

## Standard I: The Moon

**Science Benchmark:**

The appearance of the lighted portion of the moon changes in a predictable cycle as the result of the relative positions of Earth, the moon, and the sun.

**STANDARD 1**

Students will understand that the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.

**STANDARD I: Students will understand that the appearance of the moon changes in a predictable cycle as it orbits Earth and as Earth rotates on its axis.**

*Objective 1:* Explain patterns of changes in the appearance of the moon as it orbits Earth.

- a. Describe changes in the appearance of the moon during a month.
- b. Identify the pattern of change in the moon's appearance.
- c. Use observable evidence to explain the movement of the moon around Earth in relationship to Earth turning on its axis and the position of the moon changing in the sky.
- d. Design an investigation, construct a chart, and collect data depicting the phases of the moon.

*Objective 2:* Demonstrate how the relative positions of Earth, the moon, and the sun create the appearance of the moon's phases.

- a. Identify the difference between the motion of an object rotating on its axis and an object revolving in orbit.
- b. Compare how objects in the sky (the moon, planets, stars) change in relative position over the course of the day or night.
- c. Model the movement and relative positions of Earth, the moon, and the sun.



**Science language students should use:**

Axis of rotation, orbits, phases of the moon, revolution, reflection

# Intended Learning Outcomes For Sixth 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 sixth grade students will be able to:

**1. Use Science Process and Thinking Skills**

- a. Observe simple objects, patterns, and events, and report their observations.
- b. Sort and sequence data according to criteria given.
- c. Given the appropriate instrument, measure length, temperature volume, and mass in metric units as specified.
- d. Compare things, processes, and events
- e. Use classification systems.
- f. Plan and conduct simple experiments.
- g. Formulate simple research questions.
- h. Predict results of investigations based on prior data.
- i. Use data to construct a reasonable conclusion.

**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.
- d. Maintain an open and questioning mind toward new ideas and alternative points of view.
- e. Seek and weigh evidence before drawing conclusions.
- f. Accept and use scientific evidence to help resolve ecological Problems.

**3. Understand Science Concepts and Principles**

- a. Know and explain science information specified for the grade level.
- b. Distinguish between examples and non-examples of concepts that have been taught.
- c. Solve problems appropriate to grade level by applying science principles and procedures.

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



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4. **Communicate Effectively Using Science Language and Reasoning**
    - a. Record data accurately when given the appropriate form (e.g., table, graph, chart).
    - b. Describe or explain observations carefully and report with pictures, sentences, and models.
    - c. Use scientific language in oral and written communication.
    - d. Use reference sources to obtain information and cite the source.
    - e. Use mathematical reasoning to communicate information.
  5. **Demonstrate Awareness of Social and Historical Aspects of Science**
    - a. Cite examples of how science affects life.
    - b. Understand the cumulative nature of science knowledge.
  6. **Understand the Nature of Science**
    - a. Science is a way of knowing that is used by many people, not just scientists.
    - b. Understand that science investigations use a variety of methods and do not always use the same set of procedures; understand that there is not just one “scientific method.”
    - c. Science findings are based upon evidence.

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