

Compare Flat and Solid Shapes

Find what is alike and what is different.

GRADE 2 • 2.MG.4.d

2.MG.4.d "Compare and contrast plane and solid figures (circles/spheres, squares/cubes, and rectangles/rectangular prisms) according to their characteristics (e.g., number and shapes of their faces, edges, vertices)."

NAME _____

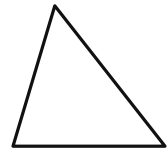
DATE _____

Materials and setup

Bring a cube, a rectangular-prism box with no square faces, a ball, paper and a pencil. An adult reads aloud. Use the models to count hidden parts. Give comparisons aloud and write the requested short answers.

TRY THE IDEA

Plane figures are flat. Solids take up space. A face is a flat surface; edges meet at vertices (corners). Squares are rectangles, and cubes are rectangular prisms.



WORKED EXAMPLE

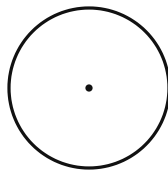
Look at this triangle. Is it a plane figure?

1. The triangle is flat.
2. Its outline has 3 sides and 3 corners.

Answer: Yes. A triangle is a plane figure.

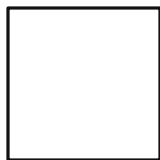
PRACTICE 4 problems

- 1** Name this plane figure and the ball's solid shape. Tell how their curved boundary or surface is alike. Which is flat and which takes up space? Write both names.



ANSWER _____

- 2** Name this plane figure and the matching real solid. Count the plane figure's sides and corners. Count the solid's faces and vertices. Write the two names and the counts.



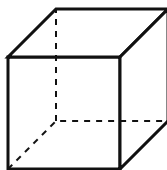
ANSWER _____

- 3** Name this plane figure and the matching real box shape. Count the plane figure's sides and the solid's faces and edges. Tell how their shapes connect.



ANSWER _____

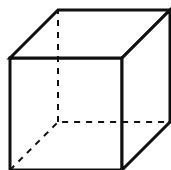
- 4** The square has 4 corners. Does that mean the cube has 4 vertices? Turn the cube to check. Write a correction.



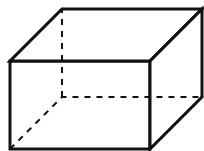
ANSWER _____

APPLY IT Show your work

- 1** On the supplied paper, trace one face of the cube. Name the flat outline. Tell one way it matches the cube and one way it differs. Write the outline's name.



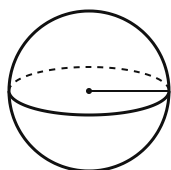
- 2** Trace one face of the rectangular box on paper. Name the outline. Compare its 4 corners with all the box's vertices. Write the two counts.



CHALLENGE

One step up

A student says, "A sphere is a circle with flat faces." Use the ball and the circle picture to correct both parts of the claim.



WORK SPACE AND ANSWER

PRACTICE 1

Circle: flat, with a curved boundary. Sphere: solid, with a curved surface. Neither has vertices.

PRACTICE 2

Square: 4 sides, 4 corners. Cube: 6 faces, 8 vertices. Each cube face is a square.

PRACTICE 3

Rectangle: 4 sides. Rectangular prism: 6 faces, 12 edges. Each face is a rectangle.

PRACTICE 4

No. A square has 4 corners, but a cube has 8 vertices across the whole solid.

APPLY IT 1

Square, also a rectangle. The outline matches a cube face but is flat; the cube takes up space and has 6 faces.

Check the actual tracing. A single face outline is not the whole solid.

APPLY IT 2

Rectangle; 4 corners in the outline and 8 vertices on the box.

The supplied box has no square faces. The tracing is a nonsquare rectangle; the entire solid has 6 faces.

CHALLENGE

A sphere is solid and a circle is flat. A sphere has a curved surface and no flat faces.

Listen for comparisons of each required pair, not just flat/solid labels. Real models reveal hidden parts. A square is a special rectangle, and a cube is a special rectangular prism. A circle has no straight sides or corners; a sphere has no flat faces, edges or vertices.