



The Geometry of Solids

Learning Targets:

- I can identify parts of geometric solids
- I can classify geometric solids

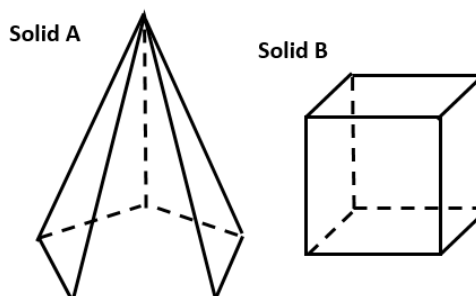


The Geometry of Solids

Launch

Describe the similarities and differences between the two geometric solids.

Similarities



Differences



The Geometry of Solids

Most of the geometric figures you have worked with so far have been flat plane figures with two dimensions—base and height. In this chapter you will work with solid figures with three dimensions—length, width, and height. Most real-world solids, like rocks and plants, are very irregular, but many others are geometric. Some real-world geometric solids occur in nature: viruses, oranges, crystals, the earth itself. Others are human-made: books, buildings, baseballs, soup cans, ice cream cones.



This amethyst crystal is an irregular solid, but parts of it have familiar shapes.

Can you think of other real-world geometric solids?

scoring Geometry
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Lesson 11.1 The Geometr

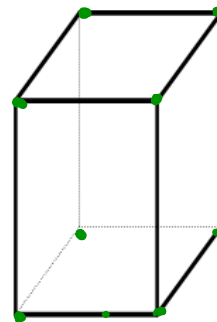
Polyhedron: A geometric solid formed by polygons that enclose a single region of space. A polyhedron has no curved surfaces.

We can describe polyhedrons by identifying its number of faces, edges, and vertices.

Face: The *polygonal* surface of a polyhedron 1)

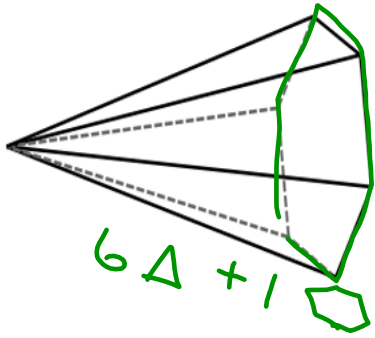
Edge: The *segment* where two faces of a polyhedron intersect

Vertex: The *point* where three or more edges of a polyhedron intersect.



Number of Faces	<u>6</u>
Number of Edges	<u>12</u>
Number of Vertices	<u>8</u>

2)

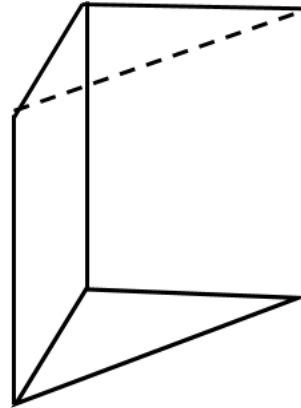


Number of Faces 7

Number of Edges 12

Number of Vertices 7

3)



Number of Faces 5

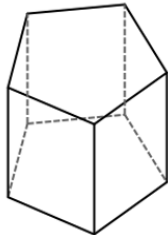
Number of Edges 9

Number of Vertices 6

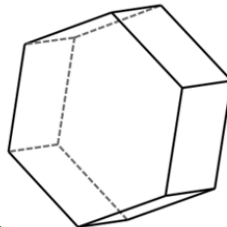
$$F + V = E + 2$$

A **Prism** is a polyhedron that has TWO BASES that are congruent and parallel, and surfaces which are all polygons. It has lateral faces that are parallelograms (in our class, they will be rectangles).

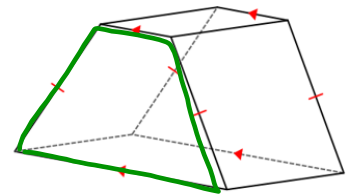
For each prism,
Outline the Bases



Pentagonal Prism



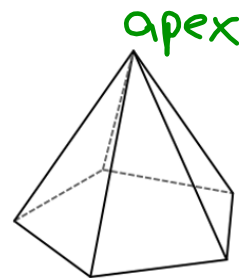
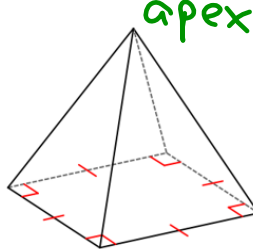
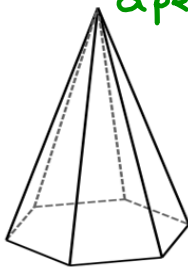
Hexagonal Prism



Trapezoidal Prism

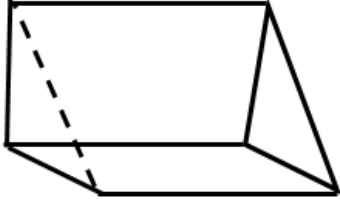
A **Pyramid** is a polyhedron that has ONE BASE. It has lateral faces that are triangles. It also has a vertex where the lateral faces meet which is called the apex of the pyramid.

For each pyramid,
• Label the apex
• Outline the Base

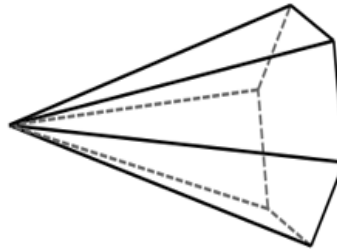


A polyhedron is named by the shape of its Base and its type - Prism or Pyramid.

Name the following polyhedrons:

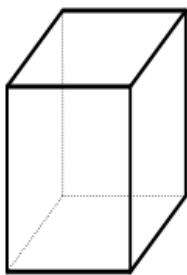


Triangular
Prism



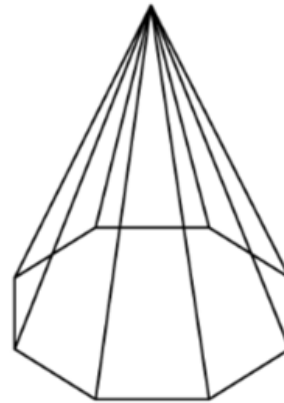
Hexagonal
Pyramid

Name the following polyhedrons:



Rectangular
Prism

Diagonal

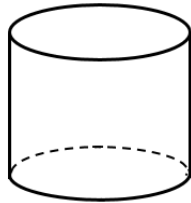


Octagonal
Pyramid

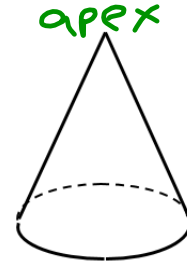
Examples of Non-polyhedrons

There are also geometric solids that have curved surfaces.

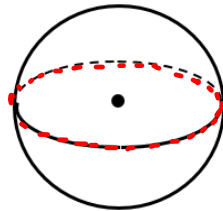
A Cylinder is a curved solid that has TWO BASES are congruent, parallel and circular.



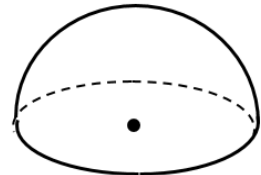
A Cone is a curved solid that has ONE BASE that is circular. It has one vertex called the apex.



A Sphere is the set of all points in a space at a given distance from a given point. It can be thought of as a three-dimensional circle.



A Hemisphere is half of a sphere, and its circular BASE.



Practice:

Use Figure A to answer the questions #1-5.

1) Name the solid Pentagonal Prism

2) The solid has 7 total faces; it has 2 Base(s) and 5 lateral face(s). (Rectangles)

3) Name each base FGHIJ, ABCDE

4) How many edges does the solid have? 15

5) How many vertices does the solid have? 10

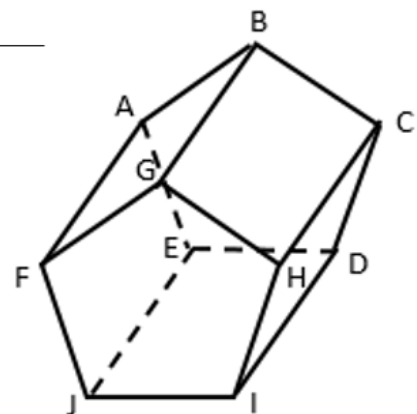


Figure A

Use Figure B to answer the questions #6-10.

6) Name the solid Square Pyramid

7) The solid has 5 total faces; it has
1 Base(s) and 4 lateral face(s).

8) Name each base BCDE

9) How many edges does the solid have? 8

10) How many vertices does the solid have? 5

$$F + V = E + 2$$

$$5 + 5 = 8 + 2$$

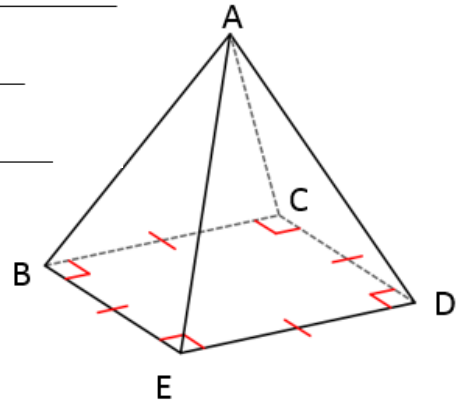
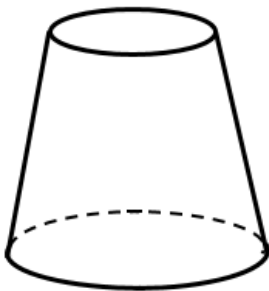


Figure B

11) Is this a cylinder or a cone or neither? Explain.



Assignment:

11.1 and 1.8 Geometry of Solids Homework Day 1