Activity 3. Hills and Valleys of the Sea Surface

The surface of the sea is not flat; it consists of "hills and valleys" — high and low levels of water that make up its "ocean topography." (Select one of the maps of **Activity 1**, and ask your friends to choose other maps from the same series.)

Build an Ocean Topography Model:

(1) Collect the materials you will need: colored ocean topography maps from plate 4 or 5, tracing paper, pencil, thin cardboard, card stock, scissors, glue, paint (optional).

(2) Enlarge the map on a photocopy machine if you want to have a bigger model.

(3) Place the tracing paper on top of the map you have selected. Trace the contours of the surface by outlining each of the different colors on the image. (You will be following the contour lines or the print.) Use the scale to determine the height of each area.

(4) Trace the line of each contour onto a separate sheet of card stock, then cut out each contour outline. (Optional: Use different colored card stock for each contour level. You may buy colored stock, or paint what you have.)

(5) Cut small pieces of cardboard to place between each layer. (The cardboard provides a means of indicating the relative height of each contour.)

(6) Position card stock and cardboard on the tracing paper, glue the card stock cutouts one on top of each other to build the model of the sea surface.

(7) Display the series of models to show the rise and fall of the 1997-1998 El Niño.

Discover More About Oceans and El Niño; Look Carefully at Your Models When Answering These Questions:

(1) What is the difference between the highest and the lowest points of the ocean surface, and how did this difference vary with time?

(2) How does the sea-surface topography compare to land topography? Are they very similar or very different? Why?

(3) How might the ocean topography affect ocean currents? (Hint: think about which way the water will flow, and look at meteorological maps.)

(4) What other measurements from satellites, ships, or buoys might help scientists to understand El Niño conditions?

The above material is adapted from the CD-ROM "**Visit to an Ocean Planet**." See the CD-ROM for more in-depth activities:

http://topex-www.jpl.nasa.gov/education/cdrom.html