

Weather

STANDARD II:

Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.

Science Benchmarks

Weather describes conditions in the atmosphere at a certain place and time. Water, energy from the sun, and wind create a cycle of changing weather. The sun's energy warms the oceans and lands at Earth's surface, creating changes in the atmosphere that cause the weather. The temperature and movement of air can be observed and measured to determine the effect on cloud formation and precipitation. Recording weather observations provides data that can be used to predict future weather conditions and establish patterns over time. Weather affects many aspects of people's lives.

STANDARD II: **Students will understand that the elements of weather can be observed, measured, and recorded to make predictions and determine simple weather patterns.**

Objective 1: Observe, measure, and record the basic elements of weather.

- a. Identify basic cloud types (i.e., cumulus, cirrus, stratus clouds).
- b. Observe, measure, and record data on the basic elements of weather over a period of time (i.e., precipitation, air temperature, wind speed and direction, and air pressure).
- c. Investigate evidence that air is a substance (e.g., takes up space, moves as wind, temperature can be measured).
- d. Compare the components of severe weather phenomena to normal weather conditions (e.g., thunderstorm with lightning and high winds compared to rainstorm with rain showers and breezes).

Objective 2: Interpret recorded weather data for simple patterns.

- a. Observe and record effects of air temperature on precipitation (e.g., below freezing results in snow, above freezing results in rain)
- b. Graph recorded data to show daily and seasonal patterns in weather.
- c. Infer relationships between wind and weather change (e.g., windy days often precede changes in the weather; south winds in Utah often precede a cold front coming from the north).

Objective 3: Evaluate weather predictions based upon observational data.

- a. Identify and use the tools of a meteorologist (e.g., measure rain fall using a rain gauge, measure air pressure using a barometer, measure temperature using a thermometer).
- b. Describe how weather and forecasts affects people's lives.
- c. Predict weather and justify predictions with observable evidence.
- d. Evaluate the accuracy of student and professional weather forecasts.
- e. Relate weather forecast accuracy to evidence or tools used to make the forecast (e.g., feels like rain vs. barometer is dropping).

Science language students should use:

Atmosphere, meteorologist, freezing, cumulus, stratus, cirrus, air pressure, thermometer, air temperature, wind speed, forecast, severe, phenomena, precipitation, seasonal, accuracy, barometer, rain gauge, components

Intended Learning Outcomes for Fourth Grade Science

The Intended Learning Outcomes (ILOs) describe the skills and attitudes students should learn as a result of science instruction. They are an essential part of the Science Core Curriculum and provide teachers with a standard for evaluation of student learning in science. Instruction should include significant science experiences that lead to student understanding using the ILOs.

The main intent of science instruction in Utah is that students will value and use science as a process of obtaining knowledge based upon observable evidence.

By the end of the third grade students will be able to:

- 1. Use Science Process and Thinking Skills**
 - a. Observe simple objects and patterns and report their observations.
 - b. Sort and sequence data according to a given criterion.
 - c. Make simple predictions and inferences based upon observation.
 - d. Compare things and events.
 - e. Use instruments to measure length, temperature, volume, and weight using appropriate units.
 - f. Conduct a simple investigation when given directions.
 - g. Develop and use simple classification systems.
 - h. Use observations to construct a reasonable explanation.
- 2. Manifest Science Attitudes and Interests**
 - a. Demonstrate a sense of curiosity about nature.
 - b. Voluntarily read or look at books and other materials about science.
 - c. Pose questions about objects, events, and processes.
- 3. Understand Science Concepts and Principles**
 - a. Know science information specified for their grade level.
 - b. Distinguish between examples and non-examples of science concepts taught.
 - c. Explain science concepts and principles using their own words and explanations.
- 4. Communicate Effectively Using Science Language and Reasoning**
 - a. Record data accurately when given the appropriate form and Format (e.g., table, graph, chart).
 - b. Report observations with pictures, sentences, and models.
 - c. Use scientific language appropriate to grade level in oral and written communication.
 - d. Use available reference sources to obtain information.

- **Instruction should include significant science experiences that lead to student understanding using ILOs.**

