



CHAPTER 3—LAB 1: A TOPOGRAPHIC MAP IN THREE DIMENSIONS

Introduction

A topographic map shows the shape of the land surface with contour lines. On page 29 you will find Figure 3-6, a contour map. You will be using this map to make a three-dimensional model of the land at this location. You will cut the map along the contour lines, paste each piece of the map on a sheet of cardboard or foam, and stack the pieces of cardboard or foam.

For this lab, the number of people in your group may be determined by the number of contour lines (lines of equal elevation) to be cut out in making your model of the land. The procedure below should make this clear.

Objective

The object of this lab is to help you visualize the shape of the land just by looking at a flat topographic map.

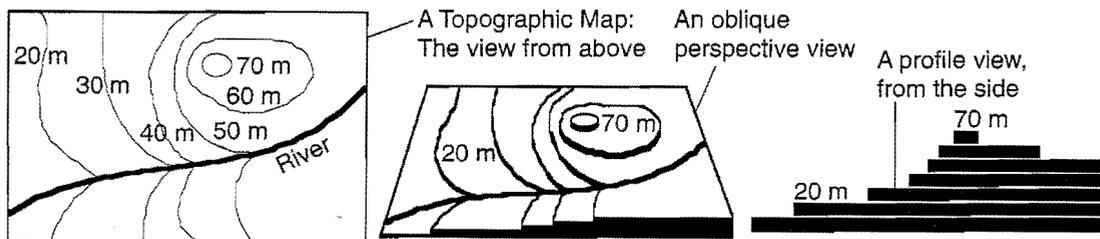


FIGURE 3-5. A contour model from three points of view.

Materials

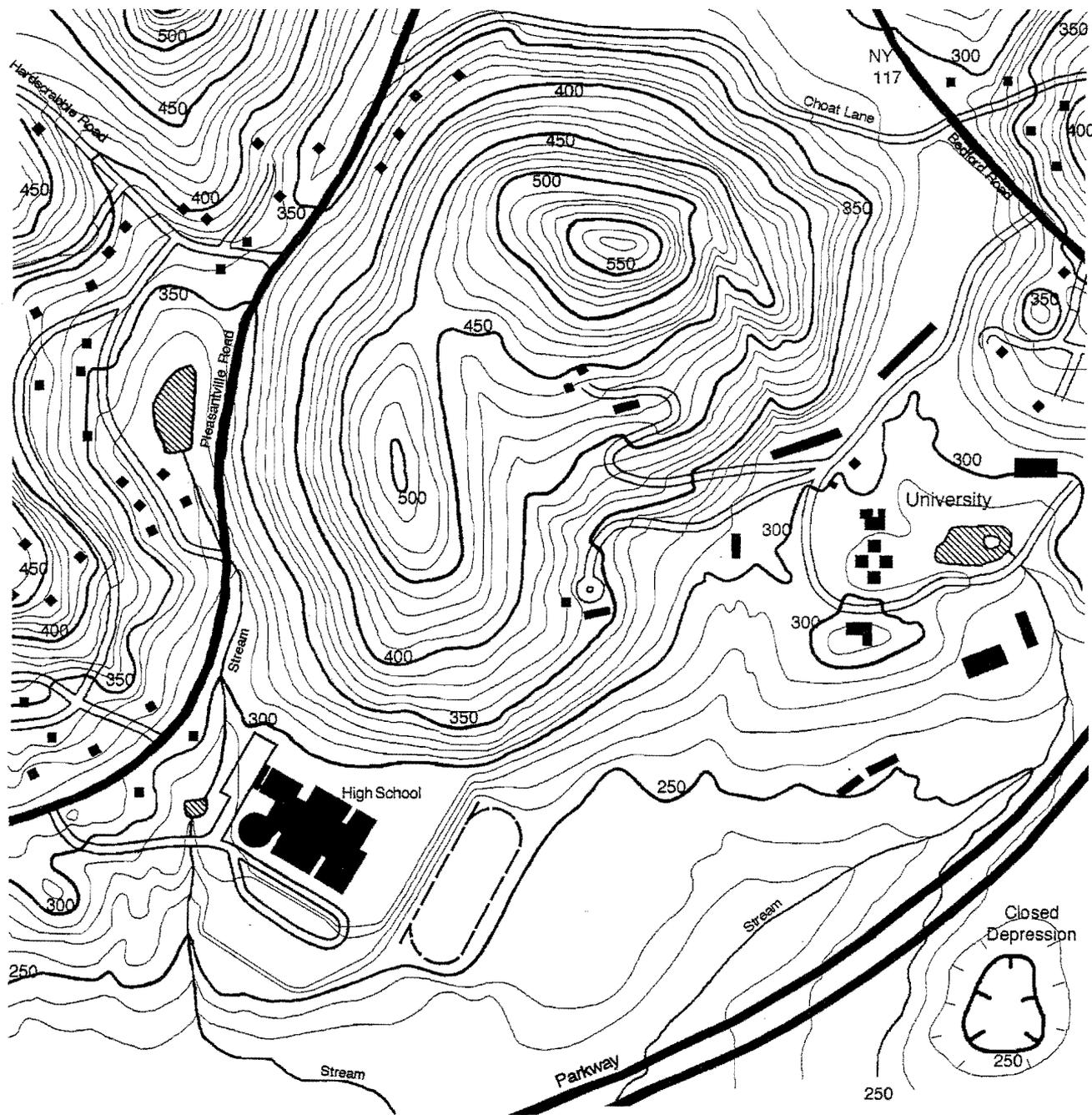
Contour map on page 29, foam tray or corrugated cardboard, scissors, glue or glue sticks, highlighter pens or colored pencils

Procedure

1. What is the difference in elevation (contour interval) from one thin contour line to the next?

2. What is the minimum (lowest) elevation on the map on page 29? (Hint: It is less than 250 feet.)

3. What is the maximum elevation shown in the region of your map? (Hint: It is more than 550 feet.)
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4. What is the range in elevation? (This is the difference between the highest elevation and the lowest.)
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5. How many dark 50-foot index contour lines are shown on the map? _____
6. Using this interval, how many contour levels will you need to cut out? (*Hint*: the answer to step 5 plus 1.) _____ This is the maximum number of stacked sheets of foam or cardboard and the approximate number of people in your group for this activity.
7. Now that you have determined the number of people in your group, you will need to assign each person a different contour level, starting at the base level, which is about 200 feet on this map. The next person will cut along the 250-foot level, and the next will cut along the 300-foot level, etc. What is your index contour? (Each person in the group will have a different contour!)
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8. The person assigned the lowest contour will paste the whole map on a piece of stiff backing material such as Styrofoam™ or thick cardboard. He or she will cut the sheet of cardboard along the rectangular edges of the map region.
9. Cut out your map along your assigned contour, and then paste the paper to the backing material. Cut the backing along your assigned contour line to isolate the areas at the index level or above. (Note: Do not cut along the roads or the streams. Cut only along the contour line.)
10. When each person in the group has cut out her or his own piece of cardboard, paste the sections together starting with the lowest contour level and ending with the highest contour level to make a three-dimensional model of the map area.



LEGEND:

Roads: Major:	Minor:	Elevations in feet above mean sea level
Paths:	Ponds:	
Houses and other Buildings:		

← NORTH

0 km 0.1 0.2 0.3 0.4 0.5

Scale: 14 cm: 1 km

FIGURE 3-6.

Wrap-Up

(You will need your three-dimensional topographic model or the full map page to answer the following questions.)

1. This map is a model; of what is it a model?

2. What name is applied to the lines on a topographic map that show the elevation of the land?

3. What do contour maps show about the map area that is not shown on other maps, such as most road maps?

4. What does any point on a particular topographic contour line have in common with all other points on the same line?

5. Explain what the contour interval on a topographic map is.

6.
 - a. What is the contour interval between the thin lines?
 - b. What is the interval between the thicker index contour lines?
7. What is the elevation of the high school?

8. What is the elevation of the pond along Pleasantville Road?

8. Describe the shape of the land in places where the contour lines are far apart, such as the area near the oval running track south of the high school.

10. How can you tell where the slope is steep just by looking at contour lines?

11. How long is the portion of Bedford Road shown on this map?
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12. What is the minimum straight-line distance from Bedford Road to the nearest corner of the high school?
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13. Near the bottom right corner of the map are contour lines with hachures (little lines that point inward). What does this special kind of contour line show?
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14. What is the elevation of the land at the center of this feature?
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15. What shape is made by contour lines that cross a stream?
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16. In what direction, do the angular shapes mentioned in question 17 always point?
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17. If you wanted to walk from the pond on Pleasantville Road to the pond at the university with only a small change in elevation, what route would you take?
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18. If an injured person were stranded at the top of the highest hill, what route could an ambulance take to get as close as possible to that person?
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19. If Pleasantville Road were completely blocked by an accident along the pond, how many different ways could you drive around the roadblock and still stay within this map?
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20. In what way is this map unlike most maps that you might use?
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