

**2016-2017 Environmental (Earth) Science****Power Standards**

1. The student will be able to analyze the universe, the Earth, and its place within the universe.
2. The student will be able to predict how and why the Earth is constantly changing.
3. The student will be able to assess how Earth's surface processes & human activities affect each other.

**Learning targets**

- 1.1. I can use the scientific method to answer experimental questions.
- 1.2. I can accurately calculate various measurements using the metric system.
- 1.3. I can communicate scientific ideas about the way stars, over their life cycle, produce elements.
- 1.4. I can evaluate evidence from Earth's history to explain Earth's formation.
- 2.1 I can develop a model, illustrating how continental and ocean-floor features are formed.
- 2.2 I can analyze data to make claims that a change to Earth's surface can cause changes to other Earth's systems.
- 2.3 I can develop a model of Earth's interior to describe the cycling of matter by thermal convection.
- 2.4 I can use a model to describe how variations in the flow of energy in and out of Earth's systems result in climate changes.
- 2.5 I can conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- 3.1 I can use evidence to construct an explanation of a variety of influences on human activity.
- 3.2 I can illustrate the relationships between management of natural resources, the sustainability of human populations, and biodiversity.
- 3.3 I can evaluate solutions that reduce impacts of human activities on natural systems.
- 3.4 I can analyze global climate models to predict future impacts to Earth systems.

**Course Details**

**UNIT: Experimental Method** -- 3 Week(s)

**UNIT: Maps** -- 2 Week(s)

**UNIT: Earth Materials** -- 4 Week(s)

**UNIT: Environmental Science** -- 0 Day(s)

**UNIT: Earth History** -- 0 Day(s)

**UNIT: Tectonics, Earthquakes and Volcanoes** -- 0 Day(s)

**UNIT: Astronomy** -- 0 Day(s)

**UNIT: Weather** -- 0 Day(s)

**2016-2017 Biology****Power Standards**

1. The student will be able to differentiate between the four major macromolecules, their subcomponents, and structure.
2. The student will be able to distinguish the different structure and functions of cellular components.
3. The student will be able to analyze the flow of energy within an organism.
4. The student will be able to explain how proteins are produced from specific DNA sequences.
5. The student will be able to analyze modes of cellular reproduction and their roles within an organism.
6. The student will be able to predict how different characteristics are passed through generations.
7. The student will be able to explain the diversity of life given evidence of evolution by natural selection.
8. The student will be able to connect energy flow throughout an ecosystem with relationships between organisms and their environment.

**Learning targets**

- 1.1 I can relate the different subatomic particles of an atom.
- 1.2 I can compare different types of chemical bonds.
- 1.3 I can describe the biologically relevant properties of water (cohesion, adhesion, capillary action, surface tension, polarity).
- 1.4 I can identify the parts of a solution (solute, solvent).
- 1.5 I can explain the structure and function of macromolecules (carbohydrates, proteins, nucleic acids, lipids).
- 2.1 I can explain the different parts of cell theory.
- 2.2 I can contrast the structure and function of prokaryotes and eukaryotes.
- 2.3 I can explain the structure and function of cell organelles and structures.
- 2.4 I can describe the structure and function of a cell membrane.
- 2.5 I can predict the flow of water across the cell membrane when in hypertonic, hypotonic or isotonic solutions.
- 2.6 I can identify prokaryotes and eukaryotes using a microscope.
- 2.7 I can use a model to illustrate hierarchical organization from cell to organism.
- 3.1 I can explain how energy is stored and released in the phosphate bonds of ATP.
- 3.2 I can design models of photosynthesis and chemosynthesis that demonstrates how the level of inputs and outputs effects its rate.
- 3.3 I can design a model of cellular respiration that demonstrates how the level of inputs affects its rate.
- 3.4 I can differentiate between aerobic and anaerobic respiration.
- 3.5 I can explain the relationship between photosynthesis and cellular respiration.
- 3.6 I can explain how enzymes interact with substrates to increase the rate of chemical reactions.
- 3.7 I can predict how different environmental factors can affect the rate of enzyme activity.
- 4.1 I can describe the structure of nucleic acid monomers and how they interact to store genetic information.
- 4.2 I can describe how DNA is replicated.
- 4.3 I can transcribe a specific DNA sequence to its corresponding mRNA complementary strand
- 4.4 I can translate a specific mRNA sequence to its corresponding amino acid chain.
- 4.5 I can use a specific DNA sequence to make its corresponding amino acid chain.
- 4.6 I can identify the role of different organelles in the process of protein production.
- 4.7 I can explain the effect of different types of genetic mutations on protein production.
- 4.8 I can explain the effect of mutations on the organism as a whole.
- 5.1 I can differentiate between asexual and sexual reproduction.
- 5.2 I can explain the stages of mitosis.
- 5.3 I can explain how uncontrolled cell division can lead to cancer.
- 5.4 I can contrast the stages and purpose of meiosis and mitosis.
- 5.5 I can explain how cells differentiate into their specific roles within an organism.
- 6.1 I can defend complete dominance using Gregor Mendel's pea experiments.
- 6.2 I can use punnett squares to predict probable offspring genotypes and phenotypes.
- 6.3 I can model the law of segregation using punnett squares.
- 6.4 I can demonstrate variations of dominance using punnett squares.
- 6.5 I can predict the occurrence of sex-linked traits using male and female chromosomal differences.
- 6.6 I can deduce the genotypes and phenotypes of individuals based on their family pedigree.
- 7.1 I can explain how evolution occurs through the process of natural selection.
- 7.2 I can defend the process of evolution by natural selection through a variety of evidence.
- 7.3 I can utilize evidence of evolution to demonstrate the closeness of relationships between different organisms in different taxa.
- 8.1 I can track the path of energy through trophic levels in an ecosystem.
- 8.2 I can distinguish between ecological relationships (predator/prey, symbiotic, competitive).
- 8.3 I can predict how changes in one population can affect an entire food web.
- 8.4 I can explain how different elements and compounds are cycled through an ecosystem.
- 8.5 I can predict how different environmental factors can affect the rate of population growth and carrying capacity.

## Course Details

**UNIT: Chemistry/Biochemistry** -- 5 Week(s)

**UNIT: Cells and Membranes** -- 4 Week(s)

**UNIT: Energy and Enzymes** -- 4 Week(s)

**UNIT: DNA** -- 4 Week(s)

**UNIT: Cell Division** -- 3 Week(s)

**UNIT: Genetics** -- 4 Week(s)

**UNIT: Evolution** -- 3 Week(s)

**UNIT: Ecology** -- 4 Week(s)

**UNIT: Zoology/Dissection** -- 3 Week(s)

**2016-2017 Physical Science****Power Standards**

1. The student will be able to analyze matter and its interactions.
2. The student will be able to analyze motion, forces and their interactions.
3. The student will be able to analyze principles of energy.
4. The student will be able to analyze waves and their relationship to information transfer.

**Learning targets**

- 1.1 I can use the periodic table to predict relative properties of elements.
- 1.2 I can explain the products of a simple chemical reaction.
- 1.3 I can compare physical and chemical properties of a variety of substances.
- 1.4 I can explain the properties of various categories of structural materials.
- 1.5 I can explain a chemical system by changing conditions that would alter the amount of products at equilibrium.
- 1.6 I can balance equations to explain conservation of matter and mass.
- 1.7 I can use scientific models to explain changes in atoms and energy caused by nuclear processes.
- 2.1 I can use data to analyze Newton's Laws.
- 2.2 I can use mathematical representations to analyze momentum.
- 2.3 I can use motion and momentum principles to evaluate a protective device for effectiveness during collision.
- 2.4 I can describe gravitational forces between objects.
- 2.5 I can use scientific evidence to explain the relationship between electric current and magnetic field.
- 3.1 I can calculate change in energy of a system.
- 3.2 I can explain how one form of energy converts into another form of energy.
- 3.3 I can use a model to explain the forces between objects and the changes in energy of the objects due to their interaction.
- 4.1 I can use mathematical concepts to explain the relationships between frequency, wavelength, and speed traveling in various media.
- 4.2 I can describe a variety of wave models and phenomena.

**Course Details**

**UNIT: Chemistry 1** – 23 Day(s)

**UNIT: Chemistry 2** – 33 Days(s)

**UNIT: Chemistry 3** – 20 Days(s)

**UNIT: Chemistry 4** – 14 Day(s)

**UNIT: Physics 1** – 60 Days(s)

**UNIT: Physics 2** – 27 Days(s)

**2016-2017 Chemistry**

Grades 10 - 12, Duration 1 Year, 1 Credit

Required Course

**Power Standards**

1. The student will be able to analyze the structure, properties, and interactions of matter.
2. The student will be able to predict interactions between objects and within systems of objects.
3. The student will be able to analyze how energy is transferred and conserved.

**Learning targets**

- 1.1 I can categorize a substance based on physical and chemical properties.
- 1.2 I can describe the atom as having a positive nucleus with negative electrons.
- 1.3 I can describe the location of electrons using Quantum Numbers.
- 1.4 I can categorize elements according to their location on the Periodic Table.
- 1.5 I can describe the difference between ionic and covalent compounds.
- 2.1 I can balance a chemical reaction.
- 2.2 I can compare the mass of a reactant to the mass of the product.
- 2.3 I can calculate the molarity of a solution.
- 2.4 I can describe the properties of gases (Ideal Gas Law).
- 2.5 I can list the factors that affect a reaction rate.
- 2.6 I can explain shifts in equilibrium using Le Châtelier's Principle.
- 2.7 I can calculate the pH of a solution.
- 3.1 I can illustrate how energy is transferred between a system and its surroundings.
- 3.2 I can describe the relationship between wavelength, frequency and energy.
- 3.3 I can determine the relationship between energy and mole ratios.

**Course Details**

**UNIT: Matter and Energy** -- 3 Week(s)

**UNIT: Atomic Structure** -- 3 Week(s)

**UNIT: Electron Cloud** -- 3 Week(s)

**UNIT: The Periodic Table** -- 2 Week(s)

**UNIT: Chemical Bonding** -- 2 Week(s)

**UNIT: Chemical Reactions** -- 3 Week(s)

**UNIT: Stoichiometry** -- 3 Week(s)

**UNIT: Solutions and Gases** -- 2 Week(s)

**UNIT: Chemical Reactions Rates and Equilibrium** -- 3 Week(s)

**UNIT: Acids and Bases** -- 1 Week(s)

**2016-2017 Field Biology****Power Standards**

1. The student will be able to evaluate the structure and processes of organisms.
2. The student will be able to evaluate the interactions and relationships between organisms and ecosystems.
3. The student will be able to compare relationships between organisms using taxonomic classifications.

**Learning targets**

- 1.1 I can use a model to illustrate the hierarchical organization of interacting systems that provide specific functions and operations within multicellular organisms.
- 1.2 I can compare different reproductive methods for a variety of species and organisms.
- 2.1 I can use a model to illustrate the roles of various organisms and their processes have on Earth's systems/ecosystems.
- 2.2 I can evaluate scientific evidence that shows how biological and physical changes affect organisms and an ecosystem.
- 2.3 I can design a solution to positively impact the environment and biodiversity.
- 2.4 I can use scientific evidence to explain the factors that contribute to the process of evolution.
- 2.5 I can use scientific evidence to explain how natural selection leads to adaptation of populations.
- 2.6 I can use scientific evidence to analyze the cause and effect relationships in changing environmental conditions.
- 2.7 I can create a model to test a solution to mitigate adverse impacts of human activity on biodiversity.
- 3.1 I can classify organisms by anatomical adaptations.
- 3.2 I can classify organisms by behavior patterns.
- 3.3 I can evaluate local fauna, including classification by anatomical adaptations (9-12.LS4.A.1), (9-12.LS4.B.1),

**Course Details**

**UNIT: Taxonomy** – 2 Week(s)

**UNIT: Evolution** – 2 Weeks(s)

**UNIT: Porifera/Cnidaria/Worms** – 1 Week(s)

**UNIT: Mollusca/Echinodermata** -- 1 Week(s)

**UNIT: Anthropods** -- 3 Week(s)

**UNIT: Vertebrata** -- 1 Week(s)

**UNIT: Fish** -- 1 Week(s)

**UNIT: Amphibia** -- 1 Week(s)

**UNIT: Reptilia** -- 1 Week(s)

**UNIT: Aves** -- 1 Week(s)

**UNIT: Mammalia** -- 1 Week(s)

**2016-2017 Astronomy****Power Standards**

1. The student will be able to analyze matter and its interactions.
2. The student will be able to analyze the relationships and interactions between motion, forces, and energy.
3. The student will be able to analyze waves and their relationship to information transfer.
4. The student will be able to analyze the Earth's place in the Universe.

**Learning targets**

- 1.1 I can use the periodic table to predict relative properties of elements.
- 1.2 I can explain the products of a simple chemical reaction.
- 1.3 I can compare physical and chemical properties of a variety of substances.
- 1.4 I can explain the properties of various categories of structural materials.
- 1.5 I can explain the effects of changes of reacting particles on the rate of a reaction.
- 1.6 I can balance equations to explain conservation of matter and mass.
- 1.7 I can use scientific models to explain changes in atoms and energy caused by nuclear processes.
- 2.1 I can analyze gravitational forces between objects.
- 2.2 I can use a model to explain the forces between objects and the changes in energy of the objects due to their interaction.
- 3.1 I can use mathematical concepts to explain the relationships between frequency, wavelength, and speed traveling in various media.
- 3.2 I can describe a variety of wave models and phenomena.
- 3.3 I can explain how electromagnetic radiation interacts with matter.
- 3.4 I can describe the effects of frequencies of electromagnetic radiation on matter.
- 4.1 I can communicate scientific ideas about the way stars, over their life cycle, produce elements
- 4.2 I can explain the Big Bang Theory using astronomical evidence.
- 4.3 I can predict the motion of orbiting objects in the solar system
- 4.4 I can evaluate evidence from Earth's history to explain Earth's formation.

**Course Details**

**UNIT: History of Astronomy** -- 2 Week(s)

**UNIT: Making Observations** -- 1 Week(s)

**UNIT: Telescopes** -- 1 Week(s)

**UNIT: Eyepiece Technology** -- 1 Week(s)

**UNIT: Photometry/Light** -- 2 Week(s)

**UNIT: Stellar Life Cycles** -- 2 Week(s)

**UNIT: Pulsars** -- 1 Week(s)

**UNIT: Cosmology** -- 1 Week(s)

**UNIT: Exoplanets** -- 1 Week(s)

**UNIT: Observations at Observation Site** -- 6 Week(s)

## 2016-2017 Genetics

### Power Standards

1. The student will be able to analyze how model genetic organisms live and grow.
2. The student will be able to predict how different heredity characteristics are passed through generations.
3. The student will be able to evaluate how recent genetic research impacts our understanding of human health.

### Learning targets

- 1.1 I can identify and compare the components of nucleic acid structure
- 1.2 I can compare and sequence the steps of protein production.
- 1.3 I can identify mutation types, causes and describe how a mutation impacts a protein's structure and function.
- 1.4 I can compare different strategies used to control protein production
- 1.5 I can compare and sequence the steps of DNA replication.
- 1.6 I can explain the importance of mitosis to maintaining homeostasis.
- 1.7 I can compare meiosis to mitosis.
- 2.1 I can apply concepts of statistics and probability to predict corresponding F1 and F2 generation results.
- 2.2 I can analyze generation data from a model genetics organism.
- 3.1 I can evaluate how recent genetics research impacts our understanding of biology and human health.
- 3.2 I can analyze a variety of resources that relate to the impact genetics plays in human health.

### Course Details

**UNIT: DNA** -- 9 Week(s)

**UNIT: Cell Division** -- 4 Week(s)

**UNIT: Genetic Heredity Patterns** -- 5 Week(s)

**UNIT: Genetic Research** -- Ongoing



## 2016-2017 Human Anatomy & Physiology

Science

Grades 11 - 12, Duration 1 Year, 1 Credit

Elective Course

### Power Standards

1. The student will be able to evaluate the structure and processes of organisms.
2. The student will be able to evaluate the interactions and relationships between human physiological processes and disease contraction and management.

### Learning targets

- 1.1 I can use and construct models to identify anatomical structures and features of organisms.
- 1.2 I can use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- 1.3 I can use a model to identify/locate anatomical structures and features of the cat.
- 2.1 I can explain the human physiological processes that are responsible for certain diseases/conditions.
- 2.2 I can create a plan to limit susceptibility to preventable diseases.

### Course Details

**UNIT: Body Orientation** -- 4 Week(s)

**UNIT: Tissues and Biomolecules** -- 4 Week(s)

**UNIT: Integumentary System** -- 4 Week(s)

**UNIT: Bones** -- 4 Week(s)

**UNIT: Stat!** -- 2 Week(s)

**UNIT: Dissection** -- 10 Week(s)

**UNIT: Blood** -- 4 Week(s)

**2016-2017 Physics****Power Standards**

1. The student will be able to analyze matter and its interactions.
2. The student will be able to analyze motion, forces and their interactions.
3. The student will be able to analyze principles of energy.
4. The student will be able to analyze waves and their relationship to information transfer.

**Learning targets**

- 1.1 I can compare physical and chemical properties of a variety of substances.
- 1.2 I can use scientific models to explain changes in atoms and energy caused by nuclear processes.
- 2.1 I can use data to analyze Newton's Laws.
- 2.2 I can use mathematical representations to analyze momentum.
- 2.3 I can use motion and momentum principles to evaluate a protective device for effectiveness during collision.
- 2.4 I can describe gravitational forces between objects.
- 2.5 I can use scientific evidence to explain the relationship between electric current and magnetic field.
- 3.1 I can calculate change in energy of a system.
- 3.2 I can use models to compare the motions of particles with the relative position of particles.
- 3.3 I can design a device that converts one form of energy into another form of energy.
- 3.4 I can conduct an investigation resulting in a uniform energy distribution among the components in the system.
- 4.1 I can use mathematical concepts to explain the relationships between frequency, wavelength, and speed traveling in various media.
- 4.2 I can describe a variety of wave models and phenomena.
- 4.3 I can explain how electromagnetic radiation interacts with matter.
- 4.4 I can describe the effects of frequencies of electromagnetic radiation on matter.

**Course Details**

**UNIT: Motion in One Axis** -- 3 Week(s)

**UNIT: Motion in Two Axis** -- 3 Week(s)

**UNIT: Periodic Motion** -- 4 Week(s)

**UNIT: Wave Structure and Motion** -- 4 Week(s)

**UNIT: Mirrors** -- 3 Week(s)

**UNIT: Lenses** -- 3 Week(s)

**UNIT: Electric Charge and Force** -- 3 Week(s)

**UNIT: Potential Energy** -- 2 Week(s)

**UNIT: Electric Circuits and Components** -- 4 Week(s)

**UNIT: Buoyant Force and Pressure** -- 2 Week(s)

**2016-2017 AP Chemistry****Power Standards**

1. The students will be able to explain changes in matter involve the rearrangement and/or reorganization of atoms and/or transfer of electrons.
2. The student will be able to explain properties of materials by the structure and the arrangement of atoms, ions or molecules and the forces between them.
3. The student will be able to explain the rates of chemical reactions are determined by molecular collisions.
4. The student will be able to explain how the laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.
5. The student will be able to describe how any bond or intermolecular attraction that can be formed can be broken. These two processes are in a dynamic competition, sensitive to initial conditions and external perturbations.
6. The student will be able to conduct lab investigations.

**Learning targets**

- 1.1 I can explain the properties of elements using the regular variations that occur in the electronic structures of atoms (periodicity).
- 1.2 I can explain the conservation of atoms by calculating the masses of substances in a chemical process (stoichiometry).
- 2.1 I can explain the difference between types of compounds and molecules (compounds and molecules).
- 2.2 I can describe the properties of matter from particle spacing and the forces of attraction between them (intermolecular forces).
- 3.1 I can describe how elementary reactions occur from collisions between molecules (Collision Theory).
- 3.2 I can predict the rate of a chemical reaction by measuring the concentrations of reactants over time (Rate Law).
- 4.1 I can explain why breaking bonds require energy and forming bonds releases energy (enthalpy,  $\Delta H$ ).
- 4.2 I can explain how a chemical reaction can be spontaneous or non-spontaneous. (entropy,  $\Delta S$ , gibbs free energy,  $\Delta G$ ).
- 5.1 I can describe how systems at equilibrium are responsive to external influences. (equilibrium).
- 5.2 I can determine pH of a solution from equilibrium concentrations. (acid-base chemistry).
- 6.1 I can identify the correct variables and equipment necessary to measure the desired quantities in an experiment (experiment design).
- 6.2 I can report data to the appropriate level of precision (data analysis).
- 6.3 I can properly use lab-specific terms (terminology).
- 6.4 I can accurately use models to explain laboratory concepts (modeling).

**2016-2017 Botany**

Grades 11 - 12, Duration 1 Semester, .5 Credits

Elective Course

**Power Standards**

1. The students will be able to evaluate the structure and processes of organisms.
2. The student will be able to evaluate the structure and processes
3. The student will be able to analyze the various components of heredity and inheritance of traits.
4. The student will be able to describe biological evolution, diversity and adaptations.

**Learning targets**

- 1.1 I can use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- 1.2 I can conduct an investigation to prove that feedback mechanisms maintain homeostasis.
- 1.3 I can use a model to illustrate photosynthesis.
- 1.4 I can use a model to explain cellular respiration and its results.
- 2.1 I can explain how photosynthesis is responsible for the cycling of matter and energy flow through ecosystems, their trophic levels, and other Earth's systems.
- 2.2 I can evaluate scientific evidence that shows how biological and physical changes affect an ecosystem.
- 2.3 I can design a solution to positively impact the environment and biodiversity.
- 3.1 I can compare asexual and sexual reproduction with regard to genetic information and variation in offspring.
- 3.2 I can use a model to explain how mutations affect the structure and function of an organism.
- 4.1 I can use scientific evidence to explain the factors that contribute to the process of evolution.
- 4.2 I can use scientific evidence to analyze the cause and effect relationships in changing environmental conditions.
- 4.3 I can devise a multi-step plan to restore the stability and/or biodiversity of an ecosystem when given a scenario describing the possible adverse effects of human interactions with that ecosystem

**Course Details**

**UNIT: Plant Structure** -- 3 Week(s)

**UNIT: Reproduction** -- 3 Week(s)

**UNIT: Evolution & Natural Selection** -- 4 Week(s)

**UNIT: Building A Better World** -- 6 Week(s)

**2016-2017 Atmospheric Science****Power Standards**

1. The student will be able to analyze matter and its interactions.
2. The student will be able to analyze waves and their relationship to information transfer.
3. The student will be able to analyze the Earth's place in the Universe.
4. The student will be able to analyze Earth's systems.
5. The student will be able to evaluate the relationship between the Earth and human activity.

**Learning targets**

- 1.1 I can use the periodic table to predict relative properties of elements.
- 1.2 I can explain the products of a simple chemical reaction.
- 1.3 I can compare physical and chemical properties of a variety of substances.
- 1.4 I can design a chemical system by changing conditions that would alter the amount of products at equilibrium.
- 1.5 I can use scientific models to explain changes in atoms and energy caused by nuclear processes.
- 2.1 I can describe a variety of wave models and phenomena.
- 2.2 I can explain how electromagnetic radiation interacts with matter.
- 2.3 I can describe the effects of frequencies of electromagnetic radiation on matter.
- 3.1 I can explain the Big Bang Theory using astronomical evidence.
- 3.2 I can predict the motion of orbiting objects in the solar system.
- 4.1 I can use a model to describe how variations in the flow of energy in and out of Earth's systems result in climate changes.
- 4.2 I can use evidence to construct an explanation of the simultaneous coevolution of Earth's systems and life on Earth.
- 5.1 I can use evidence to construct an explanation of a variety of influences on human activity.
- 5.2 I can illustrate the relationships between management of natural resources, the sustainability of human populations, and biodiversity.
- 5.3 I can evaluate solutions that reduce impacts of human activities on natural systems.
- 5.4 I can analyze a variety of scientific data to predict future impacts to Earth systems.

**Course Details**

**UNIT: Optical telescopes** -- 3 Week(s)

**UNIT: Stars and Galaxies** -- 3 Week(s)

**UNIT: The Sun and The Moon** -- 3 Week(s)

**UNIT: Atmospheric Structure & Pressure Systems** -- 2 Week(s)

**UNIT: Coriolis effect** -- 2 Week(s)

**UNIT: Weather Maps** -- 2 Week(s)

**2016-2017 Historical Geology****Power Standards**

1. The student will be able to evaluate matter and its interactions.
2. The student will be able to analyze the Earth's place in the Universe.
3. The student will be able to analyze Earth's systems.
4. The student will be able to evaluate the relationship between the Earth and human activity.
5. The student will be able to evaluate the interactions, energy, and dynamics of ecosystems.
6. The student will be able to analyze the various components heredity and inheritance of traits.
7. The student will be able to describe biological evolution, diversity, and adaptations.

**Learning targets**

- 1.1 I can use the periodic table to predict relative properties of elements.
- 1.2 I can use the products of a simple chemical reaction.
- 1.3 I can compare physical and chemical properties of a variety of substances.
- 2.1 I can communicate scientific ideas about the way stars, over their life cycle, produce elements.
- 2.2 I can analyze data, showing why continental rocks are much older than ocean floor rocks.
- 2.3 I can evaluate evidence from Earth's history to explain Earth's formation.
- 2.4 I can describe gravitational forces between objects.
- 3.1 I can develop a model, illustrating how continental and ocean-floor features are formed.
- 3.2 I can analyze data to make claims that a change to Earth's surface can cause changes to other Earth's systems.
- 3.3 I can develop a model of Earth's interior to describe the cycling of matter by thermal convection.
- 3.4 I can conduct an investigation of the properties of water and its effects on Earth materials and surface processes.
- 3.5 I can describe the cycling of carbon among Earth's systems.
- 3.6 I can use evidence to construct an explanation of the simultaneous coevolution of Earth's systems and life on Earth.
- 4.1 I can use evidence to construct an explanation of a variety of influences on human activity.
- 4.2 I can illustrate the relationships between management of natural resources, the sustainability of human populations, and biodiversity.
- 4.3 I can analyze a variety of scientific data to predict future impacts to Earth systems.
- 5.1 I can explain the processes that are responsible for the cycling of matter and energy flow through and ecosystem.
- 5.2 I can use a model to illustrate photosynthesis.
- 6.1 I can compare asexual and sexual reproduction with regard to genetic information and variation in offspring.
- 6.2 I can use a model to explain how mutations affect the structure and function of an organism.
- 6.3 I can make and defend a claim explaining the causes of inheritable genetic variations.
- 6.4 I can use mathematical principles to explain variation and distribution of expressed traits in a population.
- 7.1 I can analyze scientific evidence claiming common ancestry and biological evolution are supported by empirical evidence.
- 7.2 I can analyze data to compare patterns of embryonic development across multiple species.
- 7.3 I can use scientific evidence to explain the factors that contribute to the process of evolution.
- 7.4 I can use statistics and probability to compare organisms with advantageous heritable traits to those that lack this trait.
- 7.5 I can use scientific evidence to explain how natural selection leads to adaptation of populations.
- 7.6 I can use scientific evidence to analyze the cause and effect relationships in changing environmental conditions.

**Course Details**

**UNIT: Introduction to Geology** -- 4 Week(s)

**UNIT: Geologic Time** -- 2 Week(s)

**UNIT: Plate Tectonics** -- 3 Week(s)