

## Weather vs. Climate

Many people believe that weather and climate are interchangeable words for the same definition. They actually have very different meanings! Weather is a short term phenomenon that occurs in a region over a short period of time. Rain, sleet, snow, wind, current temperatures, and thunderstorms are all examples of weather. Climate is a long term phenomenon that occurs in a region over a long period time. Average rainfall over the years and average temperatures are both examples of climate.

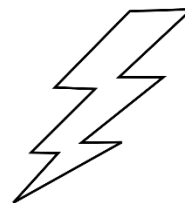
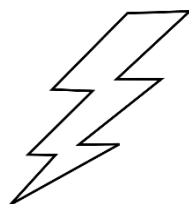
Precipitation in any short amount of time, like you would see on the 7-day forecast, is an example of weather. According to the national weather service, on average, the same city in the United States will only have the exact same temperature for no more than 10 days per year. That means that if the temperature in Atlanta, Georgia is 85 degrees Fahrenheit one day, it will only be 85 degrees Fahrenheit for 9 more days that year on average!

When precipitation, wind patterns, and temperatures are measured over long periods of time (decades and centuries), it is an example of climate. Antarctica, for instance, has a much different climate than California. Because temperatures in Antarctica are cold year round, and they have been for thousands of years, we can say that Antarctica has a cold climate. According to the Encyclopedia Britannica, the Gobi Desert gets less than 2 inches of rain per year. We would say that they have a very dry climate.

A regions climate and weather are not always the same. There are times when a place with a very dry climate has rainfall and times when a very wet place has a drought. Just because a desert has some rainfall doesn't mean that it has a wet climate, it just means it rained on that day, which is an example of weather. The overall conditions of the desert after being observed for many years, however, are dry. The climate of a desert is dry.

Can the climate of a region give us a good hint as to what the weather will be like there on a certain day? Absolutely! If your family decided to take a trip to Florida over the summer to visit beaches, you may assume that the 7 day forecast would be very hot and muggy. Florida has a very hot and muggy climate, so over the course of time, you are more likely to find yourself breaking a sweat on the beaches there rather than needing a coat or jacket.

So, while climate and weather both deal with precipitation and temperature, they actually have some major differences. Weather is what you usually see on the news every day and climate is in it for the long haul.



**Directions:** After reading *Weather vs. Climate*, answer the following questions. Refer back to the text when necessary.

1. What is the central idea of the text?

- a. Weather and climate are nearly the same thing.
- b. Climate is a long term phenomenon involving temperature and precipitation while weather is short term phenomenon involving those things.
- c. The weather and climate of a region can be the same thing.
- d. There are several differences between weather and climate, but they are ultimately the same thing.

2. Which detail from the text supports your answer to number one?

- a. "Antarctica, for instance, has a much different climate than California."
- b. "There are times when a place with a very dry climate has rainfall and times when a very wet place has a drought."
- c. "Antarctica, for instance, has a much different climate than California."
- d. "Because temperatures in Antarctica are cold year round, and they have been for thousands of years, we can say that Antarctica has a cold climate."

3. Why is reasonable to predict the weather of an area based on its climate?

- a. An areas climate can give clues as to what the weather will be like on a specific day.
- b. An areas climate and weather always matchup with each other.
- c. Weather is a short term climate, so they must be the same.
- d. Climate is a short term weather, so they must be the same.

4. A seven day forecast on the news is an example of...

- a. precipitation
- b. wind direction
- c. climate
- d. weather

5. The average temperature in a region during the 20<sup>th</sup> century would be an example of...

- a. forecast
- b. climate
- c. weather
- d. degrees Fahrenheit

6. Which of these is an example of climate?

- a. A seven day forecast on the news.
- b. A series of tornadoes ripping through a town in Arkansas.
- c. The average amount of rainfall in New York City from 1918-2018
- d. A category 3 hurricane in Florida.

7. Which of these is an example of weather?

- a. The average temperature in London in December from 1950-2000.
- b. The yearly rainfall totals in the Gobi Desert.
- c. The average precipitation in Seattle since 1960.
- d. A snowstorm in middle Tennessee.

8. How does this sentence fit into the overall structure of the text?

*"According to the Encyclopedia Britannica, the Gobi Desert gets less than 2 inches of rain per year."*

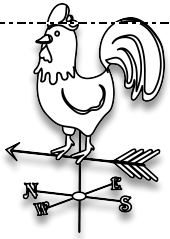
- a. It provides supporting detail to the central idea that weather is a short term phenomenon and climate is long term.
- b. It provides the central idea of the text.
- c. It provides a claim that climate change is dangerous to the Earth.
- d. It provides evidence to support the theme of the text that weather can be frightening and climate is not.

9. Reread paragraph one. Based on the text, what do you think the word "interchangeable" means?

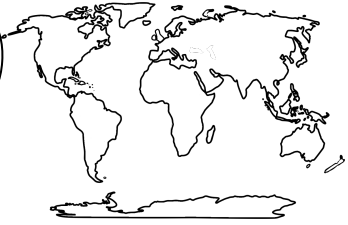
- a. Able to be switched.
- b. To flip backwards and forwards.
- c. To change positions over time.
- d. Rain, sleet, snow, and hail.

10. Reread paragraph 4. Based on the text, what do you think the word "drought" means?

- a. Extremely wet conditions
- b. Extremely dry conditions
- c. Extremely sandy conditions
- d. Extremely windy conditions



# WEATHER vs CLIMATE

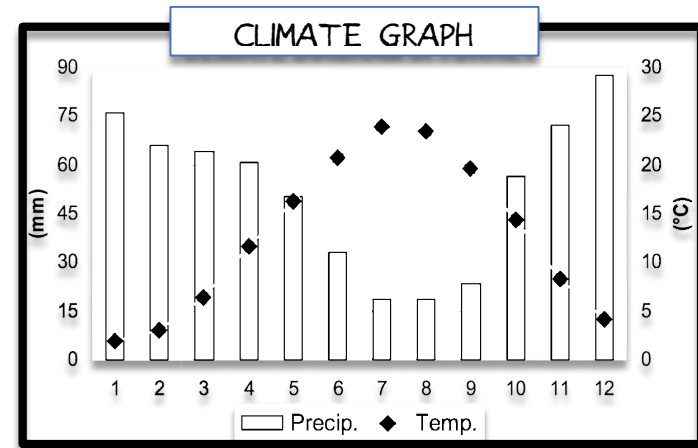
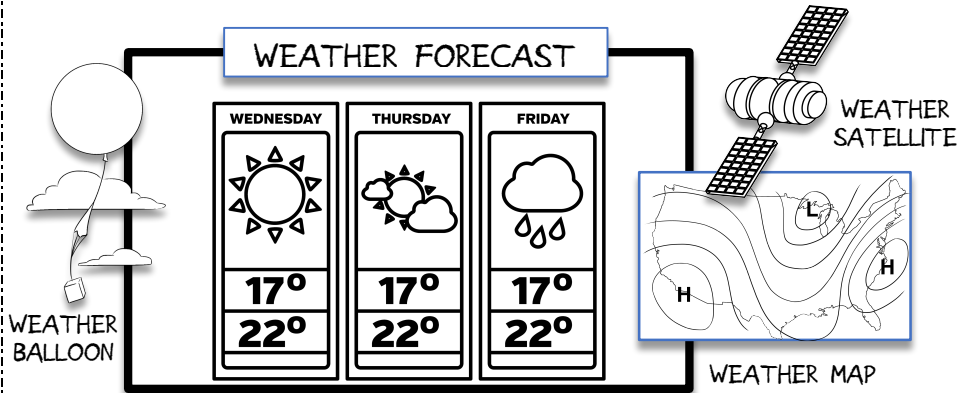


WHAT YOU GET

WHAT YOU EXPECT

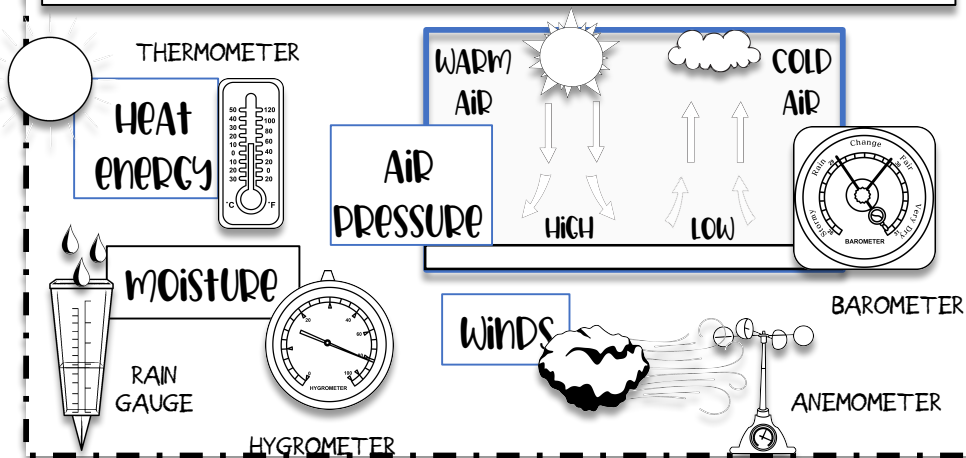
-the conditions of the atmosphere at a particular time and place

-the general weather of an area over a long period of time, (average weather) and includes seasonal changes in weather

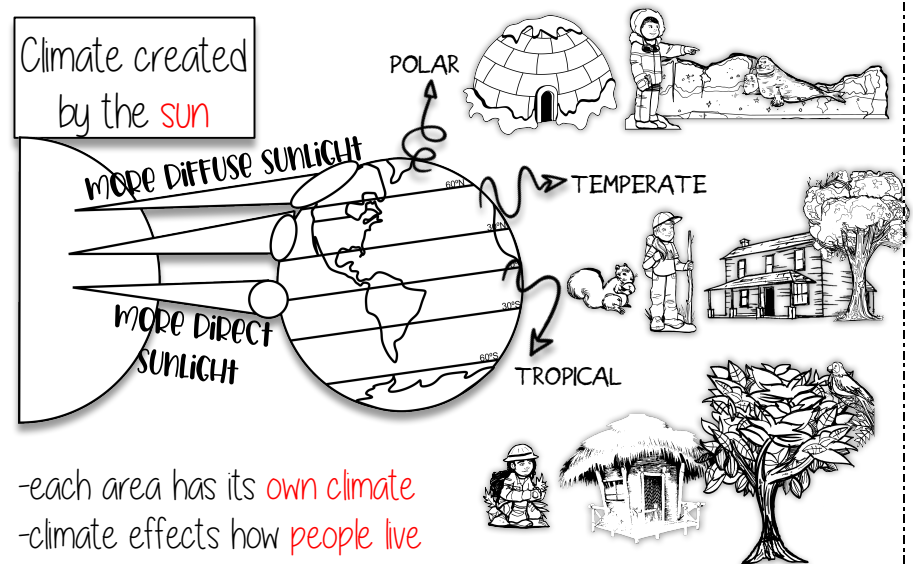


Changes in these factors determine the kind of weather you experience. Can change within minutes or hours.

The weather of an area is due to four atmospheric factors:

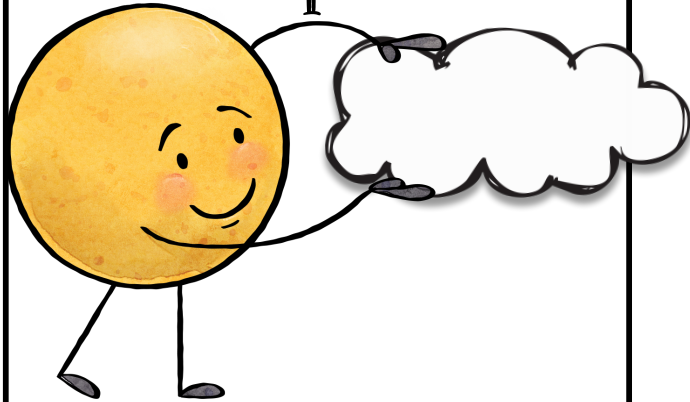


Climate created by the sun



-each area has its own climate  
-climate effects how people live  
-plants and animals live in areas with very specific climate conditions

# Understanding Checkpoint ✓



## Weather vs Climate

Name \_\_\_\_\_

Date \_\_\_\_\_

Period \_\_\_\_\_

1. Climate covers a smaller / larger area than weather. **CIRCLE ONE**
2. The average weather conditions of a region is
  - a. daily temperature.
  - b. weather.
  - c. climate.
  - d. the forecast.
3. Two factors that determine climate are
  - a. precipitation and temperature.
  - b. precipitation and air pressure.
  - c. hurricanes and tornadoes.
  - d. winds and humidity.
4. The condition of Earth's atmosphere at a particular time and place is
  - a. climate.
  - b. weather.
  - c. humidity.
  - d. temperature.

5. A barometer is used to measure
  - a. air pressure.
  - b. humidity.
  - c. precipitation.
  - d. wind speed.
6. The 3 major climate zones are:
  - a. rainforest, polar, and oceanic.
  - b. land, sea, and sky.
  - c. temperate, tropical, and polar.
  - d. north, south, and east.
7. Which type of weather most likely occurs in a high-pressure area?
  - a. clear
  - b. foggy
  - c. rainy
  - d. snowy

Label each of the following as:

W = weather

C = climate

- \_\_\_\_\_ 8. It is raining.
- \_\_\_\_\_ 9. There is a hurricane affecting the Gulf Coast.
- \_\_\_\_\_ 10. In winter, I need to always wear a warm jacket.
- \_\_\_\_\_ 11. It snowed 6 inches last night.
- \_\_\_\_\_ 12. Typically, rainfall in May will be under 1 inch.

# Weather vs. Climate Sorting Activity

**Remember:**

- *Weather* is a description of the atmospheric conditions (sun, rain, snow, temperature, wind, humidity, air pressure) in a specific location or at a specific time.
- *Climate* is a description of the prevailing (most common) weather conditions found in a place over a long period of time or that happen in a larger region.

<b>Climate</b>	<b>Weather</b>

**Directions:** Cut off the bottom of this page. Cut out the statement cards below. Finally, decide whether each statement is about *climate* or *weather* and place it in the correct category above.



<p><b>Today's high temperature was 98° Fahrenheit.</b></p>	<p><b>The spring season is wetter in Oregon than it is in Utah.</b></p>	<p><b>The forecast called for rain today, but sun tomorrow.</b></p>
<p><b>Average annual rainfall in San Antonio is 31.96 inches.</b></p>	<p><b>If it is sunny on Saturday, I will go to the park.</b></p>	<p><b>Three years ago we had snow on Christmas Day.</b></p>
<p><b>Friday's baseball game was canceled due to rain.</b></p>	<p><b>The Antarctic region is dryer than the Arctic region.</b></p>	<p><b>Thunderstorms dropped 6" of rain on Boston this week.</b></p>
<p><b>Michigan averages 150-250 inches of snow per year.</b></p>	<p><b>People move to California, because it never gets too hot.</b></p>	<p><b>The desert Southwest is generally hot and dry.</b></p>

## Introduction

- Climates are different all over the world.
- Climates are classified by how much precipitation they receive and their average temperatures.
- There are six main climate regions: tropical rainy, dry, temperate marine, temperate continental, polar, and highlands.
- There are also sub-climates within the main categories.
- These sub-climates help blend each climate region gradually into the next one.

## Tropical Rainy Climates

- There are two types of rainy climates: tropical wet and tropical wet-and-dry.
- Tropical wet areas are found in low areas near the equator.
- Tropical wet-and-dry areas are found in higher altitudes, but still close to the equator.



## Tropical Wet

- Tropical wet climates will have many rainy days with afternoon thunderstorms.
- The thunderstorms are caused when the region heats up from the sun's energy.
- With this heat and rainfall large vegetation grows and makes up what we know as a rain forest.
- These rain forests hold over half of the world's species of plants and animals.



## Tropical Wet-and-Dry

- Tropical wet-and-dry climates receive a little less rain than tropical wet climates.
- These areas have a dry season and a rainy season while tropical wet regions do not.
- Instead of rain forests there are vast areas of grassland with a few clumps of trees dotted throughout.
- These areas are known as savannas.



## Dry Climates

- A climate is deemed dry if the amount of precipitation that falls is less than the water that evaporates.
- Dry regions are often found inland, far away from any large sources of water.
- Most humid air masses would lose their water vapor before reaching the area.
- There are two major types of dry climates: arid and semi-arid.

## Arid Climates

- A hot, sandy desert is what you typically think of when you think of an arid climate.
- Deserts can also be rocky and cold.
- An area is a desert if it receives less than 25 centimeters of rain a year. That is less than a foot.
- Only special species and plants that have adapted to the deserts can survive in them.



## Semi-Arid Climates

- Semi-arid regions are found on the edges of deserts.
- These regions are known as steppes.
- A steppe is still dry, but it gets enough rainfall for small vegetation to grow.
- In the United States the Great Plains are considered a semi-arid climate.



## Temperate Marine Climates

- Temperate marine climates fall along the coast in temperate regions.
- There are three kinds of temperate marine climates: marine west coast, humid subtropical, and Mediterranean.
- All of these sub-climates all have humid and mild winters with little to no snowfall.



## Marine West Coast

- The coldest temperate marine climate can be found in the marine west coast zone.
- This zone can only be found on the west coasts of continents above 40 degrees north latitude and below 40 degrees south latitude.
- These regions have very humid and rainy winters, and the summer can vary between very wet and dry.
- The heavier precipitation can product forest of thick and tall trees. The redwood forests in Washington and Oregon thrive in this climate.



## Mediterranean

- The Mediterranean sub-climate is dryer than the west coast marine environment.
- The name of this sub-climate comes from the fact that most of this zone is found only near the Mediterranean Sea with a few places along the middle of California.
- The climate has two types of vegetation: one has dense shrubs and small trees, another has grasses with a few large trees.
- California's Napa Valley is part of a Mediterranean climate.

A black and white photograph of an orange tree with several ripe oranges hanging from the branches. The background is slightly blurred, showing more of the tree and some sky.

## Humid Subtropical

- The humid subtropical climates are the warmest of the temperate marine climates.
- This climate is wet and warm, but not as constant as the wet tropical climate.
- The summers are hot and there are large amounts of rainfall in the winter.
- Oranges, peaches, peanuts, and sugar cane are grown in humid subtropical climates.

A black and white photograph of a dirt path leading through a wooded area. The path is in the foreground, and the trees and foliage are in the background, creating a sense of depth.

## Temperate Continental Climates

- Continental climates are not influenced very much by oceans or large bodies of water.
- This means that these climates can have extreme temperatures such as scorching hot summers and bitter cold winters.
- Temperate continental climates are only found in the Northern Hemisphere above 40 degrees latitude North.
- Continents in the southern hemisphere are not far enough away from an ocean to create temperate continental climate.



## Humid Continental

- Tropical and polar air masses constantly make changes to humid continental climates.
- In the winter polar air masses can bring weather that is below zero while in the summer the temperatures can be above 100 degrees Fahrenheit.
- Moderate amounts of precipitation occur in the spring and summer while less occur in the fall and winter.



## Subarctic

- North of the humid continental climates you will find the subarctic climate.
- Summers are short and winters are very long with very low temperatures.
- Only trees like spruce, fir, and pines can survive in this climate.
- Large animals such as moose, deer, and bear thrive in this environment.

## Polar Climates



- Polar climates are the coldest climate region.
- The two sub-climates that make up this region are the ice cap and tundra climates.
- The air is so cold in the polar regions that it cannot hold large amounts of moisture.
- Very little precipitation falls in this zone.

## Ice Cap



- Ice cap climates are found mainly in Antarctica and on the northern part of Greenland.
- Average temperatures are always at or below freezing.
- Snow and ice cover the zone year round.
- Very few plants and animals can survive in this climate.

## Tundra

- Tundra climate runs across Russia, Alaska, and Northern Canada.
- Some layers of the tundra are always frozen due to the constant cold and the permanently frozen soil is known as permafrost.
- Trees cannot grow on the tundra due to the lack of precipitation and low temperatures.
- Despite the low temperatures the summers can be full of life with insects hatching, flowers blooming, and birds raising their young.

## Highlands

- Why are the highlands considered a different category?
- Temperature falls as you increase in altitude and large areas above sea level can produce completely different climates than those found a few miles away.
- Precipitation also increases with higher altitudes as air masses are pushed upward into cooler air.
- For instance, even though the Himalayas are closer to the equator than the state of Florida their altitude makes the climate completely different.

## Conclusion

- Earth is made up of many different climates including tropical rainy, dry, temperate marine, temperate continental, polar, and highlands.
- Tropical rainy climates are very wet and hot and are made up of rainforests and thick savannas.
- Dry climates have higher evaporation rates than precipitation.
- Temperate marine climates have mild summers and winters.
- Temperate continental climates have extreme temperatures.
- Polar regions are covered in ice and snow nearly year round.
- Highland zones can be close to the equator, but the altitude changes their entire climate.



NAME:

DATE:

# Climate Zones



## Worksheet

1. Which of the six main climate regions do you live in?
2. These \_\_\_\_\_ help blend each climate region gradually into the next one.
3. Tropical wet climates will have many rainy days with afternoon \_\_\_\_\_.
4. Why do tropical wet-and-dry climates have savannas instead of rain forests?
5. Deserts can also be rocky and \_\_\_\_\_.
6. A \_\_\_\_\_ is still dry, but it gets enough rainfall for small vegetation to grow.
7. What kinds of forest can survive in the marine west coast climate?
8. The Mediterranean sub-climate is \_\_\_\_\_ than the west coast marine environment.
9. What are two kinds of crops you can grow in the humid subtropical climate?
10. Why is there very little precipitation in the polar climates?



NAME:

DATE:

11. Why are the Himalayas colder than Mexico if they are found in similar latitudes?

## Climate Zones

### The Big Debate!

For this exercise you will work with either a partner or a small group. In your group you are going to decide which climate zone you and your friend would want to live in. You may pick either one of the main six climate zones discussed or one of the sub-climate zones. You will be given some time to research more about your climate zone. In the boxes below you will list which climate zone you choose and defend why you would wish to live there. Remember not every place is perfect so you will also be listing some not so good things about living there (example: tropical regions often have to deal with hurricanes). Your instructor will specify how many items you need for each category. At the end you will present your findings.

**My Climate:** \_\_\_\_\_

**Pros:**

**Cons:**