

# Norton City Schools Standards-Based Science Course of Study 2003

## FIRST GRADE

**NATURE OF SCIENCE**-These scientific process skills should be integrated into the following grade level content units.

**Science and Technology Standard (ST)**

**Scientific Inquiry Standard (SI)**

**Scientific Ways of Knowing Standard (SK)**

K-2 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p><b>By the end of the K-2 program, the student will:</b></p> <p><b><u>Science and Technology</u></b></p> <p>* Explain why people, when building or making something, need to determine what it will be made of and how it will affect other people and the environment. (ST-A)</p> <p>* Explain that to construct something requires planning, communication, problem solving and tools. (ST-B)</p> <p><b><u>Scientific Inquiry</u></b></p> <p>* Ask a testable question. (SI-A)</p> <p>* Design and conduct a simple investigation to explore a question. (SI-B)</p>	<p><b>By the end of First Grade, the student will:</b></p> <p><b><u>Understanding Technology</u></b></p> <p>* Explore that some kinds of materials are better suited than others for making something new (e.g., building materials used in the <i>Three Little Pigs</i>). (ST-1-1)</p> <p>* Explain that when trying to build something or get something to work better, it helps to follow directions and ask someone who has done it before. (ST-1-2)</p> <p><b><u>Abilities To Do Technological Design</u></b></p> <p>* Investigate that tools are used to help make things and some things cannot be made without tools. (ST-1-6)</p> <p>* Explore that several steps are usually needed to make things (e.g., building with blocks). (ST-1-7)</p> <p>* Investigate that when parts are put together they can do things that they could not do by themselves (e.g., blocks, gears and wheels). (ST-1-8)</p> <p><b><u>Doing Scientific Inquiry</u></b></p> <p>* Ask “what happens when” questions. (SI-1-1)</p> <p>* Explore and pursue student-generated “what happens when” questions. (SI-1-2)</p>	

# Norton City Schools Standards-Based Science Course of Study 2003

<p><b>★ Gather and communicate information from careful observations and simple investigation through a variety of methods. (SI-C)</b></p> <p><b><u>Scientific Ways of Knowing</u></b></p> <p><b>★ Recognize that there are different ways to carry out scientific investigations. Realize that investigations can be repeated under the same conditions with similar results and may have different explanations. (SK-A)</b></p> <p><b>★ Recognize the importance of respect for all living things. (SK-B)</b></p> <p><b>★ Recognize that diverse groups of people contribute to our understanding of the natural world. (SK-C)</b></p>	<p><b>★ Use appropriate safety procedures when completing scientific investigations. (SI-1-3)</b></p> <p><b>★ Work in a small group to complete an investigation and then share findings with others. (SI-1-4)</b></p> <p><b>★ Create individual conclusions about group findings. (SI-1-5)</b></p> <p><b>★ Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, timers, simple balances and other appropriate tools). (SI-1-6)</b></p> <p><b>★ Make estimates to compare familiar lengths, weights and time intervals. (SI-1-7)</b></p> <p><b>★ Use oral, written and pictorial representation to communicate work. (SI-1-8)</b></p> <p><b>★ Describe things as accurately as possible and compare with the observations of others. (SI-1-9)</b></p> <p><b><u>Nature of Science</u></b></p> <p><b>★ Discover that when a science investigation is done the same way multiple times, one can expect to get very similar results each time it is performed. (SK-1-1)</b></p> <p><b>★ Demonstrate good explanations based on evidence from investigations and observations. (SK-1-2)</b></p> <p><b><u>Science and Society</u></b></p> <p><b>★ Explain that everybody can do science, invent things and have scientific ideas no matter where they live. (SK-1-3)</b></p>	
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# Norton City Schools Standards-Based Science Course of Study 2003

## FIRST GRADE

### CHARACTERISTICS OF PLANTS

**Earth and Space Sciences Standard (ES)**

**Life Sciences Standard (LS)**

K-2 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the K-2 program, the student will:</p> <p><b>Earth and Space Sciences</b></p> <p>* Explain that living things cause changes on Earth. (ES-B)</p> <p><b>Life Sciences</b></p> <p>* Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms). (LS-A)</p> <p>* Explain how organisms function and interact with their physical environment. (LS-B)</p> <p>* Describe similarities and differences that exist among individuals of the same kind of plants and animals. (LS-C)</p>	<p>By the end of First Grade, the student will:</p> <p><b>Processes That Shape the Earth</b></p> <p>* Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks). (ES-1-3)</p> <p><b>Characteristics and Structure of Life</b></p> <p>* Explore that organisms, including people, have basic needs, which include air, water, food, living space and shelter. (LS-1-1)</p> <p>* Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). (LS-1-2)</p> <p><b>Diversity and Interdependence of Life</b></p> <p>* Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting. (LS-1-4)</p> <p>* Recognize that seasonal changes can influence the health, survival or activities of organisms. (LS-1-5)</p> <p><b>Sub-Objectives to Meet Indicators:</b></p> <ul style="list-style-type: none"><li>• Recognize characteristics that can identify a thing as living:<ul style="list-style-type: none"><li>◦ Ability to grow and change</li><li>◦ Ability to react to its environment</li><li>◦ Need for food or another source of energy</li></ul></li></ul>	

Note: Ohio Academic Content Standards, Benchmarks and Indicators, are typed in bold print and designated by a “★”.

## Norton City Schools Standards-Based Science Course of Study 2003

	<ul style="list-style-type: none"><li>◦ Take in gases for respiration (e.g., breathing, etc.)</li><li>◦ Ability to reproduce</li><li>◦ Made up of cells (taught at grades 3-4)</li><li>• Identify a living organism's need for:<ul style="list-style-type: none"><li>◦ Source of food or energy</li><li>◦ Water</li><li>◦ Gases to take in (e.g., breathing, etc.)</li><li>◦ Environment that will allow for survival (e.g., protection, light temperature, etc.)</li></ul></li><li>• Recognize the parts of a plant and their functions by growing plants (e.g., roots, seeds, leaves, stems, flowers, etc.).</li><li>• Alter conditions for growing plants to determine their effects on seed/plant growth (e.g., less water, fertilizer, no sun, etc.).</li><li>• Make measurements of plants and graph their rates of change over time.</li><li>• Create a list of conditions for keeping something alive, taking into account growing conditions as well as resources needed.</li><li>• Classify plants according to their physical properties (e.g., size, shape, color, texture, etc.).</li><li>• Describe categories of plants (e.g., fruits, vegetables, trees, herbs, houseplants, etc.).</li><li>• Compare and contrast outdoor and indoor plants.</li><li>• Describe the changes in plants through the various seasons.</li></ul>	
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# Norton City Schools Standards-Based Science Course of Study 2003

## FIRST GRADE

### CHARACTERISTICS OF ANIMALS

**Earth and Space Sciences Standard (ES)**

**Life Sciences Standard (LS)**

K-2 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the K-2 program, the student will:</p> <p><b><u>Earth and Space Sciences</u></b></p> <p>* Explain that living things cause changes on Earth. (ES-B)</p> <p><b><u>Life Sciences</u></b></p> <p>* Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms). (LS-A)</p> <p>* Explain how organisms function and interact with their physical environment. (LS-B)</p> <p>* Describe similarities and differences that exist among individuals of the same kind of plants and animals. (LS-C)</p>	<p>By the end of First Grade, the student will:</p> <p><b><u>Processes That Shape the Earth</u></b></p> <p>* Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks). (ES-1-3)</p> <p><b><u>Characteristics and Structure of Life</u></b></p> <p>* Explore that organisms, including people, have basic needs which include air, water, food, living space and shelter. (LS-1-1)</p> <p>* Explain that food comes from sources other than grocery stores (e.g., farm crops, farm animals, oceans, lakes and forests). (LS-1-2)</p> <p>* Explore that humans and other animals have body parts that help to seek, find and take in food when they are hungry (e.g., sharp teeth, flat teeth, good nose, sharp vision). (LS-1-3)</p> <p><b><u>Diversity and Interdependence of Life</u></b></p> <p>* Investigate that animals eat plants and/or other animals for food and may also use plants or other animals for shelter and nesting. (LS-1-4)</p> <p>* Recognize that seasonal changes can influence the health, survival or activities of organisms. (LS-1-5)</p> <p><b><u>Sub-Objectives to Meet Indicators:</u></b></p> <ul style="list-style-type: none"><li>• Recognize characteristics that can identify a thing as living:</li></ul>	

## Norton City Schools Standards-Based Science Course of Study 2003

	<ul style="list-style-type: none"><li>◦ Ability to grow and change</li><li>◦ Ability to react to its environment</li><li>◦ Need for food or another source of energy</li><li>◦ Take in gases for respiration (e.g., breathing, etc.)</li><li>◦ Ability to reproduce</li><li>◦ Made up of cells (taught at grades 3-4)</li><li>● Identify a living organism's need for:<ul style="list-style-type: none"><li>◦ Source of food or energy</li><li>◦ Water</li><li>◦ Gases to take in (e.g., breathing, etc.)</li><li>◦ Environment that will allow for survival (e.g., protection, light, temperature, etc.)</li></ul></li><li>● Explore similarities and differences between various categories of animals (e.g., insects, birds, mammals, fish, amphibians, reptiles, zoo, wild, domesticated, etc.).</li><li>● Classify animals by types of home, environment, basic needs, etc.</li><li>● Compare and contrast animals according to their physical properties (e.g., size, color, shape, texture, weight, etc.).</li><li>● Observe animal growth from a baby to an adult, noting ways animals grow and develop.</li><li>● Classify animals according to physical characteristics (e.g., by body coverings, habitats, legs, adaptive features, wings, etc.).</li><li>● Identify animals that use camouflage as an adaptation to survive (e.g., chameleons, snowshoe rabbits, stick bugs, etc.).</li></ul>	
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# Norton City Schools Standards-Based Science Course of Study 2003

## FIRST GRADE STATES OF MATTER Physical Sciences Standard (PS)

K-2 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p><b>By the end of the K-2 program, the student will:</b></p> <p><b>Physical Sciences</b></p> <p>* Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change. (PS-A)</p>	<p><b>By the end of First Grade, the student will:</b></p> <p><b>Nature of Matter</b></p> <p>* Classify objects according to the materials they are made of and their physical properties. (PS-1-1)</p> <p>* Investigate that water can change from liquid to solid or solid to liquid. (PS-1-2)</p> <p>* Explore and observe that things can be done to materials to change their properties (e.g., heating, freezing, mixing, cutting, wetting, dissolving, bending and exposing to light). (PS-1-3)</p> <p>* Explore changes that greatly change the properties of an object (e.g., burning paper) and changes that leave the properties largely unchanged (e.g., tearing paper). (PS-1-4)</p> <p>* Explore the effects some objects have on others even when the two objects might not touch (e.g., magnets). (PS-1-5)</p> <p>* Investigate a variety of ways to make things move and what causes them to change speed, direction and/or stop. (Review from Kindergarten-PS-1-6)</p> <p><b>Sub-Objectives to Meet Indicators:</b></p> <ul style="list-style-type: none"><li>• Use the senses to investigate the physical properties of objects:<ul style="list-style-type: none"><li>◦ Color</li><li>◦ Temperature</li><li>◦ Magnetic/Nonmagnetic</li><li>◦ Size</li><li>◦ Weight/Mass</li></ul></li></ul>	

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## Norton City Schools Standards-Based Science Course of Study 2003

	<ul style="list-style-type: none"><li>◦ Shape</li><li>◦ Texture</li><li>◦ Float/Sink</li><li>◦ Luster/Shininess</li><li>◦ Malleability/Flexibility</li><li>• Determine the material(s) that objects are made from (e.g., plastic, metal, glass, paper, wood, etc.).</li><li>• Separate and sort objects according to the materials from which they are made.</li><li>• Observe properties of gases (e.g., take up space, have volume, have weight, exert pressure, etc.).</li><li>• Observe properties of liquids (e.g., take the shape of their containers, are fluids, etc.).</li><li>• Observe properties of solids (e.g., have their own shape, etc.).</li><li>• Compare and contrast solids, liquids and gases.</li><li>• Identify examples of solids, liquids and gases.</li><li>• Use the senses to describe physical changes of solids, liquids and gases (e.g., cooking foods, freezing and melting of ice, evaporating water, observing dry ice, etc.).</li></ul>	
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# Norton City Schools Standards-Based Science Course of Study 2003

## FIRST GRADE

### NATURAL RESOURCES: AIR, WATER AND SOIL

Earth and Space Sciences Standard (ES)

Physical Sciences (PS)

Science and Technology Standard (ST)

K-2 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p><b>By the end of the K-2 program, the student will:</b></p> <p><b><u>Earth and Space Sciences</u></b></p> <p>★ Describe what resources are and recognize some are limited but can be extended through recycling or decreased use. (ES-D)</p> <p><b><u>Physical Sciences</u></b></p> <p>★ Recognize sources of energy and their uses. (PS-C)</p> <p><b><u>Science and Technology</u></b></p> <p>★ Explain why people, when building or making something, need to determine what it will be made of and how it will affect other people and the environment. (ST-A)</p>	<p><b>By the end of First Grade, the student will:</b></p> <p><b><u>Earth Systems</u></b></p> <p>★ Identify that resources are things that we get from the living (e.g., forests) and nonliving (e.g., minerals, water) environment and that resources are necessary to meet the needs and wants of a population. (ES-1-1)</p> <p>★ Explain that the supply of many resources is limited but the supply can be extended through careful use, decreased use, reusing and/or recycling. (ES-1-2)</p> <p><b><u>Processes That Shape the Earth</u></b></p> <p>★ Explain that all organisms cause changes in the environment where they live; the changes can be very noticeable or slightly noticeable, fast or slow (e.g., spread of grass cover slowing soil erosion, tree roots slowly breaking sidewalks). (ES-1-3)</p> <p><b><u>Nature of Energy</u></b></p> <p>★ Explore how energy makes things work (e.g., batteries in a toy and electricity turning fan blades). (PS-1-7)</p> <p>★ Recognize that the sun is an energy source that warms the land, air and water. (PS-1-8)</p> <p>★ Describe that energy can be obtained from many sources in many</p>	<ul style="list-style-type: none"><li>• Extension-Recycling Center<ul style="list-style-type: none"><li>◦ Collect and sort materials that can be recycled (e.g., plastics, glass, aluminum, etc.) as a class or school project.</li><li>◦ Recycle materials to create a usable item (e.g., art project, milk carton birdhouse, paper mache, terrarium, etc.).</li><li>◦ Compare and contrast characteristics of common recyclable objects.</li><li>◦ Compare the six different recyclable plastics according to physical properties (e.g., transparent, hard/soft, rigid/flexible, heavy/light, etc.).</li><li>◦ Explain the stages in recycling of objects seen in daily life (e.g., paper, plastic, glass, aluminum, etc.).</li></ul></li></ul>

# Norton City Schools Standards-Based Science Course of Study 2003

	<p>ways (e.g., food, gasoline, electricity or batteries). (PS-1-9)</p> <p><b><u>Science and Technology</u></b></p> <p>* Identify some materials that can be saved for community recycling projects (e.g., newspapers, glass and aluminum). (ST-1-3)</p> <p>* Explore ways people use energy to cook their food and warm their homes (e.g., wood, coal, natural gas and electricity). (ST-1-4)</p> <p>* Identify how people can save energy by turning things off when they are not using them (e.g., lights and motors). (ST-1-5)</p> <p><b><u>Sub-Objectives to Meet Indicators:</u></b></p> <ul style="list-style-type: none"><li>• Identify a living organism's need for:<ul style="list-style-type: none"><li>◦ Source of food or energy</li><li>◦ Water</li><li>◦ Gases to take in</li><li>◦ Environment that will allow for survival (e.g., protection, light, temperature, natural defenses, shelter)</li></ul></li><li>• Compare and contrast the three most important natural resources on the earth, i.e., air, water and soil.</li><li>• Explore and describe environmental problems caused by air, water and soil pollution (e.g., acid rain, air pollution by transportation, erosion/weathering, littering, insecticidal/pesticidal runoff, deforestation, draining swamps, forest fires, oil spills, seasonal change, construction, etc.).</li><li>• Identify and predict the effects of air, water, and soil pollution on the basic needs of living things and the possible endangerment or extinction of organisms.</li><li>• Discuss positive and negative ways humans affect the environment (e.g., insecticides, recycling, etc.).</li><li>• Explore ways living things respond to a change in the environment (e.g., deforestation, draining swamps, forest fires, oil spills, pesticidal runoff, seasonal change, construction, etc.).</li><li>• List ways resources are recycled, renewed, and reused (e.g., paper, plastic, glass, etc.).</li></ul>	
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