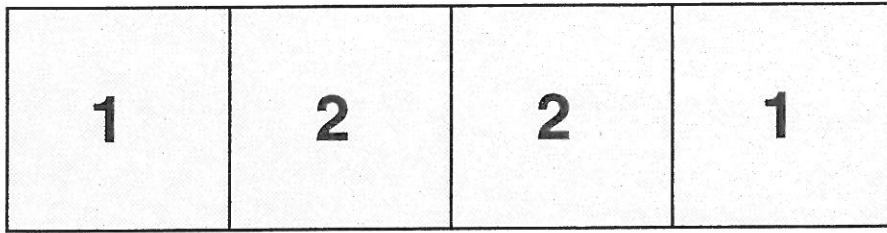
Put them on the coded plan.

Check that you understand the code before continuing.



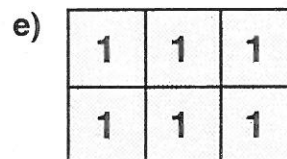
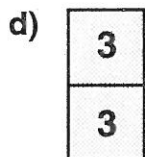
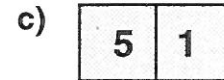
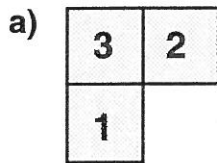
Turn over →

1. Make as many different solids as you can using this coded plan.
Draw your solids.



2. Make a different coded plan.
Draw all the different solids to go with it.

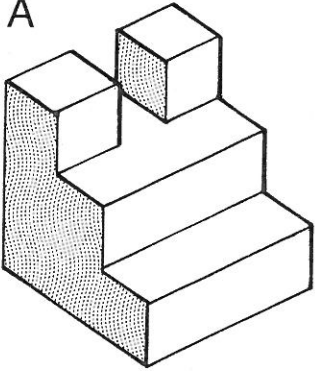
3. Use your 2 tricubes to try to make a solid for each of these coded plans.
One is impossible to make. Draw your solids.



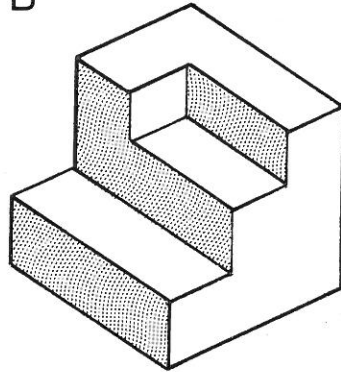
Building cubes

6 pairs will build 6 cubes. Can you match them?

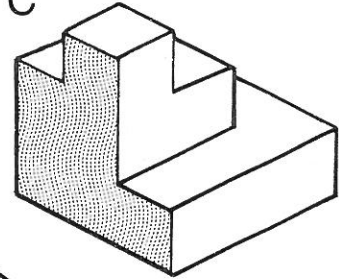
A



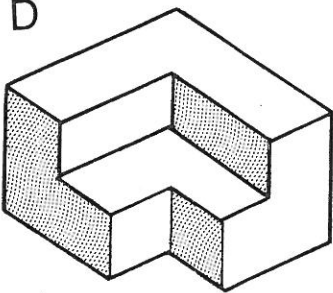
B



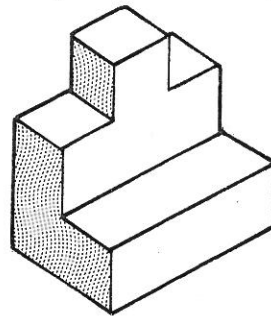
C



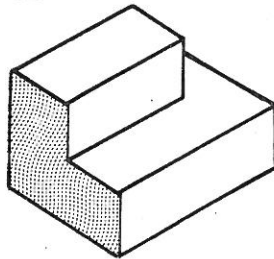
D



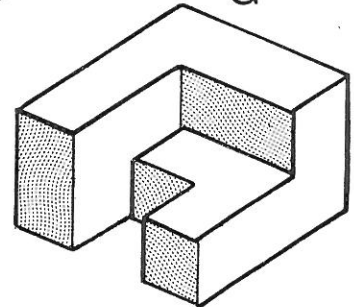
F



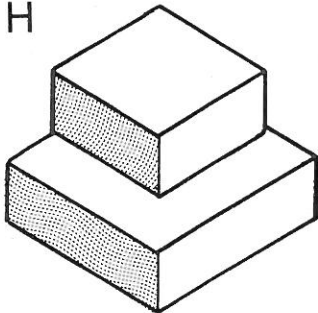
E



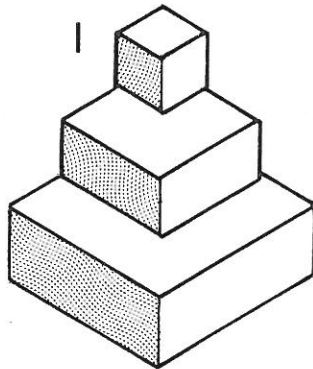
G



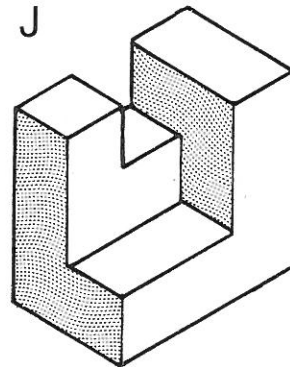
H



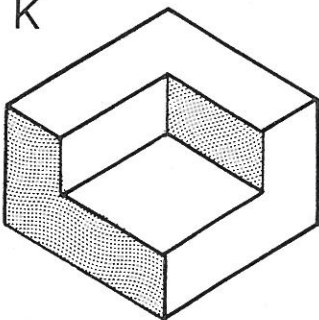
I



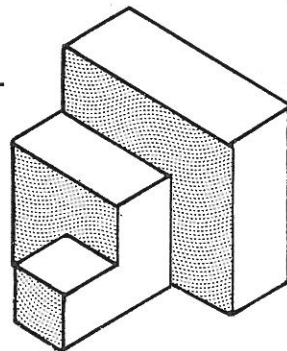
J



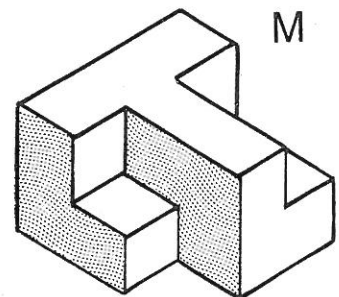
K



L

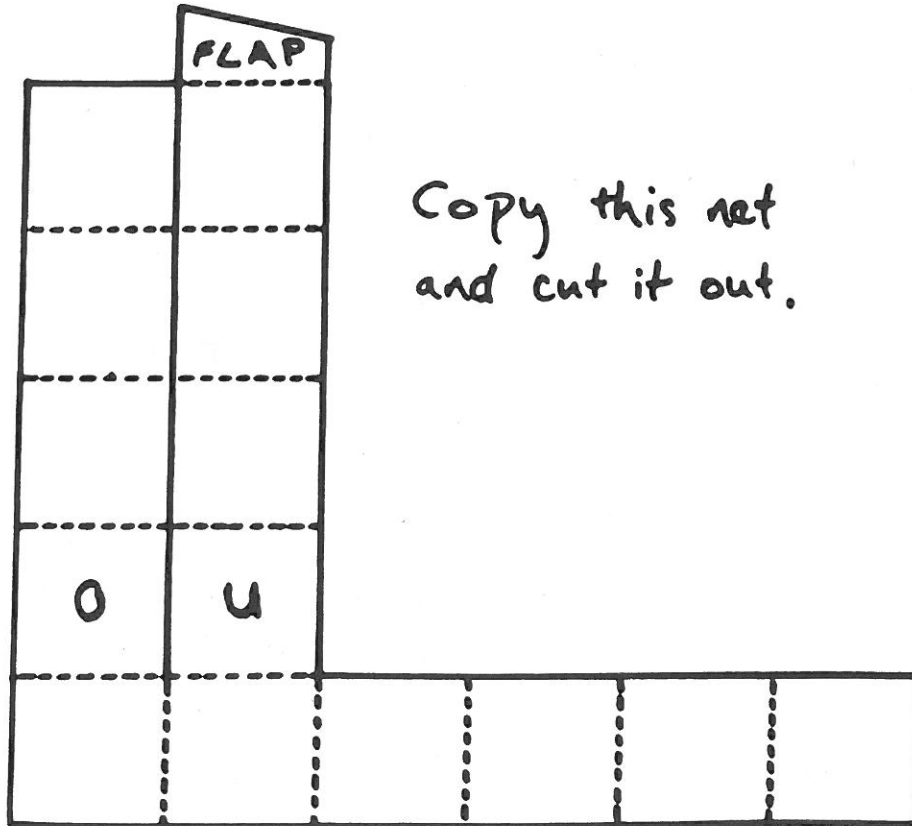


M



You will need: cm. squared paper, scissors

The Plaited Cube



Copy this net
and cut it out.

Cut along the thick lines.

Fold along the dotted lines.

Put the square marked "O" over the square marked "U" ("O" for Over, "U" for under) and plait your cube.

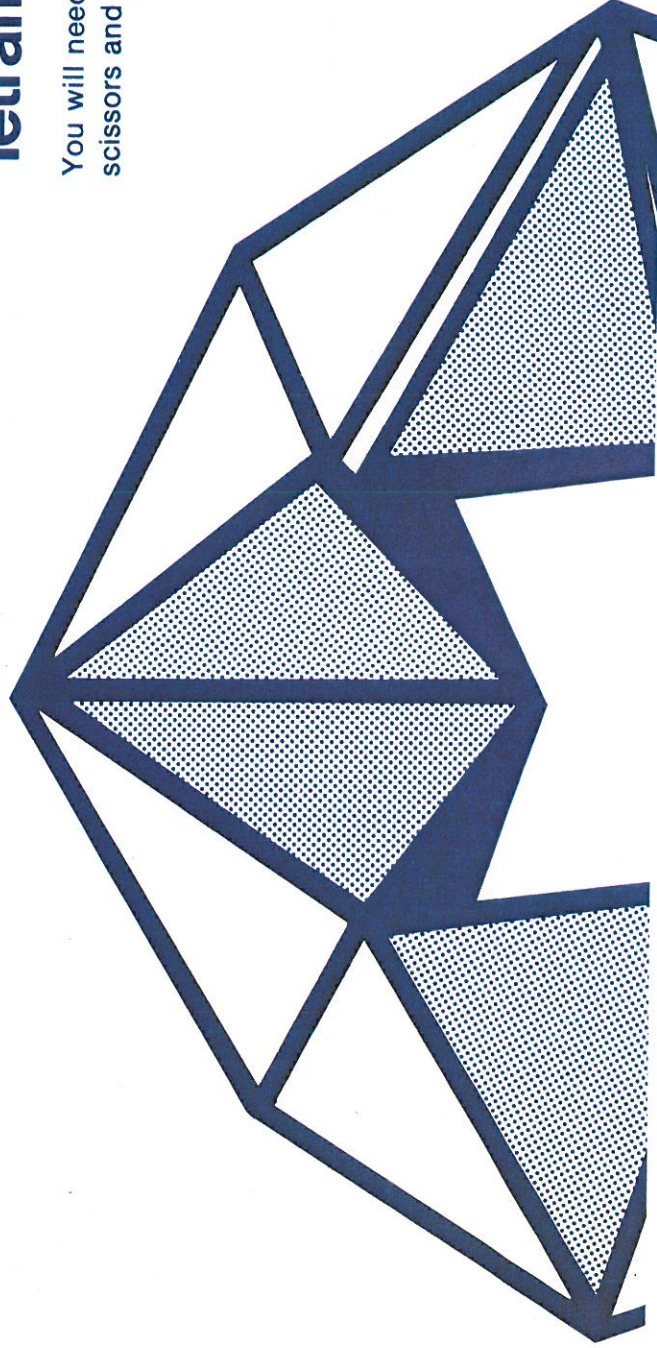
If you plait it correctly the flap will tuck in last of all and your cube should be strong enough to roll over without falling apart.

This can be tricky - be patient.

Smile 0145

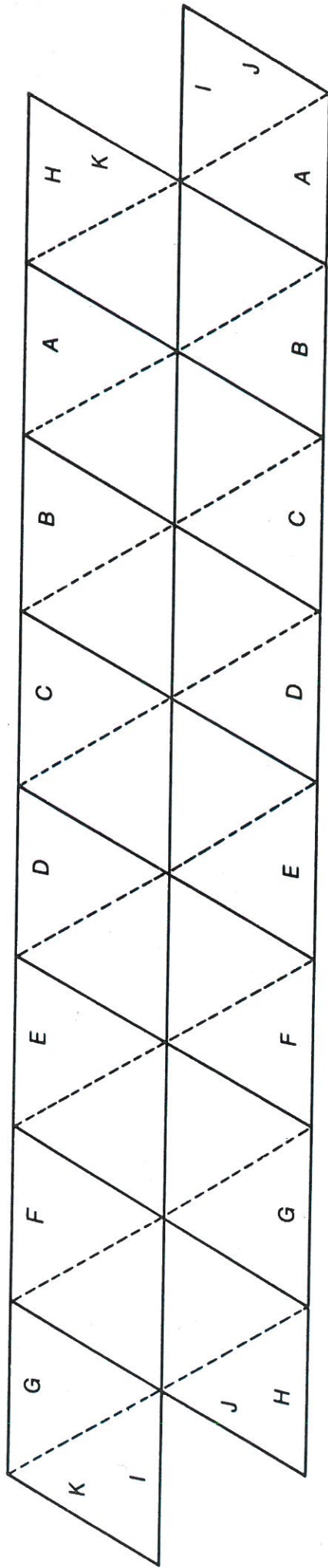
Tetraflexagon

You will need isometric paper,
scissors and sellotape.

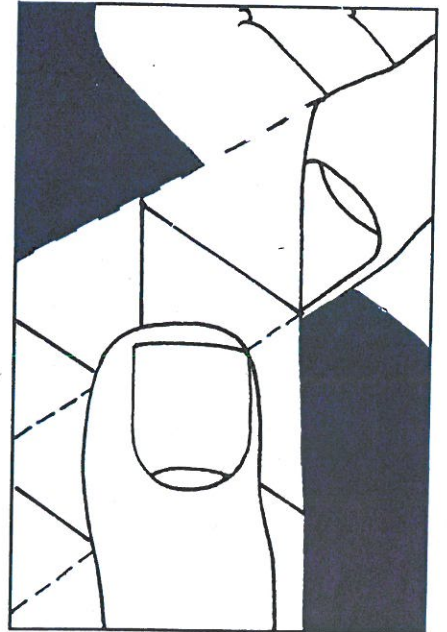


This is a net for a tetraflexagon.

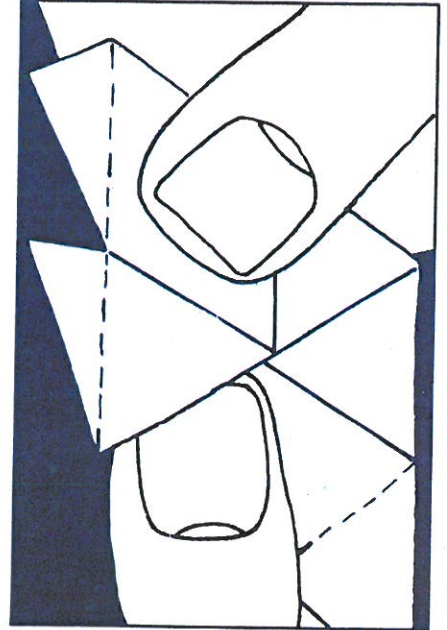
- 1) Draw it on isometric paper — the triangles are all equilateral and their sides should be about 3 cm.
- 2) Cut out the net.



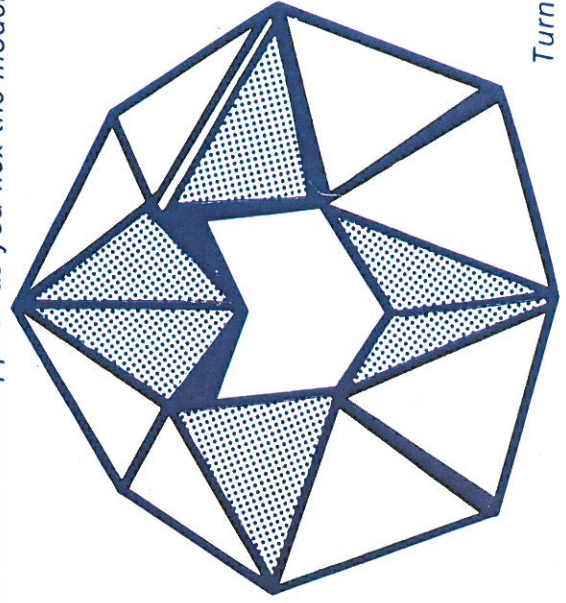
- 3) Fold along the dotted lines so that each fold is in the same direction.
- 4) The outside edges of the net are labelled with letters. Copy these labels onto *both* front and back of the net.



- 5) Fold along the solid lines, but in the opposite directions from the first folds.
- 6) Join the edges which have the same letter with sellotape. Start with D to D.



Decorate the ring – if you use four different colours or patterns, you can make four different faces appear as you flex the model.



Turn over