The Correlation of PLATO® Curricula to West Virginia Content Standards and Objectives

Science - Grades 9-12

June 19, 2009

INTRODUCTION

PLATO Learning Inc. combines PLATO computer-assisted instruction into a flexible integrated learning system to enhance instructional effectiveness in education programs. This document identifies PLATO instructional activities that correlate to the West Virginia Content Standards and Objectives: Grades 9-12, Science, Grades 9-12. URL: http://wvde.state.wv.us/policies/p2520.35_ne.pdf.

It is recommended that instructors review the correlation in order to fine-tune the activity to fit their educational environment. Modules may be added or removed; Web sites and offline activities may also be incorporated to enhance the learning path.

The following PLATO courseware was used in this correlation report:

Biology Series
Chemistry Series
Earth and Space Science with Assessments
Life Science
Physical Science with Assessments
Technology Fundamentals

PLATO Learning, Inc. looks forward to supporting your initiatives in providing successful educational programs using PLATO® computer-based lessons.

Grades 9-12

Grade 09 - Science

Standard 1: Nature of Science

SC.O.9.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
- Introduction to Biology
  - Biology: The Study of Life
- Genetics and Evolution
  - Mendel's Principles of Heredity
  - DNA: The Molecule of Life
  - From DNA to Protein

SC.O.9.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
- Introduction to Biology
  - Biology: The Study of Life
- Genetics and Evolution
  - Mendel's Principles of Heredity

SC.O.9.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
- Genetics and Evolution
  - Genetic Engineering

Life Science
- Genetics and Heredity
  - Genetic Variation and Biotechnology
- Human Health and Reproduction
  - Immunity and Preventing Disease

Physical Science with Assessments
- Energy and Its Applications (with Assessments)
  - Magnetism and Electromagnetism (with Assessments)

SC.O.9.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.9.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.9.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Forces and Motion (with Assessments)
Motion (with Assessments)

SC.O.9.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.9.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles; predict the influence of external variances such as potential sources of error, or interpret maps).

PLATO Modules are not available for this learning expectation.

Standard: 2 Content of Science

SC.O.9.2.1 apply principles of Mendelian genetics to solve heredity problems.

Biology Series

Cell Structure and Specialization
Meiosis
Genetics and Evolution
Mendel's Principles of Heredity
DNA: The Molecule of Life
From DNA to Protein
Investigating Heredity
Evolution (Biology Series)
Life Science
Genetics and Heredity
Genes and Traits
Heredity
Genetic Variation and Biotechnology
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.9.2.2 illustrate meiosis and mitosis and relate to chromosome number and production of sperm, egg and body cells.

Biology Series
Cell Structure and Specialization
Mitosis
Meiosis
Genetics and Evolution
DNA: The Molecule of Life
Investigating Heredity
Evolution (Biology Series)
The Diversity of Life
Viruses and Bacteria (Biology Series)
Life Science
Cells: The Basis for Life
Similarities in Cell Structures and Functions
Cellular Processes
Genetics and Heredity
Genes and Traits
Heredity
Human Health and Reproduction
Immunity and Preventing Disease
Human Reproduction and Development

SC.O.9.2.3 analyze cyclic changes in populations of organisms.

Biology Series
Introduction to Biology
Biology: The Study of Life

Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Genetics and Evolution
Evolution (Biology Series)
Ecology
The Biosphere
Biomes
Food Chains and Webs
Population Ecology
Human Impacts on the Environment
The Diversity of Life
Vertebrates
The Animal Kingdom
Birds (Biology Series)
Life Science
Structure and Function in Living Organisms
Levels of Organization
Organisms and Their Environment
Living with the Environment
Change Over Time
Fossils and the Geologic Time Scale
Evolution and Natural Selection

SC.O.9.2.4 design an environment that demonstrates the interdependence of plants and animals (e.g., energy and chemical cycles, adaptations of structures and behaviors).

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Photosynthesis
Ecology
Biomes
Food Chains and Webs
Population Ecology
Human Impacts on the Environment
The Diversity of Life
Protista
Non-Flowering Plants
Flowering Plants
Vertebrates
Invertebrates (Biology Series)
Plant Anatomy

- The Leaf
- The Animal Kingdom
  - Cnidarians
  - Mollusks
  - Arthropods
  - Annelids
- Life Science
  - Cells: The Basis for Life
    - Cellular Processes
  - Classification and Diversity of Life
    - The Plant Kingdom
    - Exploring Vertebrates
  - Organisms and Their Environment
    - Maintaining Conditions for Life
    - Living with the Environment
    - Flow of Energy and Matter in Nature
    - Biomes and Biodiversity
  - Change Over Time
    - Fossils and the Geologic Time Scale
    - Evolution and Natural Selection

SC.O.9.2.5 compare and contrast the structure and function of cells, tissues and systems of different organisms.

- Biology Series
  - The Energy and Chemistry of Life
    - Cellular Respiration
    - Photosynthesis
  - Cell Structure and Specialization
    - Inside the Cell
    - The Plasma Membrane and Cellular Transport
    - Mitosis
    - Meiosis
  - Plant Anatomy
    - The Leaf
    - Roots and Stems
  - The Diversity of Life
    - Flowering Plants
    - Vertebrates
    - Invertebrates (Biology Series)
  - The Animal Kingdom
    - Sponges
    - Cnidarians
    - Mollusks

Birds (Biology Series)
Annelids
Life Science
Cells: The Basis for Life
What is Life?
Similarities in Cell Structures and Functions
Differences and Specialization in Cells
Cellular Processes
Structure and Function in Living Organisms
Levels of Organization
Structure and Function of Tissues and Organs
Organ Systems
Classification and Diversity of Life
Bacteria, Protists, and Fungi
The Plant Kingdom
The Animal Kingdom

SC.O.9.2.6 diagram the transfer of matter and energy in the chemical/molecular processes of photosynthesis, respiration and fermentation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Plant Anatomy
The Leaf
The Diversity of Life
Non-Flowering Plants
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Cellular Processes

SC.O.9.2.7 predict chemical and physical properties of an element using its position in the periodic table.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Atomic Structure
Electronic Structure
Periodic Table and Trends
Naming Chemical Compounds
Bonding I

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)

SC.O.9.2.8 compare the types of radioactive decay in terms of particles and energy generated.

Biology Series
Ecology
Human Impacts on the Environment
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.9.2.9 predict the changes in density as mass and volume change.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Chemical Transformations
States of Matter
Earth and Space Science with Assessments
Rocks and Soil (with Assessments)
Rocks and The Rock Cycle (with Assessments)
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)
Physical and Chemical Properties of Matter (with Assessments)

SC.O.9.2.10 relate molecular motion, kinetic energy and states of matter.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Bonding II
Gases & Their Properties
Solutions
Chemical Transformations

Chemical Equilibrium
States of Matter
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
States of Matter (with Assessments)
Energy and Its Applications (with Assessments)
Heat (with Assessments)

SC.O.9.2.11 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Bonding I
Chemical Transformations
Chemical Reactions
Solubility & Precipitation
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)

SC.O.9.2.12 propose the results of changing the number of protons, neutrons or electrons on the properties of an atom.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Atomic Structure
Electronic Structure
Periodic Table and Trends
Naming Chemical Compounds
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)
The Periodic Table (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)

SC.O.9.2.13 determine formulas and names for binary compounds.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)

Naming Chemical Compounds
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)
Physical and Chemical Properties of Matter (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)
Chemical Reactions (with Assessments)

SC.O.9.2.14 classify a binary chemical bond as ionic, nonpolar covalent or polar covalent.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Solubility & Precipitation
States of Matter
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)

SC.O.9.2.15 given a chemical equation deduce the coefficients and classify the reaction type (e.g., synthesis or combination, decomposition, single replacement, or double replacement and combustion).

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Properties of Acids, Bases and Salts
Chemical Transformations
Chemical Reactions
Formulas, Equations, & Stoichiometry
Chemical Equilibrium
Solubility & Precipitation
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)

SC.O.9.2.16 assess and provide evidence to justify the occurrence of a chemical reaction (e.g., production of color, light, heat, sound, smell, gas, or precipitate).

- Chemistry Series
  - Chemical Transformations
    - Chemical Reactions
- Physical Science with Assessments
  - Properties and Structures of Matter (with Assessments)
    - Physical and Chemical Properties of Matter (with Assessments)
  - Chemistry Fundamentals (with Assessments)
    - Chemical Reactions (with Assessments)

SC.O.9.2.17 differentiate various forms of energy and energy transformations including fission and fusion.

- Chemistry Series
  - Introductory Chemistry
    - Atomic Structure
    - Electronic Structure
- Earth and Space Science with Assessments
  - Earth, Space, and the Universe (with Assessments)
    - The Sun, Earth, and Moon (with Assessments)
    - Space: Stars, Galaxies, and the Universe (with Assessments)
- Technology Fundamentals
  - Introducing Energy and Systems
  - Mechanical Systems
  - Heat Systems
  - Electrical Systems
- Physical Science with Assessments
  - Energy and Its Applications (with Assessments)
    - Properties and Sources of Energy (with Assessments)
    - Heat (with Assessments)
    - Electricity, Circuits, and Power (with Assessments)
    - Magnetism and Electromagnetism (with Assessments)
    - Properties of Sound and Light (with Assessments)
    - The Behavior of Sound and Light (with Assessments)
  - Forces and Motion (with Assessments)
    - Motion (with Assessments)

SC.O.9.2.18 assess absorption and dissipation of heat by various materials.

- Technology Fundamentals
  - Heat Systems

Electrical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)

SC.O.9.2.19 experimentally deduce and diagram the magnetic field of a bar magnet.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.9.2.20 construct electric circuits and mathematically model electric circuits using Ohm's Law and power equations.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)

SC.O.9.2.21 establish the relationship between distance and the intensity of light, charge and gravitational attraction (e.g., inverse square law).

Chemistry Series
Introductory Chemistry
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.9.2.22 interpret and draw conclusions from speed-distance-time data and graphs.

Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.9.2.23 analyze experiments to determine which variables affect the motion of pendulums.

Technology Fundamentals
Mechanical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.9.2.24 differentiate between transverse and longitudinal waves and model examples of each type (e.g., light, sound, or seismic).

Chemistry Series
Introductory Chemistry
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.9.2.25 predict weather based on the relationships of temperature, air pressure, wind speed, wind direction and humidity as depicted on a weather map and meteorological data.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Weather (with Assessments)
Climate (with Assessments)

SC.O.9.2.26 analyze the relationships among latitude, altitude and climate.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Weather and Atmospheric Processes (with Assessments)
Weather (with Assessments)
Climate (with Assessments)

SC.O.9.2.27 classify common rock forming minerals by examining their physical and chemical properties.

Earth and Space Science with Assessments
- The Energetic Earth (with Assessments)
  - Volcanoes (with Assessments)
- Rocks and Soil (with Assessments)
  - Rocks and The Rock Cycle (with Assessments)

SC.O.9.2.28 analyze the processes of the rock cycle to predict the paleo-environment in which a rock sample is formed.

Earth and Space Science with Assessments
- Rocks and Soil (with Assessments)
  - Rocks and The Rock Cycle (with Assessments)

SC.O.9.2.29 examine seismographic and geologic evidence to determine structure and composition of the Earth's interior.

Earth and Space Science with Assessments
- Looking at Earth's Features (with Assessments)
  - Earth's Composition (with Assessments)
- The Energetic Earth (with Assessments)

SC.O.9.2.30 use relative dating techniques to determine the ages of stratagraphic layers.

Earth and Space Science with Assessments
- Looking at Earth's Features (with Assessments)
  - Supporting Life: Earth's Surface and Landforms (with Assessments)
- The Energetic Earth (with Assessments)
  - Volcanoes (with Assessments)
- Rocks and Soil (with Assessments)
  - Rocks and The Rock Cycle (with Assessments)

SC.O.9.2.31 interpret a half-life graph to determine the absolute age of a given sample.

Biology Series
- Genetics and Evolution
  - Evolution (Biology Series)

Life Science
- Change Over Time
  - Fossils and the Geologic Time Scale

SC.O.9.2.32 compare and contrast theoretical models explaining forces driving lithospheric plate motion (e.g., slab pull, plate push, or convection).

Biology Series
Genetics and Evolution
Evolution (Biology Series)
Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Volcanoes (with Assessments)
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.9.2.33 research and organize evidence to support the theory of plate tectonics.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Water in Our World (with Assessments)
The Oceans (with Assessments)

Standard: 3 Application of Science

SC.O.9.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Electrical Systems

SC.O.9.3.2 investigate, compare and design scientific and technological solutions to personal and societal problems.

PLATO Modules are not available for this learning expectation.

SC.O.9.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.9.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
- Ecology
  - Human Impacts on the Environment
- The Animal Kingdom
  - Mollusks

Earth and Space Science with Assessments
- Water in Our World (with Assessments)
  - The Oceans (with Assessments)
  - Fresh Water (with Assessments)

Life Science
- Organisms and Their Environment
  - Biomes and Biodiversity

SC.O.9.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Ecology
  - Human Impacts on the Environment

SC.O.9.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

Grade 10 - Science

Standard: 1 Nature of Science

SC.O.10.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

PLATO Modules are not available for this learning expectation.

SC.O.10.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
- Introduction to Biology
  - Biology: The Study of Life
- Genetics and Evolution
  - Mendel's Principles of Heredity

SC.O.10.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.10.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic.)

Technology Fundamentals
Electrical Systems

SC.O.10.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.10.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data interact with simulations, conduct research, and present and communicate conclusions.

PLATO Modules are not available for this learning expectation.

SC.O.10.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

PLATO Modules are not available for this learning expectation.

SC.O.10.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

PLATO Modules are not available for this learning expectation.

Standard: 2 Content of Science

SC.O.10.2.1 relate the structure of cell organelles to their functions.

- Biology Series
  - The Energy and Chemistry of Life
    - Cellular Respiration
    - Photosynthesis
  - Cell Structure and Specialization
    - Inside the Cell
    - The Plasma Membrane and Cellular Transport
    - Mitosis
  - Genetics and Evolution
    - From DNA to Protein
  - The Diversity of Life
    - Fungi
  - Plant Anatomy
    - The Leaf
  - The Animal Kingdom
    - Sponges
    - Cnidarians

SC.O.10.2.2 apply knowledge of cells to variations in cells, tissues, and organs of different organisms.

- Biology Series
  - The Energy and Chemistry of Life
    - Cellular Respiration
    - Photosynthesis
  - Cell Structure and Specialization
    - Inside the Cell
    - The Plasma Membrane and Cellular Transport
    - Meiosis
    - Blood and Immunity
  - Genetics and Evolution
    - DNA: The Molecule of Life
  - Plant Anatomy
    - The Leaf
    - Roots and Stems
  - The Animal Kingdom
    - Sponges
    - Cnidarians
    - Arthropods
    - Annelids
  - The Diversity of Life
    - Vertebrates

Invertebrates (Biology Series)

SC.O.10.2.3 compare and contrast mechanisms for the movement of materials into and out of cells.

Biology Series
- Cell Structure and Specialization
  - Inside the Cell
  - The Plasma Membrane and Cellular Transport
- The Animal Kingdom
  - Sponges

SC.O.10.2.4 explore the discovery of DNA and its structure; examine nucleotide bonding to the importance of to the double helix structure.

Biology Series
- The Energy and Chemistry of Life
  - Cellular Respiration
  - Photosynthesis
- Cell Structure and Specialization
  - Inside the Cell
  - Mitosis
- Genetics and Evolution
  - DNA: The Molecule of Life
  - From DNA to Protein
  - Genetic Engineering

SC.O.10.2.5 apply DNA analysis to current societal and technological issues (e.g., DNA's role in protein synthesis, heredity, cell division, or cellular functions).

Biology Series
- Genetics and Evolution
  - DNA: The Molecule of Life
  - From DNA to Protein
  - Genetic Engineering

SC.O.10.2.6 integrate DNA mutations, chromosomal crossing over and linkage with the principles of genetics.

Biology Series
- Cell Structure and Specialization
  - Mitosis
  - Meiosis
- Genetics and Evolution
  - Mendel's Principles of Heredity
  - DNA: The Molecule of Life

From DNA to Protein
Investigating Heredity
Genetic Engineering
Evolution (Biology Series)
The Diversity of Life
Viruses and Bacteria (Biology Series)
Classification of Living Things

SC.O.10.2.7 compare the ontogeny and phylogeny using the embryonic development of invertebrate and vertebrate animals.

Biology Series
The Diversity of Life
Vertebrates
Invertebrates (Biology Series)

SC.O.10.2.8 compare traditional and modern classification systems.

Biology Series
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
Non-Flowering Plants
Flowering Plants
Vertebrates
Classification of Living Things
Invertebrates (Biology Series)
The Animal Kingdom
Mollusks
Arthropods
Birds (Biology Series)
Annelids

SC.O.10.2.9 construct a scientific explanation for variation in the species and common ancestors using fossil records, homologous features and selective pressures.

Biology Series
Genetics and Evolution
Evolution (Biology Series)
The Diversity of Life
Non-Flowering Plants
Vertebrates
The Animal Kingdom
Sponges

Birds (Biology Series)

SC.O.10.2.10 compare and contrast theories for the development, diversity and/or extinction of a species (e.g., natural selection, Lamarckism, or catastrophism).

Biology Series
- Introduction to Biology
  - Biology: The Study of Life
- Genetics and Evolution
  - Evolution (Biology Series)
- Ecology
  - Human Impacts on the Environment
- The Diversity of Life
  - Vertebrates
  - Invertebrates (Biology Series)
- The Animal Kingdom
  - Birds (Biology Series)

Earth and Space Science with Assessments
- Weather and Atmospheric Processes (with Assessments)
  - Climate (with Assessments)

SC.O.10.2.11 construct diagrams showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.

Biology Series
- The Energy and Chemistry of Life
  - Photosynthesis
- Ecology
  - The Biosphere
- Plant Anatomy
  - The Leaf
- The Diversity of Life
  - Non-Flowering Plants

Chemistry Series
- Chemical Transformations
  - Chemical Reactions

SC.O.10.2.12 integrate the human body systems to the functioning of the entire organism.

Technology Fundamentals
- Introducing Energy and Systems

SC.O.10.2.13 design an investigation in which the needs of growing plants are determined.

Biology Series
- The Energy and Chemistry of Life
  - Enzymes
- Cell Structure and Specialization
  - The Plasma Membrane and Cellular Transport

SC.O.10.2.14 evaluate environmental factors that affect succession, populations and communities.

Biology Series
- Introduction to Biology
  - Biology: The Study of Life
- Cell Structure and Specialization
  - The Plasma Membrane and Cellular Transport
- Ecology
  - Food Chains and Webs
  - Population Ecology
  - Human Impacts on the Environment
- The Animal Kingdom
  - Mollusks

Earth and Space Science with Assessments
- Weather and Atmospheric Processes (with Assessments)
  - Climate (with Assessments)

SC.O.10.2.15 model the flow of matter and energy flow through the respiration process.

Biology Series
- The Energy and Chemistry of Life
  - Cellular Respiration
  - Photosynthesis
- Ecology
  - The Biosphere
  - Human Impacts on the Environment
- Plant Anatomy
  - The Leaf

SC.O.10.2.16 compare and contrast by investigation the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.

Biology Series
- Cell Structure and Specialization
  - The Plasma Membrane and Cellular Transport

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Chemical Equilibrium

SC.O.10.2.17 compare and contrast the characteristics of physical, chemical and nuclear changes/reactions.

Chemistry Series
Chemical Transformations
Chemical Reactions

SC.O.10.2.18 determine the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussa's Law).

Chemistry Series
Introductory Chemistry
Gases & Their Properties

SC.O.10.2.19 characterize by investigation variance in thermal energy in physical and chemical changes.

Chemistry Series
Introductory Chemistry
Solutions
Chemical Transformations
Chemical Equilibrium
Reaction Rates
Technology Fundamentals
Introducing Energy and Systems
Heat Systems

SC.O.10.4.20 compare and contrast the characteristics and uses of electromagnetic waves and relate the frequency of the wave to its application.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)

Technology Fundamentals
Electrical Systems

SC.O.10.2.21 correlate the motion of a body to its Doppler shift.

PLATO Modules are not available for this learning expectation.

SC.O.10.2.22 qualitatively explain the relationship between electricity and magnetism.

PLATO Modules are not available for this learning expectation.

SC.O.10.2.23 qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, or mechanical).

PLATO Modules are not available for this learning expectation.

SC.O.10.2.24 apply Newton's Laws of Motion to depict the relationship among rate, force, momentum, work, and time using kinematics graph and mathematical models.

Technology Fundamentals
Mechanical Systems

SC.O.10.2.25 describe and quantify how machines can provide mechanical advantage.

PLATO Modules are not available for this learning expectation.

SC.O.10.2.26 determine the effect of different forces on vibrating systems (e.g., pendulums, or springs).

Technology Fundamentals
Mechanical Systems

SC.O.10.2.27 apply the characteristics and behaviors of mechanical waves to earth processes.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Earthquakes (with Assessments)

SC.O.10.2.28 predict the amplitude and frequency of tides using the concepts of gravity and positions of the earth-sun-moon (e.g., spring and neap tides).

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

SC.O.10.2.29 evaluate the effects of geological events on weather and climate (e.g., volcanism and bolide impact).

Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
Climate (with Assessments)

SC.O.10.2.30 analyze the effects of mechanical and chemical weathering mechanisms on the earth's surface to produce sediments.

Earth and Space Science with Assessments
Rocks and Soil (with Assessments)
Rocks and The Rock Cycle (with Assessments)
Weathering, Soil, and Erosion (with Assessments)

SC.O.10.2.31 relate the theories of electric and magnetic fields to the dynamics of the earth's magnetosphere.

Earth and Space Science with Assessments
The Energetic Earth (with Assessments)

SC.O.10.2.32 examine the effects of plate tectonics on geological and biological processes (e.g., rock cycle and paleo-geography).

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Earthquakes (with Assessments)
Volcanoes (with Assessments)
Rocks and Soil (with Assessments)
Rocks and The Rock Cycle (with Assessments)

SC.O.10.2.33 correlate geological and chemical processes to fossil formation (e.g., petrification, permineralization, or rapid burial).

PLATO Modules are not available for this learning expectation.

SC.O.10.2.34 explain theories of cosmology using electromagnetic evidence.

Technology Fundamentals
Electrical Systems

Standard: 3 Application of Science

SC.O.10.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

Technology Fundamentals
- Introducing Energy and Systems
- Mechanical Systems
- Fluid Systems
- Heat Systems
- Electrical Systems

SC.O.10.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

PLATO Modules are not available for this learning expectation.

SC.O.10.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.10.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
- Ecology
  - Human Impacts on the Environment
- The Animal Kingdom
  - Mollusks

Earth and Space Science with Assessments
- Water in Our World (with Assessments)
  - Fresh Water (with Assessments)

SC.O.10.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Ecology
  - Human Impacts on the Environment

SC.O.10.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

Grade 9: Physical Science

Standard 1: Nature and Application of Science

SC.O.PS.1.1 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
  Introductory Chemistry
    Properties of Acids, Bases and Salts
Physical Science with Assessments
  Chemistry Fundamentals (with Assessments)
    Mixtures and Solutions (with Assessments)

SC.O.PS.1.2 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
  Genetics and Evolution
    DNA: The Molecule of Life
    From DNA to Protein

SC.O.PS.1.3 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
  Electrical Systems

SC.O.PS.1.4 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
  Electrical Systems

SC.O.PS.1.5 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
  Introduction to Biology
    Biology: The Study of Life

SC.O.PS.1.6 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.PS.1.7 given current science-technology-societal issues, construct and defend potential solutions.

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

SC.O.PS.1.8 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.PS.1.9 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

PLATO Modules are not available for this learning expectation.

Standard 2: Content of Science

SC.O.PS.2.1 apply dimensional analysis and scientific notation in making metric calculations.

Biology Series
Introduction to Biology
Biology: The Study of Life
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Gases & Their Properties
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)
Energy and Its Applications (with Assessments)
Heat (with Assessments)

SC.O.PS.2.2 predict chemical and physical properties of an element using its position in the periodic table.

Chemistry Series
Introductory Chemistry

Introduction to Chemistry (Chemistry Series)
Atomic Structure
Electronic Structure
Periodic Table and Trends
Naming Chemical Compounds
Bonding I
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)

SC.O.PS.2.3 collect data to infer the relationships among density, mass and volume and apply to earth models: â€¢ plate tectonics â€¢ weather systems â€¢ ocean currents

Earth and Space Science with Assessments
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Weather (with Assessments)

SC.O.PS.2.4 relate molecular motion and the amount of kinetic energy to the temperature of a system.

Chemistry Series
Chemical Transformations
States of Matter
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Technology Fundamentals
Heat Systems
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
States of Matter (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)

SC.O.PS.2.5 characterize compounds as ionic, nonpolar covalent or polar covalent and distinguish the difference between molecular and ionic structures.

Chemistry Series

Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Naming Chemical Compounds
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Chemical Transformations
Chemical Reactions
Formulas, Equations, & Stoichiometry
Solubility & Precipitation
States of Matter
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)
Physical and Chemical Properties of Matter (with Assessments)
States of Matter (with Assessments)
The Periodic Table (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)
Chemical Reactions (with Assessments)

SC.O.PS.2.6 write formulas and name compounds given oxidation numbers of monatomic and polyatomic ions.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Naming Chemical Compounds
Bonding I
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)
Physical and Chemical Properties of Matter (with Assessments)
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)
Chemical Reactions (with Assessments)

SC.O.PS.2.7 determine the coefficients and classify the reaction type of a chemical equation: â€¢ synthesis or combination â€¢ decomposition â€¢ single replacement or double replacement â€¢ combustion

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Chemical Transformations

Chemical Reactions
Solubility & Precipitation
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)

SC.O.PS.2.8 cite evidence for the occurrence of a chemical reaction from student generated experimental data: â€¢ production of color â€¢ light â€¢ heat â€¢ sound â€¢ smell â€¢ gas â€¢ precipitate

Chemistry Series
Chemical Transformations
Chemical Reactions
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Physical and Chemical Properties of Matter (with Assessments)
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)

SC.O.PS.2.9 qualitatively and quantitatively describe the law of conservation of mass/energy: â€¢ mechanical â€¢ thermal â€¢ chemical â€¢ electrical â€¢ nuclear

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.PS.2.10 compare the types of particles liberated in nuclear decay and interpret half-life graphs: â€¢ radiometric dating â€¢ nuclear medicine â€¢ nuclear waste disposal

PLATO Modules are not available for this learning expectation.

SC.O.PS.2.11 experimentally demonstrate the relationship between heat and temperature: â€¢ specific heat â€¢ melting point â€¢ latent heat

Chemistry Series
Chemical Transformations
States of Matter
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Technology Fundamentals
Heat Systems
Physical Science with Assessments

Properties and Structures of Matter (with Assessments)
States of Matter (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)

SC.O.PS.2.12 predict, experimentally determine and diagram magnetic fields of magnets.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PS.2.13 construct and diagram DC circuits and solve for unknown variables using Ohm's Law and power equations.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)

SC.O.PS.2.14 qualitatively explain the relationship between electricity and magnetism.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PS.2.15 conduct experiments to verify the inverse square relationship between gravity, distance and intensity of light and sound.

PLATO Modules are not available for this learning expectation.

SC.O.PS.2.16 experimentally obtain data and apply graphs, vectors and mathematical models to quantify Newton's Laws of motion: â€¢ velocity â€¢ acceleration â€¢ force â€¢ momentum â€¢ time

Technology Fundamentals
Mechanical Systems
Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.PS.2.17 conduct an experiment to calculate the mechanical advantages, work in/out and efficiencies of simple machines.

Technology Fundamentals
Mechanical Systems

Physical Science with Assessments
Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.PS.2.18 design, conduct and analyze experiments to determine variables affecting the period of pendulums.

Technology Fundamentals
Mechanical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.PS.2.19 differentiate between transverse and longitudinal waves and model examples of each type and relate to water, light and sound waves.

Chemistry Series
Introductory Chemistry
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.PS.2.20 examine seismographic and geologic evidence to determine structure, composition and age of the Earth.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
The Energetic Earth (with Assessments)

SC.O.PS.2.21 predict and present a weather forecast using a weather map and meteorological data.

PLATO Modules are not available for this learning expectation.

SC.O.PS.2.22 analyze latitude, altitude and surface features to predict climatic conditions.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

Weather and Atmospheric Processes (with Assessments)
Weather (with Assessments)
Climate (with Assessments)

SC.O.PS.2.23 research and organize evidence to support the theory and effects of plate tectonics including: â€¢ density â€¢ force â€¢ mountain building â€¢ fossil â€¢ magnetic evidence

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.PS.2.24 apply fusion, heat transfer, gravity, and electromagnetism to the sun's evolution and its impact on the solar system.

Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
The Sun, Earth, and Moon (with Assessments)

SC.O.PS.2.25 investigate theories for the origin and configuration of the solar system: â€¢ nebular theory â€¢ Earth-Moon formation â€¢ heliocentric â€¢ geocentric models

Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
The Solar System (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)

Grade 10: Biology

Standard 1: Nature and Application of Science

SC.O.B.1.1 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.B.1.2 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution

DNA: The Molecule of Life
From DNA to Protein

SC.O.B.1.3 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.B.1.4 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.B.1.5 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

SC.O.B.1.6 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.B.1.7 given current science-technology-societal issues, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

SC.O.B.1.8 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution

Genetic Engineering

SC.O.B.1.9 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

PLATO Modules are not available for this learning expectation.

Standard 2: Content of Science

SC.O.B.2.1 investigate and correlate the properties of chemical and biological molecules to their function in biochemical pathways.

Biology Series
- The Energy and Chemistry of Life
  - Biochemistry: The Chemistry of Life

SC.O.B.2.2 relate the structure of cellular organelles to their functions and interactions in eukaryotic cells.

Biology Series
- The Energy and Chemistry of Life
  - Cellular Respiration
- Cell Structure and Specialization
  - Inside the Cell
  - The Plasma Membrane and Cellular Transport
  - Mitosis
  - Meiosis
- Genetics and Evolution
  - From DNA to Protein
  - Evolution (Biology Series)
- The Diversity of Life
  - Viruses and Bacteria (Biology Series)
  - Protista
- Plant Anatomy
  - The Leaf

SC.O.B.2.3 compare and contrast cell types: prokaryotic/eukaryotic, plant/animal, archaea/bacteria, various body cells.

Biology Series
- The Energy and Chemistry of Life
  - Cellular Respiration
- Cell Structure and Specialization
  - Inside the Cell
  - The Plasma Membrane and Cellular Transport
  - Mitosis
  - Meiosis

Genetics and Evolution
From DNA to Protein
Evolution (Biology Series)
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Plant Anatomy
The Leaf

SC.O.B.2.4 relate the structure and function of individual body systems to the overall functioning of the organism.

Biology Series
Cell Structure and Specialization
Inside the Cell
The Diversity of Life
Fungi
Non-Flowering Plants
Flowering Plants
Vertebrates
Invertebrates (Biology Series)
Plant Anatomy
The Leaf
Roots and Stems
The Animal Kingdom
Cnidarians
Mollusks
Arthropods
Birds (Biology Series)
Annelids

SC.O.B.2.5 predict and assess responses of organisms to internal and environmental stimuli.

Biology Series
Plant Anatomy
The Leaf
The Animal Kingdom
Cnidarians

SC.O.B.2.6 analyze the chemistry and fluid mosaic model of the cell membrane as they relate to import and export of molecules necessary for life including: â€¢ osmosis â€¢ diffusion â€¢ active transport â€¢ passive transport â€¢ dialysis.

Biology Series

Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport

SC.O.B.2.7 quantitatively analyze the flow of energy through cellular processes: â€¢ photosynthesis â€¢ cellular respiration â€¢ fermentation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Plant Anatomy
The Leaf
The Diversity of Life
Non-Flowering Plants

SC.O.B.2.8 differentiate mechanisms of homeostasis in living systems (negative and positive feedback).

Biology Series
The Energy and Chemistry of Life
Enzymes
Cell Structure and Specialization
Blood and Immunity
The Diversity of Life
Vertebrates

SC.O.B.2.9 examine the processes of binary fission, mitosis, meiosis and relate them to: â€¢ the number of chromosomes â€¢ production of daughter cells, somatic cells, and gametes â€¢ variations or lack of variations within a species.

Biology Series
Cell Structure and Specialization
Mitosis
Meiosis

SC.O.B.2.10 use Punnett squares to predict genotypic and phenotypic ratios by applying Mendel's Laws of Genetics: in monohybrid and dihybrid crosses, complete dominance, incomplete dominance, codominance, sex-linked traits, multiple alleles.

Biology Series
Genetics and Evolution
Mendel's Principles of Heredity
DNA: The Molecule of Life
Investigating Heredity

Evolution (Biology Series)

SC.O.B.2.11 analyze karyotypes and pedigrees as diagnostic tools.

Biology Series
- Cell Structure and Specialization
  - Meiosis
- Genetics and Evolution
  - DNA: The Molecule of Life
  - Investigating Heredity

SC.O.B.2.12 construct and use models of DNA to explain replication and mutations.

Biology Series
- Cell Structure and Specialization
  - Mitosis
- Genetics and Evolution
  - DNA: The Molecule of Life
  - From DNA to Protein
  - Genetic Engineering

SC.O.B.2.13 differentiate the structure and function of messenger, transfer and ribosomal RNA in the process of transcription and translation.

Biology Series
- Genetics and Evolution
  - DNA: The Molecule of Life
  - From DNA to Protein
  - Genetic Engineering
- The Diversity of Life
  - Classification of Living Things

SC.O.B.2.14 research and debate the application of DNA technology in the context of social, ethical, and political issues.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Cell Structure and Specialization
  - Meiosis
  - Blood and Immunity
- Genetics and Evolution
  - From DNA to Protein
  - Investigating Heredity
  - Genetic Engineering

The Diversity of Life
Classification of Living Things

SC.O.B.2.15 evaluate the evidence for natural selection including: â€¢ speciation â€¢ fossil record evidence â€¢ molecular similarities â€¢ homologous structures.

Biology Series
Genetics and Evolution
Evolution (Biology Series)
The Diversity of Life
Vertebrates

SC.O.B.2.16 evaluate the influence of the historical social context on the development of evolutionary theory.

Biology Series
Introduction to Biology
Biology: The Study of Life
Genetics and Evolution
Evolution (Biology Series)
The Diversity of Life
Non-Flowering Plants
Vertebrates
Classification of Living Things
Invertebrates (Biology Series)
The Animal Kingdom
Sponges
Cnidarians
Birds (Biology Series)

SC.O.B.2.17 compare morphological, cladistic and other classification systems including domains, kingdoms and other taxa.

Biology Series
Genetics and Evolution
Evolution (Biology Series)
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
Non-Flowering Plants
Flowering Plants
Vertebrates
Classification of Living Things
Invertebrates (Biology Series)

The Animal Kingdom
Sponges
Mollusks
Arthropods
Birds (Biology Series)
Annelids

SC.O.B.2.18 justify the placement of viruses in classification systems.

Biology Series
Introduction to Biology
Biology: The Study of Life
Genetics and Evolution
Genetic Engineering
The Diversity of Life
Viruses and Bacteria (Biology Series)

SC.O.B.2.19 examine the cycle of viruses and compare disease prevention: â€¢ vaccinations â€¢ vector control â€¢ drug therapy.

Biology Series
Introduction to Biology
Exploring Biology
Cell Structure and Specialization
Blood and Immunity
The Diversity of Life
Viruses and Bacteria (Biology Series)
Fungi

SC.O.B.2.20 evaluate environmental factors that affect succession, populations and communities.

Biology Series
Ecology
Population Ecology
Human Impacts on the Environment

SC.O.B.2.21 propose ecosystem models that incorporate interactions of biotic and abiotic environmental variables in biogeochemical cycles.

PLATO Modules are not available for this learning expectation.

SC.O.B.2.22 interpret changes in energy as it flows through an ecosystem to illustrate conservation of energy in the energy pyramid, food web, and food chain.

Biology Series
Introduction to Biology

Biology: The Study of Life
Ecology
Food Chains and Webs
The Diversity of Life
Non-Flowering Plants

SC.O.B.2.23 analyze interrelationships of organisms within an ecosystem â€¢ competition â€¢ predation â€¢ symbiosis o commensalism o mutualism o parasitism.

Biology Series
Ecology
The Biosphere
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
Flowering Plants
Invertebrates (Biology Series)
The Animal Kingdom
Sponges
Cnidarians
Mollusks
Annelids

SC.O.B.2.24 analyze graphs, GIS data and traditional maps reflecting changes in population to predict limiting factors in ecosystems as they determine carrying capacity.

Biology Series
Introduction to Biology
Biology: The Study of Life
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Ecology
Population Ecology

Grade 10: Conceptual Biology

Standard 1: Nature and Application of Science

SC.O.CB.1.1 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.CB.1.2 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.CB.1.3 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.CB.1.4 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.CB.1.5 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

SC.O.CB.1.6 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.CB.1.7 given current science-technology-societal issues, construct and defend potential solutions.

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

SC.O.CB.1.8 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O CB.1.9 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

PLATO Modules are not available for this learning expectation.

Standard 2: Content of Science

SC.O.CB.2.1 relate molecules to their functions in biochemical pathways.

Biology Series
The Energy and Chemistry of Life
Biochemistry: The Chemistry of Life

SC.O.CB.2.2 relate the structure of cellular organelles to their functions and interactions in eukaryotic cells.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport
Mitosis
Meiosis
The Diversity of Life
Protista
Plant Anatomy
The Leaf
Life Science
Cells: The Basis for Life
Similarities in Cell Structures and Functions
Differences and Specialization in Cells
Cellular Processes

Classification and Diversity of Life
Bacteria, Protists, and Fungi
The Animal Kingdom
Exploring Vertebrates
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.CB.2.3 compare and contrast cell types: â€¢ prokaryotic/eukaryotic â€¢ plant/animal â€¢ various body cells.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport
Mitosis
Meiosis
Genetics and Evolution
From DNA to Protein
Evolution (Biology Series)
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Plant Anatomy
The Leaf
The Animal Kingdom
Sponges
Cnidarians
Life Science
Cells: The Basis for Life
Similarities in Cell Structures and Functions
Differences and Specialization in Cells
Cellular Processes
Classification and Diversity of Life
Bacteria, Protists, and Fungi
The Animal Kingdom
Exploring Vertebrates
Genetics and Heredity
Genes and Traits
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.CB.2.4 incorporate the structure and function of individual body systems to the overall functioning of the organism.

- Biology Series
  - Cell Structure and Specialization
    - Inside the Cell
  - The Diversity of Life
    - Fungi
    - Non-Flowering Plants
    - Flowering Plants
    - Vertebrates
    - Invertebrates (Biology Series)
  - Plant Anatomy
    - The Leaf
    - Roots and Stems
  - The Animal Kingdom
    - Cnidarians
    - Mollusks
    - Arthropods
    - Birds (Biology Series)
    - Annelids
- Life Science
  - Cells: The Basis for Life
    - Differences and Specialization in Cells
  - Structure and Function in Living Organisms
    - Organ Systems
  - Classification and Diversity of Life
    - The Plant Kingdom
    - The Animal Kingdom

SC.O.CB.2.5 predict and assess responses of organisms to internal and environmental stimuli: â€¢ homeostasis metabolism â€¢ cyclic behaviors.

- Biology Series
  - Cell Structure and Specialization
    - Blood and Immunity
  - Plant Anatomy
    - The Leaf
  - The Animal Kingdom
    - Cnidarians
  - The Diversity of Life
    - Vertebrates
- Life Science
  - Structure and Function in Living Organisms

Organ Systems
Organisms and Their Environment
Maintaining Conditions for Life

SC.O.CB.2.6 correlate the properties of molecules to their movement through biological membranes: â€¢ osmosis â€¢ diffusion.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Life Science
Cells: The Basis for Life
Cellular Processes

SC.O.CB.2.7 analyze the flow of energy through cellular processes: â€¢ photosynthesis â€¢ cellular respiration â€¢ fermentation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Plant Anatomy
The Leaf
The Diversity of Life
Non-Flowering Plants
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Cellular Processes

SC.O.CB.2.8 apply the absorption spectrum of photosynthetic pigments to the action of spectrum of photosynthesis.

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Plant Anatomy
The Leaf
The Diversity of Life
Non-Flowering Plants
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Cellular Processes

SC.O.CB.2.9 examine the processes of binary fission, mitosis, and meiosis and relate them to: â€¢ the number of chromosomes â€¢ production of daughter cells â€¢ variations or lack of variations within a species.

Biology Series
- Cell Structure and Specialization
  - Mitosis
  - Meiosis

Life Science
- Cells: The Basis for Life
  - Cellular Processes
- Genetics and Heredity
  - Heredity
- Human Health and Reproduction
  - Immunity and Preventing Disease
  - Human Reproduction and Development

SC.O.CB.2.10 use Punnett squares to determine genotypic and phenotypic ratios by applying Mendel's Laws of Genetics: monohybrid and dihybrid, crosses, complete dominance, incomplete dominance, codominance. sex-linked traits, multiple alleles.

Biology Series
- Genetics and Evolution
  - Mendel's Principles of Heredity
  - DNA: The Molecule of Life
  - Investigating Heredity
  - Evolution (Biology Series)

Life Science
- Genetics and Heredity
  - Heredity

SC.O.CB.2.11 explore the discovery of DNA and examine the molecular structure of the double helix.

Biology Series
- Cell Structure and Specialization
  - Mitosis
- Genetics and Evolution
  - DNA: The Molecule of Life
  - From DNA to Protein
  - Genetic Engineering

Life Science
- Cells: The Basis for Life
  - The Chemistry of Living Cells

Similarities in Cell Structures and Functions
Cellular Processes
Genetics and Heredity
Genes and Traits
Heredity
Human Health and Reproduction
Human Reproduction and Development
Change Over Time
Evolution and Natural Selection

SC.O.CB.2.12 analyze karyotypes and pedigrees as diagnostic tools.

Biology Series
Cell Structure and Specialization
Meiosis
Genetics and Evolution
DNA: The Molecule of Life
Investigating Heredity
Life Science
Genetics and Heredity
Heredity

SC.O.CB.2.13 compare and contrast the social, political, and ethical implications of genetic engineering using current DNA technology.

Biology Series
Introduction to Biology
Exploring Biology
Cell Structure and Specialization
Meiosis
Blood and Immunity
Genetics and Evolution
From DNA to Protein
Investigating Heredity
Genetic Engineering
The Diversity of Life
Classification of Living Things
Life Science
Genetics and Heredity
Genes and Traits
Heredity
Genetic Variation and Biotechnology
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.CB.2.14 evaluate the evidence of evolution through natural selection â€¢ speciation â€¢ fossil record evidence â€¢ molecular similarities â€¢ homologous structures.

- Biology Series
  - Introduction to Biology
    - Biology: The Study of Life
  - Genetics and Evolution
    - Evolution (Biology Series)
  - The Diversity of Life
    - Non-Flowering Plants
    - Vertebrates
  - The Animal Kingdom
    - Sponges
    - Birds (Biology Series)
- Life Science
  - Change Over Time
    - Fossils and the Geologic Time Scale
    - Evolution and Natural Selection

SC.O.CB.2.15 compare morphological and other classification systems including domains, kingdoms and other taxa.

- Biology Series
  - Genetics and Evolution
    - Evolution (Biology Series)
  - The Diversity of Life
    - Viruses and Bacteria (Biology Series)
    - Protista
    - Fungi
    - Non-Flowering Plants
    - Flowering Plants
    - Vertebrates
    - Classification of Living Things
    - Invertebrates (Biology Series)
  - The Animal Kingdom
    - Sponges
    - Mollusks
    - Arthropods
    - Birds (Biology Series)
    - Annelids
- Life Science
  - Classification and Diversity of Life
    - Classifying Life

Bacteria, Protists, and Fungi
Exploring Vertebrates
Change Over Time
Fossils and the Geologic Time Scale
Evolution and Natural Selection

SC.O.CB.2.17 evaluate forest and wildlife best management practices as they affect succession, populations and communities.

Biology Series
Ecology
Human Impacts on the Environment
Life Science
Organisms and Their Environment
Biomes and Biodiversity

SC.O.CB.2.16 examine the cycle of viruses and compare disease prevention; â€¢ vaccinations â€¢ vector control â€¢ drug therapy

Biology Series
Introduction to Biology
Exploring Biology
Cell Structure and Specialization
Blood and Immunity
The Diversity of Life
Viruses and Bacteria (Biology Series)
Fungi
Life Science
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.CB.2.18 assess the implications of invasive on native wildlife and their habitat requirements.

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Ecology
Biomes
Food Chains and Webs
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
Climate (with Assessments)

Life Science
Organisms and Their Environment
Biomes and Biodiversity

SC.O.CB.2.19 interpret changes in energy as it flows through an ecosystem to illustrate conservation of energy in the energy pyramid, food web, and food chain.

Biology Series
Introduction to Biology
Biology: The Study of Life
Ecology
Food Chains and Webs
The Diversity of Life
Non-Flowering Plants
Life Science
Organisms and Their Environment
Flow of Energy and Matter in Nature

SC.O.CB.2.20 characterize complex interactions of organisms with ecosystems based on their niches including interspecific and intraspecific competition and symbiosis.

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Ecology
The Biosphere
Population Ecology
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
Flowering Plants
Invertebrates (Biology Series)
The Animal Kingdom
Sponges
Cnidarians
Mollusks
Annelids
Life Science
Organisms and Their Environment
Living with the Environment
Flow of Energy and Matter in Nature

SC.O.CB.2.21 analyze graphs, GIS data, and traditional maps reflecting changes in populations to predict limiting factors in ecosystems and determine carrying capacity.

Biology Series
Introduction to Biology
Biology: The Study of Life
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Ecology
Population Ecology
Life Science
Organisms and Their Environment
Living with the Environment

SC.O.CB.2.22 predict the effects of human activities on biogeochemical cycles of matter and energy in the biosphere over time: â€¢ water quality â€¢ air quality â€¢ recycling â€¢ global warming

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Ecology
The Biosphere
Human Impacts on the Environment
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Climate (with Assessments)

Grade 11/12: Biology II

Standard 1: Nature of Science

SC.O.BII.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.BII.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology

Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.BII.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.BII.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.BII.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.BII.1.6 use appropriate technology solutions with a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

PLATO Modules are not available for this learning expectation.

SC.O.BII.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions.

Technology Fundamentals
Electrical Systems

SC.O.BII.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, or predict the influence of external variances such as potential sources of error, or interpret maps.

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.BII.2.1 correlate functional groups to unique properties of organic molecules to biochemical pathways.

Biology Series
The Energy and Chemistry of Life
Biochemistry: The Chemistry of Life

SC.O.BII.2.2 describe the transfer of energy during condensation and hydrolysis reactions of organic molecules (e.g., ATP, enzyme substrate and active site).

Biology Series
The Energy and Chemistry of Life
Biochemistry: The Chemistry of Life

SC.O.BII.2.3 summarize the electrochemical gradients in various cells and their corresponding environments.

Biology Series
The Energy and Chemistry of Life

Cellular Respiration
Enzymes
Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport
Life Science
Cells: The Basis for Life
Cellular Processes

SC.O.BII.2.4 analyze the properties of water and its importance in biological systems (e.g., polarity, solubility, specific heat, pH, and buffers).

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
States of Matter
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Bonding and Types of Compounds (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.BII.2.5 examine the flow of energy through specific molecules in light dependent and light independent photosynthesis reactions, glycolysis, Kreb's cycle, EPS, and fermentation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Plant Anatomy
The Leaf
The Diversity of Life
Non-Flowering Plants
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Cellular Processes

SC.O.BII.2.6 interpret important research leading to the current knowledge of molecular genetics (e.g., Griffith, Avery, Hershey & Chase, Chargaff, Franklin & Wilkins and Waston & Crick).

PLATO Modules are not available for this learning expectation.

SC.O.BII.2.7 explain the use of restriction enzymes, vectors, plasmids and probes in recombinant DNA.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Cell Structure and Specialization
  - Blood and Immunity
- Genetics and Evolution
  - Investigating Heredity
  - Genetic Engineering
- The Diversity of Life
  - Classification of Living Things

Life Science
- Genetics and Heredity
  - Genetic Variation and Biotechnology

SC.O.BII.2.8 conduct and interpret DNA investigations such as RFLP and PCR.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Cell Structure and Specialization
  - Blood and Immunity
- Genetics and Evolution
  - Investigating Heredity
  - Genetic Engineering
- The Diversity of Life
  - Classification of Living Things

Life Science
- Genetics and Heredity
  - Genetic Variation and Biotechnology

SC.O.BII.2.9 analyze the process of DNA replication including DNA polymerase, semi-conservative replication and base-pairing.

Biology Series
- Cell Structure and Specialization
  - Mitosis
- Genetics and Evolution

DNA: The Molecule of Life
Life Science
Cells: The Basis for Life
Cellular Processes
Genetics and Heredity
Genes and Traits

SC.O.BII.2.10 apply the processes of transcription and translation to gene expression.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein
Genetic Engineering
Life Science
Cells: The Basis for Life
Cellular Processes
Genetics and Heredity
Genes and Traits

SC.O.BII.2.11 demonstrate the role of DNA in determining phenotype and illustrate ways of controlling and regulating expression and function of genes.

Biology Series
Genetics and Evolution
Mendel's Principles of Heredity
From DNA to Protein
Investigating Heredity
Genetic Engineering
Evolution (Biology Series)
Life Science
Genetics and Heredity
Heredity
Genetic Variation and Biotechnology

SC.O.BII.2.12 distinguish between chromosomal and gene mutations and their potential effects.

Biology Series
Genetics and Evolution
Genetic Engineering
Evolution (Biology Series)
The Diversity of Life
Classification of Living Things

Life Science
Genetics and Heredity
Genes and Traits
Heredity
Genetic Variation and Biotechnology

SC.O.BII.2.13 analyze a karyotype to determine chromosomal abnormalities.

Biology Series
Cell Structure and Specialization
Meiosis
Genetics and Evolution
Investigating Heredity
Life Science
Genetics and Heredity
Heredity

SC.O.BII.2.14 predict phenotypic ratios of crosses involving pleiotropy, epistasis, multiple alleles and polygenic inheritance.

Biology Series
Cell Structure and Specialization
Mitosis
Genetics and Evolution
Mendel's Principles of Heredity
DNA: The Molecule of Life
From DNA to Protein
Investigating Heredity
Genetic Engineering
Evolution (Biology Series)
Life Science
Genetics and Heredity
Genes and Traits
Heredity
Human Health and Reproduction
Human Reproduction and Development

SC.O.BII.2.15 evaluate treatment of viral diseases based on lytic and lysogenic cycles.

Biology Series
Cell Structure and Specialization
Blood and Immunity
Genetics and Evolution
Genetic Engineering

The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
The Animal Kingdom
Mollusks
Arthropods
Life Science
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.BII.2.16 analyze the criteria for classifications of protists (e.g., motility, cellular structures, reproduction, energy sources).

Biology Series
The Diversity of Life
Protista
Classification of Living Things
Life Science
Cells: The Basis for Life
What is Life?
Classification and Diversity of Life
Classifying Life
Bacteria, Protists, and Fungi
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.BII.2.17 survey the fungi kingdom (e.g., characteristics, reproduction, relationship to humans and the ecosystem).

Biology Series
Introduction to Biology
Exploring Biology
The Diversity of Life
Fungi
Classification of Living Things
Life Science
Classification and Diversity of Life
Classifying Life
Bacteria, Protists, and Fungi
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.BII.2.18 compare and contrast members of the plant kingdom in terms of their reproductive systems.

Biology Series
- Cell Structure and Specialization
  - Mitosis
  - Meiosis
- The Diversity of Life
  - Viruses and Bacteria (Biology Series)
  - Fungi
  - Non-Flowering Plants
  - Flowering Plants
  - Classification of Living Things
  - Invertebrates (Biology Series)
- Plant Anatomy
  - The Leaf

Life Science
- Classification and Diversity of Life
  - Classifying Life
  - The Plant Kingdom
  - Exploring Vertebrates

SC.O.BII.2.19 compare and contrast members of the animal kingdom in terms of their complexity (e.g., tissues, nervous and digestive systems).

Biology Series
- The Diversity of Life
  - Vertebrates
  - Classification of Living Things
  - Invertebrates (Biology Series)

Life Science
- Classification and Diversity of Life
  - Classifying Life
  - The Animal Kingdom
  - Exploring Vertebrates

SC.O.BII.2.20 survey embryonic development of animals including gastrulation, development of different body cavities, and tissues develop from germ layers.

Biology Series
- Cell Structure and Specialization
  - Meiosis
- The Animal Kingdom
  - Cnidarians
  - Mollusks
  - Arthropods
  - Birds (Biology Series)

Annelids
The Diversity of Life
Vertebrates
Invertebrates (Biology Series)
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Classification and Diversity of Life
Exploring Vertebrates
Human Health and Reproduction
Human Reproduction and Development

SC.O.BII.2.21 examine types of innate and learned animal behaviors (e.g., competitive, reproductive, social, cyclic, and communication).

Biology Series
The Animal Kingdom
Cnidarians
Mollusks
Birds (Biology Series)
The Diversity of Life
Vertebrates
Life Science
Cells: The Basis for Life
What is Life?
Classification and Diversity of Life
The Animal Kingdom
Exploring Vertebrates
Organisms and Their Environment
Maintaining Conditions for Life

Standard 3: Application of Science

SC.O.BII.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, and change over time).

Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Electrical Systems

SC.O.BII.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.BII.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.BII.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Fresh Water (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

SC.O.BII.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.BII.3.6 given current science-technology-societal issues, construct and defend potential solutions.

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

Grade 11: Chemistry

Standard 1: Nature of Science

SC.O.C.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.C.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity

SC.O.C.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.C.1.4 conduct and conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic.

Technology Fundamentals
Electrical Systems

SC.O.C.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.C.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

PLATO Modules are not available for this learning expectation.

SC.O.C.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, or propose revisions to investigations based on manipulation of variables and/or analysis of error; communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.C.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.C.2.1 classify pure substances by their chemical and physical properties.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)

SC.O.C.2.2 research and evaluate the contributions of Dalton, Bohr, Heisenberg, and Schrödinger to the evolution of the atomic theory.

Chemistry Series
Introductory Chemistry
Atomic Structure
Electronic Structure

SC.O.C.2.3 determine the proper set of quantum numbers (n, l, ml, and ms) for any electron in any given element.

Chemistry Series
Introductory Chemistry
Atomic Structure
Electronic Structure

SC.O.C.2.4 produce electron configurations and orbital diagrams for any element on the periodic table and predict the chemical properties of the element from the electron configuration.

Chemistry Series
Introductory Chemistry
Electronic Structure
Periodic Table and Trends
Bonding I
Bonding II

SC.O.C.2.5 illustrate Lewis' dot structures for representative (main group) elements.

Chemistry Series
Introductory Chemistry
Bonding I
Bonding II

SC.O.C.2.6 generate the correct formula and/or name for ionic and molecular compounds.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Naming Chemical Compounds
Bonding I

SC.O.C.2.7 analyze periodic trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity.

Chemistry Series
Introductory Chemistry
Periodic Table and Trends
Bonding I
Bonding II

SC.O.C.2.8 predict the type of bonding that occurs between atoms and characterize the properties of the ionic, covalent or metallic substances.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Solubility & Precipitation
States of Matter

SC.O.C.2.9 construct models to explain the structure and geometry of organic and inorganic molecules.

Chemistry Series
- Introductory Chemistry
  - Bonding I
  - Bonding II
- Chemical Transformations
  - Chemical Reactions
  - Formulas, Equations, & Stoichiometry
  - Solubility & Precipitation

SC.O.C.2.10 given the reactants, anticipate the products and create balanced equations for the five general types of chemical reactions (e.g., synthesis or combination, decomposition, single replacement, or double replacement and combustion).

Chemistry Series
- Introductory Chemistry
  - Properties of Acids, Bases and Salts
- Chemical Transformations
  - Chemical Reactions
  - Solubility & Precipitation

SC.O.C.2.11 determine experimentally the effects of temperature and concentration on solution properties (e.g., solubility, conductivity, density and colligative properties).

Biology Series
- Cell Structure and Specialization
  - The Plasma Membrane and Cellular Transport

Chemistry Series
- Introductory Chemistry
  - Properties of Acids, Bases and Salts
  - Solutions
- Chemical Transformations
  - Chemical Equilibrium
  - Solubility & Precipitation

SC.O.C.2.12 classify reactions as exothermic and endothermic reactions by the direction of heat flow in a chemical reaction.

Chemistry Series
- Introductory Chemistry
  - Solutions
- Chemical Transformations
  - Chemical Equilibrium

Reaction Rates

SC.O.C.2.13 generate mole conversions that demonstrate the ability to convert from one type of quantity to another (e.g., mass to number of particles, number of particles to volume, or volume to mass).

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Solutions
Chemical Transformations
Formulas, Equations, & Stoichiometry

SC.O.C.2.14 perform calculations using the combined gas laws.

Chemistry Series
Introductory Chemistry
Gases & Their Properties

SC.O.C.2.15 perform the following "mole" calculations: molarity, percentage composition, empirical and molecular formula, formulas of hydrates and theoretical yield.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Properties of Acids, Bases and Salts
Bonding I
Solutions
Chemical Transformations
Chemical Reactions
Formulas, Equations, & Stoichiometry
Solubility & Precipitation

SC.O.C.2.16 compare and contrast the Arrhenius and Bronsted-Lowry definitions of acids and bases.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Properties of Acids, Bases and Salts

SC.O.C.2.17 compare methods of measuring pH (e.g., indicators, indicator papers, or pH meters).

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.C.2.18 predict the product of an acid-base reaction.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.C.2.19 investigate and explain water's role as a solvent based upon principles of polarity of substances.

Chemistry Series
Introductory Chemistry
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

Standard 3: Application of Science

SC.O.C.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, or systems and change over time).

PLATO Modules are not available for this learning expectation.

SC.O.C.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.C.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.C.3.4 collaborate to research present current environmental and technological issues and predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)

Fresh Water (with Assessments)

SC.O.C.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.C.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

Grade 11: Conceptual Chemistry

Standard 1: History and Nature of Science

SC.O.CC.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.CC.1.2 demonstrate how a testable framework is employed to seek solutions for personal and societal issues. (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity

SC.O.CC.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.CC.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and

peer review, objectivity, openness, skepticism, fairness, or creativity and logic.

Technology Fundamentals
Electrical Systems

SC.O.CC.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.CC.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

PLATO Modules are not available for this learning expectation.

SC.O.CC.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.CC.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.CC.2.1 classify pure substances by their chemical and physical properties.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)

SC.O.CC.2.2 classify examples of matter as pure substance or mixture.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)

SC.O.CC.2.3 compare and contrast the properties of metals, nonmetals and metalloids.

Chemistry Series
Introductory Chemistry
Electronic Structure
Periodic Table and Trends
Naming Chemical Compounds
Bonding I

SC.O.CC.2.4 use the kinetic molecular theory to explain states of matter.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Bonding II
Gases & Their Properties
Solutions
Chemical Transformations
States of Matter

SC.O.CC.2.5 perform calculations using the combined gas laws.

Chemistry Series
Introductory Chemistry
Gases & Their Properties

SC.O.CC.2.6 produce and use electron configuration to explain chemical properties of elements.

PLATO Modules are not available for this learning expectation.

SC.O.CC.2.7 generate the correct formula and/or name for ionic and molecular compounds.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Naming Chemical Compounds
Bonding I

SC.O.CC.2.8 predict the type of bonding that occurs between atoms and characterize the properties of the ionic, covalent or metallic bond formed.

Chemistry Series
- Introductory Chemistry
  - Naming Chemical Compounds
  - Properties of Acids, Bases and Salts
  - Bonding I
  - Bonding II
  - Solutions
- Chemical Transformations
  - Chemical Reactions
  - Solubility & Precipitation
  - States of Matter

SC.O.CC.2.9 given the reactants, anticipate the products and create balanced equations for the five general types of chemical reactions (e.g., synthesis or combination, decomposition, single replacement, or double replacement and combustion).

Chemistry Series
- Introductory Chemistry
  - Properties of Acids, Bases and Salts
- Chemical Transformations
  - Chemical Reactions
  - Solubility & Precipitation

SC.O.CC.2.10 analyze the periodic table to predict trends in atomic size, ionic size, electronegativity, ionization energy and electron affinity

Chemistry Series
- Introductory Chemistry
  - Periodic Table and Trends
  - Bonding I
  - Bonding II

SC.O.CC.2.11 illustrate Lewis' dot structures for representative (main group) elements.

Chemistry Series
- Introductory Chemistry
  - Bonding I
  - Bonding II

SC.O.CC.2.12 generate mole conversions that demonstrate the ability to convert from one type of quantity to another (e.g., mass to number of particles, number of particles to volume, or volume to mass).

Chemistry Series
- Introductory Chemistry
  - Gases & Their Properties
  - Solutions
- Chemical Transformations
  - Formulas, Equations, & Stoichiometry

SC.O.CC.2.13 perform the following "mole" calculations: molarity, percentage composition, empirical and molecular formula, formulas of hydrates, theoretical yields.

Chemistry Series
- Introductory Chemistry
  - Introduction to Chemistry (Chemistry Series)
  - Properties of Acids, Bases and Salts
  - Bonding I
  - Solutions
- Chemical Transformations
  - Chemical Reactions
  - Formulas, Equations, & Stoichiometry
  - Solubility & Precipitation

SC.O.CC.2.14 construct models to explain the structure and geometry of organic and inorganic molecules and the lattice structures of crystals.

Chemistry Series
- Introductory Chemistry
  - Properties of Acids, Bases and Salts
  - Bonding I
  - Bonding II
- Chemical Transformations
  - Chemical Reactions
  - Formulas, Equations, & Stoichiometry
  - Solubility & Precipitation
  - States of Matter

SC.O.CC.2.15 determine experimentally the effects of temperature and concentration on solution properties (e.g., solubility, conductivity, or density and colligative properties).

Biology Series
- Cell Structure and Specialization
  - The Plasma Membrane and Cellular Transport

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Solutions
Chemical Transformations
Chemical Equilibrium
Solubility & Precipitation

SC.O.CC.2.16 compare methods of measuring pH (e.g., indicators, indicator papers, or pH meters).

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.CC.2.17 investigate and explain water's role as a solvent based upon principles of polarity of substances.

Chemistry Series
Introductory Chemistry
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

SC.O.CC.2.18 compare and contrast the Arrhenius and Bronsted-Lowry definitions of acids and bases.

Chemistry Series
Introductory Chemistry
Naming Chemical Compounds
Properties of Acids, Bases and Salts

SC.O.CC.2.19 classify reactions as exothermic and endothermic reactions by the direction of heat flow in a chemical reaction.

Chemistry Series
Introductory Chemistry
Solutions
Chemical Transformations
Chemical Equilibrium
Reaction Rates

SC.O.CC.2.20 given the reactants, anticipate the products and create balanced equations for nuclear reactions.

Chemistry Series
Introductory Chemistry
Atomic Structure

Standard 3: Application of Science

SC.O.CC.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, or systems and change over time).

PLATO Modules are not available for this learning expectation.

SC.O.CC.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.CC.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.CC.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
Fresh Water (with Assessments)

SC.O.CC.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.CC.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

Grade 12: Chemistry II

Standard 1: Natural Science

SC.O.CII.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.CII.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity

SC.O.CII.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.CII.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate recording keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic.

Technology Fundamentals
Electrical Systems

SC.O.CII.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts

SC.O.CII.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or

report data, interact with simulations, conduct research, and present and communicate conclusions.

PLATO Modules are not available for this learning expectation.

SC.O.CII.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, or propose revisions to investigations based on manipulation of variables and/or analysis of error; communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.CII.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps.

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.CII.2.1 identify types of binding forces such as: ionic, covalent, metallic, and van der Waals forces (including London) and relate binding forces to state, structure, and properties of matter.

Chemistry Series
Introductory Chemistry
Periodic Table and Trends
Naming Chemical Compounds
Properties of Acids, Bases and Salts
Bonding I
Bonding II
Solutions
Chemical Transformations
Chemical Reactions
Solubility & Precipitation
States of Matter

SC.O.CII.2.2 investigate the valence bond including the concepts of hybridization of orbitals, resonance, and formation of sigma and pi bonds and demonstrate an understanding of the VSEPR theory.

Chemistry Series
Introductory Chemistry
Bonding I
Bonding II
Chemical Transformations
Chemical Reactions
Solubility & Precipitation

SC.O.CII.2.3 interpret the ideal gas laws on the basis of the kinetic-molecular theory.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Bonding II
Gases & Their Properties
Solutions
Chemical Transformations
States of Matter

SC.O.CII.2.4 relate Avogadro's hypothesis and its relation to the mole concept.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Solutions
Chemical Transformations
Formulas, Equations, & Stoichiometry

SC.O.CII.2.5 define changes of state, including critical temperatures and triple points, based on the kinetic molecular theory.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Bonding II
Gases & Their Properties
Solutions
Chemical Transformations

Chemical Equilibrium
States of Matter

SC.O.CII.2.6 calculate concentration and explain the effect of changing concentration on the colligative properties of solutions.

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Solutions
Chemical Transformations
Chemical Equilibrium

SC.O.CII.2.7 identify oxidation numbers for ions and for any element in a compound to calculate the electron movement in a redox reaction and calculate the voltage using the Nernst equation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration

SC.O.CII.2.8 explain physical and chemical dynamic concepts; calculate equilibrium constants Kp, Kc, Ksp, Ka, and apply Le Chatelierâ€™s principle.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Solutions
Chemical Transformations
Chemical Equilibrium
Solubility & Precipitation

SC.O.CII.2.9 use experimental data and graphical analysis to determine reactant order, rate constants, and reaction rate laws, calculate the rate of reaction and explain the effect of temperature on rate changes.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Chemical Transformations
Chemical Reactions
Chemical Equilibrium
Reaction Rates

SC.O.CII.2.10 determine the heat of formation, heat of reaction, heat of vaporization and heat of fusion; apply Hess's Law.

Chemistry Series
Chemical Transformations
States of Matter

SC.O.CII.2.11 using the second law of thermodynamics, calculate the free energy of formation, free energy of reaction and the dependence of free energy on enthalpy and entropy changes.

Technology Fundamentals
Heat Systems

SC.O.CII.2.12 perform all calculations with attention given to significant figures, precision of measured values, and the use of logarithmic and exponential relationships.

Chemistry Series
Chemical Transformations
Chemical Reactions
Formulas, Equations, & Stoichiometry
Solubility & Precipitation
Reaction Rates

SC.O.CII.2.13 calculate molar masses from gas density, freezing-point, and boiling-point measurements.

Chemistry Series
Introductory Chemistry
Solutions
Chemical Transformations
Formulas, Equations, & Stoichiometry

SC.O.CII.2.14 identify weak electrolytes; define pH, pOH, pK, Ka, Kb, Kw, ionization constant, percent ionization, Ksp; calculate pH and pOH; measure pH with indicator papers and electronic meters; recognize salts that undergo hydrolysis and write a reaction for the ion with water and interpret a titration curve to identify the equivalence point don't forget buffers.

Biology Series
The Energy and Chemistry of Life
Biochemistry: The Chemistry of Life
Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Bonding I

Chemical Transformations
Chemical Reactions
Solubility & Precipitation

SC.O.CII.2.15 perform stoichiometric calculations to produce values for theoretical yield and to decide the limiting reactant of a given chemical reaction.

Chemistry Series
Introductory Chemistry
Solutions
Chemical Transformations
Formulas, Equations, & Stoichiometry
Reaction Rates

SC.O.CII.2.16 recognize simple organic functional groups and classify simple organic compounds by name.

Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Naming Chemical Compounds
Bonding I

Standard 3: Application of Science

SC.O.CII.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, system, or change over time).

PLATO Modules are not available for this learning expectation.

SC.O.CII.3.2 investigate, compare and design scientific and technological solutions to address and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.CII.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.CII.3.4 collaborate to research present current environmental and technological and evaluate the required academic preparation.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom

Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
Fresh Water (with Assessments)

SC.O.CII.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.CII.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

High School: Earth Science

Standard 1: Nature of Science

SC.O.ES.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.ES.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)

Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.ES.1.3 relate societal, cultural, and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.ES.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocols, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.ES.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.ES.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and to present and communicate conclusions.

Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)

SC.O.ES.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numerical data, evaluate the data in the context of scientific laws and principles, construct a conclusion bases on findings,

propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.ES.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.ES.2.1 identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.

Biology Series
Introduction to Biology
Biology: The Study of Life
Ecology
The Biosphere
Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Life Science
Organisms and Their Environment
Flow of Energy and Matter in Nature

SC.O.ES.2.2 analyze seismic, density, gravity, and magnetic data to explain the structure of the earth.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
The Energetic Earth (with Assessments)

SC.O.ES.2.3 characterize the eras, epochs and periods in relation to earth history and geologic development.

- Biology Series
  - The Energy and Chemistry of Life
    - Photosynthesis
  - Genetics and Evolution
    - Evolution (Biology Series)
  - The Animal Kingdom
    - Sponges
    - Cnidarians
  - The Diversity of Life
    - Invertebrates (Biology Series)
- Earth and Space Science with Assessments
  - The Energetic Earth (with Assessments)
    - Plate Tectonics and Earth Movements (with Assessments)
  - Water in Our World (with Assessments)
    - The Oceans (with Assessments)
  - Weather and Atmospheric Processes (with Assessments)
    - The Atmosphere (with Assessments)
    - Climate (with Assessments)
- Life Science
  - Change Over Time
    - Fossils and the Geologic Time Scale

SC.O.ES.2.4 analyze radiometric dating and rock and fossil evidence to determine the age of substances.

- Earth and Space Science with Assessments
  - Looking at Earth's Features (with Assessments)
    - Supporting Life: Earth's Surface and Landforms (with Assessments)
  - The Energetic Earth (with Assessments)
    - Plate Tectonics and Earth Movements (with Assessments)
  - Weather and Atmospheric Processes (with Assessments)
    - Climate (with Assessments)

SC.O.ES.2.5 use chemical and physical properties to distinguish between common minerals and explain their economic uses.

- Earth and Space Science with Assessments
  - Rocks and Soil (with Assessments)
    - Rocks and The Rock Cycle (with Assessments)

SC.O.ES.2.6 use rock characteristics to predict paleoenvironments or geologic conditions which existed during the formation of a given rock sample.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Volcanoes (with Assessments)
Rocks and Soil (with Assessments)
Rocks and The Rock Cycle (with Assessments)

SC.O.ES.2.7 investigate and describe the properties of water, which contribute to its critical role in physical and chemical weathering.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

SC.O.ES.2.8 compare and contrast the effectiveness of agents and processes of degradation, i.e., â€¢ weathering by gravity, â€¢ wind, â€¢ water, â€¢ ice.

Earth and Space Science with Assessments
Rocks and Soil (with Assessments)
Rocks and The Rock Cycle (with Assessments)
Weathering, Soil, and Erosion (with Assessments)
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)

SC.O.ES.2.9 predict geologic activity associated with specific plate boundaries and interactions.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Earthquakes (with Assessments)
Volcanoes (with Assessments)
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.10 analyze modern and historical seismic information to determine epicenter location and magnitude of earthquakes.

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Earthquakes (with Assessments)

SC.O.ES.2.11 evaluate current explanations for mechanisms, which drive the motion of plates (convection, slab-pull, plate push).

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Volcanoes (with Assessments)

SC.O.ES.2.12 relate the effect of degradation and tectonic forces on the earth's surface features, i.e., â€¢ weathering, â€¢ physical features of the ocean floor, â€¢ life with the oceans.

Biology Series
Genetics and Evolution
Evolution (Biology Series)
Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Earthquakes (with Assessments)
Volcanoes (with Assessments)
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.13 construct and/or interpret information on topographic maps.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.14 identify and describe chemical and physical properties of oceans, i.e., â€¢ composition, â€¢ currents, â€¢ physical features of the ocean floor.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.15 compare and contrast characteristics of the various oceans, including their lateral and vertical motions.

Earth and Space Science with Assessments

Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.16 analyze the evolution of the ocean floor including ocean crust, sedimentation, active and passive continental margins.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.17 examine the stratification of the oceans, i.e., â€¢ temperature, â€¢ salinity zones, â€¢ biological zones.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
The Oceans (with Assessments)

SC.O.ES.2.18 investigate to explain heat transfer in the atmosphere and its relationship to meteorological processes (e.g., pressure, winds, evaporation, condensation, or precipitation).

Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Weather and Atmospheric Processes (with Assessments)
Weather (with Assessments)
Life Science
Organisms and Their Environment
Flow of Energy and Matter in Nature

SC.O.ES.2.19 predict the effects of ocean currents on climate.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
The Oceans (with Assessments)
Weather and Atmospheric Processes (with Assessments)
Climate (with Assessments)

SC.O.ES.2.20 use meteorological evidence and weather maps (including air masses, wind, barometric pressure, and temperature data) to forecast weather.

PLATO Modules are not available for this learning expectation.

SC.O.ES.2.21 examine global change over time, i.e., â€¢ climatic trends, â€¢ global warming, â€¢ ozone depletion.

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Ecology
The Biosphere
Food Chains and Webs
Human Impacts on the Environment
Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Climate (with Assessments)

SC.O.ES.2.22 apply Newton's Law of Universal Gravitation to the motion of celestial objects to explain phenomenon observed in the sun-earthmoon system.

Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
The Solar System (with Assessments)

SC.O.ES.2.23 analyze several origin theories of the solar system and universe and use them to explain the celestial bodies and their movements.

Earth and Space Science with Assessments
The Energetic Earth (with Assessments)
Earth, Space, and the Universe (with Assessments)
The Solar System (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)

SC.O.ES.2.24 compare ancient and modern methods of studying and uses for astronomy (e.g., calendar, navigation).

Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
The Sun, Earth, and Moon (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)

SC.O.ES.2.25 use various wavelengths of the electromagnetic spectrum to investigate the observable universe.

Earth and Space Science with Assessments

Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.ES.2.26 compare the relationship between earth processes and natural disasters with their impact on humans.

Biology Series
Ecology
Population Ecology
Earth and Space Science with Assessments
Looking at Earth's Features (with Assessments)
Earth's Composition (with Assessments)
Supporting Life: Earth's Surface and Landforms (with Assessments)
The Energetic Earth (with Assessments)
Plate Tectonics and Earth Movements (with Assessments)
Earthquakes (with Assessments)
Volcanoes (with Assessments)

SC.O.ES.2.27 evaluate the potential conflicts, which arise between societal reliance on natural resources and the need to act as responsible stewards to reclaim the earth, including disposal of hazardous and non-hazardous waste.

Biology Series
Ecology
The Biosphere
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.ES.2.28 research alternative energy sources and evaluate the ecological, environmental and economic cost-benefit ratio.

Earth and Space Science with Assessments

Weather and Atmospheric Processes (with Assessments)
Climate (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

Standard 3: Application of Science

SC.O.ES.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, system, or change over time).

PLATO Modules are not available for this learning expectation.

SC.O.ES.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.ES.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.ES.3.4 collaborate to present research on current environmental and technological issues and predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Fresh Water (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

SC.O.ES.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.ES.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

High School: Human Anatomy and Physiology

Standard 1: Nature of Science

SC.O.HAP.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.HAP.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)

The Behavior of Sound and Light (with Assessments)
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.HAP.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.HAP.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.HAP.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.HAP.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)

SC.O.HAP.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.HAP.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: Content of Science

SC.O.HAP.2.1 apply directional terminology (proximal, dorsal, medial, lateral, visceral, superficial, deep, etc.) to locate human body structures.

Biology Series
The Animal Kingdom
Annelids

SC.O.HAP.2.2 describe the organizational levels, interdependency and the interaction of cells, tissues, organs, and organ systems.

Biology Series
Cell Structure and Specialization
Inside the Cell
The Animal Kingdom
Cnidarians
The Diversity of Life
Invertebrates (Biology Series)
Life Science
Cells: The Basis for Life
Differences and Specialization in Cells
Structure and Function in Living Organisms
Levels of Organization
Structure and Function of Tissues and Organs

SC.O.HAP.2.3 categorize, by structure and function, the various types of human tissue (e.g., muscle, epithelial, connective, or nervous).

Biology Series
Cell Structure and Specialization
Inside the Cell
Blood and Immunity
Life Science
Structure and Function in Living Organisms

Structure and Function of Tissues and Organs

SC.O.HAP.2.4 relate the structure of the integumentary system to its function as a sensory organ, environmental barrier and temperature regulator.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.HAP.2.5 relate how bone tissue is important to the development of the human skeleton.

Biology Series
Cell Structure and Specialization
Inside the Cell
Blood and Immunity
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.6 correlate the structure and function of the elements of the skeletal system (bone, articulations and insertions).

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.7 model the mechanisms of muscular contraction on the cellular and molecular levels.

Biology Series
Cell Structure and Specialization
Inside the Cell
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems

Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.8 integrate the skeletal, muscular and nervous systems to the functioning of the organism.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.9 model the muscular system including locations, origins, insertions, muscle groups and types of muscles.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.10 classify the various types of neurons emphasizing the relationship of structure and function.

Biology Series
Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport
The Animal Kingdom
Arthropods
Annelids
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs

SC.O.HAP.2.11 model the mechanism of a nerve impulse at the cellular and molecular levels.

Biology Series
Cell Structure and Specialization
Inside the Cell
The Plasma Membrane and Cellular Transport
The Animal Kingdom
Arthropods
Annelids

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs

SC.O.HAP.2.12 compare and contrast the parts and functions of the central and peripheral nervous system including the autonomic portions.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems

SC.O.HAP.2.13 apply the structure of the ear and eye to their function/dysfunction in relation to environmental perception.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.HAP.2.14 apply the action of specific enzymes to their roles in bodily functions.

PLATO Modules are not available for this learning expectation.

SC.O.HAP.2.15 incorporate the role of endocrine glands and their hormones into the overall functions and dysfunctions of the body.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.16 analyze the role of components and processes of the digestive system in supplying essential nutrients.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems

SC.O.HAP.2.17 explain how structures of the respiratory system are essential to cellular respiration, gas exchange and communication.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems

SC.O.HAP.2.18 illustrate the structure of the circulatory and lymphatic systems and the function of blood to the role of transportation, cellular support and defense.

Biology Series
Cell Structure and Specialization
Inside the Cell
Blood and Immunity
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems

SC.O.HAP.2.19 compare the compatibility of blood types and assess the molecular basis for blood functions.

Biology Series
Cell Structure and Specialization
Inside the Cell
Blood and Immunity
The Diversity of Life
Vertebrates
Life Science
Structure and Function in Living Organisms
Levels of Organization
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.HAP.2.20 integrate the functions of the excretory system to the maintenance of the other body systems.

Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.21 compare and contrast the structure and function of male and female reproductive systems.

Biology Series
Cell Structure and Specialization
Meiosis
Genetics and Evolution
DNA: The Molecule of Life
The Diversity of Life
Vertebrates
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.22 outline the events of reproduction for the formation of gametes through fertilizations and embryological development.

Biology Series
Cell Structure and Specialization
Meiosis
Genetics and Evolution
DNA: The Molecule of Life
The Diversity of Life
Flowering Plants
Vertebrates
Invertebrates (Biology Series)
Life Science
Human Health and Reproduction
Human Reproduction and Development

SC.O.HAP.2.23 assess the role of components of the immune system in defending the body.

Biology Series
Cell Structure and Specialization
Blood and Immunity
Life Science
Structure and Function in Living Organisms
Structure and Function of Tissues and Organs
Organ Systems
Human Health and Reproduction
Immunity and Preventing Disease

SC.O.HAP.2.24 research disease causative factors, symptoms, prevention and treatment.

Biology Series
Introduction to Biology
Exploring Biology
Cell Structure and Specialization
Blood and Immunity
Genetics and Evolution
Investigating Heredity
Genetic Engineering
The Diversity of Life
Viruses and Bacteria (Biology Series)
Protista
Fungi
The Animal Kingdom
Mollusks
Arthropods
Life Science
Human Health and Reproduction
Immunity and Preventing Disease

Standard 3: Application of Science

SC.O.HAP.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

PLATO Modules are not available for this learning expectation.

SC.O.HAP.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Technology Fundamentals
Electrical Systems

SC.O.HAP.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.HAP.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)

The Oceans (with Assessments)
Fresh Water (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

SC.O.HAP.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.HAP 3.6 given a current science-technology-societal issue, construct and defend potential solutions.

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
The Periodic Table (with Assessments)

High School: Physics

Standard 1: Nature of Science

SC.O.P.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

Biology Series
Genetics and Evolution
DNA: The Molecule of Life
From DNA to Protein

SC.O.P.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
The Energy and Chemistry of Life
Cellular Respiration
Genetics and Evolution
Mendel's Principles of Heredity

Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Chemical Reactions (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.P.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.P.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.P.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.P.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

Physical Science with Assessments

Forces and Motion (with Assessments)
Motion (with Assessments)

SC.O.P.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).

Technology Fundamentals
Electrical Systems

SC.O.P.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

Biology Series
Introduction to Biology
Biology: The Study of Life

Standard 2: The Content of Science

SC.O.P.2.1 construct and interpret graphs of position versus time, velocity versus time and acceleration versus time.

Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.P.2.2 appraise data, either textbook generated or laboratory collected, for motion in one and/or two dimensions, then select the correct mathematical method for communicating the value of unknown variables.

Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.P.2.3 develop solutions for multi-step problems involving velocity, acceleration, momentum and net force.

Chemistry Series
Introductory Chemistry

Gases & Their Properties
Physical Science with Assessments
Forces and Motion (with Assessments)
Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.P.2.4 interpret graphical, algebraic and/or trigonometric solutions to prove the values for vector components and resultants.

PLATO Modules are not available for this learning expectation.

SC.O.P.2.5 justify Newton's Laws of Motion in terms of equilibrium and net force situations.

Technology Fundamentals
Mechanical Systems
Physical Science with Assessments
Forces and Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

SC.O.P.2.6 evaluate the conservation of energy and momentum and deduce solutions for elastic and inelastic collisions.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Forces and Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.P.2.7 assess the magnitude of buoyant force on submerged and floating objects.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Chemical Transformations
States of Matter
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)

SC.O.P.2.8 compare the pressure exerted by a fluid to the depth of an object in the fluid.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Chemical Transformations
States of Matter
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)

SC.O.P.2.9 anticipate the effects of Bernoulli's principle on fluid motion.

Technology Fundamentals
Fluid Systems
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)

SC.O.P.2.10 examine the reflective, refractive and diffractive properties of mechanical and transverse waves.

Chemistry Series
Chemical Transformations
States of Matter
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.11 perform calculations to determine wavelength, frequency, velocity or energy of a wave.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.12 compare and contrast the physical properties of mechanical and transverse waves.

Earth and Space Science with Assessments

Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.13 research applications of Doppler shift in determining an approaching or receding source in wave propagation.

Biology Series
Genetics and Evolution
Genetic Engineering
Life Science
Genetics and Heredity
Genetic Variation and Biotechnology
Human Health and Reproduction
Immunity and Preventing Disease
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.14 apply ray optics diagrams to lenses and mirrors; use the lens/mirror equation and the magnification equation to solve optics problems.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.15 justify the image results obtained by diagramming the ray optics of lenses and mirrors and/or by deducing the image information from the lens/mirror equation.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.P.2.16 construct and analyze electrical circuits and calculate Ohm's law problems for series and parallel circuits.

Physical Science with Assessments
Energy and Its Applications (with Assessments)

Electricity, Circuits, and Power (with Assessments)

SC.O.P.2.17 distinguish between direct and alternating current and identify ways of generating each type.

Technology Fundamentals
Electrical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)

SC.O.P.2.18 analyze the motion of a projectile.

Physical Science with Assessments
Forces and Motion (with Assessments)
Newton's Laws: Forces and Motion (with Assessments)

Standard 3: Application of Science

SC.O.P.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Electrical Systems

SC.O.P.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

Biology Series
Introduction to Biology
Exploring Biology
Genetics and Evolution
Genetic Engineering

SC.O.P.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.P.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment

The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Fresh Water (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity

SC.O.P.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.P.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

High School: Conceptual Physics

Standard 1: Nature of Science

SC.O.CP.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

PLATO Modules are not available for this learning expectation.

SC.O.CP.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues. (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
Genetics and Evolution
Mendel's Principles of Heredity

SC.O.CP.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.CP.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.CP.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.CP.1.6 use appropriate technology solutions within a problem solving setting to measure and collect data, interpret data, analyze and/or report data, interact with simulations, conduct research, and present and communicate conclusions.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.CP.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated; design a controlled investigation that produces numeric data; evaluate the data in the context of scientific laws and principles; construct a conclusion based on findings; propose revisions to investigations based on manipulation of variables and/or analysis of error; communicate and defend the results and conclusions).

PLATO Modules are not available for this learning expectation.

SC.O.CP.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

PLATO Modules are not available for this learning expectation.

Standard 2: Content of Science

SC.O.CP.2.1 solve right triangle vector problems both graphically and algebraically.

PLATO Modules are not available for this learning expectation.

SC.O.CP.2.2 compare and contrast distance, velocity and acceleration of moving objects to describe accelerated and non-accelerated motions of a particle from textbook or lab collected data.

Physical Science with Assessments
- Forces and Motion (with Assessments)
  - Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)

SC.O.CP.2.3 analyze the motion of a projectile.

Physical Science with Assessments
- Forces and Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)

SC.O.CP.2.4 illustrate forces acting on objects with free body diagrams.

PLATO Modules are not available for this learning expectation.

SC.O.CP.2.5 interpret Newton's Laws in terms of natural phenomena.

Earth and Space Science with Assessments
- Earth, Space, and the Universe (with Assessments)
  - The Solar System (with Assessments)

Physical Science with Assessments
- Forces and Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)

SC.O.CP.2.6 compare and contrast kinetic and potential energies and recognize situations where mechanical energy is conserved.

Chemistry Series
- Introductory Chemistry
  - Gases & Their Properties

Physical Science with Assessments
- Energy and Its Applications (with Assessments)
  - Properties and Sources of Energy (with Assessments)
  - Heat (with Assessments)

SC.O.CP.2.7 deduce work, energy, power and efficiency in mechanical systems.

Technology Fundamentals
- Introducing Energy and Systems
- Mechanical Systems
- Fluid Systems

Physical Science with Assessments

Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.CP.2.8 analyze Archimedes' and Pascal's principles to solve problems involving equilibrium and stability of floating systems.

Chemistry Series
Introductory Chemistry
Gases & Their Properties
Chemical Transformations
States of Matter
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)

SC.O.CP.2.9 recognize the effects of Bernoulli's principle on fluid motion

Technology Fundamentals
Fluid Systems
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Understanding and Measuring Matter (with Assessments)

SC.O.CP.2.10 compare and contrast the common temperature scales, convert from one temperature scale to another and evaluate temperature in terms of kinetic energy.

PLATO Modules are not available for this learning expectation.

SC.O.CP.2.11 apply the mechanism of heat transfer and relate to environmental and energy conservation issues.

Biology Series
The Energy and Chemistry of Life
Photosynthesis
Ecology
The Biosphere
Human Impacts on the Environment
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Climate (with Assessments)
Technology Fundamentals
Heat Systems
Life Science

Organisms and Their Environment
Biomes and Biodiversity
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Forces and Motion (with Assessments)
Work and Simple Machines (with Assessments)

SC.O.CP.2.12 relate the first law of thermodynamics to energy conservation.

Biology Series
The Energy and Chemistry of Life
Cellular Respiration
Photosynthesis
Enzymes
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Heat (with Assessments)

SC.O.CP.2.13 compare and contrast sound and light waves using the concepts of reflection, refraction, and interference.

Chemistry Series
Introductory Chemistry
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.14 solve problems involving wave speed, frequency and wavelength; determine factors that affect the speed of sound; recognize that the speed of light is a constant.

Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Cycle and Movements of Water (with Assessments)
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.15 model the production of a standing wave and propose a practical application of such a wave.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.16 compare the Doppler shift effect for sound and light and point out examples of its occurrences and applications.

Biology Series
Genetics and Evolution
Genetic Engineering
Life Science
Genetics and Heredity
Genetic Variation and Biotechnology
Human Health and Reproduction
Immunity and Preventing Disease
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Magnetism and Electromagnetism (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.17 diagram image location involving plane and spherical mirrors, concave and convex lenses.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.18 illustrate the applications of colored lights and pigments.

Chemistry Series
Introductory Chemistry
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments

Energy and Its Applications (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.19 examine the concept of polarization.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.CP.2.20 analyze simple direct current circuits using Ohm's Law.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)

SC.O.CP.2.21 distinguish between direct current and alternating current circuits and describe how AC is converted to DC.

Technology Fundamentals
Electrical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)

Standard 3: Application of Science

SC.O.CP.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and function, systems, or change over time).

Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Electrical Systems

SC.O.CP.3.2 investigate, compare and design scientific and technological solutions to personal and societal problems.

PLATO Modules are not available for this learning expectation.

SC.O.CP.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.CP.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
Ecology
Human Impacts on the Environment
The Animal Kingdom
Mollusks
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Fresh Water (with Assessments)
Life Science
Organisms and Their Environment
Biomes and Biodiversity

SC.O.CP.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
Introduction to Biology
Exploring Biology
Ecology
Human Impacts on the Environment

SC.O.CP.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.

High School: Physics II

Standard 1: Natural Science

SC.O.PII.1.1 formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.

PLATO Modules are not available for this learning expectation.

SC.O.PII.1.2 demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").

Biology Series
Introduction to Biology
Biology: The Study of Life
Genetics and Evolution
Mendel's Principles of Heredity

SC.O.PII.1.3 relate societal, cultural and economic issues to key scientific innovations.

Biology Series
Genetics and Evolution
Genetic Engineering

SC.O.PII.1.4 conduct and/or design investigations that incorporate the skills and attitudes and/or values of scientific inquiry (e.g., established research protocol, accurate record keeping, replication of results and peer review, objectivity, openness, skepticism, fairness, or creativity and logic).

Technology Fundamentals
Electrical Systems

SC.O.PII.1.5 implement safe procedures and practices when manipulating equipment, materials, organisms, and models.

Chemistry Series
Introductory Chemistry
Properties of Acids, Bases and Salts
Physical Science with Assessments
Chemistry Fundamentals (with Assessments)
Mixtures and Solutions (with Assessments)

SC.O.PII.1.6 use appropriate technology solutions with a problem solving setting to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.PII.1.7 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analyze of error, or communicate and define the results and conclusions).

PLATO Modules are not available for this learning expectation.

SC.O.PII.1.8 draw conclusions from a variety of data sources to analyze and interpret systems and models (e.g., use graphs and equations to measure and apply variables such as rate and scale, evaluate changes in trends and cycles, predict the influence of external variances such as potential sources of error, or interpret maps).

PLATO Modules are not available for this learning expectation.

Standard 2: Content of Science

SC.O.PII.2.1 apply graphical analysis to interpret motion in terms of position, velocity, acceleration, and time.

Physical Science with Assessments
- Forces and Motion (with Assessments)
  - Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)

SC.O.PII.2.2 use data to deduce mathematical relationships involving one and two dimensional motion

Physical Science with Assessments
- Forces and Motion (with Assessments)
  - Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)

SC.O.PII.2.3 experimentally verify laws of motion including Newton's Laws, Conservation of Momentum (linear and angular), and Conservation of Energy.

Chemistry Series
- Introductory Chemistry
  - Gases & Their Properties

Physical Science with Assessments
- Energy and Its Applications (with Assessments)
  - Properties and Sources of Energy (with Assessments)
- Forces and Motion (with Assessments)
  - Newton's Laws: Forces and Motion (with Assessments)
  - Work and Simple Machines (with Assessments)

SC.O.PII.2.4 using knowledge of linear motion equations, synthesize concepts of rotational motion (e.g., angular speed and acceleration, centripetal acceleration, Newtonian gravitation, Kepler's Laws, torque).

Earth and Space Science with Assessments
- Earth, Space, and the Universe (with Assessments)
  - The Solar System (with Assessments)

Technology Fundamentals
- Mechanical Systems

SC.O.PII.2.5 predict and verify the effect of variables on the properties and dynamics of fluids.

Earth and Space Science with Assessments
- Weather and Atmospheric Processes (with Assessments)
  - The Atmosphere (with Assessments)

Technology Fundamentals
Introducing Energy and Systems
Fluid Systems
Heat Systems

SC.O.PII.2.6 interpret and apply concepts of thermal physics (e.g., distinction of heat and temperature, thermal expansion, properties of Ideal Gases, Kinetic Theory, specific heat, and energy transfer).

Biology Series
Cell Structure and Specialization
The Plasma Membrane and Cellular Transport
Chemistry Series
Introductory Chemistry
Introduction to Chemistry (Chemistry Series)
Bonding II
Gases & Their Properties
Solutions
Chemical Transformations
States of Matter
Earth and Space Science with Assessments
Weather and Atmospheric Processes (with Assessments)
The Atmosphere (with Assessments)
Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
States of Matter (with Assessments)
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Heat (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PII.2.7 deduce the relative values of electric force and field strength based on the magnitude of and the distance from the point charge (e.g., Coulomb's Law and inverse square law).

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PII.2.8 construct, diagram and evaluate complex electrical circuits.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Electricity, Circuits, and Power (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PII.2.9 predict and interpret magnetic forces and magnetic fields, and apply their effect on the motion of a point charge and to the electric current in a wire or coil.

Physical Science with Assessments
Energy and Its Applications (with Assessments)
Magnetism and Electromagnetism (with Assessments)

SC.O.PII.2.10 critique electromagnetic induction and evaluate its application to electric circuits and various devices.

Chemistry Series
Introductory Chemistry
Atomic Structure
Electronic Structure
Earth and Space Science with Assessments
Earth, Space, and the Universe (with Assessments)
Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)
Properties of Sound and Light (with Assessments)
The Behavior of Sound and Light (with Assessments)

SC.O.PII.2.11 investigate, analyze, and evaluate the concepts of solid-state physics and the application of semiconductors and superconductors in the advancement of electronics through the development of diodes, transistors, and integrated circuits.

PLATO Modules are not available for this learning expectation.

SC.O.PII.2.12 apply knowledge of simple harmonic motion (e.g., springs, pendulums and other oscillating objects) to calculate the kinetic and potential energies of the oscillating system.

Technology Fundamentals
Mechanical Systems
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

SC.O.PII.2.13 examine wave properties and their interactions (e.g., reflection, refraction, dispersion, total internal deflection, interference, diffraction, Doppler Shift, beats, and polarization).

Earth and Space Science with Assessments
  Water in Our World (with Assessments)
    The Cycle and Movements of Water (with Assessments)
  Earth, Space, and the Universe (with Assessments)
    Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
  Energy and Its Applications (with Assessments)
    Properties of Sound and Light (with Assessments)
    The Behavior of Sound and Light (with Assessments)

SC.O.PII.2.14 evaluate the application of wave properties to the development of optical and acoustical devices.

Earth and Space Science with Assessments
  Water in Our World (with Assessments)
    The Cycle and Movements of Water (with Assessments)
  Earth, Space, and the Universe (with Assessments)
    Space: Stars, Galaxies, and the Universe (with Assessments)
Physical Science with Assessments
  Energy and Its Applications (with Assessments)
    Properties of Sound and Light (with Assessments)
    The Behavior of Sound and Light (with Assessments)

SC.O.PII.2.15 critique the role of technology in the development of historical models of the atom (e.g., radioactivity, atomic spectra, particle accelerators, etc.).

Chemistry Series
  Introductory Chemistry
    Atomic Structure
    Electronic Structure
Physical Science with Assessments
  Properties and Structures of Matter (with Assessments)
    Atoms, Elements, Compounds and Mixtures (with Assessments)

SC.O.PII.2.16 examine evidence for the historical development of the quantum mechanical theory (e.g., Planck's blackbody radiation, Einstein's photoelectric effect, deBroglie's duality).

Chemistry Series
  Introductory Chemistry
    Atomic Structure
    Electronic Structure

Physical Science with Assessments
Properties and Structures of Matter (with Assessments)
Atoms, Elements, Compounds and Mixtures (with Assessments)

SC.O.PII.2.17 calculate an atom's binding energy as related to Einstein's special theory of relativity, and interpret the nuclear forces present.

Chemistry Series
Introductory Chemistry
Atomic Structure

SC.O.PII.2.18 differentiate between stable and unstable nuclei, and if the nucleus is unstable predict the type(s) of nuclear decay.

Biology Series
Ecology
Human Impacts on the Environment
Chemistry Series
Introductory Chemistry
Atomic Structure
Earth and Space Science with Assessments
Water in Our World (with Assessments)
The Oceans (with Assessments)
Physical Science with Assessments
Energy and Its Applications (with Assessments)
Properties and Sources of Energy (with Assessments)

Standard 3: Application of Science

SC.O.PII.3.1 synthesize concepts across various science disciplines to better understand the natural world (e.g., form and functions, systems, or change over time).

Technology Fundamentals
Introducing Energy and Systems
Mechanical Systems
Fluid Systems
Heat Systems
Electrical Systems

SC.O.PII.3.2 investigate, compare and design scientific and technological solutions to address personal and societal problems.

PLATO Modules are not available for this learning expectation.

SC.O.PII.3.3 communicate experimental designs, results and conclusions using advanced technology tools.

PLATO Modules are not available for this learning expectation.

SC.O.PII.3.4 collaborate to present research on current environmental and technological issues to predict possible solutions.

Biology Series
- Ecology
  - Human Impacts on the Environment
- The Animal Kingdom
  - Mollusks

Earth and Space Science with Assessments
- Water in Our World (with Assessments)
  - The Oceans (with Assessments)
  - Fresh Water (with Assessments)

Life Science
- Organisms and Their Environment
  - Biomes and Biodiversity

SC.O.PII.3.5 explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.

Biology Series
- Introduction to Biology
  - Exploring Biology
- Ecology
  - Human Impacts on the Environment

SC.O.PII.3.6 given a current science-technology-societal issue, construct and defend potential solutions.

PLATO Modules are not available for this learning expectation.