

TRB³

Elementary Science Teacher Resource Book

**A PROFESSIONAL DEVELOPMENT
RESOURCE FOR TEACHING
CORE CURRICULUM**

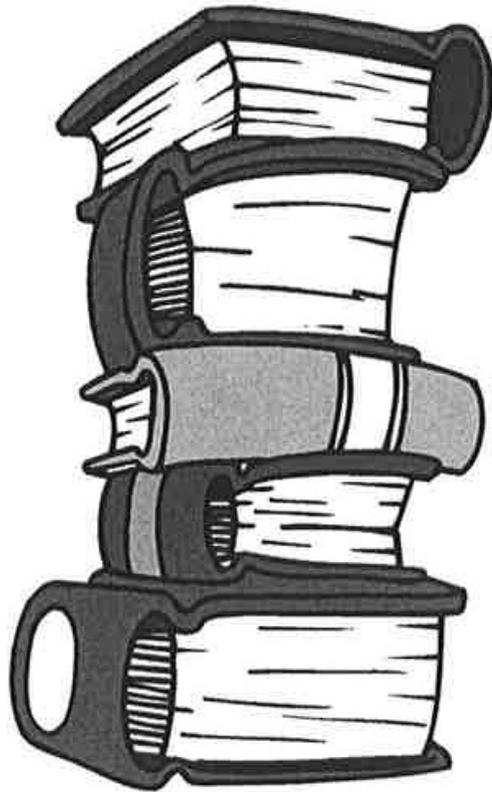
GRADE 3

LITERACY -- STRATEGIES – ASSESSMENT

Utah State Office of Education

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3. Third Grade Science Core Curriculum



Third Grade Science Core Curriculum

In third grade students learn about interactions relationships, relative motion and cause and effect. They study the movement of Earth and the moon. They begin to learn of forces that move things; they learn of heat and light. Third graders observe, classify, predict, measure, and record.

Third graders should be encouraged to be curious. They should be helped and encouraged to pose their own questions about objects, events, processes, and results. Effective teachers provide students with hands-on science investigations in which student inquiry is an important goal. Teachers should provide opportunities for all students to experience many things. Third graders should use their senses as they feel the warmth of the sun on their face, watch the moon as it seems to move through broken clouds, sort and arrange their favorite rocks, look for patterns in rocks and flowers, observe a snail move ever so slowly up the side of a terrarium, test materials for slipping and sliding, measure the speed of rolling objects, and invent ways to resist gravity. They should come to enjoy science as a process of learning about the world.

Third grade Core concepts should be integrated with concepts and skills from other curriculum areas. Reading, writing, and mathematics skills should be emphasized as integral to the instruction of science. Personal relevance of science in students' lives is always an important part of helping students to value science, and should be emphasized at this grade level.

This Core was designed using the American Association for the advancement of Science's Project 2061: Benchmarks For Science Literacy and the National Academy of Science's National Science Education Standards as guides to determine appropriate content and skills.

The Third grade Science Core has three online resources designed to help with classroom instruction; they include Teacher Resource Book – a set of lesson plans, assessment items and science information specific to Third grade; Sciber Text – an electronic science textbook specific to the Utah Core; and the science test item pool. This pool includes multiple-choice questions, performance tasks, and interpretive items aligned to the standards and objectives of the third grade Science Core. These resources are all available on the Utah Science Home Page. <http://www.usoe.k12.ut/us/curr/science>.

Safety Precautions:

The hands-on nature of this science curriculum increases the need for teachers to use appropriate precautions in the classroom and field. Teachers must adhere to the published guidelines of the proper use of animals, equipment, and chemicals in the classroom. These guidelines are available on the Utah Science Home Page.

- Personal relevance of science in students' lives is always an important part of helping students to value science, and should be emphasized at this grade level.



Third Grade Science Standards

Science Benchmark

Earth orbits around the sun, and the moon orbits around the Earth. Earth is spherical in shape and rotates on its axis to produce the night and day cycle. To people on Earth, this turning of the planet makes it appear as though the sun, moon, planets and stars are moving across the sky once a day. However, this is only a perception as viewed from Earth.

STANDARD I

Students will understand that the shape of Earth and the moon are spherical and that Earth rotates on its axis to produce the appearance of the sun and moon moving through the sky.

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Objective 1: Describe the appearance of Earth and the moon.

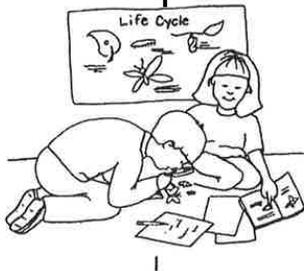
- a. Describe the shape of Earth and the moon as spherical.
- b. Explain that the sun is the source of light that lights the moon.
- c. List the differences in the physical appearance of Earth and the moon as viewed from space.

Objective 2: Describe the movement of Earth and the moon and the apparent movement of other bodies through the sky.

- a. Describe the motions of Earth (i.e., the rotation [spinning] of Earth on its axis, the revolution [orbit] of Earth around the sun.
- b. Use a chart to show that the moon orbits Earth approximately every 28 days.
- c. Use a model of Earth to demonstrate that Earth rotates on its axis once every 24 hours to produce the night and day cycle.
- d. Use a model to demonstrate why it seems to a person on Earth That the sun, planets, and stars appear to move across the sky.

Science language students should use:

Model, orbit, sphere, moon, axis, rotation, revolution, appearance



Science Benchmark

For any particular environment, some types of plants and animals survive well, some survive less well and some cannot survive at all. Organisms in an environment interact with their environment. Models can be used to investigate these interactions.

STANDARD II: Students will understand that organisms depend on living and non-living things within their environment.

Objective 1: Classify living and non-living things in an environment.

- a. Identify characteristics of living things (i.e., growth, movement, reproduction).
- b. Identify characteristics of non-living things.
- c. Classify living and non-living things in an environment.

Objective 2: Describe the interactions between living and non-living Things in a small environment.

- a. Identify living and non-living things in a small environment (e.g., terrarium, aquarium, flowerbed) composed of living and non-living things.
- b. Predict the effects of changes in the environment (e.g., temperature, light, moisture) on a living organism.
- c. Observe and record the effect of changes (e.g., temperature, amount of water, light) upon the living organisms and non-living things in a small-scale environment.
- d. Compare a small-scale environment to a large environment (e.g., aquarium to a pond, terrarium to a forest).
- e. Pose a question about the interaction between living and non-living things in the environment that could be investigated by observation.

Science language students should use:

environment, interaction, living, non-living, organism, survive, observe, terrarium, aquarium, temperature, moisture, small-scale.

STANDARD II:

Students will understand that organisms depend on living and non-living things within their environment.

Science Benchmark

Forces cause changes in the speed or direction of the motion of an object. The greater the force placed on an object, the greater the change in motion. The more massive an object is, the less effect a given force will have upon the motion of the object. Earth's gravity pulls objects toward it without touching them.

STANDARD III

Students will understand the relationship between the force applied to an object and resulting motion of the object.

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Objective 1: Demonstrate how forces cause changes in speed or direction of objects.

- a. Show that objects at rest will not move unless a force is applied to them.
- b. Compare the forces of pushing and pulling.
- c. Investigate how forces applied through simple machines affect the direction and/or amount of resulting force.

Objective 2: Demonstrate that the greater the force applied to an object, the greater the change in speed or direction of the object.

- a. Predict and observe what happens when a force is applied to an object (e.g., wind, flowing water).
- b. Compare and chart the relative effects of a force of the same strength on objects of different weight (e.g., the breeze from a fan will move a piece of paper but may not move a piece of cardboard).
- c. Compare the relative effects on forces different strengths on an object (e.g., strong wind affects an object differently than a breeze).
- d. Conduct a simple investigation to show what happens when objects or various weights collide with one another (e.g., marbles, balls).
- e. Show how these concepts apply to various activities (e.g., batting a ball, kicking a ball, hitting a golf ball with a golf club) in terms of force, motion, speed, direction, and distance (e.g., slow, fast, hit hard, hit soft).

STANDARD IV: Students will understand that objects near Earth are Pulled toward Earth by gravity.

Objective 1: Demonstrate that gravity is a force.

- a. Demonstrate that a force is required to overcome gravity.
- b. Use measurement to demonstrate that heavier objects require more force than lighter ones to overcome gravity.

Objective 2: Describe the effects of gravity on the motion of an object.

- a. Compare how the motion of an object rolling up or down a hill changes with the incline of the hill.
- b. Observe, record, and compare the effect of gravity on several objects in motion (e.g., a thrown ball and a dropped ball falling to Earth).
- c. Pose questions about gravity and forces.

Science language students should use:

Distance, force, gravity, weight, motion, speed direction, simple machine.

STANDARD IV:

Students will understand that objects near Earth are pulled toward Earth by gravity.

Science Benchmark

Light is produced by the sun and observed on Earth. Living organisms use heat and light from the sun. Heat is also produced from motion when one thing rubs against another. Things that give off heat often give off light. While operating, mechanical and electrical machines produce heat and/or light.

STANDARD IV:

Students will understand that the sun is the main source of heat and light for things living on Earth. They will also understand that the motion of rubbing objects together may produce heat.

STANDARD IV: Students will understand that the sun is the main sun source of heat and light for things living on Earth. They will also understand that the motion of Rubbing objects together may produce heat.

Objective 1: Provide evidence showing that the sun is the source of heat and light for Earth.

- a. Compare temperature in sunny and shady places.
- b. Observe and report how sunlight affects plant growth.
- c. Provide 3 examples of how sunlight affects plant growth.
- d. Identify and discuss as a class some misconceptions about heat sources (e.g., clothes do not produce heat, ice cubes do not give off cold).

Objective 2: Demonstrate that mechanical and electrical machines produce Heat and sometimes light.

- a. Identify and classify mechanical and electrical sources of heat.
- b. List examples of mechanical and electrical devices that produce light.
- c. Predict, measure, and graph the temperature changes produced by a variety of mechanical machines and electrical devices while they are operating.

Objective 3: Demonstrate that heat may be produced when objects are rubbed against one another.

- a. Identify several examples of how rubbing one object against another produces heat.
- b. Compare relative differences in the amount of heat given off or forced required to move an object over lubricated/non-lubricated surfaces and smooth/rough surfaces (e.g., waterslide with and without water, hands rubbing together with and without lotion).

Science language students should use:

Mechanical, electrical, temperature, degrees, lubricated, misconception, heat source, machine