

Course Title: Physical Science (Choice)
Course Provider: Florida Virtual
DESE code #: 135010
Number of Semesters: Two
Per Semester Cost: \$375.00

Prerequisites:

Usually taken by 9th graders

Course Description:

This course is designed as an interactive, 21st century course focusing on basic physics and chemistry. Topics include forces and motion, energy through waves, electricity and magnetism, the matter around us, chemical bonding and reactions. This course is designed to serve as a foundation for the study of the physical sciences. The utilization of scientific inquiry, web 2.0 tools, interactive experiences, higher order thinking, collaborative projects, real world application through labs and a variety of assessments all aid the student in ultimately demonstrating a vast understanding of the importance of the physical and chemical properties of the world around them; enabling them to apply these properties to their everyday lives.

Course Syllabus/Outline:

Segment 1

- Speed, Velocity and Acceleration
- The Laws of Motion
- Forces in Action
- Energy
- Work and Power
- Energy Transfer
- Introduction to waves
- Mechanical waves
- Electromagnetic waves
- Reflection and Refraction
- Electrical Charges
- Electrical Current
- Electrical Circuits
- Magnetism
- Relationship between Electricity and magnetism
- Renewable and Non-Renewable Resources

*Collaborative project: Students are required to submit one collaborative project in segment 1. There will be two different options in the segment to choose from.

Segment 2

- Classifying Matter
- States of Matter
- Properties of Matter
- Atomic Theory
- Atomic Mass
- Periodic Table of Elements
- Chemical Bonding
- Chemical Formulas
- Hydrogen hydroxide
- Solubility and Concentration
- Acids and Bases
- Chemical reactions
- Classifying Chemical Reactions

- Reaction Rates and Energy
- Radioactivity
- Nuclear Reactions
- Better Living through Chemistry

*Collaborative project: Students are required to submit one collaborative project in segment 2. There will be three different options throughout the segment to choose from.

Special notes from evaluation team:

Course Title: Physical Science (Choice)
Course Provider: Aventa
DESE code #: 135010
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

Usually taken by 9th graders

Course Description:

This course provides students with instruction in the nature of science, including scientific processes, the scientific method, and scientific inquiry. It covers safety in the lab and the field, principles for conducting experiments, and the need for scientific communication. The course then covers the atomic nature of matter, classification of the elements, the periodic table, acids, and bases. Next, students are introduced to energy. They learn what energy is and the various forms of energy. They explore energy transformations and specifically discuss the production of electricity. The course discusses energy in motion, with emphasis on defining work, power, velocity, acceleration, forces, and gravity. Students learn about Newton's laws of motion and simple machines and have the opportunity to design their own machine using the basic principles of physics. Finally, the course discusses the composition and structure of the universe, the life cycles of stars, and space exploration.

Course Objectives:

After completing the course, students will be able to:

- Describe the nature of science and apply knowledge of the nature of science
- Conduct scientific experiments and communicate the results in appropriate ways
- Describe and apply the processes of science, such as making observations, asking questions, formulating hypotheses, analyzing data, and making inferences
- Describe the atomic nature of matter and explain how elements are classified
- Define and give examples of acids, bases, solutions, mixtures, and compounds
- Define energy and differentiate various forms of energy
- Explain energy in motion and describe forces, velocity, acceleration, work, power, and the use of simple machines
- Describe how energy travels in waves and describe wave phenomena
- Describe chemical reactions and discuss them in terms of conservation of mass and energy
- Describe nuclear reactions, forms of energy transformation, and the energy crisis
- Explain the generation of electricity and magnetism
- Describe the composition and structure of the universe
- Describe the life cycle of a star
- Explain past achievements and future goals for space exploration

Course Syllabus/outline:

Scientific Nature

- What is Science?
- Scientific Process
- THE Scientific Method
- Characteristics of Science
- Laws and Principles

Scientific Inquiry

- Experimental and Technological Design
- Safety
- Performing an Experiment
- Drawing Conclusions
- Communicate Findings

- Evaluating and Redesigning

Matter

- Atomic Nature of Matter
- Classification of Elements
- Patterns and the Periodic Table
- Compounds and Bonds
- Acids and Bases
- Solutions and Mixtures

Energy and Change

- What is Energy?
- Identifying Matter
- Properties of Matter (Mass, State)
- Changes in Matter (Change of State, Gas Laws)
- Energy Conservation
- Transformation of energy

Energy in Motion

- Motion and Speed
- Velocity and Acceleration
- Mass v Weight
- Types of Forces
- Newton's Laws
- Gravity
- Fluids

Machines

- Simple Machines
- Work and Power
- The Human Body
- Complex Machines and Toys

Electricity and Magnetism

- Electrical Safety
- Circuits
- Magnets
- Electromagnet: Motors/Generators

Waves

- Modeling waves
- Interactions
- Electromagnetic Spectrum
- Sound
- Light

Chemical Reactions

- Types of Reactions
- Conservation of Matter and Energy
- Nuclear Reactions

The Universe

- Composition and Structure
- Structures Within
- Life Cycle of a Star
- Measuring Distance
- Space Exploration

Special notes from evaluation team:

Course Title: Physical Science Foundations
Course Provider: Aventa
DESE code #: 135010
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

Usually taken by 9th graders

Course Description:

Physical science is the introductory course to high school science courses and beyond. Students will expand on their middle science experiences to prepare them for biology, chemistry, and physics. This course will emphasize scientific thinking as a way of understanding the natural phenomenon that surrounds us. In this regard there will be numerous opportunities to dialog with other students about scientific theory and practice. In addition, there will be both simulated and real world laboratory experiences to further expand your scientific horizons.

Course Objectives

Upon completion of this course students will be conversant in a number of scientific topics, understand how science is used in our daily lives, and be comfortable with solving simple algebraic equations that support scientific laws.

The course content has been appropriately grouped into smaller topics to increase retention and expand opportunities for assessment. With each topic, quizzes are presented to the student. Audio readings are included with every portion of content, allowing auditory learners the opportunity to engage with the course. Test pools and randomized test questions are utilized in quizzes as well as unit exams, ensuring that students taking the course will not be presented with the same exams. Additionally, the course includes additional practice activities (such as cloze activities), as well as pre-topic vocabulary lists, that introduce key vocabulary in English and in Spanish.

Course Syllabus/Outline:

Semester 1

- Introduction to physical science
- Energy and motion
- Newton's laws
- Energy
- Simple machines
- Waves
- Electricity

Semester 2

- Matter
- Atomic structure and periodic table
- Chemical bonds
- Elements and their properties
- Interaction of matter

Special notes from evaluation team:

Course Title: Health
Course Provider: Aventa
DESE code #: 085300
Number of Semesters: One
Per Semester Cost: \$299.00

Prerequisites:

Required course for Missouri graduation

Course Description:

This Health course will help you develop the knowledge and skills you need to make healthy decisions that allow you to stay active, safe and informed. The lessons and activities are designed to introduce students to important aspects of the main types of health: emotional and mental, social and consumer, and physical. Among other topics, you will explore nutrition, understanding and avoiding disease, first aid and CPR, and human sexuality. You will find out about the components of a healthy lifestyle and ways to approach making healthy choices and decisions.

Course Objectives:

- Introduce students to concepts and applications of the main types of health: mental and emotional, social and consumer, and physical
- Introduce methods and strategies for decision-making for healthy life choices
- Present opportunities for students to apply their value systems to decisions concerning health
- Introduce and assess communication skills that demonstrate healthy choices with respect for self, family and others
- Introduce resources provided by online sources, parents, friends and community members in making healthy choices

Course Syllabus/Outline:

UNIT I: Mental and Emotional Health

Section 1 - Introduction to Health Education
 Section 2 - Types of Health
 Section 3 - Introduction to Mental and Emotional Health
 Section 4 - Understanding and Managing Emotions
 Section 5 - Understanding Stress
 Section 6 - Understanding Depression, Suicide, and Death
 Section 7 - Understanding and Developing Identity

UNIT II: Social and Consumer Health

Section 1 - Introduction to Social and Consumer Health
 Section 2 - Governmental Agencies
 Section 3 - Making Good Health Choices

UNIT III: Physical Health: Nutrition

Section 1 - Introduction to Nutrition
 Section 2 - Food Pyramid
 Section 3 - Essential Nutrients

UNIT IV: Physical Health - Preventing Disease

Section 1 - Introduction to Preventing Disease
 Section 2 - Infectious and Non-Infectious Diseases
 Section 3 - Infectious Diseases Continued
 Section 4 - Chronic Diseases

UNIT V: Physical Health - First Aid and CPR

Section 1 - Introduction to First Aid and CPR
 Section 2 - Adult and Child CPR
 Section 3 - First Aid
 Section 4 - Special Situations and Safety

UNIT VI: Physical Health - Human Sexuality

Section 1 - Introduction to Human Sexuality

Section 2 - Physical Anatomy and Development

Section 3 - Introduction to Contraception

Section 4 - Sexually Transmitted Diseases

Section 5 - Dating and Sex

Section 6 - Conception, Fetal Development, and Birth

Section 7 - Decisions: Abstinence

UNIT VII: Physical Health - Drug and Alcohol Awareness

Section 1 - Introduction to Drug and Alcohol Awareness

Section 2 - Alcohol Awareness

Section 3 - Illegal Drug Awareness

Section 4 - Tobacco Awareness

Special notes from evaluation team:

Course Title: Biology
Course Provider: Connections Academy
DESE code #: 134200
Number of Semesters: Two
Per Semester Cost: \$395.00

Prerequisites:

None

Course Description – Semester 1:

Designed as a preparation for college-level biology courses, students in Biology A study the role of a biologist, analyze the life of a cell, make genetic predictions, and infer how and why organisms change. Hands-on explorations and virtual simulations enhance students' comprehension of key science concepts.

Course Syllabus/Outline – Semester 1:

Units:

What is Biology?

Welcome to biology, the study of the diversity and unity of living organisms. In this opening unit, you will review the common characteristics of all organisms, examine various scientific methods, compare quantitative and qualitative information, and begin to examine how scientific discovery may affect society.

Ecology

All living and nonliving components on Earth, including plants, animals, water, air, and soil, have an effect on each other. **Ecology** is the study of how living and nonliving elements interact. In this unit you will study these interactions as you identify **biotic** and **abiotic** factors that exist in different ecosystems, study the characteristics of different **biomes**, analyze how and why ecosystems change, and examine people's impact on the environment.

The Life of a Cell

No matter how simple or complex, buildings are all composed of basic units of structural materials. Similarly, all organisms are made up of one or more cells, the basic units of life. In this unit you will explore the life of a cell as you study the chemistry of cells, identify cell structures and functions, examine how cells transfer matter and energy, and analyze the cell cycle.

Genetics

Most physical traits, such as eye and hair color, are passed on from one generation to the next. In this unit you will learn how genetics plays a role in determining traits as you study the history of genetics, analyze the structure and function of DNA, study patterns of heredity, and explore how genetic technology influences human life.

Change Through Time

Just as Earth itself is dynamic, so is the life that exists upon it. In this unit you will explore how life on Earth has changed as you examine hypotheses about how life began, study the theory of evolution, analyze ancestral evidence of humans, and compare ways in which organisms are classified.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes and answers to questions in your Science journal before you begin to review.

Textbook:

Glencoe Biology: The Dynamics of Life

Textbook (online access):

Glencoe Biology: The Dynamics of Life

Course Description – Semester 2:

In Biology B, students examine and compare plant and animal species, beginning with the simplest bacteria and finishing with complex systems of mammals. The final unit examines the systems of the human body, with additional lessons on the human lifecycle, nutrition, and the effects of pharmaceuticals. Students complete traditional lessons as well as hands-on and virtual labs to reinforce important concepts and theories.

Course Syllabus/Outline – Semester 2:**Units:**Viruses, Bacteria, Protists, and Fungi

We can readily recognize plant and animal diversity because plants and animals are readily visible. However, much of life's diversity exists in organisms that we do not see every day such as bacteria, protists, and fungi. In this unit you will examine and compare different types of bacteria, protists, and fungi. In addition, you will analyze the characteristics of viruses, nonliving things commonly confused with bacteria.

Plants

By now you probably know that plants are essential for most life on Earth. Not only do they provide food and energy for most organisms, they also supply life-sustaining gases. In this unit you will study the characteristics and functions of a vast array of plants and analyze the similarities and differences among them.

Invertebrates

The majority of animals on Earth are invertebrates, or animals without backbones. These animals can exist almost anywhere on Earth—from the deepest crevices of the ocean floors to the steepest snow-covered mountain tops. In this unit you will explore the variations that enable invertebrates to adapt to almost any environment and sustain almost any condition.

Vertebrates

Humans have many biological, social, and cultural ties with other vertebrates, or animals with backbones. Some people keep vertebrates, such as birds, fish, dogs, and cats, as pets. Many people rely on the products of these animals, such as milk, eggs, and leather. Some view specific vertebrates, such as cows, as religious or cultural symbols. In this unit you will explore the characteristics, adaptations, and behaviors of various types of vertebrates.

The Human Body

The human body is a complex system of chemicals, organs, vessels, and connectors that enable people to compete in soccer games, solve algebra problems, and make decisions about how to spend their free time. In this unit you will analyze the major systems of the human body and examine how they interact with one another.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes and answers to questions in your Science journal before you begin to review.

CD/DVD:

Froguts

Textbook:

Glencoe Biology: The Dynamics of Life

Textbook (online access):

Glencoe Biology: The Dynamics of Life

Special notes from evaluation team:

Course Title: Biology Foundations
Course Provider: Aventa
DESE code #: 134200
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

None

Course Description:

This course is an introduction to general biology and to the processes of scientific inquiry and thinking. It will include the fundamental principles of living organisms including physical and chemical properties of life, cellular organization and function, the transfer of energy through metabolic systems, cellular reproduction, the classification of living things, the six kingdoms of life will be examined. The main focus is to present biological information in an understandable and straight forward way that will capture the students' interest dealing with up to date principles and concepts.

The course content has been appropriately chunked into smaller topics to increase retention and expand opportunities for assessment. With each topic, quizzes are presented to the student. Audio readings are included with every portion of content, allowing auditory learners the opportunity to engage with the course. Test pools and randomized test questions are utilized in quizzes as well as unit exams, ensuring that students taking the course will not be presented with the same exams. Additionally, the course includes additional practice activities (such as cloze activities), as well as pre-topic vocabulary lists, that introduce key vocabulary in English and in Spanish.

Course Syllabus/Outline:

Biological Principals

- Introduction to Biology
- Characteristics and Organization of Life
- Tools of Biology

Chemical and Molecular Basis of Life

- The chemical context of life
- Properties of water
- Basic atomic structure
- Metabolism and energy

Cells

- The structure and function of cells
- Homeostasis and transport
- Photosynthesis
- Cellular respiration
- Cell reproduction

Genetics

- Fundamentals of genetics
- Mendalian genetics
- Genes and chromosomes
- Human heredity
- Biotechnology

Evolution

- Origin of life
- Darwinism
- Classification of living things
- Evolution in process
- Human evolution

Microorganisms

- Bacteria
- Viruses
- Protists
- Fungi

Ecology and Ecosystems

- Overview of ecology and ecosystems
- Factors affecting organisms
- Aquatic and terrestrial biomes
- Populations and communities

Plants

- Overview of plant kingdom
- Plant structure and function
- Plants reproduction

Animals

- Major groups of invertebrates
- Major groups of vertebrates

Human Biology and Populations

Special notes from evaluation team:

Course Title: AP Biology
Course Provider: Aventa
DESE code #: 134200
Number of Semesters: Two
Per Semester Cost: \$438.00

Prerequisites:

General Biology and Chemistry

Course Description:

This course is a comprehensive analysis of general biology that includes biochemistry, molecular biology, genetics, mechanisms of evolution, evolutionary history of biological diversity, plant and animal form and function, and ecology. The AP Biology course is designed to be the equivalent of a college introductory biology course usually taken by biology majors or pre-medical students their first year. The textbook used, the range and depth of topics covered, discussion topics and kinds of labs done in this course are equivalent to those taking this course in college. College Board guidelines are followed in determining the course.

Course Objectives

After completing the course, students will be able to:

- Understand the concepts presented in an introductory college biology course
- Acquire investigative and laboratory skills needed in the study of biology
- Promote interest in the study of the biological sciences and appreciation for the place of science in modern society
- Equip and prepare students for the Advanced Placement Biology examination

Required Text: *Biology, 7th AP Edition*, Neil A. Campbell and J. Reese; ISBN# 0-8053-7146-X

Course Syllabus/Outline:

Introduction & The Chemistry of Life

- Exploring Life
- Molecular Biology

The Cell

- Diffusion & Osmosis Lab
- Enzyme Catalysis
- Mitosis & Meiosis
- Cell Respiration
- Plant Pigments & Photosynthesis

Genetics

- Genetics of Organisms

Mechanisms of Evolution

- Population Genetics & Evolution

Evolutionary History of Biological Diversity Plant Form and Function

- Transpiration

Animal Form and Function

- Physiology of the Circulatory System

Ecology

- Animal Behavior
- Dissolved Oxygen & Aquatic Primary Productivity

Special notes from evaluation team:

Course Title: Chemistry
Course Provider: Aventa
DESE code #: 134600
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

This grade 11-12 course requires successful completion of lower level science courses and math skills equal at least to Algebra I.

Course Description:

This course adheres closely to standards for the teaching of chemistry. It emphasizes the mathematical, theoretical and experimental basis of modern chemistry. Emphasis is placed on the use of theoretical and mathematical concepts to explain and predict chemical behavior. An overview of the significant learning objectives that are presented in this course include Measurement, Atomic Structure, Chemical Bonding, Conservation of Matter, Stoichiometry, Gases, Acids and Bases, Solutions, Chemical Thermodynamics, Reaction Rates, Chemical Equilibrium, Organic Nomenclature, Biochemistry, and Nuclear chemistry.

Course Syllabus/outline:

Semester 1

- Measurement
- Atoms
- Bonding
- Matter
- Gases
- Acids and Bases
- Solutions

Semester 2

- Thermodynamics
- Rates
- Equilibrium
- Organic Chemistry
- Nuclear Chemistry

Special notes from evaluation team:

Course Title: AP Chemistry
Course Provider: Aventa
DESE code #: 134600
Number of Semesters: Two
Per Semester Cost: \$613.29 (Semester 1)
\$329.00 (Semester 2)

Prerequisites:
General Chemistry

Course Description:

Advanced Placement Chemistry is equivalent to a full-year introductory college course in general Chemistry. Student will learn fundamental analytical skills to logically assess chemical problems proficiently. Through fascinating and elaborative lessons, students will develop the skills necessary to arrive at conclusions based on informed judgment and present evidence in clear and persuasive essays.

Required Text:

In order to be successful in this course, you will need to purchase a chemistry textbook. You need to purchase the following book: ***Chemistry: The Molecular Nature of Matter and Change***, by Silberberg

Course Syllabus/Outline:

Semester 1

- An Introduction to Chemistry
- The Components of Matter
- Stoichiometry of Formulas and Equations
- The Major Classes of Chemical Reactions
- Gases and the Kinetic-Molecular Theory
- Thermochemistry: Energy Flow and Chemical Change
- Quantum Theory and the Nature of Light
- Electron Configuration and Chemical Periodicity
- Models of Chemical Bonding
- The Shapes of Molecules
- Theories of Covalent Bonding

Semester 2

- Intermolecular Forces: Liquids, Solids, and Phase Changes
- The Properties of Mixtures: Solutions and Colloids
- Periodic Patterns in the Main-Group Elements
- Organic Compounds and the Atomic Properties of Carbon
- Kinetics: Rates and Mechanisms of Chemical Reactions
- Equilibrium: The Extent of Chemical Reactions
- Oxidation and Reduction Reactions
- Thermodynamics: Entropy, Free Energy, and the Directions of Chemical Reactions

Special notes from evaluation team:

Course Title: Earth Science
Course Provider: Connections Academy
DESE code #: 133800
Number of Semesters: Two
Per Semester Cost: \$395.00

Prerequisites:

None

Course Description – Semester 1:

This is the first of two courses that comprise Earth Science. This course is designed to prepare the student to confidently enter and complete college-level Earth science courses. The Prentice Hall text, *Earth Science*, provides the basis for the course content.

This course consists of varied curriculum that provides the student the opportunity to explore, compare, research, reflect, and make real-world connections. The student will engage in hands-on explorations and virtual simulations, which will enhance traditional lesson formats.

During this course, the student will identify the branches of Earth science, locate geographic features on topographic maps, conduct hands-on experiments with minerals and rocks, compare and contrast weathering and erosion, explore plate tectonics with relation to earthquakes and volcanoes, and investigate the formation of mountains.

Course Syllabus/Outline – Semester 1:

Units:

Introduction to Earth Science

Earth Science is a vast branch of science that covers many subject areas, including geology, oceanography, meteorology, and astronomy. Earth scientists study physical and chemical aspects of Earth and its place in the solar system, using various mapping techniques and advanced global positioning technology. Because Earth contains so many interactive parts, scientists often study Earth as a system. The Earth system is powered by energy from the sun and by geologic forces inside Earth.

In this introductory unit, you will learn about Earth's composition and internal structure. You will read about different techniques that scientists use to study Earth and other planets in the solar system and you will learn how the theory of plate tectonics influences the field of Earth science. You will explore Earth's four major spheres—the geosphere, hydrosphere, atmosphere, and biosphere—and you will determine how human activity impacts the Earth system.

Minerals

Did you know that close to 4,000 different minerals have been identified on Earth? When scientists discover a new mineral, they study its physical characteristics and try to determine how it may have formed. Once a mineral has been named, it can be grouped with other minerals that share similar properties.

In this unit, you will examine some of the more common mineral groups on Earth, including silicates, carbonates, oxides, sulfates, sulfides, halides, and native elements. You will learn about mineral properties and the tests that scientists conduct to classify minerals. You will also study elements, atoms, and subatomic particles, and you will learn how atoms of different elements combine to form compounds.

Rocks

When different minerals mix together, they form rocks. There are three main types of rocks on Earth—igneous, sedimentary, and metamorphic—each of which forms in a unique way. Rocks can change from one type to another because of the rock cycle, which you will learn about, and the constant changes within Earth's interior.

In this unit, you will study each rock type in great detail. You will learn how each one forms and where scientists usually find that type of rock on Earth. You will explore the rock cycle and the natural processes that influence rock transformations. At the end of the unit, you will conduct an investigation using various samples from your rock kit.

Earth's Resources

Earth contains valuable resources—such as air and water—that are used every day by plants, animals, and humans. These resources are categorized into two main groups: renewable resources and nonrenewable resources. Since there are limited amounts of nonrenewable resources on Earth, scientists have determined alternative ways to extract energy from resources such as wind, water, and the sun.

In this unit, you will explore different forms of renewable and nonrenewable resources. You will read about fossil fuels and the ways they are used to produce energy for various human activities. You will identify alternative energy resources and their advantages and disadvantages, and you will explore how Earth's natural resources can be protected from harmful pollutants and overuse.

Sculpturing Earth's Surface

Geologically, Earth is constantly changing. Earth's surface is influenced by internal forces that create mountains and external forces that weather and erode Earth's crust. Some geologic changes occur over long periods of time, while others happen quickly, drastically changing landscapes in minutes.

In this unit, you will study processes that sculpt Earth's surface, including weathering, erosion, deposition, and even human activities such as logging and construction. You will learn how and why mass movements occur, and you will explore the various ways water can shape landscapes over time.

Glaciers, Deserts, and Wind

Glaciers cover and shape approximately 10 percent of the total land area on Earth. As a glacier moves—or flows—it erodes rock from valley floors and walls. In sharp contrast, deserts are areas that lack moisture and have very little organic material. Desert ecosystems are easily shaped by running water and wind.

In this unit, you will learn about glaciers and deserts. You will study different types of glaciers and how they move, and you will read how sand- and pebble-covered deserts are affected by the processes of weathering and erosion. At the end of the unit, you will take a closer look at exactly how wind erodes desert landscapes.

Earthquakes and Earth's Interior

Caused by the rapid release of energy stored inside Earth, earthquakes can greatly damage Earth's surface, particularly if they occur near a large city. Earthquakes can create various hazards, including seismic shaking, landslides, and even tsunamis.

In this unit, you will explore earthquakes and why they occur. By completing the lab *Locating an Earthquake* you will learn how scientists are able to determine an earthquake's epicenter and its focus. In order to understand how scientists measure earthquakes, you will study two types of seismic waves: body waves and surface waves.

Plate Tectonics and Other Igneous Activity

The hypothesis of continental drift, followed by the theory of plate tectonics, significantly changed scientists' understanding of Earth's geologic forces. As scientists began to accept new ideas about movement within Earth's layers, they were able to explain many other geologic forces, such as earthquakes, volcanic eruptions, and even seafloor spreading.

In this unit, you will explore the theory of plate tectonics and how it impacted the field of geology. You will learn what causes tectonic plate motion and you will examine different types of plate boundaries. During

the unit, you will read how volcanic eruptions are directly related to activity within Earth's interior. You will learn about different types of volcanism and you will study the three main types of volcanoes: shield, cinder cone, and composite cone.

Mountain Building

Mountains are classified into four main types: volcanic, folded, fault-block, and dome. These types of mountains can be found in various places on Earth's surface. The mountain-building process occurs mostly at convergent plate boundaries, where colliding plates result in massive forces that create mountains.

In this unit, you will explore how and where mountains are built on Earth's surface. You will identify the four main types of mountains and at which convergent plate boundary they usually occur. During the unit, you will complete an investigation of anticlines and synclines, which will help you better understand the different types of folded mountains.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes and answers to questions in your science journal before you begin to review.

Science Kit:

Goggles, safety
Hand lens
Magnet, bar (set of 2)
Rock and mineral kit, advanced
Streak plate
Thermometers (2)

Textbook:

Prentice Hall Earth Science

Textbook (online access):

Prentice Hall Earth Science

Course Description – Semester 2:

This is the second of two courses that comprise Earth Science. This course is designed to prepare the student to confidently enter and complete college-level Earth science courses. The Prentice Hall text, *Earth Science*, provides the basis for the course content.

This course consists of varied curriculum that provides the student the opportunity to explore, compare, research, reflect, and make real-world connections. The student will engage in hands-on explorations and virtual simulations, which will enhance traditional lesson formats.

During this course, the student will explore Earth's history by studying fossils and rock layers; investigate oceanic productivity and features on the sea floor; learn about atmospheric processes, including the water cycle; infer how severe storms form; study the Earth-moon-sun relationship; and explore other celestial bodies, such as stars.

Course Syllabus/Outline – Semester 2:

Units:

Geologic Time and Earth's History

In this introductory unit, you will explore Earth's early history by studying fossils, the rock record, and the geologic time scale. You will learn how scientists are able to date rock layers using radiometric dating, and how they are able to develop theories of past environments using fossils. In addition, you will learn

how the geologic time scale is organized and how it was originally developed by scientists in the 1800s.

During this unit, you will complete a lab on fossils, which will enable you to understand how fossils can be used to define rock sequences. At the end of the unit, you will study Precambrian Time and the Paleozoic, Mesozoic, and Cenozoic Eras. You will learn how Earth changed biologically and geologically during these important time periods in history.

Oceanography

In this unit, your reading assignments and activity components will immerse you in the field of oceanography. From physical features of the ocean floor to ocean productivity and the diversity of marine life, you will find that you cover most aspects of the world's oceans throughout this unit.

During this unit, you will study the density of seawater. You will be asked to complete a Virtual Lab in which you will experiment with different solids and liquids, to better understand density. At the end of the unit, you will learn about waves, tides, and how ocean waters circulate throughout the world. You will also learn about shoreline processes and how various features are created due to natural causes.

Meteorology: Part 1

In this unit, you will study various topics within the field of meteorology. You will learn how to differentiate between weather and climate, and you will compare and contrast heat and temperature. When studying heat, you will complete an investigation about the specific heat of land and water.

During this unit, you will also explore how clouds form. You will learn about the four processes that lift air—orographic lifting, frontal wedging, convergence, and localized convective lifting—and you will study how different types of precipitation form. At the end of the unit, you will study air pressure and wind. You will learn how air pressure is exerted on objects and how local and regional wind patterns form.

Meteorology: Part 2

In this unit, you will continue your study of meteorology. First you will learn about air masses and how they are classified. Then you will explore fronts, including: warm fronts, cold fronts, stationary fronts, and occluded fronts. You will also study severe storms and you will identify the conditions in which they form.

During this unit, you will explore global climates and the characteristics that define them. You will learn about some of the natural processes that can cause changes in climate, and you will study global warming. Upon completion of the unit, you will have a better understanding of the consequences of global warming and climate change.

Astronomy: Part 1

In this unit, you will begin to study outer space. You will first learn how early astronomers viewed Earth's place in the solar system, and you will study famous contributors to early astronomy, such as Galileo and Newton. Next you will study the Earth-moon-sun system and you will identify different features on the surface of the moon.

During this unit, you will examine the solar system and its interrelated parts. You will learn about the terrestrial and Jovian planets, as well as other bodies such as asteroids, meteors, and comets. By the end of the lesson, you will be able to explain why Pluto is no longer considered one of the planets in our solar system.

Astronomy: Part 2

In this unit, you will study light and how it applies to the field of astronomy. You will examine the electromagnetic spectrum and you will learn how the Doppler effect can be used to study stars. You will also study the following types of telescopes: refracting, reflecting, radio, and space.

During this unit, you will investigate the orbital speed of the planets in our solar system. You will also

learn about star properties and the birth, life, and death of stars. Finally, you will learn about the universe on a greater scale; you will discover that scientists believe in universal expansion and you will study the big bang theory.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes and answers to questions in your science journal before you begin to review.

CD/DVD:

Prentice Hall Virtual Earth Science

Science Kit:

Thermometers (2)

Textbook:

Prentice Hall Earth Science

Textbook (online access):

Prentice Hall Earth Science

Special notes from evaluation team:

Course Title: Earth Science Foundations
Course Provider: Aventa
DESE code #: 133800
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

None

Course Description:

This introductory Earth Science course incorporates the body of knowledge and facts accumulated from people's observations of the Earth around them and the skies above them. This observed information of the earth has evolved over centuries into the branch of science known as earth science. Earth science has several different branches of study: the solid earth (geology), the earth's waters (hydrology and oceanography), the earth's atmosphere (meteorology), and the universe beyond earth (astronomy). Using careful observation and experimentation, students will learn to effectively analyze and evaluate the earth's natural phenomena and their causes, as well as, its relationship in the universe by focusing on the four major areas of study.

The course content has been appropriately chunked into smaller topics to increase retention and expand opportunities for assessment. With each topic, quizzes are presented to the student. Audio readings are included with every portion of content, allowing auditory learners the opportunity to engage with the course. Test pools and randomized test questions are utilized in quizzes as well as unit exams, ensuring that students taking the course will not be presented with the same exams. Additionally, the course includes additional practice activities (such as cloze activities), as well as pre-topic vocabulary lists, that introduce key vocabulary in English and in Spanish.

Course Syllabus/Outline:

Semester 1

GEOLOGY

Overview of Planet Earth in Terms of Earth Science

- What is earth science?
- Explore the branches of earth science
- Understand the importance of earth science
- Earth as a series of interrelated systems
- Think like an earth scientist (scientific method)

Minerals, Rocks, and the Rock Cycle

- Minerals and Basic Atomic Structure
- Rock-Forming Minerals
- Igneous, Sedimentary, and Metamorphic Rocks
- Rock Cycle and Earth's Systems

Plate Tectonics, Deformation of Earth's Crust, Earthquakes, and Volcanoes

- Plate Tectonics
- Folds, Faults, and Rock Deformation
- Earthquakes
- Volcanoes

Weathering, Erosion, and Deposition; Glaciers and Deserts

- Weathering
- Erosion
- Deposition
- Glaciers
- Deserts

Geologic Time, Relative Age Dating, and Isotopic Dating

- Geologic Time

- Relative Age Dating
- Isotopic Dating

Semester 2**HYDROLOGY & OCEANOGRAPHY**

Hydrology

- Rivers, Streams, and Floods
- Groundwater

Oceanography

- Ocean Basins
- Waves, Currents, and Tides
- Coastal Processes

METEOROLOGY

The Atmosphere, Weather, and Climate

- The Atmosphere
- Weather Factors and Patterns
- Climate Factors and Zones
- Climate Change

ASTRONOMY

The Earth, Moon, Sun, Solar System, Stars, Galaxies, and the Universe

- The Earth, Moon, and Sun
- The Solar System
- Stars, Galaxies, and the Universe

Special notes from evaluation team:

Course Title: Environmental Science
Course Provider: Connections Academy
DESE code #: 134215
Number of Semesters: Two
Per Semester Cost: \$345.00

Prerequisites:
None

Course Description – Semester 1:

Environmental Science A offers students the opportunity to understand the concepts fundamental to ecology and measures to prevent damage to the environment. Lessons in the A course review the scientific method, discuss biodiversity, and review earth processes, including the rain and carbon cycles. Students take a detailed look at the various types of pollution and study how to safeguard resources.

Course Syllabus/Outline – Semester 1:

Units:

The Methods and Nature of Environmental Science

Welcome to environmental science, the study of the interactions between the physical, chemical, and biological components of the environment, including their effects on all types of organisms. In this opening unit you will learn about the job of an environmentalist, review the scientific method, and explore how organisms are classified.

Earth's Processes

Several natural processes and cycles affect organisms that inhabit the Earth. In this unit, you will learn about such phenomena as you analyze the water and carbon cycles, examine the greenhouse effect, and explore causes of air, water, and food chain pollution.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes before you begin to review.

Course Description – Semester 2:

In the second course of Environmental Science, students learn about environmental programs and policies, including waste management and conservation. Students study the effect of environmental organizations as well as government agencies charged with protecting the environment. The final unit examines technology and its impact on the environment; topics include energy production, modern agriculture, and public land management.

Course Syllabus/Outline – Semester 2:

Units:

Environmental Science Programs and Policies

The United States has several agencies and departments that are dedicated to monitoring and protecting the nation's natural resources. In this unit, you will learn about how these local and federal agencies work together to effect policy changes, regulate environmental concerns, and prevent further harm to the environment as we move into the future.

The Effects of Environmental Science Technology

There have been many recent advancements in environmental science technology. Many of the previous methods of energy and fuel production have caused harm to the world around you. Today, there are new and innovative methods geared towards preserving and protecting the environment. In this unit you will examine these technological advances and learn how environmental science is changing.

Final Review and Exam

In this unit, you will have the opportunity to prepare for and take the final exam. The final exam may include any material that has been presented throughout the semester. Since this is a comprehensive exam, it may be helpful to organize your notes before you begin to review.

Special notes from evaluation team:

Course Title: Physics
Course Provider: Aventa
DESE code #: 135900
Number of Semesters: Two
Per Semester Cost: \$299.00

Prerequisites:

Successful completion of Algebra II, Geometry also recommended

Course Description:

The goal of physics is to describe the physical world using a small number of basic assumptions, concepts, and equations. In this course, emphasis is placed on relating physics to the everyday world. Students explore the concepts involved with motion in one- and two-dimensions, forces, work and energy, momentum and collisions, circular motion and gravitation. They recognize the importance of the laws of thermodynamics. Students learn the characteristics of waves and describe the behavior of waves with emphasis on light and sound. They understand the relationship between electricity and magnetism. Finally, the students gain a simple understanding of atomic physics. Approximately 40% of the course involves virtual laboratory investigations. Some activities will require ordinary household items such as rulers, meter sticks, balls or marbles, string, paper and pencils. Part 1 focuses on understanding motion. Students learn kinematic equations and apply them to various situations. They explore forces, work and energy and apply these concepts in the special case of circular motion. Heat and the laws of thermodynamics are covered. Part 2 focuses on waves, in particular sound and light. The course then moves to understanding electricity and magnetism and the relationship between the two. It concludes with a basic exploration of atomic physics.

Course Objectives:

After completing the course, students will be able to:

- Explain the laws governing motion and interpret the equations governing motion
- Describe the effects of forces on the motion of objects
- Recognize that energy and momentum are conserved
- Analyze and explain the laws of thermodynamics
- Identify characteristics of waves and describe behaviors of waves
- Demonstrate the relationship between electricity and magnetism
- Explain simple examples of quantum physics
- Describe how physics influences everyday life
- Explain field and laboratory investigations using the scientific method
- Use critical thinking and scientific problem solving to make informed decisions

Required Text:

None. Digital text book included in the course, *Physics*, Holt 2006

Course Syllabus/Outline:

Course Overview

- Course Introduction
- Getting Started
- Laboratories

Physics and the Laws of Motion

- Physics and the Laws of Motion: Introduction
- Motion in One Dimension
- Two-Dimensional Motion and Vectors
- Forces and the Laws of Motion
- Exam Preparation

Energy and Motion

- Energy and Motion: Introduction

- Word and Energy
- Momentum and Collisions
- Circular Motion and Gravitation
- Exam Preparation

Heat and Thermodynamics

- Heat and Thermodynamics: Introduction
- Heat
- Thermodynamics
- Exam Preparation

Part 1 Exam

Waves

- Waves: Introduction
- Vibrations and Waves
- Sound
- Light
- Exam Preparation

Electricity

- Electricity: Introduction
- Electric Forces and Fields
- Electrical Energy and Current
- Circuits and Circuit Elements
- Exam Preparation

Magnetism and Atomic Physics

- Magnetism and Atomic Physics: Introduction
- Magnetism
- Electromagnetic Induction
- Atomic Physics
- Exam Preparation

Part II Exam

Special notes from evaluation team:

Course Title: AP Physics
Course Provider: Aventa
DESE code #: 135900
Number of Semesters: Two
Per Semester Cost: \$594.78 (Semester 1)
 \$438.00 (Semester 2)

Prerequisites:

Successful completion of Algebra II and Trigonometry with one year of Physics highly recommended

Course Description:

AP Physics is a yearlong introduction to the algebra-based major areas of physics – mechanics, fluids, waves, optics, electricity, magnetism and modern physics (atomic and nuclear). Students learn to think like scientists: making predictions based on observations, writing hypothesis, designing and completing experiments, and reaching conclusions based on the analysis of data derived from these experiments. Students apply the concepts of physics to their everyday experiences and current events and issues in science and engineering. The course provides opportunities for guided inquiry and student-centered learning to foster critical thinking skills.

Course Objectives:

Upon completion of this course, the student will be able to:

- Read, understand, and interpret physical information
- Demonstrate proficiency in explaining and solving algebra-based problems in the major areas of physics
- Apply the concepts and procedures of scientific reasoning to understanding physics phenomenon
- Perform experiments, interpret the results of observations and communicate results

Required Text:

Physics: Principles with Applications, 6/E Giancoli | ©2005 | Pearson ISBN #0131846612

Physlet® Physics: Interactive Illustrations, Explorations and Problems for Introductory Physics, 1/E Christian & Belloni | ©2004 | Pearson ISBN #0131019694

Course Syllabus/Outline:

UNIT I: Introduction to Physics

- Mathematics and Science Review
- Data Collection and Analysis

UNIT II: Kinematics

- Motion in One Dimension
- Motion in Two Dimensions

UNIT III: Newton's Laws of Motion

- Static Equilibrium
- Dynamic Equilibrium
- Systems of Two or More Objects

UNIT IV: Work, Energy, Power and Momentum

- Forces, Work and Work-Energy Theorem
- Conservation of Energy
- Power
- Simple Harmonic Motion, Springs, and the Pendulum
- Gravity and Orbits
- Momentum & Impulse
- Circular Motion & Torque

UNIT V: Fluid Mechanics

- Density and Pressure
- Buoyancy
- Fluids in Motion

UNIT VI: Thermal Physics

- Temperature and Heat
- Ideal Gases
- Thermodynamics
- Semester Exam

UNIT VII: Electrostatics

- Charge and Coulomb's Law
- Electric Field and Electric Potential
- Electrostatics with Conductors
- Capacitors

UNIT VIII: Electric Circuits

- Currents, Resistance, & Power
- Direct Currents
- Capacitors in Circuits

UNIT XI: Magnetic Fields and Electromagnetism

- Magnetic Fields
- Electromagnetic Induction

UNIT X: Wave Motion, and Sound

- Traveling Waves
- Wave Propagation
- Standing Waves

UNIT XI: Optics

- Physical Optics
- Geometric Optics
- Mirrors
- Lenses

UNIT XII: Modern Physics

- Atomic Physics and Quantum Effects
- Atomic Energy Levels and Wave-Particle Duality
- Nuclear Physics

UNIT XIII: Preparing for the AP Physics Exam

- Preparing for the Exam
- The Final Exam
- Post World War II Civil Rights Legislation

Special notes from evaluation team: