



Alignment Document

State of Washington And Aventa Learning Earth Science

Earth Science

2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
1	The student understands and uses scientific concepts and principles		
1.1	use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things		
1.1.1	Physical Science		
1.1.1.a	use properties to sort natural and manufactured materials and objects, for example size, weight, shape, color, texture, and hardness	Minerals, Rocks, and the Rock Cycle	The Rock Cycle
		Minerals, Rocks, and the Rock Cycle	Identifying Minerals
1.1.1.b	describe the relative position and motion of objects		
1.1.1.c	describe experiences with sound, for example vibrations, echoes, and pitch; describe experiences with light in terms of bouncing off, passing through, and changes in path direction		
1.1.2	Earth/Space Science		
1.1.2.a	observe and examine physical properties of earth materials such as rocks and soil, water (as liquid, solid, and vapor) and the gases of the atmosphere	Minerals, Rocks, and the Rock Cycle	All Sections
1.1.3	Life Science		
1.1.3.a	distinguish living organisms from nonliving objects, and use characteristics to sort common organisms into plant and animal groups		



AVENTA LEARNING

1.2	recognize the components, structure, and organization of systems and the interconnections within and among them		
1.2.1	Systems		
1.2.1.a	identify the parts of a system, how the parts go together, and how they depend on each other		
1.2.2	Physical Science		
1.2.2.a	understand that energy keeps things running and comes in many forms	Minerals, Rocks, and the Rock Cycle	The Rock Cycle
		Minerals, Rocks, and the Rock Cycle	The Climate System
1.2.2.b	know that energy can be transferred between various forms		
1.2.2.c	know that matter is made of small particles		
1.2.2.d	know that matter can undergo changes of state such as evaporation, condensation, or freezing and thawing	Atmosphere and Climate	Heat and the Atmosphere
1.2.3	Earth/Space Science		
1.2.3.a	recognize that the earth is a spherical planet with a mainly solid interior and a surface composed of landforms, bodies of water, and an atmosphere	Astronomy	Earth, Sun, and Moon
1.2.3.b	know that the earth is one of several planets that orbits the sun, and the moon orbits the earth	Astronomy	Earth, Sun, and Moon
1.2.4	Life Science		
1.2.4.a	know that living things are composed of parts made of cells		
1.2.4.b	describe the life cycles of plants and animals, and recognize the differences between inherited and acquired characteristics		
1.2.4.c	understand the organization and function of human body structures and internal organs, and how they work together		
1.3	understand how interactions within and among systems cause changes in matter and energy		
1.3.1	Physical Science		
1.3.1.a	describe forces in terms of strength and direction		
1.3.1.b	investigate and recognize factors which determine the effects of a push or pull on the motion of objects		
1.3.2	Earth/Space Science		



1.3.2.a	identify processes that slowly change the surface of the earth such as erosion and weathering, and those that rapidly change the surface of the earth such as landslides, volcanic eruptions, and earthquakes	Weathering	All Sections
		Plate Tectonics, Earthquakes, and Volcanoes	Convergent Boundaries
		Plate Tectonics, Earthquakes, and Volcanoes	Divergent Boundaries
1.3.2.b	recognize that fossils provide evidence of plants, animals, and environments that existed long ago	Geologic Time	Fossils and Rocks
1.3.2.c	observe and measure weather indicators such as temperature, wind direction and speed, and precipitation, noting changes and patterns of change from day to day and over the seasons		
1.3.2.d	observe and describe the patterns of movement of the sun and moon relative to each other and the earth, and relate them to the earth's rotation		
1.3.3	Life Science		
1.3.3.a	recognize that living things need constant energy supplied from food or light and that, in ecosystems, substances such as air, water, nutrients, and the chemicals in food are continually recycled		
1.3.3.b	know that fossil records show patterns of structural change in organisms over time		
1.3.3.c	describe how an organism's behavior and ability to survive is influenced by its environment, other life forms, and availability of food and/or other resources		
1.3.3.d	know humans and other living things depend on the natural environment, and can cause changes in their environment that affect their ability to survive		
2	The student knows and applies the skills and processes of science and technology.		
2.1	develop abilities necessary to do scientific inquiry		
2.1.1	ask questions about objects, organisms, and events in the environment	Minerals, Rocks, and the Rock Cycle	Minerals Lab
		Minerals, Rocks, and the Rock Cycle	Rocks Lab



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2.1.2	plan and conduct simple investigations, using appropriate tools, measures, and safety rules	Minerals, Rocks, and the Rock Cycle	Minerals Lab
		Minerals, Rocks, and the Rock Cycle	Rocks Lab
2.1.3	use data to construct reasonable explanations	Minerals, Rocks, and the Rock Cycle	Minerals Lab
		Minerals, Rocks, and the Rock Cycle	Rocks Lab
		Plate Tectonics, Earthquakes, and Volcanoes	Earthquake Lab
2.1.4	model objects, events, or processes by representing them with concrete objects, metaphors, analogies, or other conceptual or physical constructs		
2.1.5	record and report observations, explanations, and conclusions using oral, written, and mathematical expression	Minerals, Rocks, and the Rock Cycle	Minerals Lab
		Minerals, Rocks, and the Rock Cycle	Rocks Lab
		Plate Tectonics, Earthquakes, and Volcanoes	Earthquake Lab
2.2	apply science knowledge and skills to solve problems or meet challenges		
2.2.1	identify problems found in familiar contexts in which science/technology can be or has been used to design solutions		
2.2.2	propose, design, and test a solution to a problem		
2.2.3	evaluate how well a design or a product solves a problem	Astronomy	Space Exploration Projects
3	The student understands the nature and contexts of science and technology.		
3.1	understand the nature of scientific inquiry		
3.1.1	understand that all scientific observations should be reported accurately even when they contradict expectations		
3.1.2	distinguish between questions that can be answered with science and technology and those that cannot		
3.1.3	explain why similar investigations may not produce similar results		
3.1.4	recognize that results of scientific investigations can come from expected and unexpected sources		



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3.1.5	know that ideas in science change as new scientific thinking, theories, and evidence arise	Plate Tectonics, Earthquakes, and Volcanoes	Introduction
		Plate Tectonics, Earthquakes, and Volcanoes	Development of Theory
3.2	know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace		
3.2.1	know that science and technology have been practiced by all peoples throughout history	Planet Earth	All Sections
3.2.2	recognize that people have invented tools for everyday life and for scientific investigations	Planet Earth	All Sections
3.2.3	identify the knowledge and skills of science, mathematics, and technology used in common occupations	Planet Earth	All Sections
1	The student understands and uses scientific concepts and principles		
1.1	use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things		
1.1.1	Physical Science		
1.1.1.a	use physical and chemical properties to sort and identify substances, for example density, boiling point, and solubility		
1.1.1.b	describe the positions, relative speeds, and changes in speed of objects		
1.1.1.c	describe sound, water waves, and light, using wave properties such as, wave length, reflection, refraction, transmission, absorption, scattering, and interference		
1.1.2	Earth/Space Science		
1.1.2.a	classify rocks and soils into groups based on their chemical and physical properties; describe the processes by which rocks and soils are formed	Minerals, Rocks, and The Rock Cycle	The Rock Cycle
1.1.3	Life Science		
1.1.3.a	categorize plants and animals into groups according to how they accomplish life processes and by similarities and differences in external and internal structures		



AVENTA LEARNING

1.2	recognize the components, structure, and organization of systems and the interconnections within and among them		
1.2.1	Systems		
1.2.1.a	describe how the parts of a system interact and influence each other		
1.2.2	Physical Science		
1.2.2.a	understand that energy is a property of substances and systems and comes in many forms, including stored energy, energy of motion, and heat energy such as heat, light, electrical, mechanical, sound, nuclear, and chemical		
1.2.2.b	determine factors that affect rate and amount of energy transfer; associate a decrease in one form of energy with an increase in another		
1.2.2.c	understand that all matter is made up of atoms, which may be combined in various kinds, ways, and numbers	Mineral, Rocks, and the Rock Cycle	Basic Chemistry and Atomic Structure of Matter
1.2.2.d	understand physical and chemical changes at the particle level, and know that matter is conserved	Mineral, Rocks, and the Rock Cycle	Chemical Reactions
		Mineral, Rocks, and the Rock Cycle	Atomic Structure
1.2.3	Earth/Space Science		
1.2.3.a	describe the components and relationships of the earth system, including the solid earth (crust, hot convecting mantle and dense metallic core), the hydrosphere (oceans, seas, lakes, rivers, and streams), and the atmosphere (a mixture of gases)	Plate Tectonics, Earthquakes, and Volcanoes	Introduction
		Atmosphere and Climate	Structure of the Atmosphere
1.2.3.b	describe the relationships of the earth to the sun, the moon, the other planets and their moons, and smaller objects such as asteroids and comets	Astronomy	Earth, Sun, Moon
		Astronomy	The Solar System
1.2.4	Life Science		
1.2.4.a	know that specialized cells within multicellular organisms form different kinds of tissues, organs, and organ systems to carry out life functions		



1.2.4.b	understand that all living things reproduce and pass on genetic information, and that an organism's characteristics are determined by both genetic and environmental influences		
1.2.4.c	identify and describe human life functions, and the interconnecting organ systems necessary to maintain human life such as digestion, respiration, reproduction, circulation, excretion, movement, disease prevention, control, and coordination		
1.3	understand how interactions within and among systems cause changes in matter and energy		
1.3.1	Physical Science		
1.3.1.a	know the factors that determine the strength of the various forces		
1.3.1.b	understand the effects of balanced and unbalanced forces on the motion of objects along a straight line		
1.3.2	Earth/Space Science		
1.3.2.a	describe the processes of constructive and destructive forces and how they continually change landforms on earth	Plate Tectonics, Earthquakes, and Volcanoes	Divergent Boundaries
		Plate Tectonics, Earthquakes, and Volcanoes	Convergent Boundaries
1.3.2.b	know the importance of fossils in documenting life and environmental changes over time	Geologic Time	Fossils and Rocks
1.3.2.c	relate global atmospheric movement and the formation of ocean currents to weather and climate	World of Weather	All Sections
		Atmosphere and Climate	Heating of the Atmosphere
1.3.2.d	describe how the regular and predictable motions of most objects in the solar system account for such phenomena as the day, year, phases of the moon, eclipses, seasons, and ocean tides	Astronomy	Earth, Sun, Moon
1.3.3	Life Science		
1.3.3.a	understand that individual organisms use matter and energy for life processes, and the mechanisms accomplishing these processes are complex, integrated, and regulated		



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1.3.3.b	describe how biological evolution accounts for species diversity, adaptation, natural selection, extinction, and change in organisms over time		
1.3.3.c	explain how organisms interact with their environment and with other organisms to acquire energy, cycle matter, influence behavior, and establish competitive or mutually beneficial relationships		
1.3.3.d	explain how human societies' use of natural resources affects quality of life and the health of ecosystems		
2	The student knows and applies the skills and processes of science and technology.		
2.1	develop abilities necessary to do scientific inquiry		
2.1.1	generate questions that can be answered through scientific investigations		
2.1.2	design, conduct, and evaluate scientific investigations, using appropriate equipment, mathematics, and safety procedures		
2.1.3	use evidence from scientific investigations to think critically and logically to develop descriptions, explanations, and predictions	Minerals, Rocks, The Rock Cycle	Mineral Lab
		Minerals, Rocks, The Rock Cycle	Rock Lab
		Plate Tectonics, Earthquakes, and Volcanoes	Earthquake Lab
2.1.4	correlate models of the behavior of objects, events, or processes to the behavior of the actual things; test models by predicting and observing actual behaviors or processes		
2.1.5	communicate scientific procedures, investigations, and explanations orally, in writing, with computer-based technology, and in the language of mathematics	Minerals, Rocks, The Rock Cycle	Mineral Lab
		Minerals, Rocks, The Rock Cycle	Rock Lab
		Plate Tectonics, Earthquakes, and Volcanoes	Earthquake Lab
2.2	apply science knowledge and skills to solve problems or meet challenges		



2.2.1	identify and examine common, everyday challenges or problems in which science/technology can be or has been used to design solutions	World of Weather	Hurricane Forecasting Discussion
		Atmosphere and Climate	Gulf Steam and Green House Effects Discussion Question
2.2.2	identify, design, and test alternative solutions to a challenge or problem		
2.2.3	compare and contrast multiple solutions to a problem or challenge		
3	The student understands the nature and contexts of science and technology.		
3.1	understand the nature of scientific inquiry		
3.1.1	understand the operational and ethical traditions of science and technology such as skepticism, cooperation, intellectual honesty, and proprietary discovery		
3.1.2	understand that scientific investigation is limited to the natural world		
3.1.3	provide more than one explanation for events or phenomena; defend or refute the explanations using evidence		
3.1.4	describe how methods of investigation relate to the validity of scientific, experiments, observations, theoretical models, and explanation		
3.1.5	explain how scientific theory, hypothesis generation, experimentation, and observation are interrelated and may lead to changing ideas	Geologic Time	Geologic Time Scale
		Plate Tectonics, Earthquakes, and Volcanoes	Introduction
		Plate Tectonics, Earthquakes, and Volcanoes	Development of Theory
		Plate Tectonics, Earthquakes, and Volcanoes	Ocean Floor Mapping
		Plate Tectonics, Earthquakes, and Volcanoes	Magnetic Striping
		Plate Tectonics, Earthquakes, and Volcanoes	Polar
		Plate Tectonics, Earthquakes, and	Sea Floor Spreading)

		Volcanoes	
3.2	know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace		
3.2.1	know that science and technology have been developed, used, and affected by many diverse individuals, cultures, and societies throughout human history	Planet Earth	All Sections
3.2.2	compare and contrast scientific inquiry and technological design in terms of activities, results, and influence on individuals and society; know that science enables technology and vice versa		
3.2.3	investigate the use of science, mathematics, and technology within occupational/career areas of interest	Planet Earth	All Sections
1	The student understands and uses scientific concepts and principles		
1.1	use properties to identify, describe, and categorize substances, materials, and objects, and use characteristics to categorize living things		
1.1.1	Physical Science		
1.1.1.a	examine the basis for the structure and use of the periodic table	Minerals, Rocks, and the Rock Cycle	Basic Chemistry
		Minerals, Rocks, and the Rock Cycle	Atomic Structure of Matter
1.1.1.b	describe the average speed, direction of motion, and average acceleration of objects, for example increasing, decreasing, or constant acceleration		
1.1.1.c	describe water waves and sound, relating the ideas of frequency, wave length, and speed, and by relating energy to amplitude		
1.1.2	Earth/Space Science		
1.1.2.a	correlate the chemical composition of earth materials - rocks, soils, water, gases of the atmosphere - with properties that determine their use to humans	Minerals, Rocks, and the Rock Cycle	The Rock Cycle
		The Atmosphere and Climate	Climate Systems
1.1.3	Life Science		
1.1.3.a	classify organisms into distinct groups according to structural, cellular, biochemical, and genetic characteristics		



AVENTA LEARNING

1.2	recognize the components, structure, and organization of systems and the interconnections within and among them		
1.2.1	Systems		
1.2.1.a	analyze systems, including the inputs and outputs of a system and its subsystems		
1.2.2	Physical Science		
1.2.2.a	understand many forms of energy as they are found in common situations on earth and in the universe		
1.2.2.b	understand that total energy is conserved; analyze decreases and increases in energy during transfers, in terms of total energy conservation		
1.2.2.c	relate the structural characteristics of atoms to the principles of atomic bonding		
1.2.2.d	analyze and explain the factors that affect physical and chemical changes, and how matter and energy are conserved in a closed system		
1.2.3	Earth/Space Science		
1.2.3.a	explain how patterns and arrangements of landforms, oceans, and atmosphere are determined by natural forces and how the theory of plate tectonics accounts for movement over time	Plate Tectonics, Earthquakes, and Volcanoes	All Sections
1.2.3.b	understand that the solar system is in a galaxy in an expanding universe composed of immense numbers of stars and celestial bodies	Astronomy	The Solar System
1.2.4	Life Science		
1.2.4.a	understand that specific genes regulate the functions performed by structures within the cells of multicellular organisms		
1.2.4.b	describe how genetic information (DNA) in the cell is controlled at the molecular level, and provides genetic continuity between generations		
1.2.4.c	compare and contrast the specialized structural and functional systems that regulate human growth and development, and maintain health		
1.3	understand how interactions within and among systems cause changes in matter and energy		
1.3.1	Physical Science		



1.3.1.a	identify various forces and their relative magnitudes, and explain everyday situations in terms of force		
1.3.1.b	explain the effects of unbalanced forces in changing the direction of motion of objects		
1.3.2	Earth/Space Science		
1.3.2.a	understand that patterns of movement in the plates that comprise the earth's surface are the result of outward transfer of the earth's internal heat, and that historical patterns of movement can be identified from clues in rock formations; describe how volcanoes and earthquakes in Washington State occur because of this interaction	Plate Tectonics, Earthquakes, and Volcanoes	All Sections
1.3.2.b	understand that fossils and radioactive elements can be used to correlate and determine the sequence of geologic events	Geologic Time	Fossils and Rocks
1.3.2.c	correlate global climate to energy transfer by the sun, cloud cover, the earth's rotation, and positions of mountain ranges and oceans	World of Weather	Wind
		World of Weather	Moisture
		World of Weather	Weather and Forecasting
1.3.2.d	understand that the earth, planets, sun, and the rest of the celestial bodies in the universe are continuing to evolve because of interactions between matter and forces of nature	Astronomy	The Solar System
1.3.3	Life Science		
1.3.3.a	explain how organisms can sustain life by obtaining, transporting, transforming, releasing, and eliminating matter and energy		
1.3.3.b	investigate and examine the scientific evidence used to develop theories for evolution, speciation, adaptation, and biological diversity		
1.3.3.c	compare and contrast the complex factors (biotic and abiotic) that affect living organisms' interactions in biomes, ecosystems, communities, and populations		
1.3.3.d	analyze the effects of natural events and human activities on the earth's capacity to sustain biological diversity		
2	The student knows and applies the skills and processes of science and technology.		
2.1	develop abilities necessary to do scientific inquiry		



2.1.1	study and analyze questions and related concepts that guide scientific investigations	Minerals, Rocks, The Rock Cycle	Mineral Lab
		Minerals, Rocks, and the Rock Cycle	Rock Lab
		Earthquakes, and Volcanoes	Earthquake Lab
2.1.2	design, conduct, and evaluate systematic and complex scientific investigations, using appropriate technology, multiple measures, and safe approaches		
2.1.3	formulate and revise scientific explanations and models using logic and evidence; recognize and analyze alternative explanations and predictions		
2.1.4	use mathematics, computers and/or related technology to model the behavior of objects, events, or processes	Minerals, Rocks, The Rock Cycle	Mineral Lab
		Minerals, Rocks, and the Rock Cycle	Rock Lab
		Earthquakes, and Volcanoes	Earthquake Lab
2.1.5	research, interpret, and defend scientific investigations, conclusions, or arguments; use data, logic, and analytical thinking as investigative tools; express ideas through oral, written, and mathematical expression	Astronomy	Space Exploration Project Discussion Question
2.2	apply science knowledge and skills to solve problems or meet challenges		
2.2.1	study and analyze challenges or problems from local, regional, national, or global contexts in which science/technology can be or has been used to design a solution	World of Weather	Hurricane Forecasting Discussion
		Atmosphere and Climate	Gulf Steam and Green House Effects Discussion Question
2.2.2	research, model, simulate, and test alternative solutions to a problem		
2.2.3	propose, revise, and evaluate the possible constraints, applications, and consequences of solutions to a problem or challenge		
3	The student understands the nature and contexts of science and technology.		
3.1	understand the nature of scientific inquiry		
3.1.1	analyze and explain why curiosity, honesty, openness, and skepticism are integral to scientific inquiry		



AVENTA LEARNING

3.1.2	identify and analyze factors that limit the extent of scientific investigation		
3.1.3	compare, contrast, and critique divergent results from scientific investigations based on scientific arguments and explanations		
3.1.4	analyze and evaluate the quality and standards of investigative design, processes, and procedures	Astronomy	Space Exploration Project Discussion Question
3.1.5	know that science involves testing, revising, and occasionally discarding theories; understand that scientific inquiry and investigation lead to a better understanding of the natural world and not to absolute truth	Plate Tectonics, Earthquakes, and Volcanoes	Introduction
		Plate Tectonics, Earthquakes, and Volcanoes	Development of Theory
3.2	know that science and technology are human endeavors, interrelated to each other, to society, and to the workplace		
3.2.1	analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies	Geologic Time	Age of the Earth Discussion Question
3.2.2	analyze how the scientific enterprise and technological advances influence and are influenced by human activity, for example societal, environmental, economical, political, or ethical considerations	Astronomy	Space Exploration Project Discussion Question
3.2.3	investigate the scientific, mathematical, and technological knowledge, training, and experience needed for occupational/career areas of interest	Planet Earth	All Sections