

COSEE *WEST*

Lesson Plan for Middle School Science by Paul Martin

## **Currents: California Current, Gulf Stream Current**

Objective: Incorporating historical and real time data into a context that will illustrate and help define currents. The overall objective is to familiarize students with retrieving temperature information from specific geographically located buoys and then illustrating with arrows on a map the generalized temperature of currents and the direction of currents flow. It will also be an excellent introduction to ocean circulation, liquid convection, global currents, longitude and latitude coordinates and the interconnectivity of the oceans. The art and geography aspects of the project will help with the retention and understanding of the California Current and the Gulf Stream Current.

Vocabulary: Currents, Gulf Stream Current, California Current, interconnectivity, buoy, temperature sensor, circulation, convection, water flow direction, longitude and latitude coordinates

Procedure: The class will be divided into groups of three or four by counting; this will allow schools with limited computer availability to access real time and historical data in manageable groups. The groups will be instructed where to go on the internet to retrieve the water temperature data from buoys. Water temperatures will be recorded in Celsius and by longitude and latitude coordinates. Maps will be handed out to the groups and the temperatures will be written down on the maps with proper geographic placement. Groups will then receive outlined arrows and then proceed to color the arrows red and blue. Red arrows will represent warm currents and blue arrows will represent cold currents. After coloring the arrows, groups will then cut out the arrows. Finally the arrows will be pasted to the cardstock maps. The arrows will point toward the direction of current flow. Groups will be instructed what to name their currents and then proceed to write the name of the currents on the corresponding current. A larger, professionally illustrated current map will be introduced and displayed in the classroom for expanded discussion of currents, the interconnectivity of the oceans by currents and for future use in discussions, lesson plans and related subjects.

Materials: Computers with internet access, a list of exact internet sites with water temperatures and proper geographic location of buoys, cardstock political maps of the earth with longitude and latitude lines, white cardstock with dotted arrows for cutouts of the arrows, blue and red crayons for coloring of the arrows, scissors for coloring the arrows, paste or putty for attaching the prepared arrows to the political map and large global current map for display in the classroom.

Time: Two Classroom Periods. The first classroom period will be used for project introduction lecture, project instructions, data retrieval and data recording. The second classroom period will be used for maps, preparation and placement of current arrows, introduction and display of the larger classroom global current map. There will also be a concluding lecture on the project that will review vocabulary, explain the significance of the California Current and the Gulf Stream Current and introduce global currents.

