

**Lab Activity Title:** Climate Factors Past and Present  
**Recommended Grade Level:** 8  
**Discipline:** Earth/Environmental Science  
**Topic:** Weather vs. Climate  
**Time Requirements:** 90 minutes  
**Submitted by:** Karen McCabe

### **National Science Education Standards Addressed**

Earth and Space Science

- Structure of the Earth system
- Global patterns of atmospheric movement influence local weather.

Abilities Necessary to Do Scientific Inquiry

- Use appropriate tools and techniques to gather, analyze and interpret data.
- Develop descriptions, explanations, predictions, and models using evidence.
- Think critically and logically to make the relationships between evidence and explanations.

### **Internet Resources**

Weather Eye: [http://weathereye.kgan.com/cadet/climate/climate\\_vs.html](http://weathereye.kgan.com/cadet/climate/climate_vs.html)

A Student's Guide to Climate Change: <http://www.epa.gov/climatechange/kids/>

### **Learning Objectives**

Students will formulate working definitions of weather and climate and use the Internet to research and identify factors that affect Earth's climate system.

### **Materials**

1. Computer with internet access for each student group
2. "Climate Factors: Past and Present" handout (attached)

### **Procedure:**

1. Engage students in whole class brainstorming session about the differences between weather and climate.
2. Draw a T-chart for Weather and climate on chalkboard or interactive whiteboard.
3. Allow students to discuss and record their ideas of what factors comprise weather and climate.
4. Guide students as they formulate an accepted definition for weather and climate.
5. Record the class definitions on the chart.
6. Form student groups of 3-4 and assign them to a computer with internet access.

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7. Go to the Weather Eye Web site ([http://weathereye.kgan.com/cadet/climate/climate\\_vs.html](http://weathereye.kgan.com/cadet/climate/climate_vs.html)) to read an explanation about weather vs. climate.
8. Go to "A Student's Guide to Climate Change" website <http://www.epa.gov/climatechange/kids/> to read another description of weather and climate.
9. Students will complete the chart found on "Climate Factors Past and Present" handout.
10. Handouts will be collected and graded.

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## **Climate Factors: Past and Present**

Directions: Use the Learn the Basics tab found on the Kids Guide to Climate Change website found at <http://www.epa.gov/climatechange/kids/basics/past.html> to complete the following.

I. Explain three reasons why today's climate change is different than the climate change of the past.

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II. Complete the table below to examine natural factors that affect climate.

| Climate Factor | Description | Illustration |
|----------------|-------------|--------------|
|----------------|-------------|--------------|

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|                                     |  |  |
|-------------------------------------|--|--|
| <i>Changes in the Earth's orbit</i> |  |  |
| <i>Changes in the sun's energy</i>  |  |  |
| <i>Photosynthesis</i>               |  |  |
| <i>Volcanic eruptions</i>           |  |  |

Unit Plan: Weather vs. Climate

Lesson: What's the Climate?

Grade: 8

Time Required: 90 minutes

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### **Internet Resources**

NOAA JetStream - Climate: <http://www.srh.noaa.gov/jetstream/global/climate.htm>

Image: United States Annual Mean Daily Average Temperature:

<http://www.ncdc.noaa.gov/img/about/cdrom/climatls1/info/temp.gif>

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Image: United States Annual Mean Total Precipitation:  
<http://www.ncdc.noaa.gov/img/about/cdrom/climatls1/info/prec.gif>

### Learning Objective

Students will use the Internet to gather climatic data for specific regions and rank them based on personal preference.

### Materials

1. Computers with internet access for each group
2. Copies of “What’s the Climate?” handout

### Procedure

1. Students will work in groups to research the climate of their own area and four different US Cities.
2. Students will complete all parts of the “What’s the Climate?” handout.
3. Student data will be used to complete the final component of the instructional unit.
4. “What’s the Climate?” handout will be collected and graded.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Day: \_\_\_\_\_ Period: \_\_\_\_\_

## What’s the Climate?

### Part I.

Directions: Go to this NOAA (National Oceanic and Atmospheric Agency) Web site <http://www.srh.noaa.gov/jetstream/global/climate.htm> to complete the chart below:

| CATEGORY & NAME | LATITUDE | CLIMATE FEATURE  |
|-----------------|----------|--|
| A: Tropical     | 15°-25°  | Average temperatures=64° F<br>Annual precipitation=59” |

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|           |  |  |
|-----------|--|--|
| <b>B:</b> |  |  |
| <b>C:</b> |  |  |
| <b>D:</b> |  |  |
| <b>E:</b> |  |  |
| <b>H:</b> |  |  |

Use the climate map on this webpage to find the state you live in and record the climate category:

MY STATE: \_\_\_\_\_

Find three states that have different climates and record below:

STATE: \_\_\_\_\_ CLIMATE CATEGORY: \_\_\_\_\_

STATE: \_\_\_\_\_ CLIMATE CATEGORY: \_\_\_\_\_

STATE: \_\_\_\_\_ CLIMATE CATEGORY: \_\_\_\_\_

Part 2:

1. Go to: <http://www.ncdc.noaa.gov/img/about/cdrom/climatls1/info/temp.gif> to find the Annual Mean Daily Temperature for the cities in the chart below. Record the Annual Mean Daily Temperatures on the data chart.
2. Go to: <http://www.ncdc.noaa.gov/img/about/cdrom/climatls1/info/prec.gif> to find the Annual Mean Total Precipitation for the cities. Record the Annual Mean Total Precipitation on the data chart.
3. When you have recorded the temperature and precipitation for each city, think about which city you would like to visit and rate each city according to your preference.

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| <b>City</b>                          | <b>Annual<br/>Mean<br/>Daily<br/>Temperature</b> | <b>Annual<br/>Mean<br/>Total<br/>Precipitation</b> | <b>Rating<br/>#1 Choice, #2 Choice<br/>#3 Choice, #4 Choice</b> |
|--------------------------------------|--|--|---|
| <b>Your City, State:</b>             |  |  |   |
| <b>Galveston, Texas</b>              |  |  |   |
| <b>Burlington, Vermont</b>           |  |  |   |
| <b>San Francisco,<br/>California</b> |  |  |   |
| <b>Miami, Florida</b>                |  |  |   |

Unit Plan: Weather vs. Climate

Lesson: Climate Challenge

Grade: 8

Time Required: 90 minutes

### **National Science Education Standards Addressed**

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- Think critically and logically to make the relationships between evidence and explanations.

### **Learning Objectives**

Students will interpret climate data from the prior activity and make decisions based on that data.

### **Materials**

1. “What’s the Climate?” handout from previous day
2. Graph paper or graphing software
3. Copies of “Climate Challenge” handout

### **Procedure**

1. Distribute both handouts.
2. Go over scenario below:

You are employed as a climatologist for the National Oceanic and Atmospheric Agency (NOAA) in your city. Your role is to work with your team to set up weather stations that record the daily weather for your region throughout the year and compile annual climate data reports. Your supervisor has just notified you that your team is being transferred from your current city to one of these cities:

- Galveston, Texas
- Burlington, Vermont
- San Francisco, California
- Miami, Florida

3. Students will use the temperature and precipitation data from the “What’s The Climate?” table to create a line graph that illustrates the data.
4. Students will decide which city they will relocate to first, second, third, and fourth. Using their graph, students will write a report detailing their decision.

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Day: \_\_\_\_\_ Period: \_\_\_\_\_

## **Climate Challenge**

You will need the climate data sheets from Worksheet #1 to complete this task.

**Challenge:** You are employed as a climatologist for the National Oceanic and Atmospheric Agency (NOAA) in your city. Your role is to work with your team to set up weather stations that record the daily weather for your region throughout the year and

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