

# Norton City Schools Standards-Based Science Course of Study

## THIRD 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)**

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><b><u>Science and Technology</u></b></p> <ul style="list-style-type: none"> <li>★ Describe how technology affects human life. (ST-A)</li> <li>★ Describe and illustrate the design process. (ST-B)</li> </ul> <p><b><u>Scientific Inquiry</u></b></p> <ul style="list-style-type: none"> <li>★ Use appropriate instruments safely to observe, measure and collect data when conducting a scientific investigation. (SI-A)</li> <li>★ Organize and evaluate observations, measurements and other data to formulate inferences and conclusions. (SI-B)</li> <li>★ Develop, design and safely conduct scientific investigations and communicate the results. (SI-C)</li> </ul>	<p>By the end of Third Grade, the student will:</p> <p><b><u>Understanding Technology</u></b></p> <ul style="list-style-type: none"> <li>★ Describe how technology can extend human abilities (e.g., to move things and to extend senses). (ST-3-1)</li> <li>★ Describe ways that using technology can have helpful and/or harmful results. (ST-3-2)</li> <li>★ Investigate ways that the results of technology may affect the individual, family and community. (ST-3-3)</li> </ul> <p><b><u>Abilities To Do Technological Design</u></b></p> <ul style="list-style-type: none"> <li>★ Use a simple design process to solve a problem (e.g., identify a problem, identify possible solutions and design a solution). (ST-3-4)</li> <li>★ Describe possible solutions to a design problem (e.g., how to hold down paper in the wind). (ST-3-5)</li> </ul> <p><b><u>Doing Scientific Inquiry</u></b></p> <ul style="list-style-type: none"> <li>★ Select the appropriate tools and use relevant safety procedures to measure and record length and weight in metric and English units. (SI-3-1)</li> <li>★ Discuss observations and measurements made by other people. (SI-3-2)</li> <li>★ Read and interpret simple tables and graphs produced by self/others. (SI-3-3)</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

<p><b><u>Scientific Ways of Knowing</u></b></p> <ul style="list-style-type: none"> <li>★ Distinguish between fact and opinion and explain how ideas and conclusions change as new knowledge is gained. (SK-A)</li> <li>★ Describe different types of investigations and use results and data from investigations to provide the evidence to support explanations and conclusions. (SK-B)</li> <li>★ Explain the importance of keeping records of observations and investigations that are accurate and understandable. (SK-C)</li> <li>★ Explain that men and women of diverse countries and cultures participate in careers in all fields of science. (SK-D)</li> </ul>	<ul style="list-style-type: none"> <li>★ Identify and apply science safety procedures. (SI-3-4)</li> <li>★ Record and organize observations (e.g., journals, charts and tables). (SI-3-5)</li> <li>★ Communicate scientific findings to others through a variety of methods (e.g., pictures, written, oral and recorded observations). (SI-3-6)</li> </ul> <p><b><u>Nature of Science</u></b></p> <ul style="list-style-type: none"> <li>★ Describe different kinds of investigations that scientists use depending on the questions they are trying to answer. (SK-3-1)</li> </ul> <p><b><u>Ethical Practices</u></b></p> <ul style="list-style-type: none"> <li>★ Keep records of investigations and observations and do not change the records that are different from someone else’s work. (SK-3-2)</li> </ul> <p><b><u>Science and Society</u></b></p> <ul style="list-style-type: none"> <li>★ Explore through stories how men and women have contributed to the development of science. (SK-3-3)</li> <li>★ Identify various careers in science. (SK-3-4)</li> <li>★ Discuss how both men and women find science rewarding as a career and in their everyday lives. (SK-3-5)</li> </ul>	
--	--	--

# Norton City Schools Standards-Based Science Course of Study

## THIRD GRADE ROCKS AND SOIL

### Earth and Space Sciences Standard (ES)

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><b><u>Earth and Space Sciences</u></b></p> <ul style="list-style-type: none"> <li>* Summarize the processes that shape Earth’s surface and describe evidence of those processes. (ES-B)</li> <li>* Describe Earth’s resources including rocks, soil, water, air, animals and plants and the ways in which they can be conserved. (ES-C)</li> </ul>	<p>By the end of Third Grade, the student will:</p> <p><b><u>Earth Systems</u></b></p> <ul style="list-style-type: none"> <li>* Compare distinct properties of rocks (e.g., color, layering and texture). (ES-3-1)</li> <li>* Observe and investigate that rocks are often found in layers. (ES-3-2)</li> <li>* Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather. (ES-3-3)</li> <li>* Observe and describe the composition of soil (e.g., small pieces of rock and decomposed pieces of plants and animals, and products of plants and animals). (ES-3-4)</li> <li>* Investigate the properties of soil (e.g., color, texture, capacity to retain water, ability to support plant growth). (ES-3-5)</li> <li>* Investigate that soils are often found in layers and can be different from place to place. (ES-3-6)</li> </ul> <p><b><u>Diversity and Interdependence of Life</u></b></p> <ul style="list-style-type: none"> <li>* Observe and explore how fossils provide evidence about animals that lived long ago and the nature of the environment at that time. (LS-3-5)</li> </ul> <p><b><u>Sub-Objectives to Meet Indicators:</u></b></p> <ul style="list-style-type: none"> <li>• Differentiate between rocks and minerals, including:               <ul style="list-style-type: none"> <li>◦ Rocks are aggregates of minerals and they may also contain organic matter.</li> <li>◦ Rocks have different properties (e.g., color, layering, texture, etc.).</li> </ul> </li> </ul>	

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

	<ul style="list-style-type: none"><li>◦ Rocks reflect the way they were formed and the minerals in them.</li><li>◦ Minerals are composed of only one substance, and that substance is the same in all samples of the mineral.</li><li>● Examine the properties of rocks and minerals, including:<ul style="list-style-type: none"><li>◦ Color</li><li>◦ Texture</li><li>◦ Smell</li><li>◦ Luster</li><li>◦ Transparency</li><li>◦ Hardness</li><li>◦ Shape</li><li>◦ Reaction to magnets</li><li>◦ Cleavage</li></ul></li><li>● Demonstrate that rocks can be broken down into small particles (weathering) to form soil.</li><li>● Identify the properties of soil, including:<ul style="list-style-type: none"><li>◦ Soil contains particles of different sizes.</li><li>◦ Different soils absorb water at different rates.</li><li>◦ Soil affects plant and root growth.</li></ul></li><li>● Examine the composition of soil, including:<ul style="list-style-type: none"><li>◦ Air is present in soil.</li><li>◦ Soil may contain animals, plants, and their remains.</li><li>◦ Over time, dead plants become part of soil.</li><li>◦ Sand, clay, and humus are the three basic components of soil.</li></ul></li><li>● Compare and contrast the soil characteristics that differ from place to place (e.g., beaches, playgrounds, homes, differences between regions of the United States, etc.).</li><li>● Explain why different types of soil exist (e.g., different kinds of remains of plants and animals, chemicals in the soil, weather and climate in the area, etc.).</li><li>● Create examples of soil layering.</li><li>● Illustrate profiles of soil layering.</li></ul>	
--	--	--

# Norton City Schools Standards-Based Science Course of Study

## THIRD GRADE ENVIRONMENTS AND ADAPTATIONS OF ANIMALS Life Sciences Standard (LS)

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><b><u>Life Sciences</u></b></p> <ul style="list-style-type: none"> <li>★ Differentiate between the life cycles of different plants and animals. (LS-A)</li> <li>★ Analyze plant and animal structures and functions needed for survival and describe the flow of energy through a system that all organisms use to survive. (LS-B)</li> <li>★ Compare changes in an organism’s ecosystem/ habitat that affect its survival. (LS-C)</li> </ul>	<p>By the end of Third Grade, the student will:</p> <p><b><u>Heredity</u></b></p> <ul style="list-style-type: none"> <li>★ Compare the life cycles of different animals including birth to adulthood, reproduction and death (e.g., egg-tadpole-frog, egg-caterpillar-chrysalis-butterfly). (Review from Second Grade-LS-3-1)</li> </ul> <p><b><u>Diversity and Interdependence of Life</u></b></p> <ul style="list-style-type: none"> <li>★ Relate animal structures to their specific survival functions (e.g., obtaining food, escaping or hiding from enemies). (LS-3-2)</li> <li>★ Classify animals according to their characteristics (e.g., body coverings and body structure). (LS-3-3)</li> <li>★ Use examples to explain that extinct organisms may resemble organisms that are alive today. (LS-3-4)</li> <li>★ Observe and explore how fossils provide evidence about animals that lived long ago and the nature of the environment at that time. (LS-3-5)</li> <li>★ Describe how changes in an organism’s habitat are sometimes beneficial and sometimes harmful. (LS-3-6)</li> </ul> <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:               <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</li> </ul> </li> </ul>	

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

	<ul style="list-style-type: none"><li>◦ Ability to reproduce</li><li>◦ Made up of cells</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</li><li>◦ Environment that will allow for survival (e.g., protection, light, temperature, etc.)</li></ul></li><li>● Clarify the components of animal habitats (i.e., food, water, shelter, and space in a suitable arrangement/amount).</li><li>● Compare and contrast the various habitats/biomes (e.g., deserts, marshes, oceans, rainforests, farms, savannas, etc.) and how they support the basic needs of organisms for survival.</li><li>● Identify the physical adaptations of animals (e.g., coloration, body covering, types of teeth, types of feet, types of beaks, camouflage, etc.).</li><li>● Identify behavioral adaptations of animals (e.g., migration, hibernation, protection from predators, mimicry, etc.).</li><li>● Describe how a certain characteristic or behavior helps an organism meet its basic needs and identify what basic needs are being met by these characteristics or behaviors.</li><li>● Distinguish between absolutely necessary conditions for growth or survival from conditions that are not necessary.</li><li>● Compare and contrast how organisms, at a population or individual level, react to major environmental changes that are daily or seasonal and regular (e.g., temperature, food availability, pollution, seasonal change, deforestation, construction, wildlife poaching, etc.).</li><li>● Compare and contrast how certain conditions can lead to an animal's endangerment or extinction.</li></ul>	
--	---	--

# Norton City Schools Standards-Based Science Course of Study

## THIRD GRADE FORCES AND MOTION

### Physical Sciences Standard (PS)

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><u>Physical Sciences</u>  <b>★ Describe the forces that directly affect objects and their motion. (PS-C)</b></p>	<p>By the end of Third Grade, the student will:</p> <p><u>Forces and Motion</u>  <b>★ Describe an object’s position by locating it relative to another object or the background. (PS-3-1)</b>  <b>★ Describe an object’s motion by tracing and measuring its position over time. (PS-3-2)</b>  <b>★ Identify contact/non-contact forces that affect motion of an object (e.g., gravity, magnetism and collision). (PS-3-3)</b>  <b>★ Predict the changes when an object experiences a force (e.g., a push or pull, weight and friction). (PS-3-4)</b></p> <p><u>Sub-Objectives to Meet Indicators:</u></p> <ul style="list-style-type: none"> <li>• Define force operationally (through experimentation) as a push or pull.</li> <li>• Describe forces qualitatively (e.g., weaker, stronger, etc.) and quantitatively (e.g., spring scales, rulers, balances, timers, etc.).</li> <li>• Recognize how real-world devices can be used to reduce effort or force related to motion (e.g., simple machines, complex machines, etc.).</li> <li>• Observe that objects at rest will tend to stay at rest unless forces act upon them and that objects in motion tend to stay in motion unless forces act upon them, i.e. inertia.</li> <li>• Recognize relationships between mass and force, including:             <ul style="list-style-type: none"> <li>◦ Things only move when something moves them.</li> <li>◦ Things keep moving until something stops them.</li> <li>◦ The harder something is pushed, the faster it goes.</li> <li>◦ The more massive something is, the harder it is to move.</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

	<ul style="list-style-type: none"><li>• Explore forces that affect motion, including:<ul style="list-style-type: none"><li>◦ Friction (e.g., air resistance, etc.)</li><li>◦ Gravity</li><li>◦ Magnetism</li><li>◦ Air Pressure</li></ul></li><li>• Compare and contrast physical characteristics that are associated with causing or reducing friction (e.g., surfaces, lubricants, wheels, etc.).</li><li>• Investigate real-world examples of motion that can be observed, determining why objects move or stop moving.</li></ul>	
--	--	--



# Norton City Schools Standards-Based Science Course of Study

## THIRD GRADE SIMPLE MACHINES

### Physical Sciences Standard (PS)

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><b><u>Physical Sciences</u></b>  <b>★ Explain the operation of simple mechanical devices.</b>            (Note: This is Fourth Grade Ohio Proficiency Learner Outcome, PS-4-10. It must be taught through the 2003-2004 school year.)</p>	<p>By the end of Third Grade, the student will:</p> <p><b><u>Sub-Objectives to Meet Indicators:</u></b></p> <ul style="list-style-type: none"> <li>• Define force operationally (through experimentation) as a push or pull.</li> <li>• Describe forces qualitatively (e.g., weaker, stronger, etc.) and quantitatively (e.g., spring scales, rulers, balances, timers, etc.).</li> <li>• Define work operationally (through experimentation) as force that moves an object a distance (work = force x distance).</li> <li>• Explore a variety of “simple mechanical devices”, which are defined as “simple, one-function machines”.</li> <li>• Identify the six simple machines (levers, pulleys, wheels and axles, inclined planes, screws, and wedges).</li> <li>• Explore the function(s) of the six simple machines to explain the advantages they have to make work easier and/or faster, thus reducing effort and force:               <ul style="list-style-type: none"> <li>◦ Levers-lift</li> <li>◦ Screws-lift, hold things together</li> <li>◦ Pulleys-lift or lower</li> <li>◦ Wedges-cut, split</li> <li>◦ Wheels and Axles-move objects from one place to another</li> <li>◦ Inclined Planes-move objects from a lower to higher area and vice versa</li> </ul> </li> <li>• Use qualitative and quantitative data to infer that machines make work easier and/or faster.</li> <li>• Compare and contrast how simple mechanical devices work (e.g., forces, motions, distances involved, etc.).</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

	<ul style="list-style-type: none"><li>• Define operationally (through experimentation) the following terms related to these simple machines:<ul style="list-style-type: none"><li>◦ Levers-force, fulcrum, load/effort</li><li>◦ Pulleys-movable pulley, immovable pulley (optional)</li><li>◦ Wheels and Axles-gears</li></ul></li><li>• Construct levers and manipulate their components (force, fulcrum, and load).</li><li>• Identify the contribution of forces in each part of a system (machine) in order to do work more easily.</li><li>• Recognize examples and uses of simple machines in school, at home, and in other places as real-world devices.</li><li>• Recognize how real-world devices can be used to reduce effort or force.</li><li>• Explain how when a machine is used, effort gets easier, work is not reduced and something else is sacrificed (e.g., speed, distance of effort, etc.).</li></ul>	
--	--	--

# Norton City Schools Standards-Based Science Course of Study

## THIRD GRADE NUTRITION

### Life Sciences Standard

3-5 Benchmarks	Grade Level Indicators and Sub-Objectives	Teaching Strategies/Resources
<p>By the end of the 3-5 program, the student will:</p> <p><b>★ Analyze and/or evaluate various nutritional plans for humans. (Note: This is Fourth Grade Ohio Proficiency Learner Outcome, LS-4-19. It must be taught through the 2003-2004 school year.)</b></p>	<p>By the end of Third Grade, the student will:</p> <p><b><u>Sub-Objectives to Meet Indicators:</u></b></p> <ul style="list-style-type: none"> <li>● Analyze the food pyramid to give examples of foods that meet the basic nutritional needs of humans:               <ul style="list-style-type: none"> <li>◦ Grains (e.g., breads, cereals, etc.)</li> <li>◦ Fruits (e.g., apples, pears, etc.)</li> <li>◦ Vegetables (e.g., carrots, cucumbers, etc.)</li> <li>◦ Meat (e.g., nuts, chicken, fish, etc.)</li> <li>◦ Dairy (e.g., milk, yogurt, cheese, etc.)</li> <li>◦ Other (e.g., sugar, oils, etc.)</li> </ul> </li> <li>● Analyze “Nutrition Facts” labels and ingredient lists for food items to compare and contrast whether a food item is relatively high or low in the following nutrients:               <ul style="list-style-type: none"> <li>◦ Protein</li> <li>◦ Carbohydrates (sugars or starches)</li> <li>◦ Fat</li> <li>◦ Vitamins</li> <li>◦ Minerals</li> </ul> </li> <li>● Analyze meal menus of nutritional plans to recognize what nutrients may be lacking, be low in, or have too much of in the foods to be consumed, including:               <ul style="list-style-type: none"> <li>◦ Protein</li> <li>◦ Carbohydrates (sugars or starches)</li> <li>◦ Fat</li> <li>◦ Vitamins</li> </ul> </li> </ul>	

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

	<ul style="list-style-type: none"><li>◦ Minerals</li><li>• Determine whether or not a food item or diet is well balanced according to the U.S. Department of Agriculture Food Guide Pyramid.</li><li>• Recognize the relationship between caloric needs and:<ul style="list-style-type: none"><li>◦ Energy and nutrients needed to be active and maintain or build the body</li><li>◦ People's size</li><li>◦ People's stage of growth</li><li>◦ People's level of activity</li></ul></li><li>• Make inferences about food fads and diets (e.g., protein diets, Slim-Fast, low-fat, balanced diet, etc.).</li></ul>	
--	---	--