MA.5.GR.1.2

Overarching Standard: *MA.5.GR.1* Classify two-dimensional figures and three-dimensional figures based on defining attributes.

Benchmark of Focus

MA.5.GR.1.2 Identify and classify three-dimensional figures into categories based on their defining attributes. Figures are limited to right pyramids, right prisms, right circular cylinders, right circular cones and spheres.

Benchmark Clarifications

Clarification 1: Defining attributes include the number and shape of faces, number and shape of bases, whether or not there is an apex, curved or straight edges and curved surfaces or flat faces.

Related Benchmark/Horizontal Alignment
- There are no direct connections outside of this standard; however, teachers are encouraged to find possible indirect connections.

Vertical Alignment

Previous Benchmarks	Next Benchmarks
MA.4.GR.1.1	MA.6.GR.2.4

Terms from the K-12 Glossary
- Cone
- Cylinder
- Edge
- Prism
- Pyramids
- Sphere
- Vertex

Purpose and Instructional Strategies

The purpose of this benchmark is to begin formal categorization of three-dimensional figures based on attributes of their faces, edges and vertices. Three dimensional figures were identified informally in Kindergarten and Grade 1. The work in Grade 5 prepares students for more detailed work with three-dimensional figures, including finding volumes and surface areas using formulas and nets (MA.6.GR.2.4).

- Instruction includes having students use language they have already learned and apply it to a larger variety of figures including prisms and pyramids with any number of sides.
- During instruction teachers should explain that a cone has one flat face, a cylinder has two flat faces, and a sphere does not have any flat faces, but each of these figures has a curved surface.
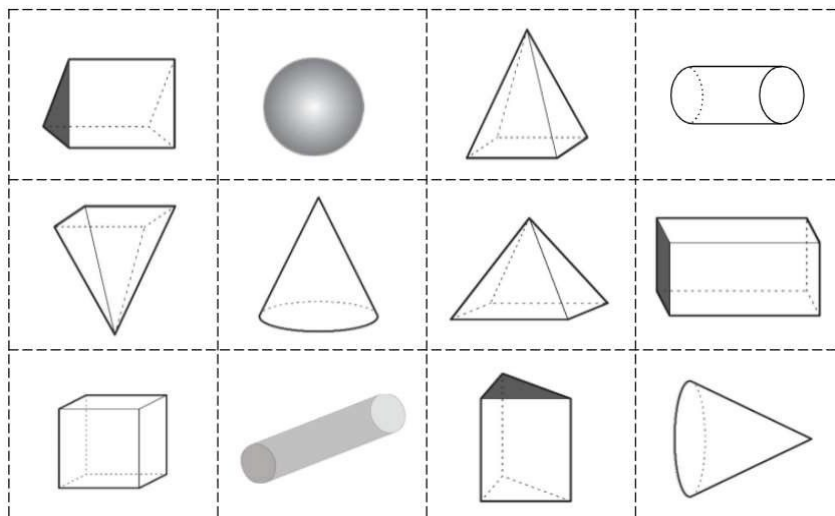

Common Misconceptions or Errors

- Students may believe that the orientation of a figure changes the three-dimensional shape.

Strategies to Support Tiered Instruction
- Instruction includes teacher providing a graphic organizer that contains three-dimensional figure names and definitions from the glossary. Students match images of the figures in different orientations to their definitions.
  - For example, the teacher provides students with a graphic organizer like the one shown below and a set of three-dimensional figure picture cards. Students match the image to the defining attributes listed.

| Figure	Pyramid (right, regular)	Prism (right)	Circular Cylinder (right)	Circular Cone	Sphere
Defining Attributes	A figure containing a polygonal base and rectangular faces. The rectangular faces have the same size and shape and they connect the sides of the base to a common point called the apex.	A figure with two parallel bases that are the same shape and same size. The bases are connected by rectangular faces that are perpendicular to the bases. A box with identical polygons on each end.	A figure containing two congruent, parallel, circular bases whose edges are connected by a perpendicular curved surface.	A three-dimensional figure with a circular base and an apex that is connected to the base by a collection of line segments that form a curved surface.	A three-dimensional figure with all points equidistant from a point called the center.
Examples					

Example Figure Cards

- Instruction includes providing three-dimensional figures made of plastic or wood and having students identify the shapes that make up their base or bases and faces. Students then look at the definition for each figure and classify it based on the attributes they identified.

o For example, the teacher provides the students with a triangular prism like the one shown below. The students then identify the two bases as triangles and the faces connecting them as rectangles. The teacher provides students with the definitions for three-dimensional figures and has them determine which classification it fits in.
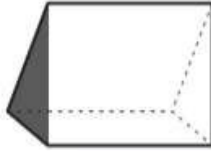
Questions to ask students:
- What is the difference between a pyramid and a prism?
  - o Students should explain that a right prism has two parallel bases that are the same size and shape. The bases are connected by rectangular faces that are perpendicular to the bases. A pyramid has one polygonal base and triangular faces. The triangular faces have the same size and shape and connect the sides of the base to a common point called the apex.

- How are a right circular cylinder and a right circular cone alike? How are they different?
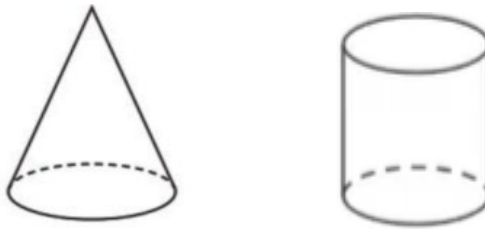
  - o Both three-dimensional figures are made up of curved surfaces, however a right circular cylinder has two flat bases, while a right circular cone has one flat base and an apex.

Instructional Tasks
Instructional Task 1
Categorize the three-dimensional figures below into the table.

Contains circular faces	Contains rectangular faces	May contain a rectangular face	Contains no faces

- Right pyramids
- Spheres
- Right circular cylinders
- Right prisms
- Right circular cones

Instructional Items
Instructional Item 1

Select all the shapes that contain an apex.

      a. Right pyramids
      b. Spheres
      c. Right circular cylinders
      d. Right prisms
      e. Right circular cone

Achievement Level Descriptors

Benchmark	Context	Assessment Limits
MA.5.GR.1.2 Identify and classify three-dimensional figures into categories based on their defining attributes. Figures are limited to right pyramids, right prisms, right circular cylinders, right circular cones, and spheres. Clarification 1: Defining attributes include the number and shape of faces, number, and shape of bases, whether or not there is an apex, curved or straight edges and curved or flat faces.	Mathematical	N/A

ALD 2	ALD 3	ALD 4	ALD 5
Identifies three-dimensional figures, limited to right pyramids, right prisms, right circular cylinders, and right circular cones	Identifies and classifies three-dimensional figures into categories when given attributes; figures are limited to right pyramids, right prisms, right circular cylinders, right circular cones, and spheres.	Identifies and classifies three-dimensional figures into categories based on their defining attributes; figures are limited to right pyramids, right prisms, right circular cylinders, right circular cones, and spheres.	Identifies and classifies three-dimensional figures, including right pyramids, right prisms, right circular cylinders, right circular cones, and spheres, into multiple categories based on their defining attributes.

Additional Resources:
CPALMS

CPALMS lesson: Three-Dimensional Play Dough

Resources/Tasks to Support Your Child at Home:
- Khan Academy Video: Recognizing common 3D shapes
- Youtube video: What is the difference between a Prism and Pyramid and what are Faces, Vertices and Edges - YouTube