

Pre-Kindergarten

Medina County Schools'

Course of Study

For

Science

June, 2009

STANDARD 1: EARTH AND SPACE SCIENCES

Students demonstrate an understanding about how Earth systems and processes interact in the geosphere resulting in the habitability of Earth. This includes demonstrating an understanding of the composition of the universe, the solar system and Earth. In addition, it includes understanding the properties and the interconnected nature of Earth's systems, processes that shape Earth and Earth's history. Students also demonstrate an understanding of how the concepts and principles of energy, matter, motion and forces explain Earth systems, the solar system and the universe. Finally, they grasp an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with Earth and space sciences.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. Observe constant and changing patterns of objects in the day and night sky.	SC.1.A.PK.1 <i>The Universe</i>	1. Begin to use terms such as night and day, sun and moon to describe personal observations.	Vocabulary
	SC.1.A.PK.2	2. Observe and represent the pattern of day and night through play, art materials or conversation.	
B. Explain that living things cause changes on Earth.	SC.1.B.PK.3 <i>Processes that Shape the Earth</i>	3. Observe, explore, and compare changes that animals and plants cause in their surroundings (e.g., falling leaves, holes left by worms or squirrels).	Assessments
			Resources/Remediation/ Enrichment

STANDARD 2: LIFE SCIENCES

Students demonstrate an understanding of how living systems function and how they interact with the physical environment. This includes an understanding of the cycling of matter and flow of energy in living systems. An understanding of the characteristics, structure and function of cells, organisms and living systems will be developed. Students will also develop a deeper understanding of the principles of heredity, biological evolution, and the diversity and interdependence of life. Students demonstrate an understanding of different historical perspectives, scientific approaches and emerging scientific issues associated with the life sciences.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. Discover that there are living things, non-living things and pretend things, and describe the basic needs of living things (organisms).	SC.2.A.PK.1 <i>Characteristics and Structure of Life</i> SC.2.A.PK.2	1. Identify common needs (e.g., food, air water) of familiar living things. 2. Begin to differentiate between real and pretend through stories, illustrations, play and other media (e.g., talking flowers or animals).	Vocabulary
B. Explain how organisms function and interact with their physical environment.	SC.2.B.PK.3 <i>Diversity and Interdependence of Life</i>	3. Observe and begin to recognize the ways that environments support life by meeting the unique needs of each organism (e.g., plant/soil, birds/air, fish/water).	Assessments
C. Describe similarities and differences that exist among individuals of the same kind of plants and animals.	SC.2.C.PK.4 <i>Heredity</i> SC.2.C.PK.5	4. Match familiar adult family members, plants and animals with their young (e.g., horse/colt, cow/calf). 5. Recognize physical differences among the same class of people plants or animals (e.g., dogs come in many sizes and colors).	Resources/Remediation/ Enrichment

STANDARD 3: PHYSICAL SCIENCES

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. Discover that many objects are made of parts that have different characteristics. Describe these characteristics and recognize ways an object may change.	SC.3.A.PK.1 <i>Nature of Matter</i>	1. Explore and identify parts and wholes of familiar objects (e.g., books, toys, furniture).	Vocabulary
	SC.3.A.PK.2	2. Explore and compare materials that provide many different sensory experiences (e.g., sand, water, wood).	Assessments
	SC.3.A.PK.3	3. Sort familiar objects by one or more property (e.g., size, shape, function).	
B. Recognize that light, sound and objects move in different ways.	SC.3.B.PK.4 <i>Forces and Motion</i>	4. Demonstrate understanding of motion related words (e.g., up, down, fast, slow, rolling, jumping, backward, forward).	Resources/Remediation/ Enrichment
	SC.3.B.PK.5	5. Explore ways of moving objects in different ways (e.g., pushing, pulling, kicking, rolling, throwing, dropping).	
C. Recognize sources of energy and their uses.	SC.3.C.PK.6 <i>Nature of Energy</i>	6. Explore musical instruments and objects and manipulate one's own voice to recognize the changes in the quality of sound (e.g., talks about loud, soft, high, low, fast, slow).	

STANDARD 3: PHYSICAL SCIENCES (Cont.)

Students demonstrate an understanding of the composition of physical systems and the concepts and principles that describe and predict physical interactions and events in the natural world. This includes demonstrating an understanding of the structure and properties of matter, the properties of materials and objects, chemical reactions and the conservation of matter. In addition, it includes understanding the nature, transfer and conservation of energy; motion and the forces affecting motion; and the nature of waves and interactions of matter and energy. Students demonstrate an understanding of the historical perspectives, scientific approaches and emerging scientific issues associated with the physical sciences.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
<p>C. Recognize sources of energy and their uses.</p>	<p>SC.3.PK.C.7</p>	<p>7. Explore familiar sources of the range of colors and the quality of light in the environment (e.g., prism, rainbow, sun shadow).</p>	<p>Vocabulary</p>
			<p>Assessments</p>
			<p>Resources/Remediation/ Enrichment</p>

STANDARD 4: SCIENCE AND TECHNOLOGY

Students recognize that science and technology are interconnected and that using technology involves assessment of the benefits, risks and costs. Students should build scientific and technological knowledge, as well as the skill required to design and construct devices. In addition, they should develop the processes to solve problems and understand that problems may be solved in several ways.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. Explain why people, when building or making something, need to determine what it will be made of, how it will affect other people and the environment.	SC.4.A.PK.1 <i>Understanding Technology</i>	1. Identify the intended purpose of familiar tools (e.g., scissors, hammer, paintbrush, cookie cutter).	Vocabulary
B. Explain that to construct something requires planning, communication, problem solving and tools.	SC.4.A.PK.2	2. Explore new uses for familiar materials through play, art or drama (e.g., paper towel rolls as kazoos, pan for a hat).	
	SC.4.B.PK.3 <i>Abilities To Do Technological Design</i>	3. Use familiar objects to accomplish a purpose, complete a task or solve a problem (e.g., using scissors to create paper tickets for a puppet show, creating a ramp for a toy truck).	Assessments
	SC.4.B.PK.4	4. Demonstrate the safe use of tools such as scissors, hammers, writing utensils, with adult guidance.	
			Resources/Remediation/ Enrichment

STANDARD 5: SCIENTIFIC INQUIRY

Students develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They understand how to develop hypotheses and make predictions. They are able to reflect on scientific practices as they develop plans of action to create and evaluate a variety of conclusions. Students are also able to demonstrate the ability to communicate their findings to others.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. Ask a testable question.	SC.5.A.PK.1 <i>Doing Scientific Inquiry</i>	1. Ask questions about objects, organisms and events in their environment during shared stories, conversations and play (e.g., ask about how worms eat).	Vocabulary
	SC.5.A.PK.2	2. Show interest in investigating unfamiliar objects, organisms and phenomena during shared stories, conversations and play (e.g., “Where does hail come from?”).	
	SC.5.A.PK.3	3. Predict what will happen next based on previous experiences (e.g., when a glass falls off the table and hits the tile floor, it most likely will break).	Assessments
	SC.5.A.PK.4	4. Investigate natural laws acting upon objects, events, and organisms (e.g., repeatedly dropping objects to observe the laws of gravity, observing the life cycle of insects).	
			Resources/Remediation/ Enrichment

STANDARD 5: SCIENTIFIC INQUIRY (Cont.)

Students develop scientific habits of mind as they use the processes of scientific inquiry to ask valid questions and to gather and analyze information. They understand how to develop hypotheses and make predictions. They are able to reflect on scientific practices as they develop plans of action to create and evaluate a variety of conclusions. Students are also able to demonstrate the ability to communicate their findings to others.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
B. Design and conduct a simple investigation to explore a question.	SC.5.B.PK.5	5. Use one or more of the senses to observe and learn about objects, organisms and phenomena for a purpose (e.g., to record, classify, compare, talk about).	Vocabulary
	SC.5.B.PK.6	6. Explore objects, organisms and events using simple equipment (e.g., magnets and magnifiers, standard and non-standard measuring tools).	
C. Gather and communicate information from careful observations and simple investigation through a variety of methods.	SC.5.C.PK.7	7. Begin to make comparisons between objects or organisms based on their characteristics (e.g., animals with four legs, smooth and rough rocks).	Assessments
	SC.5.C.PK.8	8. Record or represent and communicate observations and findings through a variety of methods (e.g., pictures, words, graphs, dramatizations) with assistance.	
			Resources/Remediation/ Enrichment

STANDARD 6: SCIENTIFIC WAYS OF KNOWING

Students realize that the current body of scientific knowledge must be based on evidence, be predictive, logical, subject to modification and limited to the natural world. This includes demonstrating an understanding that scientific knowledge grows and advances as new evidence is discovered to support or modify existing theories, as well as to encourage the development of new theories. Students are able to reflect on ethical scientific practices and demonstrate an understanding of how the current body of scientific knowledge reflects the historical and cultural contributions of women and men who provide us with a more reliable and comprehensive understanding of the natural world.

Ohio Benchmarks Grade PreK	Instructional Organization	Grade Level Indicators	Notes
A. 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.	SC.6.A.PK.1 <i>Nature of Science</i>	1. Offer ideas and explanations (through drawings, emergent writing, conversation, movement) of objects, organisms and phenomena, which may be correct or incorrect.	Vocabulary
B. Recognize the importance of respect for all living things.	SC.6.B.PK.2 <i>Ethical Practices</i>	2. Recognize the difference between helpful and harmful actions toward living things (e.g., watering or not watering plants).	Assessments
C. Recognize that diverse groups of people contribute to our understanding of the natural world.	SC.6.C.PK.3 <i>Science and Society</i>	3. Participate in simple, spontaneous scientific explorations with others (e.g., digging to the bottom of the sandbox, testing materials that sink or float).	Resources/Remediation/ Enrichment