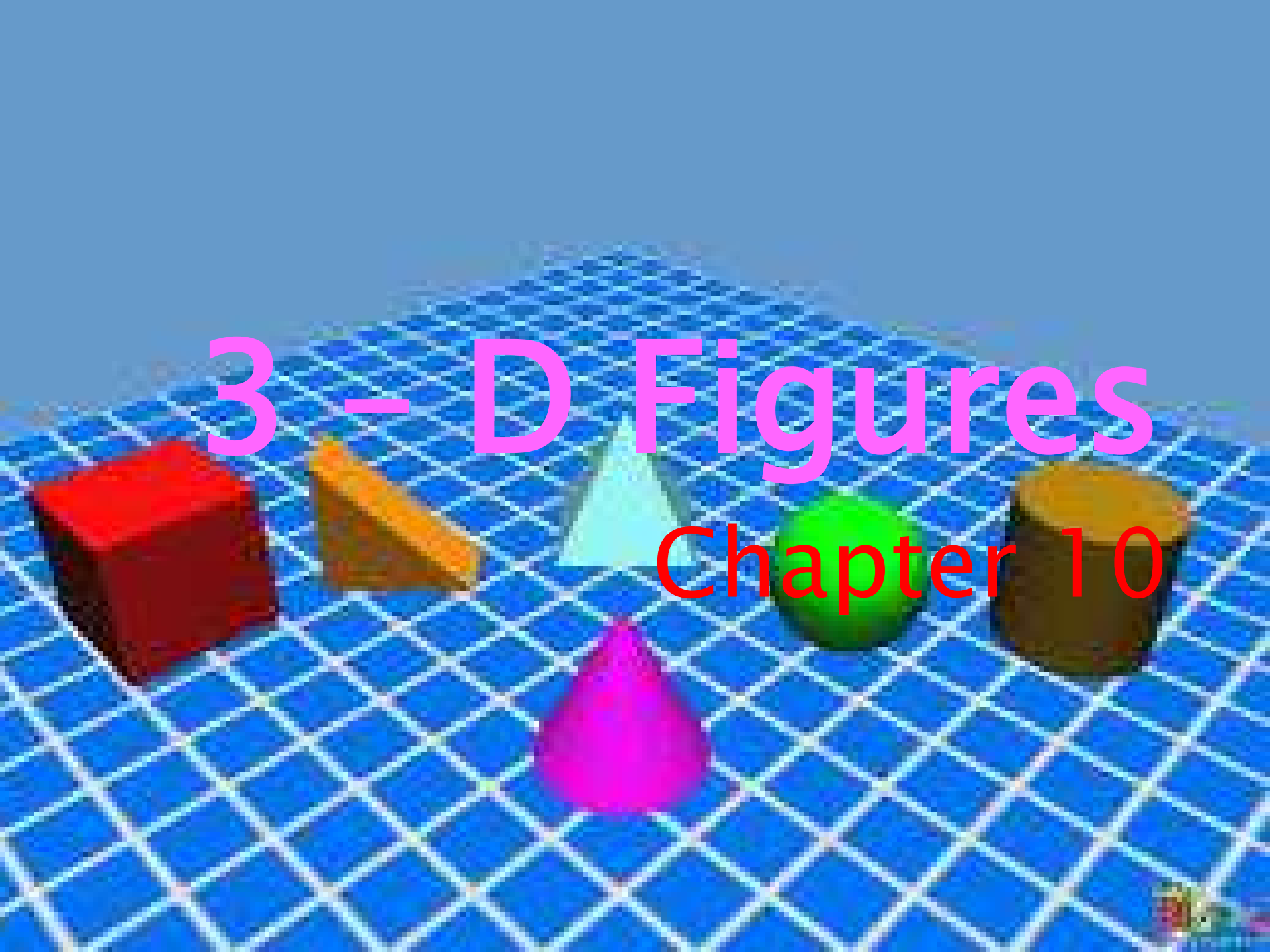
Warm Up

- Describe your bid ideas (what you learned) about triangles during last weeks activity with the straws and coffee filters.


3 – D Figures
Chapter 10

Learn **to identify various three-dimensional figures.**

Face – a flat surface of a three-dimensional figure.

Edge – where two faces meet

Polygon – a closed plane figure formed by 3 or more line segments.

Polyhedron – a three-dimensional figure whose faces are all polygons.

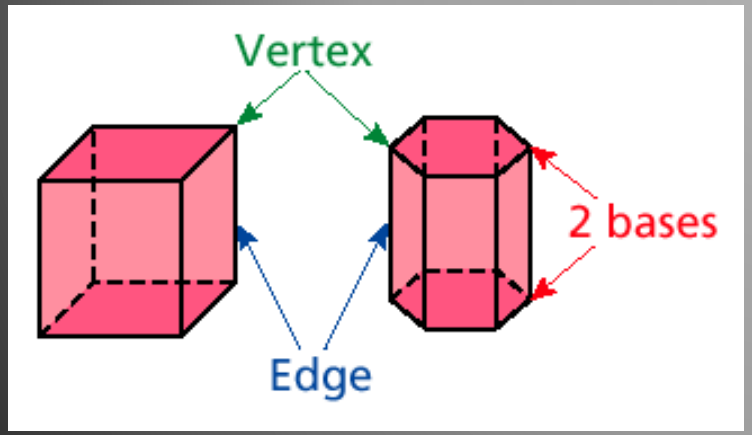
Vertex – a point where three or ore edges meet.

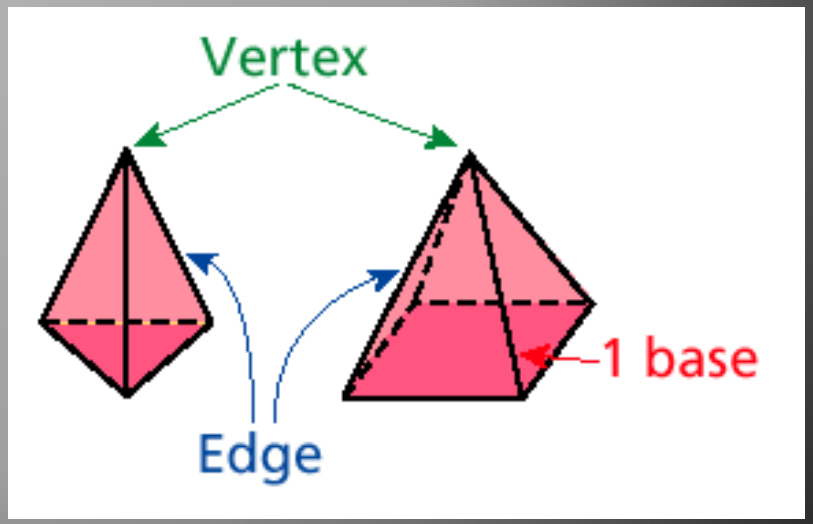
Base – the face that is used to name a polyhedron.

A prism has 2 bases, and a pyramid has one base.

A **prism** is a polyhedron that has two parallel, congruent bases. The bases can be any polygon. The other faces are parallelograms.

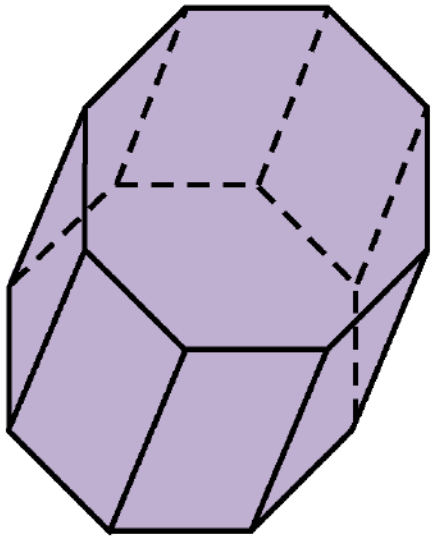
A **pyramid** is a polyhedron that has one base. The base can be any polygon. The other faces are triangles.





Additional Example 1A: Naming Prisms and Pyramids

Identify the bases and faces of the figure. Then name the figure.



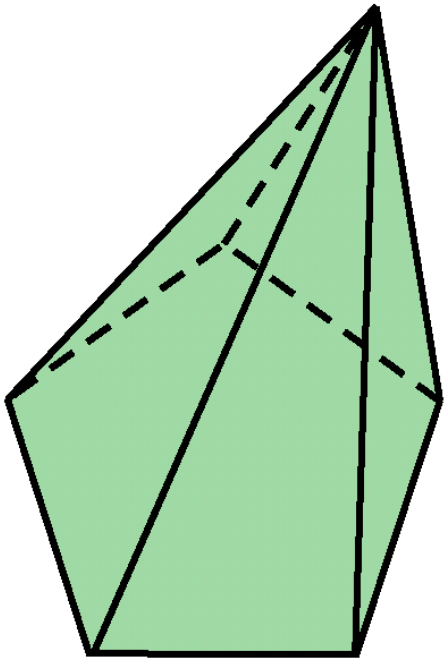
There are two octagonal bases.

There are eight rectangular faces.

The figure is an octagonal prism.

Additional Example 1B: Naming Prisms and Pyramids

Identify the bases and faces of the figure. Then name the figure.

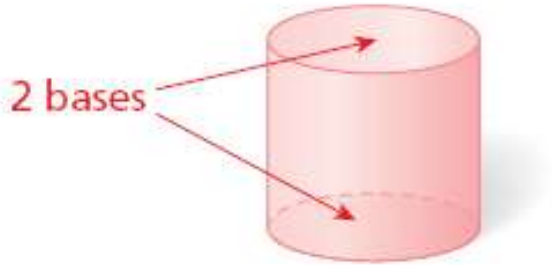
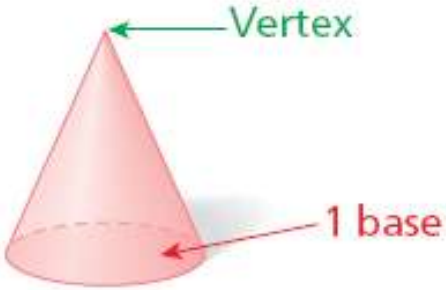


There is one base, and it is a pentagon.

There are five triangular faces.

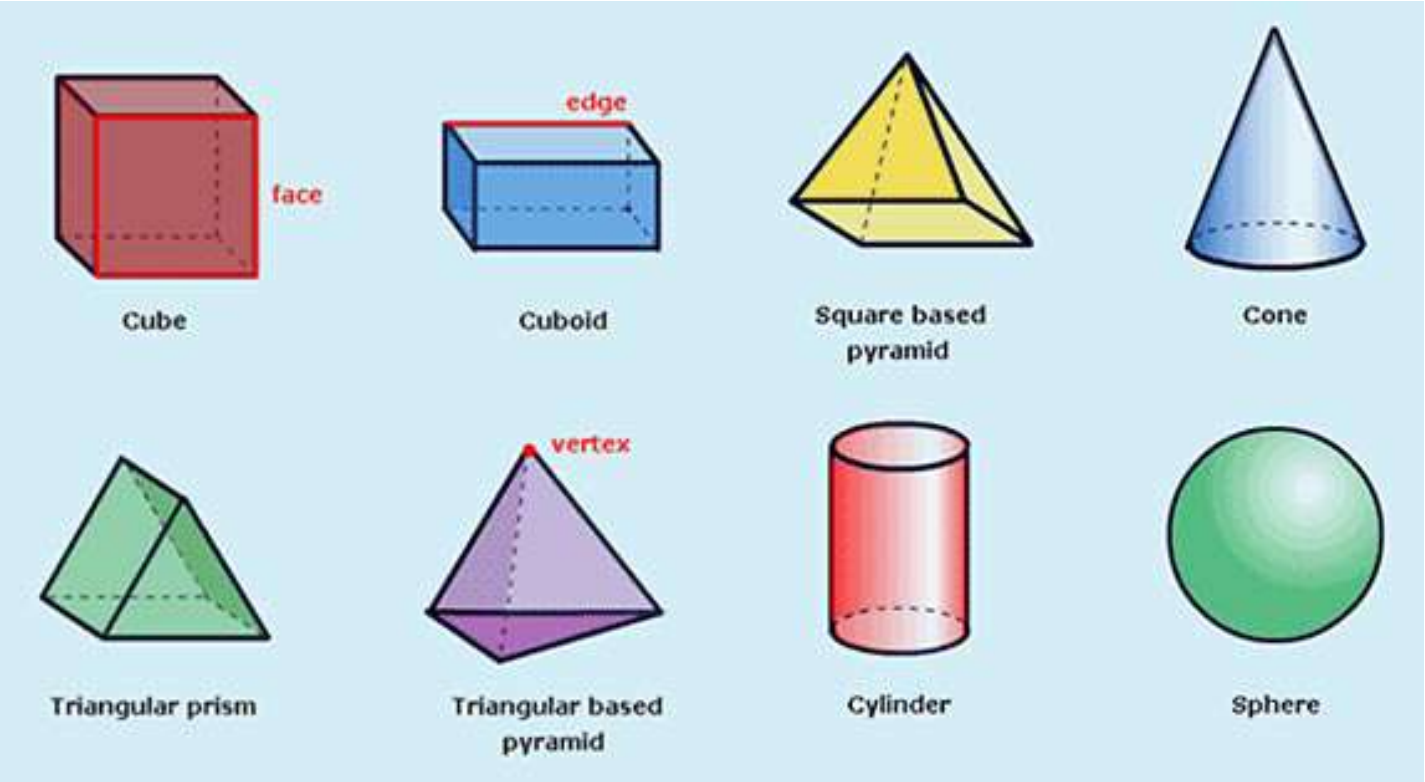
The figure is a pentagonal pyramid.

Other three-dimensional figures include *cylinders* and *cones.* These figures are not polyhedrons because they are not made of faces that are all polygons.

Cylinders	Cones
A **cylinder** has two parallel, congruent bases that are circles. 	A **cone** has one base that is a circle and a surface that comes to a point called the vertex. 

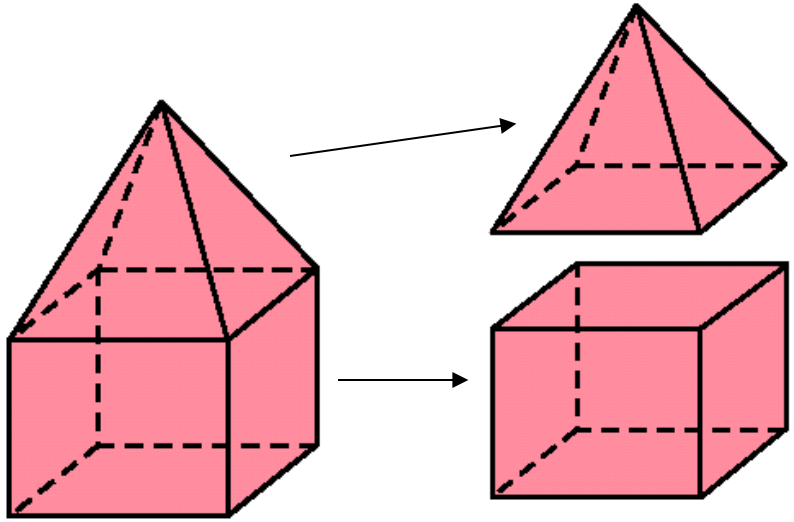
You can use properties to classify three-dimensional figures.

video



Additional Example 2A: Classifying Three-Dimensional Figures

Classify each figure as a polyhedron or not a polyhedron. Then name the figure.



The faces are all polygons, so the figure is a polyhedron.

There is one rectangular base for each figure.

The figure is made up of a rectangular pyramid and a rectangular prism.

Additional Example 2B: Classifying Three-Dimensional Figures

Classify each figure as a polyhedron or not a polyhedron. Then name the figure.

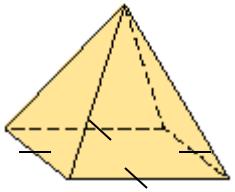
The faces are not all polygons, so the figure is not a polyhedron.

There is one circular base.

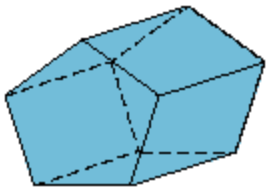
The figure is a cone.

Lesson Quiz: Part I

Identify the bases and faces of each figure. Then name each figure.

1. 

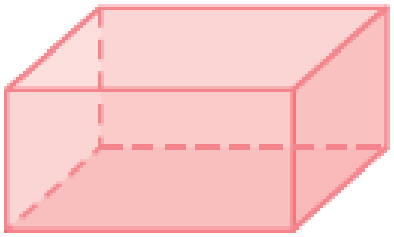
One square base, 4 triangular faces; square pyramid

2. 

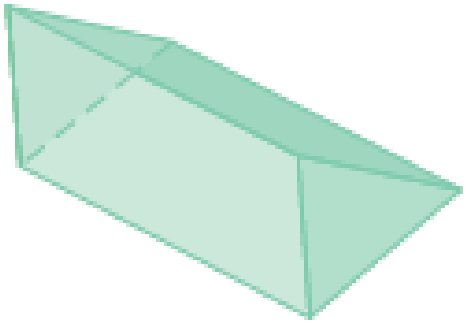
Two pentagon bases, 5 rectangular faces; pentagonal prism

Lesson Quiz: Part II

Classify each figure as a polyhedron or not a polyhedron. Then name the figure.

3. 

polyhedron,
rectangular prism

4. 

polyhedron,
triangular prism

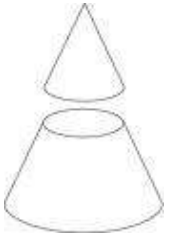
Cross-Sections of 3-D Figures

Cross-Section – is a view of the inside of a three-dimensional figure after it is sliced.

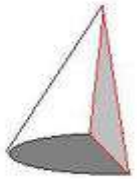
Cross-Sections

You will visualize planes cutting across a 3-D figure. If the object has a base you can cut it the following ways.

- Parallel to base –



- Perpendicular to base –



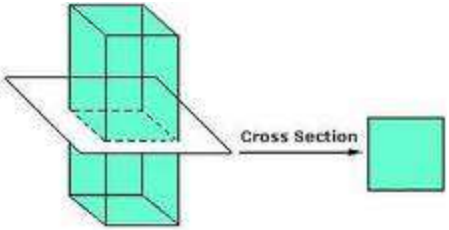
- Tilted/Diagonal to base

Cross-Sections

Describe the cross-sections seen when a rectangular prism is cut

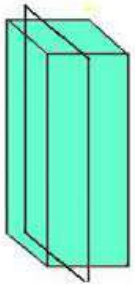
- Parallel to base –

  Square



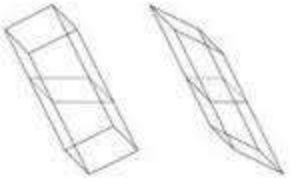
- Perpendicular to base

  Rectangle



- Tilted/Diagonal to base –

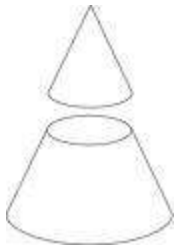
  Parallelogram



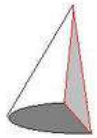
Cross-Sections

Describe the cross-section seen when a cone is cut..

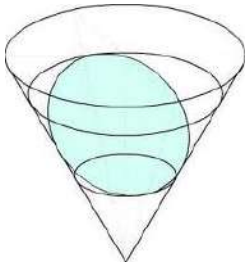
- Parallel to base –
  - Circle



- Perpendicular to base –
  - Triangle

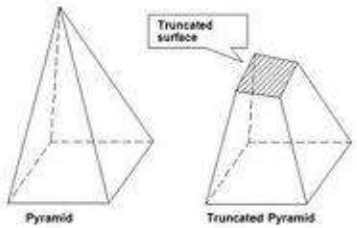


- Diagonal to base –
  - Ellipse (oval)

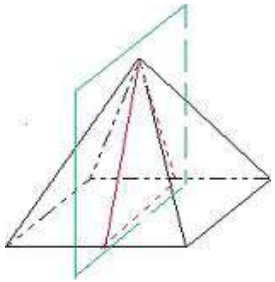


Cross-Sections

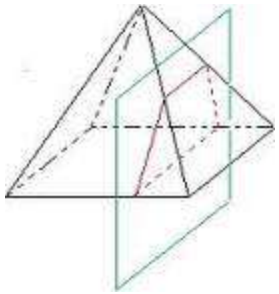
- Describe the cross-section seen when a Square Pyramid is cut…
- Parallel to base –
  - Square



- Perpendicular to base –
  - Triangle



- Diagonal to base –
  - Trapezoid

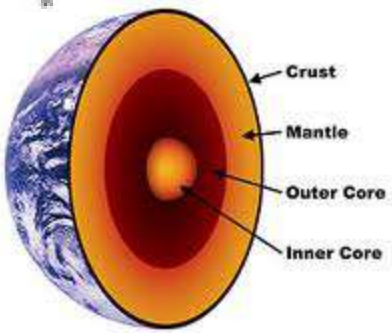


Cross-Sections

Describe the cross-section seen when a sphere is cut…video

- Parallel to base –
  - Circle

- Perpendicular to base –
  - Circle



- Diagonal to base –
  - Circle