32200 Contour Model Kit

Purpose:

To model the shape of earth surface features in two dimensions using hand drawn contour lines. A Mount Capulin replica depicts a steep-sided volcano in New Mexico.

Required Accessories:

Water
Tape
Ruler, metric

Background:

Contour lines, as visualized on the earth's surface, are closed curves (in the grandest sense) at constant elevation, which are always perpendicular to the slope of the surface at any point. Since a contour line might actually close only after wandering a large geographical region, contour lines on a model, a map or chart might not seem to close. Each contour line has an expressed or implied elevation. The contour interval is the constant difference between adjacent contour lines. Closely spaced contour lines on a map or chart would indicate a steep slope. Drainage features such as gullies, stream, or rivers are distinguished on the map or chart by a consistent dip in the contour lines as each crosses the thread of the stream at right angles.

Procedure:

Using tape, secure the mountain replica to the bottom of the box. The hole in the top of the mountain should be sufficient to keep the model from floating. Make marks one centimeter apart up the side of the box, beginning at the bottom. Label this elevation scale using zero at the bottom. Carefully fill the box with water until you reach your first mark. The resulting "shore line" matches the definition of a contour line since it is at a constant elevation. Observing this is the whole point of the activity. This, and the remaining contour lines can be inscribed on a two-dimensional surface. First, cover the box with it's lid and place the acetate sheet on top of the lid. Then, using the crayon, draw each contour of the replica as it appears at the "shore line" directly onto the acetate sheet by viewing from above. Water is carefully added to bring the level to the next mark, holding the mountain tightly to the bottom each time if necessary, until the mountain is totally submerged.

The following illustration is not to be taken as the answer for this problem, but it to merely suggest a likely outcome. The resolution of the topography can be increased or decreased by increasing or decreasing the number of vertical height sections scaled on the box. One centimeter scales to about 250 feet on the actual mountain. If the bottom of the box represents an elevation of 6,280 feet above mean sea level, the contours on the chart can be labeled to correspond to the actual volcano.

Evaluation Questions:

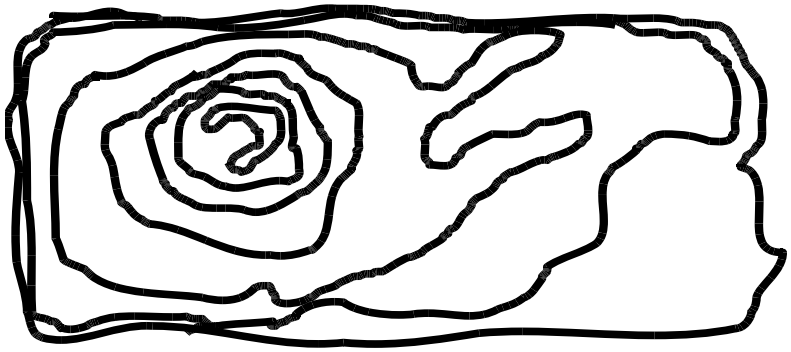
1. Describe the general shape of the contour lines. (They form irregular concentric closed curves around the volcano.)

2. What general statement can be made about the closeness of the lines and the steepness of the slope? (The closer the contour lines are spaced, the steeper is the slope of the land being mapped).

3. Describe how the solidified lava flows have affected the pattern of contour lines. (They appear as a series of nearly half-circles within the contour's larger circular pattern.)

4. How would a steep valley down the side of the volcano change the contour pattern? (As they cross the valley, the lines will point sharply up-valley.)

5. Would it be possible to distinguish a basin from a mountain on a topographic map or chart? (Yes. If the basin is deep, the contour lines would show a decreasing elevation. Since each contour line is not necessarily labeled, basins can also be distinguished by depression contours or hachure marks.)



Time Allocation:
To prepare this product for an experimental trial should take less than ten minutes. Actual experiments will vary with needs of students and the method of instruction, but are easily concluded within one class period. Crayon marks directly on the mountain replica may not be able to be erased.

Feedback:
If you have a question, a comment, or a suggestion that would improve this product, you may call our toll free number.