

Weather

Narrative Summary

This unit introduces first-graders to the concept of weather and how it affects their lives. Using a variety of tools, students observe, discuss, measure, and record data on cloud cover, precipitation, wind, and temperature. They learn how to read a thermometer and construct a rain gauge to measure precipitation. They also study cloud formations and use a wind scale to estimate the speed of wind. To apply their new skills and knowledge, students compare their own weather predictions with an actual weather forecast and use the weather data they have collected to form generalizations about the weather in their own locale.

Science Content

Throughout this unit, students use science tools to extend their senses. Students engage in scientific inquiry by setting up several simple investigations on the effect color has on temperature and heat absorption. Math skills are used in context when students apply a scale to their measurements and create graphs. Long-term data collection is emphasized when students take responsibility for collecting data, recording it in a class weather calendar, and making reports to their classmates. Students use data to look for patterns and learn to make predictions. Reading selections extend the unit's content by addressing the career of meteorology and the history and invention of the umbrella and mackintosh raincoat.



Assessment

In Lesson 1, students observe the day's weather and then discuss how they might use this information to decide what they will wear to school. A class graph serves as a means of organizing information about students' favorite types of weather. This pre-unit assessment, matched to a post-unit assessment following Lesson 16, serves as a basis for assessing students' growth in knowledge. Throughout the

unit, assessments are incorporated, or embedded, into the lessons. Lesson 8, which serves as an embedded assessment, asks students to apply what they have learned about temperature to a new situation. By measuring the temperatures of hot, cold, and mixed hot and cold water, students demonstrate growth in learning to read and record temperature. At the close of the unit, students make sense of their data on wind speed, cloud cover, precipitation, and temperature by comparing their weather predictions with those of a meteorologist. Additional assessments at the end of the unit include developing and presenting student-made weather reports, drawing pictures of different types of weather, and presenting weather information to visitors. Students can also revisit a temperature activity from earlier in the unit.

Goals for Weather

In this unit, students' observations and activities expand their awareness of weather, its features, and its effects on their daily lives. Their experiences introduce them to the following concepts, skills, and attitudes.

Concepts

- Weather changes from day to day and week to week.
- Features of weather include cloud cover, precipitation, wind, and temperature.
- Tools used to measure different features of weather include wind scales, thermometers, and rain gauges.
- Meteorologists are scientists who study, observe, and record information about the weather and who use that information to forecast the weather.
- Weather affects the decisions people make about the clothing they will wear and about their outside activities.

Skills

- Observing the weather by using the senses.
- Discussing and recording information about weather features.
- Using simple tools to estimate wind speed and measure temperature and rainfall.
- Observing differences in types of clouds.
- Conducting experiments and drawing conclusions about appropriate clothing for different types of weather.
- Organizing weather data on graphs and long-term data collection charts.
- Interpreting and summarizing long-term weather data.

Attitudes

- Increasing awareness of weather.
- Appreciating how weather affects daily life.
- Recognizing that measurements and long-term records are useful and help us learn more about weather.



Weather

Fundamental Concepts and Principles Addressed (K–4)

Science as Inquiry

Abilities necessary to do scientific inquiry

- Ask a question about objects, organisms, and events in the environment.
- Plan and conduct a simple investigation.
- Employ simple equipment and tools to gather data and extend the senses.
- Use data to construct a reasonable explanation.
- Communicate investigations and explanations.

Understandings about scientific inquiry

- Scientific investigations involve asking and answering a question and comparing the answer to what scientists already know about the world.
- Scientists use different kinds of investigations, depending on the questions they are trying to answer. Types of investigations include describing events, classifying them, and doing a fair test (experimenting).
- Simple instruments, such as magnifiers and thermometers, provide more information than scientists obtain using only their senses.

Physical Science

Properties of objects and materials

- Objects have many observable properties, including size, shape, color, and temperature. These properties can be measured using tools, such as thermometers.
- Objects can be described by the properties of the materials from which they are made, and those properties can be used to separate or sort a group of objects.
- Materials can exist in different states—solid, liquid, and gas. Some common materials, such as water, can be changed from one state to another.

Earth and Space Science

Objects in the sky

- The sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.
- The sun provides the light and heat necessary to maintain the temperature of the earth.

Changes in the earth and 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.

Science and Technology

Understandings about science and technology

- People have always had questions about their world. Science is one way of answering questions and explaining the natural world.
- People have always had problems and invented tools and techniques (ways of doing something) to solve problems.
- Scientists and engineers often work in teams with different individuals doing different things that contribute to the results.
- Women and men of all ages, backgrounds, and groups engage in a variety of scientific and technological work.
- Tools help scientists make better observations, measurements, and equipment for investigations. They help scientists see, measure, and do things they could not otherwise see, measure, and do.

Abilities to distinguish between natural objects and objects made by humans

- Objects can be categorized into two groups, natural and designed.

Science in Personal and Social Perspectives

Personal health

- Safety and security are basic needs of humans. Safety involves freedom from danger, risk, or injury. Student understandings include following safety rules.

Science and technology in local challenges

- People continue inventing new ways of doing things, solving problems, and getting work done. New ideas and inventions often affect other people.

History and Nature of Science

Science as a human endeavor

- Science and technology have been practiced by people for a long time.

- Men and women have made a variety of contributions throughout the history of science and technology.
- Many people choose science as a career. Many people derive great pleasure from doing science.

Unifying Concepts and Processes

Systems, order, and organization

Evidence, models, and explanation

Constancy, change, and measurement