Sunday Academy 2014-1
Weather vs. Climate: Is there a difference?

Description:

Students will examine aspects of weather and climate, determine what the difference is and how they can measure the aspects of each.

Objectives:

- Students will compare and contrast weather and climate
- Students will build devices to measure weather data such as wind speed and air pressure
- Students will gather weather and climate data
- Students will manipulate weather conditions to see what type of weather they can create using a weather simulator

Standards covered:

9-10.1.1	Explain how models can be used to illustrate scientific principles
9-10.2.8	Analyze data found in tables, charts, and graphs to formulate conclusions
9-10.5.4	Identify the short-term and long-term effects of physical processes

Session Organization

11:00-11:30	Cultural connection and general organization
11:30-12:00	Video and quiz/group discussion
12:00-12:30	Lunch
12:30-1:15	Activity one: gather data from one city, comparing weather data to climate
1:15-1:30	Information on weather data-humidity, wind, precipitation, air pressure etc
1:30-2:15	Activity 2: Build an anemometer
2:15-2:30	Activity 3: Weather maker-simulator
2:30-3:00	Wrap up and clean up

After watching the you tube video on climate and weather, define each. List some things that affect each:

Climate:

Weather:

Climate vs. Weather Quiz-taken from discovery.com

1. What is the difference between climate and weather?
   A. There is no difference.
   B. Climate refers to weather conditions for a region over a period of time.
   C. Weather refers to climatic conditions for a region over a period of time.
   D.Climate is the location of the weather conditions at a particular time.

2. Earth is not the only planet that exhibits weather conditions. What is required for a planet to support weather systems?
   A. a surface B. a moon C. an atmosphere D. existing life

3. If it is winter in the Northern Hemisphere, what season is it in the Southern Hemisphere?
   A. spring B. summer C. fall D. winter

4. Why is it common to see snow on very high mountains in the tropics?
   A. The circulation of the air blows the cold upward.
   B. It occasionally snows in the tropics.
   C. The higher the altitude, the colder the temperature.
   D. It is colder on the shady side of the mountains.

5. How does atmospheric circulation influence climate?
   A. by producing winds that distribute heat and moisture
   B. by producing ocean currents that cause tornadoes
   C. by producing tornadoes that cause ocean currents
   D. by distributing air that causes wind

6. From what do clouds form?
   A. moisture released from wind B. air pollution
   C. water that has evaporated from the earth
   D. moisture released from rivers

7. What happens to the water vapor in the air when the air temperature cools?
   A. It evaporates. B. Water droplets form. C. It dissipates into the air.
   D. It turns into a gas.

8. Forecasters use clouds to help predict the weather. Which of the following may be a reason for this?
   A. Certain cloud types appear after storms.
   B. There is no other way to predict weather.
   C. Certain cloud types often appear before storms.
   D. Certain storms come from certain clouds.

9. What powerful storm can kill more people and destroy more property than any other natural disaster? A. thunderstorm B. earthquake C. lightning D. hurricane

10. What do scientists call the circulation of water through the Earth's crust, oceans, and atmosphere? A. condensation B. evaporation C. the water cycle D. precipitation

List the following terms as either related Climate or Weather

_____1. The forecast on the local news

_____2. Its windy but sunny outside

_____3. It snows in North Dakota in January and February

_____4. Summers in Missouri are hot and humid

_____5. It's raining

_____6. We had 6 inches of snow yesterday

_____7. The average temperature for September in Fargo is 67 degrees F.

_____8. North Africa is a desert.

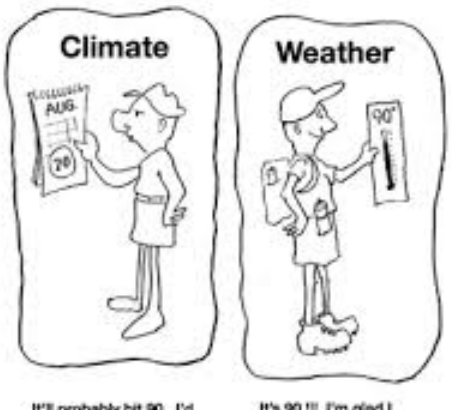
_____9. The highest temperature ever recorded at this town was 43 Cº

_____10. It's partly cloudy

Collecting Temperature data

1. Go to the website http://www.weather.com
2. Type in a city name or zip code
3. Select hourly temp, record the temperatures for one day (use the next 18 hours at the bottom of the page to get all 24 hours)
4. Record this information in the table
5. Select monthly from the left hand side of the page
6. At the bottom of the calendar, select averages and then daily averages from the drop-down menu at the top.
7. Select a month
8. Write down the "average high", average low, and mean temperatures

Results table:



Weather Data-hourly temperatures			**Climate Data-average high, low and mean**		
Date	time	Temperature	Average high temperature	Average low temperature	Mean temperature

Questions:

1. If a scientist reported that your state was warmer last month than the month a year ago, would you consider this to be evidence for climate change? Why or why not?

2. If every summer for the past decade has been hotter than usual, could this be a sign of climate change? Explain your answer

Weather indicators

What are things beside temperature would you consider to be part of weather?

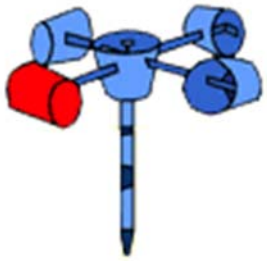
Activity 2-building an anemometer (Taken from scholastic news)

Anemometer

Meteorologists use anemometers to measure wind speed in one area. With this data, they can determine how quickly a storm, or weather system, will travel to other areas.

Build Your Own Weather Tool!
Use the materials and follow the directions below.

Materials



• Five 3-ounce paper cups
• Hole punch
• One straight pin
• Pencil (with eraser)
• Scissors
• Stapler
• Two straight plastic straws
• Watch with a second hand

Directions

1. Punch one hole in each of four paper cups, about ½" below the rim. Color the outside of one of the cups.
2. In the fifth cup, punch four evenly spaced holes about ¼ " below the rim.
3. Push a straw through the hole of the colored cup. Fold down the tip of the straw inside the cup, and staple it to the cup on the side opposite the hole.
4. Push the straw through two opposite holes in the four-hole cup. Attach another cup to the opposite end of the straw. Make sure that the second cup faces the opposite direction from the first cup.
5. Repeat the above step with the other two cups and straw.
6. Position the four cups so that they face the same direction — clockwise or counterclockwise. Make sure the cups are all the same distance from the center.
7. Poke a hole in the bottom of the center cup. Push the eraser end of the pencil through the hole.
8. Push the pin through the intersection of the two straws. Then push it into the eraser as far as possible.

Experiment!

1. With a friend, take the anemometer outside to an open area where the wind is blowing.
2. While one of you times exactly one minute on the watch, the other counts how many times the colored cup goes by in one minute. This is the number of revolutions per minute (RPM).
3. Convert your answer for RPM to miles per hour (MPH) using this formula:
   RPM X 0.2142 = MPH

Activity 3-Weather simulator

1. Go to the following website:
   http://teacher.scholastic.com/activities/wwatch/investigate/weather_maker.htm
2. Explore the weather maker by moving the sliders up and down.

List the factors that cause:

Rain:

Snow:

Overcast:

Most serious storm possible:

List any other weather you created: