



# Alignment Document

## State of West Virginia And Aventa Learning Earth Science

### Earth Science

#### 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
SC.10.1	Students will: demonstrate an understanding of the history of science and the evolvement of scientific knowledge, demonstrate an understanding of science as a human endeavor encompassing the contributions of diverse cultures and scientists, and demonstrate an understanding of the nature of science.		
SC.10.1.1	formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.		
SC.10.1.2	recognize that science has practical and theoretical limitations.		
SC.10.1.3	recognize that science is based on a set of observations in a testable framework that demonstrate basic laws that are consistent.	Planet Earth	Steps of the Scientific Method
SC.10.1.4	conclude that science is a blend of creativity, logic and mathematics.		
SC.10.1.5	trace the development of key historical concepts and principles describing their impact on modern thought and life by identifying the scientist's contributions.	Planet Earth	Astronomy

SC.10.2	Students will: demonstrate the abilities necessary to do scientific inquiry, demonstrate understanding about scientific inquiry, and demonstrate the ability to think and act as scientists by engaging in active inquiries, investigations and hands-on activities a minimum of 50% of the instructional time.		
SC.10.2.1	model and exhibit the skills, attitudes and/or values of scientific inquiry (e.g., curiosity, logic, objectivity, openness, skepticism, appreciation, diligence, integrity, ethical practice, fairness, creativity).		
SC.10.2.2	demonstrate ethical practices for science (e.g., established research protocol, accurate record keeping, replication of results and peer review).		
SC.10.2.3	apply scientific approaches to seek solutions for personal and societal issues.		
SC.10.2.4	properly and safely manipulate equipment, materials, chemicals, organisms and models.		
SC.10.2.5	conduct explorations in a variety of environments (e.g., laboratories, museums, libraries, parks and other outdoors locations).		
SC.10.2.6	use appropriate technology solutions (e.g., computer, CBL, probe interfaces, software) to measure and collect data; interpret data; analyze and/or report data; interact with simulations; conduct research; and present and communicate conclusions.		
SC.10.2.7	demonstrate science processes within a problem solving setting (e.g., observing, measuring, calculating, communicating, comparing, ordering, categorizing, classifying, relating, hypothesizing, predicting, inferring, considering alternatives, and applying).		

SC.10.2.8	design, conduct, evaluate and revise experiments (e.g., identify questions and concepts that guide investigations; design investigations; identify independent and dependent variables in experimental investigations; manipulate variables to extend experimental activities; use technology and mathematics to improve investigations and communications; formulate and revise scientific explanations and models using logic and evidence; recognize alternative explanations; communicate and defend a scientific argument).		
SC.10.3	Students will: = demonstrate an understanding of interdependent themes present in the natural and designed world (e.g., systems, order, and organization; evidence, models, and explanation; constancy, change and measurement; equilibrium and evolution; form and function), demonstrate the ability to identify, construct, test, analyze and evaluate systems, models, and changes, and demonstrate the ability to draw conclusions about and predict changes in natural and designed systems.		
SC.10.3.1	analyze systems to understand the natural and designed world; use systems analysis to make predictions about behaviors in systems; recognize order in units of matter, objects or events.		
SC.10.3.2	apply evidence from models to make predictions about interactions and changes in systems.		
SC.10.3.3	measure changes in systems using graphs and equations relating these to rate, scale, patterns, trends and cycles.		
SC.10.3.4	understand that different characteristics, properties or relationships within a system might change as its dimensions are increased or decreased (e.g., scale up, scale down).		

SC.10.4	Students will: demonstrate knowledge, understanding and applications of scientific facts, concepts, principles, theories and models as delineated in the objectives, demonstrate an understanding of the interrelationships among physics, chemistry, biology and the earth and space sciences, and apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.		
0	Science Subject Matter/Concepts		
SC.10.4.1	demonstrate an understanding of the interconnections of biological, earth and space and physical science concepts.		
0	The Cell and Molecular Basis for Heredity		
SC.10.4.2	identify and explain the structure and function of cell organelles (e.g., Golgi bodies, endoplasmic reticulum, mitochondria, chloroplasts, ribosomes, lysosomes, vacuoles).		
SC.10.4.3	compare the variations in cells, tissues and organs of different organisms (e.g., endocrine, nervous, digestion and immune systems).		
SC.10.4.4	identify mechanisms for the movement of materials into and out of cells (e.g., active and passive transport, endo- and exocytosis).		
SC.10.4.5	explore the discovery of DNA and its structure by constructing a model to demonstrate the nucleotide bonding and the double helix structure.		
SC.10.4.6	relate the role of DNA analysis to genetic disorders, forensic science, molecular genetics, and biotechnology (e.g., protein synthesis, heredity, cell division, cellular functions).		
SC.10.4.7	review principles of genetics (e.g., number of chromosomes, mutations, crossover, Punnett squares, linkage).		
0	Evolution and Interdependence of Organisms		
SC.10.4.8	compare the embryonic development of invertebrate and vertebrate animals (e.g., ontogeny and phylogeny, diversity, taxonomy).		

SC.10.4.9	construct and manipulate models which show variations in living things.		
SC.10.4.10	recognize that fossil records provide a scientific explanation for variation in the species and common ancestors.		
SC.10.4.11	relate the role of natural selection to the development, diversity and or extinction of a species.		
0	Matter, Energy, and Organization in Living Systems		
SC.10.4.12	construct diagrams showing energy flow and cycles of matter between chemical and biological systems including photosynthesis, stored chemical energy, decomposition, carbon and nitrogen cycles.		
SC.10.4.13	explain how the nervous, endocrine and immune systems work together in the human body.		
SC.10.4.14	review the needs of growing plants and the environments supplying those needs.		
SC.10.4.15	review factors that affect succession, populations and communities (e.g., use maps, graphs, charts, tables).		
SC.10.4.16	trace matter and energy flow through the respiration process (e.g., ATP, carbon, oxygen, water).		
0	Structure and Properties of Matter		
SC.10.4.17	investigate the properties of solutions including density, conductivity, solubility, concentration, pH and colligative properties.		
0	Chemical Reaction		
SC.10.4.18	differentiate among physical, chemical and nuclear changes and reactions.		
0	Energy		
SC.10.4.19	investigate the relationships among temperature, pressure and volume in gases and interpret graphs that depict these relationships (e.g., Charles' Law, Boyle's Law, Gay-Lussac's Law).		
SC.10.4.20	investigate and measure changes in thermal energy in physical and chemical changes.		

SC.10.4.21	compare and contrast the characteristics and uses of waves in various parts of the electromagnetic spectrum; calculate the frequency of a particular wavelength.		
SC.10.4.22	summarize the relationship between frequency and speed (e.g., Doppler effect).		
SC.10.4.23	qualitatively explain the relationship between electricity and magnetism and describe how electrical components of a circuit function.		
SC.10.4.24	qualitatively and quantitatively describe the conservation of energy (e.g., thermal, chemical, mechanical).		
0	Motions and Forces		
SC.10.4.25	apply Newton's Laws of Motion to depict the relationship among rate, force, momentum, work, and time using kinematics graph and mathematical models.		
SC.10.4.26	describe and quantify how machines can provide mechanical advantages.		
SC.10.4.27	determine the effect of different forces on vibrating systems (e.g., pendulums, springs).		
SC.10.4.28	demonstrate qualitative and quantitative understanding of pressure in various systems (e.g., water pipes, circuits, blood vessels).		
0	Energy in the Earth System		
SC.10.4.29	relate the characteristics and behavior of mechanical waves to earth processes (e.g., explain the formation of water waves as a function of wind velocity, duration, and fetch).		
SC.10.4.30	relate the cause of tides to their height and frequency.	Earth and Space	Earth and the Moon
SC.10.4.31	investigate effects of geological events on weather and climate (e.g., ocean currents and atmospheric conditions).	Changes in the Atmosphere	Heating the Atmosphere
		Changes in the Atmosphere	Wind
		Changes in the Atmosphere	Moisture in the Atmosphere
		Changes in the Atmosphere	Weather and Forecasting

SC.10.4.32	observe and describe the effects of water on the earth's surface (e.g., changes in particle size, slope, velocity).	Weathering, Erosion, and Deposition	Erosion, Deposition, and Landscape Development
SC.10.4.33	relate Earth's electromagnetic field to the dynamics of the magnetosphere.		
SC.10.4.34	discuss theories for the causes of plate tectonics.	Plate Tectonics, Volcanoes, Earthquakes, and Deformation	Internal Structure of the Earth
0	Geochemical Cycles		
SC.10.4.35	discuss physical and chemical relationships between minerals in rock cycle.	Minerals, Rocks and the Rock Cycle	Identifying Minerals
0	Origin and Evolution in the Earth Systems and Universe		
SC.10.4.36	investigate fossils as evidence for evolution and indicators of paleo-environments.		
SC.10.4.37	compare and contrast morphological features of fossils to present-day organisms.		
SC.10.4.38	use fossil evidence to estimate the relative and absolute ages of rock layers.	The History of Earth and the Atmosphere	The History of Earth
SC.10.4.39	compare and contrast the characteristics of Earth and the other planets relative to their distance from the Sun.	Earth and Space	The Solar System and the Universe
SC.10.4.40	interpret apparent motion of constellations and their relationship to the rotation of the earth.		
SC.10.5	Students will: demonstrate an understanding of the interdependence between science and technology, demonstrate the ability to distinguish between natural and man-made objects, demonstrate abilities of technological design, and demonstrate the ability to utilize technology to gather data and communicate designs, results and conclusions.		
SC.10.5.1	investigate and analyze the interdependence of science and technology.		
SC.10.5.2	research and design solutions to a personal or a societal problem created by technology.		

SC.10.5.3	compare and test modifications to an engineering design.		
SC.10.5.4	utilize technology to communicate designs, results and conclusions.		
SC.10.6	Students will: demonstrate the ability to evaluate personal and societal benefits when examining health, population, resource and environmental issues, demonstrate the ability to evaluate the impact of different points of view on health, population, resource and environmental practices, predict the long-term societal impact of specific health, population, resource and environmental practices, and demonstrate an understanding of public policy decisions as related to health, population, resource and environmental issues.		
SC.10.6.1	investigate the effects of natural phenomena on the habitat and habitat change.		
SC.10.6.2	research current environmental issues (e.g., depletion of fossil fuels, global warming, destruction of rainforest pollution).		
SC.10.6.3	describe the impact of cultural, technological, and economic influences on the evolving nature of scientific thought and knowledge.		
SC.10.6.4	explore occupational opportunities in science and technology including the academic preparation necessary.		
SC.10.6.5	engage in decision making activities and actions to resolve science-technology-society issues.		