

**Correlation of
Seeds of Science/Roots of Reading
4th and 5th Grade Integrated Science and Literacy Units:**

*Aquatic Ecosystems
Planets & Moons
Models of Matter
Chemical Changes*

**with the State of Pennsylvania
Science Standards for Grades 4 and 5**



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	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
3.1. UNIFYING THEMES- GRADE 4				
A. Know that natural and human-made objects are made up of parts.	• •			
• Identify and describe what parts make up a system.	• • •	•	•	
• Identify system parts that are natural and human-made	• •	•	•	
• Describe the purpose of analyzing systems.	• •			
• Know that technologies include physical technology systems				
B. Know models as useful simplifications of objects or processes.	• • •	• • •	• • •	• •
• Identify different types of models.	• • •	• • •	• • •	• •
• Identify and apply models as tools for prediction and insight.	• • •	• • •	• • •	• •
• Apply appropriate simple modeling tools and techniques.	• • •	• • •	• • •	• •
• Identify theories that serve as models (e.g., molecules).			• • •	
C. Illustrate patterns that regularly occur and reoccur in nature.	• • •	• • •	• •	• •
• Identify observable patterns	• • •	• • •	•	• •
• Use knowledge of natural patterns to predict next occurrences	• • •	• •		• •
D. Know that scale is an important attribute of natural and human made objects, events and phenomena.		• •		
• Identify the use of scale as it relates to the measurement of distance, volume and mass.		• •		
• Describe scale as a ratio				
• Explain the importance of scale in producing models and apply it to a model.				
E. Recognize change in natural and physical systems.	• • •	• •	• •	• •
• Recognize change as fundamental to science and technology concepts.	• •			• •
• Examine and explain change by using time and measurement.	• •			
• Describe relative motion.		• • •		
• Describe the change to objects caused by heat, cold, light or chemicals.			• •	• • •

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
3.2. INQUIRY AND DESIGN- GRADE 4				
A. Identify and use the nature of scientific and technological knowledge.	• • •	• • •	• • •	• • •
• Distinguish between a scientific fact and a belief.	• •	• •	• •	• •
• Provide clear explanations that account for observations and results.	• • •	• • •	• • •	• • •
• Relate how new information can change existing perceptions.	• • •	• • •	• • •	• • •
B. Describe objects in the world using the five senses.	• • •	• • •	• • •	• • •
• Recognize observational descriptors from each of the five senses	•	•	•	•
• Use observations to develop a descriptive vocabulary.	• • •	• •	• •	• •
C. Recognize and use the elements of scientific inquiry to solve problems.	• • •	• •	• •	• • •
• Generate questions about objects, organisms and/or events that can be answered through scientific investigations.	• • •	• •	• •	• • •
• Design an investigation.	• • •			• • •
• Conduct an experiment.	• •		• •	• • •
• State a conclusion that is consistent with the information.	• • •	• • •	• • •	• • •
D. Recognize and use the technological design process to solve problems.		• • •		
• Recognize and explain basic problems.		• •		
• Identify possible solutions and their course of action.		• • •		
• Try a solution.		• • •		
• Describe the solution, identify its impacts and modify if necessary.		• • •		
• Show the steps taken and the results.		• •		
3.3 BIOLOGICAL SCIENCES				
A. Know the similarities and differences of living things.	• •			
• Identify life processes of living things	• • •			
• Know that some organisms have similar external characteristics and that similarities and differences are related to environmental habitat.	• • •			
• Describe basic needs of plants and animals.	• • •			

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3.3. BIOLOGICAL SCIENCES- GRADE 4 continued				
B. Know that living things are made up of parts that have specific functions.	• • •			
• Identify examples of unicellular and multicellular organisms.	•			
• Determine how different parts of a living thing work together to make the organism function.	• •			
C. Know that characteristics are inherited and, thus, offspring closely resemble their parents.				
• Identify characteristics for animal and plant survival in different climates.				
• identify physical characteristics that appear in both parents and offspring and differ between families, strains or species.				
D. Identify changes in living things over time.	• •			
• Compare extinct life forms with living organisms.				
3.4 PHYSICAL SCIENCE, CHEMISTRY AND PHYSICS- GRADE 4				
A. Recognize basic concepts about the structure and properties of matter.			• • •	• •
• Describe properties of matter			• • •	• •
• Know that combining two or more substances can make new materials with different properties.				• • •
• Know different material characteristics			• • •	• • •
B. Know basic energy types, sources and conversions.				
• Identify energy forms and examples				
• Know the concept of the flow of energy by measuring flow through an object or system.				
• Describe static electricity in terms of attraction, repulsion and sparks.				
• Apply knowledge of the basic electrical circuits to design and construction simple direct current circuits.				
• Classify materials as conductors and nonconductors.				
• Know and demonstrate the basic properties of heat by producing it in a variety of ways.				
• Know the characteristics of light (e.g., reflection, refraction, absorption) and use them to produce heat, color or a virtual image.				

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3.4 PHYSICAL SCIENCE, CHEMISTRY AND PHYSICS- GRADE 4 continued				
C. Observe and describe different types of force and motion.		• •		
• Identify characteristics of sound (pitch, loudness and echoes)				
• Recognize forces that attract or repel other objects and demonstrate them.		• •		
• Describe various types of motions.		• •		
• Compare the relative movement of objects and describe types of motion that are evident.		• • •		
• Describe the position of an object by locating it relative to another object or the background		• •		
D. Describe the composition and structure of the universe and the earth's place in it.		• •		
• Recognize earth's place in the solar system.		• • •		
• Explain and illustrate the causes of seasonal changes.				
• Identify planets in our solar system and their general characteristics.		• • •		
• Describe the solar system motions and use them to explain time (e.g., days, seasons), major lunar phases and eclipses.		• •		
3.5 EARTH SCIENCES- GRADE 4				
A. Know basic landforms and earth history.				
• Describe earth processes that have affected selected physical features in students' neighborhoods.				
• Identify various earth structures (e.g., mountains, faults, drainage basins) through the use of models.				
• Identify the composition of soil as weathered rock and decomposed organic remains.				
• Describe fossils and the type of environment they lived in				
B. Know types and uses of earth materials.				
• Identify uses of various earth materials				
• Identify and sort earth materials according to a classification key				

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3.5 EARTH SCIENCES- GRADE 4 continued				
C. Know basic weather elements.				
• identify cloud types.				
• Identify weather patterns from data charts (including temperature, wind direction and speed, precipitation) and graphs of the data.				
• Explain how the different seasons effect plants, animals, food availability and daily human life.				
D. Recognize the earth's different water resources.				
• Know that approximately three-fourths of the earth is covered by water.	• •			
• identify and describe types of fresh and salt-water bodies.	• • •			
• Identify examples of water in the form of solid, liquid and gas on or near the surface of the earth.				
• Explain and illustrate evaporation and condensation.			• • •	
• Recognize other resources available from water				
3.8 SCIENCE, TECHNOLOGY AND HUMAN ENDEAVORS- GRADE 4				
A. Know that people select, create and use science and technology and that they are limited by social and physical restraints.		• •		
• Identify and describe positive and negative impacts that influence or result from new tools and techniques.				
• Identify how physical technology, informational technology and biotechnology are used to meet human needs.		•	• •	• •
• Describe how scientific discoveries and technological advancements are related.		• •		
• Identify interrelationships among technology, people and their world.	•	•	•	•
• Apply the technological design process to solve a simple problem.		• • •		

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3.8 SCIENCE, TECHNOLOGY AND HUMAN ENDEAVORS- GRADE 4 continued				
B. Know how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.		• •	•	•
• Identify and distinguish between human needs and improving the quality of life.				
• Identify and distinguish between natural and human-made resources.				
• Describe a technological invention and the resources that were used to develop it.		• • •		
C. Know the pros and cons of possible solutions to scientific and technological problems in society.				
• Compare the positive and negative expected and unexpected impacts of technological change.				
• Identify and discuss examples of technological change in the community that have both positive and negative impacts.				
4.1 WATERSHEDS AND WETLANDS- GRADE 4				
A. Identify various types of water environments.	• • •			
• Identify the lotic system (e.g., creeks, rivers, streams).	•			
• Identify the lentic system (e.g., ponds, lakes, swamps).	•			
B. Explain the differences between moving and still water.	•			
• Explain why water moves or does not move.				
• Identify types of precipitation.				
C. Identify living things found in water environments	• • •			
• Identify fish, insects and amphibians that are found in fresh water.	• • •			
• Identify plants found in fresh water.	• • •			
D. Identify a wetland and the plants and animals found there.	• •			
• Identify different kinds of wetlands.				
• Identify plants and animals found in wetlands.	• •			
• Explain wetlands as habitats for plants and animals.	• •			

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4.1 WATERSHEDS AND WETLANDS- GRADE 4 continued				
E. Recognize the impact of watersheds and wetlands on animals and plants.				
• Explain the role of watersheds in everyday life.				
• Identify the role of watersheds and wetlands for plants and animals.				
4.2 RENEWABLE AND NONRENEWABLE RESOURCES- GRADE 4				
A. Identify needs of people.				
• Identify plants, animals, water, air, minerals and fossil fuels as natural resources.				
• Explain air, water and nutrient cycles.				
• Identify how the environment provides for the needs of people.	• •			
B. Identify products derived from natural resources.				
• Identify products made from trees.				
• Identify by-products of plants and animals.				
• Identify the sources of manmade products				
C. Know that some natural resources have limited life spans.				
• Identify renewable and nonrenewable resources used in the local community.				
• Identify various means of conserving natural resources.	• •			
• Know that natural resources have varying life spans.				
D. Identify by-products and their use of natural resources.				
• Understand the waste stream.				
• Identify those items that can be recycled and those that can not.				
• Identify use of reusable products.				
• Identify the use of compost, landfills and incinerators.				

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4.3 ENVIRONMENTAL HEALTH- GRADE 4				
A. Know that plants, animals and humans are dependent on air and water.	• •			
• Know that all living things need air and water to survive.	• •			
• Describe potentially dangerous pest controls used in the home.				
• Identify things that cause sickness when put into the air, water or soil.				
• Identify different areas where health can be affected by air, water or land pollution.				
• Identify actions that can prevent or reduce waste pollution.				
B. Identify how human actions affect environmental health.	• • •			
• Identify pollutants.				
• Identify sources of pollution.	•			
• Identify litter and its effect on the environment.				
• Describe how people can reduce pollution.	•			
C. Understand that the elements of natural systems are interdependent.	• • •			
• Identify some of the organisms that live together in an ecosystem.	• • •			
• Understand that the components of a system all play a part in a healthy natural system.	• • •			
• Identify the effects of a healthy environment on the ecosystem.	• •			
4.6 ECOSYSTEMS AND THEIR INTERACTIONS- GRADE 4				
A. Understand that living things are dependent on nonliving things in the environment for survival.	• • •			
• Identify and categorize living and nonliving things.	•			
• Describe the basic needs of an organism.	• • •			
• Identify basic needs of a plant and an animal and explain how their needs are met.	• •			
• Identify plants and animals with their habitat and food sources.	• • •			
• Identify environmental variables that affect plant growth.	• •			

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4.6 ECOSYSTEMS AND THEIR INTERACTIONS- GRADE 4 continued				
• Describe how animals interact with plants to meet their needs for shelter.	• •			
• Describe how certain insects interact with soil for their needs.				
• Understand the components of a food chain.	• • •			
• Identify a local ecosystem and its living and nonliving components.	•			
• Identify a simple ecosystem and its living and nonliving components.	• • •			
• Identify common soil textures.				
• Identify animals that live underground.				
B. Understand the concept of cycles.				
• Explain the water cycle.				
• Explain the carbon dioxide/oxygen cycle (photosynthesis).				
C. Identify how ecosystems change over time.	• • •			
4.7 THREATENED, ENDANGERED, AND EXTINCT SPECIES- GRADE 4				
A. Identify differences in living things.	• • •			
• Explain why plants and animals are different colors, shapes and sizes and how these differences relate to their survival.	• • •			
• Identify characteristics that living things inherit from their parents.				
• Explain why each of the four elements in a habitat is essential for survival.	• • •			
• Identify local plants or animals and describe their habitat.				
B. Know that adaptations are important for survival.	• •			
• Explain how specific adaptations can help a living organism to survive.	• •			
• Explain what happens to a living thing when its food, water, shelter or space is changed.	• •			
C. Define and understand extinction.				
• Identify plants and animals that are extinct.				
• Explain why some plants and animals are extinct.				
• Know that there are local and state laws regarding plants and animals.	•			

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4.8 HUMANS AND THE ENVIRONMENT- GRADE 4				
A. Identify the biological requirements of humans.				
• Explain how a dynamically changing environment provides for sustainability of living systems.				
• Identify several ways that people use natural resources.				
B. Know that environmental conditions influence where and how people live.				
• Identify how regional natural resources influence what people use.				
• Explain the influence of climate on how and where people live.				
C. Explain how human activities may change the environment.	• • •			
• Identify everyday human activities and how they affect the environment.	• •			
• Identify examples of how human activities within a community affect the natural environment.	• • •			
D. Know the importance of natural resources in daily life.				
• Identify items used in daily life that come from natural resources.				
• Identify ways to conserve our natural resources.				
• Identify major land uses in the community.				

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3.1 UNIFYING THEMES- GRADE 7				
A. Explain the parts of a simple system and their relationship to each other.	• • •	• •	•	
• Describe a system as a group of related parts that work together to achieve a desired result	• •	• •		
• Explain the importance of order in a system.				
• Distinguish between system inputs, system processes and system outputs.	•			
• Distinguish between open loop and closed loop systems.				
• Apply systems analysis to solve problems.				
B. Describe the use of models as an application of scientific or technological concepts.	• • •	• •	• • •	• •
• Identify and describe different types of models and their functions.	• •	• •	• • •	•
• Apply models to predict specific results and observations	• • •	• •	• • •	•
• Explain systems by outlining a system's relevant parts and its purpose and/or designing a model that illustrates its function.	• •		• • •	
C. Identify patterns as repeated processes or recurring elements in science and technology.	• • •	• • •	• •	• •
• Identify different forms of patterns and use them to group and classify specific objects.		• • •		
• Identify repeating structure patterns.	• •	• •		
• Identify and describe patterns that occur in physical systems informational systems and biochemical-related systems.				
D. Explain scale as a way of relating concepts and ideas to one another by some measure.		• •		
• Apply various applications of size and dimensions of scale to scientific, mathematical, and technological applications.		•		
• Describe scale as a form of ratio and apply to a life situation.				

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3.1 UNIFYING THEMES- GRADE 7- continued				
E. Identify change as a variable in describing natural and physical systems.	• • •	• •	• •	• •
• Describe fundamental science and technology concepts that could solve practical problems.	•	•	•	•
• Explain how ratio is used to describe change.				
• Describe the effect of making a change in one part of a system on the system as a whole.	• • •		•	
3.2 INQUIRY AND DESIGN- GRADE 7				
A. Explain/apply scientific/technological knowledge.	• •	• • •	• •	• •
• Distinguish between a scientific theory and a belief.	•	•	•	•
• Answer “What if” questions based on observation, inference or prior knowledge or experience.	• • •	• • •	• • •	• • •
• Explain how skepticism about an accepted scientific explanation led to a new understanding.				
• Explain how new information may change existing theories and practice.	• •	•	• •	• •
B. Apply process knowledge to make and interpret observations.	• • •	• • •	• • •	• • •
• Measure materials using a variety of scales.				
• Describe relationships by making inferences and predictions.	• • •	• •	• • •	• • •
• Communicate, use space / time relationships, define operationally, raise questions, formulate hypotheses, test and experiment,				
• Design controlled experiments, recognize variables, and manipulate variables.	• • •			• • •
• Interpret data, formulate models, design models, and produce solutions.	• • •		• •	• •
C. Identify and use the elements of scientific inquiry to solve problems.				
• Generate questions about objects, organisms and/or events that can be answered through scientific investigations.	• • •	• •	• • •	• • •
• Evaluate the appropriateness of questions.	• • •			• • •
• Design an investigation with limited variables to investigate a question.	• • •			• • •
• Conduct a two-part experiment.	• •			• •
• Judge the significance of experimental information in answering the question.	• •			• •
• Communicate conclusions from the experiment.	• • •			• • •

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3.2 INQUIRY AND DESIGN- GRADE 7 continued				
D. Know and use the technological design process to solve problems.		• • •		
• Define different types of problems.				
• Define all aspects of the problem, necessary information and questions that must be answered.		• •		
• Propose the best solution.		• • •		
• Design and propose alternative methods to achieve solutions.				
• Apply a solution.		• •		
• Explain the results, present improvements, identify and infer the impacts of the solution.		• •		
3.3 BIOLOGICAL SCIENCES- GRADE 7				
A. Describe the similarities and differences that characterize diverse living things.	• • •			
• Describe how the structures of living things help them function in unique ways.	• • •			
• Explain how to use a dichotomous key to identify plants and animals.				
• Account for adaptations among organisms that live in a particular environment.	• •			
B. Describe the cell as the basic structural and functional unit of living things.				
• Identify the levels of organization from cell to organism.				
• Compare life processes at the organism level with life processes at the cell level.				
• Explain that cells and organisms have particular structures that underlie their functions.				
• Describe and distinguish among cell cycles, reproductive cycles and life cycles.				
• Explain disease effects on structures or functions of an organism.				

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3.3 BIOLOGICAL SCIENCES- GRADE 7 continued				
C. Know that every organism has a set of genetic instructions that determines its inherited traits.				
• Identify and explain inheritable characteristics.				
• Identify that the gene is the basic unit of inheritance.				
• Identify basic patterns of inheritance (e.g., dominance, recessive, co-dominance).				
• Describe how traits are inherited.				
• Distinguish how different living things reproduce				
• recognize that mutations can alter a gene.				
• Describe how selective breeding, natural selection and genetic technologies can change genetic makeup of organisms.				
D. Explain basic concepts of natural selection.				
• Identify adaptations that allow organisms to survive in their environment.	• •			
• Describe how an environmental change can affect the survival of organisms and entire species.	• •			
• know that differences in individuals of the same species may give some advantage in surviving and reproducing.				
• recognize that populations of organisms can increase rapidly.				
• Describe the role that fossils play in studying the past.				
• Explain how biologic extinction is a natural process.				
3.4 PHYSICAL SCIENCE, CHEMISTRY AND PHYSICS- GRADE 7				
A. Describe concepts about the structure and properties of matter.			• • •	• •
• Identify elements as basic building blocks of matter that cannot be broken down chemically.				• • •
• Distinguish compounds from mixtures.				• •
• Describe and conduct experiments that identify chemical and physical properties.				• •
• Describe reactants and products of simple chemical reactions.				• • •

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3.4 PHYSICAL SCIENCE, CHEMISTRY AND PHYSICS- GRADE 7, continued				
B. Relate energy sources and transfers to heat and temperature.				
<ul style="list-style-type: none"> Identify and describe sound changes in moving objects. 				
<ul style="list-style-type: none"> Know that the sun is a major source of energy that emits wavelengths of visible light, infrared and ultraviolet radiation. 	•			
<ul style="list-style-type: none"> Explain the conversion of one form of energy to another by applying knowledge of each form of energy. 				
<ul style="list-style-type: none"> Explain the parts and functions in an electrical circuit. 				
C. Identify and explain the principles of force and motion.				
<ul style="list-style-type: none"> Describe the motion of an object based on its position, direction and speed. 				
<ul style="list-style-type: none"> Classify fluid power systems according to fluid used or mode of power transmission 				
<ul style="list-style-type: none"> Explain various motions using models. 		• •		
<ul style="list-style-type: none"> Explain how convex and concave mirrors and lens change light images. 				
<ul style="list-style-type: none"> Explain how sound and light travel in waves of differing speeds, sizes and frequencies. 				
D. Describe essential ideas about the composition and structure of the universe and the earth's place in it.		• •		
<ul style="list-style-type: none"> Compare various planets' characteristics. 		• • •		
<ul style="list-style-type: none"> Describe basic star types and identify the sun as a star type. 				
<ul style="list-style-type: none"> Describe basic star types and identify the sun as a star type. 				
<ul style="list-style-type: none"> Identify gravity as the force that keeps planets in orbit around the sun and governs the rest of the movement of the solar system and the universe. 		• • •		
<ul style="list-style-type: none"> Illustrate how the positions of stars and constellations change in relation to the Earth during an evening and from month to month. 				
<ul style="list-style-type: none"> Identify equipment and instruments that explore the universe. 		• • •		

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3.4 PHYSICAL SCIENCE, CHEMISTRY AND PHYSICS- GRADE 7, continued				
<ul style="list-style-type: none"> Identify the accomplishments and contributions provided by selected past and present scientists in the field of astronomy. 		• •		
<ul style="list-style-type: none"> Identify and articulate space program efforts to investigate possibilities of living in space and on other planets 				
3.5 EARTH SCIENCES- GRADE 7				
A. Describe earth features and processes.				
<ul style="list-style-type: none"> Describe major layers of the earth. 				
<ul style="list-style-type: none"> Describe the processes involved in the creation of geologic features and that these processes seen today are similar to those in the past. 				
<ul style="list-style-type: none"> Describe the processes that formed Pennsylvania geologic structures and resources including mountains, glacial formations, water gaps and ridges. 				
<ul style="list-style-type: none"> Explain how the rock cycle affected rock formations in the state of Pennsylvania. 				
<ul style="list-style-type: none"> Distinguish between examples of rapid surface changes and slow surface changes 				
<ul style="list-style-type: none"> Identify living plants and animals that are similar to fossil forms. 				
B. Recognize earth resources and how they affect everyday life.				
<ul style="list-style-type: none"> Identify and locate significant earth resources in Pennsylvania. 				
<ul style="list-style-type: none"> Explain the processes involved in the formation of oil and coal in Pennsylvania. 				
<ul style="list-style-type: none"> Explain the value and uses of different earth resources 				
<ul style="list-style-type: none"> Compare the locations of human settlements as related to available resources. 				
C. Describe basic elements of meteorology.				
<ul style="list-style-type: none"> Explain weather forecasts by interpreting weather data and symbols. 				
<ul style="list-style-type: none"> Explain the oceans' impact on local weather and the climate of a region. 				

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3.5 EARTH SCIENCES- GRADE 7- continued				
<ul style="list-style-type: none"> Identify how cloud types, wind directions and barometric pressure changes are associated with weather patterns in different regions of the country. 				
<ul style="list-style-type: none"> Explain and illustrate the processes of cloud formation and precipitation. 				
<ul style="list-style-type: none"> Describe and illustrate the major layers of the earth's atmosphere. 				
<ul style="list-style-type: none"> Identify different air masses and global wind patterns and how they relate to the weather patterns in different regions of the U.S. 				
D. Explain the behavior and impact of the earth's water systems.				
<ul style="list-style-type: none"> Explain the water cycle using the processes of evaporation and condensation. 				
<ul style="list-style-type: none"> Describe factors that affect evaporation and condensation. 			• •	
<ul style="list-style-type: none"> Distinguish salt from fresh water 	• •			
<ul style="list-style-type: none"> Compare the effect of water type and the life contained in them. 	• •			
<ul style="list-style-type: none"> Identify ocean and shoreline features 	• •			
3.8 SCIENCE, TECHNOLOGY AND HUMAN ENDEAVORS- GRADE 7				
A. Explain how sciences and technologies are limited in their effects and influences on society.				
<ul style="list-style-type: none"> Identify and describe the unavoidable constraints of technological design. 		• • •		
<ul style="list-style-type: none"> Identify changes in society as a result of a technological development. 				
<ul style="list-style-type: none"> Identify and explain improvements in transportation, health, sanitation and communications as a result of advancements in science and technology and how they effect our lives. 				
B. Explain how human ingenuity and technological resources satisfy specific human needs and improve the quality of life.				
<ul style="list-style-type: none"> Identify interrelationships between systems and resources. 		• •	•	•
<ul style="list-style-type: none"> Identify and describe the resources necessary to solve a selected problem in a community and improve the quality of life. 				

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3.8 SCIENCE, TECHNOLOGY AND HUMAN ENDEAVORS- GRADE 7-continued				
<ul style="list-style-type: none"> identify and explain specific examples of how agricultural science has met human needs and has improved the quality of life. 				
C. Identify the pros and cons of applying technological and scientific solutions to address problems and the effect upon society.				
<ul style="list-style-type: none"> Describe the positive and negative expected and unexpected effects of specific technological developments. 				
<ul style="list-style-type: none"> Describe ways technology extends and enhances human abilities. 		•••	•	
4.1 WATERSHEDS AND WETLANDS- GRADE 7				
A. Explain the role of the water cycle within a watershed.				
<ul style="list-style-type: none"> Explain the water cycle. 				
<ul style="list-style-type: none"> Explain the water cycle as it relates to a watershed. 				
B. Understand the role of the watershed.				
<ul style="list-style-type: none"> Identify and explain what determines the boundaries of a watershed. 				
<ul style="list-style-type: none"> Explain how water enters a watershed. 				
<ul style="list-style-type: none"> Explain factors that affect water quality and flow through a watershed. 				
C. Explain the effects of water on the life of organisms in a watershed.				
<ul style="list-style-type: none"> Explain how water is necessary for all life. 	•			
<ul style="list-style-type: none"> Explain how the physical components of aquatic systems influence the organisms that live there in terms of size, shape and physical adaptations. 	•••			
<ul style="list-style-type: none"> Describe the life cycle of organisms that depend on water. 	•			
<ul style="list-style-type: none"> Identify organisms that have aquatic stages of life and describe those stages. 	••			

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.1 WATERSHEDS AND WETLANDS- GRADE 7- continued				
D. Explain and describe characteristics of a wetland.	•			
• Identify specific characteristics of wetland plants and soils.				
• Recognize the common types of plants and animals.	•			
• Describe different types of wetlands.				
• Describe the different functions of a wetland.				
E. Describe the impact of watersheds and wetlands on people.				
• Explain the impact of watersheds and wetlands in flood control, wildlife habitats and pollution abatement.				
• Explain the influence of flooding on wetlands				
4.2 RENEWABLE AND NONRENEWABLE RESOURCES- GRADE 7				
A. Know that raw materials come from natural resources.				
• Identify resources used to provide humans with energy, food, housing and water.				
• Explain how plants and animals may be classified as natural resources.				
• Compare means of growing or acquiring food.				
• Identify fiber and other raw materials used in clothing and shelter production.				
• Identify types of minerals and fossil fuels used by humans.				
B. Examine the renewability of resources.				
• Identify renewable resources and describe their uses.				
• Identify nonrenewable resources and describe their uses.				
• Compare finished products to their original raw material.				
• Identify the waste derived from the use of renewable and nonrenewable resources.				
• Determine how consumption may impact the availability of resources.				
• Compare the time spans of renewability for fossil fuels and alternative fuels.				

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.2 RENEWABLE AND NONRENEWABLE RESOURCES- GRADE 7- continued				
C. Explain natural resource distribution				
<ul style="list-style-type: none"> Distinguish between readily available and less accessible resources. 				
<ul style="list-style-type: none"> Identify the locations of different concentrations of fossil fuels and mineral resources. 				
<ul style="list-style-type: none"> Analyze the effects of management practices on air, land and water in forestry, agriculture, fisheries, wildlife, mining and food and fiber production that is unique to different climates. 	•			
D. Describe the role of recycling and waste management.				
<ul style="list-style-type: none"> Identify materials that can be recycled in the community. 				
<ul style="list-style-type: none"> Explain the process of closing the loop in recycling. 				
<ul style="list-style-type: none"> Compare the decomposition rates of different organic materials. 				
<ul style="list-style-type: none"> Describe methods that could be used to reuse materials for new products. 				
<ul style="list-style-type: none"> Evaluate the costs and benefits of disposable products. 				
4.3 ENVIRONMENTAL HEALTH- GRADE 7				
A. Identify environmental health issues.				
<ul style="list-style-type: none"> Identify various examples of long-term pollution and explain their effects on environmental health. 	•			
<ul style="list-style-type: none"> Identify diseases that have been associated with poor environmental quality. 				
<ul style="list-style-type: none"> Describe different types of pest controls and their effects on the environment. 				
<ul style="list-style-type: none"> Identify alternative products that can be used in life to reduce pollution. 				

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.3 ENVIRONMENTAL HEALTH- GRADE 7- continued				
B. Describe how human actions affect the health of the environment.	• • •			
• Identify land use practices and their relation to environmental health.	• •			
• Explain how natural disasters affect environmental health.				
• Identify residential and industrial sources of pollution and their effects on environmental health.	•			
• Explain the difference between point and nonpoint source pollution.				
• Explain how nonpoint source pollution can affect the water supply and air quality.				
• Explain how acid deposition can affect water, soil and air quality.				
• Explain the relationship between resource use, reuse, recycling and environmental health.				
C. Explain biological diversity.	• •			
• Explain the complex, interactive relationships among members of an ecosystem.	• • •			
• Explain how diversity affects ecological integrity of the natural resources.				
4.6 ECOSYSTEMS AND THEIR INTERACTIONS- GRADE 7				
A. Explain the flows of energy and matter from organism to organism within an ecosystem.	• • •			
• Identify and explain the characteristics of biotic and abiotic.	• • •			
• Describe and explain the adaptations of plants and animals to their environment.	• • •			
• Demonstrate the dependency of living components in the ecosystem on the nonliving components.	• • •			
• Explain energy flow through a food web.	• • •			
• Explain the importance of the predator/prey relationship and how it maintains the balances within ecosystems.	• •			
• Understand limiting factors and predict their effects on an organism.	•			

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.6 ECOSYSTEMS AND THEIR INTERACTIONS- GRADE 7- continued				
• Identify niches for producers, consumers and decomposers within an ecosystem.	• •			
• Compare and contrast the major ecosystems of Pennsylvania.				
• Identify the major characteristics of a biome.				
• Compare and contrast different biomes and their characteristics.				
• Identify the relationship of abiotic and biotic components and explain their interaction in an ecosystem.				
• Explain how different soil types determine the characteristics of ecosystems.	•			
B. Explain the concepts of cycles.				
• Identify and explain cycles within an ecosystem.				
• Analyze the role of different cycles within an ecosystem.				
C. Explain how ecosystems change over time.	• •			
• Explain how ecosystems change.	• •			
• Identify the succession stages of a given ecosystem.				
• Explain how specific organisms may change an ecosystem.	• • •			
• Explain a change in an ecosystem that relates to humans.	• • •			
4.7 THREATENED, ENDANGERED AND EXTINCT SPECIES- GRADE 7				
A. Describe diversity of plants and animals in ecosystems.	• • •			
• Select an ecosystem and describe different plants and animals that live there.	• • •			
• Identify adaptations in plants and animals.	• • •			
• Recognize that adaptations are developed over long periods of time and are passed on from one generation to the next.				
• Understand levels of ecosystem organization (e.g., individuals, populations, species).				

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.7 THREATENED, ENDANGERED AND EXTINCT SPECIES- GRADE 7-continued				
B. Explain how species of living organisms adapt to their environment.				
• Explain the role of individual variations in natural selection.				
• Explain how an adaptation is an inherited structure or behavior that helps an organism survive and reproduce.				
• Describe how a particular trait may be selected over time and account for a species' adaptation.				
• Compare and contrast animals and plants that have very specific survival requirements with those that have more general requirements for survival				
• Explain how living things respond to changes in their environment.				
• Explain how one species may survive an environmental change while another might not.				
C. Explain natural or human actions in relation to the loss of species.	• •			
• Identify natural or human impacts that cause habitat loss.	• • •			
• Explain how habitat loss can affect the interaction among species and the population of a species.				
• Analyze and explain the changes in an animal population over time.				
• Explain how a habitat management practice affects a population.	• •			
• Explain the differences among threatened, endangered and extinct species.				
• Identify Pennsylvania plants and animals that are on the threatened or endangered list.				
• Describe state laws passed regarding threatened and endangered species in Pennsylvania.				
• Explain why one species may be more susceptible to becoming endangered than another species.				

	Aquatic Ecosystems	Planets & Moons	Models of Matter	Chemical Changes
4.8 HUMANS AND THE ENVIRONMENT- GRADE 7- continued				
A. Describe how the development of civilization relates to the environment.				
• Explain how people use natural resources in their environment.				
• Locate and identify natural resources in different parts of the world.				
• Compare and contrast how people use natural resources throughout the world.				
B. Explain how people use natural resources.				
• Describe how natural resources are used for survival.				
• Explain how natural resources and technological changes have affected the development of civilizations.				
• Explain how climate and extreme weather events (e.g., drought, flood) influence people's lives				
C. Explain how human activities may affect local, regional and national environments.	• • •			
• Describe what effect consumption and related generation of wastes have on the environment.				
• Explain how a particular human activity has changed the local area over the years.	• • •			
D. Explain the importance of maintaining the natural resources at the local, state and national levels.				
• Explain how human activities and natural events have affected ecosystems.	• • •			
• Explain how conservation practices have influenced ecosystems.	• • •			
• Define the roles of Pennsylvania agencies that deal with natural resources.				