

STANDARD 1: SCIENCE AS INQUIRY

Grades K-2

SCIENCE AS INQUIRY – The student will experience science as *full inquiry*. In the elementary grades, students begin to develop the physical and intellectual abilities of scientific inquiry.

Benchmark 1: The student will be involved in activities that develop skills necessary to conduct scientific inquiries.

| Grades K-2 Indicators | Instructional Examples |
|--|---|
| <p>The student...</p> <ol style="list-style-type: none"> 1. identifies <i>properties</i> of objects. 2. <i>classifies</i> and arranges groups of objects by a variety of properties, one property at a time. 3. uses appropriate materials, <i>tools</i>, and <i>safety procedures</i> to collect information. 4. asks and answers questions about objects, organisms, and events in his/her environment. 5. describes an observation orally or pictorially. | <p>The student...</p> <ol style="list-style-type: none"> 1. states properties of objects such as leaves, shells, rocks, water, and insects. 2. groups seeds by color, texture, and size; groups objects by whether they float or sink; groups rocks by texture, color, and hardness. 3. <ol style="list-style-type: none"> a. uses tools such as magnifiers, balances, scales, thermometers, measuring cups, and spoons when engaged in investigations. b. uses appropriate precautions, procedures, and safety equipment when doing investigations. 4. observes and asks questions about a variety of objects and discusses how they are alike and different. 5. draws pictures of plant growth on a daily basis; notes color, number of leaves; labels plant parts. |
| <p>Teacher Notes:</p> <p>These activities involve asking a simple question, completing an investigation, answering the question and presenting the results to others. Not every activity will involve all of these stages nor must any particular sequence of these stages be followed.</p> <p><i>Full inquiry</i> – involves asking a simple question, completing an investigation, answering the question, and presenting the results to others. In elementary grades, students begin to develop the physical and intellectual abilities of scientific inquiry. They can design investigations to try things to see what happens – they tend to focus on concrete results of tests and will entertain the idea of a “fair” test (a test in which only one variable at a time is changed) (see page 122 in the National Science Education Standards, 1996).</p> | |

Properties – a word(s) that describe(s) an object based on direct observations using touch, sight, hearing, taste, smell, and measurement.

Classify – a method for establishing order on collections of objects or events. Students use classification systems to identify objects or events, to show similarities, differences, and interrelationships. It is important to realize that all classification systems are subjective and may change as criteria change; the test for a good classification system is whether others can use it.

Tools – object(s) used to achieve a goal, to make an observation, and extend the senses (see page 122 in the National Science Education Standards, 1996).

STANDARD 2: PHYSICAL SCIENCE

Grades K-2

PHYSICAL SCIENCE - The students will explore the world by observing and manipulating common objects and materials in their environment.

Benchmark 1: All students will develop skills to describe objects.

| Grades K-2 Indicators | Instructional Examples |
|--|---|
| <p>The student...</p> <ol style="list-style-type: none">1. observes <i>properties of objects</i> and measures or describes those <i>properties</i> using age-appropriate tools and materials.2. separates or sorts a group of objects or materials by <i>properties</i>.3. compares the properties of solids and liquids.4. describes the position of an object in relation to other objects. | <p>The student...</p> <ol style="list-style-type: none">1. measures and compares size, <i>mass</i>, shape, color, texture, and temperature of objects.2. compares and sorts objects by shape, size, <i>mass</i>, and color.3. compares the <i>properties</i> of liquid water and frozen water, or liquid (melted) chocolate chips and solid chocolate chips.4. describes the object's position as being up, down, beside, in front of, or behind the other object. |
| <p>Teacher Notes:</p> <p>All students will have opportunities to compare, describe, and sort objects.</p> <p><i>Mass</i> - measure of the amount of material something contains. <i>Properties</i> – a word(s) that describe(s) an object based on direct observations using touch, sight, hearing, taste, smell, and measurement.</p> | |

STANDARD 3: LIFE SCIENCE

Grades K-2

LIFE SCIENCE – The student will begin to develop an understanding of biological concepts.

Benchmark 1: The student will develop an understanding of the characteristics of living things.

| Grades K-2 Indicators | Instructional Examples |
|--|---|
| <p>The student...</p> <ol style="list-style-type: none"> 1. discusses that <i>organisms</i> live only in <i>environments</i> in which their needs can be met. 2. observes <i>life cycles</i> of different living things. 3. observes living things in various <i>environments</i>. 4. examines the <i>structures</i>/parts of living things. | <p>The student...</p> <ol style="list-style-type: none"> 1. <ol style="list-style-type: none"> a. learns that children need air, water, food, shelter, and care. b. learns that plants need light, air, water*. c. learns that animals need air, water, food, and shelter. 2. observes the <i>life cycles</i> of butterflies, mealworms, plants, and/or humans. 3. observes classroom plants; takes nature walks and field trips in his/her own area; observes terrariums and aquariums. 4. observes that butterflies have wings, legs, and antennae; plants have roots, leaves and flowers; and people have a head, a body, skin and hair. |
| <p>Teacher Notes:</p> <p>Through direct experiences, students will observe living things, their <i>life cycles</i>, and their habitats.</p> <p>* - like children and animals, plants also require nutrients. Children and animals obtain nutrients and energy from the food they eat. Plants obtain their nutrients from the soil/root media by way of their roots, and energy from the sun.</p> <p><i>Organisms</i> – any form of life.</p> <p><i>Environment</i> – all external conditions and factors, living and non-living that affects an organism during its life time.</p> <p><i>Life cycle</i> – the process by which organisms mature, reproduce, and die.</p> <p><i>Structures</i> – parts of the organisms that serve different functions in growth, survival, and reproduction.</p> | |

STANDARD 4: EARTH AND SPACE SCIENCE

Grades K-2

EARTH AND SPACE SCIENCE – The student will observe closely the objects and materials in their *environment*.

Benchmark 1: The student will describe *properties* of earth materials.

| Grades K-2 Indicators | Instructional Examples |
|---|--|
| The student... 1. observes, compares, and sorts earth materials. | The student... 1 a. describes and compares soils by color and texture; sorts pebbles and rocks by size, shape, and color. b. observes <i>earth materials</i> around the playground, on a field trip, or in his/her own yard. |
| <p>Teacher Notes:</p> <p>Earth materials may include rocks, soils, air, and water.</p> <p><i>Environment</i> - all external conditions and factors, living and non-living that affects an organism during its life time.</p> <p><i>Properties</i> – word that describes an object based on direct observations using touch, sight, hearing, taste, smell, and measurements.</p> <p><i>Earth materials</i> - rocks, soil, water, and the gases of the atmosphere. The varied materials have different physical and chemical properties which make them useful in different ways.</p> | |

STANDARD 4: EARTH AND SPACE SCIENCE

Grades K-2

EARTH AND SPACE SCIENCE – The student will observe closely the objects and materials in their environment.

Benchmark 2: The student will observe and compare objects in the sky.

| Grades K-2 Indicators | Instructional Examples |
|---|---|
| <p>The student...</p> <ol style="list-style-type: none">1. observes and recognizes the sun, moon, stars, clouds, birds, airplanes, and other objects in the sky.2. describes that the sun provides light and warmth. | <p>The student...</p> <ol style="list-style-type: none">1. observes day and night sky regularly.2<ol style="list-style-type: none">a. observes that shadows are formed when an object (buildings, window blinds, clouds, etc.) blocks the sunlight.b. experiences how standing in the shade is cooler than standing in the direct sunlight. |
| <p>Teacher Notes:</p> <p>The sun, moon, stars, clouds, birds, and other objects such as airplanes have properties that can be observed and compared.</p> | |

STANDARD 4: EARTH AND SPACE SCIENCE

Grades K-2

EARTH AND SPACE SCIENCE – The student will observe closely the objects and materials in their environment.

Benchmark 3: The student will describe changes in weather.

| Grades K-2 Indicators | Instructional Examples |
|---|--|
| <p>The student...</p> <ol style="list-style-type: none">1. observes changes in the weather from day to day.2. records weather changes daily.3. discusses weather safety procedures. | <p>The student...</p> <ol style="list-style-type: none">1. draws pictures or uses symbols to record weather observations.2. uses weather charts, calendars, and logs to record daily weather.3. practices tornado drill procedures; talks about the dangers of lightning and flooding. |
| <p>Teacher Notes:</p> <p>Weather includes snow, rain, sleet, wind, and violent storms.</p> | |

STANDARD 5: SCIENCE AND TECHNOLOGY

Grades K-2

SCIENCE AND TECHNOLOGY – The student will have a variety of educational experiences that involve science and *technology*.

Benchmark 1: The student will use technology to learn about the world around them.

| Grades K-2 Indicators | Instructional Examples |
|---|---|
| The student... 1. explores the way things work. 2. experiences science through <i>technology</i> . | The student... 1. observes the inner workings of age appropriate toys, wind-up clocks, music boxes, and other mechanical devices. 2. uses <i>tools</i> such as balances, thermometers, hand lenses, bug viewers, and science software programs. |
| Teacher Notes: Students will use software and other technological resources to discover the world around them. <i>Technology</i> – application of knowledge through inventions. <i>Tools</i> – object(s) used to achieve a goal, to make an observation, and extend the senses (see page 122 in the National Science Education Standards, 1996). | |

STANDARD 6: SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES**Grades K-2****SCIENCE IN PERSONAL AND ENVIRONMENTAL PERSPECTIVES – The student will have a variety of experiences that provide understandings for various science-related personal and environmental challenges.****Benchmark 1: The student will demonstrate responsibility for their own health.**

| Grades K-2 Indicators | Instructional Examples |
|--|---|
| <p>The student...</p> <ol style="list-style-type: none">1. engages in personal care.2. discusses healthy foods.3. discusses that humans need to practice being safe. | <p>The student...</p> <ol style="list-style-type: none">1. practices washing hands, brushing teeth, and engaging in exercise; discusses appropriate types of clothing to wear; discusses personal hygiene.2. explores real fruits and vegetables for textures, tastes, and health value, and/or cuts out pictures of foods and sorts into healthy and not healthy groups.3. discusses the need to obey traffic signals, use crosswalks, and the danger of talking to strangers. |
| <p>Teacher Notes:</p> <p>This standard should be integrated with physical science, life science, earth and space science standards, and physical education.</p> <p>Health encompasses safety, personal hygiene, exercise, and nutrition.</p> | |

STANDARD 7: HISTORY AND NATURE OF SCIENCE

Grades K-2

HISTORY AND NATURE OF SCIENCE – The student will experience scientific inquiry and learn about people from history.

Benchmark 1: The student will know they practice science.

| Grades K-2 Indicators | Instructional Examples |
|---|---|
| <p>The student...</p> <ol style="list-style-type: none"> 1. is involved in explorations that make his/her mind wonder and know that he/she is practicing science. 2. uses <i>technology</i> to learn about people in science. | <p>The student...</p> <ol style="list-style-type: none"> 1. experiences a scientific environment with the teacher leading him/her through the scientific process by asking simple questions, developing simple testable statements (hypotheses), testing the statements by doing simple investigations, and reporting their findings. The following are simple questions that could be used to start the process: <ol style="list-style-type: none"> a. Does a banana float in water? b. What happens if you hold a chocolate chip in your hand? c. What happens if you rub your hands together very fast? 2. reads short stories and views films or videos; listens to guest speakers who are involved in science. |
| <p>Teacher Notes:</p> <p>This standard should be integrated with physical science, life science, and earth and space science standards.</p> <p><i>Technology</i> – application of knowledge through inventions.</p> | |