

## Assignment Discovery Online Curriculum

**Lesson title:**

Weather Maps

**Grade level:**

4-6

**Subject area:**

Earth Science

**Duration:**

Two class periods

**Objectives:**

Students will do the following:

- Understand basic information about weather
- Learn about different types of weather maps
- Create and present national weather maps showing different conditions

**Materials:**

- Internet access
- Print resources about weather
- Five pieces of poster board, each with an outline of the United States; markers; stickers; scissors

**Procedures:**

1. Begin the lesson by writing the following questions on the board:

- What are some examples of weather?
- Where does weather come from?
- Where does weather happen?
- How does weather happen?
- Is weather always the same?

As students answer the questions, write their ideas on the board.

2. As a class, come up with a definition for weather. One definition for weather is the following: The state of the atmosphere at a given time in a particular place. (If students aren't familiar with the term *atmosphere*, it can be defined as the layer of air that surrounds Earth.) Then have students brainstorm elements that make up weather. You might ask what makes one day's weather different from the next, for example:

- Temperature
- Precipitation (rainfall, snowfall)
- Wind speed
- Humidity

- Cloud cover

3. Explain that meteorologists, or scientists who predict and report the weather, use different types of maps to show the elements of weather. In this lesson, students will work in groups to look at one type of weather map, focus on one aspect of weather, research facts about that aspect, and present their map to the class.

4. Write the following types of maps on the board:

- Satellite
- Radar
- Precipitation
- Temperature
- Wind speed
- Front

Divide the class into six groups and assign each one a different type of map. Provide the links and questions below for each group. In addition, give each group one poster board with an outline of the United States. Tell each group to use the map as a base to draw its assigned type of map for today's weather. Remind them to include a map key. Each group should also create a presentation that answers the questions below.

### **Satellite maps**

MAP: <<http://www.usatoday.com/weather/satpic/wsatusa.htm>>

BACKGROUND: <<http://www.usatoday.com/weather/wsatwork.htm>>

- What do satellite images show? Why is this information important?
- How do we get satellite images? How do satellites travel?
- What can meteorologists learn by the shade of the clouds on a satellite image?

### **Radar maps**

MAP: <[http://www.cnn.com/WEATHER/NAmerica/radar\\_image.html](http://www.cnn.com/WEATHER/NAmerica/radar_image.html)>

BACKGROUND: <<http://www.usatoday.com/weather/wearadar.htm>>

- What does radar show?
- How do you use the map key on a radar map?
- How do we get radar images?
- What are some of the limitations of radar maps?

### **Precipitation maps**

MAP: <<http://www.usatoday.com/weather/wrain.htm>>

BACKGROUND: <[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/cld/prcp/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/cld/prcp/home.rxml)>

<<http://www.usatoday.com/weather/wds8.htm>>

- What is precipitation?
- What are some examples of precipitation?
- Define the different types of precipitation on the map.
- What causes different types of precipitation?

### **Temperature maps**

MAPS: <[http://www.cnn.com/WEATHER/NAmerica/region\\_map.html](http://www.cnn.com/WEATHER/NAmerica/region_map.html)>  
<[http://www.weather.com/maps/maptype/currentweatherusnational/uscurrenttemperatures\\_large.html](http://www.weather.com/maps/maptype/currentweatherusnational/uscurrenttemperatures_large.html)>

BACKGROUND: <<http://www.usatoday.com/weather/whattemp.htm>>

- What is temperature? (For the clearest definition, see the “Weather terms” chart in the background article.)
- What are the two most important factors in temperature?
- Why is it usually cooler at night?
- Why does temperature change during the seasons?

### **Wind-speed maps**

MAP:

<[http://www.weather.com/maps/maptype/currentweatherusnational/uscurrentwindsgusts\\_large.html](http://www.weather.com/maps/maptype/currentweatherusnational/uscurrentwindsgusts_large.html)>

BACKGROUND: <<http://www.usatoday.com/weather/wpress.htm>>

- Explain the main cause of winds.
- Why are some winds stronger than others?
- How does wind affect the weather?
- How are winds named?

### **Front maps**

MAP: <[http://www.weather.com/maps/maptype/currentweatherusnational/index\\_large.html](http://www.weather.com/maps/maptype/currentweatherusnational/index_large.html)>

BACKGROUND: <<http://www.usatoday.com/weather/fronts/wtdfrontam.htm>>

- What is a low-pressure system? What is a high-pressure system? What kind of weather does each typically bring?
- What is a cold front? What is a warm front? What types of weather does each typically bring?
- Explain how the map key shows each of the terms above.

Other helpful sites:

What is Weather?

<<http://teacher.scholastic.com/activities/wwatch/reporters/central/whatis.htm>>

Weather

<<http://www.learner.org/exhibits/weather/index.html>>

Weather Basics

<<http://www.usatoday.com/weather/basics/wworks0.htm>>

Meteorology A to Z

<<http://www.wxdude.com/topics.html>>

Glossary: National Weather Service

<<http://www.nws.mbay.net/guide.html>>

5. The next day, have the groups hang their posters on a bulletin board. Ask members of each group to give a weather report using their map. Their presentations should also answer the questions provided. Following the presentations, ask each group to compare its map with another and explain how the two are related.

### **Discussion Questions:**

1. Using the maps from the activity, choose one place in the country that had different weather from your hometown's. How do you think this weather affected kids in that area? How might their days have been different from yours? Think about what they wore, what they did for recess, and what they planned for after school.
2. Why is it helpful to use different types of weather maps? When might some maps be more helpful than others? For example, why might you be more interested in precipitation one day and wind speed the next?
3. Describe other maps you've seen in weather reports (examples: UV index, snowfall, pollen count). Why are these maps important?

### **Evaluation:**

Use the following three-point rubric to evaluate how well students conducted research, created their maps, and participated in class discussions.

**Three points:** strong research skills; developed a creative and innovative way to present information; and participated actively in class discussions.

**Two points:** on-grade-level research skills; developed competent ways to present information; and somewhat engaged in class discussions.

**One point:** weak research skills; did not complete the display; and was not engaged in class discussions.

### **Extension:**

#### **From Seattle to Sarasota**

Print out temperature, satellite, and front maps of the current national weather. (See Web sites above.) Then have students work in pairs to give a weather report for a city in a different part of the country. This information, including a local Doppler radar image, is available at *weather.com* by entering the city and state at the top of the page. Students should report on current conditions, such as temperature, humidity, and precipitation, as well as the forecast for the next five days. In addition, their reports on current weather conditions should use the Doppler radar image. Encourage students to be creative in their language and presentation. For example, think about how a dramatic change in weather, such as a sudden drop in temperature or a thunderstorm, might affect people's lives. How might that affect a meteorologist's weather report?

### **Suggested Reading:**

### ***The Handy Weather Answer Book***

Walter A. Lyons. Accord Publishing, 1997.

Everything you could possibly want to know about the weather is all here in this “handy” book! Set up in a question-and-answer format, chapters cover topics like: instruments used to measure the weather; the layers of the atmosphere; wild weather like hurricanes, thunderstorms, and tornadoes; cold weather like snow and ice; weather forecasting; and careers in meteorology. Whew! That’s a lot of information! Occasional black and white photographs accompany the text, as does an extensive list of titles for further reading.

### ***Weather Watch: Forecasting the Weather***

Jonathan D.W. Kahl. Lerner Publications Company, 1996.

Learn all about how meteorologists predict the weather.

### **Vocabulary:**

#### **air pressure**

Definition: The weight per unit of area of a column of air that reaches to the top of the atmosphere.

Context: Areas of high **air pressure**, or high-pressure systems, usually have clear skies, and areas of low **air pressure**, or low-pressure systems, usually have clouds.

#### **atmosphere**

Definition: The layer of air that surrounds Earth and is made up of nitrogen (about 78 percent), oxygen (about 21 percent), and miscellaneous gases (about 1 percent).

Context: Our weather takes place in the lower part of the **atmosphere**.

#### **front**

Definition: A narrow zone of transition between air masses that differ in temperature or humidity.

Context: Most changes in the weather occur along **fronts**.

#### **humidity**

Definition: A measure of the amount of moisture in the air in the form of invisible water vapor.

Context: **Humidity** is important for making weather forecasts, because it can help scientists predict precipitation.

#### **meteorologist**

Definition: A scientist who studies the weather.

Context: **Meteorologists** use different types of maps to report the weather.

#### **precipitation**

Definition: Moisture that falls from clouds in the form of rain, snow, sleet, or hail.

Context: Without rain or other forms of **precipitation**, the ground becomes dry, and crops cannot grow.

#### **temperature**

Definition: The measure of the heat energy of the gases in the air.

Context: Changes in **temperature** lead to changes in air pressure, bringing different kinds of weather.

**weather**

Definition: The state of the atmosphere at a given time in a particular place.

Context: The three main factors of **weather** are humidity, air pressure, and temperature.

**wind**

Definition: The movement of air, which tends to move from a high-pressure area to a low-pressure area.

Context: **Winds** are named for the direction from which they blow, so an easterly wind blows from the east.

**Academic Standards:**

This lesson adheres to the National Science Education Standards for students in grades 5-8:

Earth Science: Understanding the elements of weather.

**Credit:**

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