

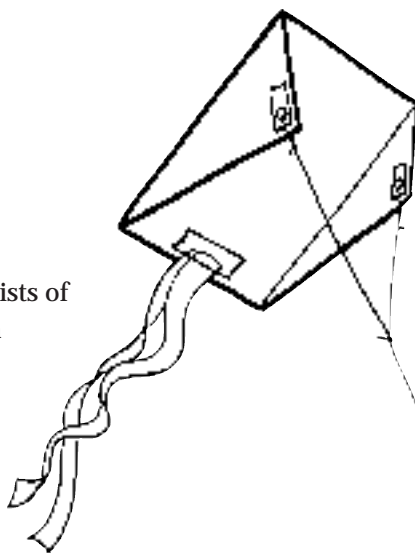


OVERVIEW

AIR AND WEATHER

GOALS

The Air and Weather Module consists of four sequential investigations, each designed to introduce concepts in earth science. The investigations provide opportunities for young students to explore the natural world by using simple tools to observe and monitor change.



FOSS EXPECTS STUDENTS TO

- Develop an interest in air and weather.
- Experience air as a material that takes up space and can be compressed into a smaller space.
- Observe the force of air pressure pushing on objects and materials.
- Observe and compare how moving air interacts with objects.
- Observe and describe changes that occur in weather over time.
- Become familiar with instruments used by meteorologists to monitor air and weather conditions.
- Compare monthly and seasonal weather conditions using bar graphs.
- Observe the location of the Sun and the Moon in the sky over a day and the change in the appearance of the Moon over a month.
- Organize and communicate observations through drawing and writing.
- Acquire vocabulary associated with properties of air and weather conditions.

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AIR AND WEATHER MODULE MATRIX

SYNOPSIS

SCIENCE CONTENT

THINKING PROCESSES

1. EXPLORING AIR

Students explore properties of a common gas mixture, air. Using vials, syringes, and tubing, students experience air as matter, discovering that it takes up space and can be compressed and that compressed air builds up pressure that can push objects around. They construct and compare parachutes and balloon rockets that use air.

- Air is matter.
- Air takes up space.
- Air interacts with objects.
- Air resistance affects how things move.
- Air is all around objects.
- Air can be compressed.
- The pressure from compressed air can move things.
- Air is a gas.

- Observe the properties of air as it interacts with other materials.
- Observe the properties of air when it is put under pressure.
- Compare the path a balloon rocket travels along a flight line to that of an air-filled plastic bag.

2. OBSERVING WEATHER

Students record weather over 4–8 weeks on a class calendar and in weather journals. Students monitor temperature with a thermometer and rainfall with a rain gauge. They learn to identify three basic cloud types by matching their observations to a cloud chart.

- Weather is the condition of the atmosphere (air) and changes over time.
- Temperature, precipitation, and cloud types are components of the weather that can be described.
- Meteorologists are scientists who study weather.
- There are different kinds of clouds.
- Rain is water that comes from clouds.

- Observe and record daily weather on a class calendar and in individual journals.
- Observe and compare cloud types.
- Measure temperature and rainfall.

3. WIND EXPLORATIONS

Students look for evidence of moving air. They observe and describe wind speed using pinwheels, an anemometer, and a wind scale. They observe bubbles and construct wind vanes to find the wind's direction. Flying kites, they feel the strength of the wind and the direction it is moving.

- Wind is moving air.
- Wind speed and wind direction are components of weather that can be described using anemometers and wind vanes.
- Wind scales are tools used to describe the speed of the wind.

- Observe and compare the action of moving air and its effects on pinwheels, bubbles, and kites.
- Observe and describe the direction of the wind using wind vanes.
- Observe and describe the speed of the wind using an anemometer.

4. LOOKING FOR CHANGE

Students organize monthly weather data using graphs to describe weather trends. They continue to monitor weather throughout the year, to compare the seasons. At home they make observations of the night sky, looking for observable changes in weather conditions as well as in objects in the sky (Sun, Moon, stars). Students are introduced to the changing location of the Sun in our sky and the changing appearance of the Moon.

- Weather conditions change over time.
- Weather observations can be organized, compared, and predicted.
- The Sun heats the Earth during the day.
- Each season has a typical weather pattern that can be observed, compared, and predicted.
- The bright appearance of the Moon changes shape in a pattern that can be observed, compared, and predicted.
- The Sun and Moon appear to move slowly across the sky.

- Organize and graph class weather data recorded for a month.
- Record weather data throughout the year and compare seasonal weather conditions.
- Observe the changing location of the Sun during a day.
- Observe and record nightly weather and the changing appearance of the Moon.

Math Extensions

- Solve two problems.

Science Extensions

- Student projects.
- Make an air cannon.
- Send air through a garden hose.
- Inflate a ball.

- *What Is All around Us?*

Students look for toys at home that use air to make them work, or they invent a toy that uses air. They draw a picture and describe the toy.

Language Extensions

- Create meteorologist tool kits.
- Explore weather lore.

Math Extensions

- Solve two problems.

Art Extensions

- Create foggy-day or cloud pictures.
- Go cloud watching.
- Make spilt-milk images.

Science Extensions

- Keep track of hourly weather.
- Make a temperature graph.
- Compare weather reports.

- *What's the Weather Today?*

Students make a cloud window out of construction paper and tape it to a window. The cloud window gives a reference from which to see cloud movement.

Language Extension

- Read wind poetry and stories.

Math Extensions

- Solve two problems.

Social Studies Extension

- Research kite culture.

Art Extension

- Create a wind catcher.

Science Extensions

- Try new kite designs and materials.
- Have a kite festival.
- Invite a kite expert.
- Bring wind catchers from home.

- *Understanding the Weather*

Students make a whirligig at home. They use the whirligig to search for air movement around their homes.

Language Extension

- Create seasonal acrostic poems.

Math Extensions

- Solve two problems.

Science Extension

- Look for weather graphs in the newspaper.

- *Seasons*

Students read a story about a boy named Harry who was always wearing the wrong clothes for the weather conditions. They design and draw pictures of Harry's all-weather wardrobe.

FOSS AND NATIONAL STANDARDS

The Air and Weather Module emphasizes the development of observation and description skills. This module supports the following National Science Education Standards.

SCIENCE AS INQUIRY

Develop students' abilities to do and understand scientific inquiry.

- Ask and answer questions.
- Plan and conduct simple investigations.
- Employ tools and techniques to gather data.
- Use data to construct reasonable explanations.
- Communicate investigations and explanations.
- Understand that scientists use different kinds of investigations and tools to develop explanations using evidence and knowledge.

CONTENT: EARTH SCIENCE

Develop students' understanding of properties of earth materials, objects in the sky, and changes in the sky.

- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.
- Objects in the sky have patterns of movement. The Moon moves across the sky on a daily basis much like the Sun. The movements can be observed and described.
- The Sun provides the light and heat necessary to maintain the temperature of the Earth.
- Earth materials include air (gases of the atmosphere). Air has specific properties, which can be measured using tools.

SCIENCE AND TECHNOLOGY

Develop students' understanding about science and technology.

- Tools help scientists make better observations.

SCIENCE IN PERSONAL AND SOCIAL PERSPECTIVES

Develop students' abilities to make personal health decisions.

- Dress appropriately for the weather conditions.
- Behave safely in response to storms.