

SCIENCE
RHINEBECK PRIORITIZED CURRICULUM

Grade 6

The Living Environment

Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Key Idea 1: Living things are both similar to and different from each other and from non-living things.

Background:

Living things are similar to each other yet different from non-living things. The cell is a basic unit of structure and function of living things (cell theory). For all living things, life activities are accomplished at the cellular level. Human beings are an interactive organization of cells, tissues, organs, and systems. Viruses lack cellular organization.

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Standard 4: Key Idea 1: Performance Indicator 1.1: Living things are both similar to and different from each other and from non-living things					
<i>Essential Knowledge/Skills (Major Understandings)</i>	<i>Priority Code</i>	<i>Essential Questions</i>	<i>Classroom Ideas</i>	<i>Assessment Ideas</i>	<i>Time/Notes</i>
1.1f Many plants have roots, stems, leaves and reproductive structures. These organized groups of tissues are responsible for a plant's life activities	I	<ul style="list-style-type: none"> ▪ What do plants get from soil? How? 	<ul style="list-style-type: none"> ▪ Topsoil Tour Labs ▪ Nutrient →Part→Function Maze 	<ul style="list-style-type: none"> ▪ Mapping ▪ Labeling diagrams 	
Standard 4: Key Idea 1: Performance Indicator 1.2: Explain the functioning of the major human organ systems and their interactions					
<i>Essential Knowledge/Skills (Major Understandings)</i>	<i>Priority Code</i>	<i>Essential Questions</i>	<i>Classroom Ideas</i>	<i>Assessment Ideas</i>	<i>Time/Notes</i>
1.2d During respiration, cells use oxygen to release the energy stored in food. The respiratory system supplies oxygen and removes carbon dioxide (gas exchange) 1.2j Disease breaks down the structures or functions of an organism. Some diseases are the result of failures of the system. Other diseases are the result of damage by infection from other organisms (germ theory). Specialized cells protect the body from infectious disease. The chemicals they produce identify and destroy microbes that enter the body.	I E	<ul style="list-style-type: none"> ▪ Why do we breathe? ▪ What does HIV/AIDS do to the body? How does the body respond? 	<ul style="list-style-type: none"> ▪ Lung capacity lab ▪ Chemical equation for respiration v. photosynthesis ▪ Building oxygen and carbon dioxide molecules ▪ Model lung ▪ Readings/ diagrams ▪ Newton's Apple video clip: The Immune System ▪ Visuals with captions ▪ Discussions 	<ul style="list-style-type: none"> ▪ Journal entries ▪ Student responses ▪ Student explanations ▪ Visuals with captions 	

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Key Idea 3: Individual organisms and species change over time.

Background:

Evolution is the change in a species over time. Millions of diverse species are alive today. Generally this diversity of species developed through gradual processes of change occurring over many generations. Species acquire many of their unique characteristics through biological adaptation, which involves the selection of naturally occurring variations in populations (natural selection). Biological adaptations are differences in structures, behaviors, or physiology that enhances survival and reproductive success in a particular environment.

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Standard 4: Key Idea 3: Performance Indicator 3.2: Describe factors responsible for competition within species and the significance of that competition.					
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3.2d Although the time needed for change in a species is usually great, some species of insects and bacteria have undergone significant change in just a few years	N	<ul style="list-style-type: none"> ▪ What are some reasons scientists have had difficulty developing medications for HIV/AIDS? 	<ul style="list-style-type: none"> ▪ Readings ▪ Discussion 	<ul style="list-style-type: none"> ▪ Student responses 	

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Key Idea 6: Plants and animals depend on each other and their physical environment.

Background:

An environmentally aware citizen should have an understanding of the natural world. All organisms interact with one another and are dependent upon their physical environment. Energy and matter flow from one organism to another. Matter is recycled in ecosystems. Energy enters ecosystems as sunlight, and is eventually lost from the community to the environment, mostly as heat.

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Standard 4: Key Idea 6: Performance Indicator 6.1: Describe the flow of energy and matter through food chains and food webs.					
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6.1a Energy flows through ecosystems in one direction, usually from the Sun, through producers to consumers and then to decomposers. This process may be visualized with food chains or energy pyramids.	E	<ul style="list-style-type: none"> ▪ What is the main source of energy on earth? 	<ul style="list-style-type: none"> ▪ Soil ecosystem ▪ Life Cycle Analysis of Materials/Products ▪ Diagrams ▪ "Caesar's Last Breath" EarthSearch, Klutz ▪ Selected readings and read alouds ▪ Mapping ▪ Topsoil Tour Labs 	<ul style="list-style-type: none"> ▪ Mapping ▪ Notebook/journal entries ▪ Student responses ▪ Multiple choice, matching diagrams, short answer test ▪ Teacher observation ▪ Visual with checklist and rubric assessment ▪ Project with teacher/student created rubrics 	
6.1c Matter is transferred from one organism to another and between organisms and their physical environment. Water, nitrogen, carbon dioxide, and oxygen are examples of substances cycled between the living and non-living environment.	E	<ul style="list-style-type: none"> ▪ Since matter cannot be created or destroyed in ordinary chemical reactions, where does it go? ▪ What do plants get from soil? How? 			

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Standard 4: Key Idea 6: Performance Indicator 6.2: Provide evidence that green plants make food and explain the significance of this process to other organisms.

<i>Essential Knowledge/Skills (Major Understandings)</i>	<i>Priority Code</i>	<i>Essential Questions</i>	<i>Classroom Ideas</i>	<i>Assessment Ideas</i>	<i>Time/Notes</i>
<p>6.2a Photosynthesis is carried on by green plants and other organisms that contain chlorophyll. In this process, the Sun's energy is converted into and stored as chemical energy in the form of a sugar. The quantity of sugar molecules increases in green plants during photosynthesis in the presence of sunlight.</p> <p>6.2b The major source of atmospheric oxygen is photosynthesis. Carbon dioxide is removed from the atmosphere and oxygen is released during photosynthesis.</p> <p>6.2c Green plants are the producers of food which is used directly or indirectly by consumers.</p>	<p>I</p> <p>I</p> <p>E</p>	<ul style="list-style-type: none"> ▪ What is the probably the most important chemical reaction on earth? ▪ Why do we care about soil? Plants? ▪ Where does the oxygen we breath in come from? ▪ Where does the carbon dioxide we exhale go to? 	<ul style="list-style-type: none"> ▪ Topsoil tour ▪ Soil ecosystem ▪ Diagrams ▪ "The Living Soil", Cobblestone Magazine ▪ Photosynthesis and respiration: chemical equations and diagrams ▪ "Caesar's Last Breath" EearthSearch ▪ Selected readings and read alouds ▪ Decomposers reading and questions ▪ Science Court: Soil ▪ Brainstorming ▪ Mapping ▪ Readings and discussions ▪ Interactive multimedia "Soil Test" ▪ <u>Women in Science</u>, Betty Harris, chemist ▪ Video ▪ Step by step guided visuals ▪ Video: "The Greenhouse Effect" (sources, gases in atmosphere, energy) 	<ul style="list-style-type: none"> ▪ Mapping ▪ Notebook/journal entries ▪ Student responses ▪ Multiple choice, matching diagrams, short answer test ▪ Teacher observation ▪ Project with teacher/student created rubrics ▪ Visual with checklist and rubric assessment 	

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Key Idea 7: Human decisions and activities have had a profound impact on the physical and living environment.

Background:

The number of organisms an ecosystem can support depends on the resources available and physical factors; quantity of light, air, and water; range of temperature, and soil composition. To ensure the survival of our planet, people have a responsibility to consider the impact of their actions on the environment.

Guiding Questions:

How is balance important to a system?
Why is interdependence important to a system?

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Resource Materials			
Title	Source	Title	Source
Topsoil Tour	La Motte	The Life Cycle of Everyday Stuff	NSTA Press
Women in Science (CD)	Tom Snyder Productions		
The Greenhouse Effect (video)	Scott Resources		
EarthSearch by John Cassidy	Klutz, 1994		
The Immune System (video)	Newton's Apple Classics		
Soil (magazine)	Cobblestone Magazine		
Science Court: Soil (CD)	Tom Snyder Productions		
World Population (video)	Zero Population Growth		
Toast	Bullfrog Productions		