

Grade 5 Science Course Overview Copied from: Science, Copied on: 08/31/22

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Cover

EAST BRUNSWICK PUBLIC SCHOOLS

East Brunswick New Jersey

Superintendent of Schools

Dr. Victor P. Valeski

Science

Science Grade 5

Course Number: 4105

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Course Overview

The K-12 science curriculum in all schools in New Jersey must be aligned with the New Jersey Student Learning Standards. These standards focus on the processes of science as well as content in three major areas: earth, life and physical science. Each of these areas of science needs to be addressed at every grade level in order to foster a strong science knowledge base for students as well as an appreciation and understanding of how science works to help people solve problems.

One of the strong points of the East Brunswick Schools' science curriculum is the emphasis on hands-on investigations of the natural world. Our science program emphasizes doing science, not reading about it in a book. The fifth grade science curriculum consists of three modules that were selected from two nationally-recognized programs – *Full Option Science System (FOSS)* and *Science and Technology for Children (STC)*. The earth/environmental science unit is *Ecosystems (STC)* which focuses on ecological systems and how they function. The life science unit is *Microworlds (STC)* which introduces students to the study of microscopic organisms. The physical science unit is *Levers and Pulleys (FOSS)* which allows students to experiment with simple machines and how they work.

In addition to these science kits, the fifth grade curriculum includes two units of study that were developed by the teachers in the district. The *Trashpower* unit was developed to give students an understanding of how society deals with the waste and pollution that it generates from the activity of humans. The unit is particularly appropriate in this district because, not only do the students live in the most densely populated state in the nation, but the town itself is host to one of the largest sanitary landfills in the state (Edgeboro). The second unit is *Rocketry*. Students investigate the science behind the operation of rockets (Newton's Laws). They construct and launch model rockets as the culminating activity of the unit.

Textbooks and other resources

Delta FOSS Levers & Pulleys, 2nd Edition, Copyright 2005

TG Foss Levers & Pulleys

Carolina STC Ecosystems, 3rd Edition, Copyright 2013

Carolina STC Microworlds, 2nd Edition, Copyright 2004

Standards

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| SCI.3-5-ETS1-3 | Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved. |
| SCI.3-5-ETS1-2 | Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem. |
| SCI.3-5-ETS1-1 | Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost. |
| SCI.5-ESS2-1 | Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. |
| SCI.5-ESS2-2 | Describe and graph the amounts and percentages of water and fresh water in various reservoirs to provide evidence about the distribution of water on Earth. |
| SCI.5-ESS3-1 | Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment. |
| SCI.5-LS1-1 | Support an argument that plants get the materials they need for growth chiefly from air and water. |
| SCI.5-LS2-1 | Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. |
| SCI.5-PS1-1 | Develop a model to describe that matter is made of particles too small to be seen. |
| SCI.5-PS2-1 | Support an argument that the gravitational force exerted by Earth on objects is directed down. |
| SCI.5-PS3-1 | Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. |
| 5-PS1-3 | Make observations and measurements to identify materials based on their properties. |
| 5-PS1-4.3.1 | Conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. |
| 5-PS1-3.PS1.A.1 | Measurements of a variety of properties can be used to identify materials. (Boundary: At this grade level, mass and weight are not distinguished, and no attempt is made to define the unseen particles or explain the atomic-scale mechanism of evaporation and condensation.) |
| 5-PS2-1.7.1 | Support an argument with evidence, data, or a model. |

Grade 5 Science Planning Guide

| Instructional Objectives | Instructional Activities/ Methods/Assignments |
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| Unit 1: Microworlds | Unit 1: Microworlds |
| be able to: | |
| <ul style="list-style-type: none"> Determining which of various objects | Lesson 1: Pre-unit Assessment: Observing a Penny |

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| <p>can magnify</p> <ul style="list-style-type: none">• Using magnifiers to observe living and non-living specimens• Using appropriate equipment and techniques to prep <p>microscope slides for viewing</p> <p>Unit 1: Microworlds, cont'd.</p> | <p>(T.G. pps.3-8)</p> <ul style="list-style-type: none">• Teacher assesses prior knowledge of magnifiers• Students set up a notebook to record their observations and ideas• Students learn to use hand magnifiers• Students discover something new in an everyday object <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 2:</p> <p>Communicate Your Observations</p> <p>(T.G. pps.9-14)</p> <ul style="list-style-type: none">• Students have more practice making detailed observations• Students record their observations in both words and sketches |
| <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds,</p> | |

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| <p>cont'd.</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using hair-widths and millimeters• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 3:</p> <p>Learning About Lenses</p> <p>(T.G. pps. 15-20)</p> <ul style="list-style-type: none">• Students experiment with different shapes to see which magnifies• Students discover the properties common to all objects that act as magnifiers |
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| <p>measurements of small objects, using</p> <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 4:</p> <p>Learning About Lenses:</p> <p>(T.G. pps. 21-24)</p> <ul style="list-style-type: none">• use lenses to explore several common objects• review the properties of magnifying lenses |
| <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic | |

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| <p>specimens for closer observation</p> <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none"> • Using a microscope to observe basic cell structure • Communicating detailed observations through writing, drawing and discussion • Making measurements of small objects, using hair-widths and millimeters • Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none"> • Using a microscope to | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 5: Learning to Use the Microscope (T.G. pps. 25-30)</p> <ul style="list-style-type: none"> • Students acquire background information about the microscope • Students learn the function of the parts of the microscope and how to adjust th <p>Unit 1: Microworlds, cont'd.</p> |
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| <p>observe basic cell structure</p> <ul style="list-style-type: none">• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation | <p>Lesson 6:</p> <p>Practicing with the Microscope:</p> <p>(T.G. pps. 31-36)</p> <ul style="list-style-type: none">• Students continue practicing using microscopes• Students make detailed and careful observations of black and white newsprint dots that create images |
| <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and</p> | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 7:</p> <p>Field Of Vision:</p> <p>(T. G. pps. 37-42)</p> <ul style="list-style-type: none">• Students demonstrate an under-standing of field of view by measuring object u |

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| <p>millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> | |
| <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 8:</p> <p>Preparing Slides</p> <p>(T.G. pps. 43-53)</p> <ul style="list-style-type: none">• Preparing wet mount and well slides• Students learn to focus up and focus down with microscopes |

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| <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using hair-widths and millimeters• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> | |
| <p>Unit 1: Microworlds, cont'd.</p> | <p>Unit 1: Microworlds, cont'd.</p> |
| <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making | <p>Lesson 9:</p> <p>What Is It?</p> <p>(T.G. pps. 49-54)</p> <ul style="list-style-type: none">• Identify an unknown specimen due to observations• Application of viewing skills of 3-D objects under microscope• Proper well slide preparation |

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| <p>measurements of small objects, using</p> <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> | |
| <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 10</p> <p>Exploring Common Objects</p> <p>(T. G. pps. 55-60)</p> <ul style="list-style-type: none">• Students make discoveries as they make observations• Practice preparing slides of different types• Perfect light adjustment and focusing techniques with microscopes |

**Unit 1: Microworlds,
cont'd.**

- Using a microscope to observe basic cell structure
- Communicating detailed observations through writing, drawing and discussion
- Making measurements of small objects, using

hair-widths and
millimeters

- Exploring ways to slow movement of living microscopic specimens for closer observation

**Unit 1: Microworlds,
cont'd.**

- Using a microscope to observe basic cell structure
- Communicating

Unit 1: Microworlds, cont'd.

Lesson 11:

Looking Inside an Onion

(T.G. pps 61-66)

- Students examine and explore the internal structure of an onion
- Students observe and describe the cells of an onion

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| <p>detailed observations through writing, drawing and discussion</p> <ul style="list-style-type: none">• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement of living microscopic specimens for closer observation | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 12</p> <p>Looking at Living Things: Volvox (T.G. 67-70)</p> <ul style="list-style-type: none">• Students learn the best way to handle living creatures and prepare slides for the microscope• Students use microscope to observe microscopic creatures |
| <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using <p>hair-widths and millimeters</p> <ul style="list-style-type: none">• Exploring ways to slow movement | |

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| <p>of living microscopic specimens for closer observation</p> <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none">• Using a microscope to observe basic cell structure• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using hair-widths and millimeters• Exploring ways to slow movement of living microscopic specimens for closer observation <p>Unit 1: Microworlds, cont'd.</p> <ul style="list-style-type: none">• Using a microscope to | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 13</p> <p>Looking At Living Things: Blepharisma (T.G. pps. 71-74)</p> <ul style="list-style-type: none">• Students practice using microscope skills on living organisms• Students recognize individual microbes on slides• Students observe an organism reproducing by binary fusion |
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| <p>observe basic cell structure</p> <ul style="list-style-type: none">• Communicating detailed observations through writing, drawing and discussion• Making measurements of small objects, using hair-widths and millimeters• Exploring ways to slow movement of living microscopic specimens for closer observation | <p>Lesson 14</p> <p>Looking At Living Things: Vinegar Eels</p> <p>(T.G. pps. 75-78)</p> <ul style="list-style-type: none">• Students use microscope skills to observe a very fast moving organism• Students experiment with methods to slow down the Vinegar Eel |
| <p>Unit 2: Levers and Pulleys</p> <p>Investigation 1:</p> <p>Levers</p> | |
| <p>The be able to:</p> <ul style="list-style-type: none">• Gain experience constructing and using levers. | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 15</p> |

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| <ul style="list-style-type: none">• Learn the concepts of lever arm, fulcrum, load and effort.• Experience one advantage that can be gained by using a lever-reduced effort. <p>Unit 2: Levers and Pulleys, cont'd.</p> <p>Investigation 1:</p> <p>Levers</p> <ul style="list-style-type: none">• Collect organize and analyze data from lever experiments• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and | <p>Looking at Living Things: Hay and Grass Infusions</p> <p>(T.G. pps.79-82)</p> <ul style="list-style-type: none">• Students discover that microbes have developed in the grass and hay infusion• Students record their discoveries• Teacher evaluates individual student progress <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 16</p> <p>Looking at Living Things: Hay and Grass Infusions 2</p> <p>(T. G. pps. 83-86)</p> <ul style="list-style-type: none">• Students observe in greater detail microbes• Students make more completed and detailed records of observations• Teacher evaluates the student's progress |
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| <p>relating.</p> <p>Review for Summative Assessment</p> <p>Summative Assessment</p> <p>Unit 2: Levers and Pulleys, cont'd.</p> <p>Investigation 1:</p> <p>Levers</p> <ul style="list-style-type: none">• Collect organize and analyze data from lever experiments• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and relating. <p>Review for Summative Assessment</p> <p>Summative Assessment</p> <p>Investigation 2</p> | <p>Unit 1: Microworlds, cont'd.</p> <p>Lesson 17</p> <p>Post Unit Assessment (T. G. pps. 87-88)</p> |
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More Leverage

- Learn to identify Class 1, 2, and 3 levers.
- Diagram levers to show placement and the direction of the load effort.
- Analyze common tools in terms of levers.
- Analyze pictures of tools in terms of levers

Investigation 2

More Leverage, cont'd.

- Use scientific thinking processes to conduct investigations and build explanations:

Unit 2: Levers and Pulleys

Investigation 1:

Levers

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| <p>observing, communicating, comparing, organizing and relating.</p> <p>Investigation 2 More Leverage, cont'd.</p> <p>• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing and relating.</p> | <p>Part 1</p> <p>Introduction to Levers</p> <ul style="list-style-type: none">• Develop a sense of how levers work• Vocabulary• Learn how to use a spring scale <p>Unit 2: Levers and Pulleys, cont</p> <p>Investigation 1: Levers</p> |
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| <p>Investigation 2 More Leverage, cont'd.</p> <ul style="list-style-type: none">• Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing and relating. | <p>Part 2</p> <p>Lever Experiment A</p> <ul style="list-style-type: none">• Conduct experiment• Discover relationship between load, fulcrum and effort• Gather and graph data. <p>Unit 2: Levers and Pulleys, cont</p> <p>Investigation 1:</p> <p>Levers</p> <p>Part 3</p> <p>Lever Experiment B</p> |
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Investigation 2

More Leverage, cont'd.

Review for Summative Assessment

Investigation 2

More Leverage

- Conduct experiment
- Discover relationship between load, fulcrum and effort
- Gather and graph data.

- Explore arrangements of the fulcrum, effort and load on the lever arm.
- Classify levers

Investigation 3:

Pulleys

- Assemble and investigate one- and two-pulley systems.
- Learn vocabulary associated with the pulley systems.
- Discover the advantages of using pulley:
- Diagram pulley systems.

Investigation 2

More Leverage, cont'd.

Part 2: Lever Diagrams

- Use each class lever.

Investigation 3:

Pulleys, cont'd.

- Use scientific thinking processes to conduct investigations and build explanations: observing, communicating, comparing, organizing, and relating.

Investigation 2
More Leverage, cont'd.

Investigation 3:
Pulleys, cont'd.

Part 3:
Real World Levers

- Use scientific thinking processes to conduct investigations and build explanations: observing, communicating,
- Investigate tools and determine lever class.

comparing,
organizing, and
relating.

Investigation 4: Pulleys at Work

- Investigate pulley systems with one and two pulleys
- Discover the relationship between the number of ropes pulling on a load and the effort required to pull a load
- Record and compare the distance moved by the load and the effort in four different pulley systems

Part 4: Lever Pictures

- Analyze pictures and identify lever class.

Investigation 2 More Leverage, cont'd.

**Investigation 4: Pulleys
at Work, cont'd.**

- Using scientific thinking processes to conduct investigations and building explanations: observing, communicating, comparing, organizing, and relating

**Investigation 4: Pulleys
at Work, cont'd.**

Review for Summative
Assessment

Summative Assessment

**Investigation 2
More Leverage, cont'd.**

Unit 3: Ecosystems

- Students record and discuss their thoughts about how living things depend on each other.
- Students observe and discuss a riverbank environment

Investigation 3:

Pulleys

Part 1: One-Pulley Systems

- Set up one-pulley system
- Quantify and compare effort.

**Unit 3: Ecosystems,
cont'd.**

- Students share what they know about a terrestrial environment
- Students think about the terraria and aquaria as models of environments
- Students set up their terraria
- Students make detailed records about items they have placed in their terraria
- Students predict what will happen in their terraria in the next week

Investigation 3:

Pulleys, cont'd.

Part 2: Two-Pulley Systems

- Investigate two pulleys used together
- Diagram 4 pulley systems

**Unit 3: Ecosystems,
cont'd.**

- Students discuss the needs of organisms in an aquatic environment
- Students set up their aquaria by adding gravel, water, elodea, duckweed, and algae
- Students observe, quantify, and record information about the organisms they place in their aquaria

Investigation 3:

Pulleys, cont'd.

Part 3: Pulley Game

**Unit 3: Ecosystems,
cont'd.**

- Students discuss the needs of organisms in an aquatic environment
- Students set up their aquaria by adding gravel,

- Play game setting up different pulley systems
- Review pulleys systems from previous lessons

water, elodea, duckweed, and algae

- Students observe, quantify, and record information about the organisms they place in their aquaria

Investigation 4: Pulleys at Work

Unit 3: Ecosystems, cont'd.

Part 1: Effort in Pulley Systems

- Students discuss information on aquatic plants and algae gained through observation and reading
- Students complete their aquaria by adding mosquito fish and snails
- Students continue to record their observations of plants, algae, and animals in their aquaria and plants in their terraria

- Predict the effort required to lift the load
- Identify the direction of the effort
- Students collect data systematically for analysis

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| <p>Unit 3: Ecosystems, cont'd.</p> <ul style="list-style-type: none"> • Students discuss what they have read and observed • Students offer evidence of dependent and interdependent relationships in their ecosystems • Students predict what changes might occur in both their aquaria and terraria • Students read about germination <p>Unit 3: Ecosystems, cont'd.</p> | <p>Investigation 4: Pulleys at Work, cont'd.</p> <p>Part 2: Measuring Distance</p> <ul style="list-style-type: none"> • Determine the relationship between the mechanical advantage and the distance <p>Investigation 4: Pulleys at Work, cont'd.</p> <p>Part 3: Choosing Your Own Investigation</p> <ul style="list-style-type: none"> • Students investigate and design a lever or a pulley system |
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- Students continue to observe plant growth in their terraria
- Students make observations and record descriptions of the animals they add to their terraria
- Students identify and record similarities and differences between crickets and isopo

Unit 3: Ecosystems, cont'd.

Unit 3: Ecosystems

- Students continue to discuss their concepts of the word 'ecosystem'
- Through reading, students learn more about crickets and isopods

Lesson 1: Pre-Unit Assessment: Thinking about Ecosystems

Students will use student investigation booklet pp. 3-5

Students will discuss food chains, food webs, and energy flow in the riverbank commi

**Unit 3: Ecosystems,
cont'd.**

- Students discuss their terrestrial and aquatic ecosystems from observations and readings
- Students explore food chains and consider the impact organisms have on one another
- Students create a web of their terrestrial ecosystems

and compare it with Lesson 5's aquatic web

**Unit 3: Ecosystems,
cont'd.**

- Students predict how one ecosystem might influence the other

Unit 3: Ecosystems, cont'd.

Lesson 2: Setting Up the Terrarium

Observe materials using an observation table

Students fill out table of what will be in the terrarium

Students build their terrarium

Students fill out diagram

MAKE 3 CLASS CONTROL MODELS FOR EACH CLASS YOU TEACH (THES

**Unit 3: Ecosystems,
cont'd.**

Unit 3: Ecosystems, cont'd.

Lesson 3: Setting Up the Aquarium

Students build their aquaria

Students observe the materials

Students diagram their aquaria

- Students observe, describe, and compare stable and disturbed eco-columns
- Students become familiar with pH paper
- Students identify and discuss natural causes that can disturb an ecosystem
- Students read and write about human-made disturbing forces, or pollutants

During the 3 days of student observations of their aquaria and terraria, students make can use the following:

Brainpop

Ecosystems

Food Chains

Land Biomes

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| <ul style="list-style-type: none">• Students reflect through a self-assessment | <p>Unit 3: Ecosystems, cont'd.</p> |
| <p>Unit 3: Ecosystems, cont'd.</p> <ul style="list-style-type: none">• Students discuss and analyze the causes and effects of three types of pollution• Students plan experiments to study the effects of pollution• Students determine variables and controls and prepare to use simulations in a scientific investigation• Students predict the possible effects of pollutants in their class model ecosystems | <p>Lesson 3: Setting Up the Aquarium, cont'd.</p> <p>Photosynthesis</p> <p>Plant Growth</p> <p>Seed Plants</p> <p>Six Kingdoms</p> <p>Soil</p> <p>Plant Adaptations to Aquatic Life</p> <p>http://www.mbgnet.net/bioplants/adapt.html</p> <p>Farming in Space</p> <p>http://voyager.cet.edu/iss/activities/newfarming.html</p> <p>MAKE 3 CLASS CONTROL MODELS FOR EACH CLASS YOU TEACH (THES</p> |
| <p>Unit 3: Ecosystems, cont'd.</p> | <p>Unit 3: Ecosystems, cont'd.</p> |
| <ul style="list-style-type: none">• Students test and record the pH of our Ecosystems• Students | <p>Lesson 4: Adding Animals to the Aquarium</p> |

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| <p>Unit 3: Ecosystems, cont'd.</p> <ul style="list-style-type: none"> • Students observe and record the effects pollutants have on the ecosystems • Students observe the control eco-column • Students connect the death of the producers to the viability of the consumers within the eco-columns • Students understand the importance of plants in the environment | <p>Lesson 5: Observing the Completed Aquarium</p> <p>Discuss living and non-living things in their ecosystems</p> <p>Discuss interdependent relationships</p> <p>Reading selection on page 31 in Student Investigations Booklet</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 6: Adding Animals to the Terrarium</p> <p>Create a Venn Diagram to compare and contrast Aquarium plants and Terrarium plant</p> <p>Observe and add animals to terraria</p> <p>Record animal characteristics using Observation Chart/ Diagram</p> |
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| <p>Unit 3: Ecosystems, cont'd.</p> <ul style="list-style-type: none"> • Students discuss the effects of pollutants and make final observations • Student teams review data collected • Students draw conclusions | <p>Reading Selection pages 38-40 in Student Investigations Booklet</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 6: Adding Animals to the Terrarium, cont'd.</p> <p>Create a Venn Diagram to compare and contrast Aquarium plants and Terrarium plant</p> <p>Observe and add animals to terraria</p> <p>Record animal characteristics using Observation Chart/ Diagram</p> <p>Reading Selection pages 38-40 in Student Investigations Booklet</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 7: Joining the Terrarium and Aquarium</p> <p>Discuss the terms: producers, consumers, and scavengers</p> |
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**Unit 3: Ecosystems,
cont'd.**

- Class draws conclusions about the effect of each pollutant
- Students examine results
- read about the Chesapeake Bay

Discuss how the two ecosystems relate to each other

Discuss and observe eco-columns and predict what might occur over time

Make Terrestrial Food Chain Wheel

Unit 3: Ecosystems, cont'd.

Lesson 7: Joining the Terrarium and Aquarium, cont'd.

Discuss the terms: producers, consumers, and scavengers

Discuss how the two ecosystems relate to each other

**Unit 3: Ecosystems,
cont'd.**

- Class draws

Discuss and observe eco0columns and predict what might occur over time

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| <p>conclusions about the effect of each pollutant</p> <ul style="list-style-type: none"> • Students examine results • read about the Chesapeake Bay | <p>Make Terrestrial Food Chain Wheel</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 8: Upsetting the Stability</p> <p>Teachers will lead discussion about pollution and lead the acidity activity TG p. 85</p> <p>Teachers will introduce vocabulary</p> <p>Read about and discuss Acid Rain Student manual pp. 48-49</p> <p>Read and discuss about Crops and Cows—What's the Problem Student manual p. 51</p> <p>Read and discuss When Salt isn't Safe Student manual p. 52</p> <p>**Teach in connection with Non-point Pollution pp. 48-54 in the Trash Power Manua</p> |
| <p>Unit 3: Ecosystems, cont'd.</p> <ul style="list-style-type: none"> • Class draws conclusions about the effect of each pollutant • Students examine | <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 10: Planning Pollution Experiments</p> |

results

- Read about the Chesapeake Bay

Option 1: Pollute half of the students eco-columns

Option 2: Pollute the Teacher's class model

Discuss the concept of a controlled experiment

*discuss variables

Eco-column pollutant activity planning TG p. 101-103

*See fact sheets TG pp. 104-106

Unit 4: Trash Power

Unit 3: Ecosystems, cont'd.

Lesson 11: Setting up our Pollution Experiment

Students will conduct experiment by polluting eco-columns

Students will gather data using the table on activity sheet 11-A

Unit 3: Ecosystems, cont'd.

Unit 4: Trash Power

- To define - trash, natural resources, renewable resources, and nonrenewable resources.

Lesson 11: Setting up our Pollution Experiment

Students will conduct experiment by polluting eco-columns

- To sort and classify trash.

Students will gather data using the table on activity sheet 11-A

- To develop an understanding of human's influence on the ecological process.
- To develop a community profile of East Brunswick regarding solid waste management.

Unit 4: Trash Power, cont'd.

- To develop an understanding of human's need to find a viable solution to solid waste management.
- To develop an understanding of alternative energy sources.

Unit 3: Ecosystems, cont'd.

Lesson 12: Observing Early Effects of Pollution

Students will observe the effects of the pollutants on their ecosystems and they will cc

**Unit 4: Trash Power,
cont'd.**

- To develop an understanding of human's need to find a viable solution to solid waste management.
- To develop an understanding of alternative energy sources.

Unit 3: Ecosystems, cont'd.

Lesson 13: Where do the Pollutants Go?

Students continue to observe ecosystems and comparing them to the control experiment

Students will analyze their results to of the Pollution experiment using Record Sheet 1

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| <p>Unit 4: Trash Power, cont'd.</p> <ul style="list-style-type: none"> • To develop an understanding of human's need to find a viable solution to solid waste management. • To develop an understanding of alternative energy sources. | <p>Unit 3: Ecosystems, cont'd.</p> <p>Lesson 14: Drawing Conclusions about our Experiment</p> <p>Students will draw conclusions about the results of the pollutants in their eco-columns</p> <p>Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Danger"</p> <p>Students will make connections from their reading to their experiments</p> <p>Students will view video Living on the Edge and make connections from their experiments</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Students will draw conclusions about the results of the pollutants in their eco-columns</p> |
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| <p>Unit 4: Trash Power, cont'd.</p> <ul style="list-style-type: none"> • To develop an understanding of human's need to find a viable solution to solid waste management. • To develop an understanding of alternative energy sources. | <p>Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Danger"</p> <p>Students will make connections from their reading to their experiments</p> <p>Students will view video Living on the Edge and make connections from their experiments</p> <p>Unit 3: Ecosystems, cont'd.</p> <p>Students will draw conclusions about the results of the pollutants in their eco-columns</p> <p>Students will read the reading selection, "The Chesapeake Bay: An Ecosystem in Danger"</p> <p>Students will make connections from their reading to their experiments</p> <p>Students will view video Living on the Edge and make connections from their experiments</p> |
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**Unit 4: Trash Power,
cont'd.**

- To define key terms – sanitary landfill, methane gas, leachate, clay liner, NIMBY, cap, source reduction, and ground water.

- To review the concepts of “decomposers” as related to natural recycling

(sunlight ®

plant and

animal life ®

decomposers

® raw

materials ®

plant life).

**Unit 4: Trash Power,
cont'd.**

- To explore and

Unit 4: Trash Power

******* ENRICHMENT ACTIVITIES**

Use the Enrichment Activities section of the Trash Power manual to supplement

******* ADDITIONAL RESOURCES**

Use the websites and activities listed at the end of each unit 1

******* CURRENT EVENTS *****

be responsible for completing Current Event Article:

Unit 4: Trash Power

Section 1

- Students will answer Trash Power questions on Student Manual page 2.
- dissect classroom trash, categorize, record, and graph data (bar graph).

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| <p>develop an understanding of the positive and negative aspects related to sanitary landfills.</p> <ul style="list-style-type: none"> • Write a formal lab report: form a hypothesis, list materials, procedures, record observations, form conclusions from evidence. | <ul style="list-style-type: none"> • Discuss with class terms natural, renewable, and nonrenewable resource using • complete “Challenge” on Student Manual pages 11. <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • Research on Materials (see additional resources) • Discuss alternative energy sources pages 16-27. • review and discuss solid waste facts and complete the Community Profile on <p style="text-align: right;">Additional Resources and Activi</p> |
| <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • To explore and develop an understanding of the positive and negative aspects related to sanitary landfills. • Write a formal lab | <p>DNR kids Website: Solid Waste and Recycling</p> <p>http://www.metrokc.gov/DNR/kidStudents/willeb/solid_waste_main.htm</p> <p>Unit 4: Trash Power, cont’d.</p> |

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| <p>report: form a hypothesis, list materials, procedures, record observations, form conclusions from evidence.</p> | <p>Trash Pizza (Activity)</p> <p>http://www.kid-at-art.com/htdoc/lesson</p> <p>Natural Resources</p> <p>http://www.eco-pros.com/naturalresour</p> <p>http://www.brainpop.com/science/ourfragileenvironment/naturalresources/ (video and</p> <p>Mineral Search</p> <p>http://www.urbanext.uiuc.edu/world/minerals.html</p> |
| <p>Unit 4: Trash Power, cont'd.</p> <ul style="list-style-type: none"> • To introduce key terms – absorb, aquatic life, sludge, biodegradable, non-biodegradable, refuse, contamination, water pollution, industrial waste, sewage, and algae. • To explore and develop an understanding of the positive and negative aspects related to ocean dumping. | <p>Unit 4: Trash Power, cont'd.</p> <p><i>Solid Waste</i></p> <p>http://www.brainpop.com/technology/scienceandindustry/wastemanagement/ (video :</p> <p>http://www.epa.gov/oStudentswill/kids/index.htm (Planet Protectors Club interactive</p> <p>Fossil Fuels</p> <p>http://www.brainpop.com/technology/energytechnology/fossilfuels/ (video and quiz)</p> |

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| <p>Unit 4: Trash Power, cont'd.</p> <ul style="list-style-type: none"> • To develop an understanding for the environmental impact of oil spills and the process of cleaning these spills. • To provide an opportunity for students to work as team members to analyze specific water pollution case studies. <p>Unit 4: Trash Power, cont'd.</p> | <p>Gas and Oil</p> <p>http://www.brainpop.com/science/energy/gasandoil/ (video and quiz)</p> <p>Unit 4: Trash Power, cont'd.</p> <p>Plastic from Petroleum</p> <p>http://www.brainpop.com/science/matterandchemistry/plastic/ (video and quiz)</p> <p>Air Pollution</p> <p>http://www.brainpop.com/science/ourfragileenvironment/airpollution/ (video and quiz)</p> <p>Alternative Energy Sources</p> <p>http://www.brainpop.com/science/energy/energysources/ (video and quiz)</p> |
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- To introduce key terms – composting, natural garbage, decay, decomposition, bacteria, decomposer, nutrients, decomposable waste, and decomposition resistant waste.
- To explore and develop the positive and negative aspects of composting.

Unit 4: Trash Power, cont'd.

Section – 2

Sanitary Landfills

- read and discuss pages 34-35 of the Student Manual.

Landfill / Ocean Dump Lab

- create a landfill and an ocean dump in closed containers with teacher assistance. sketch and label each environment and record observations for approx. 6 weeks

Unit 4: Trash Power, cont'd.

- To introduce key terms – composting, natural garbage, decay, decomposition, bacteria, decomposer, nutrients, decomposable waste, and decomposition resistant waste.

Unit 4: Trash Power, cont'd.

Section – 2, cont'd.

Sanitary Landfills

**** need to bring in a closed container, and a variety of garbage from home. ****

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| <p>resistant waste.</p> <ul style="list-style-type: none"> • To explore and develop the positive and negative aspects of composting. | <ul style="list-style-type: none"> • record predictions and observations using Student Manual page 44. • view the video “The Rotten Truth About Garbage” and respond to questions c |
| <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • To introduce key terms – incineration, resource recovery, dioxins, scrubber, and pollutants. • To explore the positive and negative impacts of incineration and resource recovery. • To provide an opportunity for students to work as team members to debate | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 2, cont’d.</p> <p>Sanitary Landfills</p> <ul style="list-style-type: none"> • Diagram a Sanitary Landfill: draw and label a side view of a sanitary landfill, pipes and methane gas pipes and generator. <p>Sanitary Landfills</p> <p style="text-align: right;">*****Additional Resources****:</p> <p>The Garbage Story: Dealing with Solid Waste</p> <p>http://gtm-media.discoveryeducation.com/videos/The%20Garbage%20Story%20Dealing%20wit</p> <p>Unit 4: Trash Power, cont’d.</p> |

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| <p>environmental issues.</p> <p>Unit 4: Trash Power, cont'd.</p> <p>1. To introduce key terms – incineration, resource recovery, dioxins, scrubber, and pollutants.</p> <p>1. To explore the positive and negative impacts of incineration and resource recovery.</p> <p>1. To provide an opportunity for students to work as team members to debate environmental issues.</p> | <p>Section – 2, cont'd.</p> <p>Sanitary Landfills</p> <p>What's a Landfill http://www.kid-at-art.com/htdoc/educate.html</p> <p>Energy Kids Page http://www.eia.doe.gov/kids/energyfacts/saving/recycling/solidwaste/landfiller.html</p> <p>Landfill Links: http://www.dmoz.org/Kids_and_Teens/School_Time/Science/Environment/Garbage/I</p> <p>Unit 4: Trash Power, cont'd.</p> <p>Section – 3</p> <p><i>Water Pollution</i></p> |
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****Ecosystems coordinates with this section**

Unit 4: Trash Power, cont'd.

- To introduce key terms – litter and open dumping.
- To explore the
- Environmental impact of littering and open dumping.

- read and discuss vocabulary as Ocean Dumping is introduced to class using S
- Teacher will discuss with class what an oil spill is and its environmental effect

Unit 4: Trash Power, cont'd.

Section – 3, cont'd.

Water Pollution

- view the video “Bottom of the Barrel” and respond to questions on Student M

Oil Spill Lab

- explore means of cleaning up an oil spill using items brought in from home ar
- view the video “Down the Drain” and respond to questions on Student Manua

**Unit 4: Trash Power,
cont'd.**

- To introduce key terms – litter and open dumping.
- To explore the effects of open dumping.
- Environmental impact of littering and open dumping.

**Unit 4: Trash Power,
cont'd.**

Unit 4: Trash Power, cont'd.

Section – 3, cont'd.

Water Pollution

- read and analyze various water pollution case studies using Student Manual p.

******* Additional Resources *****

Clean Water Program

<http://www.oceansidecleanwaterprogram.org/kids.asp>

Dawn Dish Detergent Fighting to Help Animal Oil Spill Victims

Unit 4: Trash Power, cont'd.

Section – 3, cont'd.

Water Pollution

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| <p>terms – reuse, reduce, and recycle.</p> <ul style="list-style-type: none"> • To interpret data in order to recycle • To develop an understanding of the recycling processes. | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 3, cont’d.</p> <p><i>Water Pollution</i></p> <p>http://www.chewonki.org/cleanwater/energy_choices.asp (facts, activities and teaching</p> |
| <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • To introduce key terms – reuse, reduce, and recycle. | <p>Unit 4: Trash Power, cont’d.</p> |

Section – 4

- To interpret data in order to recycle
- To develop an understanding of the recycling processes.

Composting

- read and discuss “Garbage to Soil” on Student Manual page 73.
- read and discuss composting using Student Manual pages 74-78.

Garbage Eater Lab

- identify the benefits of composting organic materials. Student
- Manual page 79.

Unit 4: Trash Power, cont'd.

Unit 4: Trash Power, cont'd.

Section – 4, cont'd.

- To introduce key terms – reuse, reduce, and recycle.

- Students create a compost heap using construction paper to make soil, organic

Composting

Rotting Bananas Lab

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| <ul style="list-style-type: none">• To interpret data in order to recycle• To develop an understanding of the recycling processes. | <ul style="list-style-type: none">• predict, observe the effects of yeast on bananas (keep a control). complete a v decomposition, and draw conclusions from evidence. |
| Unit 4: Trash Power, cont'd. | |
| Section – 4, cont'd. | |
| | ***** Additional Resources *** |
| | Earth 911 http://earth911.org/composting/ |
| | Composting for Kids http://sustainable.tamu.edu/slidesets/kidscompost/cover.html |
| Unit 4: Trash Power, cont'd. | Kids Recycle http://www.kidsrecycle.org/composting.php |
| <ul style="list-style-type: none">• To introduce key terms – reuse, reduce, and recycle. | United Streaming Video: “Grossology: Kid Rot” http://player.discoveryeducation.com/index.cfm?guidAssetId=76EA436F-B721-4F23 |
| <ul style="list-style-type: none">• To interpret data in order to recycle | |

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| <ul style="list-style-type: none"> • To develop an understanding of the recycling processes. | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 5</p> <p>Incineration and Resource Recovery</p> <ul style="list-style-type: none"> • read and discuss Student Manual pages 82-83. • To Burn or to Not to Burn Student Manual pages 84-86. <p style="text-align: right;">Mock Town Council Meeting</p> <ul style="list-style-type: none"> • Class will be divided into research and presentation teams to answer problem c <p style="text-align: right;">*****Additional Resources*****</p> |
| <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • To introduce key terms – reuse, reduce, and recycle. • To interpret data in order to recycle | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 6</p> <p>Littering and Open Dumping</p> <ul style="list-style-type: none"> • Introduction questions about littering <p>Student Manual page 106.</p> <ul style="list-style-type: none"> • read and discuss open dumping and the related health hazards as a result of so 107. |

- To develop an understanding of the recycling processes.

- take a walking field trip around school to collect litter.

Unit 4: Trash Power, cont'd.

Section – 6, cont'd.

Littering and Open Dumping

- chart items from their litter collection on Student Manual page 108.

Unit 4: Trash Power, cont'd.

******* Additional Activities *****

Littering and Environmental Issues

- To introduce key terms – reuse, reduce, and recycle.
- To interpret data in order to recycle
- To develop an

<http://www.brainpop.com/science/ourfragileenvironment/humansandtheenvironment/>

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| <p>understanding of the recycling processes.</p> | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 7</p> <p>Packaging</p> <ul style="list-style-type: none"> • explore the package problem by going on a package hunt to locate items with pages 112-114. • work with a partner to evaluate a packaged item that they have brought from home |
| <p>Unit 4: Trash Power, cont’d.</p> <ul style="list-style-type: none"> • To introduce key terms – reuse, reduce, and recycle. • To interpret data in order to recycle • To develop an understanding of the recycling processes. | <p>Unit 4: Trash Power, cont’d.</p> <p>Section – 8</p> <p>Reducing, Reusing, and Recycling</p> <ul style="list-style-type: none"> • review key terms and set up an experiment “Reusing Your School Waste” on pages 115-116 for about 1 week. |

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| <p>Unit 4: Trash Power, cont'd.</p> <ul style="list-style-type: none">• To introduce key terms – reuse, reduce, and recycle.• To interpret data in order to recycle• To develop an understanding of the recycling processes. | <ul style="list-style-type: none">• complete conclusion on Student manual page 89. <p>collect their lunch trash and complete Student Journal pages 120-121.</p> <p>Unit 4: Trash Power, cont'd.</p> <p>Section – 8, cont'd.</p> <p>Reducing, Reusing, and Recycling</p> <p>Trash Art</p> <ul style="list-style-type: none">• Turn Trash Into Treasure Student Manual page 122.• learn the steps to recycling paper, plastic and glass. Recycling Processes: plas page 134. <p>Unit 4: Trash Power, cont'd.</p> |
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Section – 8, cont'd.

Reducing, Reusing, and Recycling

Trash Art

***** OPTIONAL ACTIVITIES **

Unit 5: Rocketry

- Students will be able to understand key terms involved in the operation of rockets – Newton's Third Law of Motion, thrust, lift, gravity, drag, telemetry, ignition, lift off, burnout, coasting period, apogee, ejection, soft landing, Robert Goddard, friction, and force.

United Streaming: Reducing, Reusing, and Recycling: Environmental Concerns

<http://player.discoveryeducation.com/index.cfm?guidAssetId=427F2D1C-A09D-4D8>

Unit 5: Rocketry

- Students will be introduced to a short history of rockets and the key terms associated with them.

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| <p>Unit 5: Rocketry, cont'd.</p> <ul style="list-style-type: none"> Students will be able to identify the various parts of the model rocket and the function of each part. To create a direct correlation between concepts trajectory and airplane flight with the trajectory, powers, and flight of a rocket. To recognize that motion can be slowed or delayed by forces such as friction and air resistance. <p>Unit 5: Rocketry , cont'd.</p> | <ul style="list-style-type: none"> Students will watch a virtual rocket launch to become familiar with a launch s http://inventors.about.com/library/inventors/blrocket.htm Students will review the parts of a model rock assembly and the functions of e <p>Unit 5: Rocketry , cont'd.</p> <ul style="list-style-type: none"> Students will study the flight phases of a model rocket and the terms associate Students will develop an understanding for Newton's Third Law of Motion th action there is an equal and opposite reaction – Blow up a balloon and let it go in the balloon goes down). Students will engage in “force & motion experiments” to investigate Newton <p>Unit 5: Rocketry , cont'd.</p> <ul style="list-style-type: none"> begin assembling their model rockets following the specific instructions provi review model rocketry safety code using <i>Estes website</i>. |
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| <ul style="list-style-type: none"> • To recognize that everything on or near the earth is pulled toward the earth's center by gravitational force. • To develop an understanding of the principles of flight as related to Newton's Third Law of Motion, and the correlation of flight pattern and distance. | <ul style="list-style-type: none"> • use <i>altimeter device</i> to track the model rockets altitude, plot data on chart, and • launch model rockets on "Rocket Day". <p>Unit 5: Rocketry , cont'd.</p> <ul style="list-style-type: none"> • Teacher will lead a debriefing about "Rocket Day". <p style="text-align: right;">***** OPTIONAL ACTIVITIES *</p> <ul style="list-style-type: none"> • On "Rocket Day" students can watch the videos "<i>October Sky</i>" and/or "<i>Apollo 11</i>". <p>**** Please note these videos are rated PG-13 and you need to have parent permission to view.</p> |
| <p>Unit 5: Rocketry , cont'd.</p> <ul style="list-style-type: none"> • To provide an opportunity for students to work collaboratively to assemble and | |

launch a model
rocket.

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Grading and Evaluation Guidelines

Common assessments are used throughout the units.

Other Details

SCED

53235 Science (Grade 5)

Science (Grade 5) courses build on the study of various systems. They may include identification and description of cycles, comparisons of forms of matter and energy, forces, or content consistent with state academic standards. Students may make comparisons and interpret and analyze information.