

Weather, Climate, and Adaptations

How do we survive?



Name: _____

Before you start...

What do you already know about weather, climate, and adaptations?

1. What is the difference between weather and climate?

2. What are two examples of biomes?

1. _____ 2. _____

3. What is one adaptation that a plant might have in the desert?

4. What happens to plants when the climate changes?

5. What are three words you would use to describe a Botanical Garden?

1. _____ 2. _____ 3. _____

Weather and Climate

What is the difference between **weather** and **climate**?

Each color of m&m means a different thing.

Color of m&m	Red	Orange	Yellow	Green	Blue	Light Brown	Dark Brown
Weather	Partly cloudy, 50° F	Cloudy 55° F	Sunny 65° F	Rainy 50° F	Snow 30° F	Sleet 40° F	Hail 45° F

You are going to start by finding the weather for March 1st for 30 years. Draw one m&m at a time and record the “weather” for that year.

Date	Weather
1-Mar-1981	
1-Mar-1982	
1-Mar-1983	
1-Mar-1984	
1-Mar-1985	
1-Mar-1986	
1-Mar-1987	
1-Mar-1988	
1-Mar-1989	
1-Mar-1990	
1-Mar-1991	
1-Mar-1992	
1-Mar-1993	
1-Mar-1994	
1-Mar-1995	

Date	Weather
1-Mar-1996	
1-Mar-1997	
1-Mar-1998	
1-Mar-1999	
1-Mar-2000	
1-Mar-2001	
1-Mar-2002	
1-Mar-2003	
1-Mar-2004	
1-Mar-2005	
1-Mar-2006	
1-Mar-2007	
1-Mar-2008	
1-Mar-2009	
1-Mar-2010	

The type of weather that was the most common was _____.

If you look at March 1st in just one year, this is weather. If you look at the average weather over 30 years, this is the climate.

What would you call the climate of your city on March 1st? (Use temperature and precipitation, for example, cold and wet.)

The climate in my city is _____

Preparing for Weather and Climate

Every day we make decisions based on weather and climate. We **adapt**, or change, what we are doing depending on our surroundings. What are some ways that you adapt to the weather or climate?

Human Adaptations: Weather

If the weather forecaster says it is going to rain, what would you wear?

I would wear _____.

If the forecaster says that it was going to be hot and sunny, what would you want to spend your day doing?

I would _____.

If you look outside and see lightning and hear thunder, would you go outside?

I would _____.

Human Adaptations: Climate

If you were going to visit a hot and humid climate, what would you pack?

I would pack _____.

When you grow up, what type of climate would you choose to live in?

I want to live in a _____ climate.

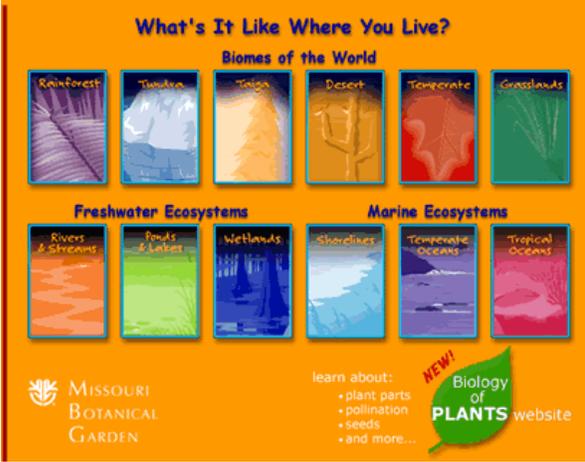
What types of plants would you grow in a dry and warm climate?

I would chose to grow _____.

Think more... How might animals be adapted to living in a specific climate?

Biomes

The climate in an area has a large impact on what grows in that region. Across the globe there are regions that have similar climates. These are called **biomes**. Biomes are areas that have similar plants, geographic locations, climate, and adaptations of organisms. Five of the primary biomes are, Aquatic, Deserts, Forests, Grasslands, and Tundra.

<p>Aquatic – Water covers 75% of the Earth’s surface. There are two types of aquatic biomes, freshwater and saltwater. Freshwater fills rivers, lakes, ponds, and other inland areas. Saltwater fills our oceans, seas, and some inland lakes. Animals adapt to living in aquatic environments by being able to move through and sometimes breathe in water.</p>	<p>Desert – Deserts are areas that receive less than 10 inches of precipitation each year. Deserts can be hot or cold. A cold desert, like Antarctica, receives a small amount of snow each year. Hot deserts, such as the Sahara, occur in areas near the equator. Life in deserts is adapted to needing little water.</p>
<p>Forest – Forests cover about one third of the Earth’s land. Forests support a large variety of animal life. There are three types of forests, tropical forests, temperate forests, and boreal forests. Tropical forests are near the equator and receive a large amount of precipitation. Temperate forests grow in the United States, Asia, and Europe. They are filled with deciduous and evergreen trees. Boreal forests grow close to the arctic circle. They get little precipitation.</p>	<p>Grassland – Grasslands are primarily covered in grasses. Over half of the continent of Africa is covered in a tropical grassland, or savannah. Tropical grasslands are near the equator and have wet and dry seasons. The other type of grassland is called a temperate grassland. The temperature in a temperate grassland is cold in the winter and warm during the summer. Santa Fe is on the edge of a temperate grassland and a forest.</p>
<p>Tundra – The tundra biome is a cold region. The plants that grow in a tundra are small shrubs and grasses. These can live through cold winters and cool summers. The tundra is found in two places. The first is at the top of tall mountains, above tree line. This area is called alpine tundra. If you look at the Sangre de Cristo Mountains you can see bare mountaintops without trees. This is the alpine tundra. Tundra is also found north of the arctic circle. This is called the arctic tundra.</p>	

Biomes and Adaptations

Plants and animals are **adapted** to live in different **biomes**. These adaptations allow plants and animals to survive in different **climates**. There are many types of adaptations. Some adaptations allow plants to use little water in a desert. Other adaptations allow animals to breathe under water. Each biome has a different population of plants and animals. The plants and animals that do well, survive to reproduce. When a plant or animal passes down an adaptation to its seedlings or babies, it is called an **inherited trait**. A trait you inherited is the color of your hair or the shape of your thumb.



Draw and label organisms with adaptations you think they might have in these biomes.

An animal in the Arctic tundra	A plant in a hot desert
A plant in a the temperate forest	An animal in a rainforest or tropical forest
An animal in the savannah or tropical grassland	A plant in the alpine tundra

Plant Adaptations Experiment

Plants are often adapted to live in a specific area with certain conditions.

Question: In which type of earth are radishes adapted to live, sand or soil?

Hypothesis: I think that radishes will prefer growing in _____.

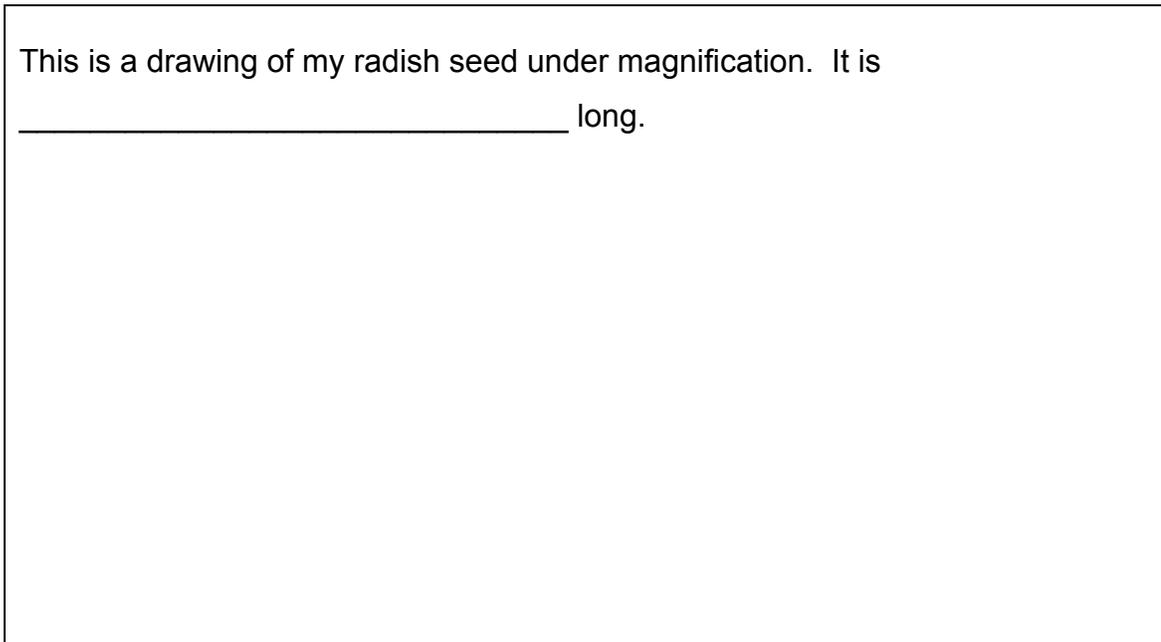
Materials:

- 2 small pots or yogurt cups
- Sand, from playground or arroyo
- Potting soil
- 6 radish seeds
- Water
- Ruler
- Microscope or magnifying glass

Procedure:

1. Measure and draw the radish seeds in the space below

This is a drawing of my radish seed under magnification. It is _____ long.



2. Fill one container almost to the top with soil
3. Fill one container almost to the top with sand
4. Place the cups in a low dish and water each pot until wet
5. Plant three seeds about 1 centimeter deep in each pot
6. Place the plants in a sunny area and continue to water the plants from below
7. Record what happens in the chart

Results:

Radish seeds in Sand

Date	Height of plant	What you see
Day 1		
Day 5		
Day ____		

Radish seeds in Soil

Date	Height of plant	What you see
Day 1		
Day 5		
Day ____		

Conclusion: Which soil did the radishes prefer? Why do you say that?

What type of climate do you think that radishes would best adapted to live in, arctic, temperate grasslands, or deserts? Why do you say that?

What do you think would happen if the climate that the radishes grew in changed? Why do you say that?

Botanical Garden Plant Research

You are going to be the expert. This research will help you give a tour of the Santa Fe Botanical Garden to your classmates. We look forward to learning from you!

The name of the plant I am researching is the _____

The Latin name is _____

This plant is from _____

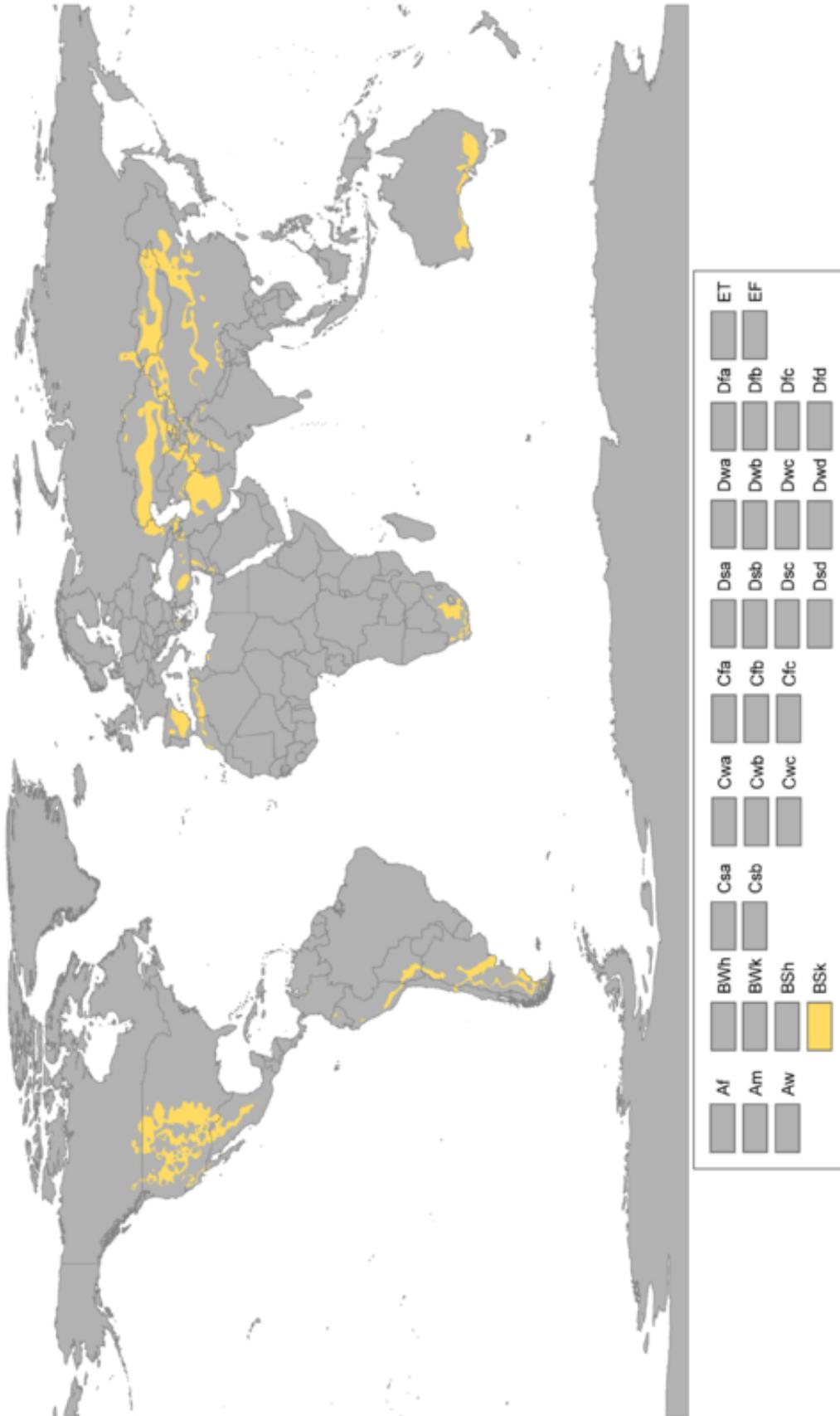
This plant is from the _____ family.

The plant likes a _____ climate.

One adaptation this plant developed is _____

I found this plant interesting because _____

Where is your plant from?



**Learning at the Botanical Garden
Field Drawing**

Find your plant in the garden.

When you do a field drawing or study, always include:

Date: _____

Time of day: _____

Weather: _____

Use sight, smell, touch, and hearing to describe what you notice. (Just no tasting!):

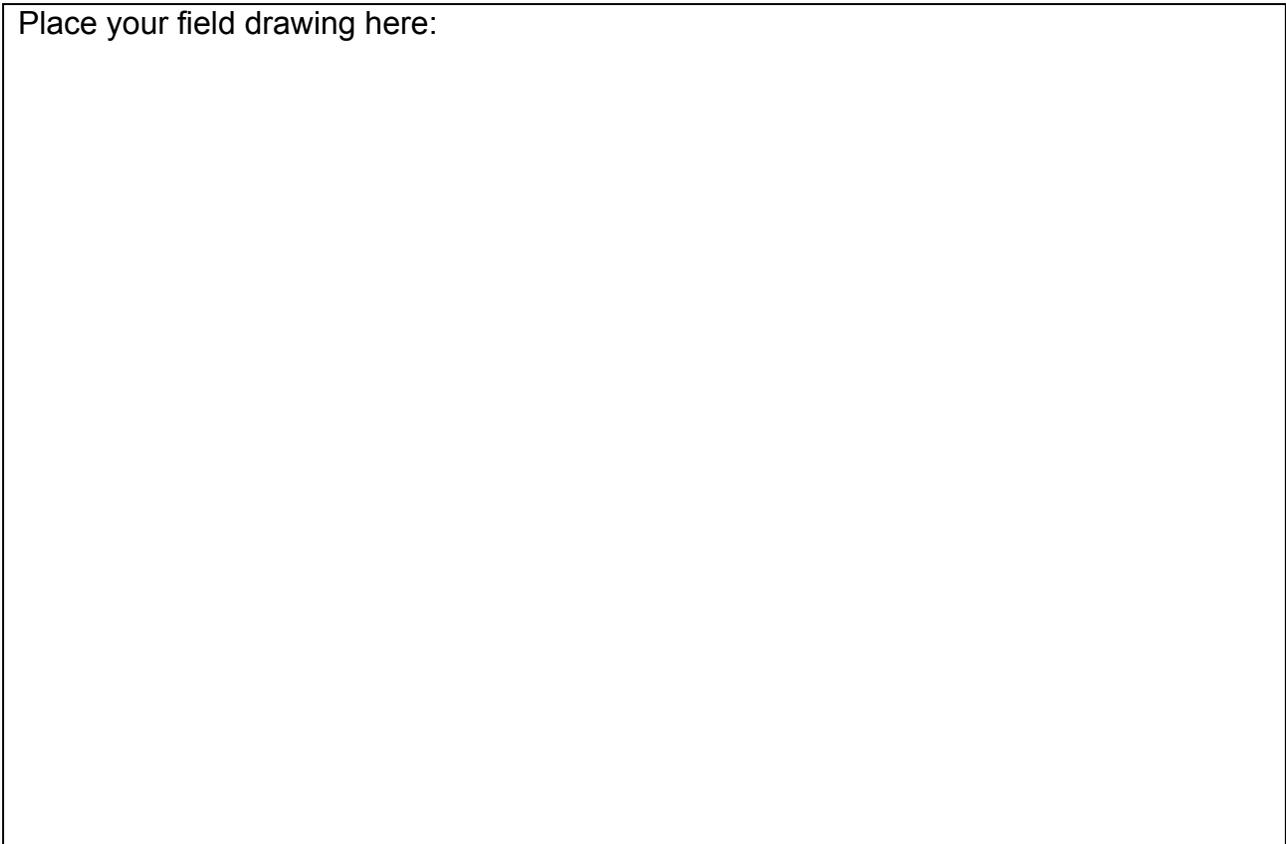
I see: _____

I smell: _____

I feel: _____

I hear: _____

Place your field drawing here:



**Learning at the Botanical Garden...
Piñon Pine Study**

How would we know if the climate were changing?

What happens to plants and animals if you change their climate?

Look at this tree. What do you see?

What do you think happened to this tree? Why do you say that? What evidence is there to support your hypothesis?

It has been hotter and drier than normal for the past several years. What impact might this have on piñon pines? What would happen if it continues to be hot and dry?

Online... Share what you noticed!

THIS PAGE WILL HAVE INSTRUCTIONS ON HOW TO POST BOTANICAL
DRAWINGS AND FIELD NOTES ON OUR WIKISITE.
WILL BE DONE SOON!

Changing the Climate Experiment

What happens to plants and animals if you have a sudden climate change?

How could you test this?

Test: Use the radish plants your class grew in soil to test the impact of climate change. One part of a changing climate is receiving a different amount of precipitation.

Question: How would changing the precipitation impact radish plants?

Hypothesis: I think that the radish will _____

Procedure:

1. Split the radish plants into three groups
2. One third: Stop watering them
3. One third: Place in a deep dish of water and keep the dish filled, flooding the roots and bottoms of the leaves
4. One third: Continue to water as usual
5. Record your results in the chart

Results: How did changing the conditions impact your plants?

Radish plants – No water

Date	What you see
Day 1	
Day 3	
Day ____	

Radish plants – Soaking in water

Date	What you see
Day 1	
Day 3	
Day ____	

Radish plants – Same amount of water

Date	What you see
Day 1	
Day 3	
Day ____	

Conclusion:

What is the impact of changing the amount of precipitation on plants? What happened to the radishes?

What do you think would happen to plants in nature if the amount of precipitation changed?

What do you know about weather, climate, and adaptations now?

1. What is the difference between weather and climate?

2. What are two examples of biomes?

1. _____ 2. _____

3. What is one adaptation that a plant might have in the desert?

4. What happens to plants when the climate changes?

5. What are three words you would use to describe a Botanical Garden?

1. _____ 2. _____ 3. _____

Glossary

Adapt _____

Adaptation _____

Alpine tundra _____

Aquatic _____

Arctic tundra _____

Biomes _____

Climate _____

Deciduous _____

Desert _____

Evergreen _____

Forest _____

Freshwater _____

Grassland _____

Inherited trait _____

Precipitation _____

