

## Slicing and cutting problems

### Purpose:

The purpose of this activity is to help your child to make common solid (three-dimensional) shapes and make paper/cardboard patterns for these, and to correctly identify prisms.

### Link to NZ Curriculum:

Your child is learning to make paper or cardboard patterns (nets) for common three-dimensional shapes, and to identify prisms by their features.

### What you need:

Play dough

A plastic knife, or 'safe' kitchen knife

Spare paper or cardboard

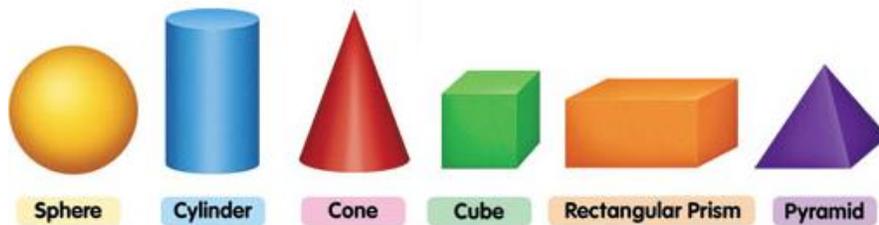
Pencil, ruler and eraser

Scissors

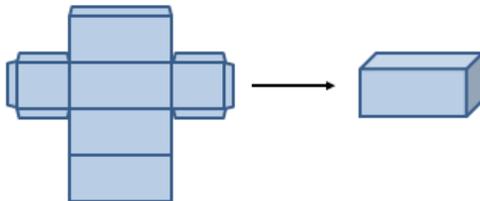
Cellotape or glue

### What to do:

- Have your child use the dough to make and name a cube, a cylinder, a sphere, a cuboid (long cube or rectangular prism), a square based pyramid, a cone and a triangular prism.



- Have your child talk to you about the distinguishing features of each shape, for example "The square based pyramid has 5 vertices (corners where 3 edges meet), 8 edges (where 2 'sides' or faces meet), and 5 faces of which one is a square and 4 are triangles."
- Have your child choose some of the shapes with straight edges, and using paper or card, make and cut a pattern for this shape. They should include tabs on their pattern so the shape can be folded and glued to make a three dimensional model. For example:



Have your child put their play dough shapes in the fridge while they cut out and glue/tape their paper/cardboard shapes together. Chilling the dough shapes will make them firmer and this will make the next task more successful.

- Now say, "I want you to slice at least twice through each play dough shape. But before you do, I want you to predict which shapes will have slices that are all the same size and shape, and which ones will have slices that are different sizes or shapes."

- Have them make their prediction and then have them slice through their play dough shapes to see if their predictions are correct.

NB. When a prism is sliced through, its slices are the same size shape, like this:



If you slice through a shape that is not a prism, eg, a pyramid, the slices will change shape and size.

So, a prism is a solid object that has two identical ends and all flat sides. The cross section is the same all along its length.

- Talk together about what has happened and together agree which shapes are prisms.

**What to expect your child to do:**

- Make and name common solid three-dimensional shapes.
- Make paper or cardboard patterns (nets) for common three-dimensional shapes.
- Identify features of prisms.