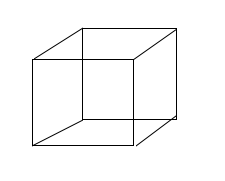
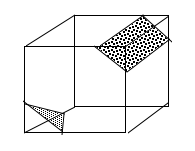
**Activity 6.4.1 Seeing Cross-Sections**

When we cut a solid with a plane the resulting 2 dimensional intersection is called a cross-section. We are going to explore the possible cross-sections of different solids by using clay and dental floss. **You may use the camera on your phone to document your solutions to the problems below.**

1. Let’s begin with a simple figure. Roll your clay into a ball, then flatten the ball so that you have a cube. It should look something like the figure on the left. The figure at the right shows two possible places that you could cut the cube with a straight down cut with the dental floss. You could cut off a vertex, forming a triangular face or you might cut off an edge to form a rectangular face. Try to see if you can do both of those cuts. You may need to re-form your cube to do the remaining problems about the cube. 
   1. Can you cut it so the face is an equilateral triangle? Explain your method.
   2. Can you cut it so the face is an isosceles triangle, but not an equilateral triangle?
   3. How could you cut it to form a right triangle?
   4. Can you find a way to cut it so there will be an irregular pentagon? Describe or illustrate how you made your cut.
   5. Is it possible to cut it so there will be a trapezoidal face?
   6. Can you cut it to form a cross-section that is a hexagon?
2. Try this again starting with a right rectangular prism that is not a cube. See how many different kinds of cross-sections you can create. Sketch pictures of them or take pictures of them with your phone. List all of the different kinds of cross-sections you were able to make here:
3. Now try this with a cylinder. Which of these are you able to make: A circle, rectangle, ellipse? Did you find others that you can share with your classmates?
4. If you use a ball of clay, you will have a sphere. What kinds of cross-sections can you make with it?
5. Now form a square pyramid. What kinds of cross-sections can you make with it?
6. Finally, form your clay into a cone. What kinds of cross-sections can you make with it? What connections can you make with previous units?