

Lakewood City Schools Standards-Based Science Course of Study

Third Grade

Scope and Sequence

The Scientific skills of observation, measuring and classifications serve as focal points for the third grade. Students learn to read and interpret simple tables and graphs, conduct safe investigations in which they collect and analyze data, and communicate the results. Third-graders explore the properties and composition of rocks and soils and the interaction of forces and motion. They also compare the life cycles of animals, classifications of animals according to their characteristics, descriptions of their habitat and adaptations to their environment. Students examine results of technology and explore careers in science, as well as scientific contributions from a diversity of cultures.

Following is an outline of the major components of the science program you will be using this year.

The Lakewood City Schools Science Standards-Based Course of Study is aligned with:

The Ohio Department of Education's
Academic Content Standards.

- ◆ Science and Technology Standard
- ◆ Scientific Inquiry Standard
- ◆ Scientific Ways of Knowing
- ◆ Earth and Space Science Standard
- ◆ Life Science Standard
- ◆ Physical Science Standard

And is arranged by Teaching Units.

Benchmarks and Grade Level Indicators as well as additional local objectives are included with each Teaching Unit for teacher planning.

A list of Teaching Resources to be used with each Teaching Unit is also included.

- ◆ McGraw-Hill Science 2002, Grade 3 Textbook
- ◆ Discovery Works Textbook Modules Grade 4 Textbook (selected chapters)
- ◆ Carolina Biological Kits: *Rocks and Minerals; Motion and Design*

This is a functional and fluid document meant to be utilized by teachers. The inclusion of teacher notes is encouraged as a lesson is implemented.

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UNIT: THE NATURE OF SCIENCE		
<u>3-5 Benchmarks by Standard</u>	<u>Grade Level Indicators</u>	<u>Lakewood Course of Study</u>
<p>By the end of the 3-5 program, the student will:</p> <p><u>Science and Technology Standard</u></p> <p>A. Describe how technology affects human life.</p> <p>B. Describe and illustrate the design process.</p> <p><u>Scientific Inquiry Standard</u></p> <p>A. Use appropriate instruments safely to observe, measure and collect data when conducting a scientific investigation.</p> <p>B. Organize and evaluate observations,</p>	<p>By the end of Third Grade, the student will:</p> <p><u>Understanding Technology</u></p> <ol style="list-style-type: none"> 1. Describe how technology can extend human abilities (e.g., to move things and to extend senses). 2. Describe ways that using technology can have helpful and/or harmful results. 3. Investigate ways that the results of technology may affect the individual, family and community. <p><u>Abilities To Do Technological Design</u></p> <ol style="list-style-type: none"> 1. Use a simple design process to solve a problem (e.g., identify a problem, identify possible solutions and design a solution). 2. Describe possible solutions to a design problem (e.g., how to hold down paper in the wind). <p><u>Doing Scientific Inquiry</u></p> <ol style="list-style-type: none"> 1. Select the appropriate tools and use relevant safety procedures to measure and record length and weight in metric and English units. 2. Discuss observations and measurements 	<p>No additional Lakewood Objectives</p> <p><i>After a brief introduction to the processes and methods of science, objectives in this unit are best taught as an <u>integral part of the Activities and Investigations</u> that you do within the Teaching Units; Rocks/Soils, Animals and Force/Motion.</i></p> <p><u>Resources</u></p> <ul style="list-style-type: none"> • McGraw-Hill Science 2002, Grade 3 Textbook: <ul style="list-style-type: none"> • Pages S 1-8 (Introduction to Book) <ul style="list-style-type: none"> ◦ Textbook per student ◦ 1 Teacher’s Edition Package per teacher ◦ 1 Teacher’s Resource Package per teacher (includes: Reading in Science Resources with Answer Key, Activity Resources with Answer Key, Assessment Book with Answer Key, Cross Curricular Project Book, School to Home Activity Book, Combined Test Prep and Practice Book, and Transparencies)

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UNIT: THE NATURE OF SCIENCE		
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<p>measurements and other data to formulate inferences and conclusions.</p> <p>C. Develop, design and safely conduct scientific investigations and communicate the results.</p>	<p>made by other people.</p> <p>3. Read and interpret simple tables and graphs produced by self/others.</p> <p>5. Record and organize observations (e.g., journals, charts and tables).</p> <p>4. Identify and apply science safety procedures.</p> <p>6. Communicate scientific findings to others through a variety of methods (e.g., pictures, written, oral and recorded observations).</p>	
<p><u>Scientific Ways of Knowing Standard</u></p> <p>A. Distinguish between fact and opinion and explain how ideas and conclusions change as new knowledge is gained.</p> <p>B. Describe different types of investigations and use results and data from investigations to provide the evidence to support explanations and conclusions.</p>	<p><u>Nature of Science</u></p> <p>1. Describe different kinds of investigations that scientists use depending on the questions they are trying to answer.</p>	
<p>C. Explain the importance of keeping records of observations and investigations that are accurate and understandable.</p>	<p><u>Ethical Practices</u></p> <p>1. Keep records of investigations and observations and do not change the records that are different from someone else's work.</p>	
<p>D. Explain that men and women of diverse countries and cultures participate in careers</p>	<p><u>Science and Society</u></p> <p>1. Explore through stories how men and</p>	

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in all fields of science.	women have contributed to the development of science. 2. Identify various careers in science. 3. Discuss how both men and women find science rewarding as a career and in their everyday lives.	

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UNIT: ROCKS & SOIL <u>3-5 Benchmarks by Standard</u>	<u>Grade Level Indicators</u>	<u>Lakewood Course of Study</u> <i>Objectives in italics go beyond Ohio Requirements</i>
<p>By the end of the 3-5 program, the student will:</p> <p><u>Earth and Space Science Standard</u></p> <p>A. Describe Earth’s resources including rocks, soil, water, air, animals and plants and the ways in which they can be conserved.</p>	<p>By the end of Third Grade, the student will:</p> <p><u>Earth Systems</u></p> <ol style="list-style-type: none"> 1. Compare distinct properties of rocks (e.g., color, layering and texture). 2. Observe and investigate that rocks are often found in layers. 3. Describe that smaller rocks come from the breakdown of larger rocks through the actions of plants and weather. 4. 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). 5. Investigate the properties of soil (e.g., 	<p>Lakewood students will do the following in order to master the Grade Level Indicators:</p> <ul style="list-style-type: none"> • Describe the distinct properties of rocks and minerals using <i>Moh’s Scale of Hardness</i> (e.g., color, layering, texture). • <i>Compare and contrast igneous, sedimentary, and metamorphic rocks.</i> • <i>Diagram the steps of the rock cycle.</i> • <i>Describe the processes beneath the surface of the Earth that cause earthquakes and volcanoes.</i> • <i>Describe how the surface of the Earth is made up of large plates which are in motion.</i> • Describe the composition and properties of soil (e.g., soil contains weathered rock, living organisms, products of plant and animals; properties of soil such as color, texture, capacity to retain water, ability to support plant growth). • <i>Design and evaluate investigations of erosion and weathering, including the selection of resources, equipment, and tools for recording data (e.g., planting grass in types of soil-clay, sand, and potting soil to reduce damage).</i>

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	<p>color, texture, capacity to retain water, ability to support plant growth).</p> <p>6. Investigate that soils are often found in layers and can be different from place to place.</p>	<ul style="list-style-type: none"> • <i>Observe and identify the effects of weathering and geological activity in their immediate world (e.g., buildings, sidewalks, cemeteries, playgrounds)</i> • <i>Determine how soil, water, and air pollution affect living organisms related to the reproduction of organisms, components of habitat (i.e., food, water, shelter, and space) and the ecological system as a whole.</i> • <i>Describe how ecological systems react and adapt to stress or negative impacts on soil (e.g., drought, acid rain, floods, housing/commercial land development, strip mining, deforestation, and farming).</i> <p><u>Resources Available</u></p> <ul style="list-style-type: none"> • McGraw-Hill Science 2002, Grade 3 Textbook: Unit C Chapter 5 <ul style="list-style-type: none"> ◦ Textbook per student ◦ 1 Teacher’s Edition Package per teacher ◦ 1 Teacher’s Resource Package per teacher (includes: Reading in Science Resources with Answer Key, Activity Resources with Answer Key, Assessment Book with Answer Key, Cross Curricular Project Book, School to Home Activity Book, Combined Test Prep and Practice Book, and Transparencies) • Rocks and Minerals Kit (Carolina Biological)-1 kit per 2 teachers and 1 teacher’s guide contained within the kit per 2 teachers • Videotapes Bill Nye the Science Guy <ul style="list-style-type: none"> ◦ <u>Rocks and Soil</u>

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UNIT: LIFE CYCLES AND ADAPTATIONS OF ANIMALS <u>3-5 Benchmarks</u>	<u>Grade Level Indicators</u>	<u>Lakewood Course of Study</u>
<p>B. 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.</p> <p>C. Compare changes in an organism's ecosystem/ habitat that affect its survival.</p>	<p><u>Diversity and Interdependence of Life</u></p> <p>2. Relate animal structures to their specific survival functions (e.g., obtaining food, escaping or hiding from enemies).</p> <p>3. Classify animals according to their characteristics (e.g., body coverings and body structure).</p> <p>4. Use examples to explain that extinct organisms may resemble organisms that are alive today.</p>	<ul style="list-style-type: none"> • Identify the life cycle phases for: <ul style="list-style-type: none"> ◦ Three Stage/Incomplete Metamorphosis-egg, nymph, adult (e.g. grasshoppers, termites, mayflies, dragonflies, cockroaches, crickets, stoneflies, damselflies, frogs) ◦ Four Stage/Complete Metamorphosis-egg, larva, pupa, adult (e.g., honeybees, butterflies, moths, flies, beetles) • Determine how soil, water, and air pollution affect living organisms related to life cycles of animals, components of habitat (i.e., food, water, shelter, and space) and the ecological system as a whole. • Sequence a set of pictures of living things (animals and humans) at different stages of growth and development.

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	5. Observe and explore how fossils provide evidence about animals that lived long ago and the nature of the environment at that time. 6. Describe how changes in an organism's habitat are sometimes beneficial and sometimes harmful.	<ul style="list-style-type: none"> • Explore ways in which organisms adapt to their habitats according to seasonal change (e.g., hibernation, migration). • Observe animals to determine their needs and how they respond to changes in the weather or the environment (e.g., adaptations, dinosaur extinction due to weather changes). • Describe how ecological systems react and adapt to stress or negative impacts on the environment (e.g., drought, acid rain, floods, mining, housing/commercial land development, strip mining, deforestation, and farming). • Recognize relationships between human activity and the environment, in terms of: <ul style="list-style-type: none"> ◦ Pollution (air, water, soil) ◦ Conservation of resources (related to animal species)

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		<u>Resources Available</u> <ul style="list-style-type: none"> • <u>McGraw-Hill Science 2002, Grade 3 Textbook:</u> Unit C; Ch. 5 <ul style="list-style-type: none"> ○ Textbook per student ○ 1 Teacher’s Edition Package per teacher ○ 1 Teacher’s Resource Package per teacher (includes: Reading in Science Resources with Answer Key, Activity Resources with Answer Key, Assessment Book with Answer Key, Cross Curricular Project Book, School to Home Activity Book, Combined Test Prep and Practice Book, and Transparencies) • <u>Houghton Mifflin Science Discovery Works 2003</u> Grade 4 Textbook: Unit A-Life Cycles <ul style="list-style-type: none"> ○ Textbook per student ○ 1 Teaching Guide by unit per teacher • <u>Videotapes Bill Nye the Science Guy</u> <ul style="list-style-type: none"> ○ Reptiles ○ Insects ○ Fish ○ Mammals ○ Amphibians ○ Birds <p style="text-align: right;">continued</p>

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		<ul style="list-style-type: none"> • <u>Biomes of Nature Series Literature</u> (The Child's World)- Each LRC Professional Library has 1 copy of the following titles: <ul style="list-style-type: none"> ◦ Coral Reefs ◦ Deserts ◦ Oceans ◦ Prairies ◦ Rainforests ◦ Tundra ◦ Wetland

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FORCE & MOTION UNIT	<u>Grade Level Indicators</u>	<u>Lakewood Course of Study</u>
<p><u>3-5 Benchmarks</u></p> <p>By the end of the 3-5 program, the student will:</p> <p><u>Physical Science Standard</u></p> <p>C. Describe the forces that directly affect objects and their motion.</p>	<p>By the end of Third Grade, the student will:</p> <p><u>Forces and Motion</u></p> <ol style="list-style-type: none"> 1. Describe an object’s position by locating it relative to another object or the background. 2. Describe an object’s motion by tracing and measuring its position over time. 3. Identify contact/non-contact forces that affect motion of an object (e.g., gravity, magnetism and collision). 4. Predict the changes when an object experiences a force (e.g., a push or pull, weight and friction). 	<p>Lakewood students will do the following in order to master the Grade Level Indicators: <i>Objectives in italics go beyond Ohio Requirements</i></p> <ul style="list-style-type: none"> • Describe how electrically charged materials and magnets attract and repel each other and certain kinds of other materials. • Explore friction, gravity, magnetism, lift and air resistance (drag) as forces that affect motion. • Compare and contrast physical characteristics that are associated with causing or reducing friction. • Design experiments that illustrate how friction can be reduced. <ul style="list-style-type: none"> • Investigate real-world examples of motion that can be observed, determining why objects move or stop moving. • Recognize relationships between mass and force, including: <ul style="list-style-type: none"> ◦ Things only move when something moves them. ◦ Things keep moving until something stops them. ◦ The harder something is pushed, the faster it goes.

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		<ul style="list-style-type: none"> ◦ The more massive something is, the harder it is to move. • 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 (also referred to as inertia/Newton’s First Law of Motion). • Investigate real-world examples of motion that can be observed, determining why objects move or stop moving. <p><i>Note: Simple Machines per se do not appear in the State Standards. Any time spent with this concept must be related to the forces and motion described in Grade Level Indicators number 3 & 4.</i></p> <p><u>Resources Available</u></p> <ul style="list-style-type: none"> • <u>McGraw-Hill Science</u> 2002, Grade 3 Textbook: UNIT E CH 9 (and 10 only as far as Note above) <ul style="list-style-type: none"> ◦ Textbook per student ◦ 1 Teacher’s Edition Package per teacher ◦ 1 Teacher’s Resource Package per teacher (includes: Reading in Science Resources with Answer Key, Activity Resources with Answer Key, Assessment Book with Answer Key, Cross Curricular Project Book, School to Home Activity Book, Combined Test Prep and Practice Book, and Transparencies) • <u>Motion and Design</u> (Carolina Biological)-1 kit per 2 teachers and 1 teacher’s guide contained within the kit per 2 teachers • <u>Videotapes Bill Nye the Science Guy</u> <ul style="list-style-type: none"> ◦ <u>Motion</u> ◦ <u>Friction</u>
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