

**Science Benchmark:**

All living things inherit a set of characteristics or traits from their parents. Members of any given species transfer traits from one generation to the next. The passing of traits from parent to offspring is called heredity and causes the offspring to resemble the parent. Some traits differ among members of a population, and these variations may help a particular species to survive better in a given environment in getting food, finding shelter, protecting itself, and reproducing. These variations give the individual a survival advantage over other individuals of the same species.

**STANDARD V:**

Students will understand that traits are passed from the parent organisms to their offspring, and that sometimes the offspring may possess variations of these traits that may help or hinder survival in a given environment.

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*Objective 1:* Using supporting evidence, show that traits are Transferred from parent organism to its offspring

- a. Make a chart and collect data identifying various traits among a given population (e.g., the hand span of students in the classroom, the color and texture of different apples, the number of petals of a given flower).
- b. Identify similar physical traits of a parent organism and its offspring (e.g., trees and sapling, leopards and cubs, chickens and chicks).
- c. Compare various examples of offspring that do not initially resemble the parent organism but mature to become similar to the parent organism (e.g., mealworms and darkling beetles, tadpoles and frogs, seedlings and vegetables, caterpillars and butterflies).
- d. Contrast inherited traits with traits and behaviors that are not inherited but may be learned or induced by environmental factors (e.g., cat purring to cat meowing to be let out of the house; the round shape of a willow is inherited, while leaning away from the prevailing wind is induced).
- e. Investigate variations and similarities in plants grown from seeds of a parent plant (e.g., how seeds from the same plant species can produce different colored flowers or identical flowers).



*Objective 2:* Describe how some characteristics could give a species a survival advantage in a particular environment.

- a. Compare the traits of similar species for physical abilities, instinctual behaviors, and specialized body structures that increase the survival of one species in a specific environment over another species (e.g., difference between the feet of snowshoe hare and cottontail rabbit, differences in leaves of plants growing at different altitudes, differences between the feathers of an owl and a hummingbird, differences in parental behavior among various fish).
- b. Identify that some environments give one species a survival advantage over another (e.g., warm water favors fish such as carp, cold water favors fish such as trout, environments that burn regularly favor grasses, environments that do not often burn favor trees).
- c. Describe how a particular physical attribute may provide an advantage for survival in one environment but not in another (e.g., heavy fur in arctic climates keep animals warm whereas in hot desert climates it would cause overheating; flippers on such animals as sea lions and seals provide excellent swimming structures in the water but become clumsy and awkward on land; cacti retain the right amount of water in arid regions but would develop root rot in a more temperate region; fish gills have the ability to absorb oxygen in water but not on land).
- d. Research a specific plant or animal and report how specific physical attributes provide an advantage for survival in a specific environment.

**Science language students should use:**

inherited, environment, species, offspring, traits, variations, survival, instincts, population, specialized structure, organism, life cycle, parent organism, learned behavior

# Intended Learning Outcomes for Fifth 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 fifth 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.  
observation.
- 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 science information specified for the grade level.
- b. Distinguish between examples and non-examples of science concepts that have been taught.  
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.

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