

Activity #10: What is Weather?

Did You Know?

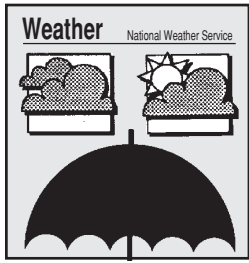
Sayings and rhymes help us to remember signs of change in the weather. "Red sky at night is a shepherd's delight," means that the weather is likely to be fine after a red sunset. "Red sky at morn, sailor take warn," means that a red sunrise is a sign of bad weather.

Meteorology, or the study of weather, began as far back as 340 B.C., when Aristotle began studying such phenomena as clouds, rain, snow, wind, hail, thunder, and hurricanes. In the 1600s more sophisticated observations of weather began with the invention of simple weather instruments, such as the barometer. Today, our observation and prediction of weather and climate is aided by computers and satellites. Observing and forecasting weather is important to many people. To do their jobs, farmers, pilots, and fishermen must consult weather forecasts every day. Many recreational activities also depend on weather forecasting. Weather includes temperature, clouds and sky conditions, precipitation, wind, and storms.

1. Search through today's newspaper and your collection of older newspapers for weather-related pictures. Begin a weather photo clipping file. Using the newspaper pictures, design a weather bulletin board for your classroom.
2. Select your favorite newspaper weather picture from those on the weather bulletin board and compose a weather poem (or essay) about the picture.

MY WEATHER POEM

Extension Activity: Environmental tapes and compact disks are available in most record stores. These recordings include the sounds of weather phenomena such as thunderstorms, blizzards, rain, and wind. First, see if you can find these items advertised in your daily newspaper. Then purchase one or more of the tapes (CDs) from the store with the best price. Next, play the recordings in your classroom. As you are listening, write descriptive paragraphs or short stories about the different kinds of weather.



Activity #11: Temperature

Did You Know?

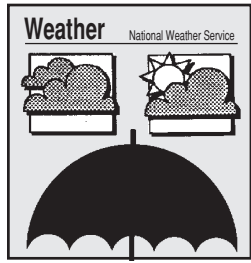
In the evening when crickets are in the cool grass, count the number of chirps they make in 14 seconds. Then add 40. That will be the exact temperature (°F) in their location. (The temperature may be slightly different where you are standing.)

Temperature is a measure of the average speed of the random motions of air molecules. The faster the molecules move, the higher the temperature. Temperature is determined by many factors, especially sunlight and wind. Latitude, altitude, and oceans also have an effect on temperature. Temperature variations are caused by other factors too. Some of these factors are shade, surfaces, colors, and reflections. Different surfaces reflect different amounts of the sun’s heat. Forests reflect about 7% of the sun’s radiation, while snow and ice reflect most of it, keeping temperatures very low. Sandy deserts reflect only about 25% of the sun’s radiation, so daytime temperatures are extremely high as most of the sun’s heat is absorbed.

1. If you look in your daily newspaper on the weather page, you will find the exact high and low temperatures for yesterday. You will also find temperature projections for today or tomorrow (depending on whether your newspaper is a morning or evening newspaper).
2. How accurate is your local newspaper at temperature projections? Look in the newspaper each day and record the projections (today’s or tomorrow’s). Then, record the actual temperatures the very next day when they are reported. Next, figure the newspaper’s percentage of accuracy. (Divide the smaller number--projected or actual, by the larger number. Do this for the high and the low.) Finally, figure an average percentage of accuracy. (Add the percentages for all seven days and divide the sum by 7 to find the average.)

WEEK DAY	PROJECTED		ACTUAL		PERCENTAGE OF ACCURACY	
	HIGH	LOW	HIGH	LOW	HIGH	LOW
SUNDAY						
MONDAY						
TUESDAY						
WEDNESDAY						
THURSDAY						
FRIDAY						
SATURDAY						

Extension Activity: Put a thermometer in a coffee can that is painted white (or covered with newspaper), and put another thermometer in a coffee can that is painted black (or covered with black paper). Put both out in the sun. Check the temperatures every five minutes and record them. (The thermometer in the black can will be warmer because black absorbs light and white reflects it. A black surface absorbs more heat during the day and gives off more heat at night than does a white surface.)



Activity #12: Fahrenheit & Celsius

Did You Know?

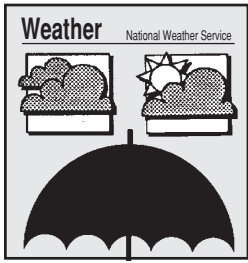
At Dallol, Ethiopia the mean (average) shade temperature over a year is 94°F (34.4°C), making it the hottest place in the world. The coldest place in the world is Vostok in Antarctica where the mean temperature over a year is a freezing -72°F (-57.8°C).

We measure temperature with instruments called thermometers. Liquid mercury or alcohol inside a thermometer rises up a thin tube when it warms up, and sinks as it cools. The first thermometer was invented by the Italian physicist Galileo. In the mid-17th century, scientists at the Academy of Experiments in Italy developed a range of instruments to make the first planned observations of the weather. One early glass thermometer measured temperature by the rise and fall of colored balls suspended in water. Simple mercury thermometers remain much the same today as they were hundreds of years ago. A German physicist, named Gabriel D. Fahrenheit, devised the first commonly used temperature scale in 1714. Almost thirty years later Anders Celsius, a Swedish astronomer, established the centigrade or Celsius scale. Both measurement scales are still in use today.

1. Some newspapers list city temperatures in both Fahrenheit and Celsius. Most U.S. newspapers, however, give temperature listings in Fahrenheit only. Turn to the weather page in your daily newspaper. Find the national and international city listings for temperature. How are they listed?
2. Using today's newspaper, find the high and low temperature for each of the following cities. Then convert each to Celsius. (To convert from F to C: subtract 32 degrees, multiply by 5, then divide the result by 9. To convert from C to F: multiply by 9, divide the result by 5, then add 32 degrees.)

CITY NAME	CONTINENT	FAHRENHEIT TEMPERATURE		CELSIUS TEMPERATURE	
		HIGH	LOW	HIGH	LOW
Philadelphia					
Denver					
Los Angeles					
Miami					
Houston					
Minneapolis					
Seattle					
Paris					
Auckland					
Tokyo					
Cairo					
Sao Paulo					

Extension Activity: Can you read a maximum-minimum thermometer giving the daily high, low, and current temperatures? Practice by reading temperatures for one week. Record your data on a chart: M-F (High, Low, Current, and Time of the Reading). Check your data against the daily newspaper's temperature information for your city. Does your data differ? Speculate why there may be a variation.



Activity #13: Water Vapor in the Air

Did You Know?

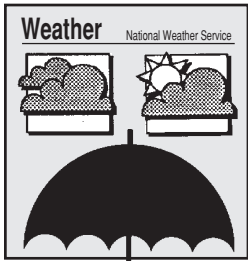
It is more efficient to water your lawn in the evening than in the afternoon. On a warm day, up to 50 percent of the water is lost to evaporation when the sun is shining overhead.

Humidity is the amount of water vapor in the air. Water becomes vapor through evaporation. Evaporation is caused by heat and wind. Water vapor becomes liquid again through condensation. Condensation is caused by cooling. Condensation occurs when air reaches its saturation point. The saturation point depends on the temperature; warm air can hold more water vapor than cold air. The temperature at which water vapor will condense is called the dew point. Water vapor that condenses on objects is visible as dew or frost. Water vapor that condenses in the air near the ground is fog. Fog forms when the air is much cooler near the ground, because the water vapor does not have to rise very far before it condenses. At higher altitudes water vapor condenses to become clouds.

1. Fog is made when water vapor condenses around specks of dust or smoke, thus creating a cloud-like appearance near the ground. Foggy conditions lower visibility and can make driving a car very difficult. Begin a newspaper clipping file of weather-related automobile accident information.
2. After several weeks of gathering articles, sort your newspaper clippings into different weather condition categories. List and summarize your information below. How many automobile accidents occurred during foggy weather?

FOG	RAIN	HAIL	ICE	SNOW	OTHER

Extension Activity: Conduct your own simple experiment to show evaporation and condensation. Carry a large metal or plastic mixing bowl outside and place it in the sun. Pour water into the bowl until it is about one-fourth full. Gently place an empty coffee mug in the center of the bowl. Be careful not to splash any water into the mug. Cover the top of the bowl with clear plastic wrap. Make sure the inside of the bowl is completely airtight. Let the bowl sit in the sun while you watch what happens. (Heat from the sun will cause the water in the bowl to evaporate. This water will rise as vapor and condense on the plastic wrap, clouding it. As more and more water vapor condenses on the plastic wrap, it will form droplets. These droplets will fall as "rain" back into the bowl and into the mug. The water in the mug will give you a rainfall measurement.)



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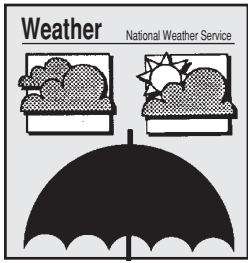
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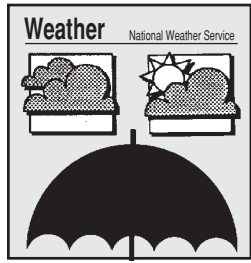
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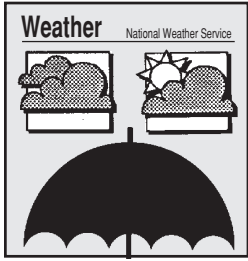
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