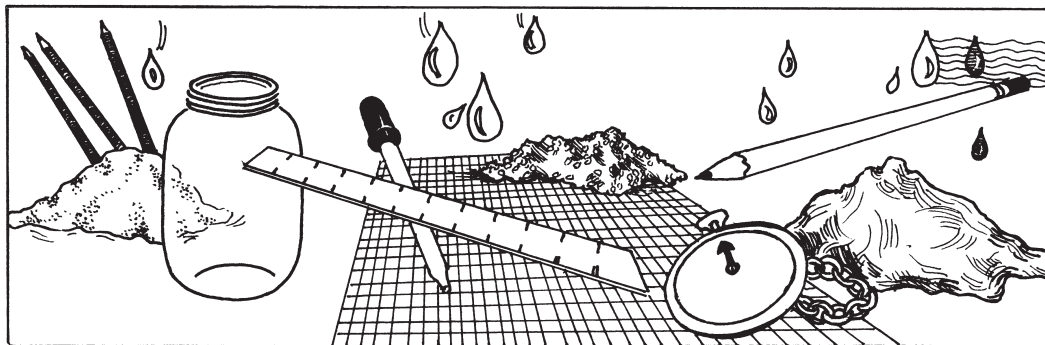


Geology Chapter Teacher Sheet



Activity #6: Mapping the Sea Floor

Objectives:

To use topographic maps to make a transect profile of the sea floor off the San Diego coast.

Time:

One 55-minute class period

Background:

After completing Activity 5, students should understand how topographic maps can be used to visualize sea floor features. This activity will give students a chance to practice the skills they learned during Activity 5 by using actual charts of the sea floor off the San Diego coastline.

Materials:

Each pair of students will need a chart of the sea floor off the San Diego coast. This chart is available from marine boating supply stores. If you can't find any you can go to <http://www.naco.faa.gov/Agents.asp> to find an agent near you (~\$9). They will also need a ruler, 3 sheets of graph paper, and a pencil.

Procedure:

Determine the line of latitude the students will use as their transect line. Each map can be used by two different pairs of students; one pair works with the map from the bottom, and the other pair works with the map from the top. Assign different latitudes to each pair of students so they can compare their graph and see how the sea floor features change. Point out to the students how the chart indicates depth under the surface as well as height above the surface.

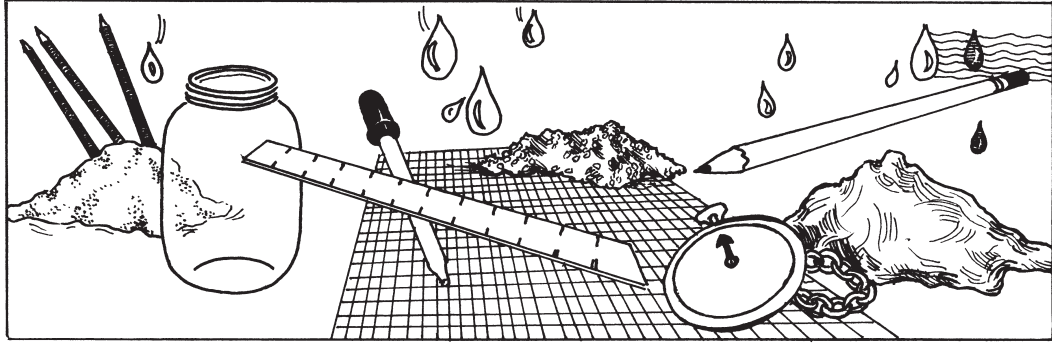
The students should tape their sheets of graph paper together horizontally, then draw the X axis and Y axis on the graph. The zero X axis represents the surface of the water. The students should indicate the water surface on their graph. The bottom of the graph will need to be greater than the deepest point on the transect line. Students then graph each point where the transect line crosses a contour line.

Be sure the students include enough of the land portion of the map to give them a visual representation of the features on the land, especially the features of the Tijuana Estuary.

Answers to student questions:

1. How can you tell from the map whether a slope is steep or not?
*When the contour lines are close together, the slope of the land is steep.
The closer the lines are together, the steeper the slope.*
2. Compare a place on the map that indicates a flat area of the seafloor with the same location on your graph. How do the contour lines on the map indicate that this area is flat?
Contour lines that are far apart indicate the land is flat.
3. If you were piloting a boat in this area, how could this map help you navigate?
You would be able to tell where the water was too shallow for your boat, and where the deeper channels were located.
4. Label the continental shelf on your topographic map. Approximately how wide is this shelf?
Answers will vary depending on the latitude used by the students.
5. Is the Tijuana Estuary flat? How can you tell?
Yes, its very flat. You can tell by the contour lines, which are far apart at this location.
6. Can you see sand dunes on your topographic map? Why or why not?
Students probably can't see sand dunes because (1) the location of the dunes is constantly shifting and might not have been in place when the map was constructed and (2) the sand dunes might not have been large enough to have been included on the map.

Geology Chapter Student Sheet



Activity #6: Mapping the Sea Floor

PURPOSE:

To use your knowledge of topographic maps to determine the features of the sea floor off the San Diego coast and the Tijuana Estuary.

INTRODUCTION:

Now that you are experts at visualizing topographic maps, you can use your new skills to find out what the sea floor looks like off the San Diego coast, and in the area of the Tijuana Estuary. Will you find hills, mountains, trenches, plains? Complete this activity to find out.

MATERIALS:

You and a partner will need a ruler or meter stick, 3 sheets of graph paper, and a pencil.

PROCEDURE:

1. Your teacher will tell you the latitude you will use. Find the latitude at the San Diego coast. Use this line of latitude as your transect line
2. Prepare your graph paper. Tape three pieces of graph paper together horizontally. Draw in your X and Y axis, with depth on the Y axis. The zero X axis line will represent the surface of the water. Above the zero line are land masses that are above the surface of the water, and below the zero line are the features of the sea floor. The graph will need to go below zero deeper than the deepest contour line along your transect.

3. Place the edge of your graph paper along the transect line. Begin inland from the San Diego coastline, and follow the transect line until you come to a point that crosses a contour line. Make a dot on the graph paper, at the proper depth, directly under the contour line. Continue along the transect line to the next contour line and make another dot on the graph paper. Connect the dots. Continue to the end of the transect line or to the end of the graph paper.
4. Describe the features that you see on your graph. Compare your graph to other graphs prepared by students using different latitudes. Do the features change? Describe any differences you see.

QUESTIONS:

1. How can you tell from the map whether a slope is steep or not?
2. Compare a place on the map that indicates a flat area of the seafloor with the same location on your graph. How do the contour lines on the map indicate that this area is flat?
3. If you were piloting a boat in this area, how could this map help you navigate?
4. Label the continental shelf on your topographic map. Approximately how wide is this shelf?
5. Is the Tijuana Estuary flat? How can you tell?
6. Can you see sand dunes on your topographic map? Why or why not?