



SPRING GROVE AREA SCHOOL DISTRICT



PLANNED COURSE OVERVIEW

Course Title: Science Grade Level(s): 4 Units of Credit: NA Classification: Required	Length of Course: Full Year Periods Per Cycle: 6 Length of Period: 30 Minutes Total Instructional Time: 90 Hours
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Course Description

This course provides students with a foundation of skills in Life, Earth, Physical Science, Environmental Literacy and Sustainability, and Engineering and Technology.

Instructional Strategies, Learning Practices, Activities, and Experiences

Anchor Charts Anticipatory Sets Bell Ringers Class Discussions Closure Critical Thinking Graphic Organizers Guided Reading Higher Level Questioning Homework	Interaction Sequence Internet Research Journals Paper and Pencil Activities Posted Objectives Practice Exercises Presentations PSSA Released Materials Question-Answer Relationships Quizzes	Reports and Speeches Research Small Group Interventions Teacher Demonstrations Teacher Made Tests Technology Integration Videos / DVDs Wait Time Wait Time Extended
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Assessments

Homework Oral Projects Presentations	Projects Reports Teacher Observations	Teacher Made Tests and Quizzes PSSA Practice Materials PSSA Item Samplers
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Materials/Resources

Core Knowledge Science Guest Speakers Internet	Leveled Readers Resource Books SAS (Standards Aligned System)	Supplemental Readings Videos / DVDs
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Adopted: 1/27/88

Revised: 9/3/91, 12/8/97, 11/15/01, 5/19/14, 5/22/23

3.1 Life Science	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
Structure and Function Information Processing Taught Using Core Knowledge Unit – Structures and Functions of Living Things Lessons 4-9	3.1.4.A - Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction. 3.1.4.B - Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

3.2 Physical Sciences	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Definitions of Energy</p> <p>Conservation of Energy and Energy Transfer</p> <p>Relationship Between Energy and Forces</p> <p>Energy in Chemical Processes and Everyday Life</p> <p>Taught Using Core Knowledge Unit Energy Transfer and Transformation Lesson 1-13</p>	<p>3.2.4.A - Use evidence to construct an explanation relating the speed of an object to the energy of that object.</p> <p>3.2.4.B - Make and communicate observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.</p> <p>3.2.4.C - Ask questions and predict outcomes about the changes in energy that occur when objects collide.</p> <p>3.2.4.D - Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.</p>

3.2 Physical Sciences -Cont'd	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Wave Properties</p> <p>Electromagnetic Radiation</p> <p>Information Technologies and Instrumentation</p> <p>Taught Using Core Knowledge Unit Investigating Waves Lessons 1, 2 and 4-14</p>	<p>3.2.4.E - Develop a model of waves to describe patterns in terms of amplitude and wavelength and that waves can cause objects to move.</p> <p>3.2.4.F - Develop a model to describe that light reflecting from objects and entering the eye allows objects to be seen.</p> <p>3.2.4.G - Generate and compare multiple solutions that use patterns to transfer information.</p>

3.3 Earth and Space Science	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
The History of Planet Earth Earth Materials and Systems Plate Tectonics and Large-Scale System Interactions Taught Using Core Knowledge Unit Processes That Shape Earth Lessons 2-6 and 8-13	3.3.4.A - Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time. 3.3.4.B - Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation. 3.3.4.C - Analyze and interpret data from maps to describe patterns of Earth's features.

3.3 Earth and Space Science Cont'd	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
Natural Resources Natural Hazards Taught Using Core Knowledge Unit Using Natural Resources for Energy Lessons 2-17	3.3.4.D - Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment. 3.3.4.E - Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.

3.4 Environmental literacy and Sustainability	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
Agricultural and Environmental Systems and Resources – Agricultural Systems	3.4.3-5.A – Analyze how living organisms, including humans, affect the environment in which they live, and how their environment affects them.
Agricultural and Environmental Systems and Resources – Environment and Society	3.4.3-5.B – Make a claim about the environmental and societal impacts of design solutions and civic actions, including their own actions.
Agricultural and Environmental Systems and Resources – Watersheds and Wetlands	3.4.3-5.C – Examine ways you influence your local environment and community by collecting and displaying data.
Environmental Literacy Skills – Investigating Environmental Issues	3.4.3-5.D – Develop a model to demonstrate how local environmental issues are connected to larger environment and human systems.
Environmental Literacy Skills – Evaluating Solutions	3.4.3-5.E – Construct an argument to support whether action is needed on a selected environmental issue and propose possible solutions.
Sustainability and Stewardship – Environmental Stewardship	3.4.3-5.F – Critique ways that people depend on and change the environment.
Sustainability and Stewardship – Environmental Justice	3.4.3-5.G – Investigate how perspectives over the use of resources and the development of technology have changed over time and resulted in conflict over the development of societies and nations.
Taught Using Lecture, Problem-Based Learning, Demonstrations, and Collaborative Learning	

3.5 Technology and Engineering	
CONTENT/KEY CONCEPTS	OBJECTIVES/STANDARDS
<p>Applying, Maintaining, and Assessing Technological Products and Systems</p> <p>Impacts of Technology</p> <p>Influence of Society on Technological Development</p> <p>Design and Design Thinking in Technology and Engineering Education</p> <p>Integration of Knowledge, Technologies, and Practices</p> <p>Taught Using Inquiry Based Learning, Problem-based Learning, Collaborative Learning, Demonstration, and Research</p>	<p>3.5.3-5.A - Use appropriate symbols, numbers, and words to communicate key ideas about technological products and systems.</p> <p>3.5.3-5.B - Examine information to assess the trade-offs to using a product or system.</p> <p>3.5.3-5.C - Follow directions to complete a technological task.</p> <p>3.5.3-5.F - Classify resources used to create technologies as either renewable or nonrenewable.</p> <p>3.5.3-5.I - Design solutions by safely using tools, materials, and skills.</p> <p>3.5.3-5.K - Judge technologies to determine the best one to use to complete a given task or meet a need.</p> <p>3.5.3-5.L - Demonstrate how tools and machines extend human capabilities, such as holding, lifting, carrying, fastening, separating, and computing.</p> <p>3.5.3-5.M - Demonstrate essential skills of the engineering design process.</p> <p>3.5.3-5.N - Identify why a product or system is not working properly.</p> <p>3.5.3-5.O - Describe requirements of designing or making a product or system.</p> <p>3.5.3-5.P - Evaluate the strengths and weaknesses of existing design solutions, including their own solutions.</p> <p>3.5.3-5.Q - Practice successful design skills.</p> <p>3.5.3-5.R - Apply tools, techniques, and materials in a safe manner as part of the design process.</p> <p>3.5.3-5.S - Illustrate that there are multiple approaches to design.</p> <p>3.5.3-5.T - Apply universal principles and elements of design.</p> <p>3.5.3-5.U - Evaluate designs based on criteria, constraints, and standards.</p> <p>3.5.3-5.V - Interpret how good design improves the human condition.</p> <p>3.5.3-5.W - Describe the properties of different materials.</p> <p>3.5.3-5.X - Explain how various relationships can exist between technology and engineering and other content areas.</p>

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<p>Applying, Maintaining, and Assessing Technological Products and Systems</p> <p>Impacts of Technology</p> <p>Influence of Society on Technological Development</p> <p>Nature and Characteristics of Technology and Engineering</p> <p>Core Concepts of Technology and Engineering</p> <p>History of Technology</p> <p>Taught Using Technology Research Project</p>	<p>3.5.3-5.D - Predict how certain aspects of their daily lives would be different without given technologies.</p> <p>3.5.3-5.E - Explain why responsible use of technology requires sustainable management of resources.</p> <p>3.5.3-5.G - Describe the helpful and harmful effects of technology.</p> <p>3.5.3-5.H - Determine factors that influence changes in a society's technological systems or infrastructure.</p> <p>3.5.3-5.J - Explain how technologies are developed or adapted when individual or societal needs and wants change.</p> <p>3.5.3-5.FF - Compare how things found in nature differ from things that are human-made, noting differences and similarities in how they are produced and used.</p> <p>3.5.3-5.GG - Describe the unique relationship between science and technology, and how the natural world can contribute to the human-made world to foster innovation.</p> <p>3.5.3-5.HH - Differentiate between the role of scientists, engineers, technologists, and others in creating and maintaining technological systems.</p>