

Differences Between Climate and Weather Activity

Time:

- Teacher instructions and introduction: 30 minutes.
- Student data collection: 50 minutes per week.
- Analysis and discussion as class: 45 minutes.

Standards:

CA state standard set 5. a. *Students know how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute the heat.*

Topical Objectives:

- Students will understand the general distinctions between weather and climate.
- Students will understand that daily weather measurements are highly variable compared to long-term climate data.

Materials:

- Local weather information from newspaper or Web source
- Data charts
- Colored pencils

Procedure:

1. Determine how long you want students to collect weather data for (a month, three months, or all year). One month of data collection is usually sufficient to effectively illustrate weather variation, but longer-term data collection enables discussion of seasonal changes.
2. Determine what weather data you want students to collect (for example, daily high and low temperature, normal high and low temperature, record high and low temperature, daily precipitation, or normal precipitation).
3. Have the students prepare graphs to record data (the detail of the graphs depends upon the duration of your weather data collection and the data that you choose to include). You may wish to have the students post their graphs around the room and add data to them periodically.
4. Have students begin to collect data (don't forget weekends) by clipping weather data from a newspaper or checking with an on-line source. Record this information in a notebook.
5. Either daily or weekly, have students record each day's weather data on the graph. Be sure to record the average or "normal" values. The comparison between the average and daily weather data will form the basis for the discussion of the differences between weather and climate.
6. In a class discussion, ask the students to compare daily weather data to the "normal" or "average" data. What features do they observe? Lead the students to discuss the differences between weather and climate that they can observe in their charts. Discuss the following questions:
 - a. For any of the weather data, which line on the graph is more variable: the daily values or the average values? Why?

- b. If you were asked to predict the weather for tomorrow from the data shown on the graph, what data would you find the most useful: the daily or average values?
 - c. If a scientist reported that last month in your state was warmer than the same month a year ago, would you consider this to be evidence for climate change? Why or why not? What kind of data would be the most convincing: changes in short-term (daily, weekly, or monthly) weather, or changes in longer-term climate data?
 - d. Based on the data that the class has collected, does this year appear to be warmer, cooler, or about the same as the average? From this data, what, if anything, can you conclude about climate change?
7. In addition to collecting and graphing local data, consider doing this exercise in cooperation with another school (or schools) in a completely different geographic location. Classes could exchange data with each other for comparison and discussion. Telecommunication techniques would enhance the links to other schools.

Assessment Ideas

1. As formative assessment, it is critical to continue to question students about why they are collecting the data and what they are seeing in the data during the exercise. If they are conducting data for a month, you may need to remind students of the goals of the exercise.
2. Create your own simulated weather datasets. Ask students to examine a dataset and answer the first two questions above.

Sources

http://www.ucar.edu/learn/1_2_2_8t.htm#top