

**Correlation of Glencoe TechCONNECT to
Virginia Science Standards of Learning
Grade 6, Life Science, Physical Science, Earth Science**

Science: Grade Six

Content Standard	Glencoe TechCONNECT Activities
Scientific Investigation, Reasoning, and Logic	
6.1 The student will plan and conduct investigations in which	
a) observations are made involving fine discrimination between similar objects and organisms;	AC140, AC146
b) a classification system is developed based on multiple attributes;	AC074, AC140
c) precise and approximate measurements are recorded;	AC071
d) scale models are used to estimate distance, volume, and quantity;	AC119
e) hypotheses are stated in ways that identify the independent (manipulated) and dependent (responding) variables;	AC122
f) a method is devised to test the validity of predictions and inferences;	AC111
g) one variable is manipulated over time, using many repeated trials;	AC122
h) data are collected, recorded, analyzed, and reported using appropriate metric measurements;	AC102, AC145
i) data are organized and communicated through graphical representation (graphs, charts, and diagrams);	AC102, AC145
j) models are designed to explain a sequence; and	AC102, AC145
k) an understanding of the nature of science is developed and reinforced.	AC102, AC145
Force, Motion, and Energy	
6.2 The student will investigate and understand basic sources of energy, their origins, transformations, and uses. Key concepts include	
a) potential and kinetic energy;	AC038
b) the role of the sun in the formation of most energy sources on Earth;	AC106
c) nonrenewable energy sources (fossil fuels including petroleum, natural gas, and coal);	AC073, AC154
d) renewable energy sources (wood, wind, hydro, geothermal, tidal, and solar); and	AC073, AC154
e) energy transformations (heat/light to mechanical, chemical, and electrical energy).	AC073, AC154

Content Standard	Glencoe TechCONNECT Activities
6.3 The student will investigate and understand the role of solar energy in driving most natural processes within the atmosphere, the hydrosphere, and on the Earth's surface. Key concepts include	
a) the Earth's energy budget;	AC037
b) the role of radiation and convection in the distribution of energy;	AC163
c) the motion of the atmosphere and the oceans;	AC163
d) cloud formation; and	AC163
e) the role of heat energy in weather-related phenomena including thunderstorms and hurricanes.	AC163
Matter	
6.4 The student will investigate and understand that all matter is made up of atoms. Key concepts include	
a) atoms are made up of electrons, protons, and neutrons;	AC138
b) atoms of any element are alike but are different from atoms of other elements;	AC076
c) elements may be represented by chemical symbols;	AC076
d) two or more atoms may be chemically combined;	AC076
e) compounds may be represented by chemical formulas;	AC076
f) chemical equations can be used to model chemical changes; and	
g) a limited number of elements comprise the largest portion of the solid Earth, living matter, the oceans, and the atmosphere.	
6.5 The student will investigate and understand the unique properties and characteristics of water and its roles in the natural and human-made environment. Key concepts include	
a) water as the universal solvent;	
b) the properties of water in all three states;	AC138
c) the action of water in physical and chemical weathering;	AC155
d) the ability of large bodies of water to store heat and moderate climate;	
e) the origin and occurrence of water on Earth;	AC163
f) the importance of water for agriculture, power generation, and public health; and	AC163
g) the importance of protecting and maintaining water resources.	AC163

Content Standard	Glencoe TechCONNECT Activities
6.6 The student will investigate and understand the properties of air and the structure and dynamics of the Earth’s atmosphere. Key concepts include	
a) air as a mixture of gaseous elements and compounds;	AC163
b) air pressure, temperature, and humidity;	AC163
c) how the atmosphere changes with altitude;	AC163
d) natural and human-caused changes to the atmosphere;	AC102, AC145
e) the relationship of atmospheric measures and weather conditions;	AC163
f) basic information from weather maps including fronts, systems, and basic measurements; and	
g) the importance of protecting and maintaining air quality.	AC102, AC145
Living Systems	
6.7 The student will investigate and understand the natural processes and human interactions that affect watershed systems. Key concepts include	
a) the health of ecosystems and the abiotic factors of a watershed;	AC106, AC146
b) the location and structure of Virginia’s regional watershed systems;	
c) divides, tributaries, river systems, and river and stream processes;	AC106, AC056
d) wetlands;	AC106
e) estuaries;	AC106
f) major conservation, health, and safety issues associated with watersheds; and	AC056, AC106, AC163
g) water monitoring and analysis using field equipment including hand-held technology.	AC163
Interrelationships in Earth/Space Systems	
6.8 The student will investigate and understand the organization of the solar system and the relationships among the various bodies that comprise it. Key concepts include	
a) the sun, moon, Earth, other planets and their moons, meteors, asteroids, and comets;	AC034, AC119, AC120
b) relative size of and distance between planets;	AC034
c) the role of gravity;	AC119, AC120
d) revolution and rotation;	AC119, AC120

Content Standard	Glencoe TechCONNECT Activities
e) the mechanics of day and night and the phases of the moon;	AC119
f) the unique properties of Earth as a planet;	AC119
g) the relationship of the Earth's tilt and the seasons;	AC119
h) the cause of tides; and	
i) the history and technology of space exploration.	AC034
Resources	
6.9 The student will investigate and understand public policy decisions relating to the environment. Key concepts include	
a) management of renewable resources (water, air, soil, plant life, animal life);	AC102, AC145
b) management of nonrenewable resources (coal, oil, natural gas, nuclear power, mineral resources);	AC154
c) the mitigation of land-use and environmental hazards through preventive measures; and	AC163
d) cost/benefit tradeoffs in conservation policies.	AC145, AC154

Science: Life Science

Content Standard	Glencoe TechCONNECT Activities
LS.1 The student will plan and conduct investigations in which	
a) data are organized into tables showing repeated trials and means;	AC116
b) variables are defined;	AC116
c) metric units (SI—International System of Units) are used;	AC065
d) models are constructed to illustrate and explain phenomena;	AC116
e) sources of experimental error are identified;	
f) dependent variables, independent variables, and constants are identified;	AC074 , AC119 , AC122 , AC140 , AC146 , AC153 , AC155
g) variables are controlled to test hypotheses, and trials are repeated;	AC122 , AC155
h) continuous line graphs are constructed, interpreted, and used to make predictions;	AC116
i) interpretations from a set of data are evaluated and defended; and	AC116
j) an understanding of the nature of science is developed and reinforced.	AC102 , AC116 , AC145
LS.2 The student will investigate and understand that all living things are composed of cells. Key concepts include	
a) cell structure and organelles (cell membrane, cell wall, cytoplasm, vacuole, mitochondrion, endoplasmic reticulum, nucleus, and chloroplast);	
b) similarities and differences between plant and animal cells;	
c) development of cell theory; and	
d) cell division (mitosis and meiosis).	
LS.3 The student will investigate and understand that living things show patterns of cellular organization. Key concepts include	
a) cells, tissues, organs, and systems; and	AC074
b) life functions and processes of cells, tissues, organs, and systems (respiration, removal of wastes, growth, reproduction, digestion, and cellular transport).	AC074 , AC027
LS.4 The student will investigate and understand that the basic needs of organisms must be met in order to carry out life processes. Key concepts include	
a) plant needs (light, water, gases, and nutrients);	AC146

Content Standard	Glencoe TechCONNECT Activities
b) animal needs (food, water, gases, shelter, space); and	AC027
c) factors that influence life processes.	AC027
LS.5 The student will investigate and understand how organisms can be classified. Key concepts include	
a) the distinguishing characteristics of kingdoms of organisms;	AC002, AC074
b) the distinguishing characteristics of major animal and plant phyla; and	AC002, AC074, AC140
c) the characteristics of the species.	AC002, AC074, AC140
LS.6 The student will investigate and understand the basic physical and chemical processes of photosynthesis and its importance to plant and animal life. Key concepts include	
a) energy transfer between sunlight and chlorophyll;	AC106
b) transformation of water and carbon dioxide into sugar and oxygen; and	AC106
c) photosynthesis as the foundation of virtually all food webs.	AC106
LS.7 The student will investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment. Key concepts include	
a) the carbon, water, and nitrogen cycles;	AC106, AC107
b) interactions resulting in a flow of energy and matter throughout the system;	AC106, AC107
c) complex relationships within terrestrial, freshwater, and marine ecosystems; and	AC106, AC107
d) energy flow in food webs and energy pyramids.	AC106, AC107
LS.8 The student will investigate and understand that interactions exist among members of a population. Key concepts include	
a) competition, cooperation, social hierarchy, territorial imperative; and	AC013
b) influence of behavior on a population.	AC013, AC031
LS.9 The student will investigate and understand interactions among populations in a biological community. Key concepts include	
a) the relationships among producers, consumers, and decomposers in food webs;	AC106, AC107, AC146, AC159
b) the relationship between predators and prey;	AC106, AC107, AC116, AC159
c) competition and cooperation;	AC106, AC107, AC146, AC159
d) symbiotic relationships; and	AC106, AC107, AC146, AC159

Content Standard	Glencoe TechCONNECT Activities
e) niches.	AC106, AC107
LS.10 The student will investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem. Key concepts include	
a) differences between ecosystems and biomes;	AC036, AC106, AC107, AC153
b) characteristics of land, marine, and freshwater ecosystems; and	AC136, AC146, AC159
c) adaptations that enable organisms to survive within a specific ecosystem.	AC146
LS.11 The student will investigate and understand that ecosystems, communities, populations, and organisms are dynamic and change over time (daily, seasonal, and long term). Key concepts include	
a) phototropism, hibernation, and dormancy;	AC146
b) factors that increase or decrease population size; and	AC116, AC158, AC160
c) eutrophication, climate changes, and catastrophic disturbances.	AC146
LS.12 The student will investigate and understand the relationships between ecosystem dynamics and human activity. Key concepts include	
a) food production and harvest;	AC159
b) change in habitat size, quality, or structure;	AC159
c) change in species competition;	AC159
d) population disturbances and factors that threaten or enhance species survival; and	AC146, AC159
e) environmental issues (water supply, air quality, energy production, and waste management).	AC145, AC163
LS.13 The student will investigate and understand that organisms reproduce and transmit genetic information to new generations. Key concepts include	
a) the role of DNA;	
b) the function of genes and chromosomes;	
c) genotypes and phenotypes;	
d) factors affecting the expression of traits;	

Content Standard	Glencoe TechCONNECT Activities
e) characteristics that can and cannot be inherited;	
f) genetic engineering and its applications; and	AC160
g) historical contributions and significance of discoveries related to genetics.	AC160
LS.14 The student will investigate and understand that organisms change over time. Key concepts include	
a) the relationships of mutation, adaptation, natural selection, and extinction;	AC074 , AC107 , AC139 , AC158 , AC160
b) evidence of evolution of different species in the fossil record; and	AC139
c) how environmental influences, as well as genetic variation, can lead to diversity of organisms.	AC074 , AC139

Science: Physical Science

Content Standard	Glencoe TechCONNECT Activities
PS.1 The student will plan and conduct investigations in which	
a) chemicals and equipment are used safely;	
b) length, mass, volume, density, temperature, weight, and force are accurately measured and reported using metric units (SI—International System of Units);	
c) conversions are made among metric units, applying appropriate prefixes;	AC065
d) triple beam and electronic balances, thermometers, metric rulers, graduated cylinders, and spring scales are used to gather data;	
e) numbers are expressed in scientific notation where appropriate;	
f) research skills are utilized using a variety of resources;	AC119, AC120, AC122, AC140, AC145, AC146, AC153, AC155, AC159
g) independent and dependent variables, constants, controls, and repeated trials are identified;	AC074, AC119, AC122, AC140, AC146, AC153, AC155
h) data tables showing the independent and dependent variables, derived quantities, and the number of trials are constructed and interpreted;	AC074, AC119, AC122, AC140, AC146, AC153, AC155
i) data tables for descriptive statistics showing specific measures of central tendency, the range of the data set, and the number of repeated trials are constructed and interpreted;	AC082, AC100
j) frequency distributions, scattergrams, line plots, and histograms are constructed and interpreted;	AC039
k) valid conclusions are made after analyzing data;	AC039
l) research methods are used to investigate practical problems and questions;	AC074, AC119, AC120, AC122, AC140, AC145, AC146, AC153, AC155
m) experimental results are presented in appropriate written form; and	AC119, AC120, AC122, AC140, AC145, AC146, AC153, AC155, AC159
n) an understanding of the nature of science is developed and reinforced.	AC122, AC146, AC153, AC155
PS.2 The student will investigate and understand the basic nature of matter. Key concepts include	
a) the particle theory of matter;	AC076
b) elements, compounds, mixtures, acids, bases, and salts;	AC076, AC138

Content Standard	Glencoe TechCONNECT Activities
c) solids, liquids, and gases;	AC138
d) characteristics of types of matter based on physical and chemical properties;	AC138
e) physical properties (shape, density, solubility, odor, melting point, boiling point, color); and	AC003
f) chemical properties (acidity, basicity, combustibility, reactivity).	
PS.3 The student will investigate and understand the modern and historical models of atomic structure. Key concepts include	
a) the contributions of Dalton, Thomson, Rutherford, and Bohr in understanding the atom; and	
b) the modern model of atomic structure.	AC076
PS.4 The student will investigate and understand the organization and use of the periodic table of elements to obtain information. Key concepts include	
a) symbols, atomic number, atomic mass, chemical families (groups), and periods;	AC076
b) classification of elements as metals, metalloids, and nonmetals; and	AC076
c) simple compounds (formulas and the nature of bonding).	AC076
PS.5 The student will investigate and understand changes in matter and the relationship of these changes to the Law of Conservation of Matter and Energy. Key concepts include	
a) physical changes;	AC138
b) nuclear reactions (products of fusion and fission and the effect of these products on humans and the environment); and	AC073
c) chemical changes (types of reactions, reactants, and products; and balanced equations).	AC138
PS.6 The student will investigate and understand states and forms of energy and how energy is transferred and transformed. Key concepts include	
a) potential and kinetic energy;	AC038
b) mechanical, chemical, and electrical energy; and	AC071, AC075, AC073
c) heat, light, and sound.	
PS.7 The student will investigate and understand temperature scales, heat, and heat transfer. Key concepts include	
a) Celsius and Kelvin temperature scales and absolute zero;	

Content Standard	Glencoe TechCONNECT Activities
b) phase change, freezing point, melting point, boiling point, vaporization, and condensation;	AC138
c) conduction, convection, and radiation; and	
d) applications of heat transfer (heat engines, thermostats, refrigeration, and heat pumps).	
PS.8 The student will investigate and understand characteristics of sound and technological applications of sound waves. Key concepts include	
a) wavelength, frequency, speed, and amplitude;	
b) resonance;	
c) the nature of mechanical waves; and	
d) technological applications of sound.	
PS.9 The student will investigate and understand the nature and technological applications of light. Key concepts include	
a) the wave behavior of light (reflection, refraction, diffraction, and interference);	
b) images formed by lenses and mirrors; and	
c) the electromagnetic spectrum.	
PS.10 The student will investigate and understand scientific principles and technological applications of work, force, and motion. Key concepts include	
a) speed, velocity, and acceleration;	AC033
b) Newton's laws of motion;	AC033, AC120
c) work, force, mechanical advantage, efficiency, and power; and	AC033
d) applications (simple machines, compound machines, powered vehicles, rockets, and restraining devices).	AC033
PS.11 The student will investigate and understand basic principles of electricity and magnetism. Key concepts include	
a) static electricity, current electricity, and circuits;	AC073
b) magnetic fields and electromagnets; and	
c) motors and generators.	AC073

Science: Earth Science

Content Standard	Glencoe TechCONNECT Activities
ES.1 The student will plan and conduct investigations in which	
a) volume, area, mass, elapsed time, direction, temperature, pressure, distance, density, and changes in elevation/depth are calculated utilizing the most appropriate tools;	AC003, AC111, AC120, AC153
b) technologies including computers, probeware, and global positioning systems (GPS), are used to collect, analyze, and report data and to demonstrate concepts and simulate experimental conditions;	
c) scales, diagrams, maps, charts, graphs, tables, and profiles are constructed and interpreted;	AC080
d) variables are manipulated with repeated trials; and	AC119, AC122, AC140, AC146
e) a scientific viewpoint is constructed and defended (the nature of science).	AC119, AC120, AC122, AC140, AC145, AC146, AC153, AC155
ES.2 The student will demonstrate scientific reasoning and logic by	
a) analyzing how science explains and predicts the interactions and dynamics of complex Earth systems;	AC034, AC077, AC155
b) recognizing that evidence is required to evaluate hypotheses and explanations;	AC074, AC120, AC122, AC140, AC145, AC146, AC153, AC155
c) comparing different scientific explanations for a set of observations about the Earth;	AC034, AC077
d) explaining that observation and logic are essential for reaching a conclusion; and	AC122, AC146, AC153, AC155
e) evaluating evidence for scientific theories.	
ES.3 The student will investigate and understand how to read and interpret maps, globes, models, charts, and imagery. Key concepts include	
a) maps (bathymetric, geologic, topographic, and weather) and star charts;	AC080
b) imagery (aerial photography and satellite images);	
c) direction and measurements of distance on any map or globe; and	AC080
d) location by latitude and longitude and topographic profiles.	AC080

Content Standard	Glencoe TechCONNECT Activities
ES.4 The student will investigate and understand the characteristics of the Earth and the solar system. Key concepts include	
a) position of the Earth in the solar system;	AC034 , AC119
b) sun-Earth-moon relationships (seasons, tides, and eclipses);	AC034 , AC119
c) characteristics of the sun, planets and their moons, comets, meteors, and asteroids; and	AC034 , AC119 , AC120
d) the history and contributions of the space program.	AC034
ES.5 The student will investigate and understand how to identify major rock-forming and ore minerals based on physical and chemical properties. Key concepts include	
a) hardness, color and streak, luster, cleavage, fracture, and unique properties; and	AC081
b) uses of minerals.	AC081
ES.6 The student will investigate and understand the rock cycle as it relates to the origin and transformation of rock types and how to identify common rock types based on mineral composition and textures. Key concepts include	
a) igneous (intrusive and extrusive) rocks;	AC081
b) sedimentary (clastic and chemical) rocks; and	AC081
c) metamorphic (foliated and unfoliated) rocks.	AC081
ES.7 The student will investigate and understand the differences between renewable and nonrenewable resources. Key concepts include	
a) fossil fuels, minerals, rocks, water, and vegetation;	AC154
b) advantages and disadvantages of various energy sources;	AC073 , AC154
c) resources found in Virginia;	
d) making informed judgments related to resource use and its effects on Earth systems; and	AC163
e) environmental costs and benefits.	AC163
ES.8 The student will investigate and understand geologic processes including plate tectonics. Key concepts include	
a) how geologic processes are evidenced in the physiographic provinces of Virginia including the Coastal Plain, Piedmont, Blue Ridge, Valley and Ridge, and Appalachian Plateau;	

Content Standard	Glencoe TechCONNECT Activities
b) processes (faulting, folding, volcanism, metamorphism, weathering, erosion, deposition, and sedimentation) and their resulting features; and	AC103, AC104, AC105, AC155
c) tectonic processes (subduction, rifting and sea floor spreading, and continental collision).	AC103, AC104, AC105
ES.9 The student will investigate and understand how freshwater resources are influenced by geologic processes and the activities of humans. Key concepts include	
a) processes of soil development;	AC155
b) development of karst topography;	AC155
c) identification of groundwater zones including the water table, zone of saturation, and zone of aeration;	AC163
d) identification of other sources of fresh water including rivers, springs, and aquifers, with reference to the hydrologic cycle;	AC163
e) dependence on freshwater resources and the effects of human usage on water quality; and	AC163
f) identification of the major watershed systems in Virginia including the Chesapeake Bay and its tributaries.	
ES.10 The student will investigate and understand that many aspects of the history and evolution of the Earth and life can be inferred by studying rocks and fossils. Key concepts include	
a) traces and remains of ancient, often extinct, life are preserved by various means in many sedimentary rocks;	AC081
b) superposition, cross-cutting relationships, index fossils, and radioactive decay are methods of dating bodies of rock;	
c) absolute and relative dating have different applications but can be used together to determine the age of rocks and structures; and	
d) rocks and fossils from many different geologic periods and epochs are found in Virginia.	
ES.11 The student will investigate and understand that oceans are complex, interactive physical, chemical, and biological systems and are subject to long- and short-term variations. Key concepts include	
a) physical and chemical changes (tides, waves, currents, sea level and ice cap variations, upwelling, and salinity variations);	

Content Standard	Glencoe TechCONNECT Activities
b) importance of environmental and geologic implications;	
c) systems interactions (density differences, energy transfer, weather, and climate);	
d) features of the sea floor (continental margins, trenches, mid-ocean ridges, and abyssal plains) as reflections of tectonic processes; and	
e) economic and public policy issues concerning the oceans and the coastal zone including the Chesapeake Bay.	
ES.12 The student will investigate and understand the origin and evolution of the atmosphere and the interrelationship of geologic processes, biologic processes, and human activities on its composition and dynamics. Key concepts include	
a) scientific evidence for atmospheric changes over geologic time;	
b) current theories related to the effects of early life on the chemical makeup of the atmosphere;	
c) comparison of the Earth's atmosphere to that of other planets;	AC034
d) atmospheric regulation mechanisms including the effects of density differences and energy transfer; and	AC102, AC145
e) potential atmospheric compositional changes due to human, biologic, and geologic activity.	AC102, AC145
ES.13 The student will investigate and understand that energy transfer between the sun and the Earth and its atmosphere drives weather and climate on Earth. Key concepts include	
a) observation and collection of weather data;	AC037
b) prediction of weather patterns;	AC037
c) severe weather occurrences, such as tornadoes, hurricanes, and major storms; and	AC037
d) weather phenomena and the factors that affect climate including radiation and convection.	AC037
ES.14 The student will investigate and understand scientific concepts related to the origin and evolution of the universe. Key concepts include	
a) nebulae;	
b) the origin of stars and star systems;	
c) stellar evolution;	

Content Standard	Glencoe TechCONNECT Activities
d) galaxies; and	AC119
e) cosmology including the big bang theory.	