

Correlation to Colorado Grade 10 Science CSAP Framework

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
ES.4.1.a 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	Students know and understand the composition of Earth, its history, and the natural processes that shape it.	describing the composition and structure of Earth's interior;	99 100 126	formation of Earth's layers description of Earth's layers formation of magma in Earth's mantle		

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ES.4.1.b 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	Students know and understand the composition of Earth, its history, and the natural processes that shape it.	using the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid-ocean ridges, and deep-sea trenches;	102	definition of plate tectonics	53	identifying tectonic plates and plate boundaries
				102	predicting what Earth might look like in 50 million years		
				106	theory of plate tectonics	54	predicting plate movement over 50 million years and the resultant land features
				107	describing plate boundaries		
				108	land features resulting from divergent plate boundaries		
				108	divergent plate boundaries		
				109	resulting land features from subduction		
				109	convergent plate boundaries		
				110	land features resulting from transform plate boundaries		
				110	transform plate boundaries		
				111	earthquakes and plate tectonics		
				121	predict separation of North America and Europe in 75 million years		
				122	predict effects of divergent plate boundaries on Great Rift Valley		

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				126	formation of magma in Earth's mantle		
				126	geologic basis for volcanic eruptions		
				127	where volcanic activity occurs		
				129	geologic basis for shield volcanoes		
				130	geologic basis for stratovolcanoes		
				131	geologic bases for cinder cone volcanoes		
				137	mountain-building		
				138	changes in land features due to erosion		
				140	effect of glaciers on land		
ES.4.1.c 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	Students know and understand the composition of Earth, its history, and the natural processes that shape it.	using evidence (for example, fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time (for example, Mount St. Helens' eruption);	33	global warming	49	determining the relative ages of rock formations
				96	relative dating	50	sequencing events in a geologic cross-section
				97	interpreting rock formations		
				97	faunal succession		
				98	table and description of the geologic time scale		
				140	ice ages		
				143	studying moon rocks on Earth		

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ES.4.1.d 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know and understand the composition of Earth, its history, and the natural processes that shape it.	evaluating the feasibility of predicting and controlling natural events (for example, earthquakes, floods, landslides); and	111	causes and descriptions of earthquakes	52	reading a bathymetric map
				113	earthquakes rating scales	53	using a geologic hazard map of frequent earthquakes
				114	where earthquakes occur		
				115	earthquake hazard map	56	construct an earthquake model
				128	types and shapes of volcanoes	57	simulate an earthquake
				129	shield volcanoes	60	understanding the Volcanic Explosivity Index
				129	formation of shield volcanoes due to hot spots	61	finding a pattern of volcanoes related to the locations of plate boundaries
				130	stratovolcanoes		
				130	formation of stratovolcanoes due to subduction		
				141	geologic hazard maps		
				154	using a geologic hazard map		

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ES.4.1.e 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	Students know and understand the composition of Earth, its history, and the natural processes that shape it.	analyzing the costs, benefits, and consequences of natural resource exploration, development, and consumption.	23	nitrogen cycle	40	actions to take to improve water quality
				31	effects of CFC's on the ozone layer	40	predict the quality of surface water to be tested and justify your answer
				34	effects of burning fossil fuels	40	predict the quality of surface water to be tested and justify your answer
				67	permafrost	41	address what you can do to maintain or improve the water quality at the test site
				77	The Clean Water Act	44	the effects of acid rain on organisms in aquatic environments
				79	water quality testing		
				80	water quality testing		
				81	effects of acid rain on the soil		
				81	effects of acid rain on natural environments		
				81	acid rain		
				87	impact of increased CO2 on oceans		
				87	impact of increased CO2 in oceans		
				88	pollution and the ocean food chain		
				89	pollution and the ocean food chain		
				116	using seismic waves for oil and gas exploration		
				134	mineral deposits and diamonds		

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Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
ES.4.2.a 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space.	Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.	analyzing the structure of, and changes in, the atmosphere, and its significance for life on Earth;	3	thermometers	10	construct and use an aneroid barometer
				4	thermometers	14	detecting ozone which is a protective atmosphere gas against high energy radiation
				23	description of Earth's atmosphere		
				23	composition of Earth's atmosphere	18	investigate the temperature effects of greenhouse gases
				24	effect of life on Earth's atmosphere	2	accurately measuring temperature using thermometers
				25	definition of atmospheric pressure	29	exploring how temperature-dependent layering creates currents
				26	measuring atmospheric pressure with barometers	34	using Doppler radar images to detect and track storms
				27	how atmospheric pressure changes with altitude	44	the effects of acid rain on organisms in aquatic environments
				28	graph showing atmospheric pressure vs. altitude	47	effect of ocean on carbon dioxide levels in the atmosphere
				29	layers of the atmosphere		
				30	layers of the atmosphere		
				33	greenhouse effect and greenhouse gasses		
				34	changes to the oceans due to increasing global temperatures		
				45	convection currents in the atmosphere		
				47	global wind patterns		
				49	slings psychrometer		

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				54	effects of moving air masses		
				54	cold fronts		
				55	jet streams		
				55	warm fronts		
				56	temperature inversion		
				81	acid rain		
				82	causes and health effects of acid rain		
				83	illustration of acid rain formation		
				84	oceans as part of the hydrosphere		
				87	impact of increased CO ₂ on oceans		
				142	how urban sprawl changes local climate		

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ES.4.2.b 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.	explaining and analyzing general weather patterns by collecting, plotting, and interpreting data;	3 4 26 37 44 49 49 50 51 53 57 58 59 70	thermometers thermometers measuring atmospheric pressure with barometers computer modeling to predict greenhouse effects Earth's tilt causes seasons sling psychrometer factors which influence the weather phase changes in the atmosphere and dewpoint cloud formation forms of precipitation description of thunderstorms description of hurricanes description of tornadoes create a model to explain why Earth has seasons	10 2 25 33 34 35 36	construct and use an aneroid barometer accurately measuring temperature using thermometers investigating factors which cause the seasons finding relative humidity using Doppler radar images to detect and track storms use radar to detect a tornado using radar to track a hurricane

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ES.4.2.c 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.	describing how energy transfer within the atmosphere influences weather (for example, the role of conduction, radiation, convection, and heat of condensation in clouds, precipitation, winds, storms);	32	distribution of incoming solar radiation	18	investigate the temperature effects of greenhouse gases
				33	Earth's "energy budget"	23	research how large bodies of water affect climate
				33	greenhouse effect and greenhouse gasses	23	research how large bodies of water affect climate
				37	Earth's internal energy	23	research how large bodies of water affect climate
				43	Earth's temperature varies with latitude	29	exploring how temperature-dependent layering creates currents
				45	convection currents in the atmosphere	31	understanding the Atlantic gyre
				46	the Coriolis effect	39	research a particular biome
				47	global wind patterns	47	effect of ocean on carbon dioxide levels in the atmosphere
				48	effects of the Gulf Stream on climate of Great Britain		
				48	descriptions of ocean currents and their effects on climate		
				49	water in the atmosphere affects weather patterns		
				54	cold fronts		
				54	effects of moving air masses		
				55	jet streams		
				55	warm fronts		
				56	rotation of air masses due to Coriolis effect		

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				60	causes and effects of the El Nino Southern Oscillation		
				62	different types of deserts and how they are formed		
				62	effect of cold ocean currents on formation of fog desserts		
				63	how tropical rainforests are formed		
				63	effect of warm ocean currents on formation of tropical rainforest		
				65	effect of large bodies of water on climate		
				67	alpine tundra occurs at high altitudes		

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ES.4.2.d 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.	investigating and explaining the occurrence and effects of storms on human populations and the environment; and	49	factors which influence the weather	35	use radar to detect a tornado
				51	cloud formation	35	describe what safety precautions the National Weather Service recommends for tornado conditions
				57	description of thunderstorms		
				58	description of hurricanes		
				59	description of tornadoes	36	using radar to track a hurricane
				70	write an action plan to stay safe during a tornado		

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ES.4.2.e 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know and understand the general characteristics of the atmosphere and fundamental processes of weather.	describing and explaining factors that may influence weather and climate (for example, proximity to oceans, prevailing winds, fossil fuel burning, volcanic eruptions).	33	greenhouse effect and greenhouse gasses	18	investigate the temperature effects of greenhouse gases
				45	convection currents in the atmosphere	23	research how large bodies of water affect climate
				46	the Coriolis effect	29	exploring how temperature-dependent layering creates currents
				47	global wind patterns	31	understanding the Atlantic gyre
				48	descriptions of ocean currents and their effects on climate	39	research a particular biome
				49	water in the atmosphere affects weather patterns	47	effect of ocean on carbon dioxide levels in the atmosphere
				54	effects of moving air masses		
				54	cold fronts		
				55	jet streams		
				55	warm fronts		
				56	rotation of air masses due to Coriolis effect		
				60	causes and effects of the El Nino Southern Oscillation		
				62	different types of deserts and how they are formed		
				63	how tropical rainforests are formed		

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ES.4.3.a 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.	identifying and explaining factors that influence the quality of water needed to sustain life;	77 77 78 79 80 81 84 87 88 89 133	The Clean Water Act water quality standards importance of water analysis water quality testing water quality testing acid rain oceans in the water cycle impact of increased CO2 on oceans pollution and the ocean food chain pollution and the ocean food chain volcanoes and water vapor	40 41 44	predict the quality of surface water to be tested and justify your answer address what you can do to maintain or improve the water quality at the test site the effects of acid rain on organisms in aquatic environments

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ES.4.3.b 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.	identifying and analyzing the costs, benefits, and consequences of using water resources;	23	nitrogen cycle	28	investigate how the ocean's salinity affects its density
				77	water quality standards	40	actions to take to improve water quality
				77	The Clean Water Act	40	predict the quality of surface water to be tested and justify your answer
				78	importance of water analysis	40	predict the quality of surface water to be tested and justify your answer
				79	water quality testing	41	address what you can do to maintain or improve the water quality at the test site
				80	water quality testing	41	address what you can do to maintain or improve the water quality at the test site
				81	effects of acid rain on natural environments	44	the effects of acid rain on organisms in aquatic environments
				81	acid rain		
				85	sources of salts in the ocean		
				86	composition of seawater		
				87	impact of increased CO ₂ on oceans		
				88	pollution and the ocean food chain		
				89	pollution and the ocean food chain		
				138	landforms shaped by water		

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ES.4.3.c 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.	explaining interactions between water and other Earth systems (for example, the biosphere, lithosphere, and atmosphere); and	23 24 29 30 34 83 84 142	description of Earth's atmosphere effect of life on Earth's atmosphere layers of the atmosphere layers of the atmosphere changes to the oceans due to increasing global temperatures illustration of acid rain formation oceans as part of the hydrosphere how urban sprawl changes local climate		
ES.4.3.d 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know major sources of water, its uses, importance, and cyclic patterns of movement through the environment.	explaining interrelationships between the circulation of oceans and weather and climate.	48 60	descriptions of ocean currents and their effects on climate causes and effects of the El Nino Southern Oscillation	23 31	research how large bodies of water affect climate understanding the Atlantic gyre

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ES.4.4.a 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	explaining the causes of and modeling the varied lengths of days, seasons, and phases of the Moon;	44 70 158 162 163 181 182 183 184 185	Earth's tilt causes seasons create a model to explain why Earth has seasons the lunar cycle lunar eclipses solar eclipses properties of the moon the moon as a satellite of Earth the moon's effect on tides on Earth the Earth-moon system giant impact theory	25 62 74 75	investigating factors which cause the seasons why studying the moon's surface is useful for understanding Earth modeling the lunar cycle constructing a lunar calendar
ES.4.4.b 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	describing the effect of gravitation on the motions observed in the solar system and beyond;	186 186 187 193 194	Johannes Kepler orbits of planets around the sun Kepler's elliptically shaped orbits asteroids and comets meteors and meteorites and the Kuiper Belt	80	simulate an object in orbit and investigate how orbital period varies within distance

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ES.4.4.c 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	describing electromagnetic radiation produced by the Sun and other stars (for example, X-ray, ultraviolet, visible light, infrared, radio);	31	ultraviolet and infrared light		
ES.4.4.d 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	comparing the Sun with other stars (for example, size, color, temperature); and	189 196 198 199 209 211	classifying the planets descriptions of the sun and comparisons to other stars features and diagram of the sun features and emissions of the sun size of the sun compare to other stars H-R diagrams comparing temperature and brightness of stars		

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ES.4.4.e 9 - 12	Earth and Space Science: Students know and understand the processes and interactions of Earth's systems and the structure and dynamics of Earth and other objects in space. (Focus: Geology, Meteorology, Astronomy, Oceanography)	Students know the structure of the solar system, composition and interactions of objects in the universe, and how space is explored.	identifying and describing the everyday impact of recent space technology (for example, more sophisticated computers, remote sensing, medical imaging).	35 77 83 112 118 168 169 170 171 172 173 208	hydrogen powered cars the clean water act catalytic converters and scrubbing reduce acid rain what we can learn from seismographs understanding earthquakes allows engineers to design safer buildings history of the telescope types and uses of telescopes types and uses of telescopes satellites as tools of astronomy spacecraft as tools of astronomy how the space shuttle works the use of spectroscopy to analyze stars	88 92	understand why spectroscopy is an important tool of astronomers measuring apparent brightness to calculate the distance to stars and galaxies

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INQ.1.a 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		asking questions and stating hypotheses, using prior scientific knowledge to help guide their development;	3	what is temperature	24	formulate a hypothesis about why the seasons occur
				8	asking questions pertaining to specific heat and heat flow	44	formulate hypothesis
				24	why is Earth's atmosphere different from other planets		
				25	why do ears pop		
				44	why does Earth have seasons		
				53	how does rain form		
				61	how do animals survive in the desert		
				67	what is a carbon sink		
				73	why haven't we run out of water		
				78	what is in your tap water		
				81	what is acid rain		
				85	why are oceans salty		
				104	proving hypotheses for sea-floor spreading		
				108	why doesn't Earth get bigger and bigger		
				154	form a hypothesis		
				162	what causes eclipses		
				195	is Pluto a planet		

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INQ.1.b 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		creating and defending a written plan of action for a scientific investigation;			57	identifying how the earthquake model represents an earthquake
INQ.1.c 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		selecting and using appropriate technologies to gather, process, and analyze data and to report information related to an investigation;			2 26 4 8	use a thermometer use a multimeter and solar cell use a thermometer and immersion heater use a timer and thermometer
INQ.1.d 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		identifying major sources of error or uncertainty within an investigation (for example, particular measuring devices and experimental procedures);	37 117 121 179	what percentage comes from this source? (problem 4) determining distance to an epicenter what explains the difference in density? (#5) how big is Earth?	13 15	calculating error between your barometer and a commercial barometer importance of good record keeping in order to avoid error

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INQ.1.e 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		constructing and revising scientific explanations and models, using evidence, logic, and experiments that include identifying and controlling variables;			13 13 19 22 27 3 47 5 55 6 71	evaluating your aneroid barometer design constructing a graph from atmospheric pressure data graphing water and ice temperature readings constructing a graph of time vs. temperature determining whether distance from light source or axial tilt plays a more significant role in causing the seasons construct a graphical model constructing a graph of drops of acid vs pH construct a temperature vs. time graph evaluating your completed bathymetric map effect of changing mass on collected data evaluate your ability to interpret rock formations

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INQ.1.f 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		communicating and evaluating scientific thinking that leads to particular conclusions;	28	atmospheric pressure at various altitudes graph	33	determining relationship between temperature of the atmosphere and relative humidity
				98	Kelvin's calculations of Earth's age	34	interpreting Doppler radar images
				152	Moh's hardness scale	61	finding a pattern of volcanoes on a bathymetric map
				219	apparent brightness vs. distance graph		
				225	use the diagram to answer the questions (#2)		
				225	arrange the items in the table (#3)		
				225	use the diagram to answer the questions (#4)		
INQ.1.g 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		recognizing and analyzing alternative explanations and models; and			13	evaluating your aneroid barometer design
						16	evaluating your qualitative ozone strips

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INQ.1.h 9 - 12	Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.		explaining the difference between a scientific theory and a scientific hypothesis.	95 98 102 103 137 140 185 186 221	relative dating and modern geology based on Steno's theories Kelvin's calculations of Earth's age theory of plate tectonics critiquing Wegener's theories of continental drift Darwin's theories of the Andes formation what causes ice ages theories of origin of the moon early theories of the solar system Big Bang theory		
INQ.5.a 9 - 12	Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.		analyzing benefits, limitations, costs, and consequences involved in using technology or resources (for example, X-rays, agricultural chemicals, natural gas reserves);	77 79 80 81 92 92	wise use of water water usage and quality effect of excess nitrates on environment acid rain explained research economic impact of producing gases that cause acid rain research the issue of acid rain	17 40 42 44	research the causes of ozone in the lower atmosphere wise use of water supply perform water quality tests investigate effect of acid rain on microorganisms

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INQ.5.b 9 - 12	Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.		analyzing how the introduction of a new technology has affected or could affect human activity (for example, invention of the telescope, applications of modern telecommunications);	35 77 81 83 92 112 118	hydrogen powered cars the clean water act acid rain explained catalytic converters and scrubbing reduce acid rain research the issue of acid rain what we can learn from seismographs understanding earthquakes allows engineers to design safer buildings	44	investigate effect of acid rain on microorganisms
INQ.5.c 9 - 12	Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.		demonstrating the interrelationships between science and technology (for example, building a bridge, designing a better running shoe); and	35 77 83 104 112 118 171 173	hydrogen powered cars the clean water act catalytic converters and scrubbing reduce acid rain using echo sounders to map the sea floor what we can learn from seismographs understanding earthquakes allows engineers to design safer buildings using satellite technology space shuttle		

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INQ.5.d 9 - 12	Students know and understand interrelationships among science, technology, and human activity and how they can affect the world.		explaining the use of technology in an occupation.	122	describe the work of a geologist and paleontologist and seismologist	40	water quality testing
INQ.6.a 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		evaluating print and visual media for scientific evidence, bias, or opinion;	92	study claims made by bottled water companies	43	study water filtration device claims
INQ.6.b 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		explaining that the scientific way of knowing uses a critique and consensus process (for example, peer review, openness to criticism, logical arguments, skepticism);	103 186	critiquing Wegener's theories of continental drift early theories of the solar system		

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INQ.6.c 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		using graphs, equations, or other models to analyze systems involving change and constancy (for example, comparing the geologic time scale to shorter time frames);	11	heat equation	13	constructing a graph from atmospheric pressure data
				28	atmospheric pressure at various altitudes graph	19	graphing water and ice temperature readings
				152	Moh's hardness scale	22	constructing a graph of time vs. temperature
				219	inverse square law	3	find equation for trend line
				219	apparent brightness vs. distance graph	3	construct a graphical model
				225	use the diagram to answer the questions (#2)	33	determining relationship between temperature of the atmosphere and relative humidity
				225	arrange the items in the table (#3)	34	interpreting Doppler radar images
				225	use the diagram to answer the questions (#4)	47	constructing a graph of drops of acid vs pH
						5	construct a temperature vs. time graph
						61	finding a pattern of volcanoes on a bathymetric map
						81	inverse square law

Correlation to Colorado Grade 10 Science CSAP Framework

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
INQ.6.d 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		analyzing and comparing models of cyclic change as used within and among scientific disciplines (for example, water cycle, circular motion, sound waves, weather cycles);	44	Earth's tilt causes seasons	25	investigating factors which cause the seasons
				70	create a model to explain why Earth has seasons	62	why studying the moon's surface is useful for understanding Earth
				84	oceans in the water cycle	74	modeling the lunar cycle
				133	volcanoes and water vapor	75	constructing a lunar calendar
				158	the lunar cycle		
				162	lunar eclipses		
				163	solar eclipses		
				181	properties of the moon		
				182	the moon as a satellite of Earth		
				183	the moon's effect on tides on Earth		
				184	the Earth-moon system		
				185	giant impact theory		

Correlation to Colorado Grade 10 Science CSAP Framework

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
INQ.6.e 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		identifying and predicting cause-effect relationships within a system (for example, the effect of temperature on gas volume, effect of carbon dioxide level on the greenhouse effect, effects of changing nutrients at the base of a food pyramid);	8	determining effect of changing mass on temperature changes	13	identifying relationships between air pressure and weather
				12	thermal equilibrium	18	investigate the temperature effects of greenhouse gases
				33	greenhouse effect and greenhouse gasses	22	identifying relationship between percent of Earth covered in water and temperature range
				49	factors that shape the weather		
				82	what causes acid rain	47	effect of ocean on carbon dioxide levels in the atmosphere
				182	relationship between orbital speed and distance between two objects	48	sequencing events
						59	concluding which conditions affect the timing and duration and intensity of an earthquake based on observation
						6	effect of changing mass on data
						65	justify which scenario was most likely
						80	investigation discovering relationship between orbital speed and distance

Correlation to Colorado Grade 10 Science CSAP Framework

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
INQ.6.f 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		identifying and describing the dynamics of natural systems (for example, weather systems, ecological systems, body systems, systems at dynamic equilibrium);	12 73 79 82	thermal equilibrium the water cycle pond ecosystem and water quality acid rain formation system		

Correlation to Colorado Grade 10 Science CSAP Framework

Introduction to Earth and Space Science

Student Text and Investigation Manual

Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
INQ.6.g 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		identifying and testing a model to analyze systems involving change and constancy (for example, a mathematical expression for gas behavior; constructing a closed ecosystem such as an aquarium);	11	heat equation	13	constructing a graph from atmospheric pressure data
				37	computer modeling to predict greenhouse effects	18	modeling the effect of greenhouse gases on Earth's temperature
				46	modeling air currents	19	graphing water and ice temperature readings
				70	create a model (#1)	22	constructing a graph of time vs. temperature
				98	model of Earth's history	28	modeling underwater rivers and waterfalls and springs
				107	modeling plate boundaries	3	find equation for trend line
				150	rock cycle model	3	construct a graphical model
				188	solar system modeling	47	constructing a graph of drops of acid vs pH
				198	model of the sun's anatomy	5	construct a temperature vs. time graph
				219	inverse square law	56	construct a model that simulates an earthquake
						81	inverse square law
						82	setting up a scale model of the solar system

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Introduction to Earth and Space Science

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Standard #: Grade	Standard	Objective	Benchmark	student text pg	detail	investigation pg	detail
INQ.6.h 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		explaining an exponential model (for example, pH scale, population growth, Richter scale); and	111 112	conversion of energy in rocks causes seismic waves seismic waves	43 46	testing pH of tap water samples determining pH of water as carbon dioxide dissolves
INQ.6.i 9 - 12	Students understand that science involves a particular way of knowing and understand common connections among scientific disciplines.		refining a hypothesis based on an accumulation of data over time (for example, Alvarez's theory on dinosaur extinction).	102 103 103 106 186 222	plate tectonic theory development continental drift theory development history of continental drift theory plate tectonic theory changing ideas about the solar system development of Big Bang theory	54	investigate plate tectonics