

**Brigantine Public School District**

Science Curriculum

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21<sup>ST</sup> CENTURY GLOBAL SKILLS

**Curriculum Design**

**Content Area: Science**

**Course Title: General Science**

**Grade Level: 5**

<b>Life Cycles</b>	<b>4 weeks</b>
<b>Matter/Scientific Method</b>	<b>5 weeks</b>
<b>Weather</b>	<b>4 weeks</b>
<b>Water Cycle</b>	<b>2 weeks</b>
<b>Ecosystems</b>	<b>4 weeks</b>
<b>Biomes</b>	<b>3 weeks</b>
<b>Earth's Interior/Surface</b>	<b>5 weeks</b>
<b>Rocks</b>	<b>4 weeks</b>
<b>Organ Systems/ Nervous/Skeletal/Muscular Systems</b>	<b>6 weeks</b>

**Date Created: July 2011**

**Board Approved on: August 25, 2011**

Unit Overview

Content Area: Life Science

Unit Title: Life Cycles – Monarch Butterflies

Target Course/Grade Level: 5<sup>th</sup> Grade

Unit Summary

- Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.
- Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.
- All animals and most plants depend on both other organisms and their environment to meet their basic needs.
- Organisms reproduce, develop, and have predictable life cycles. Organisms contain genetic information that influences their traits, and they pass this on to their offspring during reproduction.
- Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.
- Internal and external sources of energy drive Earth systems.

Primary interdisciplinary connections:

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

Learning Targets

**Standards: 5.3 Life Science:** All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.

**5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex,

dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Living organisms:
  - Interact with and cause changes in their environment.
  - Exchange materials (such as gases, nutrients, water, and waste) with the environment.
  - Reproduce.
  - Grow and develop in a predictable manner.
- Food is broken down to provide energy for the work that cells do, and is a source of the molecular building blocks from which needed materials are assembled.
- All animals, including humans, are consumers that meet their energy needs by eating other organisms or their products.
- All organisms cause changes in the ecosystem in which they live. If this change reduces another organism’s access to resources, that organism may move to another location or die.
- Symbiotic interactions among organisms of different species can be classified as:
  - Producer/consumer
  - Predator/prey
  - Parasite/host
  - Scavenger/prey
  - Decomposer/prey
- Plants and animals have life cycles (they begin life, develop into adults, reproduce, and eventually die). The characteristics of each stage of life vary by species.
- Reproduction is essential to the continuation of every species.
- Changes in environmental conditions can affect the survival of individual organisms and entire species.
- Investigations of environmental issues address underlying scientific causes and may inform possible solutions.

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.3.4.A.1	Develop and use evidence-based criteria to determine if an unfamiliar object is living or nonliving.
5.3.8.B.1	Relate the energy and nutritional needs of organisms in a variety of life stages and situations, including stages of development and periods of maintenance.

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5.3.8.B.2	Analyze the components of a consumer’s diet and trace them back to plants and plant products.
5.3.6.C.3	Describe how one population of organisms may affect other plants and/or animals in an ecosystem.
5.3.8.C.1	Model the effect of positive and negative changes in population size on a symbiotic pairing.
5.3.4.D.1	Compare the physical characteristics of the different stages of the life cycle of an individual organism, and compare the characteristics of life stages among species.
5.3.6.D.1	Predict the long-term effect of interference with normal patterns of reproduction.
5.3.6.E.1	Describe the impact on the survival of species during specific times in geologic history when environmental conditions changed.
5.4.8.G.2	Investigate a local or global environmental issue by defining the problem, researching possible causative factors, understanding the underlying science, and evaluating the benefits and risks of alternative solutions.

**Unit Essential Questions**

- 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? What do all living things have in common?
- How is matter transformed, and energy transferred/transformed in living systems?
- In what ways do organisms interact within ecosystems?

**Unit Enduring Understandings**

- Organisms reproduce, develop, 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.
- Living organisms have a variety of observable features that enable them to obtain food and reproduce.
- All organisms transfer matter and convert energy from one form to another.
- All animals and most plants depend on both other organisms and their environments for their basic needs.

**Evidence of Learning**

**Suggested Summative Assessment**

- NJ ASK 8
- Unit exam

**Formative Assessments**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• <a href="http://www.njcccs.org">www.njcccs.org</a> Classroom Application Docs</li> <li>• Hands-on activities</li> <li>• Chapter tests</li> </ul> | <ul style="list-style-type: none"> <li>• Performance assessments</li> <li>• Quizzes</li> <li>• Lab reports</li> </ul> |
|---|---|

**Unit Overview**

**Content Area: Physical Science**

**Unit Title: Matter/Scientific Method**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- All objects and substances in the natural world are composed of matter. Matter has two fundamental properties: matter takes up space, and matter has inertia.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

**Learning Targets**

**Standard 5.2 Physical Science:** Physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Pure substances have characteristic intrinsic properties, such as density, solubility, boiling point, and melting point, all of which are independent of the amount of the sample.
- Properties of solids, liquids, and gases are explained by a model of matter as composed of tiny particles (atoms) in motion.
- Each state of matter has unique properties (e.g., gases can be compressed, while solids and liquids cannot; the shape of a solid is independent of its container; liquids and gases take the shape of their containers).

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.2.6.A.3	Determine the identity of an unknown substance using data about intrinsic properties.
5.2.8.A.3	Use the kinetic molecular model to predict how solids, liquids, and gases would behave under various physical circumstances, such as heating or cooling.
5.2.4.A.2	Plan and carry out an investigation to distinguish among solids, liquids, and gases.

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<b>Unit Essential Questions</b> <ul style="list-style-type: none"><li>• How do the properties of materials determine their use?</li></ul>	<b>Unit Enduring Understandings</b> <ul style="list-style-type: none"><li>• The structures of materials determine their properties.</li></ul>
<b>Evidence of Learning</b>	
<b>Suggested Summative Assessment</b> <ul style="list-style-type: none"><li>• NJ ASK 8</li><li>• Unit exam</li></ul>	
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**Unit Overview**

**Content Area: Earth Science**

**Unit Title: Weather**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- Earth’s weather and climate systems are the result of complex interactions between land, ocean, ice, and atmosphere.
- Earth’s composition is unique, is related to the origin of our solar system, and provides us with the raw resources needed to sustain life.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Earth’s atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor. The atmosphere has a different physical and chemical composition at different elevations.
- Weather (in the short term) and climate (in the long term) involve the transfer of energy and water in and out of the atmosphere.

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.4.8.C.3	Model the vertical structure of the atmosphere using information from active and passive remote-sensing tools (e.g., satellites, balloons, and/or ground-based sensors) in the analysis.
5.4.8.F.3	Create a model of the hydrologic cycle that focuses on the transfer of water in and out of the atmosphere. Apply the model to different climates around the world.

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<b>Unit Essential Questions</b> <ul style="list-style-type: none"><li>• How do changes in one part of an Earth system affect other parts of the system?</li></ul>	<b>Unit Enduring Understandings.</b> <ul style="list-style-type: none"><li>• Earth’s components form systems. These systems continually interact at different rates of time, affecting the Earth regionally and globally.</li></ul>
<b>Evidence of Learning</b>	
<b>Suggested Summative Assessment</b> <ul style="list-style-type: none"><li>• NJ ASK 8</li><li>• Unit exam</li></ul>	
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### Unit Overview

**Content Area: Earth Science**

**Unit Title: Weather – Water Cycle**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

#### Unit Summary

- Internal and external sources of energy drive Earth systems.
- Earth’s weather and climate systems are the result of complex interactions between land, ocean, ice, and atmosphere.
- The biogeochemical cycles in the Earth systems include the flow of microscopic and macroscopic resources from one reservoir in the hydrosphere, geosphere, atmosphere, or biosphere to another, are driven by Earth's internal and external sources of energy, and are impacted by human activity.
- Knowing the characteristics of familiar forms of energy, including potential and kinetic energy, is useful in coming to the understanding that, for the most part, the natural world can be explained and is predictable.

#### Primary interdisciplinary connections:

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

### Learning Targets

**Standards: 5.2 Physical Science:** All students will understand that physical science principles, including fundamental ideas about matter, energy, and motion, are powerful conceptual tools for making sense of phenomena in physical, living, and Earth systems science.

**5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- The transfer of thermal energy by conduction, convection, and radiation can produce large-scale events such as those seen in weather.
- The Sun is the major source of energy for circulating the atmosphere and oceans.
- The Sun provides energy for plants to grow and drives convection within the atmosphere and oceans, producing winds, ocean currents, and the water cycle.
- Weather is the result of short-term variations in temperature, humidity, and air pressure.
- Climate is the result of long-term patterns of temperature and precipitation.
- Global patterns of atmospheric movement influence local weather.
- Climate is influenced locally and globally by atmospheric interactions with land masses and bodies of water.
- Weather (in the short term) and climate (in the long term) involve the transfer of energy and water in and out of the atmosphere.
- Clouds and fog are made of tiny droplets of water and, at times, tiny particles of ice.
- Rain, snow, and other forms of precipitation come from clouds; not all clouds produce precipitation.
- Most of Earth’s surface is covered by water. Water circulates through the crust, oceans, and atmosphere in what is known as the water cycle.
- Properties of water depend on where the water is located (oceans, rivers, lakes, underground sources, and glaciers).
- Circulation of water in marine environments is dependent on factors such as the composition of water masses and energy from the Sun or wind.
- An ecosystem includes all of the plant and animal populations and nonliving resources in a given area. Organisms interact with each other and with other components of an ecosystem.

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.2.6.C.3	Relate the transfer of heat from oceans and land masses to the evolution of a hurricane.
5.4.6.E.1	Generate a conclusion about energy transfer and circulation by observing a model of convection currents.
5.4.8.E.1	Explain how energy from the Sun is transformed or transferred in global wind circulation, ocean circulation, and the water cycle.
5.4.6.F.1	Explain the interrelationships between daily temperature, air pressure, and relative humidity data.
5.4.6.F.2	Create climatographs for various locations around Earth and categorize the climate based on the yearly patterns of temperature and precipitation.
5.4.8.F.1	Determine the origin of local weather by exploring national and international weather maps
5.4.8.F.2	Explain the mechanisms that cause varying daily temperature ranges in a coastal community and in a community located in the interior of the country.

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5.4.8.F.3	Create a model of the hydrologic cycle that focuses on the transfer of water in and out of the atmosphere. Apply the model to different climates around the world.		
5.4.4.G.1	Explain how clouds form.		
5.4.4.G.2	Observe daily cloud patterns, types of precipitation, and temperature, and categorize the clouds by the conditions that form precipitation.		
5.4.4.G.3	Trace a path a drop of water might follow through the water cycle.		
5.4.4.G.4	Model how the properties of water can change as water moves through the water cycle.		
5.4.6.G.1	Illustrate global winds and surface currents through the creation of a world map of global winds and currents that explains the relationship between the two factors.		
5.4.6.G.2	Create a model of ecosystems in two different locations, and compare and contrast the living and nonliving components.		
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Evidence of Learning			
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**Unit Overview**

**Content Area: Life Science**

**Unit Title: Ecosystems**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- Food is required for energy and building cellular materials. Organisms in an ecosystem have different ways of obtaining food, and some organisms obtain their food directly from other organisms.
- All animals and most plants depend on both other organisms and their environment to meet their basic needs.
- Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.
- The biogeochemical cycles in the Earth systems include the flow of microscopic and macroscopic resources from one reservoir in the hydrosphere, geosphere, atmosphere, or biosphere to another, are driven by Earth's internal and external sources of energy, and are impacted by human activity.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.3 Life Science:** All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.

**5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence

through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Almost all energy (food) and matter can be traced to the Sun.
- Plants are producers: They use the energy from light to make food (sugar) from carbon dioxide and water. Plants are used as a source of food (energy) for other organisms.
- All animals, including humans, are consumers that meet their energy needs by eating other organisms or their products.
- All animals, including humans, are consumers that meet their energy needs by eating other organisms or their products.
- Various human activities have changed the capacity of the environment to support some life forms.
- The number of organisms and populations an ecosystem can support depends on the biotic resources available and on abiotic factors, such as quantities of light and water, range of temperatures, and soil composition.
- All organisms cause changes in the ecosystem in which they live. If this change reduces another organism’s access to resources, that organism may move to another location or die.
- Symbiotic interactions among organisms of different species can be classified as:
  - Producer/consumer
  - Predator/prey
  - Parasite/host
  - Scavenger/prey
  - Decomposer/prey
- Changes in environmental conditions can affect the survival of individual organisms and entire species.
- Individual organisms with certain traits are more likely than others to survive and have offspring in particular environments. The advantages or disadvantages of specific characteristics can change when the environment in which they exist changes. Extinction of a species occurs when the environment changes and the characteristics of a species are insufficient to allow survival.
- An ecosystem includes all of the plant and animal populations and nonliving resources in a given area. Organisms interact with each other and with other components of an ecosystem.
- Personal activities impact the local and global environment.

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.3.4.B.1	Identify sources of energy (food) in a variety of settings (farm, zoo, ocean, forest).
5.3.6.B.1	Describe the sources of the reactants of photosynthesis and trace the pathway to the products.
5.3.6.B.2	Illustrate the flow of energy (food) through a community.
5.3.8.B.2	Analyze the components of a consumer’s diet and trace them back to plants and plant products.

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5.3.6.C.1	Explain the impact of meeting human needs and wants on local and global environments.
5.3.6.C.2	Predict the impact that altering biotic and abiotic factors has on an ecosystem.
5.3.6.C.3	Describe how one population of organisms may affect other plants and/or animals in an ecosystem.
5.3.8.C.1	Model the effect of positive and negative changes in population size on a symbiotic pairing.
5.3.6.E.1	Describe the impact on the survival of species during specific times in geologic history when environmental conditions changed.
5.3.8.E.1	Organize and present evidence to show how the extinction of a species is related to an inability to adapt to changing environmental conditions using quantitative and qualitative data.
5.4.6.G.2	Create a model of ecosystems in two different locations, and compare and contrast the living and nonliving components.
5.4.6.G.3	Describe ways that humans can improve the health of ecosystems around the world.

**Unit Essential Questions**

- How is matter transformed, and energy transferred/transformed in living systems?
- How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres?
- 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**

- All organisms transfer matter and convert energy from one form to another. Earth's components form systems that have cycles and patterns that allow us to make predictions.
- These systems continually interact at different rates of time, affecting the Earth locally and globally.
- 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.

**Evidence of Learning**

**Suggested Summative Assessment**

- NJ ASK 8
- Unit exam

**Formative Assessments**

- |   |   |
|---|---|
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**Unit Overview**

**Content Area: Life Science**

**Unit Title: Biomes**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- Sometimes, differences between organisms of the same kind provide advantages for surviving and reproducing in different environments. These selective differences may lead to dramatic changes in characteristics of organisms in a population over extremely long periods of time.
- Earth’s weather and climate systems are the result of complex interactions between land, ocean, ice, and atmosphere.
- The biogeochemical cycles in the Earth systems include the flow of microscopic and macroscopic resources from one reservoir in the hydrosphere, geosphere, atmosphere, or biosphere to another, are driven by Earth's internal and external sources of energy, and are impacted by human activity.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit infuses the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.3 Life Science:** All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.

**5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

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<p><b>Content Statements</b></p> <ul style="list-style-type: none"> <li>• Individuals of the same species may differ in their characteristics, and sometimes these differences give individuals an advantage in surviving and reproducing in different environments.</li> <li>• In any ecosystem, some populations of organisms thrive and grow, some decline, and others do not survive at all.</li> <li>• Climate is the result of long-term patterns of temperature and precipitation.</li> <li>• An ecosystem includes all of the plant and animal populations and nonliving resources in a given area. Organisms interact with each other and with other components of an ecosystem.</li> <li>• Personal activities impact the local and global environment.</li> </ul>	
<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.3.4.E.1	Model an adaptation to a species that would increase its chances of survival, should the environment become wetter, dryer, warmer, or colder over time.
5.3.4.E.2	Evaluate similar populations in an ecosystem with regard to their ability to thrive and grow.
5.4.6.F.2	Create climatographs for various locations around Earth and categorize the climate based on the yearly patterns of temperature and precipitation.
5.4.6.G.2	Create a model of ecosystems in two different locations, and compare and contrast the living and nonliving components.
5.4.6.G.3	Describe ways that humans can improve the health of ecosystems around the world.
<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>• In what ways are organisms of the same kind different from each other?</li> <li>• How does this help them reproduce and survive?</li> <li>• How do changes in one part of the Earth system affect other parts of the system and in what ways can Earth processes be explained as interactions among spheres?</li> </ul>	<p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>• Sometimes differences between organisms of the same kind give advantages in surviving and reproducing in different environments.</li> <li>• Earth’s components form systems that have cycles and patterns that allow us to make predictions. These systems continually interact at different rates of time, affecting the Earth locally and globally.</li> </ul>
<b>Evidence of Learning</b>	
<p><b>Suggested Summative Assessment</b></p> <ul style="list-style-type: none"> <li>• NJ ASK 8</li> <li>• Unit exam</li> </ul>	



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### Formative Assessments

- [www.njcccs.org](http://www.njcccs.org) Classroom Application Docs
- Hands-on activities
- Chapter tests
- Performance assessments
- Quizzes
- Lab reports

**Unit Overview**

**Content Area: Earth Science**

**Unit Title: Earth’s Interior/Surface**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- From the time that Earth formed from a nebula 4.6 billion years ago, it has been evolving as a result of geologic, biological, physical, and chemical processes.
- The theory of plate tectonics provides a framework for understanding the dynamic processes within and on Earth

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit infuses the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Earth’s current structure has been influenced by both sporadic and gradual events. Changes caused by earthquakes and volcanic eruptions can be observed on a human time scale, but many geological processes, such as mountain building and the shifting of continents, are observed on a geologic time scale.
- Moving water, wind, and ice continually shape Earth’s surface by eroding rock and soil in some areas and depositing them in other areas.
- Lithospheric plates consisting of continents and ocean floors move in response to movements in the mantle.
- Earth’s landforms are created through constructive (deposition) and destructive (erosion) processes.
- Earth is layered with a lithosphere, a hot, convecting mantle, and a dense, metallic core.

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- Major geological events, such as earthquakes, volcanic eruptions, and mountain building, result from the motion of plates. Sea floor spreading, revealed in mapping of the Mid-Atlantic Ridge, and subduction zones are evidence for the theory of plate tectonics.

<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.4.6.B.2	Examine Earth’s surface features and identify those created on a scale of human life or on a geologic time scale.
5.4.6.B.3	Determine if landforms were created by processes of erosion (e.g., wind, water, and/or ice) based on evidence in pictures, video, and/or maps.
5.4.6.D.1	Apply understanding of the motion of lithospheric plates to explain why the Pacific Rim is referred to as the Ring of Fire.
5.4.6.D.2	Locate areas that are being created (deposition) and destroyed (erosion) using maps and satellite images.
5.4.8.D.1	Model the interactions between the layers of Earth.
5.4.8.D.2	Present evidence to support arguments for the theory of plate motion.

**Unit Essential Questions**

- How do geologic events occurring today provide insight Earth’s past?
- To what extent does the exchange of energy within the Earth drive geologic events on the surface?

**Unit Enduring Understandings**

- Earth’s components form systems? These systems continually interact at different rates of time, affecting the shape of the Earth’s surface regionally and globally.
- Energy flow and movement of material from the Earth’s interior causes geologic events on the Earth’s surface.

**Evidence of Learning**

**Suggested Summative Assessment**

- NJ ASK 8
- Unit exam

**Formative Assessments**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><a href="http://www.njcccs.org">www.njcccs.org</a> Classroom Application Docs</li> <li>Hands-on activities</li> <li>Chapter tests</li> </ul> | <ul style="list-style-type: none"> <li>Performance assessments</li> <li>Quizzes</li> <li>Lab reports</li> </ul> |
|---|---|

**Unit Overview**

**Content Area: Earth Science**

**Unit Title: Rocks**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- From the time that Earth formed from a nebula 4.6 billion years ago, it has been evolving as a result of geologic, biological, physical, and chemical processes.
- Earth’s composition is unique, is related to the origin of our solar system, and provides us with the raw resources needed to sustain life.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.4 Earth Systems Science:** All students will understand that Earth operates as a set of complex, dynamic, and interconnected systems, and is a part of the all-encompassing system of the universe.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Fossils provide evidence about the plants and animals that lived long ago, including whether they lived on the land or in the sea as well as ways species changed over time.
- Successive layers of sedimentary rock and the fossils contained in them tell the factual story of the age, history, changing life forms, and geology of Earth.
- Erosion plays an important role in the formation of soil, but too much erosion can wash away fertile soil from ecosystems, including farms.
- Rocks can be broken down to make soil.
- Earth materials in nature include rocks, minerals, soils, water, and the gases of the atmosphere. Attributes of rocks and minerals assist in their identification.
- Soil attributes/properties affect the soil’s ability to support animal life and grow plants.
- The rock cycle is a model of creation and transformation of rocks from one form (sedimentary, igneous, or metamorphic) to another. Rock families are determined by the

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<p>origin and transformations of the rock.</p> <ul style="list-style-type: none"> <li>Rocks and rock formations contain evidence that tell a story about their past. The story is dependent on the minerals, materials, tectonic conditions, and erosion forces that created them.</li> </ul>	
<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>
5.4.4.B.1	Use data gathered from observations of fossils to argue whether a given fossil is terrestrial or marine in origin.
5.4.6.B.1	Interpret a representation of a rock layer sequence to establish oldest and youngest layers, geologic events, and changing life forms.
5.4.6.B.4	Describe methods people use to reduce soil erosion.
5.4.4.C.1	Create a model to represent how soil is formed.
5.4.4.C.2	Categorize unknown samples as either rocks or minerals.
5.4.6.C.1	Predict the types of ecosystems that unknown soil samples could support based on soil properties.
5.4.6.C.2	Distinguish physical properties of sedimentary, igneous, or metamorphic rocks and explain how one kind of rock could eventually become a different kind of rock.
5.4.6.C.3	Deduce the story of the tectonic conditions and erosion forces that created sample rocks or rock formations.
<p><b>Unit Essential Questions</b></p> <ul style="list-style-type: none"> <li>How do geologic events occurring today provide insight into Earth’s past?</li> <li>How do Earth Systems interact to create soil?</li> <li>How do we use observable characteristics of Earth materials to identify different parts of the Earth System?</li> </ul>	<p><b>Unit Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>Earth’s components form systems. These systems continually interact at different rates of time, affecting the shape of the Earth’s surface regionally and globally.</li> <li>Soil is a product of the interactions of the Earth Systems.</li> <li>The Earth System includes a variety of materials in solid, liquid and gaseous form.</li> </ul>
<b>Evidence of Learning</b>	
<p><b>Suggested Summative Assessment</b></p> <ul style="list-style-type: none"> <li>NJ ASK 8</li> <li>Unit exam</li> </ul>	
<p><b>Formative Assessments</b></p> <ul style="list-style-type: none"> <li><a href="http://www.njcccs.org">www.njcccs.org</a> Classroom Application Docs</li> <li>Hands-on activities</li> <li>Chapter tests</li> <li>Performance assessments</li> <li>Quizzes</li> <li>Lab reports</li> </ul>	

**Unit Overview**

**Content Area: Life Science**

**Unit Title: Organ Systems - Nervous/Skeletal/Muscular Systems**

**Target Course/Grade Level: 5<sup>th</sup> Grade**

**Unit Summary**

- Living organisms are composed of cellular units (structures) that carry out functions required for life. Cellular units are composed of molecules, which also carry out biological functions.

**Primary interdisciplinary connections:**

**21<sup>st</sup> century themes: 9.1-** This unit will also infuse the 21<sup>st</sup> 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.

**Learning Targets**

**Standards: 5.3 Life Science:** All students will understand that life science principles are powerful conceptual tools for making sense of the complexity, diversity, and interconnectedness of life on Earth. Order in natural systems arises in accordance with rules that govern the physical world, and the order of natural systems can be modeled and predicted through the use of mathematics.

**5.1.A.B.C.D Science Practices:** This unit will infuse the four strands of the Science Practices standard. These focus on understanding scientific explanations; generating scientific evidence through active investigation; reflecting on scientific knowledge; and participating productively in science.

**Content Statements**

- Essential functions of the human body are carried out by specialized systems:
  - Digestive
  - Circulatory
  - Respiratory
  - Nervous
  - Skeletal
  - Muscular
  - Reproductive
- Systems of the human body are interrelated and regulate the body's internal environment.
- All organisms are composed of cell(s). In multicellular organisms, specialized cells perform specialized functions. Tissues, organs, and organ systems are composed of cells and function to serve the needs of cells for food, air, and waste removal.

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<ul style="list-style-type: none"> <li>During the early development of an organism, cells differentiate and multiply to form the many specialized cells, tissues, and organs that compose the final organism. Tissues grow through cell division.</li> </ul>			
<b>CPI #</b>	<b>Cumulative Progress Indicator (CPI)</b>		
5.3.4.A.3	Describe the interactions of systems involved in carrying out everyday life activities.		
5.3.6.A.1	Model the interdependence of the human body’s major systems in regulating its internal environment.		
5.3.8.A.1	Compare the benefits and limitations of existing as a single-celled organism and as a multicellular organism.		
5.3.8.A.2	Relate the structures of cells, tissues, organs, and systems to their functions in supporting life.		
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