



Alignment Document

State of Georgia And Aventa Learning Earth Science

Earth Science 2005-2007 Benchmark Blueprint

State Standard Number	State Standard Area / Description	Unit Name	Course Topic Description
0	Earth Systems		
0	Co-Requisite - Characteristics of Science		
0	Habits of Mind		
SCSh1	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.		
SCSh1.a	Exhibit the above traits in their own scientific activities.		
SCSh1.b	Recognize that different explanations often can be given for the same evidence.		
SCSh1.c	Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.	Planet Earth	Astronomy
SCSh2	Students will use standard safety practices for all classroom laboratory and field investigations.		
SCSh2.a	Follow correct procedures for use of scientific apparatus.		
SCSh2.b	Demonstrate appropriate technique in all laboratory situations.		
SCSh2.c	Follow correct protocol for identifying and reporting safety problems and violations.		



SCSh3	Students will identify and investigate problems scientifically.		
SCSh3.a	Suggest reasonable hypotheses for identified problems.		
SCSh3.b	Develop procedures for solving scientific problems.		
SCSh3.c	Collect, organize and record appropriate data.		
SCSh3.d	Graphically compare and analyze data points and/or summary statistics.		
SCSh3.e	Develop reasonable conclusions based on data collected.		
SCSh3.f	Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.		
SCSh4	Students use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.		
SCSh4.a	Develop and use systematic procedures for recording and organizing information.		
SCSh4.b	Use technology to produce tables and graphs.		
SCSh4.c	Use technology to develop, test, and revise experimental or mathematical models.		
SCSh5	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.		
SCSh5.a	Trace the source on any large disparity between estimated and calculated answers to problems.		
SCSh5.b	Consider possible effects of measurement errors on calculations.		
SCSh5.c	Recognize the relationship between accuracy and precision.		
SCSh5.d	Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.		

SCSh5.e	Solve scientific problems by substituting quantitative values, using dimensional analysis and/or simple algebraic formulas as appropriate.		
SCSh6	Students will communicate scientific investigations and information clearly.		
SCSh6.a	Write clear, coherent laboratory reports related to scientific investigations.		
SCSh6.b	Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.		
SCSh6.c	Use data as evidence to support scientific arguments and claims in written or oral presentations.		
SCSh6.d	Participate in group discussions of scientific investigation and current scientific issues.		
0	The Nature of Science		
SCSh7	Students analyze how scientific knowledge is developed. Students recognize that:		
SCSh7.a	The universe is a vast single system in which the basic principles are the same everywhere.		
SCSh7.b	Universal principles are discovered through observation and experimental verification.	Planet Earth	Steps of the Scientific Method
SCSh7.c	From time to time, major shifts occur in the scientific view of how the world works. More often, however, the changes that take place in the body of scientific knowledge are small modifications of prior knowledge. Major shifts in scientific views typically occur after the observation of a new phenomenon or an insightful interpretation of existing data by an individual or research group.	Planet Earth	Astronomy
SCSh7.d	Hypotheses often cause scientists to develop new experiments that produce additional data.		

SCSh7.e	Testing, revising, and occasionally rejecting new and old theories never ends.		
SCSh8	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:		
SCSh8.a	Scientific investigators control the conditions of their experiments in order to produce valuable data.	Planet Earth	Steps of the Scientific Method
SCSh8.b	Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.		
SCSh8.c	Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.		
SCSh8.d	The merit of a new theory is judged by how well scientific data are explained by the new theory.		
SCSh8.e	The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.		
SCSh8.f	Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.		
SCSh9	Students will enhance reading in all curriculum areas by:		
SCSh9.a	Reading in all curriculum areas		
SCSh9.a.1	Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.		
SCSh9.a.2	Read both informational and fictional texts in a variety of genres and modes of discourse.		
SCSh9.a.3	Read technical texts related to various subject areas.		
SCSh9.b	Discussing books		

SCSh9.b.1	Discuss messages and themes from books in all subject areas.		
SCSh9.b.2	Respond to a variety of texts in multiple modes of discourse.		
SCSh9.b.3	Relate messages and themes from one subject area to messages and themes in another area.		
SCSh9.b.4	Evaluate the merit of texts in every subject discipline.		
SCSh9.b.5	Examine author's purpose in writing.		
SCSh9.b.6	Recognize the features of disciplinary texts.		
SCSh9.c	Building vocabulary knowledge		
SCSh9.c.1	Demonstrate an understanding of contextual vocabulary in various subjects.		
SCSh9.c.2	Use content vocabulary in writing and speaking.		
SCSh9.c.3	Explore understanding of new words found in subject area texts.		
SCSh9.d	Establishing context		
SCSh9.d.1	Explore life experiences related to subject area content.		
SCSh9.d.2	Discuss in both writing and speaking how certain words are subject area related.		
SCSh9.d.3	Determine strategies for finding content and contextual meaning for unknown words.		
0	Co-Requisite - Content		
SES1.	Students will investigate the composition and formation of Earth systems, including the Earth's relationship to the solar system.		
SES1.a	Describe the early evolution of the Earth and solar system, including the formation of Earth's solid layers (core, mantle, crust), the distribution of major elements, the origin of internal heat sources, and the mechanism by which heat transfer drives plate tectonics.	Earth and Space	The Solar System and the Universe
		Plate Tectonics, Volcanoes, Earthquakes and Deformation	Internal Structure of the Earth

SES1.b	Explain how the composition of the Earth's crust, mantle and core is determined and compare it to that of other solar system objects.	Earth and Space	The Solar System and the Universe
		Plate Tectonics, Volcanoes, Earthquakes and Deformation	Internal Structure of the Earth
SES1.c	Describe how the decay of radioactive isotopes is used to determine the age of rocks, Earth, and solar system.	The History of Earth and the Atmosphere	The History of Earth
SES1.d	Describe how the Earth acquired its initial oceans and atmosphere.		
SES1.e	Identify the transformations and major reservoirs that make up the rock cycle, hydrologic cycle, carbon cycle, and other important geochemical cycles.	Planet Earth	Earth as a Complex System
SES2.	Students will understand how plate tectonics creates certain geologic features, materials, and hazards.		
SES2.a	Distinguish among types of plate tectonic settings produced by plates diverging, converging, and sliding past each other.	Plate Tectonics, Volcanoes, Earthquakes, and Deformation of Earth's Crust	Earthquake activity
		Planet Earth	Earth as a Complex System
SES2.b	Relate modern and ancient geologic features to each kind of plate tectonic setting.		
SES2.c	Relate certain geologic hazards to specific plate tectonic settings.	Plate Tectonics, Volcanoes, Earthquakes, and Deformation of Earth's Crust	Earthquake activity
SES2.d	Associate specific plate tectonic settings with the production of particular groups of igneous and metamorphic rocks and mineral resources.	Minerals, Rocks, and the Rock Cycle	The Rock Cycle

SES2.e	Explain how plate tectonics creates and destroys sedimentary basins through time.	Plate Tectonics, Volcanoes, Earthquakes, and Deformation of Earth's Crust	Internal structure of the Earth
		Minerals, Rocks, and the Rock Cycle	The Rock Cycle
		Plate Tectonics, Volcanoes, Earthquakes, and Deformation of Earth's Crust	Earthquake activity
SES3.	Students will explore the actions of water, wind, ice, and gravity that create landforms and systems of landforms (landscapes).		
SES3.a	Describe how surface water and groundwater act as the major agents of physical and chemical weathering.	Weathering, Erosion, and Deposition	Weathering and Erosion
SES3.b	Explain how soil results from weathering and biological processes acting on parent rock.	Weathering, Erosion, and Deposition	Weathering and Erosion
SES3.c	Describe the processes and hazards associated with both sudden and gradual mass wasting.		
SES3.d	Relate the past and present actions of ice, wind, and water to landform distribution and landscape evolution.	Weathering, Erosion, and Deposition	Glaciers; Formation and Growth
		Weathering, Erosion, and Deposition	Erosion, Deposition, and Landscape Development
SES3.e	Explain the processes that transport and deposit material in terrestrial and marine sedimentary basins, which result, over time, in sedimentary rock.	Weathering, Erosion, and Deposition	Erosion, Deposition, and Landscape Development
SES4.	Students will understand how rock relationships and fossils are used to reconstruct the Earth's past.		
SES4.a	Describe and apply principles of relative age (superposition, original horizontality, cross-cutting relations, and original lateral continuity) and describe how unconformities form.		

SES4.b	Interpret the geologic history of a succession of rocks and unconformities.		
SES4.c	Apply the principle of uniformitarianism to relate sedimentary rock associations and their fossils to the environments in which the rocks were deposited.		
SES4.d	Explain how sedimentary rock units are correlated within and across regions by a variety of methods (e.g., geologic map relationships, the principle of fossil succession, radiometric dating, and paleomagnetism).	The History of Earth and the Atmosphere	The History of Earth
SES4.e	Use geologic maps and stratigraphic relationships to interpret major events in Earth history (e.g., mass extinction, major climatic change, tectonic events).		
SES5.	Students will investigate the interaction of insolation and Earth systems to produce weather and climate.		
SES5.a	Explain how latitudinal variations in solar heating create atmospheric and ocean currents that redistribute heat globally.	Changes in the Atmosphere	The Atmosphere
		Changes in the Atmosphere	Heating the Atmosphere
SES5.b	Explain the relationship between air masses and the surfaces over which they form.	Changes in the Atmosphere	Heating the Atmosphere
SES5.c	Relate weather patterns to interactions among ocean currents, air masses, and topography.	Changes in the Atmosphere	Heating the Atmosphere
		Changes in the Atmosphere	Wind
		Changes in the Atmosphere	Weather and Forecasting
SES5.d	Describe how temperature and precipitation produce the pattern of climate regions (classes) on Earth.		

SES5.e	Describe the hazards associated with extreme weather events and climate change (e.g., hurricanes, tornadoes, El Niño/La Niña, global warming).	Changes in the Atmosphere	Weather and Forecasting
SES5.f	Relate changes in global climate to variation in Earth/Sun relationships and to natural and anthropogenic modification of atmospheric composition.	The History of the Earth and Atmosphere	The Atmosphere
SES6.	Students will explain how life on Earth responds to and shapes Earth systems.		
SES6.a	Relate the nature and distribution of life on Earth, including humans, to the chemistry and availability of water.		
SES6.b	Relate the distribution of biomes (terrestrial, freshwater, and marine) to climate regions through time.		
SES6.c	Explain how geological and ecological processes interact through time to cycle matter and energy, and how human activity alters the rates of these processes (e.g., fossil fuel formation and combustion).		
SES6.d	Describe how fossils provide a record of shared ancestry, evolution, and extinction that is best explained by the mechanism of natural selection.		
SES6.e	Identify the evolutionary innovations that most profoundly shaped Earth systems: photosynthetic prokaryotes and the atmosphere; multicellular animals and marine environments; land plants and terrestrial environments.		