Environmental Science Institute
UNIVERSITY OF TEXAS AT AUSTIN

# The Difference Between Weather and Climate

**Grade Level**: Middle School (6-8)

**Rational or Purpose:** With the increased concern about global warming, students will analyze and interpret, and understand daily weather data. With this data, they will examine the relationship with climate and weather from the past to see if the Earth is, in fact, warming. They will also relate how daily weather is more variable than long term climate.

**Materials needed:**

For each student:

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

**Lesson Duration:** This is a long term project (about a month or more). Most of the research and data collection should be done as homework. Some time will be required during class for questions and discussion.

**Source**:
http://www.ucar.edu/learn/1_2_2_8t.htm

**Science TEKS**:

6th Grade Science: 2 A, B, C, D, E; 3 D; 14 C.
7th Grade Science: 2 A, B, C, D, E; 3 D; 14 B.
8th Grade Science: 2 A, B, C, D, E; 3 D; 12 B.

**Background:**

Since global warming is at the forefront of current events, some attention needs to be paid to the differences between weather and climate. Weather changes from day to day, and contributes to the whole climate of an area. Global warming implies that overall global temperatures are shifting towards a warmer climate. With this project students will become more informed about climate changes versus weather changes.

Weather is defined as the current atmospheric conditions. This includes temperature, rainfall, wind, and humidity as well as other conditions at a specific place. Climate is the general weather conditions, for a specified time of year, at a specific place, and it rarely changes year after year. An example of a climate trends is that it is hot in Texas in the

summer time, and that it will be snowing in Maine in the winter. One way of showing the difference between weather and climate is simply put by a middle school student, “Climate helps you decide what clothes to buy, and weather helps you decide what clothes to wear.”

We use climate to help predict the weather in the future. If we are experiencing global warming, the overall average temperature would have to be rising. If this is not the case, we would not have a global warming problem. Some look to the fact that recent summers have produced higher temperature as evidence for global warming. However, this is not the case since weather can fluctuate from year to year. By searching for an overall climate change, and finding it, we can conclude that there is global warming. With the help of an almanac to find average weather conditions for the past, and collecting weather averages at the present time, we can produce a climate graph to see if there is a warming trend or not.

**Activity**:
Students will be able to understand the difference between the terms weather and climate. They will explain how daily weather is highly variable and changeable compared to the long term climate. Once data is collected, they will be able to identify climate trends, and explain if we can determine if there is global warming.

**Procedure**

1. Have the students get into groups of three or four for this project.

2. 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.

3. Have each group determine what weather data you want students to collect. Some examples are daily high and low temperature, normal high and low temperature, record high and low temperature, daily precipitation, or normal precipitation. Try to have different data for all of the groups so another discussion can be raised later.

4. Have the students collect data daily and record on graphs. Have groups display their data to share with the class.

5. Have the students record weekly averages and normal values also. The comparison between the average and daily weather data will form the basis for the discussion of the differences between weather and climate.

6. At the end of the time allotted for the project, give the groups one class day to conclude what they have found from their collected data.

7. The next day, have a class discussion. Ask the students how the daily weather and the averaged data are different. Have the students discuss some of the topics below:

- What is the difference between climate and daily weather and how does your data form your conclusion.
- Is there any part of your data that is very different from other times in your data collection?
- Would you be accurate if you would predict the weather from your graph?
- Do you think weather can change yearly?
- How long do you think it takes for climate to change?
- If a scientist has reported that this month was significantly warmer than the same month a year ago, would this be evidence of global climate change?
- Does the data from the time you have collected appear to be warmer, cooler, or about the same as the average?

(Discussions can take two days for full participation)

8. After discussion, have the class conclude as a whole how they define climate and weather, and how they differ.
9. Have the students write a two page paper about their experiences in this project and how their data has concluded to the overall conclusion that the class has given.