CARLISLE AREA SCHOOL DISTRICT

Carlisle, PA 17013

GENERAL SCIENCE

GRADE 6

Date of Board Approval: February 16, 2017

CARLISLE AREA SCHOOL DISTRICT

PLANNED INSTRUCTION COVER PAGE

TITLE OF COURSE:	General Science	**SUBJECT:**	Science	**GRADE LEVEL:**	6
COURSE LENGTH:	One Year	**DURATION:**	46 minutes	**FREQUENCY:**	6 days/ cycle
PREREQUISITES:	N/A	**CREDIT:**	1	**LEVEL:**	N/A

Course Description/Objectives: The sixth grade General Science course is a year long course designed to provide students with a foundation for concepts in the field of earth science including plate tectonics, space, earthquakes and volcanoes, weather, as well as rocks and soil. The course also provides students with a general knowledge and application of scientific study including specific units centered on safety in the sciences, introduction to science, metric measurement, and the scientific method. The course is designed to meet Pennsylvania State Standards in Science and Technology. This course begins with a study of a broad overview of science, how it is applied in the world, and how to safely implement scientific procedures in the classroom. Continued application of these concepts will be used in the study of various earth science topics.

Text: The Nature of Science and Technology; Inside Earth; Weather and Climate; Astronomy
Science Explorer- Prentice Hall © 2009

Curriculum Writing Committee: Ashley Knight, Christine Rogers, Mike Beachy, Jen Long

COURSE TIME LINE

Unit 1: Safety — 2 days
- Classroom safety

Unit 2: Introduction to Science — 6 days
- Nature of science
- Facts, theories, and laws

Unit 3: Plate Tectonics — 30 days
- Earth's interior
- Convection in the mantle
- Drifting continents
- Sea-floor spreading
- The theory of plate tectonics

Unit 4: Metric Measurement — 13 days
- Metric vs. customary measurement
- Linear measurement
- Mass and weight
- Volume
- Density

Unit 5: Scientific Method — 5 days
- Steps of the scientific method
- Application in scientific experimentation

Unit 6: Variables — 20 days
- Controlled experiments
- Testing variables
- Graphing results and formulating predictions

Unit 7: Earthquakes and Volcanoes 12 days

- Forces in the Earth's crust
- Earthquakes and seismic waves
- Monitoring earthquakes
- Earthquake safety
- Volcanoes and plate tectonics
- Properties of magma
- Volcanic eruptions and landforms

Unit 8: Weather 28 days

- The atmosphere
- Air pressure
- Heat energy
- Wind
- Moisture
- Weather patterns

Unit 9: Space 30 days

- Earth, Moon, and Sun
- Technology and space exploration
- The Solar System

Unit 10: Rocks and Soil 11 days

- Classifying rocks
- The rock cycle

Total: 157 days

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	2 days
UNIT #1:	Safety (Essential)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.4.7.D2	Select and safely use appropriate tools, products and systems for specific tasks.
3.2.C.A6	Evaluate experimental information for relevance and adherence to science processes.

PA Core Standards: Reading

CC.3.5.6-8.D	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.J	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	2 days
UNIT #1:	Safety (Essential)	**GRADE:**	6

UNDERSTANDINGS

Students ensure a safe science classroom through preparation, identification of safety equipment, and knowledge of emergency procedures.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Safety quiz

KNOW

- Identify and locate safety equipment in the classroom.
- Understand acceptable behavior to maintain safety in the science classroom.

DO

- Draw a map of the classroom highlighting the safety equipment.
- Sign and return safety contract.
- Discuss and create a list of safe and unsafe behaviors.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	6 days
UNIT #2:	Introduction to Science (Important)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.1.6.A9	Understand how theories are developed.
3.1.6.B6	Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.
3.2.6.A6	Describe relationships using inference and prediction.

PSSA Eligible Content/Assessment Anchors :

S.6.A.1.2.1	Use evidence, observations, or explanations to make inferences about changes in systems over time.

PA Core Standards: Reading

CC.3.5.6-8.D	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.J	By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	6 days
UNIT #2:	Introduction to Science (Important)	**GRADE:**	6

UNDERSTANDINGS	
Science helps students to understand questions and solve problems.	
COMMON ASSESSMENTS/CULMINATING ACTIVITY	
Scientist stereotype illustration Unit quiz	
KNOW	**DO**
• Identify characteristics and stereotypes of scientists. • Distinguish between facts, theories, and laws. • Understand the branches of science.	• Illustrate a scientist to demonstrate characteristics vs. stereotypes. • Define fact, theory, and law. • Classify various disciplines of science into three branches.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	30 days
UNIT #3:	Plate Tectonics (Essential)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.2.6.B3	• Give examples of how heat moves in predictable ways, normally flowing from warmer objects to cooler ones until they reach the same temperature. • Explain the effect of heat on particle motion by describing what happens to particles during a phase change.
3.2.7.B3	• Differentiate among convection, conduction, and radiation. • Explain why heat energy consists of the random motion and vibrations of the particles of matter.
3.3.6.A1	• Recognize and interpret various mapping representations of Earth's common features.
3.3.8.A1	• Distinguish between physical and chemical weathering. Compare and contrast the types of energy that drive Earth's systems.
3.3.7.A3	• Explain and give examples of how physical evidence, such as fossils and surface features of glaciations support theories that the Earth has evolved over geologic time and compare geologic processes over time.
3.3.6.A6	• Describe the scales involved in characterizing Earth and its atmosphere. • Create models of Earth's common physical features.
3.3.7.A6	• Locate significant geologic structures using various mapping representations. • Describe geologic time as it relates to earth processes.

PSSA Eligible Content/Assessment Anchors:

S.6.A.3.1 2	• Explain how components of natural and human-made systems play different roles in a working system.
S.6.C.2.1.1	• Describe how heat moves in predictable ways from warmer objects to cooler ones until they reach the same temperature.

PA Core Standards: Reading

CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards: Writing

CC.3.6.6-8.B	• Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	30 days
UNIT #3:	Plate Tectonics (Essential)	**GRADE:**	6

UNDERSTANDINGS

The earth is constantly in a state of interior and exterior change.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Plate tectonics test

KNOW

- Identify the four main layers of Earth's interior.
- Explain how heat is transferred.
- Describe how convection currents occur within the earth.
- List the evidence used by Alfred Wegener to support his hypothesis of continental drift.
- Explain how sea-floor spreading relates to continental drift.
- Identify how the earth's crust is affected by the mantle.
- Explain how tectonic plate movements cause changes that occur in the earth's crust.

DO

- Label a diagram of Earth's interior.
- Distinguish between radiation, convection and conduction.
- Model how convection currents occur within the earth.
- Construct an argument using Alfred Wegener's evidence to support his theory of continental drift.
- Demonstrate the process of sea-floor spreading by constructing a model.
- Identify plate boundaries as divergent, convergent, or transform (strike-slip).
- Create a visual showing how changes that occur to the earth's crust are a result of plate tectonic movement.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	13 days
UNIT #4:	Metric Measurement (Important)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.2.6.A1	• Distinguish the differences in properties of solids, liquids, and gases. • Differentiate between volume and mass. Investigate that equal volumes of different substances usually have different masses.
3.2.7.A1	• Explain how materials are characterized by having a specific amount of mass in each unit of volume (density).
3.2.8.A1	• Differentiate between mass and weight.

PSSA Eligible Content/Assessment Anchors:

S.6.A.2.2.1	• Describe ways technology extends and enhances human abilities for specific purposes (e.g., make observations of cells with a microscope and planets with a telescope).
S.6.C.1.1.2	• Explain that materials are characterized by having a specific amount of mass in each unit of volume (density).

PA Core Standards: Reading

CC.3.5.6-8.A	• Cite specific textual evidence to support analysis of science and technical texts.
CC.3.5.6-8.C	• Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.F	• Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards: Writing

CC.3.6.6-8.C	• Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CC.3.6.6-8.A	• Write arguments focused on discipline-specific content.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	13 days
UNIT #4:	Scientific Method (Important)	**GRADE:**	6

UNDERSTANDINGS

The metric system is the universal unit of measurement in science. Students will apply their understanding of the metric system throughout their study of mass, length, volume, and density.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Volume lab, length lab, mass measurement lab, unit test

KNOW

- Understand why scientists use a standard measurement unit.
- Identify the SI (metric) prefixes and base words.
- Use the appropriate tools to find linear measurements, mass, density and volume.
- Distinguish between mass and weight.
- Identify the formula for finding density.

DO

- Persuade a reader to choose either the metric or customary system of measurement based on researched evidence.
- List the SI (metric) prefixes and base words.
- Demonstrate an understanding of the value of each metric prefix (milli-, centi-, deci-, deca-, hecto-, kilo-).
- Use a metric ruler, meter stick, triple-beam balance, scale, or graduated cylinder to accurately measure various objects.
- Compare and contrast mass and weight.
- Calculate the density of regular and irregular solids.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	5 days
UNIT #5:	Scientific Method (Compact)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.4.6.C3	• Explain why some technological problems are best solved through experimentation.
3.4.6.D1	• Apply a design process to solve problems beyond the laboratory classroom.

PSSA Eligible Content/Assessment Anchors:

S.6.A.1.1.1	• Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).

PA Core Standards: Reading

CC.3.5.6-8.A	• Cite specific textual evidence to support analysis of science and technical texts.
CC.3.5.6-8.C	• Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6–8 texts and topics*.
CC.3.5.6-8.G	• Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	5 days
UNIT #5:	Scientific Method (Compact)	**GRADE:**	6

UNDERSTANDINGS

Scientists use scientific inquiry to explore the world and answer questions.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Quiz

Experimental design lab

KNOW

- Identify the steps of the scientific method.
- Understand how the process of scientific inquiry is used to answer questions in the real world.

DO

- Sequence the steps of the scientific method by using simulated experiments.
- Create an experiment utilizing the steps of the scientific method to answer a proposed question.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	20 days
UNIT #6:	Variables (Essential)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.4.6.C2	• Show how models are used to communicate and test design ideas and processes.
3.4.6.D1	• Apply a design process to solve problems beyond the laboratory classroom.
3.1.6.B6	• Identify questions that can be answered through scientific investigations and evaluate the appropriateness of questions.
3.1.6.C4	• Design and conduct a scientific investigation and understand that current scientific knowledge guides scientific investigations.
3.2.6.A6	• Describe relationships using inference and prediction.

PSSA Eligible Content/Assessment Anchors:

S.6.A.1.1.1	• Explain how certain questions can be answered through scientific inquiry and/or technological design (e.g., consumer product testing, common usage of simple machines, modern inventions).
S.6.A.1.1.2	• Use evidence to support inferences and claims about an investigation or relationship (e.g., common usage of simple machines).
S.6.A.1.1.3	• Predict the outcome of an experiment based on previously collected data.
S.6.A.1.2.1	• Use evidence, observations, or explanations to make inferences about changes in systems over time.
S.6.A.1.2.2	• Identify variables that cause changes in natural or human-made systems.
S.6.A.2.1.1	• Use evidence, observations, or a variety of scales to describe relationships.
S.6.A. 2.1.2	• Identify variables that cause changes in natural or human-made systems.
S.6.A.3.1.1	• Describe a system as a group of related parts with specific roles that work together to achieve an observed result.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	20 days
UNIT #6:	Variables (Essential)	**GRADE:**	6

PA Core Standards: Reading

CC.3.5.6-8.C	• Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.G	• Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CC.3.5.6-8.I	• Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	20 days
UNIT #6:	Variables (Essential)	**GRADE:**	6

UNDERSTANDINGS

Scientists design and use variables in controlled experiments.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Quiz/test

Pendulum lab, boat lab, plane lab (FOSS kits)

KNOW

- Understand how variables and standards are used in an experiment.
- Demonstrate how variables affect the outcome of a controlled experiment.
- Describe relationships between independent and dependent variables.
- Identify and understand the characteristics of various types of graphs.

DO

- Identify dependent, independent, and controlled variables in an experiment.
- Test which variables affect the number of cycles a pendulum swings, the number of passengers a FOSS boat holds, and the flight of a FOSS plane.
- Draw conclusions based upon data collected during an experiment.
- Graph the results of an experiment using a concrete picture or two-coordinate graph.
- Make inferences and predictions using data from various graphs.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	12 days
UNIT #7:	Earthquakes and Volcanoes (Important)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.3.6.A1	• Recognize and interpret various mapping representations of Earth's common features.
3.3.8.A1	• Compare and contrast the types of energy that drive Earth's systems.
3.3.7.A3	• Compare geologic processes over time.

PSSA Eligible Content/Assessment Anchors

S.6.A.2.2.1	• Describe ways technology extends and enhances human abilities for specific purposes (e.g., make observations of cells with a microscope and planets with a telescope).
S.6.A.3.1 2	• Explain how components of natural and human-made systems play different roles in a working system.
S.6.A.1.2.1	• Use evidence, observations, or explanations to make inferences about changes in systems over time.

PA Core Standards: Reading

CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.I	• Compare and contrast the information gained from experiments, simulations, video or multimedia sources with that gained from reading a text on the same topic.
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	12 days
UNIT #7:	Earthquakes and Volcanoes (Important)	**GRADE:**	6

UNDERSTANDINGS

The earth is constantly in a state of interior and exterior change.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

quiz/test

triarama project

KNOW

- Identify the three types of stress and the faults associated with each one.
- Understand how the energy of an earthquake travels through the earth in the form of seismic waves.
- Identify geologic instruments and how they are used to monitor faults.
- Explain ways to prepare for a possible earthquake.
- Explain how volcanoes result from the movement of tectonic plates.
- Recognize how properties of magma affect volcanic eruptions.
- Describe the composition of a volcano.
- Name the three types of volcanoes and the eruptions associated with each.

DO

- Model/illustrate tension, compression, and shearing.
- Model/illustrate normal, reverse, strike-slip faults.
- Compare and contrast s waves, p waves, and surface waves.
- Differentiate between tilt meters, creep meters, laser-ranging devices, and GPS satellites and how they are used to monitor faults.
- List safety steps for before, during, and after an earthquake.
- Interpret maps to identify the relationship between volcano locations and plate boundaries.
- Discuss different types of eruptions and how the properties of magma affect each eruption.
- Label the following parts of a volcano: magma chamber, pipe, vent, side vent, lava flow, and crater.
- List characteristics of cinder cone, composite, and shield volcanoes and describe their eruptions.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	28 days
UNIT #8:	Weather (Essential)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.3.6.A4	• Describe how water on earth cycles in different forms and in different locations, including underground and in the atmosphere.
3.3.8.A4	• Explain how the oceans form one interconnected circulation system powered by wind, tides, the Earth's rotation, and water density differences.
3.3.6.A5	• Describe the composition and layers of the atmosphere. • Explain the effects of oceans on climate. • Describe how global patterns such as the jet stream and water currents influence local weather in measurable terms such as temperature, wind direction and speed, and precipitation.
3.3.7.A5	• Describe basic elements of meteorology. • Explain the relationship between the energy provided by the sun and the temperature differences among water, land and atmosphere.
3.3.8.A5	• Explain how the curvature of the earth contributes to climate. Compare and contrast water vapor, clouds, and humidity.
3.3.6.A6	• Describe the scales involved in characterizing Earth and its atmosphere.
3.3.7.A6	• Describe changes in atmospheric conditions associated with various weather patterns.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	28 days
UNIT #8:	Weather (Essential)	**GRADE:**	6

PSSA Eligible Content/Assessment Anchors:

S.6.A.2.2.1	• Describe ways technology extends and enhances human abilities for specific purposes (e.g., make observations of cells with a microscope and planets with a telescope).
S.6.A.3.2.1	• Describe how scientists use models to explore relationships and make predictions about natural systems (e.g., weather conditions, the solar system).
S.6.D.2.1.1	• Describe cloud types and measurable factors (i.e., wind direction, temperature, barometric pressure, moisture, and precipitation) that are associated with various weather patterns.
S.6.D.2.1.2	• Interpret weather data to develop a weather forecast.
S.6.D.2.1.3	• Explain how global patterns (jet stream, water currents) influence weather in measurable terms (e.g., wind direction, temperature, barometric pressure, precipitation).

PA Core Standards: Reading

CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.G	• Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards: Writing

CC.3.6.6-8.C	• Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.
CC.3.6.6-8.B	• Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	28 days
UNIT #8:	Weather (Essential)	**GRADE:**	6

UNDERSTANDINGS

Earth's weather is caused by the interaction of air pressure, heat energy, winds, and moisture in the atmosphere.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

pamphlet project
weather log

KNOW

- Describe the composition and layers of Earth's atmosphere.
- Understand the four main factors of weather (air pressure, heat, wind, moisture) and the tools used to measure them.
- Understand how weather patterns create disturbances in the atmosphere.
- Explain how temperature, elevation, and water vapor affect Earth's air pressure.
- Compare and contrast how high and low air pressure systems affect daily weather patterns.
- Describe how the sun and its uneven heating of the earth affect Earth's weather patterns.
- Recall the different types of precipitation (rain, snow, sleet, hail, freezing rain).
- Identify the tools used to measure the four main factors of weather and record daily weather data.

DO

- List the most abundant gases found in Earth's atmosphere (nitrogen, oxygen).
- Diagram the layers of the atmosphere and identify key characteristics of each layer.
- Recall the three types of heat transfer (radiation, conduction, convection) and apply them to the sun's heating of the atmosphere.
- Classify local and global winds and describe their affects on Earth's weather patterns.
- Diagram the water cycle.
- Classify cloud types based on their characteristics and the weather associated with each type of cloud.
- Compare and contrast water vapor, clouds, and humidity.
- Create a safety pamphlet on tornadoes or hurricanes which contains the following information: formation of the storm, location, time of year, intensity scale, and safety tips.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	30 days
UNIT #9:	Space (Essential)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.2.8.A1	• Differentiate between mass and weight.
3.3.7.A4	• Describe the motions of tides and identify their causes.
3.3.6.B1	• Compare and contrast the size, composition, and surface features of the planets that comprise the solar system as well as the objects orbiting them. • Recognize the role of gravity as a force that pulls all things on or near the earth toward the center of the earth and in the formation of the solar system and the motions of objects in the solar system. • Explain why the planets orbit the sun in nearly circular paths. • Describe how the planets change their position relative to the background of the stars. • Explain how the tilt of the earth and its revolution around the sun cause an uneven heating of the earth which in turn causes the seasons and weather patterns.
3.3.7.B1	• Explain how gravity is the major force in the formation of the planets, stars, and the solar system. • Describe gravity as a major force in determining the motions of planets, stars, and the solar system. • Compare and contrast properties and conditions of objects in the solar system to those on Earth.
3.3.6.B2	• Use models to demonstrate that earth has different seasons and weather patterns. • Use models to demonstrate that the phases of the moon are a result of its orbit around Earth.
3.3.7.B2	• Identify a variety of instruments used to gather evidence about the universe. • Describe repeating patterns in the Sun- Earth-Moon system and the positions of stars. • Relate planetary size and distance in our solar system using an appropriate scale model.
3.3.8.B2	• Explain measurements and evidence indicating the age of the universe.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	30 days
UNIT #9:	Space (Essential)	**GRADE:**	6

PSSA Eligible Content/Assessment Anchors:

S.6.A.2.2.1	• Describe ways technology extends and enhances human abilities for specific purposes (e.g., make observations of cells with a microscope and planets with a telescope).
S.6.A.3.2.1	• Describe how scientists use models to explore relationships and make predictions about natural systems (e.g., weather conditions, the solar system).
S.6.D.3.1.1	• Compare the size and surface features of the planets that comprise the solar system as well as the objects orbiting them.
S.6.D.3.1.2	• Describe how the size, composition, and surface features of the planets are influenced by their distance from the Sun.

PA Core Standards: Reading

CC.3.5.6-8.D	• Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.
CC.3.5.6-8.J	• By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

PA Core Standards: Writing

CC.3.6.6-8.C	• Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	30 days
UNIT #9:	Space (Essential)	**GRADE:**	6

UNDERSTANDINGS

The motions of Earth and the moon and their position relative to the sun result in day and night, the seasons, phases of the moon, eclipses, and tides. The solar system includes the sun, the planets and their respective moons, and smaller objects such as comets, asteroids, and meteoroids.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

planets project/presentation

KNOW

- Demonstrate how Earth moves in space.
- Explain the causes of the cycle of seasons on Earth.
- Identify what determines the strength of the force of gravity between two objects.
- Describe two factors that keep the moon and Earth in orbit.
- Explain what causes the phases of the moon.
- Describe solar and lunar eclipses.
- Identify what causes the tides.
- Describe features found on the moon's surface.
- Identify some characteristics of the moon.
- Explain how the moon formed.
- Describe the characteristics that the inner planets have in common.
- Identify the main characteristics that distinguish each of the inner planets.
- Describe characteristics that the gas giants have in common.
- Identify characteristics that distinguish each outer planet.
- Describe the characteristics of comets.
- Identify where most asteroids are found.
- Explain what meteoroids are and how they form.
- Recognize how astronomers describe the scale of the universe.
- State the big bang theory.
- Explain how the solar system was formed.

DO

- Design a model to show how Earth's rotation and revolution affect the cycle of seasons on Earth.
- Illustrate a diagram of Earth and the moon, showing what would happen if their mass or the distance between them changed.
- Describe how inertia and gravity combine to keep the moon and Earth in orbit.
- Analyze how the changing relative positions of the moon, Earth, and sun cause the phases of the moon, eclipses, and tides.
- Interpret photographs of Earth's moon to identify key features (maria, craters, and highlands).
- Compare and contrast characteristics of Earth and its moon.
- Discuss the theory of Earth's moon's origin.
- Create a project/presentation to distinguish between inner and outer planets and describe the characteristic of each individual planet.
- Compare and contrast comets, asteroids, and meteoroids using a graphic organizer.
- Rank objects in the universe according to their size (i.e. planet, sun, solar system, galaxy, and universe).
- Define the big bang theory.
- Construct a timeline that shows the events from the moment of the big bang to the present, including the formation of the solar system.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	11 days
UNIT #10:	Rocks and Soil (Compact)	**GRADE:**	6

STANDARDS:

PA Academic Standards:

3.3.7.A1
- Define basic features of the rock cycle.
- Describe the layers of the earth.
- Differentiate among the mechanisms by which heat is transferred through the Earth's system.

3.3.6.A2
- Examine how soil fertility, composition, resistance to erosion, and texture are affected by many factors.

3.3.7.A2
- Explain land use in relation to soil type and topography.

PSSA Eligible Content/Assessment Anchors:

S.6.D.1.1.2
- Identify the three basic rock types and describe their formation (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).

PA Core Standards: Reading

CC.3.5.6-8.D
- Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6–8 texts and topics.

CC.3.5.6-8.J
- By the end of grade 8, read and comprehend science/technical texts in the grades 6–8 text complexity band independently and proficiently.

KNOW, UNDERSTAND, DO

COURSE:	General Science	**TIME FRAME:**	11 days
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UNDERSTANDINGS

Forces inside and on the surface of the earth slowly change rocks into different types in a process known as the rock cycle.

COMMON ASSESSMENTS/CULMINATING ACTIVITY

Rock cycle web quest

KNOW

- Identify the three basic rock types (i.e., igneous [granite, basalt, obsidian, and pumice]; sedimentary [limestone, sandstone, shale, and coal]; and metamorphic [slate, quartzite, marble, and gneiss]).
- Explain how igneous, sedimentary, and metamorphic rocks change continuously through the rock cycle.
- Identify soil types (i.e., humus, topsoil, subsoil, loam, loess, and parent material) and their characteristics (i.e., particle size, porosity, and permeability).

DO

- Describe the formation of igneous, sedimentary, and metamorphic rocks.
- Diagram the rock cycle.
- Distinguish between the different soil types by identifying their characteristics.

Adaptations/Modifications for Students with I.E.P.s

Adaptations or modifications to this planned course will allow exceptional students to earn credits toward graduation or develop skills necessary to make a transition from the school environment to community life and employment. The I.E.P. team has determined that modifications to this planned course will meet the student's I.E.P. needs.

Adaptations/Modifications may include but are not limited to:

INSTRUCTION CONTENT

- Modification of instructional content and/or instructional approaches
- Modification or deletion of some of the essential elements

SETTING

- Preferential seating

METHODS

- Additional clarification of content
- Occasional need for one to one instruction
- Minor adjustments or pacing according to the student's rate of mastery
- Written work is difficult, use verbal/oral approaches
- Modifications of assignments/testing
- Reasonable extensions of time for task/project completion
- Assignment sheet/notebook
- Modified/adjusted mastery rates
- Modified/adjusted grading criteria
- Retesting opportunities

MATERIALS

- Supplemental texts and materials
- Large print materials for visually impaired students
- Outlines and/or study sheets
- Carbonless notebook paper
- Manipulative learning materials
- Alternatives to writing (tape recorder/calculator)