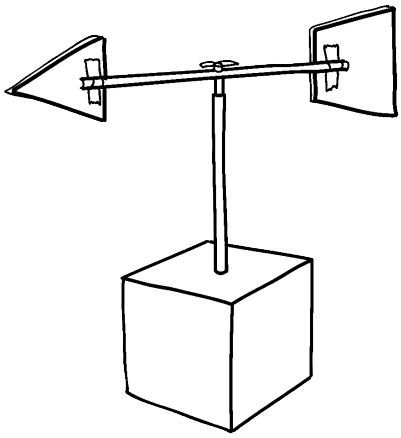
OVERVIEW
AIR AND WEATHER



CONTENT GOALS

The **Air and Weather Module** consists of four sequential investigations, each designed to introduce concepts in physical and earth science. The investigations allow young students to explore the natural world by using simple tools to observe properties of air and to measure and monitor change in the weather from day to day and over the seasons.

FOSS EXPECTS STUDENTS TO

- Develop an interest in air and weather.
- Experience air as a gas 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, describe, and record changes that occur in weather from day to day and across seasons.
- Learn that the sun warms the land, air, and water.
- Become familiar with instruments used by meteorologists to monitor and measure air and weather conditions.
- Compare monthly and seasonal weather conditions, using bar graphs.
- Record and communicate data with pictures, numbers, and words, and graphs.
- Acquire vocabulary associated with properties of air and weather conditions.

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AIR AND WEATHER MODULE MATRIX

SYNOPSIS	CA SCIENCE CONTENT STANDARDS	
1. EXPLORING AIR		
Students explore properties of a common gas mixture, air. Using vials, syringes, and tubes, 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. Students read about air and where it's found.	PS1a	Students know solids, liquids, and gases have different properties.
	I&E4a	Draw pictures that portray some features of the thing being described.
	I&E4b	Record observations and data with pictures, numbers, or written statements.
	I&E4d	Describe the relative position of objects by using two references (e.g., above and next to, below and left of).
	I&E4e	Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.
2. OBSERVING WEATHER		
Students record weather for 4–8 weeks on a class calendar and in weather journals. They measure 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. Students read about different kinds of weather.	ES3a	Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.
	ES3b	Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.
	ES3c	Students know the sun warms the land, air, and water.
	I&E4a	Draw pictures that portray some features of the thing being described.
	I&E4b	Record observations and data with pictures, numbers, or written statements.
	I&E4d	Describe the relative position of objects by using two references (e.g., above and next to, below and left of).
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 its direction. Students read how meteorologists gather information on the weather.	ES3a	Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.
	I&E4b	Record observations and data with pictures, numbers, or written statements.
4. LOOKING FOR CHANGE		
Students organize monthly weather data, using graphs to describe weather trends. They continue to measure and record weather throughout the year, to compare the seasons. Students read about the seasonal weather patterns.	ES3b	Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.
	ES3c	Students know the sun warms the land, air, and water.
	I&E4b	Record observations and data with pictures, numbers, or written statements.
	I&E4c	Record observations on a bar graph.

CONCEPTS	READING AND WRITING	ASSESSMENT
• 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.	• *FOSS Science Resources: Air and Weather,* "What Is All around Us?" • Science Notebook: Students draw and write their observations about air.	**Preassessment** **Teacher Observation/Notebook Sheet** • Observes and records where air is when an empty vial is placed under water. • Observes and reports how air affects a parachute's descent. • Observes and records how air can be compressed and how it can make things move.
• Weather describes conditions in the outside air and changes over time. • The sun warms the land, air, and water. • 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.	• *FOSS Science Resources: Air and Weather,* "What's the Weather Today?" • Science Notebook: Students draw and write about the weather conditions. They use data from the class meteorologist to write their reports.	**Teacher Observation/Notebook Sheet** • Makes objective observations of weather and describes them in drawings and words. • Uses tools to monitor weather, including a thermometer, cloud pictures, and rain gauges. • Reports weather conditions, including temperature, cloud type, and rainfall.
• Wind is moving air. • Wind speed and wind direction are components of weather that can be measured with anemometers and wind vanes. • Wind scales are tools used to describe the speed of the wind.	• *FOSS Science Resources: Air and Weather,* "Understanding the Weather" • Science Notebook: Students draw and write about the weather conditions. They use data from the class meteorologist to write their reports.	**Teacher Observation/Notebook Sheet** • Makes objective observations of weather and describes them in drawings and words. • Uses tools to monitor weather, including an anemometer and wind vanes. • Understands how knowing about wind speed and direction helps to fly kites.
• 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.	• *FOSS Science Resources: Air and Weather,* "Seasons" • Science Notebook: Students write about the seasons and make bar graphs using weather data for 4 weeks.	**Teacher Observation/Notebook Sheet** • Accurately records observations. • Uses symbols to create a bar graph of weather conditions, using class data from the past month. • Writes about the weather conditions for a particular season. **End-of-Module Assessment**

FOSS AND CALIFORNIA STANDARDS

The **Air and Weather Module** supports the following Physical and Earth Sciences Content Standards for grade 1.*

PS1 ***Materials come in different forms (states), including solids, liquids, and gases. As a basis for understanding this concept:***

PS1a Students know solids, liquids, and gases have different properties.

ES3 ***Weather can be observed, measured, and described. As a basis for understanding this concept:***

ES3a Students know how to use simple tools (e.g., thermometer, wind vane) to measure weather conditions and record changes from day to day and across the seasons.

ES3b Students know that the weather changes from day to day but that trends in temperature or of rain (or snow) tend to be predictable during a season.

ES3c Students know the Sun warms the land, air, and water.

The **Air and Weather Module** supports the following Investigation and Experimentation Content Standards for grade 1.*

INVESTIGATION AND EXPERIMENTATION

I&E4 ***Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:***

I&E4a Draw pictures that portray some features of the thing being described.

I&E4b Record observations and data with pictures, numbers, or written statements.

I&E4c Record observations on a bar graph.

I&E4d Describe the relative position of objects by using two references (e.g., above and next to, below and left of).

I&E4e Make new observations when discrepancies exist between two descriptions of the same object or phenomenon.

**Science Content Standards for California Public Schools: Kindergarten through Grade Twelve* (Sacramento: California Department of Education, 2000).

SAFETY IN THE CLASSROOM

Young children must be allowed to demonstrate that they can act responsibly with materials, but they must be given guidelines for safe and appropriate use of materials. Work with students to develop those guidelines so they participate in making behavior rules and understand the rationale for the rules. Encourage responsible actions toward other students. Look for the safety-note icon in the Getting Ready section, which will alert you to safety concerns throughout the module.

General classroom safety rules to share with students include

1. Listen carefully to your teachers's instructions. Follow all directions. Ask questions if you don't know what to do.
2. Tell your teacher if you have any allergies.
3. Never put any materials in your mouth. Do not taste anything unless your teacher tells you to do so.
4. Never smell any unknown material. If your teacher asks you to smell something, wave your hand over the material to draw the smell toward your nose.
5. Do not touch your face, mouth, ears, nose, or eyes while working with chemicals, plants, or animals.
6. Always protect your eyes. Wear safety goggles when necessary. Tell your teacher if you wear contact lenses.
7. Always wash your hands with soap and warm water after handling chemicals, plants, or animals.
8. Never mix any chemicals unless your teacher tells you to do so.
9. Report all spills, accidents, and injuries to your teacher.
10. Treat animals with respect, caution, and consideration.
11. Clean up your work space after each investigation.
12. Act responsibly during science investigations.

These safety rules are on the FOSS safety poster.

Materials Safety Data Sheets (MSDS) for materials used in the FOSS program can be found on the Delta Education website. If you have questions regarding any MSDS, call Delta Education toll free at 800-258-1302 (Monday–Friday 8 a.m. to 6 p.m. EST).

SCHEDULING THE MODULE

The Getting Ready section for each part of the investigation helps you prepare. It provides information on scheduling the investigations and introduces the tools and techniques used in the investigation. Be prepared—read the Getting Ready section first.

The first item in the Getting Ready section gives an estimated amount of time the part should take. Parts generally take one class session of 35–45 minutes.

Plan ahead for the scheduling of the parts. Below is a teaching schedule for the module. The investigations are numbered, and we suggest that they be conducted in that order, as the concepts build upon each other from investigation to investigation. It is suggested that a minimum of 8 weeks be devoted to this module. Weather monitoring and recording on the class calendar should continue through the year. At the end of each season, students make bar graphs of specific weather conditions to look for patterns. Take your time and explore the subject thoroughly.

This module is best started in the fall, so that students can monitor changes in weather over the year.

EIGHT WEEK TEACHING SCHEDULE FOR GUIDING THE INVESTIGATIONS

WEEK	1	2	3	4	5	6	7–8
Exploring Air	3 sessions	4 sessions					
Observing Weather			3–4 sessions	3 sessions			
Wind Explorations					3 sessions	3 sessions	
Looking for Change							6 sessions through the year

SCOPE AND SEQUENCE FOR FOSS CALIFORNIA 2007 EDITION

GRADE	PHYSICAL SCIENCES	LIFE SCIENCES	EARTH SCIENCES
5	Mixtures and Solutions	Living Systems	Water Planet
4	Magnetism and Electricity	Environments	Solid Earth
3	Matter and Energy	Structures of Life	Sun, Moon, and Stars
2	Balance and Motion	Insects and Plants	Pebbles, Sand, and Silt
1	Solids and Liquids Air and Weather	Plants and Animals	Air and Weather
K	Wood and Paper	Animals Two by Two Trees	Wood and Paper Trees

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