



## PROBLEM SOLVING ACTIVITY: COMPARING CLIMATES

### OBJECTIVE:

- Investigate how climatologists describe climate and create and analyze climate graphs;
- Analyze the importance of temperature and precipitation in determining climate;
- Determine which climate control factors cause major differences in climate between two locations with very different climate.

### MATERIALS:

- Map of world climate zones
- Climate graphs of Denver and San Francisco
- Calculators
- **Student Work Sheets**

### PROCEDURE

1. Read through and discuss the information on page 4 of the activity with the class.
  - Be sure to focus in on the format of the sample climate graph as well as the locations of the two cities in question.
  - Present other examples of climate graphs to discuss with students before they begin their actual part of the lesson.
2. Put students into groups of 2-3.
  - Provide students with copies of climate graphs to use for completing **DATA TABLE 1** or direct them to appropriate links to do research on the Internet.
3. Students should complete the San Francisco and Denver sections of **DATA TABLE 1** on their answer sheet, recording the climate data they researched on the Internet or from the class handouts. (**See attached handouts.**)
4. Students should work with their partners to compare each of the climate variables in **DATA TABLE 1** for which they recorded data.

## Teacher Sheet 2

5. Students should identify the climate variables that are the most different between the two locations. For this example, significant differences exist in the amount of snow precipitation that falls in San Francisco compared to Denver. There are also major differences in the minimum and maximum temperatures for January as well as July.
6. Now, direct students to think about which climate control factors (latitude, elevation, water, ocean currents, topography, prevailing winds, or vegetation) are likely to cause these major differences between the local climates of San Francisco and Denver.
7. Point out to the class that there is a large difference in elevation between San Francisco and Denver, but not much difference in latitude. This suggests that elevation may therefore play a major role in determining the local climate for each place. Some climate control factors have greater influence than others, depending upon the location of the place being considered.
8. In **Data Table 2**, students should record which climate control factors (latitude, elevation, water, ocean currents, topography, prevailing winds, or vegetation) appear to have major influence on the local climates of San Francisco and Denver. (Indicate with an -X-)
9. Next, indicate which climate control factors appear to have minor influence. (Indicate with an -X^-)
10. Working in their groups, student should provide justification for each factor they indicated as having a major influence on the climates of San Francisco and Denver.
11. Present the following questions to the class to help them write their explanations about the climate of the two cities;
  - a. Explain how two cities located at the same latitude can have different climates.
  - b. Describe how mountains affect climate of Denver.

### Teacher Sheet 3

- c. Explain how the ocean currents affect the climate of San Francisco.
- d. Describe the kinds of vegetation that you would probably see near Denver and why.
- e. How would the vegetation around San Francisco compare to the vegetation round Denver? Why?