

## Weather Unit Plan

**Title:** Weather

**Description:** Students take on the role of meteorologist to understand and prepare for a weather phenomenon that may strike in their assigned city. The *Seeing Reason Tool* helps them analyze the impact that a particular phenomenon may have on their area.

### At a Glance

**Grade Level:** 5-8

**Subject sort (for Web site index):** Science

**Subject(s):** Earth and Space Science

**Topics:** Weather, Community,

**Higher-Order Thinking Skills:** Cause and Effect, Analysis

**Key Learnings:** Weather Phenomena, Severe Storms, Natural Hazards, Disaster Preparedness

**Time Needed:** 1 month of daily 45 minute lessons

### Unit Summary

After taking on the role of meteorologist students explore the causes of weather. Student groups are assigned various cities across the globe that experience different types of weather. They gather background information on the causes and locations of their phenomenon, use the *Seeing Reason Tool* to identify the effects of their phenomenon on the given area and make informed decisions about safety during weather phenomena. Student groups present their findings to the class and individually write a report on a weather phenomenon.

### Curriculum-Framing Questions

#### Curriculum-Framing Questions

##### Essential Question

Why is it important to be prepared?

##### Unit Questions

How does weather affect us?

Why is it important to monitor the weather?

Why do we need to prepare for natural disasters?

#### Sample Content Questions

What are the characteristics of weather phenomena?

How is the risk from common phenomena influenced by location/region?

What changes in weather are indicators of climate change?

### Assessment Processes

View how a variety of student-centered [assessments](#) are used in the Weather Unit Plan. These assessments help students and teachers set goals; monitor student progress; provide feedback; assess thinking, processes, performances, and products; and reflect on learning throughout the learning cycle.

## Instructional Procedures

### Prior to Instruction

This unit of study makes use of the *Seeing Reason Tool*. Read the [Using Seeing Reason Guide](#) to help set up the tool for your students.

Review the [Weather Project Overview](#), the student directions for this project.

### Set the Stage

Prior to beginning this project, establish an understanding of basic principles of weather. Be sure that students understand the difference between weather and climate and are able to identify conditions that create or control weather. Make sure to discuss how global patterns of atmospheric movement influence local weather and the major effect that oceans have on climate. Discuss how water in the ocean holds a large amount of heat which creates weather phenomena. This can be done through a series of labs, lectures, readings, videos, and discussions. Establish a science journal for students to keep track of key scientific concepts as well as note any questions to revisit.

Invite a local meteorologist to speak with the class or visit a local news station to watch a meteorologist in action.

### Introduce the Project

Ask students the Essential Question, *Why is it important to be prepared?* Elicit student responses and engage in discussion about being prepared for anything. These can be from every day occurrences to worldwide events. Lead the discussion towards weather-related incidences.

Pose the Content Question, *What are the characteristics of weather phenomena?* Begin a class discussion on the definition of weather phenomena and examples of phenomena that will be covered in class.

Pose the Unit Question: *Why is it important to monitor the weather?* Ask students to respond to the question in their science journals. Then, elicit students' initial responses to the question. Tell students that this question will be revisited throughout the unit.

To define the scope and roles of this project give students the [Weather Project Overview](#).

Students assume the role of meteorologists for this project. To make sure students understand what a meteorologist does, provide time to explore online resources and share prior knowledge about meteorologists. Make sure to focus on how meteorologists use technology to gather data, enhance accuracy, and analyze and quantify results of their investigations. Instruct students to write any notes or questions they have about the job of a meteorologist in their science journals and add any additional thoughts in response to the Unit Question: *Why is it important to monitor the weather?*

As students research, monitor progress by asking probing questions, reading and responding to science journal entries, and conducting one-on-one conferences.

In a whole class discussion pose the following Unit and Content Questions: *How does weather affect us?* and *How is the risk from phenomena influenced by location?* Discuss local weather patterns and potential phenomena risks associated with your region. Then ask students:

- *Have you experienced weather phenomena?*
- *Where were you when these phenomena occurred?*
- *Have you lived in other places? If so, did you have weather/climate that is different than where we live now? How was it different?*
- *Did weather affect how you lived?*

Post a chart of key concepts discussed. Tell students that they will continue to examine and answer these questions in the next activity.

## **Establish Phenomena and Location**

Explain that throughout the world there are many different types of weather phenomena. Identify cities across the world that experience various weather phenomena. Assign each student a location and a weather phenomenon to research, making sure there is more than one student assigned to each location. Place students into teams based on their location and weather phenomenon. Students begin exploring their location as a team. Instruct the teams to identify the city's longitude and latitude and then chart and analyze the temperature averages for the location. Have them hypothesize in their science journals about why the location has the climate that it does.

## **Seeing Reason**

Introduce the students to the *Seeing Reason Tool* and revisit the [Using Seeing Reason Guide](#) to assist with this project. Revisit key concepts chart created earlier, and while students are in their location teams pose the following Unit and Content Questions again: *How does weather affect us?* and *How is the risk from common phenomena influenced by location?* Add these new learnings to the chart in response to these questions.

Give each team their log-in information. This is an initial map and teams may not have a lot of factors and relationships defined. At the end of their mapping session have them save a copy of their map in their portfolio. As students individually research their phenomenon, they come together as a team to analyze new information and revisit the team map.

Monitor the students as they are working on their maps. Questions to probe students to clarify understanding are listed in the [Using Seeing Reason Guide](#).

## **Examine the Seeing Reason Activity**

The *Seeing Reason* space below represents one team's investigation in this project. The map you see is functional. You can roll over the arrows to read relationships between factors, and double-click on factors and arrows to read the team's descriptions.

## **Research**

Share with students the [Weather Project Rubric](#) and discuss the criteria that will be used to assess the project. Allow for questions and make sure that students understand all aspects of the rubric. Provide students with a rich combination of text and Internet resources to use to answer and guide their research. Explain that the [Weather Project Directions](#) and the [weather report format](#) contain the questions that should be researched for the individual report and will aide the group presentation.

Students create a report of their findings. The [weather report format](#) guides their report.

As students research, monitor progress by asking probing questions, reading science journal entries, and conducting one-on-one conferences.

Encourage students to revisit their *Seeing Reason* map and add additional factors or relationships. These relationships show the cause and effect of their phenomenon on people and places as they gather new research. They should have at least four revised maps. Use the comment feature to guide discussion and further exploration of their maps. After each work session remind students to save the team map to their portfolio.

## **Team Presentation**

Students select a presentation format based on the audience, who they are presenting to, that has been associated with their location in the [Weather Project Overview](#). The audience assigned such as a group of tourist or business owners makes the real world connection for the students. They may select any type of presentation format (multimedia, poster, play, etc.) to complement their oral presentation. Share with students the [sample group presentation](#) to foster a discussion

on expectations and quality work. Give each group the [Weather Group Checklist](#) for organizing their presentation.

### **Conclude the Lesson**

After the group presentations give each team the opportunity to revisit their *Seeing Reason* map to clarify any factors or relationships based on insight from maps they saw during team presentations.

Be sure to end the final activity with a comprehensive debriefing session that revisits the Unit Questions. Then as a final journal entry pose the Essential Question: *Why is it important to be prepared?*

Give students the opportunity to express any relevant observations they may wish to make.

### **Prerequisite Skills**

- Basic word processing and desktop publishing skills.
- Basic understanding of using the Internet to research information.

### **Differentiated Instruction**

Describe changes in content, process, products, or learning environment for different learners:

#### **Resource Student**

- Locate and distribute research materials that are appropriate for their reading ability
- Distribute an outline for students to complete to help organize their research and report work.
- Assign students to work in pairs to create a report instead of individually.
- Use word processing software features such as dictation or text to speech capabilities to assist in editing student work.

#### **Gifted Student**

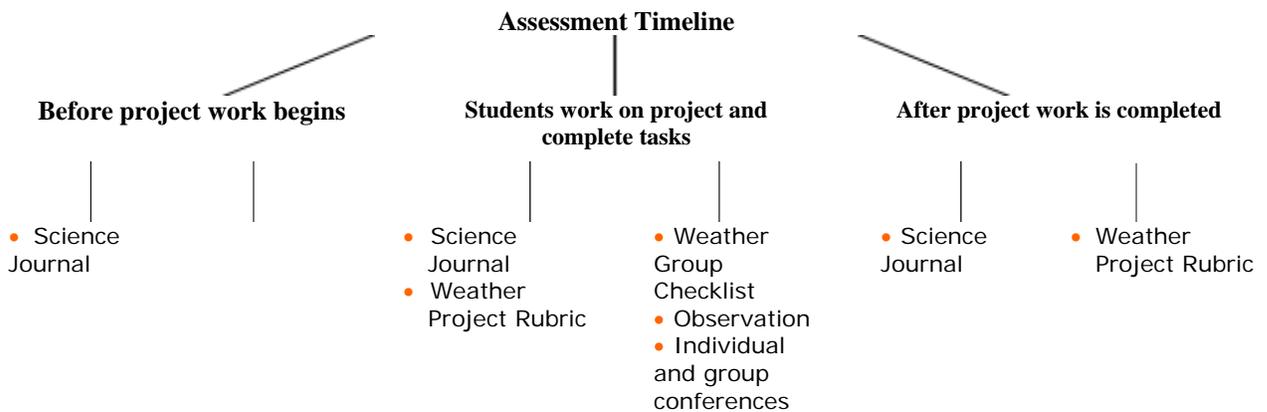
- Have students collect, graph, and draw conclusions based on data related to their phenomenon such as (causalities, cost relating to damage, severity, people effected, or number of occurrences over time).
- Have students research what contingency plans local government has in place should a natural disaster hit the region.
- Have students write a sample public service announcement to inform residents of an impending threat related their phenomenon.
- Have students create a Web-based weather survey form to collect data from people in other regions to find out *how the weather affects them* or to determine *how prepared they are to weather the weather*.

#### **English Language Learner**

- Allow the student to complete work in their first language and then have it translated into English later.
- Have a more proficient bilingual student help the English language learner.
- Use the talking text feature in word processing software to assist in editing the student work.

## THINGS YOU NEED

### Assessment Plan



Students reflect and respond in their science journal throughout the unit. The teacher reviews the journal entries to check for understanding, monitor progress, and clarify concepts. Students use the [Weather Project Rubric](#) to help guide their learning, stay on track, and self-assess their progress. Teacher uses questioning strategies throughout the unit to help students develop their higher-order-thinking skills and process content. The teacher holds individual and team group conferences to help monitor progress and answer any questions. Students use the [Weather Group Checklist](#) to plan and self-assess their group presentation. The teacher uses the [Weather Project Rubric](#) to assess their final work.

### Targeted Content Standards and Benchmarks

#### National Science Education Standards (NSES) Grades 5-8

##### Science as Inquiry

###### Content Standard A:

Technology used to gather data enhances accuracy and allows scientists to analyze and quantify results of investigations.

##### Earth and Space Science

###### Content Standard D:

Global patterns of atmospheric movement influence local weather. Oceans have a major effect on climate, because water in the oceans holds a large amount of heat.

##### Science in Personal and Social Perspectives

###### Content Standard F:

Students should understand the risks associated with natural hazards.

### Student Objectives

Student will be able to:

- Use technology to conduct research on assigned weather phenomenon
- Write a detailed report on a weather phenomenon
- Identify weather patterns that cause phenomena and describe them
- Analyze the risks caused by natural hazards
- Identify the effects that phenomena have on an area using *Seeing Reason*
- Create a group presentation on a weather phenomenon

## Materials and Resources

### Printed Materials

- Encyclopedias
- Variety of research books at different reading levels for each phenomena

### Internet Resources

This is only a partial list of Internet resources related to general weather for students.

- Nation Master

[www.nationmaster.com/graph-T/geo\\_nat\\_haz](http://www.nationmaster.com/graph-T/geo_nat_haz)\*

Listing of natural hazards by location

- Dan's Wild Weather Page

[www.wildwildweather.com/](http://www.wildwildweather.com/)\*

Resources for kids compiled by a meteorologist that address a variety of weather topics

- University of Illinois

[http://ww2010.atmos.uiuc.edu/\(Gh\)/guides/mtr/home.rxml](http://ww2010.atmos.uiuc.edu/(Gh)/guides/mtr/home.rxml)\*

Meteorology Guide

- National Weather Service Forecast Office

[www.srh.noaa.gov/oun/severewx/safety.html](http://www.srh.noaa.gov/oun/severewx/safety.html)\*

Severe Weather Safety Guide

- National Oceanic & Atmospheric Administration

[www.noaa.gov/](http://www.noaa.gov/)\*

General information about weather and storms

- Annenberg/CPB Learner.org

[www.learner.org/exhibits/weather/storms.html](http://www.learner.org/exhibits/weather/storms.html)\*

Weather what forces affect our weather?

- National Severe Storms Laboratory

[www.nssl.noaa.gov/edu/](http://www.nssl.noaa.gov/edu/)\*

Questions and guides to the how, what, where and why of storms

- Atmospheric Science Data Center

<http://eosweb.larc.nasa.gov/EDDOCS/meteorol.html>\*

Explanation what a meteorologist does

- Joanne Simpson

[www.grandtimes.com/simpson.html](http://www.grandtimes.com/simpson.html)\*

A closer look at the meteorologist Joanne Simpson

- Roger Daley

[www.science.ca/scientists/scientistprofile.php?PID=6](http://www.science.ca/scientists/scientistprofile.php?PID=6)\*

A closer look at the meteorologist Roger Daley

### Technology – Hardware

- Scanner for gathering images from research texts
- Computer with Internet connection for researching Web resources

## **Technology – Software**

- Word processing software to complete outlines
- Multimedia Software (optional for group presentation)
- Desktop Publishing Software (optional for group presentation)