

Nets and Solids

Connect flat nets with faces, edges and vertices.

GRADE 2 • 2.MG.4.b

2.MG.4.b "Compare and contrast models and nets (cutouts) of cubes and rectangular prisms (e.g., number and shapes of faces, edges, vertices)."

NAME _____

DATE _____

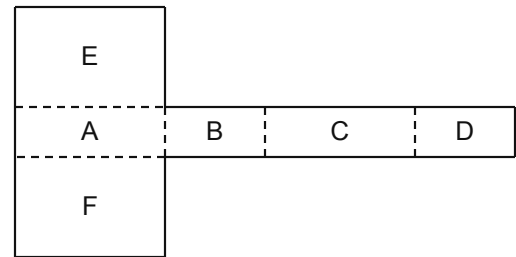
Fold in your mind

A net is a flat pattern that folds into a solid. Dashed lines are folds. A cube is a special rectangular prism with six square faces.

Try it together

Adult setup: bring a cube and a closed rectangular box with no square faces. Read aloud. In this net, find a dashed line. Where would the paper fold?

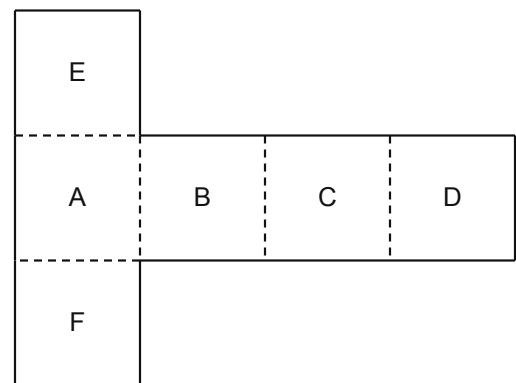
Look between faces A and B. That shared edge is dashed. Fold along the dashed line between A and B. Face-size numbers below are reference only; do not multiply.



A/C: 3×1 ; B/D: 2×1 ; E/F: 3×2 (in). Dashed edges fold.

1. Practice

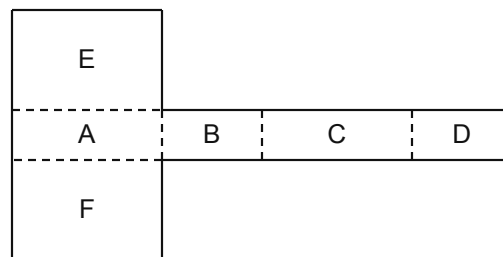
Look at this net and hold the real cube. Count the net's faces. Name their shape. Find a matching face on the cube. Write the number and shape.



A/B/C/D/E/F: 1×1 (in). Dashed edges fold.

2. Practice

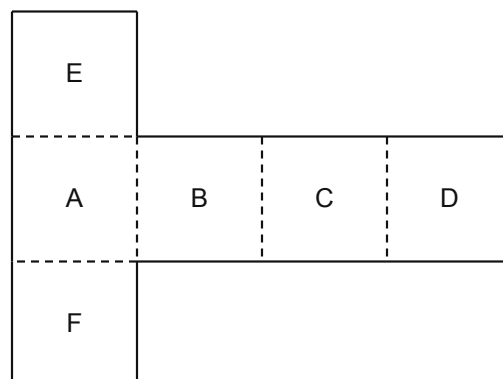
Look at this net and the real rectangular box. Count the net's faces. Name their shape. Write the number. Are all these faces squares?



A/C: 3×1 ; B/D: 2×1 ; E/F: 3×2 (in). Dashed edges fold.

3. Practice

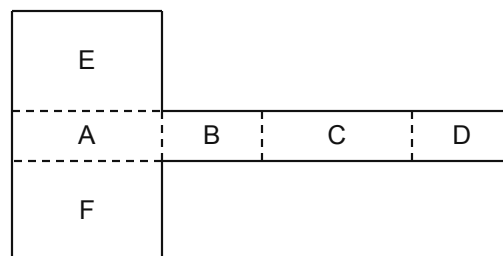
Use the real cube. Run a finger along one edge where two faces meet. Count all its edges once. Write the number. Point to a fold on the net that becomes an edge.



A/B/C/D/E/F: 1×1 (in). Dashed edges fold.

4. Practice

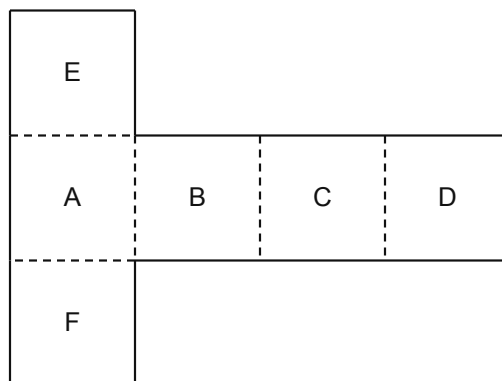
Use the real box. Touch a vertex, where three faces meet. Count the box's vertices once. Write the number. Do not count the outside corners of the flat net.



A/C: 3×1 ; B/D: 2×1 ; E/F: 3×2 (in). Dashed edges fold.

5. Apply

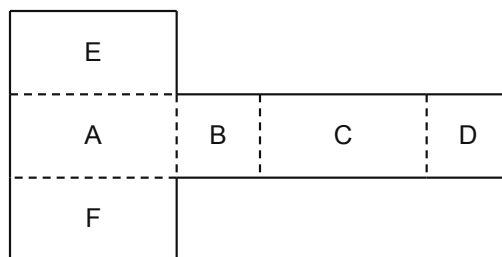
Compare the cube and box models. Say which have the same numbers of faces, edges and vertices. Write the three shared counts.



A/B/C/D/E/F: 1×1 (in). Dashed edges fold.

6. Apply

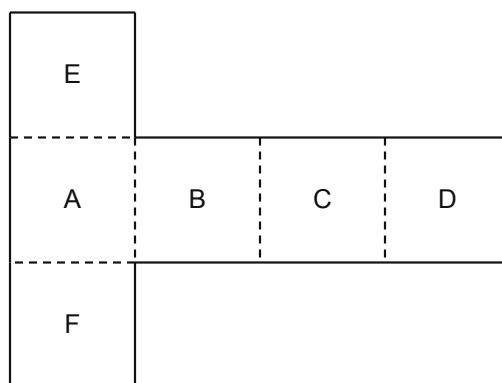
This new net has two square faces. Point to them. Are the other four faces squares? Would this fold into a cube? Explain to a partner.



A/C/E/F: 2×1 ; B/D: 1×1 (in). Dashed edges fold.

7. Challenge

All six faces here are squares. Squares are rectangles too. Explain why this net makes both a cube and a rectangular prism. Say your answer, then write the two names.



A/B/C/D/E/F: 1×1 (in). Dashed edges fold.

Task 1

6 square faces. Each square corresponds to one cube face.

Task 2

6 rectangular faces. No; none of this net's faces are squares.

Task 3

12 edges. Any dashed shared face boundary becomes an edge when folded.

Task 4

8 vertices on the solid. The outside corners of the flat net are not a direct vertex count.

Task 5

Both have 6 faces, 12 edges and 8 vertices.

Count on the real models. Folding brings some separate net edges and corners together.

Task 6

B and D are squares; A, C, E and F are nonsquare rectangles. It forms a rectangular prism, but not a cube.

A cube needs six square faces. Two square ends alone do not make a cube.

Task 7

Cube; rectangular prism. All six faces are squares, which are special rectangles.

Teacher notes

Use real models for edge and vertex counts, including hidden parts. Mark counted parts with removable dots to avoid double-counting. Students point and explain orally as directed. Nets show ideal face shapes at one scale within each diagram; dimensions are reference only. A square is a rectangle; a cube is a rectangular prism. Not every rectangular prism has six nonsquare faces.