

# Cloudy with a Chance of Science!

## Week 3: Grades 6-8

Day	Topics	Related Standards
1	Climate vs. Weather	Analyze and interpret data to construct an explanation for how advances in technology has improved weather prediction.
2	Building a House Right for the Climate	
3	Building a House Right for the Climate	
4	Dinosaur Breath	Construct and support an argument about how human consumption of limited resources impacts the biosphere.
5	Global Temperature Trends	

# Cloudy with a Chance of Science!

## Week 3

### Day 1: Climate Vs. Weather

#### Teacher/Parent Background:

Understanding short term weather conditions compared to atmospheric conditions averaged over a longer period of time helps students interpret cycles, patterns, and natural events on Earth. Students have had prior experience with the weather vs. climate component of this concept in fourth grade where students collected, analyzed, and interpreted data to explain weather and climate patterns.

We are going to go beyond interpreting simple weather maps, so that students must differentiate between weather and climate by compiling and making generalizations about weather data and trends (repeated patterns) for a longer

period of time to infer climate conditions for specific regions. In the next 2 day's activities we will focus on 3 main concepts:

- Weather refers to the daily environmental conditions we experience around us.
- Climate refers to the average conditions in a place over a longer period of time.
- Weather can be observed each day, whereas climate must be observed over time.

**Overview:** In this activity, students will collect weather data, predict weather conditions, and compare and contrast current weather data with climate in order to build a house right for the climate.

### **Related Standards:**

- Analyze and interpret data to construct an explanation for how advances in technology has improved weather prediction.

### **Key Terms:**

Weather- Describes the condition of the air outdoors, such as temperature, cloud cover, wind speed and rainfall.

Climate- The set of weather conditions that prevail in a region year after year.

Precipitation- Rain, snow, sleet or hail that falls from the clouds in the sky.

Temperature- How hot or cold something is.

Data- Pieces of information.

Humidity- The amount of water vapor in the air.

Typical- Common

### **Materials List:**

Pen/Pencil

### **Activity Description:**

Students will read the short summary about weather and climate, look through [these slides made available by Stanford University](#) and/or watch [this video](#), sort various situations as either descriptive of weather or climate and then analyze 2 graphs to determine if they are showing climate or weather data.

Answers:

Weather	Climate
B, G, J, K, L, M, N, O	A, C, D, E, F, H, I, P

Top graph is climate and the bottom graph is weather.

### Closure:

Discuss the following with students:

**How are weather and climate different?** Weather is the day to day changes in the condition of the atmosphere, but climate is the average over a long period of time.

**Compare the weather of two of the environments.** Answers will vary. Possible answers: the desert environment receives little rainfall and has hot temperatures, whereas the beach environment receives a high amount of rainfall and the temperatures may vary from hot to cool or cold.

**Why do you think a climatologist studies climate?** Answers will vary. Possible answer: to be able to predict dramatic changes in the climate for an area or to be able to show how humans are affecting the climate.

### Extension:

-Arrange a video conference with someone living in a different climate who would be interested in talking to the class on zoom. Share the differences and similarities in temperature and precipitation as well as sports and outdoor activities.

-Climate Travel Brochures: Ask students where they might like to travel once it's safe to. Assign students to a variety of destination climates that they research in order to make a travel brochure for that tourist area that emphasizes the great climate. For example if they have Vail, Colorado they would find out that the town has a mountain climate and is best for skiing and snowboarding. They would need to research which months would be best for traveling to that area. Another example would be the tropics such as a Caribbean island. Students will find out that tropical island climates are great for beach and ocean activities, but will also discover certain months are typically very rainy and should be avoided.

## Student Handouts

Read the Following:

You're going on vacation in a week and you have to start thinking about what clothes you're going to pack for your trip. You've read the weather reports for your vacation spot, but you know that the weather can change from day to day. You decide that the best way to pack is to choose clothes that work best for the climate you're going to. Is that a wise decision? What exactly is the difference between weather and climate?

**What is weather?** When we talk about weather, we mean the daily conditions in the atmosphere of a local area. Many conditions make up the weather. A few are cloud cover, wind, humidity, and temperature, which is how hot or cold the air is. One condition that is important for planning a vacation is rainfall. Rain is a type of precipitation. Precipitation is water that falls to Earth from clouds. There are many forms of precipitation, including rain, sleet, hail, and snow. They are all slightly different based on the temperature of the air as the water falls through it. Rain is liquid water that falls in droplets. Snow and hail, on the other hand, are particles of ice that fall when it is colder outside. Sleet is a mixture of rain and snow. Weather is an important part of daily life. It describes the changing conditions of the environment around us.

All weather is caused by the Sun heating Earth. When the Sun's energy heats the atmosphere unevenly, it causes different air pressures. Pressure is the weight of the air. Cold air weighs more than warm air because it is denser. Low-pressure air and high-pressure air cause different weather conditions. Low-pressure air often brings rain, thunderstorms, and hurricanes. High-pressure air usually means clear skies and sunshine. The uneven heating of the atmosphere is the reason there is different weather in most places on Earth during spring, summer, autumn, and winter.

**What is climate?** Weather is constantly changing. Scientists who predict, or forecast, the weather can't usually make forecasts beyond 10 days. Even weather reports cannot guarantee that the forecasts will be accurate. However, climate in a particular area is consistent. Climate is the type of weather in an area averaged over a long period of time, such as 30 years or more. For example, when most people think of Hawaii they picture sunshine, high temperatures, and warm rainfall. Hawaii has a tropical climate. The weather there is usually warm and humid with cool breezes and it has been that way for many years. But, that doesn't mean that Hawaii doesn't have days with cold temperatures and storms. The climate of an area describes its average temperatures, precipitation, humidity, wind, cloud cover, and other weather conditions over long periods of time. An area's climate is affected by its distance from water, its latitude on the globe, and its elevation above sea level.

2. Sort the following situations as either an example of weather or climate:

<b>A</b> The average yearly rainfall in Yuma is 3 inches.	<b>B</b> In 2005, Hurricane Katrina hit the Gulf Coast.	<b>C</b> When looking at the precipitation in the desert over time, we noticed that the desert is very dry.	<b>D</b> It is usually raining in Seattle.
<b>E</b> In a tropical rain forest it is very humid and rains almost every day	<b>F</b> A typical day in Brazil would be humid and hot.	<b>G</b> A big blizzard in Connecticut caused power outages across the state	<b>H</b> The average high temperature for Phoenix, AZ, is 93° F.
<b>I</b> Every year when Rashad goes to Colorado for Christmas, there is plenty of snow for skiing.	<b>J</b> The highest recorded temperature for Tucson, Arizona, is 117°F	<b>K</b> Maria looked out her window and noticed it was a cloudy day.	<b>L</b> Yesterday was the hottest day of the year.
<b>M</b> I had to put on a sweater today because it was cold.	<b>N</b> It was cloudy and rainy all weekend.	<b>O</b> Jenny's roof sprang a leak last week because of all the rain.	<b>P</b> Arizona is dry most of the time

Weather	Climate

3. Analyze the two graphs below. Write a big “C” over the graph that describes climate and a big “W” over the graph that describes weather.

