

North East School District PA Core Curriculum Map

Science

Fourth Grade



INTRODUCTION

North East School District has adopted Pennsylvania Department of Education's Standards Aligned System for Science Academic Standards as well as has integrated the concepts from the national standards for science by Next Generation Science.


The performance expectations in fourth grade help students formulate answers to questions such as: "What are waves and what are some things they can do? How can water, ice, wind and vegetation change the land? What patterns of Earth's features can be determined with the use of maps? How do internal and external structures support the survival, growth, behavior, and reproduction of plants and animals? What is energy and how is it related to motion? How is energy transferred? How can energy be used to solve a problem?"

They apply their knowledge of natural Earth processes to generate and compare multiple solutions to reduce the impacts of such processes on humans. In order to describe patterns of Earth's features, students analyze and interpret data from maps. Fourth graders are expected to develop an understanding that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

In the fourth-grade performance expectations, students are expected to demonstrate grade-appropriate proficiency in asking questions, developing and using models, planning and carrying out investigations, analyzing and interpreting data, constructing explanations and designing solutions, engaging in argument from evidence, and obtaining, evaluating, and communicating information. Students are expected to use these practices to demonstrate understanding of the core ideas.

This document describes what students should know and be able to do in the following eight areas:

- ◇ 3.1. Biological Sciences
- ◇ 3.2. Physical Sciences: Chemistry and Physics
- ◇ 3.3. Earth and Space Sciences
- ◇ 3.4. Technology and Engineering Education

<p><u>SCIENCE</u></p> 	<p><u>Science 4</u></p> <p>Fourth Grade Science begins the year with a focus on the Nature of Science, inquiry, and the process of a scientific investigation. We learn the scientific process, fact vs. opinion, how to make observations, and how to take measurements. From there we use those skills in our learning units about Force and Motion and Energy. We then adjust course to a wider focus on where energy comes from and the systems that power the world around us. Beginning with the Earth, Sun, and Moon system, we then move into the Earth's landforms and the rock cycle, as well as Atmosphere and Weather with the water cycle. This prior learning then leads to our unit on Biological Science, specifically on how plants and animals adapt and change to the alterations in their respective environments. Finally, at the end of the year, we focus on how human beings are impacting the ecosystems around the world in both positive and negative ways. We also learn about what we can do to prevent catastrophic change.</p> <p><u>PA CORE Reporting Categories & Assessment Anchors</u></p> <p><u>The Nature of Science</u> S.4.A.1 → Reasoning and Analysis. S.4.A.2 → Processes, Procedures, and Tools of Scientific Investigations. S.4.A.3 → Systems, Models, and Patterns.</p> <p><u>Biological Sciences</u> S.4.B.1 → Structure and Function of Organisms. S.4.B.2 → Continuity of Life. S.4.B.3 → Ecological Behavior and Systems.</p> <p><u>Physical Sciences</u> S.4.C.1 → Structure, Properties, and Interaction of Matter and Energy.</p>	<p><u>GRADE 4</u></p>
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	<p>S.4.C.2 → Forms, Sources, Conversion, and Transfer of Energy. S.4.C.3 → Principles of Motion and Force.</p> <p><u>Earth and Space Sciences</u></p> <p>S.4.D.1 → Earth Features and Processes That Change Earth and Its Resources. S.4.D.2 → Weather, Climate, and Atmospheric Processes. S.4.D.3 → Composition and Structure of the Universe.</p>			
MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
SEPTEMBER	<p>Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Identify appropriate instruments for a specific task and describe the information that the instrument can provide.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1 Distinguish between a scientific fact and an opinion, providing clear explanations that connect observations and results.</p> <p>S4.A.1.3.1 Observe and record change by using time and measurement.</p> <p>S4.A.2.1.1 Generate questions about objects, organisms, or events that can be answered through</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Scientific Tools And Measurement</i></p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p> <p>Beakers Graduated Cylinders Hand Lenses Balances</p>

	the possible effects of those changes.	<p>scientific investigations.</p> <p>S4.A.2.1.2 Design and describe an investigation to test one variable.</p> <p>S4.A.2.1.4 State a conclusion that is consistent with the information/data.</p> <p>S4.A.2.2.1 Identify appropriate tools or instruments for specific tasks and describe the information they can provide.</p>		<p>Rulers Meter Sticks Tape Measures Spring Scales Microscopes Telescope Binoculars</p> <p>Various Objects For Measurement</p> <p>Food Coloring Milk Pie Tins Cotton Balls Rubber Bands Popsicle Sticks K'Nex Lego Bricks Erasers</p>
MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
OCTOBER	Identify and describe different types of force and motion resulting from these forces, or the effect of the interaction between force and motion.	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1, S4.A.2.1.1, S4.A.2.1.2, S4.A.2.1.4, S4.A.2.2.1</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo,</p>

	<p>Recognize basic energy types and sources, or describe how energy can be changes from one form to another.</p> <p>Identify systems and describe relationships among parts of a familiar system.</p> <p>Use models to illustrate simple concepts and compare the models to what they represent.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p> <p>Apply skills necessary to conduct an experiment or</p>	<p>S4.A.3.2.3 Use appropriate, simple modeling tools and techniques to describe or illustrate a system.</p> <p><u>Physical Sciences</u></p> <p>S4.C.2.1.1 Identify energy forms, energy transfer, and energy examples.</p> <p>S4.C.2.1.2 Describe the flow of energy through an object or system.</p> <p>S4.C.3.1.1 Describe changes in motion caused by forces.</p> <p>S4.C.3.1.2 Compare the relative movement of objects or describe types of motion that are evident.</p>	<p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Making Observations And Recording Data</i></p> <p><i>Force And Motion</i></p>	<p>Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p> <p>Cotton Balls</p> <p>Rubber Bands</p> <p>Popsicle Sticks</p> <p>K'Nex</p> <p>Rubber Band Cannons</p> <p>Marbles</p> <p>Marble Launchers</p>
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	<p>design a solution to solve a problem.</p> <p>Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p>			
NOVEMBER	<p>Describe observable physical properties of matter.</p> <p>Recognize basic energy types and sources, or describe how energy can be changed from one form to another.</p> <p>Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1</p> <p>S4.A.1.3.2 Describe relative size, distance, or motion.</p> <p>S4.A.1.3.3 Observe and describe the change to objects caused by temperature change or light.</p> <p>S4.A.2.1.1, S4.A.2.1.2, S4.A.2.1.4, S4.A.2.2.1, S4.A.3.2.3</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Energy Forms And Transformations</i></p> <p><i>Heat And Light</i></p> <p><i>Electricity And Sound</i></p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p> <p>M&M's</p> <p>Flashlights</p> <p>Mirrors</p> <p>Color Paddles</p> <p>Crayons</p> <p>Colored Pencils</p>

	<p>Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p> <p>Use models to illustrate simple concepts and compare the models to what they represent.</p>	<p><u>Physical Sciences</u></p> <p>S4.C.1.1.1 Use physical properties to describe matter.</p> <p>S4.C.1.1.2 Categorize/group objects using physical characteristics.</p> <p>S4.C.2.1.1, S4.C.2.1.2</p> <p>S4.C.2.1.3 Recognize or illustrate simple direct current series and parallel circuits composed of batteries, light bulbs, wire, and on/off switches.</p> <p>S4.C.2.1.4 Identify characteristics of sound.</p> <p>S4.C.3.1.1, S4.C.3.1.2</p> <p>S4.C.3.1.3 Describe the position of an object by locating it</p>		<p>Plastic Spoons Black Light Fluorescent Light Incandescent Light Snap Circuit Kits Thermometers Prisms Musical Instruments String Rubber Bands Metal Hangers White T-Shirt Black T-Shirt</p>
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MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
DECEMBER	<p>Describe Earth’s relationship to the Sun and the Moon.</p> <p>Identify and make observations about patterns that regularly occur and reoccur in nature.</p> <p>Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Use models to illustrate simple concepts and compare the models to what they represent.</p>	<p>relative to another object or a stationary background.</p> <p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1, S4.A.1.3.2, S4.A.1.3.3, S4.A.2.1.1</p> <p>S4.A.2.1.3 Observe a natural phenomenon, record observations, and then make a prediction based on those observations.</p> <p>S4.A.2.1.4, S4.A.2.2.1</p> <p>S4.A.3.2.2 Use models to make observations to explain how systems work.</p> <p>S4.A.3.3.1 Identify and describe observable patterns.</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Properties Of Matter</i></p> <p><i>Relative Motion And Position</i></p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p> <p>Model Of The Sun Globe</p> <p>Model Of The Moon Earth/Sun/Moon Book</p> <p>Moon Phases Posters</p>

		<p>S4.A.3.3.2 Predict future conditions/events based on observable patterns.</p> <p><u>Earth And Space Sciences</u></p> <p>S4.D.3.1.1 Describe motions of the Sun-Earth-Moon system.</p> <p>S4.D.3.1.2 Explain how the motion of the Sun-Earth-Moon system relates to time.</p> <p>S4.D.3.1.3 Describe the causes of seasonal change as they relate to the revolution of the Earth and the tilt of Earth's axis.</p>		
JANUARY	<p>Describe basic landforms in Pennsylvania.</p> <p>Describe Earth's different</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p>	<p>Science Books & Articles From Library/Internet</p>

	<p>sources of water or describe changes in the form of water.</p> <p>Describe basic weather conditions and how they are measured.</p> <p>Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p> <p>Use models to illustrate simple concepts and compare the models to what they represent.</p> <p>Identify and make observations about patterns that regularly occur and reoccur in nature.</p>	<p><u>Earth And Space Sciences</u></p> <p>S4.D.1.1.1 Describe how prominent Earth features in Pennsylvania were formed.</p> <p>S4.D.1.1.2 Identify various Earth structures through the use of models.</p> <p>S4.D.1.1.3 Describe the composition of soil as weathered rock and decomposed organic remains.</p> <p>S4.D.1.3.1 Describe types of freshwater and saltwater bodies.</p> <p>S4.D.1.3.2 Explain how water goes through phase changes.</p> <p>S4.D.1.3.3</p>	<p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Earth, Sun, And Moon</i></p> <p><i>Landforms And Soil</i></p> <p><i>Earth's Water</i></p>	<p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p> <p>Play-Doh Water Cycle Model Tarp Plastic Bin Cotton Balls Construction Paper Glue Weather Tools <i>Anemometer</i> <i>Thermometer</i> <i>Barometer</i> <i>Hygrometer</i> <i>Wind Vane</i> <i>Wind Sock</i></p>
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		<p>Describe or compare lentic systems and lotic systems.</p> <p>S4.D.1.3.4 Explain the role and relationship of a watershed or a wetland on water sources.</p> <p>S4.D.2.1.1 Identify basic cloud types and make connections to basic elements of weather.</p> <p>S4.D.2.1.2 Identify weather patterns from data charts or graphs of the data.</p> <p>S4.D.2.1.3 Identify appropriate instruments to study weather and what they measure.</p>		
MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
FEBRUARY	Identify and describe similarities and differences	<u>Nature Of Science</u>	Teacher Created Assessments	Science Books & Articles From

	<p>between living things and their life processes.</p> <p>Identify systems and describe relationships among parts of a familiar system.</p> <p>Identify and explain how adaptations help organisms to survive.</p> <p>Identify that characteristics are inherited and thus, offspring closely resemble their parents.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p> <p>Use models to illustrate simple concepts and</p>	<p>S4.A.1.1.1, S4.A.1.3.1</p> <p>S4.A.1.3.4 Explain what happens to a living organism when its food supply, access to water, shelter, or space is changed.</p> <p>S4.A.3.1.2 Explain a relationship between the living and nonliving components in a system.</p> <p>S4.A.3.1.3 Categorize the parts of an ecosystem as either living or nonliving and describe their roles in the system.</p> <p>S4.A.3.2.1 Identify what different models represent.</p> <p><u>Biological Sciences</u></p> <p>S4.B.1.1.1 Identify life processes of</p>	<p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Weather</i></p> <p><i>Scientific Evidence</i></p> <p><i>Experimental Design</i></p>	<p>Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p>
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	<p>compare the models to what they represent.</p> <p>Identify and make observations about patterns that regularly occur and reoccur in nature.</p>	<p>living things.</p> <p>S4.B.1.1.2 Compare similar functions of external characteristics of organisms.</p> <p>S4.B.1.1.3 Describe basic needs of plants and animals.</p> <p>S4.B.1.1.4 Describe how different parts of a living thing work together to provide what the organism needs.</p> <p>S4.B.1.1.5 Describe the life cycles of different organisms.</p> <p>S4.B.2.1.1 Identify characteristics for plant and animal survival in different environments.</p> <p>S4.B.2.1.2 Explain how specific adaptations can help a living organism survive.</p>		
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		<p>S4.B.2.2.1 Identify physical characteristics that appear in both parents and could be passed on to offspring.</p> <p>S4.B.3.1.1 Describe the living and nonliving components of a local ecosystem.</p> <p>S4.B.3.1.2 Describe interactions between living and nonliving components of a local ecosystem.</p> <p>S4.B.3.2.1 Describe what happens to a living thing when its habitat is changed.</p> <p>S4.B.3.2.2 Describe and predict how changes in the environment can affect systems.</p>		
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<p>MARCH/APRIL</p>	<p>Identify the types and uses of Earth’s resources.</p> <p>Identify and describe human reliance on the environment at the individual or community level.</p> <p>Describe, explain, and predict change in natural or human-made systems and the possible effects of those changes on the environment.</p> <p>Identify and describe living and nonliving things in the environment and their interaction.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1</p> <p>S4.A.3.1.1 Categorize systems as either natural or human-made.</p> <p><u>Biological Sciences</u></p> <p>S4.B.3.2.3 Explain and predict how changes in seasons affect plants, animals, or daily human life.</p> <p>S4.B.3.3.3 Identify biological pests that compete with humans for resources.</p> <p>S4.B.3.3.5 Describe the effects of pollution in the community.</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Basic Needs</i></p> <p><i>Structure And Function</i></p> <p><i>Life’s Processes</i></p> <p><i>Life Cycles</i></p> <p><i>Heredity</i></p> <p><i>Adaptations</i></p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p>

	possible effects of change.	<p><u>Earth And Space Sciences</u></p> <p>S4.D.1.2.1 Identify products and by-products of plants and animals for human use.</p> <p>S4.D.1.2.2 Identify the types and uses of Earth materials for renewable, nonrenewable, and reusable products.</p>		
MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
APRIL	<p>Identify the types and uses of Earth’s resources.</p> <p>Identify and describe human reliance on the environment at the individual or community level.</p> <p>Describe, explain, and predict change in natural or human-made systems and</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1</p> <p>S4.A.1.1.2 Identify and describe examples of common technological changes past to present in the community that have either positive or negative impacts on society or the</p>	<p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p>

	<p>the possible effects of those changes on the environment.</p> <p>Identify and describe living and nonliving things in the environment and their interaction.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p>	<p>environment.</p> <p>S4.A.1.3.1</p> <p>S4.A.1.3.5 Provide examples, predict, or describe how everyday human activities may change the environment.</p> <p>S4.A.3.1.1, S4.A.3.1.2</p> <p>S4.A.3.1.4 Identify the parts of the food and fiber systems as they relate to agricultural products from the source to the consumer.</p> <p>Biological Sciences</p> <p>S4.B.3.2.2, S4.B.3.2.3</p> <p>S4.B.3.3.1 Identify everyday human activities within a community that depend on the natural environment.</p>	<p>Study Island Topic: <i>Ecosystems</i></p> <p><i>Environments And Their Organisms</i></p> <p><i>Environmental Change And The Response Of Organisms</i></p> <p><i>Human Environmental Impact</i></p> <p><i>Earth's Material And Natural Resources</i></p>	<p>National Geographic Explorer Magazines</p>
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		<p>S4.B.3.3.2 Describe the human dependence on the food and fiber systems from production to consumption.</p> <p>S4.B.3.3.3</p> <p>S4.B.3.3.4 Identify major land uses in the urban, suburban, and rural communities.</p> <p>S4.B.3.3.5</p> <p><u>Earth And Space Sciences</u></p> <p>S4.D.1.2.1, S4.D.1.2.2</p> <p>S4.D.1.2.3 Recognize ways that humans benefit from the use of water resources.</p>		
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<p>MAY</p>	<p>Apply skills necessary to conduct an experiment or design a solution to solve a problem.</p> <p>Identify appropriate instruments for a specific task and describe the information the instrument can provide.</p> <p>Identify and explain the application of scientific knowledge to possible solutions to problems.</p> <p>Recognize and describe change in natural or human-made systems and the possible effects of those changes.</p> <p>Use models to illustrate simple concepts and compare the models to what they represent.</p> <p>Identify systems and describe relationships</p>	<p><u>Nature Of Science</u></p> <p>S4.A.1.1.1, S4.A.1.3.1, S4.A.2.1.1, S4.A.2.1.2, S4.A.2.1.4, S4.A.2.2.1, S4.A.3.2.1, S4.A.3.2.3</p> <p><u>Biological Sciences</u></p> <p>S4.B.3.2.3, S4.B.3.3.1, S4.B.3.3.2, S4.B.3.3.3, S4.B.3.3.4, S4.B.3.3.5</p> <p><u>Physical Sciences</u></p> <p>S4.C.2.1.1, S4.C.2.1.2, S4.C.3.1.1</p> <p><u>Earth And Space Sciences</u></p> <p>S4.D.1.2.1, S4.D.1.2.2, S4.D.1.2.3</p>	<p><i>Final Science Project</i></p> <p>Teacher Created Assessments</p> <p>Tests/Quizzes</p> <p>Science Journals</p> <p>Questioning</p> <p>Observation</p> <p>Laboratory Activities</p> <p>Study Island Topic: <i>Models</i></p> <p><i>Systems And Patterns</i></p> <p><i>Technology And Society</i></p>	<p>Science Books & Articles From Library/Internet</p> <p>Science Videos From Youtube, Vimeo, Netflix, And Hulu</p> <p>Science Journals</p> <p>Computers</p> <p>National Geographic Explorer Magazines</p>

	among parts of a system.			
MONTH/QUARTER	CONCEPTS	STANDARDS/ ELIGIBLE CONTENT	ASSESSMENTS	RESOURCES
JUNE	Comprehensive And Cumulative Review	<u>Nature Of Science</u> <u>Biological Sciences</u> <u>Physical Sciences</u> <u>Earth And Space Sciences</u>	... As Identified	... As Identified