

# Weather Watchers

Jody F. Dalton, WBRA

## Grade Levels:

4<sup>th</sup> and 9<sup>th</sup>

## Time Allotment:

3 – 90 minute lessons

Three days of weather observation to test weather instruments made in class.

## Overview:

What should I wear today? Do I need a jacket, an umbrella? Will the game get rained out? Weather affects almost every aspect of our daily routines, but how do we find out what the weather is going to be like tomorrow or next weekend? Using instructional video, the Internet and hands-on activities, this lesson will explore tracking, recording, and predicting the weather. Students will learn about instruments used to measure and record weather and how to make weather predictions.

## Subject Matter:

Science, Math, Geography

## Learning Objectives

Students will be able to:

- Identify basic weather instruments and how they are used to record weather data,
- Define the following weather terms – weather, forecast, prediction, temperature, observation, data, phenomena, barometer, hygrometer, anemometer, rain gauge, thermometer, meteorologist, condensation, precipitation, drought, air pressure, front.
- Use basic instruments to record weather data in their area,
- Use the Internet to check short and long range forecasts,

- Discuss the role of a meteorologist and how he/she works to forecast the weather.
- Using national and state maps, identify their local area, and name other states and regions around them

## Virginia State Standards

([www.pen.k12.va.us/go/Sols/science.html](http://www.pen.k12.va.us/go/Sols/science.html))

### SCIENCE

4.6 The student will investigate and understand how weather conditions and phenomena occur and can be predicted. Key concepts include:

- Weather factors (temperature, air pressure, fronts, formation and types of clouds, and storms);
- Meteorological tools (barometer, hygrometer, anemometer, rain gauge, and thermometer).

ES 13 The student will investigate and understand energy transfer between the sun, Earth, and how the Earth's atmosphere drives weather and climate on Earth. Key concepts include

- observation and collection of weather data;
- prediction of weather patterns; and
- weather phenomena and the factors that affect climate.

## Media Components

### Video:

Passport to Weather and Climate: Tracking and Recording Weather and Climate

## Web sites for Vocabulary and Quizzes:

*ThinkQuest Library of Entries*

<http://tjunior.thinkquest.org/3805/glossary/gloss.htm>

This web site contains a Glossary of weather words and definitions.

Word Central

<http://www.wordcentral.com/>

This web site allows students to look up words and definitions quickly and easily using the dictionary database.

*Welcome to Web School*

<http://webschool.wash.k12.ut.us/science/sequential/18forecasting.html>

This web site has an excellent weather quiz as well as many interesting weather facts.

*Dan's Wild, Wild Weather Page/Quizzes*

<http://www.wildwildweather.com/quiz.htm>

This site includes several weather quizzes. The home page of this site is an excellent site for learning facts about weather and forecasting.

*The Weather Dude*

<http://www.wxduke.com/question.html>

This site includes several weather quizzes. The home page of this site offers many interesting weather facts, songs, and games.

#### **Web Quest Sites:**

*National Weather Service*

<http://weather.noaa.gov/radar/>

This web site gives radar national and local radar maps to show precipitation in the area.

*The Weather Channel*

[www.weather.com](http://www.weather.com)

This web site allows students to check for specific local forecasts.

*Dan's Wild, Wild Weather Page*

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

This web site is an excellent site for learning facts about weather and forecasting. It includes games and puzzles.

*Accuweather*

[www.accuweather.com](http://www.accuweather.com)

This web site is an excellent site for students to check radar maps and local weather conditions.

#### **Web Sites for Making Weather Instruments:**

*Making your Own Weather Instruments*

<http://teacher.scholastic.com/activities/wwatch/reporters/lab/index.htm>

This website gives specific materials and instructions needed for students to make an Anemometer, a Rain Gauge, a Wind Vane, and a Barometer.

*The Franklin Institute Online (Making Your Own Weather Instruments)*

<http://www.fi.edu/weather/todo/todo.html>

This site also gives instructions for making weather instruments.

*Education Place*

[http://www.eduplace.com/rdg/gen\\_act/weather/track.html](http://www.eduplace.com/rdg/gen_act/weather/track.html)

This web site has a page that gives instructions for making and reading weather instruments.

#### **Materials**

*Materials needed for Learning Activities:*

Each group of three will need:

- List of Vocabulary Words and computer with access to the Internet for each group of three students.
- Computer with access to the Internet and copy of the Web Quest and Web Quest Worksheet for each group of three students
- Computer with access to the Internet for each individual student if possible or computer for each group of three students.

*Materials Needed for Culminating Activities:*

Each group of three will need:

- Weather Chart
- Thermometer
- Access to a television for local weather forecasts
- Access to a computer with Internet to check local forecasts online
- Items needed to make four weather instruments – Anemometer, Wind Vane, Barometer, and Rain Gauge (See attached Project Sheet)

## Prep for Teachers

Prior to teaching this unit, bookmark all sites mentioned above. Take the time to review and cue your videotape to the first viewing segment. Photocopy all student handouts for distribution, as they are needed during the lesson.

## Introductory Activity/Setting the Stage

The following activities are used to provide your students with a personal link to the subject matter of this unit:

**Step 1.** Say: For the next several days we are going to become weather persons in training. Our goal is to become certified meteorologists and get a job for the local television station. To do this, we have several things we will need to learn along the way. We have much to do so let's get started.

### Step 2. FOCUS FOR MEDIA

**INTERACTION**, Say: So that we can get an idea of what our job will be when we become weather persons, let's begin by watching a segment of the video "Passport to Weather and Climate: Tracking and Recording Weather and Climate". You are first going to see a young man who is also studying to be a weatherman. Let's watch to see what aspect of weather he is talking about in the first segment. Notice his excitement as he talks about weather and being a meteorologist. **START** the video at the title screen – Tracking and Recording Weather and Climate. **PAUSE** when Mark says, "...It's the most exciting thing going!" ASK students what weather phenomena Mark is talking about? (cloud formations and fronts). ASK students if they think Mark is enjoying learning to be a meteorologist. (Allow discussion)

### Step 3. FOCUS FOR MEDIA

**INTERACTION**, Say: Now let's watch this next section to get an idea of some of the instruments we will use as weather forecasters. First we are going to hear about one instrument they use to watch weather. Listen carefully for the name of the instrument, what it's used for and where the

information is sent. **RESUME** video. **PAUSE** when the picture of men working at the super computer in Maryland is shown. (Discuss Answer: Satellite – used to take pictures of clouds, information sent to Wallops, Island, VA.)

### Step 4. FOCUS FOR MEDIA

**INTERACTION**, Say: Great job! Now let's take a look at some other instruments. Listen carefully for the other data that weather forecasters record to help them predict the weather. **RESUME** video. **PAUSE** when the narrator says "...wind speed and direction every hour." (Discuss Answers: temperature, humidity, direction, wind speed. Also ask: Can anyone name some of the instruments that read this data?)

### Step 5. FOCUS FOR MEDIA

**INTERACTION**, Say: Let's watch the video now to see two other instruments used in weather forecasting. Listen for their names and what they are used for. **RESUME** the video. **PAUSE** when the balloon goes up and the narrator says "...and simultaneously around the world." (Discuss Answers: Doppler Radar – measures precipitation and severe storms and Sounding Balloons – which are sent up twice a day. The video did not say how they are used; however, they are used in the measurement and evaluation of mostly upper atmospheric conditions.)

### Step 6. FOCUS FOR MEDIA

**INTERACTION**, Say: We have seen many instruments that forecasters use to predict weather. These instruments collect a great deal of data. Let's watch this last segment to see what is done with all this information so that meteorologists can predict the weather. **RESUME** the video. **STOP** the video at the scene of the family watching television in their living room. (Discuss Answers: From the super computers in Maryland, information is retrieved with computers in weather service offices and the data is integrated and displayed on one screen. This is the starting point for predicting what will happen days into the future. Detailed, complex models along with mathematical equations help determine the current state of the atmosphere and project it through time.)

**Step 7.** Say: Well, what do you think? Do you think we can learn to use some of these instruments and become meteorologists? Do you think we can pass the test and get a job as weatherpersons with the local television station? Let's see what we can do.

### **Learning Activities**

**To the Teacher:** This part of the lesson will be divided into three web-based activities all leading up to the students becoming certified weatherpersons. Divide your class into groups of three or four students. These groups will work together to complete the following activities.

**Step 1.** To complete the first activity, write the 18 vocabulary words listed in the Learning Objectives section of this lesson on the board. You may want to give each group a copy of the vocabulary included with this lesson.

Say: The first thing we need to do to pass the weather test and become weather forecasters is to become familiar with some of the words and definitions used in forecasting the weather.

#### **FOCUS FOR MEDIA INTERACTION**

Say: Work in your groups to find and write the definition for each of the words on the list. Use the web sites listed below to find the words.

<http://tqjunior.thinkquest.org/3805/glossary/gloss.htm>

<http://www.wordcentral.com/> (click on student dictionary on the left side of the page to look up words.)

**Step 2.** Say: Now that we know some of the terms we will have to use, let's do a little computer work to gather and interpret weather data. Give each group a copy of the Weather Watchers Web Quest and the Web Quest Worksheet included with this lesson.

#### **FOCUS FOR MEDIA INTERACTION**

(Read the Introduction from the Web Quest to the students.) Say: "You are working towards completing the requirements you need to become a certified meteorologist. To do this, you must show that you can check weather data, prepare a weather

forecast, and predict the weather for the next two days. You will be using the Internet to gather information you will be including in your weather forecast." Then review the remainder of the tasks, resources, and process for completing the Web Quest with the students. Have groups complete the Web Quest by following the directions given on the handout and answering the questions on the worksheet.

(Give students sufficient time to work at computers to complete the Web Quest.)

**Step 3.** To the Teacher: If possible, have each student at a separate computer to take the test. If this is not possible, have them continue to work in their groups. Several websites for weather quizzes are listed so that you may choose the quiz you think best suits your students.

Say: Now it is time to take the weather test to see if you are ready to be certified meteorologists.

#### **FOCUS FOR MEDIA INTERACTION**

Say: Go to the web site book-marked and take the weather quiz. When you are finished, print out a copy and turn it in. (Give students sufficient time to complete the test.)

Weather Quiz Websites

<http://webschool.wash.k12.ut.us/science/sequential/18forecasting.html>

<http://www.wildwildweather.com/quiz.htm> (offers several levels of quizzes)

<http://www.wxduke.com/question.html> (offers several types of quizzes)

### **Culminating Activities**

**To the Teacher:** In this section, the same student groups will work together to make their own weather instruments and use them to read the weather each day. (You may need to give students a day or two to collect the supplies they will need to make the weather instruments. It may be a good idea to have students complete step one a few days in advance of this part of the lesson. They can then compare their data to data on a local weather website such as [www.weather.com](http://www.weather.com) to see how close their instruments are to actual readings. Students should keep track of their information, check their favorite weather website, watch

the local weather report on television and try to predict what the weather will be over the next several days. You can use the weather chart included with this lesson to record data or create one that works better with your students.

**Step 1.** Say: Now that we have all passed our test, we need to have the necessary instruments to be able to read and record weather data. Let's go to the website <http://teacher.scholastic.com/activities/wwatch/reporters/lab/index.htm> and look at the instruments we will be making. Print out a list of the supplies your group will need to make the weather instruments. Decide as a group who can bring each item so that you will be ready to begin your project.

Note: If for some reason the above address is not available, you can also find directions for making weather instruments at the following sites:

<http://www.fi.edu/weather/todo/todo.html>  
[http://www.eduplace.com/rdg/gen\\_act/weather/track.html](http://www.eduplace.com/rdg/gen_act/weather/track.html)

**Step 2.** Once students have brought in all the supplies they need or you have helped them by supplying some of the more difficult to find items, have students follow the online directions for making their weather instruments. Each student should work on a different instrument to save time.

**Step 3.** Have students use their instruments to collect data outside each day and record their data on their data sheet. Students should also check the local television weather and a local weather website to compare their information. Then, have students predict the weather for the next day. This information should be recorded on the data sheet.

### **Cross-Curricular Extensions**

Reading/Art – Read the book “Cloudy with a Chance of Meatballs” by Judi Barrett. Do not show the pictures as you read the book. Have students draw pictures showing their interpretation of the scenes in the story.

Social Studies – Have students research the many different career opportunities available in the field of weather and meteorology.

Math – There are many opportunities to use math in the study of weather. For example, have students read the temperature morning, noon, and right before going home. Then see if they can find the average temperature for the day.

Technology – Students can prepare a PowerPoint presentation from the weather data to make a three day forecast, to show different weather careers, or to explain weather instruments and forecasting.

Media – Students can prepare and videotape a weather broadcast.

### **Community Connections**

1. Invite a local or regional radio or television meteorologist to visit your classroom.
2. Have students watch the weather each evening for the duration of the weather lesson. This may encourage students to stay interested in weather watching even after the classroom activities are completed.
3. Have students go online and find an “Ask the Weatherman” site and email a question about weather forecasting or weather related careers to the site weatherperson.

### **Student Materials**

1. Vocabulary List
2. Web Quest and Web Quest Worksheet
3. List of Items needed to Make Weather Instruments
4. Weather Data Chart