

# Teacher Information

## Ocean Temperatures

### I. Objectives

#### A. Forming Concepts (Introductory) Objectives

1. List data collected by marine buoys.
2. List the different kinds of moored buoys.
3. Describe how data is transmitted worldwide.
4. Explain the difference between near-shore and offshore air and water temperatures.

#### B. Interpreting Data Objectives

1. Collect information about marine buoy sites.
2. Record latitude and longitude of sites.
3. List times of most recent observations.
4. Read tables of current data and record information.
5. Interpret graphs of air and water temperatures.
6. Calculate the differences in temperature of locations at different latitudes.
7. Collect data for one week at a site closest to school.
8. Create graphs of collected data.

#### C. Applying Principles Objectives

1. Predict air temperature changes based on past and current data.
2. Predict water temperature changes based on past and current data.
3. Correlate air and water temperatures to the effects of El Nino nationwide and locally.
4. Design a buoy to collect data in outer space.

## II. Interdisciplinary Uses

### A. Social Studies

1. Investigate different cultures that live in areas near the ocean with warm and cold temperatures.
2. Predict the economic effects from fisheries in warm and cold areas.

### B. Math

1. Create graphs of various data.
2. Interpret graphs
3. Calculate differences related to graphed data.

### C. Language Arts

1. Write short reports about researched information related to climate and its effects on people.
2. Read stories related to Eskimos, Polynesians, Japanese and other cultures that depend on the sea for food.
3. Read stories about shipping, pirates, or early sea explorers.

## III. Science Standards Coordination

The Ocean Temperatures activity has been designed to incorporate science standards as specified by the National Science Education Standards (NSES) and the National Science Teachers Association (NSTA) Scope, Sequence, and Coordination (SS&C) of Secondary School Science. Only the major topics are listed. For further explanation of each standard see the complete documents:

NSES - National Academy Press, 2101 Constitution Ave, NW,  
Washington, DC 20481

NSTA - 1840 Wilson Blvd, Arlington, VA 22201-3000

<b>NSES</b>	<b>SS&amp;C</b>
Structure of the earth system	Energy transfer by heat radiation
Transfer of energy	Sun as an energy source
Earth in the solar system	Water cycle

## **IV. Advanced Preparation**

### **A. Materials**

1. One computer per two or three students is a recommended minimum.
2. One copy of the Student Activity Book for each student or group of students.

### **B. Time Required for Completing the Activity**

1. The *Get Info* section takes about 20 minutes.
2. The *Gather Data* section takes about 35 minutes.
3. The *Application* section takes about 20 minutes.

### **C. Teacher Familiarity**

Preview these materials thoroughly. As with all these activities, before using this activity in class, review the sites and work through the activity yourself to learn about Ocean Temperatures so you can answer questions or direct students to the answers.

The activity is set up so students are taken to sites containing information that will be used to answer questions regarding Ocean Temperatures. The sites contain either the answers or the information from which the students can infer the answers. At the end of the activity, there is a list of enrichment activities and related web sites.

## **D. Select Questions for Students to Answer**

It would be prudent for you to read the questions students will be expected to answer. These questions are in order of ascending difficulty. Depending on grade level and ability level, you might want to assign specific questions for your students.

## **E. Student Grouping**

These activities can be done individually or in small groups of two or three students. Students who have Internet access can also do them at home for extra credit.

## **F. Software Requirements and Duplication Preparation**

1. Adobe Acrobat Reader is required to download the pages. Click the "Tech Info" link on the Science with NOAA Research homepage to download Acrobat Reader.
2. Download the Teacher Information, Teacher Key, and Student Activity Book PDF files from the "Teacher Info" web page.
3. Duplicate and distribute student pages. Ideally, each student should have a copy of the Student Activity Book that should be distributed and discussed the day before the exercise.