<table>
<thead>
<tr>
<th>Unit 1: Motion and Forces</th>
<th>September and October</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 2: Changes in Matter</td>
<td>November and December</td>
</tr>
<tr>
<td>Unit 3: Ecosystems</td>
<td>January and February</td>
</tr>
<tr>
<td>Unit 4: Plants and Animals</td>
<td>March and April</td>
</tr>
<tr>
<td>Unit 5: Soil</td>
<td>May and June</td>
</tr>
</tbody>
</table>
Content Area: Physical Science

Unit Title: Unit 1: Motion and Forces

Target Course/Grade Level: Science/Grade 2

Unit Summary: Forces, pushes and pulls, can cause objects to move. The speed at which an object moves is related to the strength of the push or pull that imitated the movement of the object. Friction is a force that can slow down, stop or prohibit movement. Some forces act by touching, while others can act without touching.

Primary Interdisciplinary Connections: Math, Language Arts, Technology, and College and Career

21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

For further clarification refer to NJ World Class Standards Introductions at [www.njcccs.org](http://www.njcccs.org).

### Learning Targets

**Content Standards:** This unit will infuse the four strands of the Science Practices Standard 5.1. These include: understanding scientific explanations, generating scientific evidence through active investigation, reflecting on scientific knowledge and participating productively in science.

This unit will also infuse the 21st Century Life & Careers standard 9.1 strands A – D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership and cross cultural understanding and interpersonal communication.

Also infused in this unit are Technology Standard 8.1 strands A-F which states: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge, & Technology Standard 8.2 strands A-G which states: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

<table>
<thead>
<tr>
<th>CPI #</th>
<th>Cumulative Progress Indicator (CPI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.2.2.E.2</td>
<td>A force is a push or a pull. Pushing or pulling can move an object. The speed an object moves is related to how strongly it is pushed or pulled. When an object does not move in response to a push or a pull, it is because another push or pull (friction) is being applied by the environment.</td>
</tr>
<tr>
<td>5.2.2.E.3</td>
<td>Some forces act by touching, while other forces can act without touching.</td>
</tr>
</tbody>
</table>


# Unit Essential Questions
- How does friction affect movement?
- What kinds of forces act by touching?
- What kinds of forces act without touching?
- How can a force act upon an object without touching it?

# Unit Enduring Understandings
*Students will understand that...*
- Friction slows down or stops movement.
- Some forces act by touching.
- Some forces act without touching.

# Unit Objectives
*Students will know...*
5.2.2.E.2
- A force is a push or a pull. Pushing or pulling can move an object. The speed an object moves is related to how strongly it is pushed or pulled. When an object does not move in response to a push or a pull, it is because another push or pull (friction) is being applied by the environment.

5.2.2.E.3
- Some forces act by touching, while other forces can act without touching.

# Unit Objectives
*Students will be able to...*
5.2.2.E.2
- Predict an object’s relative speed, path, or how far it will travel using various forces and surfaces.

5.2.2.E.3
- Distinguish a force that acts by direct contact with an object (e.g., by pushing or pulling) from a force that can act without direct contact (e.g., the attraction between a magnet and a steel paper clip).
### Suggested Formative Assessments
- Utilize individual district wide assessments.

### Suggested Summative Assessments
- For ideas refer to NJ State DOE PEP [http://www.state.nj.us/education/njpep/index.html](http://www.state.nj.us/education/njpep/index.html)
- Utilize individual district wide assessments.

### Suggested Modifications (ELLs, Special Education, Gifted and Talented)
- Provide differentiated instruction as needed.
- Follow all IEP modifications/504 plan.

### Suggested Curriculum Development Resources/Instructional Materials/Equipment Needed

**Teacher Resources:**

### Instructional Guidance

#### 5.2.2.E.2 - To assist in meeting this CPI, students may:

- Use various toys, carts, etc. and ramps to explore speed, pathways, and forces.

- Conduct on line simulations and discuss observations and conclusions. Use appropriate methods of recording data and sharing results with classmates. Simulation of forces and movement
  - [http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml](http://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml)

#### 5.2.2.E.3 - To assist in meeting this CPI, students may:

- Explore, predict and observe forces when given a variety of objects with which to interact.

### Resources

#### 5.2.2.E.2 & 5.2.2.E.3
- National Science Digital Library, Science Digital Literacy Maps: National Science Digital Library: [Laws of Motion](http://strandmaps.nsdl.org/?id=SMS-MAP-1357)
- National Science Digital Library, [Science Refreshers](https://www.bbc.co.uk/schools/scienceclips/ages/6_7/forces_movement.shtml)
http://nsdl.org/refreshers/science/
• *Science Curriculum Topic Study* by Page Keeley
  Describing Position and Motion p. 207

Suggested websites:  [www.ncs-tech.org](http://www.ncs-tech.org), [www.teachersfirst.com](http://www.teachersfirst.com)

Additional resources should be determined by individual districts.

Teacher Notes:
**Science Unit: Motion and Forces**

**Grade: 2**

**CPI #: 5.2.2.E.2 - 5.2.2.E.4**

**Content:** A force is a push or a pull. Pushing or pulling can move an object. When an object does not move in response to a push or a pull, it is because another push or pull (friction) is being applied by the environment. Some forces act by touching, while others can act without touching.

<table>
<thead>
<tr>
<th>Website</th>
<th>Brief Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.brainpop.com/science/motionsforcesandtime/">http://www.brainpop.com/science/motionsforcesandtime/</a></td>
<td>What are the laws that rule the universe?</td>
</tr>
<tr>
<td><a href="http://www.exchange.smarttech.com/search.html?tab=resources&amp;q=&amp;sbj=sc&amp;grd=g2">http://www.exchange.smarttech.com/search.html?tab=resources&amp;q=&amp;sbj=sc&amp;grd=g2</a></td>
<td>Push Pull Q &amp; A...ex. What forces are used to open a blind on a window?</td>
</tr>
<tr>
<td><a href="http://wings.avkids.com/Curriculums/Forces_Motion/">http://wings.avkids.com/Curriculums/Forces_Motion/</a></td>
<td>Beginner activities for energy and motion.</td>
</tr>
<tr>
<td><a href="http://www1.eere.energy.gov/kids/games.html">http://www1.eere.energy.gov/kids/games.html</a></td>
<td>Games, tips, and facts for kids to learn to save energy.</td>
</tr>
</tbody>
</table>
Content Area: Physical Science

Unit Title: Unit 2: Changes in Matter

Target Course/Grade Level: Science / Grade 2

Unit Summary: All objects and substances in the natural world are composed of matter with certain properties. These properties can change as a result of such processes as heating and cooling, however, not all materials respond the same way to these processes.

Primary Interdisciplinary Connections: Math, Language Arts, Technology, and College and Career

21st Century Themes: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

For further clarification refer to NJ World Class Standards Introduction at www.njcccs.org.

Learning Targets

Content Standards: This unit will infuse the four strands of the Science Practices Standard 5.1. These include: understanding scientific explanations, generating scientific evidence through active investigation, reflecting on scientific knowledge and participating productively in science.

This unit will also infuse the 21st Century Life & Careers standard 9.1 strands A – D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership and cross cultural understanding and interpersonal communication.

Also infused in this unit are Technology Standard 8.1 strands A-F which states: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge, & Technology Standard 8.2 strands A-G which states: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

<table>
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<tr>
<th>CPI #</th>
<th>Cumulative Progress Indicator (CPI)</th>
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</thead>
<tbody>
<tr>
<td>5.2.2.B.1</td>
<td>Some properties of matter can change as a result of processes such as heating and cooling. Not all materials respond the same way to these processes.</td>
</tr>
<tr>
<td>5.4.2.G.1</td>
<td>Water can disappear (evaporate) and collect (condense) on surfaces.</td>
</tr>
<tr>
<td>Unit Essential Questions</td>
<td>Unit Enduring Understandings</td>
</tr>
<tr>
<td>-------------------------</td>
<td>------------------------------</td>
</tr>
</tbody>
</table>
| • How can matter change when heated or cooled?  
• Does all matter change the same way? | *Students will understand that...*  
• There are several ways that matter can change but not all substances respond the same way when heated or cooled. |

<table>
<thead>
<tr>
<th>Unit Objectives</th>
<th>Unit Objectives</th>
</tr>
</thead>
</table>
| *Students will know...*  
5.2.2.B.1  
• Some properties of matter can change as a result of processes such as heating and cooling. Not all materials respond the same way to these processes.  
5.4.2.G.1  
• Water can disappear (evaporate) and collect (condense) on surfaces. | *Students will be able to...*  
5.2.2.B.1  
• Generate accurate data and organize arguments that not all substances respond the same way when heated or cooled, using common materials, such as shortening or candle wax.  
5.4.2.G.1  
• Observe and discuss evaporation and condensation. |

### OCEAN COUNTY SCIENCE CURRICULUM

#### Evidence of Learning

**Suggested Formative Assessments**
- Utilize individual district wide assessments.

**Sample Assessments**
5.2.2.B.1 & 5.4.2.G.1 - *To show evidence of meeting these CPIs, students may:*

- Identify the changes of state from liquid to gas in evaporation and gas to liquid in condensation using water as an example.
- How can a water cycle be used to explain water’s ability to disappear (evaporate) and collect (condense) on surfaces?

**Suggested Summative Assessments**
- For ideas refer to NJ State DOE PEP [http://www.state.nj.us/education/njpep/index.html](http://www.state.nj.us/education/njpep/index.html)
- Utilize individual district wide assessments.

**Suggested Modifications (ELLs, Special Education, Gifted and Talented)**
- Provide differentiated instruction as needed.
• Follow all IEP modifications/504 plan.

Suggested Curriculum Development Resources/Instructional Materials/Equipment Needed/Teacher Resources:

**Instructional Guidance**

5.2.2.B.1 - *To assist in meeting this CPI, students may:*

- Observe and describe changes in the physical properties of solids and liquids after exposure to various treatments (i.e., temperature, sunlight, water).

- Use writing, drawing, and discussion to communicate observations, descriptions, investigations, and experiences concerning solids and liquids.

5.4.2.G.1 - *To assist in meeting this CPI, students may:*

- Explore what happens to water as it goes from solid to liquid and back again; use observation, measurement, and communication skills to describe change. See Science NetLinks, Water 1: Water and Ice: http://www.sciencenetlinks.com/lessons.php?Grade=k-2&BenchmarkID=4&DocID=0

- Observe the amount of water in an open container over time, and observe the amount of water in a closed container over time. Compare and contrast the sets of observations over time. See Science NetLinks, Water 2: Disappearing Water: http://www.sciencenetlinks.com/lessons.php?DocID=168

- Explore what happens to the amount of different substances as they change from a solid to a liquid or a liquid to solid. See Science NetLinks: Water 3: Melting and Freezing: http://www.sciencenetlinks.com/lessons.php?DocID=161

**Resources**

5.2.2.B.1

- *Science Curriculum Topic Study* by Page Keeley, Physical Properties and Change p. 170

5.4.2.G.1
• National Science Digital Library, Science Digital Literacy Maps
  The Physical Setting: Weather and Climate
  http://strandmaps.nsdl.org/?id=SMS-MAP-1698
• National Science Digital Library, Science Refreshers
  http://nsdl.org/refreshers/science/
• *Science Curriculum Topic Study* by Page Keeley,
  Water Cycle, p.189

Suggested websites: [www.teachersfirst.com](http://www.teachersfirst.com) and [www.ncs-tech.org](http://www.ncs-tech.org)

Additional resources should be determined by individual districts.

Teacher Notes:
<table>
<thead>
<tr>
<th>Website</th>
<th>Brief Description</th>
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</thead>
<tbody>
<tr>
<td><a href="http://www.kidzone.ws/water/bactivity1.htm">http://www.kidzone.ws/water/bactivity1.htm</a></td>
<td>Coloring water sheet of water cycle</td>
</tr>
<tr>
<td><a href="http://www.longwood.k12.ny.us">www.longwood.k12.ny.us</a></td>
<td>Water cycle smart board lesson</td>
</tr>
<tr>
<td><a href="http://proteacher.org/a/25892">http://proteacher.org/a/25892</a> Water Cycle. html</td>
<td>Adventures of Randy the Raindrop</td>
</tr>
<tr>
<td><a href="http://exchange.smartech.com">http://exchange.smartech.com</a></td>
<td>Smart board lessons</td>
</tr>
<tr>
<td><a href="http://classroom.jc-schools.net/sci-unites/matter.htm">http://classroom.jc-schools.net/sci-unites/matter.htm</a></td>
<td>Properties of matter song, Characteristicis of materials game</td>
</tr>
<tr>
<td><a href="http://aimee8myweb.ega.edu/matter">http://aimee8myweb.ega.edu/matter</a></td>
<td>Changes of matter game Oven freezer game</td>
</tr>
<tr>
<td><a href="http://www.neoK12.com">www.neoK12.com</a></td>
<td>Science theatre, videos and quizzes</td>
</tr>
</tbody>
</table>
Additional Activities:
Smart Board
Computer lab
Library
Classroom / TV VCR
TVator
Unitedstreaming.com
### Content Area: Life Science

**Unit Title:** Unit 3: Ecosystems

**Target Course/Grade Level:** Science/2nd grade

**Unit Summary:** All animals and most plants depend on both other organisms and their environment to meet their basic needs. Plants and animals have features that help them survive in different environments.

**Primary Interdisciplinary Connections:** Math, Language Arts, Technology, and College and Career.

**21st Century Themes:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

For further clarification refer to NJ World Class Standards Introduction at [www.njeccs.org](http://www.njeccs.org).

### Learning Targets

**Content Standards:** This unit will infuse the four strands of the Science Practices Standard 5.1. These include: understanding scientific explanations, generating scientific evidence through active investigation, reflecting on scientific knowledge and participating productively in science.

This unit will also infuse the 21st Century Life & Careers standard 9.1 strands A – D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership and cross cultural understanding and interpersonal communication.

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<th>Cumulative Progress Indicator (CPI)</th>
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<tbody>
<tr>
<td>5.3.2.C.1</td>
<td>Organisms interact and are interdependent in various ways; for example, they provide food and shelter to one another.</td>
</tr>
<tr>
<td>5.3.2.C.2</td>
<td>A habitat supports the growth of many different plants and animals by meeting their basic needs of food, water, and shelter.</td>
</tr>
<tr>
<td>5.3.2.C.3</td>
<td>Humans can change natural habitats in ways that can be helpful or harmful for the plants and animals that live there.</td>
</tr>
<tr>
<td>5.3.2.E.2</td>
<td>Plants and animals have special features that help them survive in different environments.</td>
</tr>
<tr>
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</tbody>
</table>

**Unit Essential Questions**
- In what ways do organisms interact within ecosystems?
- In what ways are organisms of the same kind different from each other? How does this help them reproduce and survive?

**Unit Enduring Understandings**
*Students will understand that...*
- All animals and most plants depend on both other organisms and their environments for their basic needs.
- Sometimes differences between organisms of the same kind give advantages in surviving and reproducing in different environments.

**Unit Objectives**
*Students will know...*

<table>
<thead>
<tr>
<th>5.3.2.C.1</th>
<th>Organisms interact and are interdependent in various ways.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.2.C.2</td>
<td>A habitat provides and supports plants and animals with their basic needs.</td>
</tr>
<tr>
<td>5.3.2.C.3</td>
<td>Human actions which change habitats can be helpful or harmful to plants and animals.</td>
</tr>
<tr>
<td>5.3.2.E.2</td>
<td>Plants and animals have special features that help them to survive in different environments.</td>
</tr>
</tbody>
</table>

**Unit Objectives**
*Students will be able to...*

<table>
<thead>
<tr>
<th>5.3.2.C.1</th>
<th>Describe the ways in which organisms interact with each other and their habitats in order to meet basic needs.</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.3.2.C.2</td>
<td>Identify the characteristics of a habitat that enable the habitat to support the growth of many different plants and animals.</td>
</tr>
<tr>
<td>5.3.2.C.3</td>
<td>Communicate ways that humans protect habitats and/or improve conditions for the growth of the plants and animals that live there, or ways that humans might harm habitats.</td>
</tr>
<tr>
<td>5.3.2.E.2</td>
<td>Describe how similar structures found in different organisms (e.g., eyes, ears, mouths) have similar functions and enable those organisms to survive in different environments.</td>
</tr>
</tbody>
</table>
Suggested Formative Assessments

• For ideas refer to NJ State DOE Classroom Application Documents (CAD) http://njcccs.org/CADDownload.aspx?AreaCode=5&AreaDesc=Science

• Utilize individual district wide assessments.

Sample Assessments

5.3.2.C.1 - To show evidence of meeting this CPI, students may complete the following performance assessment:

Your class has been asked to survey the types of plants and animals that live around the school property. Conduct a survey of the different types of plants and animals you see on a walk around the school grounds. Use your journal to document what you see (drawing pictures, collecting leaves, etc.). Pay special attention to how the different organisms interact with other living things and their environment to meet their needs (birds nesting in trees, ants collecting food, etc.). Report your findings to other students in schools around New Jersey and the rest of the world in a series of brief nature videos or podcasts (using a digital collaboration site), where each group highlights a different species on the school grounds.

5.3.2.C.2 - To show evidence of meeting this CPI, students may complete the following performance assessment:

Students work in groups to construct a visual representation of a habitat. They identify all living organisms of the habitat, and then identify which elements (living and non-living) of the habitat provide all organisms with food, shelter and water.

5.3.2.C.2 - To show evidence of meeting this CPI, students may answer the following question:

Which of these animals MOST likely made the hole in the cactus to find water?

A B C D
5.3.2.C.3 - To show evidence of meeting this CPI, students may complete the following assessment:

Become a participant in the Environmental Protection Agency’s (EPA) *Pick 5 for the Environment Challenge*. Choose at least five actions to commit to as a class in order to protect the environment. After you change your behaviors, let others know what you committed to through Pick Five.

5.3.2.E.2 - To show evidence of meeting this CPI, students may complete the following formative assessment:

Identify any structures that are common to a number of the species after being presented with a variety of images of different species. Explain, using their own words, how each structure can help an organism survive in its habitat.

5.3.2.E.2 - To show evidence of meeting this CPI, students may answer the following question:

Catfish have whisker-like parts around their mouths to help them feel their surroundings because they live in murky water. Which of these is a catfish?

A.  
B.  
C.  
D.  

Suggested Summative Assessments
• For ideas refer to NJ State DOE PEP http://www.state.nj.us/education/njpep/index.html
• Utilize individual district wide assessments.
Suggested Modifications (ELLs, Special Education, Gifted and Talented)

- Provide differentiated instruction as needed.
- Follow all IEP modifications/504 plan.

Suggested Curriculum development Resources/Instructional Materials/Equipment Needed

Teacher Resources:

Instructional Guidance

5.3.2.C.1 - To assist in meeting this CPI, students may:
- Identify the different kinds of living things in varying environments, and determine the relationships that exist between them.
- Recognize and provide examples of how living things coexist in different environments, sharing resources and space.

5.3.2.C.2 - To assist in meeting this CPI, students may:
- Describe how plants and animals interact with each other and their environment in a variety of settings by observing interactions in natural settings or through digital/video means.

5.3.2.C.3 - To assist in meeting this CPI, students may:
- Explain how human actions (both positive and negative) can affect the survival and health of plants and animals.

5.3.2.E.2 - To assist in meeting this CPI, students may:
- Observe a variety of plants and animals interacting with their environment.
- Journal the experience, taking note of similar structures between different organisms.
- Engage in a scientific discussion, during which they explain the role of the features or traits that help the plant or animal survive.

Resources:

5.3.2.C.1, 5.3.2.C.2 & 5.3.2.C.3
- Science NetLinks offers lesson plans and support materials associated with this CPI.
- VoiceThread is a collaborative, multimedia slide show that holds images, documents, and videos and allows people to navigate pages and leave comments. It can be used as a resource to support the sample assessment provided with this CPI.
• Environmental Protection Agency’s (EPA) Pick 5 for the Environment Challenge website explains the details of the challenge.

5.3.2.E.2
• Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of classroom teachers working with students on the specific learning goals associated with this CPI.

Suggested websites:  www.ncs-tech.org , www.teachersfirst.com

Additional resources should be determined by individual districts.

Teacher Notes:
Science Unit: Ecosystems  
Grade: 2

CPI #: 5.3.2.C.1 - 5.3.2.C.2 - 5.3.2.C.3 - 5.3.2.E.2

Content:
Organisms interact and are interdependent in various ways; for example, they provide food and shelter to one another. A habitat supports the growth of many plants and animals by meeting their basic needs of food, water, and shelter. Humans can change natural habitats in ways that can be helpful or harmful for the plants and animals that there. Plants and animals have special features that help them survive in different environments.

Website

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<tbody>
<tr>
<td><a href="http://www.crickweb.co.uk/ks2science.html#variation2C">http://www.crickweb.co.uk/ks2science.html#variation2C</a></td>
<td>Do you know which group living thing belong to?</td>
</tr>
<tr>
<td><a href="http://www.brainpop.com">www.brainpop.com</a> Your school will need a password for this site.</td>
<td>Food chain activites</td>
</tr>
<tr>
<td><a href="http://www.brainpopjr.com">www.brainpopjr.com</a> Password necessary</td>
<td>Same as above, some easier activites</td>
</tr>
<tr>
<td><a href="http://pbskids.org/sid/videoplayer.html">http://pbskids.org/sid/videoplayer.html</a></td>
<td>Sid the Science Kid and activites</td>
</tr>
<tr>
<td><a href="http://www.crickweb.co.uk/ks2science.html#variation2C">http://www.crickweb.co.uk/ks2science.html#variation2C</a></td>
<td>Mini beast classification. Habitats – id simple organisms. Food chains – construct a food chain f few of the organisms found there.</td>
</tr>
<tr>
<td><a href="http://www.scientemadesimple.com/">http://www.scientemadesimple.com/</a></td>
<td>How do animals spend the winter?</td>
</tr>
<tr>
<td><a href="http://www.exploratorium.edu/science_explo">http://www.exploratorium.edu/science_explo</a></td>
<td>Ideas for experiments and Science Fair</td>
</tr>
</tbody>
</table>
| [http://exchange.smarttech.com/search.html?tab=resource&q=recycling&sbj=sc&grd=g2](http://exchange.smarttech.com/search.html?tab=resource&q=recycling&sbj=sc&grd=g2) | Interactive – the beach is a natural res that we must take care of. Living things change their environmen
| **www.epa.gov/kids** | People share the Earth with many different kinds of plants and animals. Learn how to keep those places safe and clean. |
| **www.scholastic.com/actgreen** | Various ways to go green |
| **www.brainpop.com/earthday** | Earth Day activities |
| **http://www.brainpop.com/science/ourfragileenvironment** | Choose from any of the listed activities such as, air pollution, fossil fuels, greenhouse effect. |
| **www.brainpopjr.com** | Activities and printable worksheets |
| **http://exchange.smartboard.com/search.html?tab=resources&q=ecosystems&sbj=sc&grd=g2** | Smart Notebook lesson – How living things change their ecosystems. How changes affect living things. Living things of the past. Also includes links for other websites with same games. |
**Unit Overview**

**Content Area:** Life Science & Earth Science

**Unit Title:** Unit 4: Plants and Animals

**Target Course/Grade Level:** Science/Second grade

**Unit Summary:** Plants &/or Animals:
- have energy needs.
- have ways to obtain food and water.
- have roots to gather water and leaves to gather sunlight and the relationship between the sun and plant growth.
- have similarities and differences between parents and offspring.
- have life cycles, growth and development.
- have structures that enable them to survive in various environments.

**Primary Interdisciplinary Connections:** Math, Language Arts, Technology and College and Career.

**21st Century Themes:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

For further clarification refer to NJ World Class Standards Introduction at [www.njcccs.org](http://www.njcccs.org).

**Learning Targets**

**Content Standards:** This unit will infuse the four strands of the Science Practices Standard 5.1. These include: understanding scientific explanations, generating scientific evidence through active investigation, reflecting on scientific knowledge and participating productively in science.

This unit will also infuse the 21st Century Life & Careers standard 9.1 strands A – D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership and cross cultural understanding and interpersonal communication.

Also infused in this unit are Technology Standard 8.1 strands A-F which states: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge, & Technology Standard 8.2 strands A-G which states: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

<table>
<thead>
<tr>
<th>CPI #</th>
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<tbody>
<tr>
<td>5.3.2.B.1</td>
<td>Describe the requirements for the care of plants and animals related to meeting their energy needs.</td>
</tr>
<tr>
<td>5.3.2.B.2</td>
<td>Compare how different animals obtain food and water.</td>
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</tbody>
</table>
### Unit Essential Questions

- How is matter transformed and used as energy in living organisms?
- How do organisms change as they go through their life cycle?
- In what ways are organisms of the same kind different from each other? How does this help them reproduce and survive?

### Unit Enduring Understandings

*Students will understand that...*

- All organisms transfer matter and convert energy from one form to another.
- Organisms reproduce, develop and have predictable life cycles and pass on some traits to their offspring.
- Sometimes differences between organisms of the same kind give advantages in surviving and reproducing in different environments.

### Unit Objectives

#### Students will know...

- **5.3.2.B.1, 5.3.2.B.2, 5.3.2.B.3 & 5.4.2.E.1**
  - how plants and animals meet their energy needs.
  - how different plants and animals obtain their food.
  - that most plants get water from soil through their roots and gather light through their leaves.
- **5.3.2.D.1, 5.3.2.D.2, 5.3.2.E.1 & 5.3.2.E.2**
  - how to record the observable characteristics of plants and animals to determine the similarities and differences between parents and their offspring.
  - the life cycle and development of various plants and animals.

#### Students will be able to...

- **5.3.2.B.1, 5.3.2.B.2, 5.3.2.B.3 & 5.4.2.E.1**
  - Identify how plants and animals get their food, air, water and sunlight (energy needs).
  - Observe a variety of plants and animals and identify how each one’s physical features and/or behaviors allow them to obtain food (ie: web building, hunting/stalking, foraging).
  - Identify what plant parts obtain water and sunlight.
- **5.3.2.D.1, 5.3.2.D.2, 5.3.2.E.1 & 5.3.2.E.2**
  - Explain, in their own words, how you can tell if two animals are related or not.
  - Describe the similarities and differences between parents and offspring, such as size, color, shapes...
  - Identify the life cycle components of a bird, frog, dog...

### OCEAN COUNTY SCIENCE CURRICULUM

#### Evidence of Learning

**Suggested Formative Assessments**

- For ideas refer to NJ State DOE Classroom Application Documents
• Utilize individual district wide assessments.

**Sample Assessments**

**5.3.2.B.1 & 5.3.2.B.3 & 5.4.2.E.1 - To show evidence of meeting this CPI, students may complete the following assessments:**

Students grow plants in the classroom from seeds. Record all observations, including verbal descriptions, as well as data about the height and number of leaves of each of the plants. They draw conclusions about the effects of modifying the conditions that the plants are grown under, based on evidence.

Which of these is more important for plants than for animals in order to live?
- A. Air
- B. Water
- C. Sunlight
- D. A place to live

**5.3.2.D.1 - To show evidence of meeting this CPI, students may complete the following performance assessment:**

You are a volunteer on a farm, and the farmer needs some help trying to identify which young animals are related to which parents. The farmer has given you pictures of all the animals on the farm, and she would like you to use each animal’s distinguishing characteristics to determine the relationships. After reviewing the pictures, share your ideas with your classmates. State your claims, using the animals’ characteristics as physical evidence (markings, color, etc.) to support your claim. As a class, come to consensus about the relationships on the farm.

**5.3.2.D.2 - To show evidence of meeting this CPI, students may complete the following assessments:**

Identify which images represent changes in growth, and which images represent changes in differentiation based on images of different organisms at different stages in their life cycle. Make a claim, and support their claim using observations from the pictures.
How will the young cardinal change as it grows up?
A. It will grow more toes.
B. Its tail feathers will become shorter.
C. It will grow a pointed crest.
D. Its beak will become long and narrow.

5.3.2.E.1 - To show evidence of meeting this CPI, students may answer the following questions:

Explain, in your own words, how you can tell if two animals are related.

Which of these is a scientific observation for the mother cat A and her kitten B in the picture?
A. Cat A is prettier than kitten B.
B. Cat A has longer fur than kitten B.
C. Cat A is my favorite kitten.
D. Cat A runs faster than kitten B.

5.3.2.E.2 - To show evidence of meeting this CPI, students may answer the following questions:

Identify any structures that are common to a number of the species after being presented with a variety of images of different species. Explain, using their own words, how each structure can help an organism survive in its
Catfish have whisker-like parts around their mouths to help them feel their surroundings because they live in murky water. Which of these is a catfish?

E.  
F.  
G.  
H.

Suggested Summative Assessments
• For ideas refer to NJ State DOE PEP http://www.state.nj.us/education/njpep/index.html
• Utilize individual district wide assessments.

Suggested Modifications (ELLs, Special Education, Gifted and Talented)
• Provide differentiated instruction as needed.
• Follow all IEP modifications/504 plan.

Suggested Curriculum development Resources/Instructional Materials/Equipment Needed Teacher Resources:

Instructional Guidance
5.3.2.B.1 - To assist in meeting this CPI, students may:
• Observe a variety of plants and animals (in natural settings or using digital/video) and identify the basic needs that are common to plants or animals of the same group.

5.3.2.B.2 - To assist in meeting this CPI, students may:
• Observe a variety of animals and identify how each animal obtains food and water. Identify those unique physical features (trunks, beaks, claws, etc.) or behaviors (web-building.
hunting/stalking, foraging, etc.) that allow certain animals to obtain food.

5.3.2.B.3 - To assist in meeting this CPI, students may:

- Identify characteristics (e.g., body coverings, beak shape, number of legs, body parts) that are passed on from parents to young.
- Classify young animals based on characteristics that are passed on from parents (e.g., dogs/puppies, cats/kittens, cows/calves, chicken/chicks).

5.3.2.D.1 - To assist in meeting this CPI, students may:

- Identify characteristics (e.g., body coverings, beak shape, number of legs, body parts) that are passed on from parents to young.
- Classify young animals based on characteristics that are passed on from parents (e.g., dogs/puppies, cats/kittens, cows/calves, chicken/chicks).

5.3.2.D.2 - To assist in meeting this CPI, students may:

- Observe a complete life cycle of an organism in the classroom by recognizing, recording and communicating changes observed in the organism over time.
- Use records from their own observations to discriminate between the changes that are due to growth (size, weight, etc.) and which are due to development (structural changes).

5.3.2.E.1 - To assist in meeting this CPI, students may:

- Describe the similarities and differences between parents and offspring, such as size and color, shapes, etc. after being presented with digital images or living organisms.
- Discuss and then create a graphic organizer to represent which traits are similar or different between parents and offspring.

5.5.2.E2 - To assist in meeting this CPI, students may:

- Observe a variety of plants and animals interacting with their environment.
- Journal the experience, taking note of similar structures between different organisms.
- Engage in a scientific discussion, during which they explain the role of the features or traits that help the plant or animal survive.

5.4.2.E.1 - To assist in meeting this CPI, students may:
• Observe a variety of plants and animals (in natural settings or using digital/video means) and identify the basic needs that are common to plants or animals of the same group.

• Conduct a variety of experiments to determine how plants obtain water and light. Determine which conditions can affect the way plants obtain their energy needs.

Resources

5.3.2.B.1 & 5.3.2.B.2
• Teachers’ Domain provides lesson plans and other multimedia resources (video clips and simulations) that support this CPI. [http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_stayalive/](http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_stayalive/)

5.3.2.B.3
• Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of students discussing their scientific ideas associated with this CPI. [http://www.hsdvl.org/video.php?record_serial=5](http://www.hsdvl.org/video.php?record_serial=5)

5.3.2.D.1
• Annenberg Media’s Teachers’ Resources offer short video courses covering essential science content for K-6 teachers.

5.3.2.D.2
• Annenberg Media’s Teachers’ Resources offer short video courses covering essential science content for K-6 teachers.

5.3.2.E.1

5.3.2.E.2
• Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of classroom teachers working with students on the specific learning goals associated with this CPI.

5.4.2.E.1
• Teachers’ Domain provides lesson plans and other multimedia resources (video clips and simulations) that support this CPI.
  http://www.teachersdomain.org/resource/tdc02.sci.life.colt.lp_stayalive/

• Harvard-Smithsonian Center for Astrophysics’ Digital Video Library provides short video clips of classroom teachers working with students on the specific learning goals associated with this CPI.

• National Science Digital Library, Science Digital Literacy Maps
  The Living Environment: Flow of Energy in Ecosystems
  http://strandmaps.nsdl.org/?id=SMS-MAP-1422

Suggested websites:  www.ncs-tech.org, www.teachersfirst.com

Additional resources should be determined by individual districts.

Teacher Notes:
**Science Unit:** Plants  
**Grade:** 2

**CPI #:** 5.3.2.B.3

**Content:**

Explain that plants get water from soil through their roots and gather soil from their roots.

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<tr>
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<tr>
<td><a href="http://www.smarttech.com">www.smarttech.com</a>~</td>
<td>(for districts with Smartboards) ~ search: Science Grade 2</td>
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<tr>
<td><a href="http://www.brainpopjr.com">www.brainpopjr.com</a>~</td>
<td>Parts of a plant video, questions, quiz, word wall</td>
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<td>search: Junior PreK-2; Science~ Plants</td>
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<tr>
<td><a href="http://www.pbskids.org">www.pbskids.org</a>~</td>
<td>games and video clips</td>
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</table>
**Science Unit:** Plants/Animals  
**Grade:** 2  

**CPI #:** 5.3.2.B.1; 5.3.2.B.2; 5.3.2.B.3; 5.3.2.D.1

**Content:**
- Describe the requirements for the care of plants and animals related to meeting their energy needs.
- Compare how different animals obtain food and water.
- Explain that most plants get water from soil through their roots and gather light through their leaves.
- Record the observable characteristic changes that occur during the life cycle of plants and animals by examining a variety of species and distinguish between growth and development.

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<td><a href="http://www.unitedstreaming.com">www.unitedstreaming.com</a></td>
<td>The Magic Schoolbus Gets Planted- video</td>
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**OCEAN COUNTY SCIENCE CURRICULUM**

**Unit Overview**

**Content Area:** Earth Science  
**Unit Title:** Unit 5: Soil  
**Target Course/Grade Level:** Science / Grade 2  

**Unit Summary:** Soil is made up of a variety of materials that are a result of processes that occur on Earth.

**Primary Interdisciplinary Connections:** Math, Language Arts, Technology, and College and Career

**21st Century Themes:** All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society and the universe.

For further clarification refer to NJ World Class Standards Introduction at [www.njcccs.org](http://www.njcccs.org).

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**Learning Targets**

**Content Standards:** This unit will infuse the four strands of the Science Practices Standard 5.1. These include: understanding scientific explanations, generating scientific evidence through active investigation, reflecting on scientific knowledge and participating productively in science.

This unit will also infuse the 21st Century Life & Careers standard 9.1 strands A – D. These strands include: Critical thinking and problem solving, creativity and innovation, collaboration, teamwork and leadership and cross cultural understanding and interpersonal communication.

Also infused in this unit are Technology Standard 8.1 strands A-F which states: All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge, & Technology Standard 8.2 strands A-G which states: All students will develop an understanding of the nature and impact of technology, engineering, technological design, and the designed world, as they relate to the individual, global society, and the environment.

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<td>5.4.2.C.1</td>
<td>Soils are made of many living and nonliving substances. The attributes and properties of soil (e.g., moisture, kind and size of particles, living/organic elements, etc.) vary depending on location.</td>
</tr>
</tbody>
</table>
### Unit Essential Questions
- What is soil?
- What are the properties of soil?

### Unit Enduring Understandings
*Students will understand that...
- Soil is a product of processes that occur on Earth.
- The Earth includes a variety of materials in solid, liquid, and gaseous form.

### Unit Objectives
*Students will know...
**5.4.2.C.1**
- Soils are made of many living and nonliving substances. The attributes and properties of soil (e.g., moisture, kind and size of particles, living/organic elements, etc.) vary depending on location.

### Unit Objectives
*Students will be able to...
**5.4.2.C.1**
- Describe Earth materials using appropriate terms such as hard, soft, dry, wet, heavy, and light.

### OCEAN COUNTY SCIENCE CURRICULUM
Evidence of Learning

#### Suggested Formative Assessments
- Utilize individual district wide assessments.

#### Sample Assessments
**5.4.2.C.1 - To show evidence of meeting this CPI, students may:**

- Identify two ways that dirt and soil are different.
- Determine the characteristics of soil that they would look for when planning a vegetable garden and explain why this information is useful.

#### Suggested Summative Assessments
- For ideas refer to NJ State DOE PEP [http://www.state.nj.us/education/njpep/index.html](http://www.state.nj.us/education/njpep/index.html)
- Utilize individual district wide assessments.

#### Suggested Modifications (ELLs, Special Education, Gifted and Talented)
- Provide differentiated instruction as needed.
- Follow all IEP modifications/504 plan.
Suggested Curriculum Development Resources/Instructional Materials/Equipment Needed/Teacher Resources:

**Instructional Guidance**

5.4.2.C.1 - *To assist in meeting this CPI, students may:*

- Participate in GLOBE’s *The Scoop on Soils* found at: http://www.globe.gov/fsl/html/templ.cgi?EG_cloud&lang=en&nav=1

- Develop systematic procedures for sampling and analyzing soils from across the community.

- Investigate *Soil And My Backyard* found at: http://www.globe.gov/tctg/backyard.pdf?sectionId=104

- Develop a simple soil classification system that can be used to categorize samples from around the globe.
  
  *For teacher reference:*
  
  http://www.physicalgeography.net/fundamentals/10v.html

**Resources**

- *Science Curriculum Topic Study* by Page Keeley, Soil p.187

**Suggested websites:** www.teachersfirst.com and www.ncs-tech.org

**Additional resources should be determined by individual districts.**

**Teacher Notes:**
Content: Soils are made of many living and nonliving substances. The attributes and properties vary depending on location.

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<tr>
<td><a href="http://www.ocscd.org">www.ocscd.org</a></td>
<td>Songs, quotes and games</td>
</tr>
<tr>
<td></td>
<td>Soil safari and poster contest</td>
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<tr>
<td><a href="http://www.globe.gov">www.globe.gov</a></td>
<td>K-4 Primary Glove Storybooks with activities</td>
</tr>
<tr>
<td><a href="http://www.smarttech.com">www.smarttech.com</a></td>
<td>Interactive- soil layers, soil sleuths, soil and worm</td>
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<td></td>
<td>venn diagrams</td>
</tr>
<tr>
<td><a href="http://www.gameaquarium.com">www.gameaquarium.com</a></td>
<td>Properties of rock and soil; components of soil</td>
</tr>
<tr>
<td><a href="http://www.usiouxfalls.edu/ArPeterson">www.usiouxfalls.edu/ArPeterson</a></td>
<td>Click on K-8 Science Units</td>
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<tr>
<td><a href="http://www.brainpop.com">www.brainpop.com</a></td>
<td>Your school will need a password.</td>
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<tr>
<td><a href="http://pbskids.org/sid/videoplayer.html">http://pbskids.org/sid/videoplayer.html</a></td>
<td>Sid the science Kid / Dirt Detectives</td>
</tr>
</tbody>
</table>
Additional Activities:
United Streaming
http://www.wtamu.edu/~crobinson/DrDirt.htm - K-12 teacher resources and activities; Ask Dr. Dirt


http://www.dlese.org/library/catalog_GLOBE-000-000-000-711.htm Educational resources and lesson plans.

www.smartech.com