Primary 3 · Mathematics · Maths General Ability I

Nets and cubes

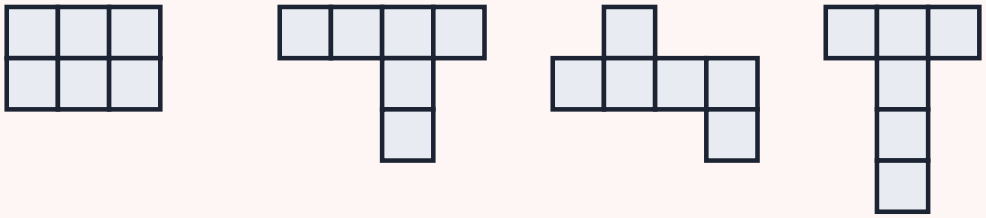
Time **30 min** Marks **20** Questions **5**

Answers are printed in red after each question, with the working where it matters. Marks in brackets show how a marker would split them.

Which nets fold into a cube?

Every net below has 6 squares, one for each face of a cube.

1 Which of these nets fold into a cube? There may be more than one. [3]



A B C D

1. A has only 2 rows of 3, so it has no way to make a top and a bottom without overlapping. It does not fold.
2. B is a row of 4 with two squares hanging below the same square. The first becomes the bottom, and the second folds round onto a side face that is already used. It does not fold.
3. C is a row of 4 with one square above and one below, on different squares. The row wraps the four sides and the extras become the top and bottom. It folds.
4. D is a column of 4 with a square on each side of the top one. The column wraps four faces and the two extras become the two remaining faces. It folds.

ANSWER **C and D**

2 Which of these nets fold into a cube? [4]

A B C D

1. A is a zigzag of three pairs. Each pair folds to a different pair of faces and nothing overlaps. It folds.
2. B is two rows of 3 that share only one column. The rows wrap round in opposite directions and meet without overlapping. It folds.
3. C has three pairs stacked with the middle pair shifted. The top and bottom pairs both fold onto the same faces. It does not fold.
4. D is a row of 4 with two squares below the same square. Those two end up on one face. It does not fold.

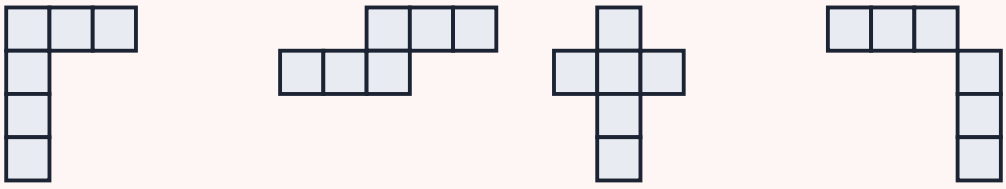
ANSWER **A and B**

3 Look again at the nets that fold. What do they have in common, and what is true of every net above that does not fold? [3]

- **Every net that folds has exactly 6 squares, and when it has a row of 4, the two extra squares sit on different squares of that row, one above and one below.**
- **The nets that fail either put two extra squares on the same side of one square, or have a block of squares that folds two of them onto the same face.**

Accept any answer that names both rules: six squares, and no overlaps. A child who only says 'they have 6 squares' has not separated the nets, since every net here has 6.

4 Which of these nets fold into a cube? [4]

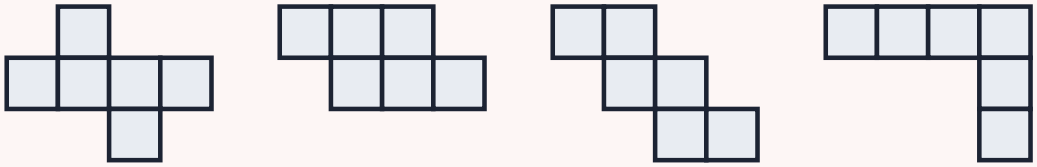


A B C D

1. A is a column of 4 with two squares beside the top one on the same side. The second of those squares folds onto a face the column already covers. It does not fold.
2. B is two rows of 3 sharing one column. It folds.
3. C is the cross: a column of 4 with a square on each side of the second one. It folds.
4. D is a column of 4 with both extra squares on the same side, so they meet on one face. It does not fold.

ANSWER **B and C**

5 Which of these nets fold into a cube? Write the letters. [6]



A B C D

1. A is a row of 4 with the two extra squares on opposite sides and one step apart, so one becomes the top and the other the bottom. It folds.
2. B is two rows of 3 that share two columns. Two of the squares fold onto the same face. It does not fold.
3. C is a zigzag of three pairs, stepped down one pair at a time. Each pair reaches a different pair of faces. It folds.
4. D puts both extra squares on the same side of a row of 4, at the same end. They meet. It does not fold.

ANSWER **A and C**

Marking notes

- Award the marks for each net correctly included or correctly left out.
- Question 3 is marked on the reason, not on the wording.

END OF PAPER