Name: _____

Understanding Topographic Maps

Topographic maps use contour lines on a two-dimensional map to describe the shape of the land surface. In this activity you will generate a topographic map from a specific shape, and you will examine maps made by your classmates from a variety of other shapes.

Making a map

Materials

frame, dental floss, hunk of modeling dough, toothpicks, whiteboard, sheet of white paper, waxed paper

Procedure

On your whiteboard, construct a dough model of the shape specified by your instructor. Make sure its relief is at least 5 cm. The model should look reasonably like a real landform would look. It should rise organically from its surroundings. None of its slopes should be vertical or overhanging. It's even better if the model is beautiful and artistic.

With the toothpick, poke two vertical holes through your model. The locations of these shafts must balance two possibly conflicting criteria: they should penetrate the model at its thickest points, and they should be as far apart as possible. Choose the locations that best satisfy these two factors.

Place the frame around your model. Use the thickness of the frame as a guide to cut a slice off the bottom of the model. Hold the length of dental floss taught and horizontal. With a sawing motion, slice completely through the dough. Lift the top of the model from the bottom layer you just cut.

Place the bottom layer on a sheet of white paper. Trace its outline on the paper. Mark the position of the two toothpick holes on the paper as well. Carefully remove the layer from the paper and place it back on a piece of waxed paper.

Repeat cutting and tracing the bottom slice until you finish the model. Position each slice on the paper by placing its toothpick holes over the toothpick marks on the paper. Outline each slice. Reconstruct your model on the waxed paper by placing each slice in its proper position atop the slice below it.

Ink over your contour lines so that they are clearly visible.

Place your contour map next to your model in the same orientation of the model, so that your classmates can easily compare the map to the model.

When you are finished, put the dough back into its pail.

Viewing the maps

Examine each model made in class and its topographic map. Make certain you understand how each map correlates to its model. Try to visualize the three-dimensional shape of the model from the appearance of its map, and check your visualization against the reality.

Sketch each topographic map.

Mound (convex hill)

Irregular ridge

Plunging ridge

Cuesta (ridge with one steep side and one gradual side)

Cone with crater

U-shaped valley

Plunging V-shaped valley

Mesa (flat-topped ridge)

Concave-sided peak

Saddle between two peaks