



Forestry Suppliers Lesson Plan

Weather

Forestry Suppliers' Meteorology F.I.E.L.D. Kit™
Fundamental Investigation of the Environment Leading to Discovery™
Study Kit Correlated to National Science Education Content Standards

If you're interested in weather monitoring for classroom activities, consider the Forestry Suppliers' Meteorology F.I.E.L.D. Kit. Use the kit for the exercises outlined in this Lesson Plan, as well as other related activities (see "Further Studies" section for a few ideas).

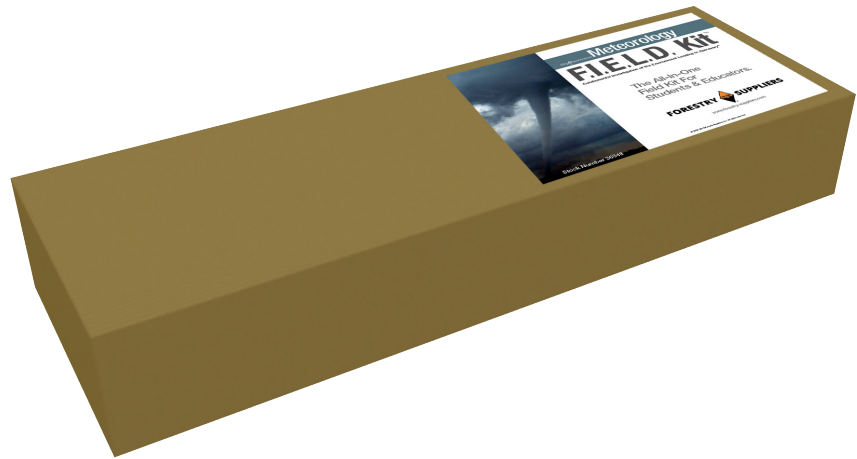
This F.I.E.L.D. Kit is available exclusively from Forestry Suppliers and includes some of the items used in this lesson plan. All kit items may also be purchased individually. Call our Sales Department at 1-800-647-5368 or visit us on the web at www.forestry-suppliers.com.

Fields of Study:

- Earth Science
- Mathematics

National Science Education Content Standards Correlation

Grades	A	B	C	D	E	F	G
K-4	✓			✓	✓		✓
5-8	✓			✓	✓	✓	✓
9-12	✓				✓	✓	



Meteorology Kit Contents		Stock Number 36848	Required For This Lesson Plan			
Qty.	Description		K-4	5-8	9-12	Stock Number
1	Sling Psychrometer 20°F to 120°F in 1° divisions, Red Liquid		✓	✓	✓	89248
1	Dwyer Hand-Held Wind Meter – English Model		✓	✓	✓	89001
1	Silva Starter 1-2-3 Baseplate Compass, Azimuth (0-360°)		✓	✓	✓	37064
1	Max/Min Dial Thermometer		✓	✓	✓	89126
1	Tru-Chek Direct-Reading Rain Gauge		✓	✓	✓	89011
1	Snow Gauge – measures up to 30" in 1/2" graduations		✓	✓	✓	88984
1	The National Audubon Society Weather Field Guide		✓	✓	✓	61311
1	GLOBE Cloud Chart					33485
1	Dial Barometer – 940-1070 millibars, 700-803 millimeters					43314

Background

One of the first questions many people ask is "What is the weather going to be like today?" Sunny, cool days with just a little breeze tend to make us a little more agreeable. Although too much wind or rain is just as unwelcome as too little, extreme weather conditions such as a thunderstorm or a tornado can frighten us. These types of weather systems can cause a lot of damage to property and to people. Being aware of atmospheric conditions or "what the weather is going to be" is important to our daily lives. We certainly want to know what Saturday's weather will be before we plan a family outing; but even more importantly, aircraft pilots and boat captains must be keenly aware of approaching storm systems in taking precaution against physical harm to passengers and damage to their vessels.

Understanding the factors, which influence weather and weather patterns, are globally important. Scientists who study weather and attempt to make accurate predictions concerning the weather are called meteorologists. The information that meteorologists provide for us is used in so many important ways. Meteorologists monitor and measure weather conditions by using various instruments, such as a barometer to measure barometric pressure, a wind meter (anemometer) used to determine wind speed, a thermometer used to measure temperature, a psychrometer used to measure humidity and gauges to measure snow or rainfall. Weather news is important to farmers, scientists, airport staff and the rest of the human population. It may be sunny outside, but it is probably raining somewhere! When you complete this activity, you will be more experienced in measuring and predicting weather.

Procedure

1. Using the Atmosphere Chart and Audubon Weather Guide, discuss various meteorological concepts with your students such as high and low pressure areas, frontal systems, cloud types, global atmospheric influences, storm systems, etc. Also, have your students watch local television meteorologists and read the local newspaper weather sections. In teaching younger students, you will need to watch newscasts and read the local newspapers to collect data or use class time to do so.
2. Begin by introducing and demonstrating each of the weather instruments found in the F.I.E.L.D. Kit. Explain to your students how each instrument plays an important role in accurately measuring the major parameters of weather phenomenon. The Sling Psychrometer is used to measure humidity, the wind meter (anemometer) is used to determine wind speed, the compass is for determining wind direction, the barometer measures barometric pressure, the thermometer is for recording maximum and minimum temperatures, the rain gauge is for measuring rainfall, and the snow gauge is for measuring snow fall. With younger students, you will need to share age appropriate information with them concerning the instrumentation; even younger students should be able to understand the basic concepts by which these instruments work.
3. Once the students have been shown how each instrument works, let them practice using each instrument before you begin the data collection activities.
4. When you feel the students are ready, give each student a weather data-collecting chart to be used each day for three to four weeks, or collect this data as a class. During this data collecting time, have your students also observe the weather forecasting being done on the local level. See if your students can determine if recorded data corresponds with the weather that occurs in the future.
5. Once students become comfortable with this concept, they should be able to forecast the weather with a limited form of accuracy.

Further Studies

- Allow students to collect data for a longer period of time and make accuracy comparisons with local forecasts.
- Direct students to research the following weather or weather-related topics by using the school or public library: tornado formation, hurricane formation, cloud type, ocean warming, ozone depletion.
- Involve the class in recording data to be submitted to a local participating news station.

Rubric

- Students should be able to identify common weather monitoring instrumentation.
- Students should know basic meteorological concepts.
- Students should be able to demonstrate the use of one weather monitoring instrumentation.

Assessment

- Quiz students concerning various meteorological concepts and the resulting impact on their environment
- When given specific data, allow students to make predictions concerning what the weather might be within a specific area.
- Have students correlate instruments with what each measures.

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Content Standards Covered

- A** Science as inquiry
 - Abilities necessary to do scientific inquiry
 - Understanding about scientific inquiry
- D** Earth and Space Science
 - Objects in the sky
 - Changes in earth and sky
- E** Science and Technology
 - Understandings about science and technology
- G** History and Nature of Science
 - Science as a human endeavor

Additional Materials

The following items are required to complete all the activities in this lesson plan.

Supplied by Teacher/Student(s)

- Data Collection Sheet

Background

One of the first questions many people ask is “What is the weather going to be like today?” Sunny, cool days with just a little breeze tend to make us a little more agreeable. Although too much wind or rain is just as unwelcome as too little, extreme weather conditions such as a thunderstorm or a tornado can frighten us. These types of weather systems can cause a lot of damage to property and to people. Being aware of atmospheric conditions or “what the weather is going to be” is important to our daily lives. We certainly want to know what Saturday’s weather will be before we plan a family outing; but even more importantly, aircraft pilots and boat captains must be keenly aware of approaching storm systems in taking precaution against physical harm to passengers and damage to their vessels.

Understanding the factors, which influence weather and weather patterns, are globally important. Weather has a great impact on agriculture as well as business endeavors. Crops must have the needed amount of light and moisture; this is dictated by the prevailing weather in that particular region. Scientists who study weather and attempt to make accurate predictions concerning the weather are called meteorologists. The information that meteorologists provide for us is used in so many important ways. Meteorologists monitor and measure weather conditions by using various instruments, such as a barometer to measure barometric pressure, a wind meter (anemometer) used to determine wind speed, a thermometer used to measure temperature, a psychrometer used to measure humidity and gauges to measure snow or rainfall. Weather patterns are somewhat predictable which enables humans to make important changes in location plans or other weather-related decisions. Weather news is important to farmers, scientists, airport staff and the rest of the human population. It may be sunny outside, but it is probably raining somewhere! When you complete this activity, you will be more experienced in measuring and predicting weather and may be considered an amateur meteorologist.

Procedure

- Using the Atmosphere Chart and Audubon Weather Guide, discuss various meteorological concepts with your students such as high and low pressure areas, frontal systems, cloud types, global atmospheric influences, storm systems, etc. Also, have your students watch local television meteorologists and read the local newspaper weather sections.
- Begin by introducing and demonstrating each of the weather instruments found in the F.I.E.L.D. Kit. Explain to your students how each instrument plays an important role in accurately measuring the major parameters of weather phenomenon. The Sling Psychrometer is used to measure humidity, the wind meter (anemometer) is used to determine wind speed, the compass is for determining wind direction, the barometer measures barometric pressure, the thermometer is for recording maximum and minimum temperatures, the rain gauge is for measuring rainfall, and the snow gauge is for measuring snow fall.
- Once the students have been shown how each instrument works, let them practice using each instrument before you begin the data collection activities.
- When you feel the students are ready, give each student a weather data-collecting chart to be used each day for three to four weeks. During this data collecting time, have your students also observe the weather forecasting being done on the local level. See if your students can determine if recorded data corresponds with the weather that occurs in the future.
- Once students become comfortable with this concept, they should be able to forecast the weather with some form of accuracy.

Further Studies

- Students will make predictions over a more extended period of time concerning the weather using their collected data and compare with the forecasts given by the local meteorologist.
- Students will research information concerning weather systems and patterns using the public or school library.
- Students may research the job description of a meteorologist or the teacher may invite a meteorologist as a guest lecturer.

Rubric

- Students should be familiar with meteorological terms.
- Students should be able to predict weather conditions when given data.
- Students should be able to show proficiency when using weather instruments.

Assessment

- Quiz students concerning the instrumentation used by meteorologists and what each measures.
- Have students compare and calculate the accuracy of their predictions.
- Have students name the common weather patterns and systems.

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Content Standards Covered

- A** Science as inquiry
 - Abilities necessary to do scientific inquiry
 - Understanding about scientific inquiry
- D** Earth and Space Science
 - Structure of the earth system
- E** Science and Technology
 - Abilities of technological design
 - Understandings about science and technology
- F** Science in Personal and Social Perspectives
 - Science and technology in society
- G** History and Nature of Science
 - Science as a human endeavor

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5. Once students become comfortable with this concept, they should be able to forecast the weather with some form of accuracy.

Further Studies

- Students will make forecasts over an extended time period using knowledge of meteorological concepts and data collected from implementing instrumentation described in Procedure.
- Students will research meteorological information including, but not limited to: hurricane formation, global weather patterns and drought.
- Students may interview a meteorologist.
- Students may complete research concerning collection of weather data by satellite.

Rubric

- Students should be familiar with meteorological terms.
- Students should be able to make limited weather predictions.
- Students should show proficiency in using weather instruments.

Assessment

- Quiz students concerning meteorological concepts and instrumentation.
- Have students determine percent error of their measurements when they compare their predictions of possible numerical data with the actual numerical conditions, possibly predicted temperature or barometric changes.

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 - Abilities of technological design
 - Understandings about science and technology
- F** Science in Personal and Social Perspectives
 - Science and technology in local, national and global challenges

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