READING MATERIAL

# Read About Weather and Climate

## DEFINITION OF WEATHER AND CLIMATE

*Weather* is the **day-to-day variation** of the atmosphere's condition locally. *Climate* is the variation of weather conditions over **long periods of time, usually years.**

***To better understand the difference between weather and climate...***

## *LET'S BREAK IT DOWN!*

## Weather is the day-to-day variation of the atmosphere's condition locally.

Weather can change quickly. TV weather reporters make daily predictions of weather conditions in your area. One day it can be sunny, the next day it is cloudy, and the next day it is rainy. The weather is constantly changing day-to-day. Just because it is summer, that doesn't mean that every day will be hot - the **daily weather varies.** To prepare for your day, most people check the weather report.

## Scientists use instruments to measure and predict the weather.

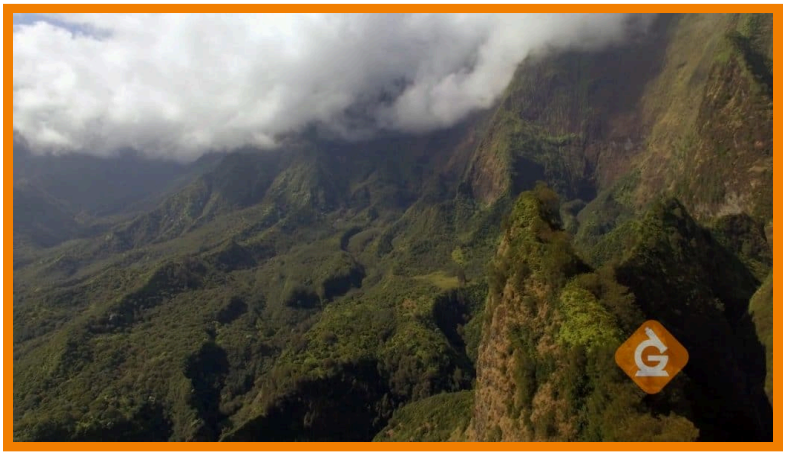
The scientific study of weather is called *meteorology*, and the people that study weather are called *meteorologists.*

Meteorologists use different instruments to gather information about the conditions in the atmosphere, such as a barometer, which measures air pressure. Air pressure changes when weather conditions change. Another weather instrument called an anemometer measures wind speed. A rain gauge collects and measures the amount of rain that has fallen.

Computers help scientists gather information from satellites that track weather patterns and this helps scientists make forecasts.

A team of meteorologists work together to interpret the data and make predictions.  In order to make accurate predictions, they need to collect data over a large region.

## Climate is the year-by-year variation of the atmosphere's condition over a large area.



Knowing an area's climate helps people plan which types of crops to plant, where to visit on vacation, and what kinds of clothes to buy.

The types of plants and animals that live in an area are also determined by its climate. Scientists use many of the same instruments to study climate as they use to study weather. The main difference is that climate is studied over a **much longer period of time, usually years.**

For example, we know from collecting weather data over **many years** that in the USA the months of July and August are usually the hottest -- it's summer! This means most days will be hot, but *not every day* ... the daily weather varies, but the climate is hot!

By studying the climate, scientists can know if something drastic is going wrong on Earth. One really hot day is probably just part of the natural variation of weather, but if lots of days are hot and this happens for years, that means the climate has changed, which could mean the Earth has changed dramatically in some way.

## Different climates exist around the world.

Our planet has a wonderful variety of different climates. Oymyakon, Russia is the coldest area inhabited on Earth, averaging -59°F during the winter months. The climate is very cold, but once in a while you could have a day that is much warmer than the rest - that would be weather.

The Atacama Desert in Chile has the driest climate in the world. It has only rained there four times in the last 37 years.

Commonwealth Bay in Antarctica is the windiest area on record, with an average wind speed of 50 mph (miles per hour). That's like a continuous blizzard!

We can put climates into a few general categories. Tropical climates, located near the equator, are always warm. In subtropical climates, temperatures are warm. Polar climates are very cold with snow and ice covering the land.

## WEATHER VS. CLIMATE EXAMPLES

**NASA tested their Mars Rover in the Atacama Desert in Chile.** This region has a climate and landscape similar to that on Mars.

**Meteorologists use weather stations to gather data.** Weather stations combine many instruments, such as a thermometer, barometer, rain gauge, and anemometer. All this data helps predict the weather.

**Meteorologists deliver forecasts in front of green screens.** TV editors replace the green wall with digital maps depicting weather conditions.

## WEATHER VS. CLIMATE VOCABULARY

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|---|---|
| **Weather** | Day-to-day variation of the atmosphere's condition locally. |
| **Climate** | The variations of weather conditions over long periods of time. |
| **Meteorologist** | A scientist that studies the atmosphere in order to understand and predict the weather. |
| **Rain Gauge** | A device used to measure the amount of rainfall over a period of time. |
| **Thermometer** | A device that measures air temperature. |
| **Anemometer** | A device that measures how fast the wind is blowing. |

# WEATHER VS. CLIMATE DISCUSSION QUESTIONS

## Is the weather forecast shown in the video the same every day? Explain.

No, each day the temperature changes. Whether or not it is going to be sunny or cloudy also changes.

## Why do Izzy and Zoe think they should be wearing summer clothes? Explain.

Zoe and Izzy live in a climate where it is typically warm in June. They expected it to be warm but didn't check the weather forecast before they got dressed.

## Why was Dr. Jeff wearing warm clothes in the summer? Explain.

Dr. Jeff knew that although the weather where he lives is usually warm in June, it can change day-to-day. He checked the forecast and realized it was cold so he put on warm clothes.

## What evidence do Zoe and Izzy find that supports their decision to wear shorts? Why?

Zoe and Izzy look at a graph of average monthly temperatures for their region over the past 10 years. It shows that the weather is usually warm in June. This is why they were surprised to find out that it was cold.

## What is the job of a meteorologist?

Vera is the name of the meteorologist the team meets at the weather station. She studies the atmosphere to predict and understand the weather. She collects weather data such as temperature, precipitation (amount of rain), wind speed, wind direction and air pressure using tools at a weather station. She also uses data from other meteorologists and satellites. She uses her understanding of all this data to make predictions about the next few days of weather in her area (Los Angeles, California). She creates a forecast based on data and presents it on TV using maps and graphics projected on a green screen.

## What types of weather data are collected by a weather station?

Weather stations are a combination of several different tools that measure weather conditions. These include thermometers to measure temperature, anemometers to measure wind speed and direction, barometers to measure air pressure and rain gauges to measure precipitation (amount of rain or snow).