

## **Intended Learning Outcomes for Diocesan Middle School Integrated Science And High School Science Graduate Profile**

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 role of science in Catholic education is essential. The main intent of science instruction in Utah Catholic Schools is that students will value and use science as a process of obtaining knowledge based upon observable evidence. Reason and faith are an integral part of our Catholic education. It is essential that science education explore the manifestation of God's presence in our world.**

**“The work of predicting, controlling and governing nature, which science today renders more practical than in the past, is itself a part of the Creator's plan.” Pope Benedict XVI**

## Intended Learning Outcomes

### 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. As applicable use Inquiry Based Data Acquisition
  - Develop and use categories to classify subjects studied.
  - Select the appropriate instrument; measure, calculate, and record in metric units, length, volume, temperature and mass, to the accuracy of instruments used.
- d. When given a problem, plan and conduct experiments in accordance with the scientific method:
  - 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, technology tools, diagram) to summarize data obtained.
  - Analyze data and construct reasonable conclusions.
  - Prepare written and oral reports of their investigation.
  - As applicable use Inquiry Based Data Acquisition
- e. Distinguish between factual statements and inferences.
- f. Use field guides or other keys to assist in the identification of subjects studied.

### 2. Manifest Scientific Attitudes and Interests

- a. Utilize primary and secondary sources and other scientific materials.
- 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. Use evidence to resolve problems.
- f. Utilize multi-media resources.

### 3. Demonstrate Understanding of Science Concepts and Principles

- a. Know and explain science information specified for their grade level.
- b. Transfer and apply concepts across disciplines.
- 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 inferences and conclusions.
- b. Use precise scientific language in oral and written communication.
- c. Use proper grammar in oral and written reports.
- d. Use a variety reference sources to obtain information and cite the sources.
- e. Effective integration of mathematical reasoning.
- f. Construct models to describe concepts and principles.
- g. Preparation and replication of experimental procedures.
- h. Interpret and analyze scientific data.

**5. Demonstrate Awareness of Social and Historical Aspects of Science**

- a. Recognizes how science is an integral part of our lives.
- 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 that have been made by both men and women from many cultures.

**6. Demonstrate Understanding of the Nature of Science**

- a. Science is a way of thinking 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.
- c. Science findings are based upon evidence.
- d. 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.
- e. Understand that science conclusions are tentative and therefore never final. Understandings based upon these conclusions are subject to revision in light of new evidence.
- f. Understand that various disciplines of science are interrelated and share common rules of evidence to explain phenomena in the natural world.

Science language students should use:	generalize, conclude, hypothesis, theory, variable, measure, evidence, data, inference, infer, compare, predict, interpret, analyze, relate, calculate, observe, describe, classify, technology, experiment, investigation, tentative, assumption
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