Science 6 - Overview

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Cover

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Science 6

Course Number: 3100

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Course Overview

Units	Labs/Activities	Digital Learning Tools
	MP1	
Unit 1 - Ecology **Essential Themes:** Organization of the living world Feeding relationships among organisms Plant structure and function Soil characteristics **Essential Question:** What interactions occur in ecosystems?	1. Claim Evidence Reasoning (CER) Activity 2. Organization of the Living World 3. Skull Observation 4. Oh Deer 5. Energy in a Food ChainGraphic Organizer(Sandwich) 6. There Was an Old Lady 7. Don't Take a Predator to Lunch 8. Dallenbach'sField Experience 9. Biotic/Abiotic Activity 10. Subjective/Objective 11. Poster Investigation 12. Producer/Consumer/Decomposer Investigation 13. ST Shrew Story/Quiz 14. Dallenbach's Assessment 15. Food Chains and Energy Pyramids Investigation 16. Food Chain and Webs Sticks 17. Ecology Quiz Assessment 18. Energy/Water Transfer Activity 19. Staying Alive (Tragedy of the Commons) 20. Photosynthesis Activity (Colored Chips) 21. Rachel Carson Article 22. Biomagnification Activity 23. Ecology Unit Test	1. Gizmo: Food Chain 2. Gizmo: Graphing Skills
	MP2	
<u>Unit 2</u> Succession **Essential Theme:** Succession of land and water Dispersal of seeds in land and water Biotic resource management **Essential Question:** How do areas change over time?	1. Soil Stations 2. Soil Stations Exit Card 3. Fire Mountain: The Eruption and Rebirth of Mount Saint Hellen's Video 4. Primary and Secondary Succession Investigation 5. How the Forrest Grew Story 6. Bodies of Water Screencast 7. Tree Tops Valley Story 8. Succession Comparison Chart 9. Factors That Affect Succession Chart 10. Symbiosis Matchup 11. Photo Finish: Pond Succession 12. Pinelands: Up-Close and Natural Video 13. Non-Native and Invasive Species Video 14. Invasive Species Graphic Organizer	1. Pinelands Powerpoint Investigation 2. Prescribed Burns: Google Do

	15. Organism Wars Activity 16. Seed Dispersal 17. Invasive Species Article (Trouble Arrives on 6 legs) 18. Forrest Management Techniques Investigation 19. Timber Activity 20. The Lorax 21. Succession Unit Assessment 22. Prescribed Burn Debate	
Unit 3 - Light and Color **Essential Theme:** Properties of waves Electromagnetic spectrum Behavior of light Why humans see color **Essential Question:** How does light interact with matter?	1. Radiant Energy 2. Waves and the Electromagnetic Spectrum 3. Behavior of Light Stations 4. Law of Reflection 5. Behavior of Light Lab Analysis 6. Reflection Lab 7. 3-2-1 Contact: Living Color Video 8. Electromagnetic Spectrum Quiz 9. Refraction Lab 10. Color Spectrum 11. Create Light Models Lab 12. Light Transmittal Lab 13. Animals and the Electromagnetic Spectrum 14. Light and Color Unit Test	1. Gizmo: Color Absorption 2. Gizmo: Heat Absorption
MP3		
Unit 4- Electricity **Essential Theme:** Types of electricity Electrical safety **Essential Question:** How does electricity travel?	1. Atoms Family 2. Matter of Fact 3. Parts of an Atom 4. Static Electricity Lab 5. Lighting Battery Lab 6. Conductors and Insulators Lab 7. Understanding Lightbulbs United Streaming 8. Electricity and Magnetism Untied Streaming 9. Open and Closed Circuit Exit Card 10. Switch Lab Activity 11. Switches and Circuits Activity 12. Electricity Unit Test Assessment	1. The Blobz Guide to Electrical Circuits 2. Gizmo: Circuit Builder (Absent Make-Up Insulator/ Conductor L 3. Gizmo: Household Energy Use
Unit 5- Regional Biodiversity **Essential Theme:** Climate vs. Weather Water cycle Seasons Climate Regions (Biomes) **Essential Question** How do geography and climate determine what organisms inhabit an area?	1. Water Cycle, Climate Vs. Weather Investigation 2. The Water Cycle Investigation? 3. The Incredible Journey 4. Planet Earth: Pole to Pole Video 5. Seasons: Earth and Sun Location Demonstration 6. Climate Regions Packet • Dry • Temperate Continental • Temperate Marine • Tropical Rainy • Polar	1. Seasons Internet Activity 2. Rain Shadow Animation

	• Highlands 7. Climate Construction Project 8. Climate Regions Unit Assessment **Fairview Field Experience**	
MP4		
Unit 6 - Oceanography **Essential Theme:** Waves and tides Characteristics of oceans Wetlands **Essential Question:** How do conditions vary in Earth's oceans?	1. Features of the Ocean Floor Investigation 2. Features of the Ocean Floor Foldable 3. Eyewitness Ocean Video 4. Features of the Ocean Floor Quiz 5. Density Tank Lab 6. Characteristics of Water Stations Lab 7. Characteristics of Water Stations Closure 8. Locating Oceans and Seas of the World 9. Seawater Soup 10. Land vs. Water 11. The Water Planet 12. Density Tank Lab 13. Current Investigations 14. Waves Investigations 15. Tides and Moon Phases 16. Spring and Neap Tides 17. Man Made Marine Ecosystem Article 18. Circulation Comparison Activity 19. Greenhouse Gas Investigation 20. Garbage Island 21. Bag-It Video 22. What Can I Do? Combating the Effects of Plastic on Earth 23. Bird Migration Simulation 24. Crash: A Tale of 2 Species 25. Oceanography Unit Assessment	1. Ocean Floor Virtual Lab 2. Effects of Waves: Beach Erosion Student PowerPoint 3. Effects of Waves: Restore the Sh 4. Gizmo: Tides 5. Gizmo: Density Lab 6. Gizmo: Density Via Comparison (Review Day) 7. Gizmo: Phases of the Moon 8. Gizmo: Seasons Earth Moon and

6-8.MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
6-8.MS-ETS1-1.1.1	Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions.
6-8.MS-ETS1-4.2	Developing and Using Models
6-8.MS-ETS1-2.7.1	Evaluate competing design solutions based on jointly developed and agreed-upon design criteria.
6-8.MS-ETS1-1.ETS1.A.1	The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions.

6-8.MS-ETS1-2.ETS1.B.1	There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem.
6-8.MS-ETS1-3.ETS1.C.1	Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design.
6-8.MS-LS2-1	Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem.
6-8.MS-LS2-5	Evaluate competing design solutions for maintaining biodiversity and ecosystem services.
6-8.MS-LS2-4	Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations.
6-8.MS-LS2-3	Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem.
6-8.MS-LS2-2	Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems.
6-8.MS-LS1-6	Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms.
6-8.MS-LS1-3	Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
SCI.MS-PS4-2	Develop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials.
SCI.MS-PS4-1	Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave.
SCI.MS-PS2-5	Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact.
TECH.8.1.8	Educational Technology: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.8.A.1	Demonstrate knowledge of a real world problem using digital tools.
TECH.8.1.8.A.3	Use and/or develop a simulation that provides an environment to solve a real world problem or theory.
TECH.8.1.8.A.4	Graph and calculate data within a spreadsheet and present a summary of the results.
TECH.8.1.8.D.1	Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media.
TECH.8.1.8.D.5	Understand appropriate uses for social media and the negative consequences of misuse.
TECH.8.1.8.E.1	Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.
TECH.8.2.8	Technology Education, Engineering, Design, and Computational Thinking - Programming: All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.8.A.4	Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.
TECH.8.2.8.B.2	Identify the desired and undesired consequences from the use of a product or system.
TECH.8.2.8.C.2	Explain the need for optimization in a design process.
TECH.8.2.8.D.1	Design and create a product that addresses a real world problem using a design process

under specific constraints.

Textbooks and other resources

Grade 6 Earth and Environmental Science: Custom Edition for East Brunswick Public Schools, Pearson Education, 2013.

Standards

The following New Jersey Science Learning Standards / Next Generation Science Standards disciplinary core ideas are addressed in this course:

6-8.MS-LS1-6.LS1.C.1	Plants, algae (including phytoplankton), and many microorganisms use the energy from light to make sugars (food) from carbon dioxide from the atmosphere and water through the process of photosynthesis, which also releases oxygen. These sugars can be used immediately or stored for growth or later use.
6-8.MS-LS1-7.LS1.C.1	Within individual organisms, food moves through a series of chemical reactions in which it is broken down and rearranged to form new molecules, to support growth, or to release energy.
6-8.MS-LS2-2.LS2.A.1	Similarly, predatory interactions may reduce the number of organisms or eliminate whole populations of organisms. Mutually beneficial interactions, in contrast, may become so interdependent that each organism requires the other for survival. Although the species involved in these competitive, predatory, and mutually beneficial interactions vary across ecosystems, the patterns of interactions of organisms with their environments, both living and nonliving, are shared.
6-8.MS-LS2-1.LS2.A.1	Organisms, and populations of organisms, are dependent on their environmental interactions both with other living things and with nonliving factors.
6-8.MS-LS2-1.LS2.A.2	In any ecosystem, organisms and populations with similar requirements for food, water, oxygen, or other resources may compete with each other for limited resources, access to which consequently constrains their growth and reproduction.
6-8.MS-LS2-1.LS2.A.3	Growth of organisms and population increases are limited by access to resources.
6-8.MS-LS2-3.LS2.B.1	Food webs are models that demonstrate how matter and energy is transferred between producers, consumers, and decomposers as the three groups interact within an ecosystem. Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter back to the soil in terrestrial environments or to the water in aquatic environments. The atoms that make up the organisms in an ecosystem are cycled repeatedly between the living and nonliving parts of the ecosystem.
6-8.MS-LS2-4.LS2.C.1	Ecosystems are dynamic in nature; their characteristics can vary over time. Disruptions to any physical or biological component of an ecosystem can lead to shifts in all its populations.
6-8.MS-LS2-5.LS2.C.1	Biodiversity describes the variety of species found in Earth's terrestrial and oceanic ecosystems. The completeness or integrity of an ecosystem's biodiversity is often used as a measure of its health.
6-8.MS-LS4-4.LS4.B.1	Natural selection leads to the predominance of certain traits in a population, and the suppression of others.
6-8.MS-LS2-5.LS4.D.1	Changes in biodiversity can influence humans' resources, such as food, energy, and

	medicines, as well as ecosystem services that humans rely on—for example, water purification and recycling.
6-8.MS-LS1-6.PS3.D.1	The chemical reaction by which plants produce complex food molecules (sugars) requires an energy input (i.e., from sunlight) to occur. In this reaction, carbon dioxide and water combine to form carbon-based organic molecules and release oxygen.
6-8.MS-LS1-7.PS3.D.1	Cellular respiration in plants and animals involve chemical reactions with oxygen that release stored energy. In these processes, complex molecules containing carbon react with oxygen to produce carbon dioxide and other materials.

Grading and Evaluation Guidelines

Marking period grades for Sixth Grade Science will be determined using the following weighting:

10% Homework

40% Common Assessments

50% Classwork, Labs

The final grade for Sixth Grade Science will be the average of the four marking period grades

Other Details

SCED

53236 Science (Grade 6)
Science (Grade 6) at Hammarskjold Middle School typically include subject matter from several strands of science, including earth/space sciences, physical sciences, and life or environmental sciences, and may organize material around thematic units. Specific content depends upon state standards for grade 6.