

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

**BRICK TOWNSHIP PUBLIC SCHOOLS
SCIENCE CURRICULUM**

Content Area: Middle School Science

Grade Level: Sixth Grade

Unit	Timeframe
Unit 1: Earth's Systems	40 Days
Unit 2: History of Earth	30 Days
Unit 3: Human Impacts	30 Days
Unit 4: Weather and Climate	40 Days
Unit 5: Space Systems	40 Days

**Date Created:
June 21, 2017**

**Board Approved
on: 9/14/17**

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

BRICK TOWNSHIP PUBLIC SCHOOLS SCIENCE: UNIT 1

Content Area: Science

Unit Title: Unit 1: Earth's Systems

Grade Level: Grade 6

Unit Summary

Students understand how Earth's geosystems operate by modeling the flow of energy and cycling of matter within and among different systems. Students investigate the controlling properties of important materials and construct explanations based on the analysis of real geoscience data. Of special importance in both topics are the ways that geoscience processes provide resources needed by society but also cause natural hazards that present risks to society; both involve technological challenges, for the identification and development of resources and for the mitigation of hazards. Students are expected to demonstrate proficiency in developing and using models, constructing explanations, and to use these practices to demonstrate understanding of the core ideas.

Primary interdisciplinary connections:

ELA/Literacy, Mathematics, Technology

21st Century Themes:

- Creativity and innovation
- Critical thinking and problem solving
- Communication
- Collaboration
- Information literacy
- Media literacy
- Information and communications technology (ICT)
- Literacy
- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills
- Productivity and accountability
- Leadership and responsibility

Technology Connections:

Prentice Hall Science Explorer (online textbooks) – www.pearsonsuccessnet.com

eScience3000 – www.escience3000.com

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Learning Targets

Next Generation Science Standards (NGSS)

Performance Expectations (PEs)	Student Learning Objectives (SLO)
MS-ESS2-1	Develop a model to describe the cycling of Earth’s materials and the flow of energy that drives this process.
MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth’s mineral, energy, and groundwater resources are the result of past and current geoscience processes.

NGSS Disciplinary Core Ideas (DCI)

Next Generation Science Standards (NGSS)	
ESS2.A: Earth’s Materials and Systems	<ul style="list-style-type: none"> All Earth processes are the result of energy flowing and matter cycling within and among the planet’s systems. This energy is derived from the sun and Earth’s hot interior. The energy that flows and matter that cycles produce chemical and physical changes in Earth’s materials and living organisms. (MS-ESS2-1)
ESS2.C: The Roles of Water in Earth’s Surface Processes	<ul style="list-style-type: none"> Water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization, and precipitation, as well as downhill flows on land. (MS-ESS2-4) Global movements of water and its changes in form are propelled by sunlight and gravity. (MS-ESS2-4)
ESS3.A: Natural Resources	<ul style="list-style-type: none"> Humans depend on Earth’s land, ocean, atmosphere, and biosphere for many different resources. Minerals, fresh water, and biosphere resources are limited, and many are not renewable or replaceable over human lifetimes. These resources are distributed unevenly around the planet as a result of past geologic processes. (MS-ESS3-1)

NGSS Disciplinary Core Ideas (DCI)

Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> How do the materials in and on Earth’s crust change over time? How does water influence and shape Earth’s surface? 	<p style="text-align: center;"><i>Students will understand that...</i></p> <ul style="list-style-type: none"> Earth is constantly changing due to natural cycles. geoscience provides resources needed by society but also cause natural hazards that present risks to society.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

	<ul style="list-style-type: none"> • technology enables us to better understand Earth’s systems and the impact of Earth’s systems on human activity. • the flow of energy from the cycling of matter within and among different systems.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • all Earth processes are the result of energy flowing and matter cycling within and among the planet’s system. • rocks are continually cycling from one kind to another due to earth's processes. • metamorphic rocks form from the deformation of Earth’s heat and pressure. • igneous rock forms from melting, cooling, and crystallization. • sedimentary rock forms from weathering, erosion, deposition, compaction, and cementation. • soil is a natural uneven distribution of resources as a result of past processes. • soil is one of Earth’s most valuable natural resources because everything that lives on land, including humans, depends directly or indirectly on soil. • soil comes from weathered rock fragments, minerals and decaying organic material. • soil is found in layers, each having a different chemical composition and texture. • water’s movements both on the land and underground cause weathering and erosion, which change the land’s surface features and create underground formations. • global movements of water and its changes in form are propelled by sunlight and gravity. • weathering, erosion and deposition act together in a cycle that wears down and builds up Earth’s surface. • most sediment washed or falls into a river as a 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • demonstrate proficiency in developing and using models and constructing explanations. • develop a conceptual model the rock cycle and how it relates to the change of Earth’s surface over time. • develop a conceptual model the water cycle and how it relates to the change of earth's surface over time. • investigate weathering and erosion as processes that break down and build up Earth’s surface. • construct explanations based on real geoscience data • explain how weathering changes the Earth’s surface over time by breaking rock into smaller pieces. • explain that erosion is the wearing away of the Earth’s surface by water, wind, ice and gravity. • debate ways that natural resources (water, soil, rocks, etc.) are needed and used by society.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

result of mass movement or run-off.

- when a glacier melts it deposits the sediment it eroded from the land creating various landforms.
- waves shape the coast through erosion by breaking down rock and transporting sand and other sediments.
- wind erosion and deposition may form sand dunes.
- water continually cycles among land, ocean, and atmosphere via transpiration, evaporation, condensation and crystallization and precipitation as well as downhill flows on land
- global movements of water and its changes in form are propelled by sunlight and gravity.

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

- Graphic organizers
- Directed reading
- Cooperative group learning
- Homework
- Journal entries

Summative Assessments

- Unit tests and quizzes
- Labs and engineering based projects

Modifications (ELLs, Special Education, Gifted and Talented)

- Follow all IEP modifications/504 plan
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Tiered assignments

Curriculum Development Resources/Instructional Materials

- Prentice Hall Science Explorer – Cells and Heredity
- Prentice Hall Science Explorer—Human Biology and Health
- Online textbooks – www.pearsonsuccessnet.com
- eScience3000 – www.escience3000.com

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

**BRICK TOWNSHIP PUBLIC SCHOOLS
SCIENCE: UNIT 2**

Content Area: Science

Unit Title: Unit 2: History of Earth

Grade Level: 6

Unit Summary

Students examine geoscience data in order to understand the processes and events in Earth’s history. Important concepts in this topic are “Scale, Proportion, and Quantity” and “Stability and Change,” in relation to the different ways geologic processes operate over the long expanse of geologic time. An important aspect of the history of Earth is that geologic events and conditions have affected the evolution of life, but different life forms have also played important roles in altering Earth’s systems.

Primary interdisciplinary connections:

ELA/Literacy, Mathematics, Technology

21st Century Themes:

- Creativity and innovation
- Critical thinking and problem solving
- Communication
- Collaboration
- Information literacy
- Media literacy
- Information and communications technology (ICT)
- Literacy
- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills
- Productivity and accountability
- Leadership and responsibility

Technology Connections:

Prentice Hall Science Explorer (online textbook) – www.pearsonsuccessnet.com

eScience3000 – www.escience3000.com

Learning Targets

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Next Generation Science Standards (NGSS)	
Performance Expectations (PEs)	Student Learning Objectives (SLO)
MS-ESS1-4	Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
MS-ESS2-2	Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.
MS-ESS2-3	Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.
NGSS Disciplinary Core Ideas (DCI)	
ESS1.C: The History of Planet Earth	<ul style="list-style-type: none"> The geologic time scale interpreted from rock strata provides a way to organize Earth's history. Analyses of rock strata and the fossil record provide only relative dates, not an absolute scale. (MS-ESS1-4) Tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches. (HS.ESS1.C GBE), (secondary to MS-ESS2-3)
ESS2.A: Earth's Materials and Systems	The planet's systems interact over scales that range from microscopic to global in size, and they operate over fractions of a second to billions of years. These interactions have shaped Earth's history and will determine its future. (MS-ESS2-2)
ESS2.B: Plate Tectonics and Large-Scale System Interactions	Maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distances, collided, and spread apart. (MS-ESS2-3)
ESS2.C: The Roles of Water in Earth's Surface Processes	Water's movements—both on the land and underground—cause weathering and erosion, which change the land's surface features and create underground formations. (MS-ESS2-2)
Unit Essential Questions <ul style="list-style-type: none"> How do people figure out that the Earth and life on Earth have changed over time? How does the movement of tectonic plates impact the surface of Earth? 	Unit Enduring Understandings <i>Students will understand that...</i> <ul style="list-style-type: none"> geoscience data can be used to understand the processes and events in Earth's history. geologic events and conditions have affected the progression of life. different life forms have also played important roles in altering Earth's systems.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Unit Objectives

Students will know...

- tectonic processes continually generate new ocean sea floor at ridges and destroy old sea floor at trenches.
- maps of ancient land and water patterns, based on investigations of rocks and fossils, make clear how Earth's plates have moved great distance, collided, and spread apart.
- plate motion; introduce plate boundaries as mountain-, volcano-, trench-, or rift-forming, but do not assess boundary names (divergent, convergent, transform).
- understand layers of the Earth.
- understand the forces that drive plate movement.
- earthquakes are created by a slow build-up of energy that has been released.
- earthquakes change the Earth's surface over time.
- energy moves through the earth as waves.
- volcanoes can form at hotspots or boundaries.
- volcanic belts form along the boundaries of earth's plates.
- geologist classify volcanic eruptions as quiet or explosive.
- geologists often use the terms active, dormant, or extinct to describe a volcano's stage of activity.
- volcanic eruptions create landforms; shield volcanoes, cinder cone volcanoes, composite volcanoes, and lava plateaus.
- the fossil record provides evidence about the history of life and past environments on Earth.
- the fossil record shows that organisms have changed over time.
- most fossils form when living things die and are buried by sediments, sediments slowly harden into rock and preserve the shape of the organism.
- the geologic time scale interpreted from rock strata provides a way to organize Earth's history.
- analyses of rock strata and the fossil record provide only relative dates, not an absolute scale.

Unit Objectives

Students will be able to...

- identify the layers of the Earth by composition and physical properties.
- explain how sea floor spreading provides a way for continent to move.
- describe how new oceanic lithosphere forms at mid-ocean ridges.
- describe the forces thought to move tectonic plates.
- describe the stress that deforms rocks.
- demonstrate proficiency in analyzing and interpreting data.
- demonstrate proficiency in constructing explanations and to use these practices to demonstrate understanding core ideas.
- use relative dates provided by fossil record to make claims regarding the disappearance of organisms.
- correlate the progression of organisms and the environmental conditions on Earth as they changed throughout geologic time.
- analyze evidence of rock formations and the fossils they contain to establish relative ages of major events in Earth's history examples of Earth's major events could range from very recent (such as the last ice age or the earliest fossils) to very old.
- explain how geologic time is recorded in rock layers.
- explain how the geological column is used in relative dating.
- construct an explanation based on evidence for how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions) and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events.
- analyze and interpret data that include similarities of rock and fossil types on different continents, the shapes of the continents (including continental shelves), and the locations of ocean structures (such as ridges, fracture zones, and trenches).

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

- Graphic organizers
- Directed reading
- Cooperative group learning
- Homework
- Journal entries

Summative Assessments

- Unit tests and quizzes
- Labs and engineering based projects

Modifications (ELLs, Special Education, Gifted and Talented)

- Follow all IEP modifications/504 plan
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Tiered assignments

Curriculum Development Resources/Instructional Materials

- Prentice Hall Science Explorer – Cells and Heredity
- Prentice Hall Science Explorer—Animals
- Online textbooks – www.pearsonsuccessnet.com
- eScience3000 – www.escience3000.com

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

**BRICK TOWNSHIP PUBLIC SCHOOLS
SCIENCE: UNIT 3**

Content Area: Science

Unit Title: Unit 3: Human Impact

Grade Level: Grade 6

Unit Summary

Students make sense of the ways that human activities impact Earth's other systems. Students use several science and engineering practices to understand the significant and complex issues surrounding human uses of land, energy, mineral, and water resources and the resulting impacts of their development.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Primary interdisciplinary connections:

ELA/Literacy, Mathematics, Technology

21st Century Themes:

- Creativity and innovation
- Critical thinking and problem solving
- Communication
- Collaboration
- Information literacy
- Media literacy
- Information and communications technology (ICT)
- Literacy
- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills
- Productivity and accountability
- Leadership and responsibility

Technology Connections:

Prentice Hall Science Explorer (online textbook) – www.pearsonsuccessnet.com

eScience3000 – www.escience3000.com

Learning Targets

Next Generation Science Standards (NGSS)

Performance Expectations (PEs)	Student Learning Objectives (SLO)
MS-ESS3-2	Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.
MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

NGSS Disciplinary Core Ideas (DCI)	
ESS3.B: Natural Hazards	Mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2)
ESS3.C: Human Impacts on Earth Systems	<ul style="list-style-type: none"> Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts (negative and positive) for different living things. (MS-ESS3-3) Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3), (MS-ESS3-4)
Unit Essential Questions <ul style="list-style-type: none"> How can natural hazards be predicted? How do human activities affect Earth systems 	Unit Enduring Understandings <i>Students will understand that...</i> <ul style="list-style-type: none"> data from the fossil record is used to describe evidence of the history of life on Earth and construct explanations for similarities in organisms. the role of variation in natural selection and how this leads to speciation. the (grade appropriate) practices of analyzing graphical displays; using mathematical models; and gathering, reading, and communicating information.
Unit Objectives <i>Students will know...</i> <ul style="list-style-type: none"> that mapping the history of natural hazards in a region, combined with an understanding of related geologic forces can help forecast the locations and likelihoods of future events. (MS-ESS3-2) human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species. But changes to Earth’s environments can have different impacts 	Unit Objectives <i>Students will be able to...</i> <ul style="list-style-type: none"> analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. apply scientific principles to design a method for monitoring and minimizing a human impact on the environment. construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

<p>(negative and positive) for different living things. (MS-ESS3-3)</p> <ul style="list-style-type: none"> • as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise. (MS-ESS3-3),(MS-ESS3-4) 	<ul style="list-style-type: none"> • use variables to represent quantities in a real-world data, and construct simple equations and inequalities to inform the development of technologies to mitigate the effects of natural hazards. • write and present the findings of a student led investigation of human consumption of a natural resource that may alter the biosphere, hydrosphere, atmosphere, or geosphere and the consequences (positive or negative) of that behavior.
--	---

BRICK TOWNSHIP PUBLIC SCHOOLS Evidence of Learning	
Formative Assessments	
<ul style="list-style-type: none"> • Graphic organizers • Directed reading • Cooperative group learning • Homework • Journal entries 	
Summative Assessments	
<ul style="list-style-type: none"> • Unit tests and quizzes • Labs and engineering based projects 	
Modifications (ELLs, Special Education, Gifted and Talented)	
<ul style="list-style-type: none"> • Follow all IEP modifications/504 plan • Teacher tutoring • Peer tutoring • Cooperative learning groups • Modified assignments • Differentiated instruction • Tiered assignments 	
Curriculum Development Resources/Instructional Materials	
<ul style="list-style-type: none"> • Prentice Hall Science Explorer – Sound and Light • Online textbooks – www.pearsonsuccessnet.com • eScience3000 – www.escience3000.com 	

BRICK TOWNSHIP PUBLIC SCHOOLS SCIENCE: UNIT 4	
Content Area: Science	
Unit Title: Unit 4: Weather and Climate	

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Grade Level: Grade 6

Unit Summary

Students construct and use models to develop understanding of the factors that control weather and climate. They take a systems approach to examining the feedbacks between systems as energy from the sun is transferred between systems and circulates through the ocean and atmosphere.

Primary interdisciplinary connections:

ELA/Literacy, Mathematics, Technology

21st Century Themes:

- Creativity and innovation
- Critical thinking and problem solving
- Communication
- Collaboration
- Information literacy
- Media literacy
- Information and communications technology (ICT)
- Literacy
- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills
- Productivity and accountability
- Leadership and responsibility

Technology Connections:

Prentice Hall Science Explorer (online textbook) – www.pearsonsuccessnet.com

eScience3000 – www.escience3000.com

Learning Targets

Next Generation Science Standards (NGSS)

Performance

Student Learning Objectives (SLO)

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Expectations (PEs)	
MS-ESS2-5	Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.
MS-ESS2-6	Develop and use a model to describe how unequal heating and rotation of the Earth cause patterns of atmospheric and oceanic circulation that determine regional climates.
MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.
NGSS Disciplinary Core Ideas (DCI)	
ESS2.C: The Roles of Water in Earth's Surface Processes	<ul style="list-style-type: none"> The complex patterns of the changes and the movement of water in the atmosphere, determined by winds, landforms, and ocean temperatures and currents, are major determinants of local weather patterns. (MS-ESS2-5) Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents. (MS-ESS2-6)
ESS2.D: Weather and Climate	<ul style="list-style-type: none"> Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns. (MS-ESS2-6) Because these patterns are so complex, weather can only be predicted probabilistically. (MS-ESS2-5) The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents. (MS-ESS2-6)
ESS3.D: Global Climate Change	<ul style="list-style-type: none"> Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming). Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on the understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior and on applying that knowledge wisely in decisions and activities. (MS-ESS3-5)
Unit Essential Questions	Unit Enduring Understandings
<ul style="list-style-type: none"> How do changes in one part of an Earth system affect other parts of the system? How does understanding the properties of Earth materials and the physical laws that govern behavior lead to predictions of Earth? How does technology extend human senses and understanding of Earth? 	<p><i>Students will understand that...</i></p> <ul style="list-style-type: none"> Earth's components form systems. These systems continually interact at different rates of time, affecting the Earth regionally and globally. Earth systems can be broken down into individual components which have observable measurable properties. technology enables us to better understand Earth's system and the impact of Earth's systems on human activity.

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • interactions of air masses as they relate to weather • the impact that air pressure systems have on the weather • how hurricanes develop • compare different types of winter storms • how thunderstorms develop and the effects of thunderstorms on weather • the effects of tornadoes as well as the mechanisms involved in their formation • the various instruments used by meteorologist to forecast weather • isobars, recognize them on a weather map and determine the type of weather each represents and differentiate weather from climate • the geographic factors that affect climate as well as the six major climate zones how oceans affect climate 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • infer from an experiment how density affects colliding air masses. • read a weather map to answer a series of questions. • observe through a demonstration two air masses with different densities. • 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.

<p>BRICK TOWNSHIP PUBLIC SCHOOLS Evidence of Learning</p>
<p>Formative Assessments</p> <ul style="list-style-type: none"> • Graphic organizers • Directed reading • Cooperative group learning • Homework • Journal entries
<p>Summative Assessments</p> <ul style="list-style-type: none"> • Unit tests and quizzes • Labs and engineering based projects
<p>Modifications (ELLs, Special Education, Gifted and Talented)</p> <ul style="list-style-type: none"> • Follow all IEP modifications/504 plan

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Tiered assignments

Curriculum Development Resources/Instructional Materials

- Prentice Hall Science Explorer – Weather and Climate
- Online textbooks – www.pearsonsuccessnet.com
- eScience3000 – www.escience3000.com

BRICK TOWNSHIP PUBLIC SCHOOLS SCIENCE: UNIT 5

Content Area: Science

Unit Title: Unit 5: Space Systems

Grade Level: Grade 6

Unit Summary

Students examine the Earth's place in relation to the solar system, Milky Way galaxy, and universe. There is a strong emphasis on a systems approach, using models of the solar system to explain astronomical and other observations of the cyclic patterns of eclipses, tides, and seasons. There is also a strong connection to engineering through the instruments and technologies that have allowed us to explore the objects in our solar system and obtain the data that support the theories that explain the formation and evolution of the universe.

Primary interdisciplinary connections:

ELA/Literacy, Mathematics, Technology

21st Century Themes:

- Creativity and innovation
- Critical thinking and problem solving
- Communication
- Collaboration
- Information literacy
- Media literacy
- Information and communications technology (ICT)
- Literacy
- Flexibility and adaptability
- Initiative and self direction
- Social and cross cultural skills

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- Productivity and accountability
- Leadership and responsibility

Technology Connections:

Prentice Hall Science Explorer (online textbook) – www.pearsonsuccessnet.com

eScience3000 – www.escience3000.com

Learning Targets

Next Generation Science Standards (NGSS)

Performance Expectations (PEs)	Student Learning Objectives (SLO)
MS-ESS1-1	Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.
MS-ESS1-3	Analyze and interpret data to determine scale properties of objects in the solar system.
MS-ESS1-2	Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.

NGSS Disciplinary Core Ideas (DCI)

ESS1.A: The Universe and Its Stars	<ul style="list-style-type: none">• Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models. (MS-ESS1-1)• Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe. (MS-ESS1-2)
ESS1.B: Earth and the Solar System	<ul style="list-style-type: none">• The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them. (MS-ESS1-2),(MS-ESS1-3)• This model of the solar system can explain eclipses of the sun and the moon. Earth's spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun. The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year. (MS-ESS1-1)• The solar system appears to have formed from a disk of dust and gas, drawn together by gravity. (MS-ESS1-2)

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

<p>Unit Essential Questions</p> <ul style="list-style-type: none"> • What predictable, observable patterns occur as a result of the interaction between the Earth, Moon and Sun? • What types of celestial bodies encompass our Universe? 	<p>Unit Enduring Understandings <i>Students will understand that...</i></p> <ul style="list-style-type: none"> • observable, predictable patterns of movement in the Sun, Earth, Moon system occur because of gravitational interaction and energy from the Sun. • the Universe is made up of galaxies, each of which is composed of solar systems, having the same elements and governed by the same laws.
<p>Unit Objectives <i>Students will know...</i></p> <ul style="list-style-type: none"> • how distance and mass affect gravitational attraction. • the difference between rotation and revolution. • the 3 laws for planetary motion. • the current theory of the origin of the Earth's moon. • the causes of the phases of the Earth's moon, eclipses, daily and monthly tides. • the factors that combine to explain the changes in the length of the day and seasons. 	<p>Unit Objectives <i>Students will be able to...</i></p> <ul style="list-style-type: none"> • distinguish between Earth's rotation and Earth's revolution • model how the Sun strikes Earth's surface. • model how solar energy spreads out over Earth's surface throughout the year. • simulate how the Moon moves around the Earth. • illustrate and demonstrate a solar eclipse and lunar eclipse. • design and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. • model the different phases of the moon. • demonstrate the gravitational pull between the Sun and a planet. • develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. • construct a scale model of our solar system. • analyze and interpret data to determine scale properties of objects in the solar system. • differentiate the sun as it relates to other stars in the universe.

BRICK TOWNSHIP PUBLIC SCHOOLS

Evidence of Learning

Formative Assessments

- Directed reading
- Cooperative group learning
- Homework
- Journal entries
- Graphic organizers

Summative Assessments

Brick Township Public Schools SCIENCE CURRICULUM

Sixth Grade

Aligned to the Next Generation Science Standards (NGSS)

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

- Unit tests and quizzes
- Labs and engineering based projects

Modifications (ELLs, Special Education, Gifted and Talented)

- Follow all IEP modifications/504 plan
- Teacher tutoring
- Peer tutoring
- Cooperative learning groups
- Modified assignments
- Differentiated instruction
- Tiered assignments

Curriculum Development Resources/Instructional Materials

- Prentice Hall Science Explorer – Astronomy
- Online textbooks – www.pearsonsuccessnet.com
- eScience3000 – www.escience3000.com