

Investigation Five – Severe Weather

Standard II Students will understand that the elements of weather can be observed, measure, and recorded to make predictions and determine simple weather patterns.
Objective 1 Observe, measure, and record the basic elements of weather.
Intended Learning Outcomes <ol style="list-style-type: none">1. Use science process and thinking skills2. Manifest scientific attitudes and interests3. Understand science concepts and principles4. Communicate effectively using science and language and reasoning

**Standard
II**

**Objective
1**

Background Information

Utah has a dry climate with mild winters and long, warm summers. Temperatures throughout the state vary. The cooler temperatures are found more in the northeastern part of the state and the mountains. The warmer temperatures are found in the western, central, and southern parts of Utah. Because of the fact that Utah gets less than ten inches of precipitation per year, it is known as a desert.

The above scenario makes Utah sound quite boring. But don't let this fool you. Utah can have very severe weather.

- January is usually our snowiest month. Valley storms in January will vary from one inch to eight inches per storm in northern and central Utah. However, there have been times when the storms in the valley have exceeded 12 inches, and snow continues to fall, adding inches every day. Plus, we can have heavy snowstorms in February, March, April, and even May.
- April and May are usually the rainiest month. Storms during these months vary from 1/8 inch to 1/2 inch per storm. But sometimes in April, storms can bring in an inch or more of rain. These storms can even continue to come in May, bringing much more precipitation.
- In the summertime, even though Utah is very hot and dry, summer storms may come in, bringing thunder and lightning, wind, and rain. Occasionally, summer cumulus clouds (thunderheads) can gather large amount of moisture coming in from the south. This moisture brings extraordinarily close lightning with the clouds being so low, heavy winds, hail, and torrents of rain come in. The lightning causes many fires throughout the state of Utah each year. The heavy winds down trees, blow roofs off houses, and blow down a whole crop of wheat or alfalfa. The hail can be the size of marbles, stripping plants of their leaves or breaking the stalks of small new plants. Torrents of rain can cause flash flooding, bringing much water and mud down from the mountains destroying crops, houses, and businesses.

- In general our mountains throughout Utah prevent high winds. But, in recent years, we have been reminded that tornadoes have formed from cold down drafts within a small area.
- Sometimes, winds in Utah preceding a storm can reach from 50 to 80 miles an hour, especially in wind gusts.
- Temperatures can exceed 115 degrees Fahrenheit in the summer and get as low as -30 degrees in the wintertime in our cities. Both of these extreme temperatures can kill plants and animals. (The cold temperatures can reach lower than -30 degrees when a wind chill is present.)

Weather like this doesn't happen often in Utah, but when it does, it causes much damage and can be life-threatening.

Pre-Assessment/Invitation to Learn

Ask the students these questions: (Have them write the answers in their journals.)

- Have you ever planned an activity and had it ruined by bad weather? What was it?
- What is considered "bad weather?"
- What type of weather have you seen or heard of in Utah that can be destructive? (Introduce severe weather here.)
- What are things that can be destroyed by severe weather?
- Explain that here in Utah we don't have it as bad as some people who live elsewhere in the country. What severe weather do other states usually encounter that we don't see much at all? (Tornadoes, ice storms, hurricanes, etc.)
- Explain that here in Utah our most dangerous weather usually occurs when we have thunder and lightning. Why are thunder and lightning storms dangerous in Utah? (If possible, show some pictures from the Internet of severe weather and its destruction.)

Rainstorms in class:

1. Turn off the lights and have everyone tap one finger on their desk as it starts to rain.
2. Tap all fingers on the desk so it rains harder.
3. Have someone switch the lights on and off quickly for lightning.
4. Add snapping fingers, clapping hands, and stomping feet, as the storm gets worse.
5. Finally, do the sounds more quietly in reverse, as the storm moves away.

Questions to ask after the storm simulation:

1. Why are thunderstorms dangerous?
2. What can happen if you are out in a thunderstorm?
3. What are precautions that you must take in a thunderstorm?

We can find the answers to these questions on the Internet.

Instructional Procedure

Today we will be exploring some wild weather information on the Internet. Each student should be given a list of addresses to enter into the computer.

1. Help the students access the Internet sites.
 - <http://www.wildwildweather.com> (lightning and tornadoes)
 - <http://www.usoe.k12.ut.us/curr/science/core/4th/4thSciber/weather/html/server.htm> (severe weather in Utah)
 - <http://www.usatoday.com/weather/wheat7.htm> (getting the high land low temperatures of the day)
 - <http://www.deseretnews.com/weather/weather.htm> (retrieving a five-day forecast in your city; looking for severe weather in the forecast)
 - <http://www.worldbookonline.com/wbol/wbAuth/jsp/wbDisplay.jsp> (average temperatures in your city)
 - <http://www.wrh.noaa.gov/saltlake/> (latest update on weather in your city.)
2. If you have access to a projector and an internet connection, you may do this with the whole class.
3. This activity lends itself to a great discussion.

Materials

- List of Web sites
- Worksheet, "Finding out about Utah's Weather."

Curriculum Extensions

Technology –

- Students can bookmark the Deseret News Web site to get daily weather instrument readings. (Standard V)
- Use the video, *Eyewitness Weather*, and discuss severe weather around the country and if Utah has had this same type of weather. (Standard V)

Language Arts –

- Read *Flash, Crash, Rumble Roll* to your class. Have a discussion afterwards. (Standard VII, Objective 2)
- Have the students write about an incident they have been through where the weather was severe enough for them to remember. (Standard VIII, Objective 6)

Math –

- Students can do some graphing and comparisons around the state or country of temperatures, precipitation, climates, etc. (Standard V, Objective 1)

Assessment Suggestions

Response questions:

1. Why is technology important to us when we want to gather information about weather?
2. What types of severe weather are there in Utah?
3. What makes severe weather “bad” weather?
4. Compare normal weather with severe weather. (rain to flooding; lightning to catching things on fire; wind to blowing roofs off of buildings, etc.)

Resources

Web sites:

- www.ksl.com (For current weather conditions and facts)
- www.digitalcurriculum.com/dcdoor.php4 (clouds and weather patterns)
- <http://deseretnews.com/weather/weather.htm> (five-day weather forecast)
- http://www.uen.org/utahlink/activities/view_activity.cgi?activity_id=3046 (average temperatures of Utah)
- <http://www.worldbookonline.com/wbol/wbAuth/jsp/wbDisplay.jsp> (average temperatures in your city)
- <http://www.usoe.k12.ut.us/curr/science/core/4th/4thSciber/weather/html/server.htm> (severe weather in Utah.)
- <http://www.wildwildweather.com> (lightning and tornadoes)

Videos:

- Check district media centers for these videos.
 - *Restless Atmosphere*
 - *What Makes Weather?*
 - *Meteorology*
 - *Weather Class with Dr. Niel Frank*
 - *Weather Express*
 - *Weather Station Backyard Science*
- There are also commercial weather videos available

Homework & Family Connections

- Students with Internet connections at home can be asked to visit weather Web sites that are given in class to show their parents and family.
- Students can be assigned to watch the evening weather forecast on one of the TV news channels and watch for severe weather around the country.
- Have the students set up a weather station at home to continue their investigation about weather.

Name _____

Finding Out About Utah's Weather

Go to the following Web sites and see if you can answer the questions below:

Wild Weather

<http://www.usatoday.com/weather/wheat7.htm>

1. What are the three highest temperatures today? _____
2. What are the three lowest temperatures today? _____

Average Temperatures in Utah

<http://www.worldbookonline.com/wbol/wbAuth/jsp/wbDisplay.jsp>

3. What are the average temperature in your city for July? _____
4. What are the average temperatures in your city for January? _____

Fire-Day Forecast

<http://desertnews.com/weather/weather.htm>

5. What is the five-day forecast along the Wasatch Front?

Monday _____

Tuesday _____

Wednesday _____

Thursday _____

Friday _____

Saturday _____

Sunday _____

<http://www.wrh.noaa.gov/saltlake/>

6. What is today's forecast for your city? _____

<http://www.usoe.k12.ut.us/curr/science/core/4th/4thSciber/weather/html/server.htm>

7. What types of severe weather are found in Utah? _____

<http://www.wildweather.com>

8. Write some facts either about lightning or tornadoes. _____

9. You can find different weather conditions of your city by going to the Web site:
<http://cirrus.sprl.umich.edu/wxnet>

10. If you have finished, go to the following site and see what you can learn about the history of weather: <http://www.almanac.com>