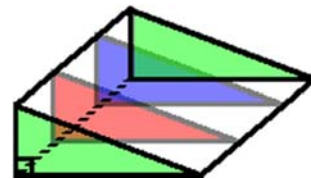
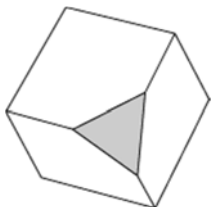


**CROSS SECTIONS**

A cross section is the face that is formed when you make a slice through an object. We create cross sections every time we cut a slice of cheese from the cheese block. Most of these cheese cross sections are squares (if we cut them just right).



Another example of cross section cuts would be these triangles. When we slice



the cross section parallel to the base of this triangular prism we get copies of the base. A cross section cannot contain any piece of the original face - it all comes from 'inside' the solid. In this picture only the grey piece is the cross section. As demonstrated by the cross section of this cube not all cross sections needs to be parallel to a face. In this activity we are going to investigate the cross sections of a cube.

**PREDICTIONS**

Before beginning this activity make predictions on which of the following cross sections are possible for a cube, cone, cylinder and pyramid. Place a check mark in the box beside the polygons that you feel are possible cross sections.

- |  |   |                                   |
|--|---|-----------------------------------|
| <input type="checkbox"/> Square              | <input type="checkbox"/> Equilateral Triangle | <input type="checkbox"/> Pentagon |
| <input type="checkbox"/> Rectangle           | <input type="checkbox"/> Scalene Triangle     | <input type="checkbox"/> Hexagon  |
| <input type="checkbox"/> Rhombus             | <input type="checkbox"/> Isosceles Triangle   | <input type="checkbox"/> Octagon  |
| <input type="checkbox"/> Parallelogram       | <input type="checkbox"/> Right Triangle       | <input type="checkbox"/> Decagon  |
| <input type="checkbox"/> Trapezoid           | <input type="checkbox"/> Circle               |                                   |
| <input type="checkbox"/> Isosceles Trapezoid |   |                                   |

**ACTIVITY:**

- 1) Using the Play-doh, make several 3D solids (cube, pyramid, cone, and cylinder).
- 2) Using a ruler (or dental floss), cut the solids in different ways to see what kinds of 2D cross sections are formed.
- 3) Record the shapes in the table below, and answer the questions that follow.

Use the space below to record the cross sections formed by cutting each 3D shape:

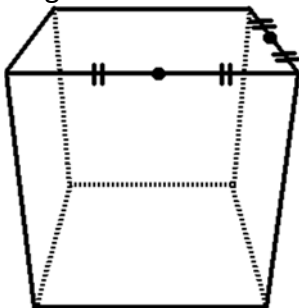
QUESTIONS

1. A couple of the shapes on the cross section list were impossible. Explain what makes them impossible.

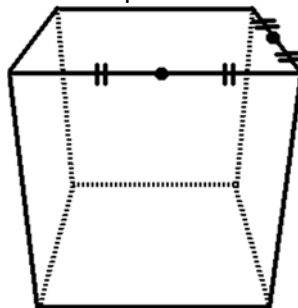
2. What is the maximum number of sides of the polygon cross section for a rectangular prism? Explain.

3. Given the two points, plot one or two other points that would create the required cross section. Label the diagram to help explain why it is the required cross section.

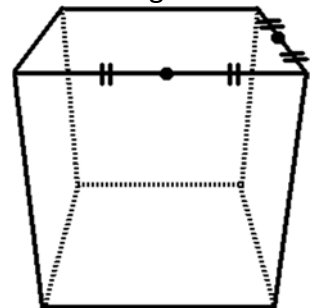
a) Rectangle



b) Isosceles Trapezoid

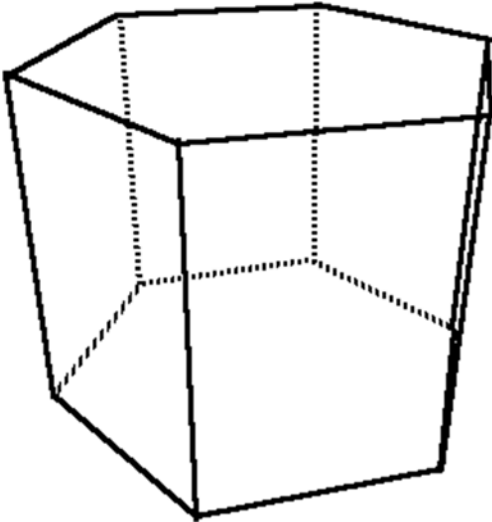


c) Isosceles Triangle



4. Given a triangular pyramid, what cross section could you create? List them.

5. Given a hexagonal prism, create an octagonal cross section.



6. Jennifer says that you can create a rectangle as a cross section for a cylinder. Rex laughs.... “Not a chance!! – Cross sections of cylinders are circles and ellipses!!!” Who is right? Explain.

7. What are the possible cross sections of a sphere?