

Norton City Schools Standards-Based Science Course of Study

SECOND 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>By the end of the K-2 program, the student will:</p> <p>Science and Technology</p> <ul style="list-style-type: none">* 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)* Explain that to construct something requires planning, communication, problem solving and tools. (ST-B) <p>Scientific Inquiry</p> <ul style="list-style-type: none">* Ask a testable question. (SI-A)* Design and conduct a simple investigation to explore a question. (SI-B)	<p>By the end of Second Grade, the student will:</p> <p>Understanding Technology</p> <ul style="list-style-type: none">* Explain that developing and using technology involves benefits and risks. (ST-2-1)* Investigate why people make new products or invent new ways to meet their individual wants and needs. (ST-2-2)* Predict how building or trying something new might affect other people and the environment. (ST-2-3) <p>Abilities To Do Technological Design</p> <ul style="list-style-type: none">* Communicate orally, pictorially, or in written form the design process used to make something. (ST-2-4) <p>Doing Scientific Inquiry</p> <ul style="list-style-type: none">* Ask “how can I/we” questions. (SI-2-1)* Ask “how do you know” questions (not “why” questions) in appropriate situations and attempt to give reasonable answers when others ask questions. (SI-2-2)* Explore and pursue student-generated “how” questions. (SI-2-3)* Use appropriate safety procedures when completing scientific investigations. (SI-2-4)* Use evidence to develop explanations of scientific investigations.	

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<p>* Gather and communicate information from careful observations and simple investigation through a variety of methods. (SI-C)</p> <p><u>Scientific Ways of Knowing</u></p> <p>* 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)</p> <p>* Recognize the importance of respect for all living things. (SK-B)</p> <p>* Recognize that diverse groups of people contribute to our understanding of the natural world. (SK-C)</p>	<p>(What do you think? How do you know?) (SI-2-5)</p> <p>* Recognize that explanations are generated in response to observations, events and phenomena. (SI-2-6)</p> <p>* Use appropriate tools and simple equipment/instruments to safely gather scientific data (e.g., magnifiers, non-breakable thermometers, timers, rulers, balances, calculators and other appropriate tools). (SI-2-7)</p> <p>* Measure properties of objects using tools such as rulers, balances and thermometers. (SI-2-8)</p> <p>* Use whole numbers to order, count, identify, measure and describe things and experiences. (SI-2-9)</p> <p>* Share explanations with others to provide opportunities to ask questions, examine evidence and suggest alternative explanations. (SI-2-10)</p> <p><u>Nature of Science</u></p> <p>* Describe that scientific investigations generally work the same way under the same conditions. (SK-2-1)</p> <p>* Explain why scientists review and ask questions about the results of other scientists' work. (SK-2-2)</p> <p><u>Ethical Practices</u></p> <p>* Describe ways in which using the solution to a problem might affect other people and the environment. (SK-2-3)</p> <p><u>Science and Society</u></p> <p>* Demonstrate that in science it is helpful to work with a team and share findings with others. (SK-2-4)</p>	
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SECOND GRADE

SOURCES OF LIGHT AND SOUND

Physical Sciences Standard (PS)

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>Physical Sciences</p> <ul style="list-style-type: none">* Recognize that light, sound and objects move in different ways. (PS-B)* Recognize sources of energy and their uses. (PS-C)	<p>By the end of Second Grade, the student will:</p> <p>Forces and Motion</p> <ul style="list-style-type: none">* Explore how things make sound (e.g., rubber bands, tuning fork and strings). (PS-2-1)* Explore and describe sounds (e.g., high, low, soft and loud) produced by vibrating objects. (PS-2-2)* Explore with flashlights and shadows that light travels in a straight line until it strikes an object. (PS-2-3) <p>Sub-Objectives to Meet Indicators:</p> <ul style="list-style-type: none">• Investigate properties of light and sound:<ul style="list-style-type: none">◦ Light<ul style="list-style-type: none">travels in a straight line until it strikes an objectcan be reflected/absorbed/refractedis made up of coloris a source of heat◦ Sound<ul style="list-style-type: none">can be reflected/absorbedloudnesspitch• Identify man-made and natural sources of light and sound:<ul style="list-style-type: none">◦ Light<ul style="list-style-type: none">Natural-sun, lightning bugs, stars, lightning, etc.Man-made-fires, candles, matches, etc.◦ Sound	

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

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	<p>Natural-children's voices, echoes, dogs barking, etc. Man-made-alarms, telephones, cars, etc.</p> <ul style="list-style-type: none">• Recognize the effects of light and sound on the environment (e.g., noise and light pollution, warning signals, information from T.V. and radio, etc.).• Measure light and sound qualitatively (e.g., loud, soft, bright, etc.).• Demonstrate that sound is produced by vibrating objects and that pitch can be varied by changing the rate of vibration.• Infer that the sun is the world's most important source of heat and light.• Investigate the sun's heat being produced and conducted from one object to another (e.g., tinted windows, dark clothing, solar cookers, etc.).• Predict what will happen when light is reflected by a mirror, refracted by a lens, or absorbed by an object.• Demonstrate that light travels in a straight line until it strikes an object where it will refract (bend) or be absorbed.	
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SECOND GRADE LIFE CYCLES IN OHIO HABITATS 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>Life Sciences</p> <ul style="list-style-type: none">* Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms). (LS-A)* Explain how organisms function and interact with their physical environment. (LS-B)* Describe similarities and differences that exist among individuals of the same kinds of plants and animals. (LS-C) <p>Earth and Space Sciences</p> <ul style="list-style-type: none">* Explain that living things cause changes on Earth. (ES-B)	<p>By the end of Second Grade, the student will:</p> <p>Characteristics and Structure of Life</p> <ul style="list-style-type: none">* Explain that animals, including people, need air, water, food, living space and shelter; and plants need air, water, nutrients (e.g., minerals), living space and light to survive. (LS-2-1)* Identify that there are many distinct environments that support different kinds of organisms. (LS-2-2)* Explain why organisms can survive only in environments that meet their needs (e.g., organisms that once lived on earth have disappeared for different reasons such as natural forces or human-caused effects). (LS-2-3) <p>Heredity</p> <ul style="list-style-type: none">* Compare similarities and differences among individuals of the same kind of plants and animals, including people. (LS-2-4) <p>Diversity and Interdependence of Life</p> <ul style="list-style-type: none">* Explain that food is a basic need of plants and animals (e.g., plants need sunlight to make food and to grow, animals eat plants and/or other animals for food, food chain) and is important because it is a source of energy (e.g., energy used to play, ride bicycles, read, etc.). (LS-2-5)* Investigate the different structures of plants and animals that help them live in different environments (e.g., lungs, gills, leaves and roots). (LS-2-6)	

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	<p>* Compare the habitats of many different kinds of Ohio plants and animals and some of the ways animals depend on plants and each other. (LS-2-7)</p> <p>* Compare the activities of Ohio's common animals (e.g., squirrels, chipmunks, deer, butterflies, bees, ants, bats and frogs) during the different seasons by describing changes in their behaviors and body covering. (LS-2-8)</p> <p>* Compare Ohio plants during the different seasons by describing changes in their appearance. (LS-2-9)</p> <p><u>Sub-Objectives to Meet Indicators:</u></p> <ul style="list-style-type: none">• Recognize characteristics that can identify a thing as living:<ul style="list-style-type: none">◦ Ability to grow and change◦ Ability to react to its environment◦ Need for food or another source of energy◦ Take in gases for respiration (e.g., breathing, etc.)◦ Ability to reproduce◦ Made up of cells (taught in grades 3-4)• Classify things as living or nonliving.• Identify a living organism's need for:<ul style="list-style-type: none">◦ Source of food or energy◦ Water◦ Gases to take in (e.g., breathing, etc.)◦ Environment that will allow for survival (e.g., protection, light, temperature, natural defenses, shelter)• Observe plants and animals to determine their needs and how they adapt physically and behaviorally to changes in the weather or the environment (e.g., dinosaur extinction due to weather changes, migration, hibernation, body covering changes in color, etc.).• Observe the life cycles of organisms through pictures or with real plants and animals (e.g., butterflies, lima beans, radishes, mealworms, frogs, etc.).• Describe life cycles of various organisms and observe characteristics at different stages of growth and development.• Compare and contrast cocoons and chrysalises.• Identify the life cycle phases for:<ul style="list-style-type: none">◦ Three Stage/Incomplete Metamorphosis-egg, nymph, adult (e.g.,	
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	<p>grasshoppers, termites, mayflies, dragonflies, cockroaches, crickets, stoneflies, damselflies, frogs, etc.)</p> <ul style="list-style-type: none">◦ Four Stage/Complete Metamorphosis-egg, larva, pupa, adult (e.g., honeybees, butterflies, moths, flies, beetles, etc.)	
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SECOND GRADE SEASONAL CHANGE

Earth and Space Sciences Standard (ES)

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><u>Earth and Space Sciences</u></p> <p>* Observe constant and changing patterns of objects in the day and night sky. (ES-A)</p> <p>* Observe, describe and measure changes in the weather, both long term and short term. (ES-C)</p>	<p>By the end of K-2 Grade, the student will:</p> <p><u>The Universe</u></p> <p>* Recognize that there are more stars in the sky than anyone can easily count. (ES-2-1)</p> <p>* Observe and describe how the sun, moon and stars all appear to move slowly across the sky. (ES-2-2)</p> <p>* Observe and describe how the moon appears a little different every day but looks nearly the same again about every four weeks. (ES-2-3)</p> <p><u>Earth Systems</u></p> <p>* Observe and describe that some weather changes occur throughout the day and some changes occur in a repeating seasonal pattern. (ES-2-4)</p> <p>* Describe weather by measurable quantities such as temperature and precipitation. (ES-2-5)</p> <p><u>Sub-Objectives to Meet Indicators:</u></p> <p>Patterns of the Sun, Moon and Stars</p> <ul style="list-style-type: none">• Create a model of the sun, moon and earth system (e.g., using a globe/sphere and a light source, StarLab, etc.).• Demonstrate how the earth revolves around the sun.• Identify the sun as the brightest star and is located in the center of our solar system.• Investigate and record the direction of a person's shadow at different times	

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	<p>during the day.</p> <ul style="list-style-type: none">• Observe patterns that stars make in the night sky, i.e. constellations (e.g., using pictures, StarLab, etc.).• Investigate what causes day and night and the changing seasons. <p>Patterns in Weather</p> <ul style="list-style-type: none">• Use weather instruments to predict weather conditions (e.g., weathervanes, rain gauges, thermometers).• Describe weather by measurable quantities, such as temperature, wind direction and speed, and precipitation.• Graph daily weather.• Observe and describe changes in weather through sequencing a set of pictures (e.g., seasonal change, water cycle).• Describe and record how weather affects choices of activities in their daily lives.	
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