

Correlation to Arizona Science Standards
Foundations of Physical Science with Earth and Space Science
Student Text and Investigation Manual

Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
1SC-P1.PO1 Science as Inquiry	Proficiency	Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations	Evaluate scientific information for relevance to a given problem	10	the research question and hypothesis	6	how do we ask questions and get answers from nature?
				19	which group did the best experiment?	18	evaluate graphs as to whether or not they show relationships between variables
				429	why haven't we run out of water		
				434	what is in your tap water	21	evaluate percent change for data collected
				437	what is acid rain		
				441	why are oceans salty	75	evaluate statistical significance
				456	asking questions pertaining to specific heat and heat flow	171	evaluate method based on data
				472	why is Earth's atmosphere different from other planets	200	evaluating your qualitative ozone strips
				473	why do ears pop		
				492	why does Earth have seasons		
				501	how does rain form		
				509	how do animals survive in the desert		
				515	what is a carbon sink		
				534	why doesn't Earth get bigger and bigger		
				588	what causes eclipses		
				621	is Pluto a planet		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
1SC-P1.PO2 Science as Inquiry	Proficiency	Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations	Propose solutions to a problem, based on information gained from scientific investigations	20 79	finding variability in data look at force data and decide the usefulness of a machine	18 19 21 30 35 45 70 141 157 182 185	use data to describe relationship between force and motion use data to infer correct relationship between variables construct reasonable explanation based on data interpret block and tackle data study data and determine importance of height on speed of marble analyze data and explain a rule proposing and comparing different electric motor designs build models of Na and Cl and use them to explain bonding add new rules to list based on findings making hypotheses and testing them against observations analyzing the results of the buffered acid experiment

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						193 explaining efficiency of heat transfer based on data 197 evaluating your aneroid barometer design 224 reconstruct a series of events from clues 235 interpreting how the drumming affects the intensity of the earthquake in the model	

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1SC-P2.PO1 Science as Inquiry	Proficiency	Compare observations of the real world to observations of a constructed model (e.g., an aquarium, a terrarium, a volcano)	Assess the capability of a model to represent a "real world" scenario	23	why make models?	13	graph distance vs. time
				24	making a graph	15	construct a quantitative graphical model
				24	what is a scientific model?	25	create a mathematical model
				24	scientific models	27	find math rule for lever equilibrium
				26	creating graphs	28	derive a math formula
				41	make a graph	37	organize data into a graph of speed vs. height
				42	interpreting distance/time graph	51	graph voltage vs. current
				459	heat equation	121	graph mass vs. volume
				485	computer modeling to predict greenhouse effects	147	organize observations into a category table
				494	modeling air currents	151	does your experiment agree with law of conservation of mass?
				518	create a model (#1)	185	constructing a graph of drops of acid vs pH
				524	model of Earth's history	187	construct a graphical model
				533	modeling plate boundaries	187	find equation for trend line
				576	rock cycle model	189	construct a temperature vs. time graph
				614	solar system modeling	197	constructing a graph from atmospheric pressure data
				624	model of the sun's anatomy		
				645	inverse square law		

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						202	modeling the effect of greenhouse gases on Earth's temperature
						203	graphing water and ice temperature readings
						206	constructing a graph of time vs. temperature
						212	modeling underwater rivers and waterfalls and springs
						231	evaluating your completed bathymetric map
						232	construct a model that simulates an earthquake
						247	evaluate your ability to interpret rock formations
						257	inverse square law
						258	setting up a scale model of the solar system
						268	discovering the mathematical relationship between apparent brightness and distance

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1SC-P3.PO1 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Analyze reports of scientific studies for elements of experimental design	11	control and experimental variables	7	doing a controlled experiment
				26	independent and dependent variables	7	variables in an experiment
				288	find the thickness of a single card	9	design three experiments and choose equipment
				448	forming a hypothesis and testing through experimentation (#5)	9	design three experiments and choose equipment
				602	identify question, hypothesis, procedure, and results (#1)	21	choose independent and dependent variables for graph
						27	recognize variables
						145	plan a procedure and select necessary equipment
						151	plan procedures and select materials
						190	effect of changing mass on collected data
						194	design and construct an aneroid barometer
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons

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1SC-P3.PO2 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Compare conclusions to original hypotheses			21 35 45 151 157 171 197	construct reasonable explanation based on data study data and determine importance of height on speed of marble analyze data and explain a rule do the data support the hypothesis add new rules to list based on findings what was happening at molecular level? evaluating your aneroid barometer design
1SC-P3.PO3 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Evaluate validity of conclusions	19	which group did the best experiment?	18 21 75 171 200	evaluate graphs as to whether or not they show relationships between variables evaluate percent change for data collected evaluate statistical significance evaluate method based on data evaluating your qualitative ozone strips

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1SC-P4.PO1 Science as Inquiry	Proficiency	Create and defend a written plan of action for a scientific investigation	Design an appropriate protocol (written plan of action) for the investigation of a scientific problem	7	experimentation begins with a question	7	perform your own experiment
				12	writing lab procedures	7	design your own experiment
				19	design your own experiment	9	design three experiments using car and ramp
				42	devise an experiment	10	conduct car/ramp experiment
						16	investigate Newton's 2nd law
						16	decide how to vary the force on the car for this experiment
						26	what variables can be changed?
						34	investigate motion on a rollercoaster
						75	design pendulum experiment
						75	perform self-designed experiment
						93	decision trees and the advantage of doing multiple trials
						151	design experiment to find out if mass is conserved
						170	what three factors influence dissolving rate?
						170	write a procedure

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						182	simulating the effect of acid rain on daphnia
						188	conducting investigation of efficiency of immersion heater
						193	conducting experiments on heat transfer
						196	writing a procedure for constructing a pointer for an aneroid barometer
						205	investigating how specific heat of water regulates Earth's temperature
						214	develop a procedure to create an underwater spring
						233	identifying how the earthquake model represents an earthquake

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
1SC-P4.PO2 Science as Inquiry	Proficiency	Create and defend a written plan of action for a scientific investigation	Justify the protocol in terms of the elements of experimental design	9	steps in the scientific method	7	compare results with hypothesis
				10	forming a hypothesis	7	variables in an experiment
				19	design your own experiment	75	plan three experiments to determine which variable affects the period of a pendulum
				448	describe steps you would take to determine whether pH affects frog population	170	which factor will produce fastest dissolving rate?
				448	forming a hypothesis and testing through experimentation (#5)	237	develop a research plan for studying volcanoes
				602	identify question, hypothesis, procedure, and results (#1)		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
1SC-P5.PO1 Science as Inquiry	Proficiency	Apply the concepts of equilibrium, form and function to a variety of phenomena	Predict the effects of various factors on the equilibrium of a system	20 24 42	how will speed change? predicting speed from a graph predict the speed of a car	76 121 156 201 204 239 242	use data to predict best string length for a pendulum clock use graph to predict mass of six objects make predictions about solubility predicting areas with high ozone concentration based on your data predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup estimating the number of meteor collisions on Earth during the last 3.5 billion years predicting the results of the crystal-growing experiment
1SC-P5.PO2 Science as Inquiry	Proficiency	Apply the concepts of equilibrium, form and function to a variety of phenomena	Explain how the relationships between form and function are evident in natural and design systems	80 509 512	form and function of wheelbarrow and sailboat and human jaw how do animals survive in the desert? how do savanna animals survive the periodic fires?	68 108	form and function of different electric motor configurations form and function of human eye, prism, and lenses

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
1SC-P5.PO3 Science as Inquiry	Proficiency	Apply the concepts of equilibrium, form and function to a variety of phenomena	Describe how present form and function of an object, organism or system could have evolved from prior form and function	80	form and function of wheelbarrow and sailboat and human jaw	68	form and function of different electric motor configurations
				509	how do animals survive in the desert?	108	form and function of human eye, prism, and lenses
				512	how do savanna animals survive the periodic fires?		

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1SC-P6.PO1 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Construct a researchable question	7	experimentation begins with a question	6	how do we ask questions and get answers from nature?
				10	the research question and hypothesis	7	design your own experiment
				19	design your own experiment	9	design three experiments using car and ramp
				42	devise an experiment	16	decide how to vary the force on the car for this experiment
				429	why haven't we run out of water	26	what variables can be changed?
				434	what is in your tap water	75	design pendulum experiment
				437	what is acid rain	93	decision trees and the advantage of doing multiple trials
				441	why are oceans salty	151	design experiment to find out if mass is conserved
				451	what is temperature	170	which method will give fastest dissolving rate?
				456	asking questions pertaining to specific heat and heat flow	170	what three factors influence dissolving rate?
				472	why is Earth's atmosphere different from other planets	233	identifying how the earthquake model represents an earthquake
				473	why do ears pop		
				492	why does Earth have seasons		
				501	how does rain form		
				509	how do animals survive in the desert		
				515	what is a carbon sink		
				534	why doesn't Earth get bigger and bigger		

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				588	what causes eclipses		
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1SC-P6.PO2 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Employ a research design that incorporates a scientific method to carry out an experiment	9	steps in the scientific method	7	compare results with hypothesis
				10	forming a hypothesis	7	variables in an experiment
				12	writing lab procedures	9	design three experiments and choose equipment
				19	design your own experiment	9	design three experiments and choose technology
				288	find the thickness of a single card	9	design three experiments and choose equipment
				448	forming a hypothesis and testing through experimentation (#5)	75	plan three experiments to determine which variable affects the period of a pendulum
				448	describe steps you would take to determine whether pH affects frog population	145	plan a procedure and select necessary equipment
				530	proving hypotheses for sea-floor spreading	151	plan procedures and select materials
				580	form a hypothesis (#7)	170	which factor will produce fastest dissolving rate?
				602	identify question, hypothesis, procedure, and results (#1)	170	devise hypothesis and explain
						170	write a procedure
						182	formulate hypothesis
						194	design and construct an aneroid barometer
						196	writing a procedure for constructing a pointer for an aneroid barometer

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						208	formulate a hypothesis about why the seasons occur
						214	develop a procedure to create an underwater spring
						237	develop a research plan for studying volcanoes

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1SC-P6.PO3 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Analyze experimental data	42	analyze a speed/distance graph	6	compare results with other groups
				485	what percentage comes from this source? (problem 4)	11	graph speed vs. position
				543	determining distance to an epicenter	11	calculate % error
				547	average density (#5)	11	analyze speed change of car
				547	what explains the difference in density? (#5)	18	study data table for relationship between force and motion
				605	how big is Earth?	25	analyze block and tackle data
				618	average distance from the sun	27	analyze lever equilibrium data
						35	does data support hypothesis?
						45	did battery voltage change?
						76	analyze pendulum data
						76	calculate % error
						129	find average velocity
						147	students analyze chemical change lab results
						171	average dissolving rate
						197	calculating error between your barometer and a commercial barometer

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						199	importance of good record keeping in order to avoid error
1SC-P6.PO4 Science as Inquiry	Proficiency	Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings	Communicate experimental findings to others			9 13 145 179 181 183	reporting on an experiment make a distance vs. time graph present findings to the class create water quality report write paragraph to explain results write summary of findings

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2SC-P1.PO1 History and Nature of Science	Proficiency	Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought	Define key factors that affect the development of scientific thought	23	why make models?	202	modeling the effect of greenhouse gases on Earth's temperature
				24	what is a scientific model?		
				24	scientific models	212	modeling underwater rivers and waterfalls and springs
				73	impact of Da Vinci's work		
				485	computer modeling to predict greenhouse effects	232	construct a model that simulates an earthquake
				494	modeling air currents	258	setting up a scale model of the solar system
				518	create a model (#1)		
				524	model of Earth's history		
				533	modeling plate boundaries		
				576	rock cycle model		
				614	solar system modeling		
				624	model of the sun's anatomy		

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2SC-P1.PO2 History and Nature of Science	Proficiency	Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought	Describe how different key factors affect the development and acceptance of scientific thought	23 24 24 73 485 494 518 524 533 576 614 624	why make models? what is a scientific model? scientific models impact of Da Vinci's work computer modeling to predict greenhouse effects modeling air currents create a model (#1) model of Earth's history modeling plate boundaries rock cycle model solar system modeling model of the sun's anatomy	202 212 232 258	modeling the effect of greenhouse gases on Earth's temperature modeling underwater rivers and waterfalls and springs construct a model that simulates an earthquake setting up a scale model of the solar system
2SC-P2.PO1 History and Nature of Science	Proficiency	Explain how scientific innovations can challenge accepted ideas	Describe how an accepted idea could be challenged by scientific innovation	110 142 313 324 448	study appliance labels and instructions create pamphlet on utility's energy saver programs development of atomic theory research and create a poster to illustrate development of atomic model study claims made by bottled water companies	76 130 162 181	analyze watch manufacturer's claims investigate Rutherford's gold foil experiment inferences from promotional materials for vehicles study water filtration device claims

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2SC-P3.PO1 History and Nature of Science	Proficiency	Explain the impact on society of major scientific developments (e.g., germ theory, molecular biology, relativity)	Describe the benefits, limitations, and consequences of major scientific developments in pure and applied science	135	circuit board explained	52	the cost of using electrical appliances
				172	generating electric power	130	investigate Rutherford's gold foil experiment
				312	contributions of Fermi	138	nuclear reactions
				313	development of atomic theory	160	how do you simulate nuclear decay?
				324	research and create a poster to illustrate development of atomic model	163	research how trees offset accumulation of CO ₂
				333	plastics	163	research how trees offset accumulation of CO ₂
				379	research fuel cells	201	research the causes of ozone in the lower atmosphere
				379	research environmental impact of fuel cells	262	determine the efficiency of a photovoltaic cell
				388	nuclear vs chemical reactions		
				391	impact of nuclear energy		
				393	contributions of Marie and Pierre Curie		
				400	reducing pollution		
				400	problems caused by airborne pollutants		
				414	effect of electrical generating facilities on dissolved oxygen in water		
				560	description of geothermal energy		
				627	the efficiency of photovoltaic cells		

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2SC-P3.PO2 History and Nature of Science	Proficiency	Explain the impact on society of major scientific developments (e.g., germ theory, molecular biology, relativity)	Explain how major scientific developments in pure and applied science have affected, or could affect, society	34 73 542 545	Newton's research impacted mathematics impact of technology studying seismic waves leads to information used in oil and gas exploration predicting tsunamis		
2SC-P4.PO1 History and Nature of Science	Proficiency	Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science	Trace the development of a selected invention, theory or discovery from its inception to modern day	312 313 321 324 332 393 528 529 529 612 648	contributions of Fermi development of atomic theory contributions of Mendeleev research and create a poster to illustrate development of atomic model plate tectonic history contributions of Marie and Pierre Curie development of plate tectonic theory continental drift theory continental drift theory history changing ideas about the solar system development of Big Bang theory	130	investigate Rutherford's gold foil experiment

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2SC-P4.PO2 History and Nature of Science	Proficiency	Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science	Explain the progression of changes in the invention, theory or discovery	312 313 321 324 332 393 528 529 529 612 648	contributions of Fermi development of atomic theory contributions of Mendeleev research and create a poster to illustrate development of atomic model plate tectonic history contributions of Marie and Pierre Curie development of plate tectonic theory continental drift theory continental drift theory history changing ideas about the solar system development of Big Bang theory	130	investigate Rutherford's gold foil experiment

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2SC-P4.PO3 History and Nature of Science	Proficiency	Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science	Describe the impact of the invention, theory or discovery on further scientific thought	73 312 332 393 528 529 529 612 648	impact of Da Vinci's work contributions of Fermi plate tectonic history contributions of Marie and Pierre Curie development of plate tectonic theory continental drift theory continental drift theory history changing ideas about the solar system development of Big Bang theory		
2SC-P5.PO1 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Define theory, law and fact	448 524 602	forming a hypothesis and testing through experimentation (#5) Kelvin's calculations of Earth's age identify question, hypothesis, procedure, and results (#1)	7 39 77	variables in an experiment analyze energy transformations in different scenarios compare law of conservation of energy to motion of pendulum

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2SC-P5.PO2 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Describe the relationships among theories, laws and fact	10	process of reviewing hypothesis explained	21	construct reasonable explanation based on data
				521	relative dating and modern geology based on Steno's theories	35	what evidence is there in support of your hypothesis?
				524	Kelvin's calculations of Earth's age	35	study data and determine importance of height on speed of marble
				528	theory of plate tectonics	39	critique group's explanation of energy transformations
				529	critiquing Wegener's theories of continental drift	39	review energy theory in context of everyday scenarios
				563	Darwin's theories of the Andes formation	39	analyze energy transformations in different scenarios
				566	what causes ice ages	45	analyze data and explain a rule
				611	theories of origin of the moon	77	show how energy loss data could be applied to designing a real clock
				612	early theories of the solar system	77	compare law of conservation of energy to motion of pendulum
				647	Big Bang theory	151	review your hypothesis
						171	did you prove or disprove your hypothesis?

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2SC-P5.PO3 History and Nature of Science	Proficiency	Explain how theory, law and fact are developed in science to answer a specific question	Explain how theories, laws and facts are used to answer specific questions	10	process of reviewing hypothesis explained	35	what evidence is there in support of your hypothesis?
				521	relative dating and modern geology based on Steno's theories	39	critique group's explanation of energy transformations
				524	Kelvin's calculations of Earth's age	39	review energy theory in context of everyday scenarios
				528	theory of plate tectonics		
				529	critiquing Wegener's theories of continental drift	39	analyze energy transformations in different scenarios
				563	Darwin's theories of the Andes formation	77	show how energy loss data could be applied to designing a real clock
				566	what causes ice ages		
				611	theories of origin of the moon	77	compare law of conservation of energy to motion of pendulum
				612	early theories of the solar system	151	review your hypothesis
				647	Big Bang theory	171	did you prove or disprove your hypothesis?

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2SC-P6.PO1 History and Nature of Science	Proficiency	Analyze evidence that supports past and current scientific theories about a specific topic	Distinguish between evidence which supports a given scientific theory (e.g., model of the atom, plate tectonics, natural selection) and evidence which does not support the theory	473 504 648	why do ears pop meteorologists use atmospheric pressure data to understand movement of weather systems evidence for Big Bang theory	6 21 35 45 215	asking questions and learning about natural world construct reasonable explanation based on data study data and determine importance of height on speed of marble analyze data and explain a rule the food paradox of the oceans

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3SC-P1.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Apply scientific thought processes and procedures to personal and social issues	Apply scientific thought processes of skepticism, empiricism, objectivity and logic seek a solution to personal and social issues	110	study appliance labels and instructions	76	analyze watch manufacturer's claims
				142	create pamphlet on utility's energy saver programs	162	inferences from promotional materials for vehicles
				214	ultrasound technology	181	study water filtration device claims
				220	voice recognition technology		
				294	invention of Kevlar		
				433	the clean water act		
				439	catalytic converters and scrubbing reduce acid rain		
				448	study claims made by bottled water companies		
				483	hydrogen powered cars		
				538	what we can learn from seismographs		
544	understanding earthquakes allows engineers to design safer buildings						
3SC-P1.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Apply scientific thought processes and procedures to personal and social issues	Apply a scientific method to the solution of personal and social issues	110	study appliance labels and instructions	76	analyze watch manufacturer's claims
				142	create pamphlet on utility's energy saver programs	162	inferences from promotional materials for vehicles
				448	study claims made by bottled water companies	163	evaluating choice of favorite car
						181	study water filtration device claims

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3SC-P2.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Describe a problem or need	74	sample engineering problem	70	proposing and comparing different electric motor designs
3SC-P2.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Propose a solution to the problem or design a product to meet the need			70	proposing and comparing different electric motor designs
3SC-P2.PO3 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Design a method of testing the solution or design a model or simulation to test the product			70 194	designing and testing different electric motors design and construct an aneroid barometer

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3SC-P2.PO4 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Carry out the test of the solution or product			70 194	designing and testing different electric motors design and construct an aneroid barometer
3SC-P2.PO5 Personal and Social Perspectives in Science and Technology	Proficiency	Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation	Evaluate the test results			70 71 71 194	designing and testing different electric motors which motor gave the highest speed and why? did draining the batteries affect motor speed? design and construct an aneroid barometer

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3SC-P3.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Define the goals of science and the goals of technology	73 433 439 483 530 538 544 597 599	relationship between science and technology the clean water act catalytic converters and scrubbing reduce acid rain hydrogen powered cars 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	70	using engineering design cycle

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
3SC-P3.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Compare the goals of science and the goals of technology	73 433 439 483 530 538 544 597 599	relationship between science and technology the clean water act catalytic converters and scrubbing reduce acid rain hydrogen powered cars 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	70	using engineering design cycle

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
3SC-P3.PO3 Personal and Social Perspectives in Science and Technology	Proficiency	Compare and contrast the goals of science and technology	Describe the impact of technology on the life, physical, earth and space sciences	379	research fuel cells	160	radioactive decay
				379	research environmental impact of fuel cells	161	research pros and cons of uses for radioactive elements
				393	carbon dating	163	research how trees offset accumulation of CO ₂
				393	radioisotopes in science and medicine	163	research how trees offset accumulation of CO ₂
				400	problems caused by airborne pollutants	182	investigate effect of acid rain on microorganisms
				400	research pros and cons of nuclear technology	201	research the causes of ozone in the lower atmosphere
				414	effect of electrical generating facilities on dissolved oxygen in water		
				437	acid rain explained		
448	research the issue of acid rain						

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
3SC-P4.PO1 Personal and Social Perspectives in Science and Technology	Proficiency	Identify and describe the basic processes of the natural ecosystems and how these processes affect, and are affected by, humans	Describe the basic processes of the natural ecosystems (e.g., water cycle, nutrient cycles)	361	chemical reactions in living systems	162	investigating combustion reactions
				378	consumer chemistry	181	testing pH of tap water samples
				378	combustion reactions		
				381	MRE ration heater reaction	184	determining pH of water as carbon dioxide dissolves
				395	chemistry of the atmosphere		
				395	chemistry of the atmosphere		
				397	carbon reactions		
				403	water structure and its function as a solvent		
				403	a water molecule is v-shaped		
				409	why water is called the universal solvent		
				420	defining and determining pH		
				420	pH and pH scale		
				421	pH of substances you use or consume		
				421	table of pH of common substances		
				438	chemical reactions and the formation of acid rain		
				440	oceans in the water cycle		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				559	volcanoes and water vapor		
				564	landforms shaped by water		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
3SC-P4.PO2 Personal and Social Perspectives in Science and Technology	Proficiency	Identify and describe the basic processes of the natural ecosystems and how these processes affect, and are affected by, humans	Explain how these processes affect, and are affected by, humans	354	chemical reactions and digestion	176	investigate acids and bases
				403	water structure and its function as a solvent	178	actions to take to improve water quality
				403	a water molecule is v-shaped	178	predict the quality of surface water to be tested and justify your answer
				409	why water is called the universal solvent	178	predict the quality of surface water to be tested and justify your answer
				411	effects of PCB's in Great Lakes	178	predict the quality of surface water to be tested and justify your answer
				414	effect of electrical generating facilities on dissolved oxygen in water	179	address what you can do to maintain or improve the water quality at the test site
				417	acids and bases compared/contrasted	181	testing pH of tap water samples
				417	define and compare acids and bases	182	the effects of acid rain on organisms in aquatic environments
				420	pH and pH scale	182	the effects of acid rain on organisms in aquatic environments
				420	defining and determining pH	182	the effects of acid rain on organisms in aquatic environments
				421	table of pH of common substances	184	determining pH of water as carbon dioxide dissolves
				421	pH of substances you use or consume		
				433	The Clean Water Act		
				435	water quality testing		
				436	water quality testing		
				437	acid rain		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				437	acid rain		
				437	effects of acid rain on the soil		
				437	effects of acid rain on natural environments		
				438	causes and health effects of acid rain		
				439	illustration of acid rain formation		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 in oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				471	nitrogen cycle		
				479	effects of CFC's on the ozone layer		
				482	changes to the oceans due to increasing global temperatures		
				482	effects of burning fossil fuels		
				504	temperature inversion		
				515	permafrost		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				568	how urban sprawl changes local climate		
5SC-P1.PO1 Physical Science	Proficiency	Predict chemical and physical properties of substances (e.g., color, solubility, chemical reactivity, melting point, boiling point)	Describe physical and chemical properties that are used to characterize substances	357 361	combustion reaction heartburn reaction		
5SC-P1.PO2 Physical Science	Proficiency	Predict chemical and physical properties of substances (e.g., color, solubility, chemical reactivity, melting point, boiling point)	Determine physical and chemical properties of a substance through observation, measurement and experimentation	357 361	combustion reaction heartburn reaction		
5SC-P1.PO3 Physical Science	Proficiency	Predict chemical and physical properties of substances (e.g., color, solubility, chemical reactivity, melting point, boiling point)	Separate mixtures of substances based on their physical and chemical properties	278 279 288	mixtures can be separated by physical means summary of matter classification create a poster of matter classification	114 114 169	separating a homogeneous mixture investigate a homogeneous mixture investigate solutions and colloids and suspensions

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P2.PO1 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Use models of atomic and molecular structure to explain properties of matter	311	all matter is formed from atoms	132	comparing atoms
				311	all matter is formed from atoms	132	atomic number determines what element that atom is
				311	protons/neutrons/electrons	132	building atom models
				311	location/size/charge of subatomic particles	133	protons and neutrons
				315	atoms of same element have same atomic number	133	location of electrons in atom
				318	proton/electron attraction	136	model stable and neutral atoms
				388	showing valence electrons in a diagram	137	importance of atomic number
						137	build atomic models
						140	find the number of electrons in outermost level
						140	review subatomic particles
5SC-P2.PO2 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Use the periodic table to predict properties of elements and compounds	321	groups of elements and valence shells	141	build model of Na and Cl atoms and explain why they bond to form a molecule
				329	periodic table columns and valence electrons	142	arrangement of electrons and groups of elements
				330	bonding and periodic table position		
				332	periodic table and electronegativities		
				335	periodic table and oxidation numbers		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P2.PO3 Physical Science	Proficiency	Describe and explain properties and composition of samples of matter, using models (including atomic and molecular structure and the periodic table)	Predict the properties of substances based upon ionic, covalent, or hydrogen bonding	324 324 335	use the periodic table to predict chemical formulas which element is more likely to combine with other elements? chemical bonding and the periodic table	136 141 141 143	ions modeling a chemical bond whan an atom ionizes ionic compounds
5SC-P3.PO1 Physical Science	Proficiency	Identify, measure, calculate, and analyze qualitative and quantitative relationships associated with energy forms and energy transfer or transformation (e.g., changes in temperature, velocity, potential energy, kinetic energy, conduction, convection, ect)	Identify qualitative and quantitative relationships associated with energy (e.g., heat, mechanical, electrical)	91 406	understand basic forms of energy hydrogen bonding and the gaseous state of water	39 204	identify type of energy involved investigating latent heat and thermal buffering

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P3.PO2 Physical Science	Proficiency	Identify, measure, calculate, and analyze qualitative and quantitative relationships associated with energy forms and energy transfer or transformation (e.g., changes in temperature, velocity, potential energy, kinetic energy, conduction, convection, ect)	Measure quantitative (e.g., heat, mechanical, electrical) relationships associated with energy	91 453 456 456 458 459 537	following an energy transformation comparing temperature in Fahrenheit and Celsius scales definition of specific heat specific heat water's specific heat helps regulate Earth's temperature heat equation potential energy transformed to kinetic energy causes earthquakes	38 147 186 205	identify potential/kinetic energy conversions feel the heat generated by chemical reaction develop a way to convert between Fahrenheit and Celsius temperature scales investigating how the high specific heat of water helps regulate Earth's temperature
5SC-P3.PO3 Physical Science	Proficiency	Identify, measure, calculate, and analyze qualitative and quantitative relationships associated with energy forms and energy transfer or transformation (e.g., changes in temperature, velocity, potential energy, kinetic energy, conduction, convection, ect)	Calculate quantitative relationships associated with energy (e.g., heat mechanical, electrical)	68 455	compound machines definition of calorie	29 190	design and construct complex gear machines calculating thermal energy in calories

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P4.PO1 Physical Science	Proficiency	Observe, measure and calculate quantities to demonstrate conservation of matter and energy in chemical changes (e.g., acid base, precipitation, heat)	Use the law of conservation of matter to explain the quantitative relationships between reactants and products in chemical reactions	359 363	balancing chemical equations history of law of conservation of mass	148 149 152 152 157	reactants and products practice balancing equations write the balanced equation predict how much product formed given the reactants predict the products of double displacement reactions
5SC-P4.PO2 Physical Science	Proficiency	Observe, measure and calculate quantities to demonstrate conservation of matter and energy in chemical changes (e.g., acid base, precipitation, heat)	Quantify the mass relationships between reactants and products in chemical reactions	336 344 349 368	writing chemical formulas calculating formula mass calculate the formula mass predicting amount of product	155	calculating product yield
5SC-P4.PO3 Physical Science	Proficiency	Observe, measure and calculate quantities to demonstrate conservation of matter and energy in chemical changes (e.g., acid base, precipitation, heat)	Use the law of conservation of energy to explain the energy changes in chemical reactions	381 382	exothermic reactions and MREs endothermic reactions and cold packs	158 158	investigate energy changes in chemical reactions measure energy changes in 3 different reactions

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P4.PO4 Physical Science	Proficiency	Observe, measure and calculate quantities to demonstrate conservation of matter and energy in chemical changes (e.g., acid base, precipitation, heat)	Quantify the energy changes in chemical reactions	381 382	exothermic reactions and MREs endothermic reactions and cold packs	158 158	investigate energy changes in chemical reactions measure energy changes in 3 different reactions
5SC-P5.PO1 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Express a chemical reaction by using a balanced equation	371	which of the equations is balanced?	149	balance these equations

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P5.PO2 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Predict the products of a chemical reaction using types of reactions (e.g., synthesis, decomposition, replacement, combustion)	336 364 368	writing chemical formulas formation of petroleum is a very slow chemical reaction predicting amount of product	155 156	calculating product yield predict products in a double displacement reaction

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P5.PO3 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Describe physical interactions through use of word equations or formulae	32	average speed discussed	8	calculating speed
				35	how to calculate acceleration	12	calculate speed of moving car
				41	find acceleration of car	14	calculate acceleration of car on ramp
				49	link between force and acceleration	17	explore 2nd law and acceleration
				53	acceleration due to gravity	19	discover 2nd law of motion
				60	how to calculate momentum	31	calculate work done on block
				64	solving problems using $f=ma$	31	work = force X distance
				64	calculate momentum	39	identify type of energy involved
				83	how to calculate work	191	calculating work input and work output
				86	how to calculate power	191	power of an immersion heater
				86	power explained	263	calculate the power output of a photovoltaic cell
				91	understand basic forms of energy		
				96	decide whether or not work is done		
				96	calculate work done		
				97	analyze power of motor		
				97	calculate power of two different machines		
				97	calculate power		
97	compare different amounts of work done						

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				97	calculate work accomplished by a motor		
				138	how to calculate electrical power		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P5.PO4 Physical Science	Proficiency	Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations	Predict the results of a physical interaction by using an algebraic formula	20 24 42 42 459 645	how will speed change? predicting speed from a graph predict the speed of a car interpreting distance/time graph heat equation inverse square law	25 27 28 76 121 156 187 201 204 239 242 257	create a mathematical model find math rule for lever equilibrium derive a math formula use data to predict best string length for a pendulum clock use graph to predict mass of six objects make predictions about solubility find equation for trend line predicting areas with high ozone concentration based on your data predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup estimating the number of meteor collisions on Earth during the last 3.5 billion years predicting the results of the crystal-growing experiment inverse square law

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
						268 discovering the mathematical relationship between apparent brightness and distance	

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P6.PO1 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Demonstrate the use of conceptual models in science (e.g., formulae, diagrams, graphs)	24	making a graph	13	graph distance vs. time
				24	interpretations of patterns in data	15	construct a quantitative graphical model
				26	creating graphs	15	interpret a speed vs. time graph
				27	reading a graph	37	organize data into a graph of speed vs. height
				41	make a graph	51	graph voltage vs. current
				78	analyze lever diagram	121	graph mass vs. volume
				476	atmospheric pressure at various altitudes graph	147	organize observations into a category table
				645	apparent brightness vs. distance graph	151	does your experiment agree with law of conservation of mass?
				651	use the diagram to answer the questions (#2)	185	constructing a graph of drops of acid vs pH
				651	arrange the items in the table (#3)	187	construct a graphical model
				651	use the diagram to answer the questions (#4)	189	construct a temperature vs. time graph
						197	constructing a graph from atmospheric pressure data
						203	graphing water and ice temperature readings
						206	constructing a graph of time vs. temperature

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
						217 determining relationship between temperature of the atmosphere and relative humidity 218 interpreting Doppler radar images 231 evaluating your completed bathymetric map 237 finding a pattern of volcanoes on a bathymetric map 247 evaluate your ability to interpret rock formations	

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P6.PO2 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Describe physical interactions of matter and energy (e.g., phase change, gas laws, momentum conservation)	60	law of conservation of momentum	36	energy conservation and the roller coaster
				88	potential and kinetic energy explained	37	investigating conservation of energy with rollercoaster
				90	conservation of energy explained	38	conservation of energy and energy transformations
				92	energy transformations and conservation		
				93	different forms of energy described	119	energy and phase changes
				96	prove that energy is conserved		
				284	changes of state		
				299	Charles' law		
				300	Boyle's law		
				498	phases changes in the atmosphere		
				623	nuclear fusion on the sun produces energy from matter		
				633	Einstein's equation		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
5SC-P6.PO3 Physical Science	Proficiency	Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior)	Justify the validity of known conceptual models applied to physical phenomena	33	understanding acceleration	14	acceleration is the rate at which speed changes
				45	Newton's second law summarized	16	thinking about force
				45	Newton's third law summarized	19	find correct relationship between force mass and acceleration
				46	force has potential to change motion	23	using 3rd law to explain common phenomena
				49	force is related to acceleration	208	developing a hypothesis about why the seasons occur
				49	Newton's second law in detail	210	investigating how the distance of Earth from the sun affects its intensity
				51	net force explained	211	investigating how Earth's tilt affects the sun's intensity
				59	Newton's third law in detail	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun
				87	concept of energy as stored work		
				481	global warming		
				491	the effects of Earth's rotation on daytime heating and nighttime cooling		
				492	Earth's tilt causes seasons		
				585	Earth's rotation and patterns of day and night		
				587	axial tilt causes the seasons		
				588	solar eclipses		
589	solar eclipses						

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				601	identify seasons		
5SC-P7.PO1 Physical Science	Proficiency	Demonstrate the understanding of gravitation as a universal force that each mass exerts on any other mass	Use the universal law of gravitation to predict how the gravity force changes with a change of distance and/or mass	52 54 55 606	gravity depends on mass Newton's law of universal gravitation calculating gravitational force between objects Newton's law of universal gravitation	257	relating the relationship between orbital speed and distance to the equation of universal gravitation
5SC-P8.PO1 Physical Science	Proficiency	Demonstrate qualitative understanding of the 1st Law of Thermodynamics (conservation of matter and energy) and the 2nd Law of Thermodynamics (entropy)	Use the 1st Law of Thermodynamics to explain the energy changes in a physical system	91 91 537 623 626	following an energy transformation following an energy transformation potential energy transformed to kinetic energy causes earthquakes energy from the sun harnessing the sun's energy	38 39	identify potential/kinetic energy conversions make an energy flow chart
5SC-P8.PO2 Physical Science	Proficiency	Demonstrate qualitative understanding of the 1st Law of Thermodynamics (conservation of matter and energy) and the 2nd Law of Thermodynamics (entropy)	Describe a sequence of events that illustrates the 2nd Law of Thermodynamics	84	work input and output	31	work output vs. work input

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P1.PO1 Earth and Space Science	Proficiency	Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution)	Describe the processes explained by prominent scientific theories of the origin of the universe	594 595 596 597 598 611 612 621 634 647	history of the telescope types and uses of telescopes types and uses of telescopes satellites as tools of astronomy spacecraft as tools of astronomy historical theories of the origin of the moon historical theories about the solar system historical theories of which objects were planets the use of spectroscopy to analyze stars the Big Bang theory of the origin of the universe	264 268	understand why spectroscopy is an important tool of astronomers measuring apparent brightness to calculate the distance to stars and galaxies
6SC-P1.PO2 Earth and Space Science	Proficiency	Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution)	Describe the processes explained by prominent scientific theories of the origin of the solar system	641	how the solar system was formed		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P1.PO3 Earth and Space Science	Proficiency	Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution)	Describe the processes explained by prominent scientific theories of the origin of life forms	472	comparison of Earth's atmosphere to other planets		
				524	extinction of the dinosaurs due to giant meteor hitting Earth		
				615	what makes Earth capable of supporting life		
				619	how an asteroid event may have caused the extinction of dinosaurs		
				641	the existence of other planetary systems		

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6SC-P1.PO4 Earth and Space Science	Proficiency	Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution)	Relate physical laws to processes explained by prominent scientific theories of the origin of the universe, solar system, and life forms	591	characteristics of the universe	255	observe and describe the appearance of the moon and Jupiter and its moons
				592	calculating and using light years		
				593	light years and time		
				633	what is a star?		
				638	the life cycle of stars		
				639	description and illustration of the life cycle of stars		
				640	birth of elements		
				640	death of massive stars		
				640	elements formed by nuclear fusion in stars		
				642	what is a galaxy?		
				643	the structure of the Milky Way Galaxy		
				648	evidence for the Big Bang theory		
				649	evidence for the Big Bang theory		
				652	research and describe astronomical objects		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P2.PO1 Earth and Space Science	Proficiency	Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days	Describe how the Earth's rotation causes day and night	491	the effects of Earth's rotation on daytime heating and nighttime cooling	208	developing a hypothesis about why the seasons occur
				492	Earth's tilt causes seasons	210	investigating how the distance of Earth from the sun affects its intensity
				585	Earth's rotation and patterns of day and night	211	investigating how Earth's tilt affects the sun's intensity
				587	axial tilt causes the seasons	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun
				588	solar eclipses		
				589	solar eclipses		
				601	identify seasons		
6SC-P2.PO2 Earth and Space Science	Proficiency	Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days	Describe how the Earth's tilt on its axis and revolution around the sun cause changes in relative length of days and nights	491	the effects of Earth's rotation on daytime heating and nighttime cooling	208	developing a hypothesis about why the seasons occur
				492	Earth's tilt causes seasons	210	investigating how the distance of Earth from the sun affects its intensity
				585	Earth's rotation and patterns of day and night	211	investigating how Earth's tilt affects the sun's intensity
				587	axial tilt causes the seasons	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun
				588	solar eclipses		
				589	solar eclipses		
				601	identify seasons		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P2.PO3 Earth and Space Science	Proficiency	Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days	Describe how the Earth's tilt on its axis and revolution around the sun cause changes in seasons	491 492 492 518 585 587 588 589 601	the effects of Earth's rotation on daytime heating and nighttime cooling Earth's tilt causes seasons Earth's tilt causes seasons create a model to explain why Earth has seasons Earth's rotation and patterns of day and night axial tilt causes the seasons solar eclipses solar eclipses identify seasons	208 209 210 211 248	developing a hypothesis about why the seasons occur investigating factors which cause the seasons investigating how the distance of Earth from the sun affects its intensity investigating how Earth's tilt affects the sun's intensity building a sundial to keep track of daily time based on the cycles between Earth and the sun
6SC-P2.PO4 Earth and Space Science	Proficiency	Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days	Describe the flow of energy to and from the Earth based on its shape, tilt, rotation and revolution	480 481 485 493 494 504	distribution of incoming solar radiation Earth's "energy budget" Earth's internal energy convection currents in the atmosphere the Coriolis effect rotation of air masses due to Coriolis effect	213	exploring how temperature-dependent layering creates currents

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6SC-P3.PO1 Earth and Space Science	Proficiency	Use the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid-oceanic ridges and deep sea trenches	Describe the relationship between the Earth's internal heat and plate tectonics	525	formation of Earth's layers	228	listing which kind of plate boundary is associated with each geologic feature
				526	description of Earth's layers	229	identifying tectonic plates and plate boundaries
				528	definition of plate tectonics	230	predicting plate movement over 50 million years and the resultant land features
				528	predicting what Earth might look like in 50 million years	237	examining the magma chemistry of volcanoes and how it relates to a volcano's location
				530	sea-floor spreading and mid-ocean ridges		
				531	magnetic patterns on the sea floor		
				532	theory of plate tectonics		
				533	describing plate boundaries		
				534	divergent plate boundaries		
				534	land features resulting from divergent plate boundaries		
				535	convergent plate boundaries		
				535	resulting land features from subduction		
				536	land features resulting from transform plate boundaries		
				536	transform plate boundaries		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				547	predict separation of North America and Europe in 75 million years		
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				552	formation of magma in Earth's mantle		
				554	properties of volcanically formed rock		
				559	types of volcanic rock		
				561	describing volcanic rock		
				563	mountain-building		
				564	changes in land features due to erosion		
				566	effect of glaciers on land		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P3.PO2 Earth and Space Science	Proficiency	Use the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid-oceanic ridges and deep sea trenches	Describe the relationships among earthquakes, volcanoes, mid-oceanic ridges, deep sea trenches and tectonic plates	530	sea-floor spreading and mid-ocean ridges	228	listing which kind of plate boundary is associated with each geologic feature
				531	magnetic patterns on the sea floor	236	understanding the Volcanic Explosivity Index
				537	earthquakes and plate tectonics	237	finding a pattern of volcanoes related to the locations of plate boundaries
				537	causes and descriptions of earthquakes		
				537	conversion of energy in rocks causes seismic waves	240	estimating the effects of meteor impacts on Earth
				538	seismic waves	241	identifying which geologic features on Earth were caused by meteors
				539	earthquakes rating scales		
				551	structure of a volcano		
				552	formation of magma in Earth's mantle		
				552	geologic basis for volcanic eruptions		
				553	where volcanic activity occurs		
				554	types and shapes of volcanoes		
				554	figure showing structure of different types of volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				555	shield volcanoes		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				555	formation of shield volcanoes due to hot spots		
				555	geologic basis for shield volcanoes		
				556	formation of stratovolcanoes due to subduction		
				556	geologic basis for stratovolcanoes		
				556	stratovolcanoes		
				557	geologic bases for cinder cone volcanoes		
				558	volcanoes shape the Earth		
				563	constructive process of mountain building		
				564	the destructive process of erosion		
				565	wind erosion		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P4.PO1 Earth and Space Science	Proficiency	Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time	Provide evidence for changes in Earth's geologic history, using data from relative age-dating techniques	524 566	table and description of the geologic time scale ice ages		
6SC-P4.PO2 Earth and Space Science	Proficiency	Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time	Provide evidence for changes in Earth's geologic history, using data from absolute age-dating techniques	524 566	table and description of the geologic time scale ice ages		
6SC-P4.PO3 Earth and Space Science	Proficiency	Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time	Describe changes or relative constancy in Earth's geologic history, using evidence gained through geologic dating techniques	521 523 524 619	origin of fossils faunal succession extinction of the dinosaurs due to giant meteor hitting Earth how an asteroid event may have caused the extinction of dinosaurs		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P5.PO1 Earth and Space Science	Proficiency	Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved	Describe the properties of water that make water a unique and essential substance	403	water structure and its function as a solvent	178	predict the quality of surface water to be tested and justify your answer
				403	a water molecule is v-shaped		
				409	why water is called the universal solvent	179	address what you can do to maintain or improve the water quality at the test site
				411	effects of PCB's in Great Lakes		
				433	The Clean Water Act	182	the effects of acid rain on organisms in aquatic environments
				435	water quality testing		
				436	water quality testing	217	finding relative humidity
				437	acid rain		
				443	impact of increased CO2 on oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				497	water in the atmosphere affects weather patterns		
				498	phase changes in the atmosphere and dewpoint		
				501	forms of precipitation		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P5.PO2 Earth and Space Science	Proficiency	Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved	Describe factors that impact water quality	411 433 435 436 437 437 443 444 445 471	effects of PCB's in Great Lakes The Clean Water Act water quality testing water quality testing effects of acid rain on natural environments acid rain impact of increased CO2 on oceans pollution and the ocean food chain pollution and the ocean food chain nitrogen cycle	178 178 179 182	actions to take to improve water quality 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
6SC-P5.PO3 Earth and Space Science	Proficiency	Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved	Describe factors that influence the reuse, recycling and conservation of water	433 434	water quality standards importance of water analysis		
6SC-P5.PO4 Earth and Space Science	Proficiency	Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved	Predict future trends in water quality control and conservation, based on factors that influence water quality and usage	433 434	water quality standards importance of water analysis		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P6.PO1 Earth and Space Science	Proficiency	Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere	Describe the processes involved in the water cycle	440 441 442 559 564	oceans in the water cycle sources of salts in the ocean composition of seawater volcanoes and water vapor landforms shaped by water	212	investigate how the ocean's salinity affects its density
6SC-P6.PO2 Earth and Space Science	Proficiency	Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere	Describe the interactions between water and the biosphere	440 471 472 477 478	oceans as part of the hydrosphere description of Earth's atmosphere effect of life on Earth's atmosphere layers of the atmosphere layers of the atmosphere		
6SC-P6-PO3 Earth and Space Science	Proficiency	Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere	Describe the interactions between water and the lithosphere	440 471 472 477 478	oceans as part of the hydrosphere description of Earth's atmosphere effect of life on Earth's atmosphere layers of the atmosphere layers of the atmosphere		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P6-PO4 Earth and Space Science	Proficiency	Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere	Describe the interactions between water and the atmosphere	440 471 471 472 477 478 497	oceans as part of the hydrosphere composition of Earth's atmosphere description of Earth's atmosphere effect of life on Earth's atmosphere layers of the atmosphere layers of the atmosphere water in the atmosphere affects weather patterns	198	detecting ozone which is a protective atmosphere gas against high energy radiation

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P6-PO5 Earth and Space Science	Proficiency	Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere	Compare the interactions between water and Earth systems	414	effect of electrical generating facilities on dissolved oxygen in water	178	predict the quality of surface water to be tested and justify your answer
				439	illustration of acid rain formation	212	investigate how the ocean's salinity affects its density
				440	oceans as part of the hydrosphere		
				441	sources of salts in the ocean		
				442	composition of seawater		
				443	impact of increased CO ₂ in oceans		
				471	description of Earth's atmosphere		
				472	effect of life on Earth's atmosphere		
				477	layers of the atmosphere		
				478	layers of the atmosphere		
				479	effects of CFC's on the ozone layer		
				482	effects of burning fossil fuels		
				482	changes to the oceans due to increasing global temperatures		
				515	permafrost		
				568	how urban sprawl changes local climate		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P7.PO1 Earth and Space Science	Proficiency	Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth	Analyze how weather and climate are influenced by heat transferred from the sun to the Earth	480	transfer of energy in and out of Earth's atmosphere	185	effect of ocean on carbon dioxide levels in the atmosphere
				480	distribution of incoming solar radiation	202	investigate the temperature effects of greenhouse gases
				481	Earth's "energy budget"		
				481	greenhouse effect and greenhouse gasses	213	exploring how temperature-dependent layering creates currents
				485	Earth's internal energy		
				493	convection currents in the atmosphere	219	use radar to detect a tornado
				497	factors which influence the weather	220	using radar to track a hurricane
				499	cloud formation		
				505	description of thunderstorms		
				506	description of hurricanes		
				507	description of tornadoes		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P7.PO2 Earth and Space Science	Proficiency	Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth	Analyze how weather is influenced by both natural and artificial Earth features (e.g., mountain ranges, cities, bodies of water)	497 499 505 506 507 510 511	factors which influence the weather cloud formation description of thunderstorms description of hurricanes description of tornadoes different types of deserts and how they are formed how tropical rainforests are formed	219 220 223	use radar to detect a tornado using radar to track a hurricane research a particular biome

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
6SC-P7.PO3 Earth and Space Science	Proficiency	Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth	Analyze how weather is influenced by both natural and artificial dynamic processes (e.g., sunspots, volcanoes, pollution, air and ocean currents)	491	Earth's temperature varies with latitude	207	research how large bodies of water affect climate
				494	the Coriolis effect	207	research how large bodies of water affect climate
				495	global wind patterns		
				496	descriptions of ocean currents and their effects on climate	215	understanding the Atlantic gyre
				496	effects of the Gulf Stream on climate of Great Britain	219	use radar to detect a tornado
				497	factors which influence the weather	220	using radar to track a hurricane
				497	water in the atmosphere affects weather patterns		
				499	cloud formation		
				502	effects of moving air masses		
				502	cold fronts		
				503	warm fronts		
				503	jet streams		
				504	rotation of air masses due to Coriolis effect		
				505	description of thunderstorms		
				506	description of hurricanes		
				507	description of tornadoes		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
				508	causes and effects of the El Nino Southern Oscillation		
				510	effect of cold ocean currents on formation of fog deserts		
				511	effect of warm ocean currents on formation of tropical rainforest		
				513	effect of large bodies of water on climate		
				515	alpine tundra occurs at high altitudes		
6SC-P7.PO4 Earth and Space Science	Proficiency	Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth	Evaluate the effects of various weather factors on the environment and daily activities on Earth	483	global temperature changing over time	209	investigating factors which cause the seasons
				485	computer modeling to predict greenhouse effects	219	describe what safety precautions the National Weather Service recommends for tornado conditions
				492	Earth's tilt causes seasons		
				518	create a model to explain why Earth has seasons		
				518	write an action plan to stay safe during a tornado		
				528	Earth's surface is changing		