

Earth Science

SC.O.ES.1.1	formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.	
	<ul style="list-style-type: none"> • Explain using historical observations 	Level 1
	<ul style="list-style-type: none"> • Explain/discuss using experimental evidence 	Level 2
SC.O.ES.1.2	demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., “scientific method”).	
	<ul style="list-style-type: none"> • Use scientific method to seek solutions for personal issues 	Level 2
	<ul style="list-style-type: none"> • Use scientific method to seek solutions for societal issues 	Level 2/3
SC.O.ES.1.3	relate societal, cultural, and economic issues to key scientific innovations.	
	<ul style="list-style-type: none"> • relate societal issues to key scientific innovations. 	Level 1
	<ul style="list-style-type: none"> • relate cultural issues to key scientific innovations. 	Level 1
	<ul style="list-style-type: none"> • relate economic issues to key scientific innovations. 	Level 1
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).	
	<ul style="list-style-type: none"> • conduct investigations that incorporate scientific inquiry 	Level 2
	<ul style="list-style-type: none"> • design investigations that incorporate scientific inquiry 	Level 2
SC.O.ES.1.5	implement safe procedures and practices when manipulating equipment, materials, organisms, and models.	Level 2
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.	
	<ul style="list-style-type: none"> • Use technology to collect data 	Level 2
	<ul style="list-style-type: none"> • Use technology to analyze data 	Level 2
	<ul style="list-style-type: none"> • Use technology to report and communicate 	Level 2
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).	
	<ul style="list-style-type: none"> • Design experiment that produces data 	Level 3
	<ul style="list-style-type: none"> • Conduct experiment that produces data 	Level 2
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).	
	<ul style="list-style-type: none"> • Draw conclusions 	Level 3
	<ul style="list-style-type: none"> • Use visuals 	Level 3
	<ul style="list-style-type: none"> • evaluate 	Level 3
	<ul style="list-style-type: none"> • predict 	Level 3
SC.O.ES.2.1	identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.	
	<ul style="list-style-type: none"> • ID Structure of lithosphere, hydrosphere, atmosphere and biosphere. 	Level 1
	<ul style="list-style-type: none"> • Describe the origin of lithosphere, hydrosphere, atmosphere and biosphere. 	Level 1
	<ul style="list-style-type: none"> • Describe evolution of lithosphere, hydrosphere, atmosphere and biosphere. 	Level 1
SC.O.ES.2.2	analyze seismic, density, gravity, and magnetic data to explain the structure of the earth.	
	<ul style="list-style-type: none"> • analyze seismic data to explain the structure of the earth. 	Level 2
	<ul style="list-style-type: none"> • analyze density data to explain the structure of the earth. 	Level 2
	<ul style="list-style-type: none"> • analyze gravity data to explain the structure of the earth. 	Level 2
	<ul style="list-style-type: none"> • analyze magnetic data to explain the structure of the earth. 	Level 2
SC.O.ES.2.3	characterize the eras, epochs and periods in relation to earth history and geologic development.	
SC.O.ES.2.4	analyze radiometric dating and rock and fossil evidence to determine the age of substances.	
SC.O.ES.2.5	use chemical and physical properties to distinguish between common minerals and explain their economic uses.	
SC.O.ES.2.6	use rock characteristics to predict paleoenvironments or geologic conditions which existed during the formation of a given rock sample.	
SC.O.ES.2.7	investigate and describe the properties of water, which contribute to its critical role in physical and chemical weathering.	
SC.O.ES.2.8	compare and contrast the effectiveness of agents and processes of degradation, i.e., <ul style="list-style-type: none"> • weathering by gravity, • wind, • water, • ice. 	
SC.O.ES.2.9	predict geologic activity associated with specific plate boundaries and interactions.	
SC.O.ES.2.10	analyze modern and historical seismic information to determine	

	epicenter location and magnitude of earthquakes.	
SC.O.ES.2.11	evaluate current explanations for mechanisms, which drive the motion of plates (convection, slab-pull, plate push).	
SC.O.ES.2.12	relate the effect of degradation and tectonic forces on the earth's surface features, i.e., <ul style="list-style-type: none"> • weathering, • physical features of the ocean floor, • life with the oceans. 	
SC.O.ES.2.13	construct and/or interpret information on topographic maps.	
SC.O.ES.2.14	identify and describe chemical and physical properties of oceans, i.e., <ul style="list-style-type: none"> • composition, • currents, • physical features of the ocean floor. 	
SC.O.ES.2.15	compare and contrast characteristics of the various oceans, including their lateral and vertical motions.	
SC.O.ES.2.16	analyze the evolution of the ocean floor including ocean crust, sedimentation, active and passive continental margins.	
SC.O.ES.2.17	examine the stratification of the oceans, i.e., <ul style="list-style-type: none"> • temperature, • salinity zones, • biological zones. 	
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).	
SC.O.ES.2.19	predict the effects of ocean currents on climate.	
SC.O.ES.2.20	use meteorological evidence and weather maps (including air masses, wind, barometric pressure, and temperature data) to forecast weather.	
SC.O.ES.2.21	examine global change over time, i.e., <ul style="list-style-type: none"> • climatic trends, • global warming, • ozone depletion. 	
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-earth-moon system.	
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.	
SC.O.ES.2.24	compare ancient and modern methods of studying and uses for astronomy (e.g., calendar, navigation).	
SC.O.ES.2.25	use various wavelengths of the electromagnetic spectrum to investigate the observable universe.	
SC.O.ES.2.26	compare the relationship between earth processes and natural disasters with their impact on humans.	
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.	
SC.O.ES.2.28	research alternative energy sources and evaluate the ecological, environmental and economic cost-benefit ratio.	
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).	
SC.O.ES.3.2	investigate, compare and design scientific and technological solutions to address personal and societal problems.	
SC.O.ES.3.3	communicate experimental designs, results and conclusions using advanced technology tools.	
SC.O.ES.3.4	collaborate to present research on current environmental and technological issues and predict possible solutions.	
SC.O.ES.3.5	explore occupational opportunities in science, engineering and technology and evaluate the required academic preparation.	
SC.O.ES.3.6	given a current science-technology-societal issue, construct and defend potential solutions.	