

## Earth Science CR

State Standard Number	State Standard Area/Description	Unit Name	Course Topic Description
SC.S.ES.1	Students will demonstrate an understanding of history and nature of science as a human endeavor encompassing the contributions of diverse cultures and scientists. demonstrate the ability to use the inquiry process to solve problems.		
SC.O.ES.1.1	formulate scientific explanations based on historical observations and experimental evidence, accounting for variability in experimental results.		
SC.O.ES.1.2	demonstrate how a testable methodology is employed to seek solutions for personal and societal issues (e.g., "scientific method").	Introduction to Earth Science	Scientific Method
SC.O.ES.1.3	relate societal, cultural, and economic issues to key scientific innovations.	Introduction to Earth Science	Enrichment Activity: Environmental Issues in Science
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).		
SC.O.ES.1.5	implement safe procedures and practices when manipulating equipment, materials, organisms, and models.		
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.		

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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).		
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).	Introduction to Earth Science	Scientific Method
SC.S.ES.2	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, earth/environmental science and astronomy. apply knowledge, understanding and skills of science subject matter/concepts to daily life experiences.		
SC.O.ES.2.1	identify and describe the structure, origin, and evolution of the lithosphere, hydrosphere, atmosphere and biosphere.		
SC.O.ES.2.2	analyze seismic, density, gravity, and magnetic data to explain the structure of the earth.	The Interior of the Earth	The Interior of the Earth: Introduction

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SC.O.ES.2.3	characterize the eras, epochs and periods in relation to earth history and geologic development.	Geologic Time, Relative Age Dating, and Absolute Age Dating	Geologic Time and Radiometric Dating
SC.O.ES.2.4	analyze radiometric dating and rock and fossil evidence to determine the age of substances.	Geologic Time, Relative Age Dating, and Absolute Age Dating	Geologic Time and Radiometric Dating
SC.O.ES.2.5	use chemical and physical properties to distinguish between common minerals and explain their economic uses.	Earth's Materials	Characteristics of Minerals The Importance of Minerals
SC.O.ES.2.6	use rock characteristics to predict paleoenvironments or geologic conditions which existed during the formation of a given rock sample.	Earth's Materials	Igneous Rocks Sedimentary Rocks Metamorphic Rocks
SC.O.ES.2.7	investigate and describe the properties of water, which contribute to its critical role in physical and chemical weathering.	The Surface of the Earth	Mechanical Weathering Chemical Weathering
SC.O.ES.2.8	compare and contrast the effectiveness of agents and processes of degradation, i.e.,		
SC.O.ES.2.8.a	weathering by gravity,		

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SC.O.ES.2.8.b	wind,	The Surface of the Earth	Mechanical Weathering
SC.O.ES.2.8.c	water,	The Surface of the Earth	Mechanical Weathering Chemical Weathering
SC.O.ES.2.8.d	ice.	The Surface of the Earth	Mechanical Weathering
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.	The Interior of the Earth	Measuring 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.,		

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SC.O.ES.2.12.a	weathering,	The Surface of the Earth	Mechanical Weathering Chemical Weathering
SC.O.ES.2.12.b	physical features of the ocean floor,	The Interior of the Earth	The Ocean Floor
SC.O.ES.2.12.c	life with the oceans.		
SC.O.ES.2.13	construct and/or interpret information on topographic maps.	The Surface of the Earth	Topographic Maps
SC.O.ES.2.14	identify and describe chemical and physical properties of oceans, i.e.,		
SC.O.ES.2.14.a	composition,	The World's Water	Characteristics of Ocean Water
SC.O.ES.2.14.b	currents,	The World's Water	Currents

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SC.O.ES.2.14.c	physical features of the ocean floor.	The World's Water	Structure of the Ocean Basin
SC.O.ES.2.15	compare and contrast characteristics of the various oceans, including their lateral and vertical motions.	The World's Water	Currents Density
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.,		
SC.O.ES.2.17.a	temperature,		
SC.O.ES.2.17.b	salinity zones,		
SC.O.ES.2.17.c	biological zones.		

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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).	The World of Weather	Wind Moisture
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.	The World of Weather	Weather Forecasting
SC.O.ES.2.21	examine global change over time, i.e.,		
SC.O.ES.2.21.a	climatic trends,		
SC.O.ES.2.21.b	global warming,		
SC.O.ES.2.21.c	ozone depletion.		

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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).	Introduction to Earth Science	Astronomy
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.	The Interior of the Earth	Faults and Earthquakes Volcanoes
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.	Earth's Environment	From Fossil Fuels to Renewable Energy

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SC.S.ES.3	Students will demonstrate the ability to use inquiry process to explore systems, models, and changes. demonstrate an understanding of the interdependence between science and technology. demonstrate an understanding of the utilization of technology to gather data and communicate designs, results and conclusions.		
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.		



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SC.O.ES.3.6	given a current science-technology-societal issue, construct and defend potential solutions.		
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