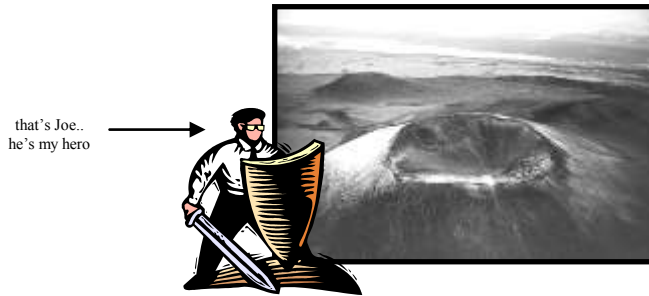


Name _____

Date _____

"JOE VERSUS THE VOLCANO"

(a.k.a. "A Very Special Contour Map Lab")



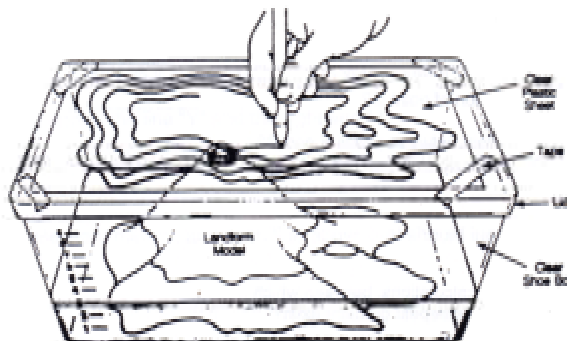
Objective: You will learn how to construct a contour map and interpret its features.

Materials:volcano model set-up
acetatefood coloring
white paperpaper towels
centimeter rulercalculator
wet/dry-erase marker

tape

Procedure A - Constructing a contour map from a three-dimensional model

- _____ 1. Securely tape the sheet of acetate to the clear plastic lid of the box.
- _____ 2. Add water to the box until the water level reaches the first marking on the centimeter scale.
(Add a couple of drops of food coloring so that you can see the water level more clearly)
- _____ 3. Place the clear lid on the box and using a wet/dry erase marker, trace the outline of the water as seen from directly above the box onto the sheet of acetate.
(This line should look like a rectangle with rounded corners.)
- _____ 4. Remove the lid and add water up to the next centimeter marking.
- _____ 5. Replace the lid and once again trace the outline of the water.
- _____ 6. Continue steps 4 and 5 until the 6cm line is reached.
- _____ 7. Remove the acetate sheet from the plastic lid and trace your contour map onto white paper.
- _____ 8. Using a contour interval of 100 meters, label each contour line with the appropriate elevation. The first contour line you drew (the curved rectangle) should equal 0 (sea level). If done correctly, the highest elevation on your map should be 500m
- _____ 9. Remember to put another contour line with hachure marks inside of the last contour line you drew. This will represent the crater of the volcano. When you label the elevation of the crater, remember to follow the "rule of hachures" and repeat the elevation of the last contour line drawn.



ROMANO

Procedure B - Determining gradient on the contour map you constructed

- ____ 1. Hold the contour map of the volcano horizontally with the rim (crater) of the volcano closer to the left and draw a straight line long-ways straight through the rim of the volcano.
- ____ 2. Where the line you drew intersects the 0 meter contour line on the left, write the letter “Y”.
- ____ 3. Where the line you drew intersects the 0 meter contour line on the right, write the letter “Z”.
- ____ 4. Fill in the data chart below to calculate the numerical gradient of the landscape on both sides of the rim of the volcano. The rim is the edge of the hole at the top of the volcano. (Use a ruler measure distances to the nearest tenth. Every centimeter measured is equal to 1km in real life.)

Gradient Data Chart

	west side of volcano <small>(between “Y” and left side of volcano rim)</small>	east side of volcano <small>(between right side of volcano rim and “Z”)</small>
change in elevation (<i>m</i>)		
distance (1 cm = 1km)		
gradient formula substitutions <small>gradient = change in field value / distance</small>		
calculated gradient with correct units <small>(rounded to nearest tenths place)</small>		

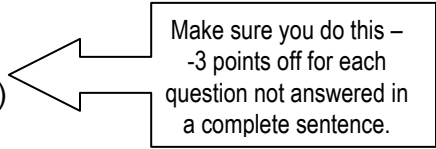
Procedure C - Drawing a topographic (contour) profile

- ____ 1. To construct the profile grid, hold another piece of white paper horizontally (long-ways) and draw a line at the bottom of the page the same length as line Y-Z you drew on your contour map. This is the baseline of the profile grid.
- ____ 2. Label the left end of the line “Y” and the right end “Z” on the baseline you drew in the previous step.
- ____ 3. Using a ruler, draw horizontal lines parallel to the baseline you drew, with each line 1 centimeter above the last. This will create the profile grid.
- ____ 4. On the very left-hand side of each line you drew, label the elevations on the profile grid. Label the baseline 0 meters, and each line on the grid above that should increase by the contour interval (100 meters).
- ____ 5. Transfer points from the contour map to appropriate lines on the topographic profile grid as learned on pages 61-63 in notes packet.
- ____ 6. Label the profiles x and y-axis with the appropriate measurements and units.

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SUMMARY QUESTIONS

(Write your answers in complete sentences.)



Make sure you do this –
-3 points off for each
question not answered in
a complete sentence.

1. Why is it unlikely that two contour lines will cross?
2. Do the calculations you made in Procedure B make sense according to the map you created?
Explain why or why not.

**The next 3 questions are not in your notes – they are thinking questions.
Use that coconut of yours (that's your head) to figure them out!**

3. When you made your profile grid, you were instructed to make gridlines that were spaced one cm apart. Why was 1cm the appropriate interval to construct the grid for this profile?
What would have happened to the look of your volcano if you made the profile gridlines 2 cm apart?
4. If you were to construct a contour map showing the elevations of a location in the United States, would a contour map of the same location be look exactly the same in 100 years? Explain your answer.
5. Where in the United States would you expect the topography to change most often because changes in elevation and landscape occur quicker there than in other locations? Explain your answer.
(Use your own prior knowledge to answer this, or do a quick Internet search to get some ideas ...)