Exploring Geometric Solids

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Modified by Charlotte Stripling

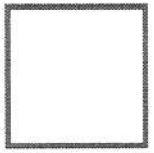
Warm UP

Copy this chart in your interactive notebook. You will fill this in as we go through the power point.

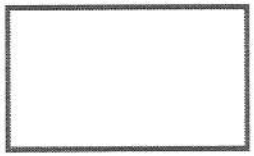
- Cross Sections

	Shape of base	Parallel to base	Perpendicular to base
Sphere			
Cube			
Rectangular Prism			
Square Pyramid			
Cylinder			
Cone			

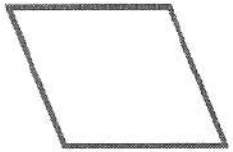
2-D Plane Figures



square
equal sides
90° ∠'s

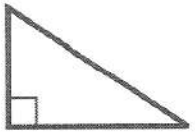


rectangle
opposite sides
parallel, 90°∠'s



parallelogram
opposite sides
parallel

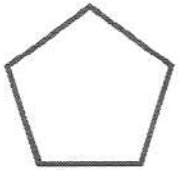
trapezoid
two sides parallel



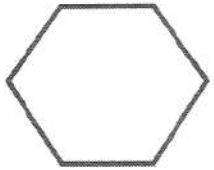
right triangle
contains 1 right ∠

acute triangle
all angles are acute
(less than 90°)

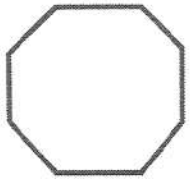
obtuse triangle
one angle is obtuse
(greater than 90°)



pentagon
5 sides



hexagon
6 sides



octagon
8 sides

DEFINITIONS

- **Cross Section: the intersection of a plane and a solid.**

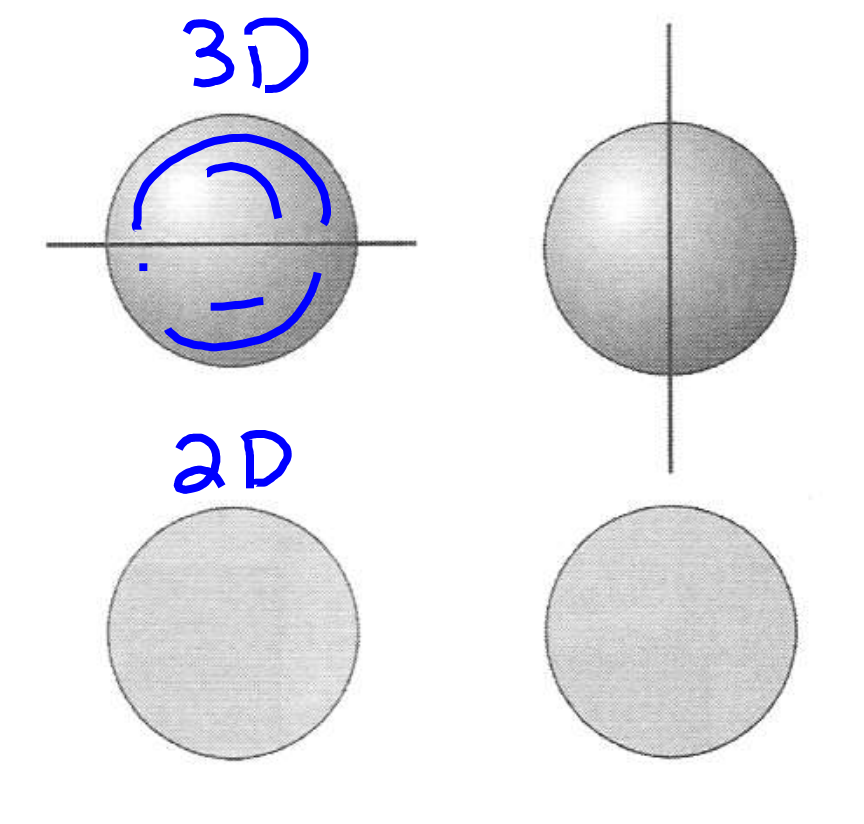
Formed by slicing through a 3D figure and looking at the inside 2D plane figure.

- **Ellipse: an oval 2D figure.**

Formed by slicing a 3D figure at an angle to its circular base (oblique).

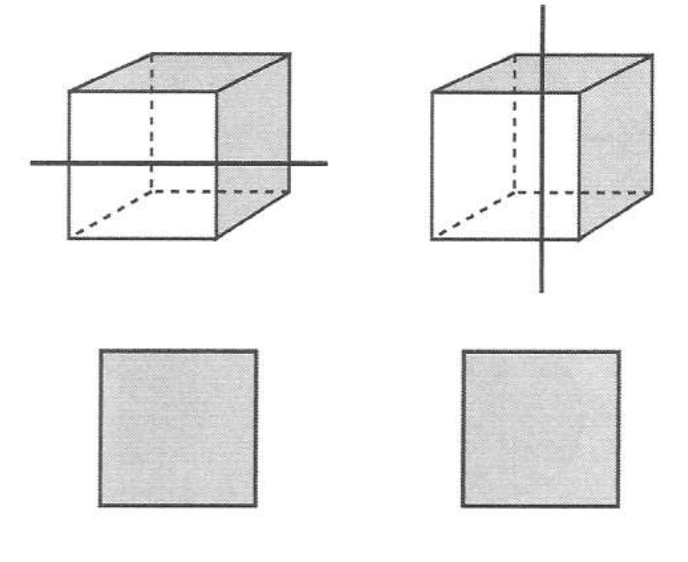
What cross-sections can I make from a sphere?

- Circle (any direction)



What cross-sections can I make from a cube?

- Square (vertical or horizontal), triangle (corners), hexagon (oblique), pentagon (oblique), parallelogram (oblique), rectangle (diagonal)

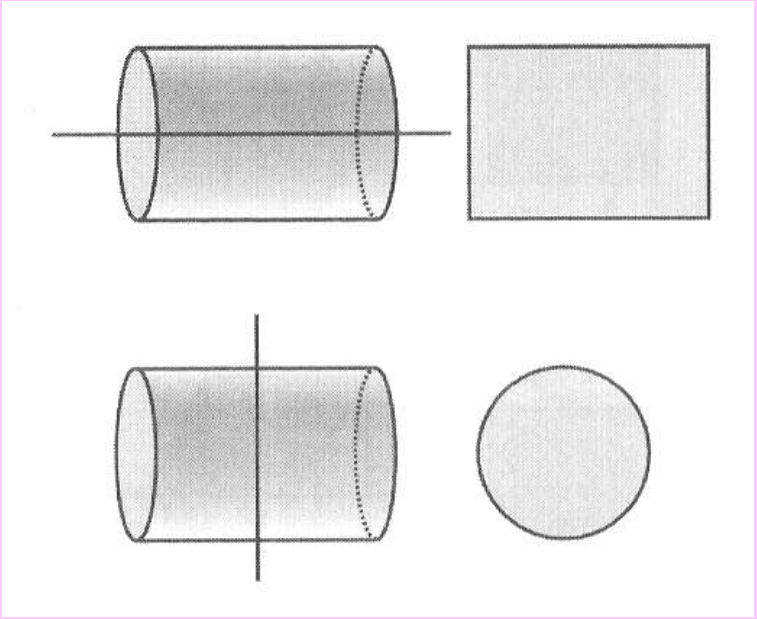


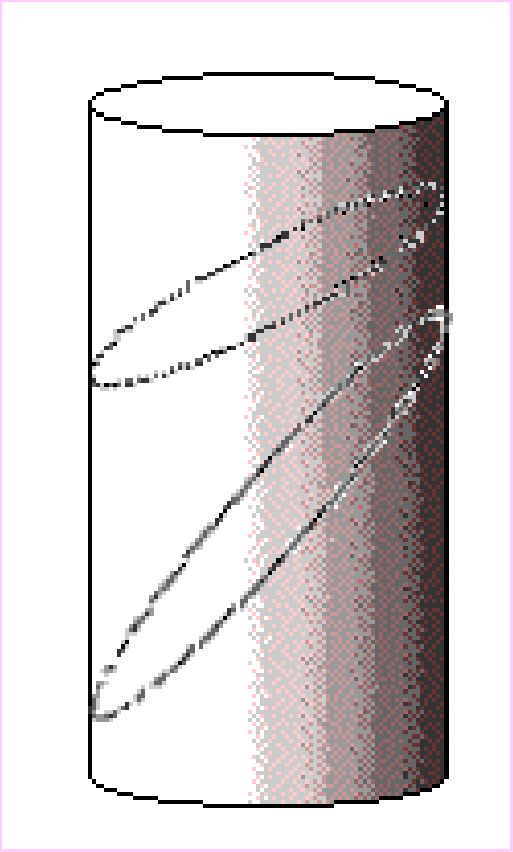
To see all cross sections click on link.

http://www.learner.org/courses/learningmath/geometry/session9/part_c/index.html

What cross-sections can I make from a cylinder?

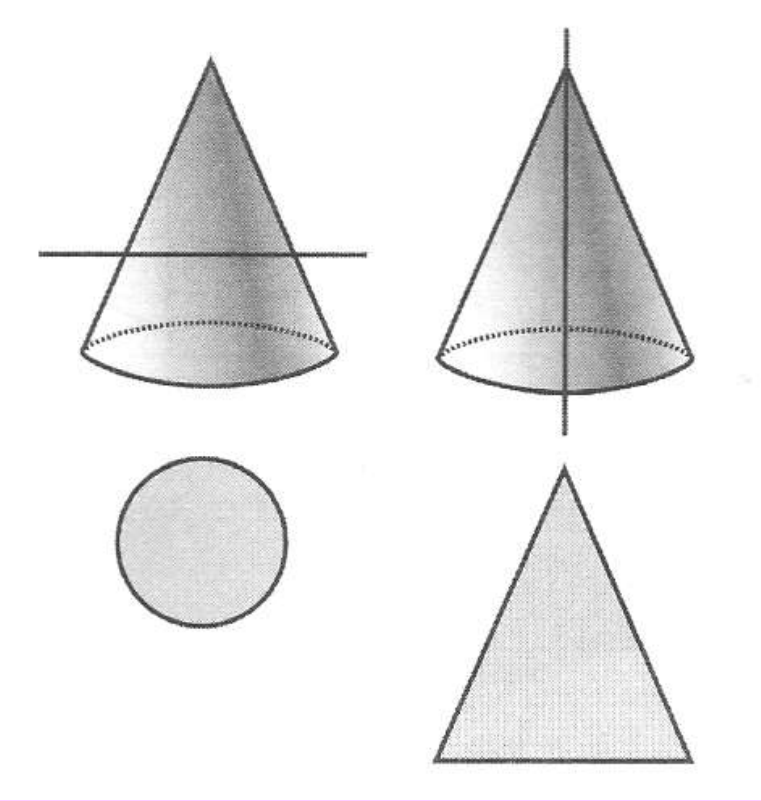
- Rectangle (vertical), Circle (horizontal), Ellipse (oblique)





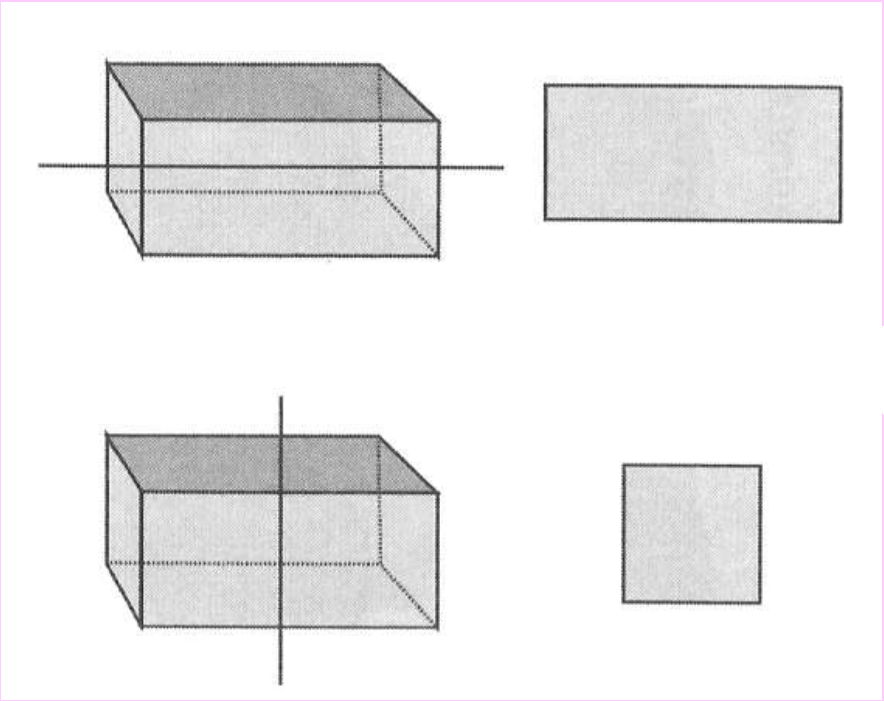
What cross-sections can I make from a cone?

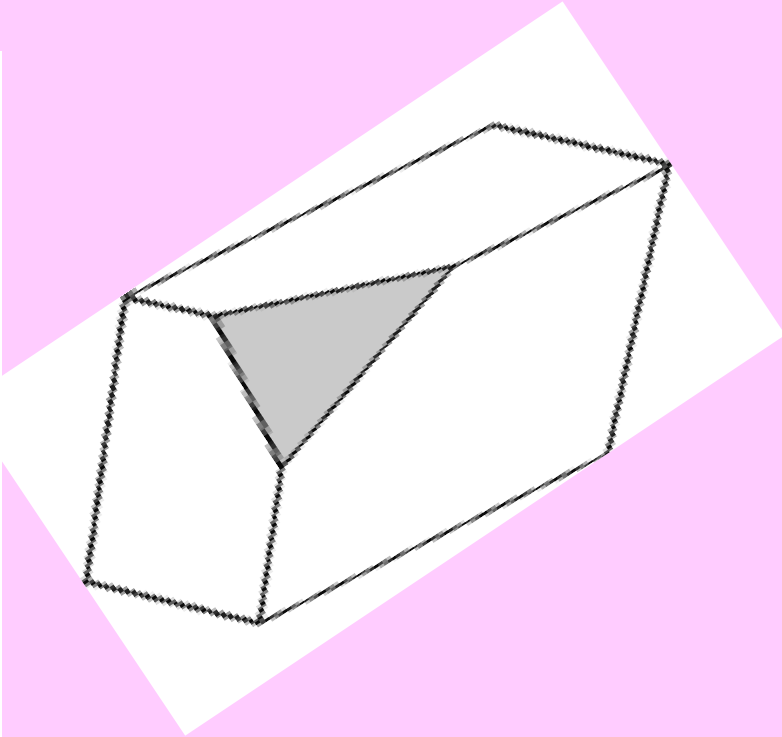
- Triangle (vertical), Circle (horizontal), Ellipse (oblique)



What cross-sections can I make from a rectangular prism?

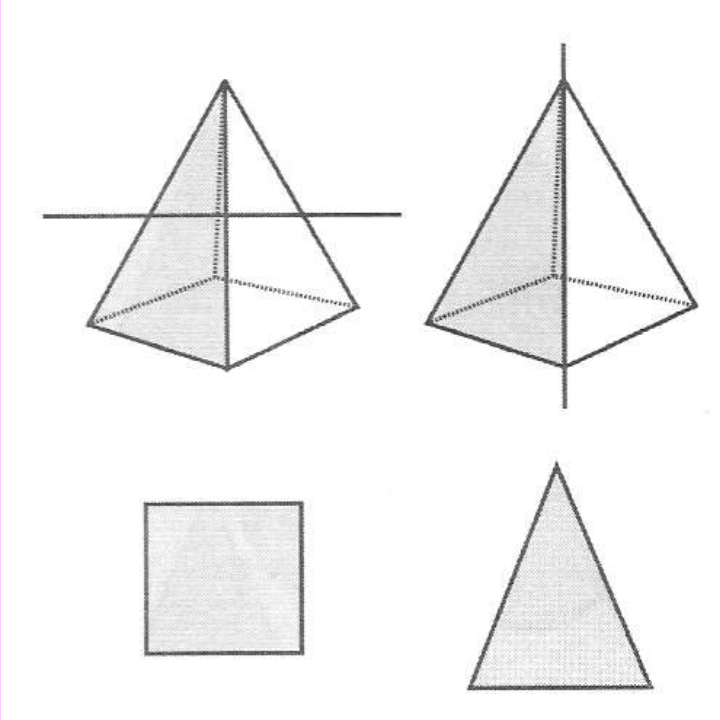
- Rectangle (vertical or horizontal), Triangle (corners)





What cross-sections can I make from a square pyramid?

- Triangle (vertical), Square (horizontal), Trapezoid (vertical not through vertex)



Video

Cross Sections:

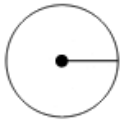
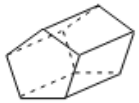
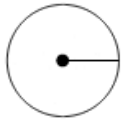
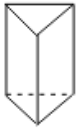
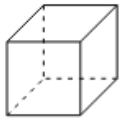
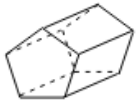
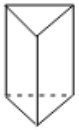
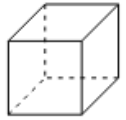
- Cross Section: **the intersection of a plane and a solid.** **Formed by slicing through a 3D figure and looking at the inside 2D plane figure.**

	Shape of base	Parallel to base	Perpendicular to base
Sphere	N/A	Circle	Circle
Cube	Square	Square	Square
Rectangular Prism	Rectangle	Rectangle	Rectangle
Square Pyramid	Rectangle	Rectangle	Triangle
Cylinder	Circle	Circle	Rectangle
Cone	Circle	Circle	Triangle

Name _____

Why Did the Plane Cross the Figure?

Directions: *Sketch and state the figure that is the cross section described for the given figure and the stated plane.*

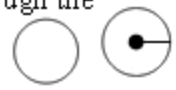
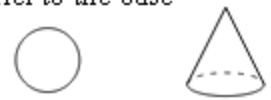
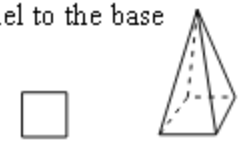
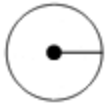
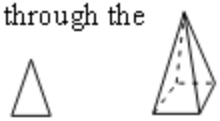
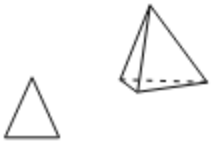
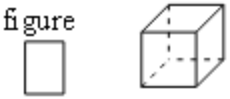
1. Passing through the center 	2. Parallel to the base 	3. Parallel to the base 
4. Parallel to the base 	5. Parallel to the base (the pentagon is the base) 	6. Passing through the top with a horizontal plane 
7. Perpendicular to the base passing through the vertex 	8. Perpendicular to the base 	9. Perpendicular to the base passing through the vertex 
10. Parallel to the base 	11. Parallel to the base 	12. Perpendicualr to the base (the pentagon is the base) 
13. Parallel to the base 	14. Perpendicular to the base 	15. At an angle with the base and passes through both the front and back sides of the figure 

Use the notes to complete the following.

TEACHER'S ANSWER KEY

Check your answers.

Why Did the Plane Cross the Figure?

1. Passing through the center  Circle (Great Circle)	2. Parallel to the base  Circle	3. Parallel to the base  Circle
4. Parallel to the base  Square	5. Parallel to the base (the pentagon is the base)  Pentagon	6. Passing through the top with a horizontal plane  Point
7. Perpendicular to the base passing through the vertex  Triangle	8. Perpendicular to the base  Rectangle	9. Perpendicular to the base passing through the vertex  Triangle
10. Parallel to the base  Triangle	11. Parallel to the base  Square	12. Perpendicular to the base (the pentagon is the base)  Rectangle
13. Parallel to the base  Triangle	14. Perpendicular to the base  Rectangle	15. At an angle with the base and passes through both the front and back sides of the figure  Rectangle

Name _____

Cross Sectional

Directions: *Read each problem carefully. Solve each problem and show your work. Then choose the correct answer from the list of choices. If no answer choices are available, write your answer in the space provided.*

1. Which of the following could represent cross sections of a cylinder?

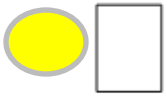
A. 

C. 

D. 

2. Which of the following shapes shows a cross section of a triangular prism that is perpendicular to the base?

A. 



C. 

D. 

3. Which of the following figures does not have a triangular cross section?

A. A square pyramid
B. A cone
C. A rectangular prism
D. A cylinder

4. A plane intersects a square pyramid at an angle oblique to its base. What describes the shape of the cross section that is produced?

A. square
B. trapezoid
C. triangle
D. rectangle

5. Which of the following shows a cross section that is parallel to the base of a pentagonal prism?

A. 

B. 

C. 

D. 

6. Which of the following are possible cross sections of a cube?

I. Square
II. Rectangle
III. Trapezoid

A. I only
B. I and II only
C. II and III only
D. I, II, and III

7. Which of the following is a cross section that is parallel to the base of a cone?

A. 

B. 

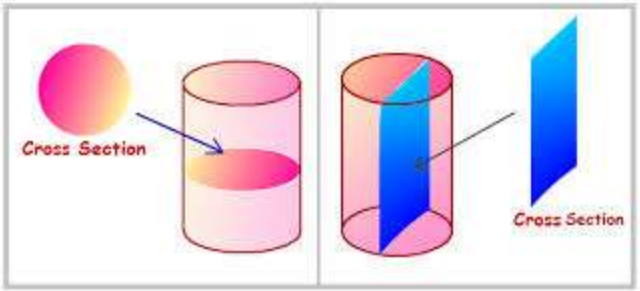
C. 

D. 

8. All the following correctly identify a correct cross section for a square pyramid except for which one?

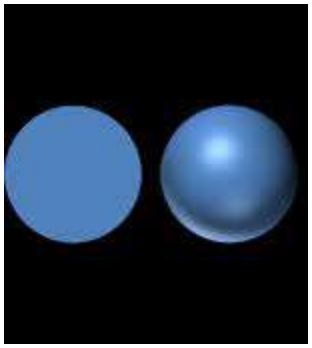
A. Square if it is parallel to the base
B. Square if it is perpendicular to the base
C. Triangle if it is perpendicular to the base
D. Triangle if it intersects the base at an angle that is not perpendicular

9. Sketch a cross section that is perpendicular to the base of a cylinder and a cross section that is parallel to the base of a cylinder.



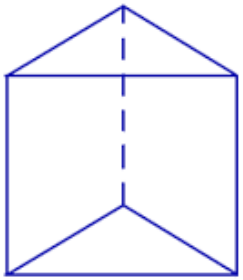
10. Sketch a cross section for each of the following figures:

a) sphere



b) hexagonal pyramid, parallel to the base

c) triangular prism, perpendicular to the base



Complete the assessment.

This is a QUIZ GRADE!!!!!!!