

Topographic Maps and Modeling 3-D Land Features

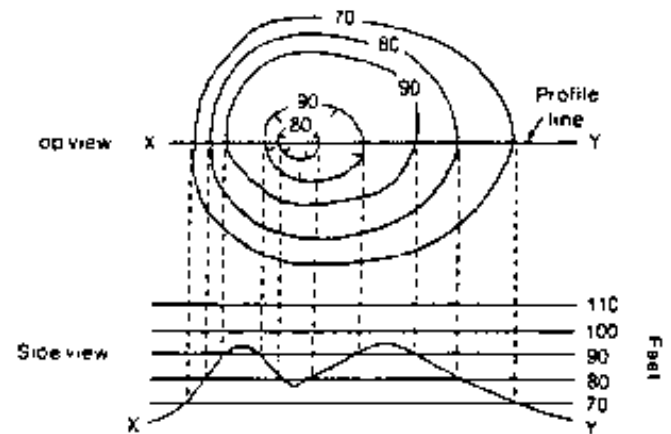
Purpose: To correlate topographic maps to the 3-D land features they represent.

Materials: Clay, Dental floss, Ruler

Procedure:

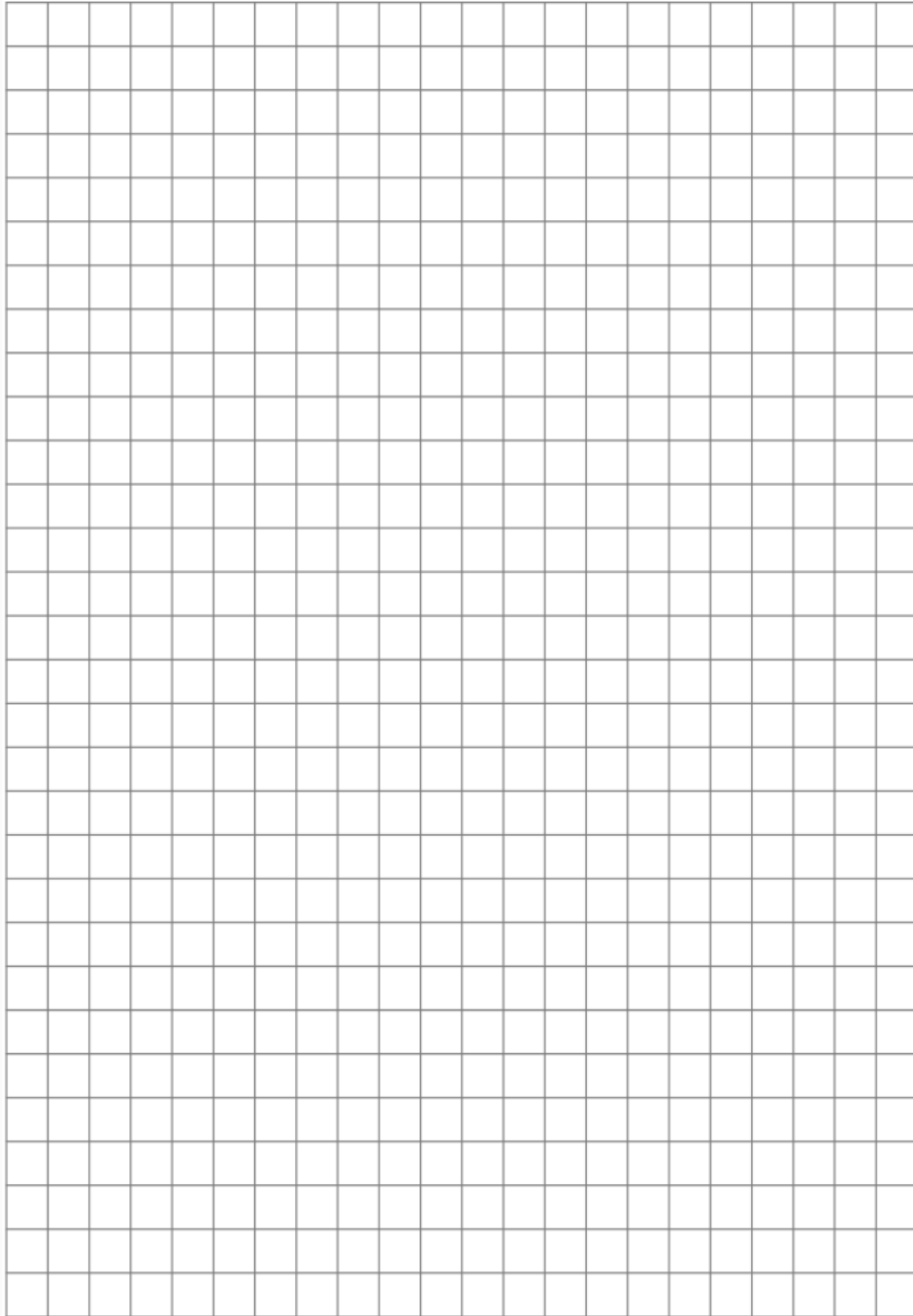
1. Create an asymmetrical mountain out of the clay. Be sure there is one steep slope and one gentle slope.
2. Place the mountain on the map sheet, then draw a vertical line down one side and onto the paper. This side will be "North" and used later on to line up layers of the mountain. Draw a compass indicating the direction of north on the sheet.
3. Trace around the base of the mountain. This is your 1st contour line.
4. Mark $\frac{1}{2}$ inch up the mountain from the bottom of on all sides. Wrap the dental floss around the mountain at the $\frac{1}{2}$ inch marks (like a belt). Cross the ends of the floss and pull the ends slowly, slicing through the clay.
5. Carefully remove the bottom slice of the mountain (keep it for later) and replace the upper portion in the same spot, lining up the "North" side on the mountain to the "North" line drawn on the paper. It should fit inside the 1st contour line.
6. Trace the replaced upper mountain on the paper. Now, there should be two contour lines, one inside the other.

7. Repeat steps 4-6, $\frac{1}{2}$ inch at a time, until the mountain is too short to do so. When you have done so, you should have several concentric loops inside each other. You have now created a topographic map of your mountain.
8. Using your contour map, graph the side view of the mountain in the space provided. Make sure to label your axes. (See example below).

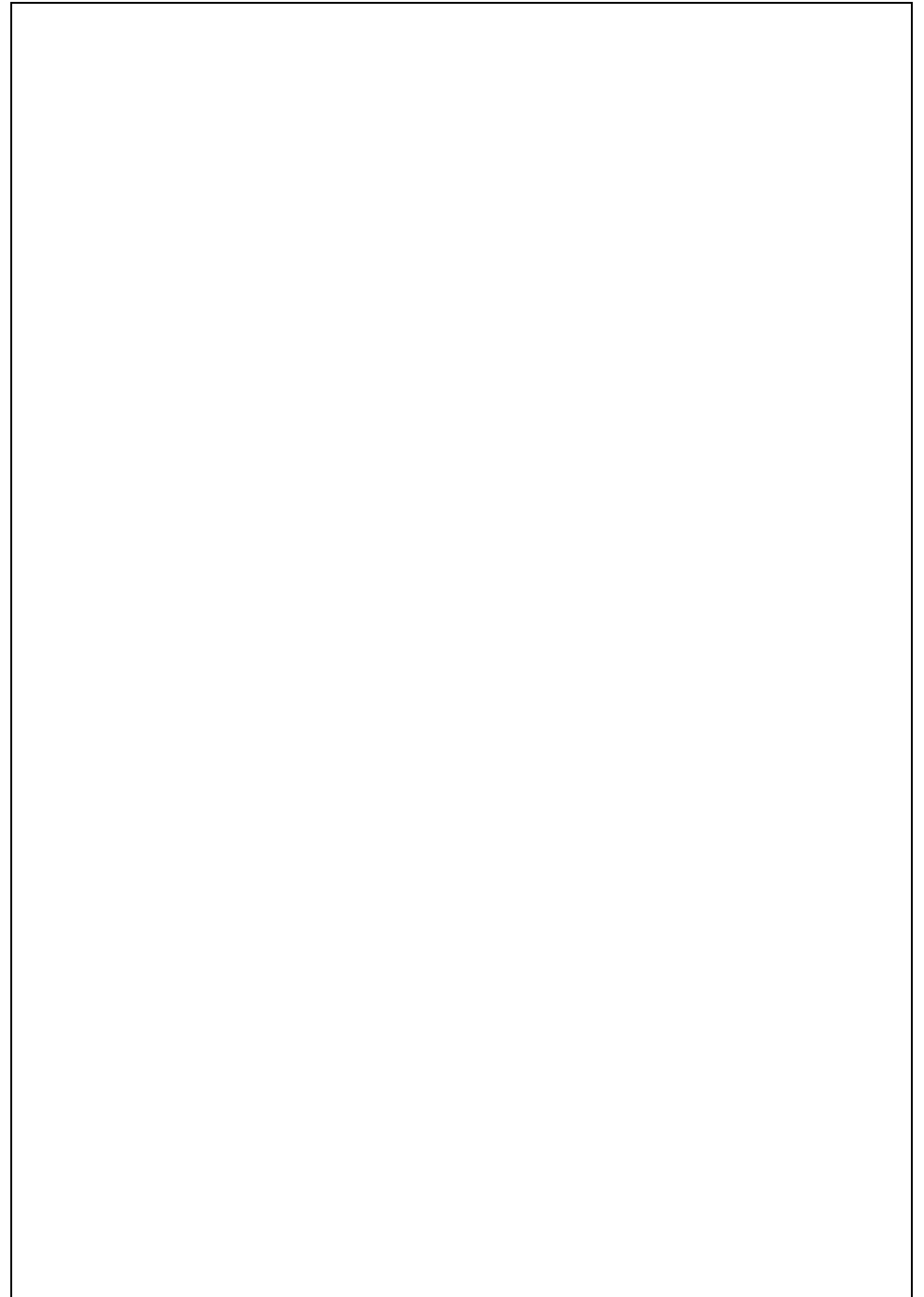


9. Restack your mountain so that it looks like it did prior to the first slicing, using "North" to line up all the pieces. Place your mountain next to your graph and compare the two.
10. Complete the analysis questions and turn in your lab sheet when finished.

SIDE VIEW GRAPH



TOPOGRAPHIC MAP



Cartographers: _____

Analysis:

1. Compare the steepest side of the mountain to its portion of the topographic map and do the same for the gentlest slope. What do you notice about the spacing of the contour lines with respect to the steepness of the slopes?

Identify your steepest slope
using compass directions: _____

2. Define contour interval.

Determine the contour interval for your map.

Label each contour line on your map.

3. Define relief in terms of topographic maps.

Determine the relief for your topographic map.
Show your calculation.

4. Define gradient in terms of topographic maps.

Scale your mountain in terms of feet and miles:
assume each vertical 1/2" change in elevation
represents 10 feet, and each inch, horizontally,
would be 1 mile.

Based on the new scale, determine the gradient
for your mountain from the lowest point to the
highest peak.