Curriculum Design	
Content Area: Science	
Course Title: General Science	**Grade Level: 7**

Living Things	**4 Weeks**
The Human Body	**4 Weeks**
Earth's Structure	**4 Weeks**
Earth's Resources/History	**8 Weeks**
Meteorology	**4 Weeks**
Astronomy	**4 Weeks**

Date Created:	**July 2011**
Board Approved on:	**August 25, 2011**

Unit Overview

Content Area: Life Science

Unit Title: Living Things

Target Course/Grade Level: 7th 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.

Primary interdisciplinary connections:

21st century themes: 9.1- 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.

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

- 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.
- Symbiotic interactions among organisms of different species can be classified as:
  - Producer/consumer
  - Predator/prey
  - Parasite/host
  - Scavenger/prey
  - Decomposer/prey
- 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.
- Anatomical evidence supports evolution and provides additional detail about the sequence of branching of various lines of descent.

CPI #	Cumulative Progress Indicator (CPI)
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.
5.3.8.B.2	Analyze the components of a consumer's diet and trace them back to plants and plant products.
5.3.8.C.1	Model the effect of positive and negative changes in population size on a symbiotic pairing.
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.
5.3.8.E.2	Compare the anatomical structures of a living species with fossil records to derive a line of descent.

Unit Essential Questions

- How is matter transformed, and energy transferred/transformed in living systems?
- 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.
- 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	
• www.njcccs.org Classroom Application Docs • Hands-on activities • Chapter tests	• Performance assessments • Quizzes • Lab reports

Unit Overview

Content Area: Life Science

Unit Title: The Human Body

Target Course/Grade Level: 7th 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.

- 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.

Primary interdisciplinary connections:

21st century themes: 9.1- 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.

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

- 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.
- 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.
- Some organisms reproduce asexually. In these organisms, all genetic information comes

from a single parent. Some organisms reproduce sexually, through which half of the genetic information comes from each parent.

- The unique combination of genetic material from each parent in sexually reproducing organisms results in the potential for variation.
- Characteristics of organisms are influenced by heredity and/or their environment.

CPI #	Cumulative Progress Indicator (CPI)
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.
5.3.8.D.1	Defend the principle that, through reproduction, genetic traits are passed from one generation to the next, using evidence collected from observations of inherited traits.
5.3.8.D.2	Explain the source of variation among siblings.
5.3.8.D.3	Describe the environmental conditions or factors that may lead to a change in a cell's genetic information or to an organism's development, and how these changes are passed on.

Unit Essential Questions	Unit Enduring Understandings
• What do all living things have in common? • How do organisms change as they go through their life cycle?	• Living organisms have a variety of observable features that enable them to obtain food and reproduce. • Organisms reproduce, develop, have predictable life cycles, and pass on some traits to their offspring.

Evidence of Learning

Suggested Summative Assessment

- NJ ASK 8
- Unit exam

Formative Assessments

- 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 Structure

Target Course/Grade Level: 7th Grade

Unit Summary

- The theory of plate tectonics provides a framework for understanding the dynamic processes within and on Earth
- 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:

21st century themes: 9.1- 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.

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 is layered with a lithosphere, a hot, convecting mantle, and a dense, metallic core.
- 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.
- Soil consists of weathered rocks and decomposed organic material from dead plants, animals, and bacteria. Soils are often found in layers, each having a different chemical composition and texture.
- Physical and chemical changes take place in Earth materials when Earth features are modified through weathering and erosion.

CPI #	Cumulative Progress Indicator (CPI)
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.
5.4.8.C.1	Determine the chemical properties of soil samples in order to select an appropriate location for a community garden.
5.4.8.C.2	Explain how chemical and physical mechanisms (changes) are responsible for creating a variety of landforms.

Unit Essential Questions	**Unit Enduring Understandings**
• How do changes in one part of an Earth system affect other parts of the system? • To what extent does the exchange of energy within the Earth drive geologic events on the surface?	• 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

- www.njcccs.org Classroom Application Docs
- Hands-on activities
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Unit Overview

Content Area: Earth Science

Unit Title: Earth's Resources/History

Target Course/Grade Level: 7th 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.

Primary interdisciplinary connections:

21st century themes: 9.1- 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.

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

- Today's planet is very different than early Earth. Evidence for one-celled forms of life (bacteria) extends back more than 3.5 billion years.
- Fossils provide evidence of how life and environmental conditions have changed. The principle of Uniformitarianism makes possible the interpretation of Earth's history. The same Earth processes that occurred in the past occur today.
- 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 origin and transformations of the rock.

CPI #	Cumulative Progress Indicator (CPI)
5.4.8.B.1	Correlate the evolution of organisms and the environmental conditions on Earth as they changed throughout geologic time.
5.4.8.B.2	Evaluate the appropriateness of increasing the human population in a region (e.g., barrier islands, Pacific Northwest, Midwest United States) based on the region's history of catastrophic events, such as volcanic eruptions, earthquakes, and floods.

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

Unit Essential Questions	**Unit Enduring Understandings**
• How do geologic events occurring today provide insight Earth's past? • How do changes in one part of an Earth system affect other parts of the system?	• 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.

Evidence of Learning

Suggested Summative Assessment

- NJ ASK 8
- Unit exam

Formative Assessments

- www.njcccs.org Classroom Application Docs
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Unit Overview

Content Area: Earth Science

Unit Title: Meteorology

Target Course/Grade Level: 7th Grade

Unit Summary

- 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.
- 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.
- Internal and external sources of energy drive Earth systems.

Primary interdisciplinary connections:

21st century themes: 9.1- 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.

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.
- The Sun provides energy for plants to grow and drives convection within the atmosphere and oceans, producing winds, ocean currents, and the water cycle.
- 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.
- Water in the oceans holds a large amount of heat, and therefore significantly affects the global climate system.

CPI #	Cumulative Progress Indicator (CPI)
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.E.1	Explain how energy from the Sun is transformed or transferred in global wind circulation, ocean circulation, and the water cycle.
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.
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.
5.4.8.G.1	Represent and explain, using sea surface temperature maps, how ocean currents impact the climate of coastal communities.

Unit Essential Questions

- How do changes in one part of an Earth system affect other parts of the system?
- What is the role of the sun in energy transfer in the atmosphere and in the
- oceans?
- How do changes in one part of an Earth system affect other parts of the system?
- 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?

Unit Enduring Understandings

- The energy from the sun is transferred throughout the oceans and atmosphere.
- Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth regionally and globally.
- 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.

Evidence of Learning	
Suggested Summative Assessment	
• NJ ASK 8 • Unit exam	
Formative Assessments	
• www.njcccs.org Classroom Application Docs • Hands-on activities • Chapter tests	• Performance assessments • Quizzes • Lab reports

Unit Overview

Content Area: Earth Science

Unit Title: Astronomy

Target Course/Grade Level: 7th Grade

Unit Summary

- Our universe has been expanding and evolving for 13.7 billion years under the influence of gravitational and nuclear forces. As gravity governs its expansion, organizational patterns, and the movement of celestial bodies, nuclear forces within stars govern its evolution through the processes of stellar birth and death. These same processes governed the formation of our solar system 4.6 billion years ago.

Primary interdisciplinary connections:

21st century themes: 9.1- 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.

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

- The relative positions and motions of the Sun, Earth, and Moon result in the phases of the Moon, eclipses, and the daily and monthly cycle of tides.
- Earth's tilt, rotation, and revolution around the Sun cause changes in the height and duration of the Sun in the sky. These factors combine to explain the changes in the length of the day and seasons.
- Gravitation is a universal attractive force by which objects with mass attract one another. The gravitational force between two objects is proportional to their masses and inversely proportional to the square of the distance between the objects.
- The regular and predictable motion of objects in the solar system (Kepler's Laws) is explained by gravitational forces.

CPI #	Cumulative Progress Indicator (CPI)
5.4.8.A.1	Analyze moon-phase, eclipse, and tidal data to construct models that explain how the relative positions and motions of the Sun, Earth, and Moon cause these three phenomena.
5.4.8.A.2	Use evidence of global variations in day length, temperature, and the amount of solar radiation striking Earth's surface to create models that explain these phenomena and seasons.
5.4.8.A.3	Predict how the gravitational force between two bodies would differ for bodies of different masses or bodies that are different distances apart.
5.4.8.A.4	Analyze data regarding the motion of comets, planets, and moons to find general patterns of orbital motion.

Unit Essential Questions	Unit Enduring Understandings
• What predictable, observable patterns occur as a result of the interaction between the Earth, Moon, and Sun? What causes these patterns?	• Observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun.

Evidence of Learning

Suggested Summative Assessment

- NJ ASK 8
- Unit exam

Formative Assessments

- www.njcccs.org Classroom Application Docs
- Hands-on activities
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