

Correlation to Arizona Science Standards
***Foundations of Physical 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 19	the research question and hypothesis which group did the best experiment?	6 18 21 75 167	how do we ask questions and get answers from nature? 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

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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	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

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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 24 24 24 26 41 42	why make models? what is a scientific model? scientific models making a graph creating graphs make a graph interpreting distance/time graph	13 15 25 27 28 37 51 121 147 151 181 183	graph distance vs. time construct a quantitative graphical model create a mathematical model find math rule for lever equilibrium derive a math formula organize data into a graph of speed vs. height graph voltage vs. current graph mass vs. volume organize observations into a category table does your experiment agree with law of conservation of mass? construct a graphical model construct a temperature vs. time graph

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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 26 288	control and experimental variables independent and dependent variables find the thickness of a single card	7 7 9 21 27 145 151	doing a controlled experiment variables in an experiment design three experiments and choose equipment choose independent and dependent variables for graph recognize variables plan a procedure and select necessary equipment plan procedures and select materials
1SC-P3.PO2 Science as Inquiry	Proficiency	Analyze and evaluate reports of scientific studies	Compare conclusions to original hypotheses			21 35 45 151 157 167	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?

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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 75 167	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

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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 12 19 42	experimentation begins with a question writing lab procedures design your own experiment devise an experiment	7 7 9 10 16 16 26 34 75 75 93 151 151 166	design your own experiment perform your own experiment design three experiments using car and ramp conduct car/ramp experiment decide how to vary the force on the car for this experiment investigate Newton's 2nd law what variables can be changed? investigate motion on a rollercoaster design pendulum experiment perform self-designed experiment decision trees and the advantage of doing multiple trials write a procedure design experiment to find out if mass is conserved write a procedure

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
						166	what three factors influence dissolving rate?
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 10 19	steps in the scientific method forming a hypothesis design your own experiment	7 7 75 166	compare results with hypothesis variables in an experiment plan three experiments to determine which variable affects the period of a pendulum which factor will produce fastest dissolving rate?
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	use data to predict best string length for a pendulum clock use graph to predict mass of six objects make predictions about solubility
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	form and function of wheelbarrow sailboat human jaw	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 sailboat human jaw	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-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
						26	what variables can be changed?
						75	design pendulum experiment
						93	decision trees and the advantage of doing multiple trials
						151	design experiment to find out if mass is conserved
						166	which method will give fastest dissolving rate?
						166	what three factors influence dissolving rate?
						198	which type of food contains the most energy?

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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	6	formulate hypothesis
				10	forming a hypothesis	7	variables in an experiment
				12	writing lab procedures	7	compare results with hypothesis
				19	design your own experiment	9	devise a hypothesis
				288	find the thickness of a single card	9	design three experiments and choose technology
						9	design three experiments and choose equipment
						34	formulate hypothesis
						75	plan three experiments to determine which variable affects the period of a pendulum
						145	plan a procedure and select necessary equipment
						151	write a procedure
						151	plan procedures and select materials
						166	devise hypothesis and explain
						166	write a procedure
						166	which factor will produce fastest dissolving rate?
						178	formulate hypothesis
						198	formulate hypothesis

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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 11 11 11 18 25 27 35 45 76 76 129 147 167	compare results with other groups graph speed vs. position analyze speed change of car calculate % error study data table for relationship between force and motion analyze block and tackle data analyze lever equilibrium data does data support hypothesis? did battery voltage change? analyze pendulum data calculate % error find average velocity students analyze chemical change lab results average dissolving rate

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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 13 145 173 175 179	reporting on an experiment make a distance vs. time graph present findings to the class write prargraph to explain results create water quality report write summary of findings
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 24 24 73	why make models? what is a scientific model? scientific models impact of Da Vinci's work		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
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	why make models? what is a scientific model? scientific models impact of Da Vinci's work		
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	110 142 313 324 434	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	76 130 162 173	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	135 172 312 313 324 333 379 379 388 391 393 400 400 408	circuit board explained generating electric power contributions of Fermi development of atomic theory research and create a poster to illustrate development of atomic model plastics research fuel cells research environmental impact of fuel cells nuclear vs chemical reactions impact of nuclear energy contributions of Marie and Pierre Curie reducing pollution problems caused by airborne pollutants capsule coating	52 130 138 160 163	the cost of using electrical appliances investigate Rutherford's gold foil experiment nuclear reactions how do you simulate nuclear decay? research how trees offset accumulation of CO ₂
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	Newton's research impacted mathematics impact of technology		

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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	312 313 321 324 393	contributions of Fermi development of atomic theory contributions of Mendeleev research and create a poster to illustrate development of atomic model contributions of Marie and Pierre Curie	130	investigate Rutherford's gold foil experiment
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	312 313 321 324 393	contributions of Fermi development of atomic theory contributions of Mendeleev research and create a poster to illustrate development of atomic model contributions of Marie and Pierre Curie	130	investigate Rutherford's gold foil experiment
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	73 312 393	impact of Da Vinci's work contributions of Fermi contributions of Marie and Pierre Curie		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
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			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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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
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 35 35 39 39 39 45 77 77 151 167	construct reasonable explanation based on data what evidence is there in support of your hypothesis? study data and determine importance of height on speed of marble critique group's explanation of energy transformations review energy theory in context of everyday scenarios analyze energy transformations in different scenarios analyze data and explain a rule show how energy loss data could be applied to designing a real clock compare law of conservation of energy to motion of pendulum review your hypothesis did you prove or disprove your hypothesis?

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
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 39 39 39 77 77 151 167	what evidence is there in support of your hypothesis? critique group's explanation of energy transformations review energy theory in context of everyday scenarios analyze energy transformations in different scenarios show how energy loss data could be applied to designing a real clock compare law of conservation of energy to motion of pendulum review your hypothesis 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			6 21 35 45	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
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	110 142 214 220 294 434	study appliance labels and instructions create pamphlet on utility's energy saver programs ultrasound technology voice recognition technology invention of Kevlar study claims made by bottled water companies	76 162 173	analyze watch manufacturer's claims inferences from promotional materials for vehicles study water filtration device claims
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	110 142 434	study appliance labels and instructions create pamphlet on utility's energy saver programs study claims made by bottled water companies	76 162 163 173	analyze watch manufacturer's claims inferences from promotional materials for vehicles evaluating choice of favorite car 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	designing and testing different electric motors

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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	designing and testing different electric motors
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			71 71	did draining the batteries affect motor speed? which motor gave the highest speed and why?
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	relationship between science and technology	70	using engineering design cycle

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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	relationship between science and technology	70	using engineering design cycle
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	379 379 393 393 400 400 444 448	research fuel cells research environmental impact of fuel cells carbon dating radioisotopes in science and medicine problems caused by airborne pollutants research pros and cons of nuclear technology acid rain explained research the issue of acid rain	160 161 163 178	radioactive decay research pros and cons of uses for radioactive elements research how trees offset accumulation of CO2 investigate effect of acid rain on microorganisms

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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)	361 378 378 381 395 395 397 421 421 444 487	chemical reactions in living systems consumer chemistry combustion reactions MRE ration heater reaction chemistry of the atmosphere chemistry of the atmosphere carbon reactions water structure and its function as a solvent a water molecule is v-shaped chemical reactions and the formation of acid rain chemical reactions in living systems	162 176	investigating combustion reactions measure pH
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	354 421 421 489	chemical reactions and digestion water structure and its function as a solvent a water molecule is v-shaped metabolism and stored energy	176 176	measure pH investigate acids and bases

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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	114 114 165	separating a homogeneous mixture investigate a homogeneous mixture investigate solutions and colloids and suspensions

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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	building atom models
				311	protons/neutrons/electrons	133	location of electrons in atom
				311	location/size/charge of subatomic particles	133	protons and neutrons
				315	atoms of same element have same atomic number	136	model stable and neutral atoms
				318	proton/electron attraction	137	importance of atomic number
				388	showing valence electrons in a diagram	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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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	which element is more likely to combine with other elements?	136	ions
				324	use the periodic table to predict chemical formulas	141	modeling a chemical bond
				335	chemical bonding and the periodic table	141	whan an atom ionizes
						143	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	understand basic forms of energy	39	identify type of energy involved

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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	following an energy transformation	38 147	identify potential/kinetic energy conversions feel the heat generated by chemical reaction
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	compound machines	29	design and construct complex gear machines

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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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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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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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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		
				86	how to calculate power		
				86	power explained		
				91	understand basic forms of energy		
				96	decide whether or not work is done		
				96	calculate work done		
				97	calculate power of two different machines		
				97	analyze power of motor		
				97	calculate work accomplished by a motor		
				97	compare different amounts of work done		

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				97	calculate power		
				138	how to calculate electrical power		
				488	work vs. calories used by the body		
				488	work vs. calories used by the body		
				491	work and mechanical systems		
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	how will speed change?	25	create a mathematical model
				24	predicting speed from a graph	27	find math rule for lever equilibrium
				42	predict the speed of a car	28	derive a math formula
				42	interpreting distance/time graph	76	use data to predict best string length for a pendulum clock
						121	use graph to predict mass of six objects
						156	make predictions about solubility

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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
						147	organize observations into a category table
						151	does your experiment agree with law of conservation of mass?
						181	construct a graphical model
						183	construct a temperature vs. time graph

Correlation to Arizona Science Standards
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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	188	specific heat and conservation of energy
				284	changes of state		
				299	Charles' law		
				300	Boyle's law		

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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	Newton's third law summarized understanding acceleration	14 16 19 23	acceleration is the rate at which speed changes thinking about force find correct relationship between force mass and acceleration using 3rd law to explain common phenomena
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	gravity depends on mass Newton's law of universal gravitation calculating gravitational force between objects		

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Standard #: Standard	Level	Concept	Performance Objective	student text pg	detail	investigation pg	detail
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	following an energy transformation following an energy transformation	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