

Intended Learning Outcomes for Seventh Integrated Science

The Intended Learning Outcomes (ILOs) describe the skills and attitudes students should learn and demonstrate 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 seventh and eight grades students will be able to:

1. Use Science Process and Thinking Skills

- a. Observe objects and events for patterns and record both qualitative and quantitative information.
- b. Sort and sequence data according to a given criterion.
- c. Develop and use categories to classify subjects studied.
- d. Select the appropriate instrument; measure, calculate, and record in metric units, length, volume, temperature and mass, to the accuracy of instruments used.
- e. When given a problem, plan and conduct experiments in which they:
 - Form research questions.
 - Discuss possible outcomes of investigations.
 - Identify variables.
 - Plan procedures to control independent variable(s).
 - Collect data on the dependent variable(s).
 - Select appropriate format (e.g., graph, chart, diagram) to summarize data obtained.
 - Analyze data and construct reasonable conclusions.
 - Prepare written and oral reports of their investigation.
- f. Distinguish between factual statements and inferences.
- g. Use field guides or other keys to assist in the identification of subjects studied.

2. Manifest Scientific Attitudes and Interests

- a. Read and look at books and other science materials voluntarily.
- b. Raise questions about objects, events, and processes that can be answered through scientific investigation.
- c. Maintain an open and questioning mind toward ideas and alternative points of view.
- d. Check reports of observations for accuracy.
- e. Accept and use scientific evidence to help resolve ecological problems.

3. Demonstrate Understanding of Science Concepts and Principles

- a. Know and explain science information specified for their grade level.
- b. Distinguish between examples and non-examples of concepts that have been taught.
- c. Compare concepts and principles based upon specific criteria.
- d. Solve problems appropriate to grade level by applying scientific principles and procedures.

4. Communicate Effectively Using Science Language and Reasoning

- a. Provide relevant data to support their inferences and conclusions.
- b. Use precise scientific language in oral and written communication.
- c. Use correct English in oral and written reports.
- d. Use reference sources to obtain information and cite the sources.
- e. Use mathematical reasoning to communicate information.
- f. Construct models to describe concepts and principles.

5. Demonstrate Awareness of Social and Historical Aspects of Science

- a. Cite examples of how science affects life.
- b. Give instances of how technological advances have influenced the progress of science and how science has influenced advances in technology.
- c. Understand the cumulative nature of the development of science knowledge.
- d. Recognize contributions to science knowledge that have been made by both men and women.

6. Demonstrate Understanding of 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.
- d. Understand that science conclusions are tentative and therefore never final. Understandings based upon these conclusions are subject to revision in light of new evidence.
- e. Understand that scientific conclusions are based on the assumption that natural laws operate today as they did in the past and that they will continue to do so in the future.
- f. Understand that various disciplines of science are interrelated and share common rules of evidence to explain phenomena in the natural world.