

An illustration of four diverse children sitting on a blue rug in a library, playing with large geometric shapes. A girl on the left holds a red triangle. A boy next to her touches a blue cube. A girl on the right holds a yellow cylinder. A boy on the far right holds a green pyramid. Various other shapes like a purple cube, a yellow pyramid, and a purple cylinder are scattered on the floor. Bookshelves with books and a potted plant are in the background.

Shapes and Their Attributes

Grade 2 Geometry: exploring sides, vertices, and faces

What Makes a Shape a Shape?

- Sides are the straight edges of a shape.
- Vertices are the corners where sides meet.
- Faces or surfaces are the flat or curved parts of a shape.
- Flat (2D) shapes have sides that are straight line segments.
- Solid (3D) shapes have faces that can be 2D shapes, like a square face on a cube.

Sorting Shapes by Attributes

Count the sides

Sort shapes into groups with 3 sides, 4 sides, or more.

Count the vertices

Sort shapes by how many corners they have.

Compare faces

Sort 3D shapes by the flat shapes you see on their faces.

Name the rule

Explain in words how you sorted your shapes.

Building Bigger Pictures from Shapes

A single shape can be made of smaller shapes put together. Artists and builders use this idea to create pictures and designs from simple shapes like triangles, squares, and circles.

- Look at a picture and find the shapes hiding inside it.
- Combine shapes to build a new design.
- Follow verbal instructions to recreate a shape picture.

Shapes on the Move: Slides, Turns, and Flips

1

Slide (translation)

The shape moves straight in one direction without turning.

2

Turn (rotation)

The shape spins around a point but stays the same size.

3

Flip (reflection)

The shape mirrors over a line, like looking in a mirror.

4

Attributes stay the same

No matter how a shape moves, its sides, vertices, and faces do not change.

Shapes Are All Around Us

Every shape has geometric attributes: sides, vertices, and faces or surfaces. We can sort shapes by these attributes, build new pictures from smaller shapes, and move shapes through slides, turns, and flips without changing what makes them that shape.

Can you find a shape in your classroom, describe its sides and vertices, and show how it would look if you turned it upside down?