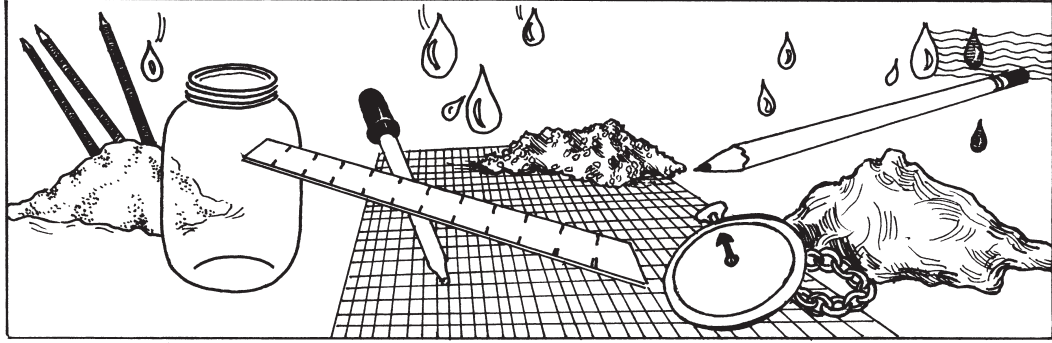


## Geology Chapter Teacher Sheet



### Activity #5: Understanding Topographic Maps

#### Objectives:

To become familiar with the terminology and use of topographic maps.

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#### Time:

One 55-minute class period

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#### Background:

Topographic maps are tools used to visualize the shape of the land from a flat map, and can also be used to visualize the hills and valleys present on the sea floor. This exercise will help students understand how topographic maps can aid in understanding sea floor features that can't be seen from land or from the surface of the water.

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#### Materials:

Each student will need a copy of each of the worksheets, a pencil and a ruler, a pair of scissors, and pieces of stiff paper or light cardboard.

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#### Procedure:

Make a transparency of the two attached Master worksheets and give each student a copy of Master #1. Use the transparency of Master #1 to explain topographic terminology to the students: contour line, contour interval, transect line, etc. The students will cut out Master #1 on the contour lines, beginning with the largest. As they cut out each line, they will trace the outline on a piece of cardboard and cut it out, then cut Master #1 on the next contour line. Continue in this fashion until they have four pieces of cardboard, each corresponding to the size of one contour. Using popsicle sticks as separators, students will reconstruct the "hill"

represented by the topographic map. Next, hand out Master #2. Tell students they will make a profile of the "hill" by graphing along the transect line from A to B. At each contour line, students will make a mark on the graph at the appropriate line. Have the students compare their completed graph to the model they made from Master #1.

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**Answers to student questions:**

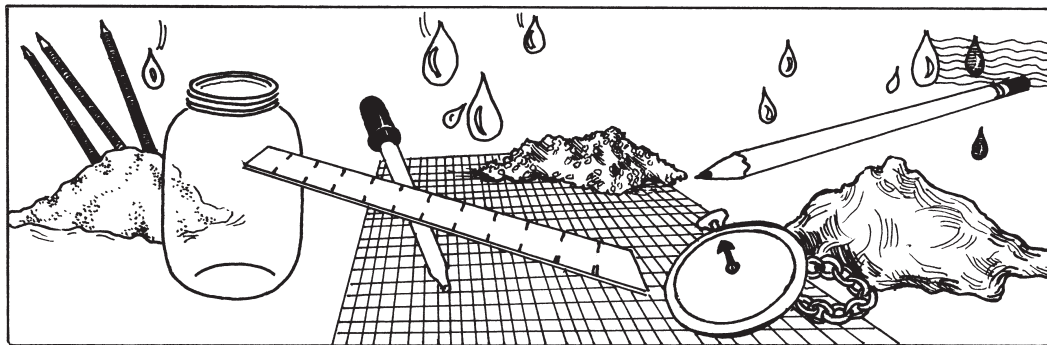
11. Describe how a topographic map might be useful in understanding how water flows through the Tijuana Estuary.

*A topographic map shows elevation of the land. Since water flows downhill, it would be possible to determine the path water would take through the estuary by looking at the changing elevation of the land.*

12. How could Justine and Marc, from the Geology reading have used a topographic map when they were constructing their "estuary"?

*Students' answers will vary, but the students should understand that a topographic map displays elevation and changes in elevation of a landscape. Using a topographic map helps us understand whether or not water will flow, how fast it might flow, and where water is most likely to stop flowing producing a pond or lake.*

## Geology Chapter Student Sheet



### Activity #5: Understanding Topographic Maps

#### PURPOSE:

To construct a model of a hill using a topographic map, and compare that model to a graph of the same map.

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#### INTRODUCTION:

Maps and charts are two-dimensional tools that aid in navigation, but most of them can't tell us the features of the land they represent. Topographic maps can help us visualize land and sea floor features such as valleys, mountains, and plains. They do this by using contour lines that tell us the depth (if underwater) or altitude (if on land) of the sea floor or land. Each contour line tells us the depth or altitude along the entire line.

This activity will show you how to "read" a contour map so you can visualize features such as valleys, trenches, and mountains.

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#### MATERIALS:

You will need a pencil and ruler, 5 pieces of stiff paper or cardboard, some popsicle sticks, glue, and scissors.

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#### PROCEDURE:

1. Cut out Master #1 along the 20 meter contour line, place on one piece of cardboard, and trace around the edges. Cut out the cardboard along the line you traced.

2. Cut Master #1 along the 40 meter line, place on a piece of cardboard, trace around the edges, and cut along the line.
3. Repeat the above steps for the 60 meter and 80 meter lines. You will have 4 pieces of cardboard that represent each contour line.
4. Use the uncut piece of cardboard as a base. Glue popsicle sticks on their edges to the bottom of the largest (20 meter) piece of cardboard. You may have to cut or break the popsicle sticks to fit. Then, glue the other edge of the popsicle sticks to the uncut piece of cardboard.
5. Glue popsicle sticks on their edges to the next largest (40 meter) piece of cardboard, and glue this piece to the 20 meter piece. Be sure the pieces are positioned the same as the contour lines are on the Master.
6. Continue to glue popsicle sticks to the bottom of the 60 meter piece of cardboard, and then the 80 meter piece of cardboard and glue each to the next larger piece. Position each piece the same as it is on the Master.
7. In your notebook or journal, describe the feature you have constructed. Note the steepness of the slant on each of the four sides of the feature.
8. Use Master #2. Begin at the "A" end of the transect line. Each time the transect line crosses a contour line, place your ruler at the point where the two lines cross, and place a dot directly under that point on the appropriate line on the graph below. For instance, where the 20 meter line crosses the transect line, place a dot directly below that point on the 20 line of the graph. Continue to place dots on the graph directly under each place along the transect line that crosses a contour line. Connect the lines on the graph.
9. Compare the graph you have made to a profile of your constructed hill. In your notebook, describe the similarities between the graph and your construction.
10. Describe how a topographic map might be useful in understanding how water flows through the Tijuana Estuary.
11. How could Justine and Marc, from the Geology reading, have used a topographic map when they were constructing their "estuary"?