

Correlation to Georgia Performance Standards: Science (revised 2006)
Foundations of Physical Science with Earth and Space Science (2007)
Student Text and Investigation Manual

Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh1.a High School Science	Characteristics of Science: Habits of Mind	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	Exhibit the above traits in their own scientific activities.	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
				435	why haven't we run out of water		
				440	what is in your tap water	21	evaluate percent change for data collected
				443	what is acid rain		
				447	why are oceans salty	75	evaluate statistical significance
				462	asking questions pertaining to specific heat and heat flow	171	evaluate method based on data
				478	why is Earth's atmosphere different from other planets	200	evaluating your qualitative ozone strips
				479	why do ears pop		
				498	why does Earth have seasons		
				507	how does rain form		
				515	how do animals survive in the desert		
				521	what is a carbon sink		
				540	why doesn't Earth get bigger and bigger		
				594	what causes eclipses		
627	is Pluto a planet						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh1.b High School Science	Characteristics of Science: Habits of Mind	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	Recognize that different explanations often can be given for the same evidence.	24	interpretations of patterns in data	15	interpret a speed vs. time graph
				27	reading a graph	21	determine effect of increasing mass
				28	identifying cause and effect relationships	21	construct reasonable explanation based on data
				41	identify cause and effect	35	study data and determine importance of height on speed of marble
				80	analyze lever diagram	45	analyze data and explain a rule
				444	what causes acid rain	190	effect of changing mass on data
				462	determining effect of changing mass on temperature changes	197	identifying relationships between air pressure and weather
				466	thermal equilibrium	206	identifying relationship between percent of Earth covered in water and temperature range
				482	atmospheric pressure at various altitudes graph	217	determining relationship between temperature of the atmosphere and relative humidity
				503	factors that shape the weather	218	interpreting Doppler radar images
				614	relationship between orbital speed and distance between two objects	224	sequencing events
				651	apparent brightness vs. distance graph		
				657	use the diagram to answer the questions (#2)		
				657	arrange the items in the table (#3)		
657	use the diagram to answer the questions (#4)						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					<p>235 concluding which conditions affect the timing and duration and intensity of an earthquake based on observation</p> <p>237 finding a pattern of volcanoes on a bathymetric map</p> <p>241 justify which scenario was most likely</p> <p>256 investigation discovering relationship between orbital speed and distance</p>

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh1.c High School Science	Characteristics of Science: Habits of Mind	Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.	Explain that further understanding of scientific problems relies on the design and execution of new experiments which may reinforce or weaken opposing explanations.	7	experimentation begins with a question	7	design your own experiment
				19	design your own experiment	7	variables in an experiment
				42	devise an experiment	9	design three experiments using car and ramp
				454	forming a hypothesis and testing through experimentation (#5)	16	decide how to vary the force on the car for this experiment
				608	identify question, hypothesis, procedure, and results (#1)	26	what variables can be changed?
						75	design pendulum experiment
						93	decision trees and the advantage of doing multiple trials
						101	how could you extend the investigation to explore materials that give off light when heated?
						117	how could you find the volume of one drop of water?
						151	design experiment to find out if mass is conserved
		170	what three factors influence dissolving rate?				
		183	specifying how the daphnia experiment could be improved				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					233 identifying how the earthquake model represents an earthquake

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh2.a High School Science	Characteristics of Science: Habits of Mind	Students will use standard safety practices for all classroom laboratory and field investigations.	Follow correct procedures for use of scientific apparatus.	24	using an electronic timer	7	use a ruler to make a measurement
				503	slings psychrometer	12	using photogates
				600	telescopes	14	using photogates
						16	use a force scale
						17	use photogates to study car on ramp
						18	use a balance to find mass of car
						21	construct reasonable explanation based on data
						30	use force scale
						35	study data and determine importance of height on speed of marble
						40	choose circuit parts to light a bulb
						44	using electrical meter
						45	analyze data and explain a rule
						46	using electrical meter
						48	using electrical meter
						50	using electrical meter
						86	use CPO Timer to measure frequency
						107	study reflection of laser beam

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					108 study refraction of laser beam 113 trace critical angle with a laser beam 158 use a thermometer

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh2.b High School Science	Characteristics of Science: Habits of Mind	Students will use standard safety practices for all classroom laboratory and field investigations.	Demonstrate appropriate techniques in all laboratory situations.	3	time measurement	4	difference between precise and accurate data
				5	make measurements with precision	5	making measurements with precision
				6	scientists use metric units	6	electronic timer and release technique
				12	importance of reliable and accurate data collection	7	measure and record variables
				80	use and understand mass measurements	7	record time interval
				286	measuring volume of solids	9	collect speed data
				286	measuring volume of liquids	12	make metric length measurement
				591	understanding time measurement in years	14	record three different time intervals
				592	clocks and the division of time	16	understand and use units of force
				611	calculating Earth's dimensions	17	record times
				636	what evidence was used to predict the existence of the Kuiper Belt?	17	measure the force
				636	use the data to answer the questions	17	measure the force
				636	use the data to answer the questions	24	collect weight data
				636	use the data to answer the questions	25	collect force data
				658	analysis with a spectrometer (#4)	25	measure and record the force
		27	write down the number of weights you use				
		30	measure height difference				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					36 collect precise speed and height data
					36 make precise height measurements
					63 making measurements with precision
					75 collect mass and amplitude data
					75 make precise length measurements
					116 measuring mass
					117 measuring volume
					150 record data as you perform experiment
					171 collect time data and record observations
					176 measure pH
					182 observing daphnia and recording movements and behavior
					182 making detailed observations
					184 collecting pH readings while adding carbon dioxide
					186 collecting temperature data
					189 collecting time and temperature data

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					193 collecting and recording time and temperature data 206 collecting temperature and time data 210 collecting qualitative data of light intensity at scale distance from the sun 217 collecting wet and dry bulb temperature readings 249 using your sundial to collect accurate data 249 calibrating a sundial 253 calibrating your telescope

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
SCSh2.c High School Science	Characteristics of Science: Habits of Mind	Students will use standard safety practices for all classroom laboratory and field investigations.	Follow correct protocol for identifying and reporting safety problems and violations.	458 safety caution on heating jar	20 safety tip for car/ramp setup 24 ropes and pulley safety 26 safety tip for hanging weights from lever 40 electrical safety 44 short circuit safety warning 56 short circuit safety warning 58 short circuit safety warning 146 safety in the lab 150 chemistry safety 158 wear goggles and apron 168 safety equipment 172 hot water safety 180 safety tip for water testing 182 safety tips for observing Daphnia 186 thermometer safety 188 heat safety 192 heat safety 202 safety in greenhouse gas investigation 210 safety using light bulbs

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					216 safety in swinging thermometers 256 safety in lab
SCSh3.a High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Suggest reasonable hypotheses for identified problems.	457 what is temperature 536 proving hypotheses for sea-floor spreading 586 form a hypothesis (#7)	170 devise hypothesis and explain 170 which method will give fastest dissolving rate? 182 formulate hypothesis 208 formulate a hypothesis about why the seasons occur

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh3.b High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Develop procedures for solving scientific problems.	7	experimentation begins with a question	7	design your own experiment
				12	writing lab procedures	9	design three experiments using car and ramp
				19	design your own experiment	16	decide how to vary the force on the car for this experiment
				42	devise an 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
						170	what three factors influence dissolving rate?
						170	write a procedure
						196	writing a procedure for constructing a pointer for an aneroid barometer
		214	develop a procedure to create an underwater spring				
		233	identifying how the earthquake model represents an earthquake				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh3.c High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Collect, organize and record appropriate data.	12	importance of reliable and accurate data collection	4	difference between precise and accurate data
				441	making observations and asking questions	6	electronic timer and release technique
				492	observing an aurora	7	record time interval
				636	what evidence was used to predict the existence of the Kuiper Belt?	9	construct a data table
				636	use the data to answer the questions	9	collect speed data
				658	analysis with a spectrometer (#4)	12	understand and use data table
						14	record three different time intervals
						17	record times
						17	record results in data table
						18	organize different combinations of data
						24	collect weight data
						24	use data table to record results
		25	collect force data				
		27	use data table to record results				
		27	write down the number of weights you use				
		30	record ropes and pulley data in table				
		36	collect precise speed and height data				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					36 organize data into a table
					75 collect mass and amplitude data
					75 create data table for self-designed experiment
					146 record detailed observations
					150 record data as you perform experiment
					151 design a data table
					171 collect time data and record observations
					171 use data table for observations
					181 organize water quality data into a table
					182 observing daphnia and recording movements and behavior
					182 making detailed observations
					184 collecting pH readings while adding carbon dioxide
					186 collecting temperature data
					189 collecting time and temperature data

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					193 collecting and recording time and temperature data
					199 collecting Schönbein strips for detecting ozone
					202 collecting data of temperature and sensations
					206 collecting temperature and time data
					210 collecting qualitative data of light intensity at scale distance from the sun
					217 collecting wet and dry bulb temperature readings
					243 recording observations of crystal growing
					249 using your sundial to collect accurate data
					251 recording the changes in the moon over a month
					253 calibrating your telescope

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SCSh3.d High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Graphically compare and analyze data points and/or summary statistics.	24	making a graph	13	make a distance vs. time graph
				26	creating graphs	13	graph distance vs. time
				27	how to read a graph	15	construct a quantitative graphical model
				41	make a graph	37	organize data into a graph of speed vs. height
						51	graph voltage vs. current
						78	reading harmonic motion data tables and graphs
						121	graph mass vs. volume
						147	organize observations into a category table
						185	constructing a graph of drops of acid vs pH
						187	construct a graphical model
						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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SCSh3.e High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Develop reasonable conclusions based on data collected.		21 think about percent change 21 construct reasonable explanation based on data 35 study data and determine importance of height on speed of marble 45 analyze data and explain a rule 157 add new rules to list based on findings 197 evaluating your aneroid barometer design
SCSh3.f High School Science	Characteristics of Science: Habits of Mind	Students will identify and investigate problems scientifically.	Evaluate whether conclusions are reasonable by reviewing the process and checking against other available information.		21 construct reasonable explanation based on data 35 study data and determine importance of height on speed of marble 45 analyze data and explain a rule

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SCSh4.a High School Science	Characteristics of Science: Habits of Mind	Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.	Develop and use systematic procedures for recording and organizing information.		<p>students are encouraged to keep a lab notebook</p> <p>9 reporting on an experiment</p> <p>9 construct a data table</p> <p>12 understand and use data table</p> <p>17 record results in data table</p> <p>18 organize different combinations of data</p> <p>24 use data table to record results</p> <p>27 use data table to record results</p> <p>30 record ropes and pulley data in table</p> <p>36 organize data into a table</p> <p>75 create data table for self- designed experiment</p> <p>151 design a data table</p> <p>171 use data table for observations</p> <p>181 organize water quality data into a table</p> <p>183 writing up a lab report</p>

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SCSh4.b High School Science	Characteristics of Science: Habits of Mind	Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.	Use technology to produce tables and graphs.		data tables and graphs can be created on computer or graphing calculator

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SCSh4.c High School Science	Characteristics of Science: Habits of Mind	Students will use tools and instruments for observing, measuring, and manipulating scientific equipment and materials.	Use technology to develop, test, and revise experimental or mathematical models.	24	making a graph	data tables and graphs can be created on computer or graphing calculator
				26	creating graphs	13 graph distance vs. time
				41	make a graph	15 construct a quantitative graphical model
						37 organize data into a graph of speed vs. height
						51 graph voltage vs. current
						121 graph mass vs. volume
						147 organize observations into a category table
						185 constructing a graph of drops of acid vs pH
						187 construct a graphical model
						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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SCSh5.a High School Science	Characteristics of Science: Habits of Mind	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	Trace the source on any large disparity between estimated and calculated answers to problems.	491	what percentage comes from this source? (problem 4)	11	calculate % error
				549	determining distance to an epicenter	21	think about percent change
				553	what explains the difference in density? (#5)	76	calculate % error
				611	how big is Earth?	151	do the data support the hypothesis
						151	does your experiment agree with law of conservation of mass?
						171	what was happening at molecular level?
						197	calculating error between your barometer and a commercial barometer
						199	importance of good record keeping in order to avoid error
						231	evaluating your completed bathymetric map
						247	evaluate your ability to interpret rock formations

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SCSh5.b High School Science	Characteristics of Science: Habits of Mind	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	Consider possible effects of measurement errors on calculations.	491	what percentage comes from this source? (problem 4)	11	calculate % error
				549	determining distance to an epicenter	76	calculate % error
				553	what explains the difference in density? (#5)	197	calculating error between your barometer and a commercial barometer
				611	how big is Earth?	199	importance of good record keeping in order to avoid error

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SCSh5.c High School Science	Characteristics of Science: Habits of Mind	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	Recognize the relationship between accuracy and precision.	12	importance of reliable and accurate data collection	4	difference between precise and accurate data
				491	what percentage comes from this source? (problem 4)	6	electronic timer and release technique
				549	determining distance to an epicenter	7	record time interval
				553	what explains the difference in density? (#5)	9	collect speed data
				611	how big is Earth?	11	calculate % error
						17	record times
						24	collect weight data
						36	collect precise speed and height data
						75	collect mass and amplitude data
						76	calculate % error
		151	does your experiment agree with law of conservation of mass?	171	collect time data and record observations		
		182	making detailed observations	184	collecting pH readings while adding carbon dioxide		
		186	collecting temperature data	189	collecting time and temperature data		

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					193 collecting and recording time and temperature data 197 calculating error between your barometer and a commercial barometer 199 importance of good record keeping in order to avoid error 231 evaluating your completed bathymetric map 247 evaluate your ability to interpret rock formations 249 using your sundial to collect accurate data 253 calibrating your telescope
SCSh5.d High School Science	Characteristics of Science: Habits of Mind	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.	featured throughout CPO Science program featured in ancillary component 596 astronomic numbers expressed in scientific notation 598 calculating light year using scientific notation 607 converting numbers to scientific notation 612 determining Earth's mass using scientific notation	featured throughout CPO Science program featured in ancillary component 271 calculating solar brightness units (SBU) from kilometers in scientific notation

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SCSh5.e High School Science	Characteristics of Science: Habits of Mind	Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.	Solve scientific problems by substituting quantitative values, using dimensional analysis, and/or simple algebraic formulas as appropriate.	18	perform dimensional analysis calculations	25	create a mathematical model
				42	interpreting distance/time graph	27	find math rule for lever equilibrium
				465	heat equation	28	derive a math formula
				598	unit conversion in calculating light years	187	find equation for trend line
				651	inverse square law	257	inverse square law
					258	determining scale distances	
						268	discovering the mathematical relationship between apparent brightness and distance
SCSh6.a High School Science	Characteristics of Science: Habits of Mind	Students will communicate scientific investigations and information clearly.	Write clear, coherent laboratory reports related to scientific investigations.			9	reporting on an experiment
						179	create water quality report
						181	write paragraph to explain results
						183	write summary of findings

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SCSh6.b High School Science	Characteristics of Science: Habits of Mind	Students will communicate scientific investigations and information clearly.	Write clear, coherent accounts of current scientific issues, including possible alternative interpretations of the data.	116	study appliance labels and instructions	76	analyze watch manufacturer's claims
				122	batteries, energy, and voltage	162	inferences from promotional materials for vehicles
				125	circuit breakers	163	economic impact of end- product of combustion reaction
				126	ground fault circuit interrupter	163	too much CO ₂
				131	how a light bulb works	163	research how trees offset accumulation of CO ₂
				148	create pamphlet on utility's energy saver programs	163	research how trees offset accumulation of CO ₂
				171	how does an electric doorbell work?	163	can trees compensate for manmade CO ₂ from vehicles and industry?
				247	how an LCD display works	164	perform water quality tests
				252	how color printers work	178	wise use of water supply
				254	how a color TV works	180	perform water quality tests
				273	fiber optics	181	study water filtration device claims
				374	limiting reactants	182	investigate effect of acid rain on microorganisms
				385	research fuel cells	201	research the causes of ozone in the lower atmosphere
				385	research environmental impact of fuel cells		
				385	hydrogen-powered cars and the environment		
				401	fossil fuels		
				406	problems caused by airborne pollutants		
439	wise use of water						

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SCSh6.c High School Science	Characteristics of Science: Habits of Mind	Students will communicate scientific investigations and information clearly.	Use data as evidence to support scientific arguments and claims in written or oral presentations.	20 explain your reasoning	9 present conclusions to the class 21 construct reasonable explanation based on data 35 study data and determine importance of height on speed of marble 37 describe the flow of energy based on experimental graph 39 give a brief presentation to the class 45 analyze data and explain a rule 47 present and defend an explanation 145 present findings and methods used 151 present results to the class
SCSh6.d High School Science	Characteristics of Science: Habits of Mind	Students will communicate scientific investigations and information clearly.	Participate in group discussions of scientific investigation and current scientific issues.		145 present findings to the class 163 evaluating choice of favorite car

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SCSh7.a High School Science	Characteristics of Science: The Nature of Science	Students will analyze how scientific knowledge is developed. Students will recognize that:	The universe is a vast single system in which the basic principles are the same everywhere.	58	Newton on a skateboard	6	asking questions and learning about natural world
				80	describe a problem that would be solved by an engineer	39	study energy transformations in daily life scenarios
				126	circuits in your house	179	researching and preparing for a field trip to test surface water
				458	balloons expands or contracts due to thermal expansion	197	evaluating the relationship between atmospheric pressure and weather
				460	temperature vs. thermal energy for a cup or pot of soup	201	suggesting ways that ozone concentrations could be reduced
				467	understanding thermal energy through cocoa example	204	connecting the latent heat investigation to Earth
				469	convection and sea breezes	215	the food paradox of the oceans
				471	examples of reflectors and absorbers	218	understanding Doppler radar
				479	why do ears pop		
				479	why do ears pop		
				482	atmospheric pressure in Denver		
				495	patterns of heating and cooling on Earth		
				496	using the North Star to estimate your latitude		

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				510 meteorologists use atmospheric pressure data to understand movement of weather systems	
				514 patterns in storm activity across the globe	
				515 how do animals survive in the desert	
				539 patterns of earthquakes and volcanoes	
				542 analogy of plate movements	
				546 boundaries of tectonic plates	
				559 the Ring of Fire	
				590 lunar cycles	
				615 tides	
				643 categorizing stars with H-R diagrams	
				654 evidence for Big Bang theory	

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SCSh7.b High School Science	Characteristics of Science: The Nature of Science	Students will analyze how scientific knowledge is developed. Students will recognize that:	Universal principles are discovered through observation and experimental verification.	5	measuring distance	5	measuring metric and english lengths
				20	explain your reasoning	6	measure time
				454	forming a hypothesis and testing through experimentation (#5)	7	variables in an experiment
				608	identify question, hypothesis, procedure, and results (#1)	9	present conclusions to the class
						16	measure force
						37	describe the flow of energy based on experimental graph
						39	give a brief presentation to the class
						44	measure voltage
						46	measure current
						47	present and defend an explanation
		48	measure resistance				
		87	measure wavelength				
		116	measure mass				
		117	measure volume				
		145	present findings and methods used				
		151	present results to the class				
		186	measure temperature				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh7.c High School Science	Characteristics of Science: The Nature of Science	Students will analyze how scientific knowledge is developed. Students will recognize that:	From time to time, major shifts occur in the scientific view of how the world works.	34	Aristotle vs. Newton	130	investigate Rutherford's gold foil experiment
				45	Newton's Laws of Motion		
				54	Newton and the force of gravity		
				111	Benjamin Franklin		
				113	Charles-Augustin Coulomb		
				318	contributions of Fermi		
				319	development of atomic theory		
				327	contributions of Mendeleev		
				330	research and create a poster to illustrate development of atomic model		
				338	plate tectonic history		
				399	contributions of Marie and Pierre Curie		
				534	development of plate tectonic theory		
				535	continental drift theory		
				535	continental drift theory history		
				618	changing ideas about the solar system		
654	development of Big Bang theory						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh7.d High School Science	Characteristics of Science: The Nature of Science	Students will analyze how scientific knowledge is developed. Students will recognize that:	Hypotheses often cause scientists to develop new experiments that produce additional data.	9	steps in the scientific method	7	perform your own experiment
				10	forming a hypothesis	7	compare results with hypothesis
				19	design your own experiment	7	variables in an experiment
				454	forming a hypothesis and testing through experimentation (#5)	10	conduct car/ramp experiment
				454	describe steps you would take to determine whether pH affects frog population	16	investigate Newton's 2nd law
				608	identify question, hypothesis, procedure, and results (#1)	34	investigate motion on a rollercoaster
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	perform self-designed experiment
						157	add new rules to list based on findings
						170	which factor will produce fastest dissolving rate?
						182	simulating the effect of acid rain on daphnia
						188	conducting investigation of efficiency of immersion heater
						193	conducting experiments on heat transfer

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
					197 evaluating your aneroid barometer design 205 investigating how specific heat of water regulates Earth's temperature 237 develop a research plan for studying volcanoes
SCSh7.e High School Science	Characteristics of Science: The Nature of Science	Students will analyze how scientific knowledge is developed. Students will recognize that:	Testing, revising, and occasionally rejecting new and old theories never ends.		21 construct reasonable explanation based on data 35 study data and determine importance of height on speed of marble 45 analyze data and explain a rule 157 add new rules to list based on findings 197 evaluating your aneroid barometer design

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh8.a High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	Scientific investigators control the conditions of their experiments in order to produce valuable data.	11	control and experimental variables	7	doing a controlled experiment
				26	independent and dependent variables	21	choose independent and dependent variables for graph
						27	recognize variables
						190	effect of changing mass on collected data
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
SCSh8.b High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	Scientific researchers are expected to critically assess the quality of data including possible sources of bias in their investigations' hypotheses, observations, data analyses, and interpretations.	19 which group did the best experiment?	18 evaluate graphs as to whether or not they show relationships between variables 21 evaluate percent change for data collected 21 construct reasonable explanation based on data 35 study data and determine importance of height on speed of marble 45 analyze data and explain a rule 75 evaluate statistical significance 171 evaluate method based on data 200 evaluating your qualitative ozone strips

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
SCSh8.c High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.	20 explain your reasoning	9 present conclusions to the class 15 discuss and test ideas with your group 19 explain how you arrived at your answer 29 discuss what you learned about gears 37 describe the flow of energy based on experimental graph 39 give a brief presentation to the class 47 present and defend an explanation 47 discuss an explanation with your group 129 explain your answer and justify 145 present findings and methods used 151 present results to the class

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh8.d High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	The merit of a new theory is judged by how well scientific data are explained by the new theory.	19	which group did the best experiment?	18	evaluate graphs as to whether or not they show relationships between variables
				530	Kelvin's calculations of Earth's age	21	evaluate percent change for data collected
				535	critiquing Wegener's theories of continental drift	21	construct reasonable explanation based on data
				618	early theories of the solar system	35	study data and determine importance of height on speed of marble
						39	critique group's explanation of energy transformations
						39	analyze energy transformations in different scenarios
						45	analyze data and explain a rule
						75	evaluate statistical significance
						77	show how energy loss data could be applied to designing a real clock
						77	compare law of conservation of energy to motion of pendulum
						171	evaluate method based on data
						200	evaluating your qualitative ozone strips

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
SCSh8.e High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	The ultimate goal of science is to develop an understanding of the natural universe which is free of biases.	23	why make models?	6	asking questions and learning about natural world
				24	scientific models		
				24	what is a scientific model?	202	modeling the effect of greenhouse gases on Earth's temperature
				479	why do ears pop		
				491	computer modeling to predict greenhouse effects	212	modeling underwater rivers and waterfalls and springs
				500	modeling air currents		
				510	meteorologists use atmospheric pressure data to understand movement of weather systems	215	the food paradox of the oceans
						232	construct a model that simulates an earthquake
				524	create a model (#1)	258	setting up a scale model of the solar system
				530	model of Earth's history		
				539	modeling plate boundaries		
				582	rock cycle model		
				620	solar system modeling		
				630	model of the sun's anatomy		
654	evidence for Big Bang theory						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SCSh8.f High School Science	Characteristics of Science: The Nature of Science	Students will understand important features of the process of scientific inquiry. Students will apply the following to inquiry learning practices:	Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes sought.	75	relationship between science and technology	70	using engineering design cycle
				422	the science of scuba diving		
				536	using echo sounders to map the sea floor		
				554	describe the work of a geologist and paleontologist and seismologist		
				603	using satellite technology		
605	space shuttle						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS01.a Physical Science	Content	Students will investigate our current understanding of the atom.	Examine the structure of the atom in terms of: proton, electron, and neutron locations; atomic mass and atomic number; atoms with different numbers of neutrons (isotopes); the relationship of the proton number to the element's identity.	317	location/size/charge of subatomic particles	132	atomic number determines what element that atom is
				317	protons/neutrons/electrons	132	building atom models
				321	atomic number discussed	133	exploring isotopes
				321	atoms of same element have same atomic number	133	identify atomic number
				322	isotopes explained	133	identify element symbol and name
				322	mass number discussed	133	identify mass number
				324	proton/electron attraction	133	protons and neutrons
				328	chemical symbols and element names	133	location of electrons in atom
				328	mass number on the periodic table	136	understanding isotopes
				328	atomic mass on the periodic table	136	mass number
				328	atomic number on the periodic table	136	atomic number
				328	atomic number on the periodic table	136	model stable and neutral atoms
						137	importance of atomic number
		137	build atomic models				
		140	review subatomic particles				

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS01.b Physical Science	Content	Students will investigate our current understanding of the atom.	Compare and contrast ionic and covalent bonds in terms of electron position.	330	which element is more likely to combine with other elements?	141	modeling a chemical bond
				330	use the periodic table to predict chemical formulas	143	classify ionic compounds
				336	ionic bonds	143	ionic compounds
				337	covalent bonds		
				338	distinguishing between ionic and covalent bonds		
				341	chemical bonding and the periodic table		
				415	dissolving an ionic compound		
				416	solute dissolution depends on chemical bonds		
SPS02.a Physical Science	Content	Students will explore the nature of matter, its classifications, and the system for naming types of matter.	Calculate density when given a means to determine a substance's mass and volume.	297	density explained	116	mass and volume measurements
				301	relationship between mass volume and density	124	build a density column
				302	density of liquid water vs. ice	212	investigate density changes in the oceans as the cause of ocean layering
SPS02.b Physical Science	Content	Students will explore the nature of matter, its classifications, and the system for naming types of matter.	Predict formulas for stable binary ionic compounds based on balance of charges.	342	writing a chemical formula	143	predict chemical formulas
				344	summary of chemical formula writing rules	145	determine empirical formula

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
SPS02.c Physical Science	Content	Students will explore the nature of matter, its classifications, and the system for naming types of matter.	Use IUPAC nomenclature for transition between chemical names and chemical formulas of binary ionic compounds (containing representative elements). binary covalent compounds (i.e. carbon dioxide, carbon tetrachloride).	345 naming compounds	143 name chemical compounds
SPS02.d Physical Science	Content	Students will explore the nature of matter, its classifications, and the system for naming types of matter.	Demonstrate the Law of Conservation of Matter in a chemical reaction.	369 history of law of conservation of mass	150 investigate conservation of mass in effervescent tablet reaction
SPS02.e Physical Science	Content	Students will explore the nature of matter, its classifications, and the system for naming types of matter.	Apply the Law of Conservation of Matter by balancing the following types of chemical equations: Synthesis Decomposition Single Replacement Double Replacement	377 which of the equations is balanced? 381 synthesis or addition reactions 382 decomposition reactions 383 single displacement reactions 383 double displacement reactions	149 balance these equations 156 investigate double displacement reactions

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page
SPS03.a Physical Science	Content	Students will distinguish the characteristics and components of radioactivity.	Differentiate among alpha and beta particles and gamma radiation.	394 nuclear vs chemical reactions	138 nuclear reactions 160 how do you simulate nuclear decay?
SPS03.b Physical Science	Content	Students will distinguish the characteristics and components of radioactivity.	Differentiate between fission and fusion.	393 fusion and fission explained 629 nuclear fusion and the sun	138 fusion and fission
SPS03.c Physical Science	Content	Students will distinguish the characteristics and components of radioactivity.	Explain the process half-life as related to radioactive decay.		160 radioactive decay
SPS03.d Physical Science	Content	Students will distinguish the characteristics and components of radioactivity.	Describe nuclear energy, its practical application as an alternative energy source, and its potential problems.	178 generating electric power 399 carbon dating 399 radioisotopes in science and medicine 406 research pros and cons of nuclear technology 566 description of geothermal energy 633 the efficiency of photovoltaic cells	161 research pros and cons of uses for radioactive elements 262 determine the efficiency of a photovoltaic cell

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS04.a Physical Science	Content	Students will investigate the arrangement of the Periodic Table.	Determine the trends of the following: Number of valence electrons Types of ions formed by representative elements Location of metals, nonmetals, and metalloids Phases at room temperature	326	groups of elements	133	using the periodic table
				327	studying the periodic table	136	building and studying the periodic table
				327	groups of elements and valence shells	141	build model of Na and Cl atoms and explain why they bond to form a molecule
				335	periodic table columns and valence electrons		
				336	bonding and periodic table position	142	arrangement of electrons and groups of elements
				338	metals nonmetals and metalloids		
				338	periodic table and electronegativities		
SPS04.b Physical Science	Content	Students will investigate the arrangement of the Periodic Table.	Use the Periodic Table to predict the above properties for representative elements.	326	groups of elements	133	using the periodic table
				327	studying the periodic table	136	building and studying the periodic table
				338	metals nonmetals and metalloids		
SPS05.a Physical Science	Content	Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.	Compare and contrast the atomic/molecular motion of solids, liquids, gases and plasmas.	290	states of matter and arrangement of molecules	118	observe melting process and study quantitatively
				291	characteristics of matter related to its state	118	molecules in a liquid
				411	molecular structure of ice	118	investigate melting
						118	think of melting process at molecular level

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SPS05.b Physical Science	Content	Students will compare and contrast the phases of matter as they relate to atomic and molecular motion.	Relate temperature, pressure, and volume of gases to the behavior of gases.	305 306	Charles' law Boyle's law	
SPS06.a Physical Science	Content	Students will investigate the properties of solutions.	Describe solutions in terms of solute/solvent conductivity concentration	413 413 418 418 419 420 421	solute and solvent defined definitions of solution and solute and solvent effect of nature of solvent on solubility effect of temperature on solubility temperature-solubility graphs effect of temperature on solubility of gasses saturated and supersaturated solutions	170 solubility and temperature 172 investigate solubility of sugar

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS06.b Physical Science	Content	Students will investigate the properties of solutions.	Observe factors affecting the rate a solute dissolves in a specific solvent.	409	why water is a nearly universal solvent	170	solubility and temperature
				415	polar solutes	170	design experiments to explore dissolving rate
				418	effect of nature of solvent on solubility	172	investigate solubility of sugar
				418	effect of temperature on solubility	175	solubility and pressure
				418	solubility value	181	water quality testing
				419	temperature-solubility graphs	181	water quality testing
				420	effect of temperature on solubility of gasses		
				420	effect of pressure on solubility of gasses		
				420	pressure and the solubility of gases		
				422	SCUBA diving and effects of pressure on gasses in the bloodstream		
SPS06.c Physical Science	Content	Students will investigate the properties of solutions.	Demonstrate that solubility is related to temperature by constructing a solubility curve.	418	effect of nature of solvent on solubility	170	solubility and temperature
				418	effect of temperature on solubility	172	investigate solubility of sugar
				419	temperature-solubility graphs		
				420	effect of temperature on solubility of gasses		

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
SPS06.d Physical Science	Content	Students will investigate the properties of solutions.	Compare and contrast the components and properties of acids and bases.	423	define and compare acids and bases	176	measure pH of everyday solutions
				423	acids and bases compared/contrasted	176	investigate acids and bases
				424	formulas and reactions of acids and bases	181	testing pH of tap water samples
				424	strong vs. weak acids	184	determining pH of water as carbon dioxide dissolves
				425	weak and strong acids and bases		
				425	strong vs. weak bases		
				426	pH and pH scale		
				426	defining and determining pH		
				426	concentration of hydronium ions determines pH and strength of acids and bases		
				427	pH of substances you use or consume		
				427	table of pH of common substances		
				428	pH and blood		
				428	examples of acid and base chemistry		
				429	acids and bases are electrolytes		
				429	electrolytes and nonelectrolytes		

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				429 electrolytes and nonelectrolytes 443 pH of acid rain 443 concentration of ions and pH	
SPS07.a Physical Science	Content	Students will relate transformations and flow of energy within a system.	Identify energy transformations within a system (e.g. lighting of a match).	95 understand basic forms of energy 95 energy conversions	38 explore energy transformations 39 identify type of energy involved
SPS07.b Physical Science	Content	Students will relate transformations and flow of energy within a system.	Investigate molecular motion as it relates to thermal energy changes in terms of conduction, convection, and radiation.	468 densely packed solids are good conductors of heat 468 heat transfer through air 469 convection currents and weather 469 warming hands over candle 470 convection currents in water 471 transfer of heat by radiation 471 solid road surface emits radiation 488 global warming and heat transfer by radiation 499 apply knowledge of heat transfer to different situations	192 investigate convection in liquids

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS07.c Physical Science	Content	Students will relate transformations and flow of energy within a system.	Determine the heat capacity of a substance using mass, specific heat, and temperature.	461	definition of calorie	190	calculating thermal energy in calories
				462	definition of specific heat		
				462	specific heat	205	investigating how the high specific heat of water helps regulate Earth's temperature
				464	water's specific heat helps regulate Earth's temperature		
				465	heat equation		
SPS07.d Physical Science	Content	Students will relate transformations and flow of energy within a system.	Explain the flow of energy in phase changes through the use of a phase diagram.			119	create a temperature vs. time graph of phase change
						204	compare the shape of the water line and the ice line on the temperature/time graph

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SPS08.a Physical Science	Content	Students will determine relationships among force, mass, and motion.	Calculate velocity and acceleration.	14	how to calculate speed	8	calculating speed
				20	find speed of bumblebee	9	collect data and calculate speed of car
				20	calculate speed of car	10	calculate speed of the car
				24	accurate speed measurements	12	find speed of car at different positions
				32	average speed vs. instantaneous	14	calculate acceleration of car on ramp
				32	average speed discussed	14	calculate speed of car at two places on the ramp
				33	understanding acceleration	17	explore 2nd law and acceleration
				35	how to calculate acceleration	17	calculate speed of car
				36	examples of acceleration	36	find speed of marble
				41	find acceleration of car		
				42	calculate speed from distance/time graph		
				49	link between force and acceleration		
				53	acceleration due to gravity		

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS08.b Physical Science	Content	Students will determine relationships among force, mass, and motion.	Apply Newton's three laws to everyday situations by explaining the following: Inertia Relationship between force, mass and acceleration Equal and opposite forces	45	Newton's third law summarized	14	exploring acceleration on a ramp
				45	Newton's second law summarized	16	2nd law
				45	Newton's first law summarized	16	thinking about force
				48	Newton's first law in detail	19	discover 2nd law of motion
				49	Newton's second law in detail	20	force and motion with car and ramp
				59	Newton's third law in detail	22	car and ramp and Newton's 3rd law
				64	solving problems using $f=ma$	23	using 3rd law to explain common phenomena
SPS08.c Physical Science	Content	Students will determine relationships among force, mass, and motion.	Relate falling objects to gravitational force	52	the effect of gravity	20	investigate effect of gravity on motion
SPS08.d Physical Science	Content	Students will determine relationships among force, mass, and motion.	Explain the difference in mass and weight.	47	weight vs. mass	20	weight vs. mass

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SPS08.e Physical Science	Content	Students will determine relationships among force, mass, and motion.	Calculate amounts of work and mechanical advantage using simple machines.	69	how to calculate mechanical advantage	25	discover mechanical advantage of ropes and pulleys
				71	how a lever works	27	set up a lever that has mechanical advantage
				73	three classes of levers	31	calculate work done on block
				80	set up a lever with MA greater than 1	31	work = force X distance
				81	calculate mechanical advantage	191	calculating work input and work output
				85	how to calculate work		
				102	calculate work done		
				102	decide whether or not work is done		
				103	calculate work accomplished by a motor		
				103	compare different amounts of work done		
SPS09.a Physical Science	Content	Students will investigate the properties of waves.	Recognize that all waves transfer energy.	201	waves transmit energy		
				486	energy and radiation relationships		
				632	the sun's energy reaches Earth in the form of electromagnetic waves		

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS09.b Physical Science	Content	Students will investigate the properties of waves.	Relate frequency and wavelength to the energy of different types of electromagnetic waves and mechanical waves.	227	importance of wavelength of sound waves	83	find speed of a wave
				243	light waves and the electromagnetic spectrum	86	adjust frequency of a standing wave
				248	color and frequency of light waves	105	explore relationship between color and wavelength
						265	an element's spectral lines correspond to specific wavelengths of light
SPS09.c Physical Science	Content	Students will investigate the properties of waves.	Compare and contrast the characteristics of electromagnetic and mechanical (sound) waves.	203	transverse and longitudinal waves	82	study wave pulses on elastic cord
				204	frequency and wavelength and amplitude	83	measure speed of a wave pulse
				211	standing waves on a string	84	make different types of waves in a ripple tank
				221	properties of sound waves	86	investigate frequency and wavelength
				228	effect of temperature on speed of sound wave	94	does sound behave like other waves?
				228	effect of medium on speed of sound wave		
				248	properties of light waves		
				486	electromagnetic radiation		
544	body waves						

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
SPS09.d Physical Science	Content	Students will investigate the properties of waves.	Investigate the phenomena of reflection, refraction, interference, and diffraction.	207	waves and refraction	85	observing reflection in water waves
				207	waves and reflection	95	interference and sound waves
				207	reflection in water waves and light waves	95	investigate interference with sound waves
				208	refraction and eyeglasses	101	examine light through diffraction grating
				212	constructive and destructive interference	106	tracing incident and reflected rays
				216	can wave interference sink a ship?	106	investigate reflection of light
				229	interference of sound waves	107	investigate how light interacts with mirrors
				231	consonance and dissonance and beats	107	plot reflected rays from a mirror
				264	refraction in optical systems	108	tracing incident and refracted rays
				264	forming images with lenses	108	explore refraction with lenses
				266	reflection and mirrors	108	investigate how light interacts with a prism
				267	refraction and lenses	108	explore refraction with a prism
				269	index of refraction	110	finding focal point and focal length of a lens
				279	find the angle of reflection	111	plotting images formed when light is refracted by a lens

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page		Volume 2 Investigation Manual Page	
						253	using a retractive telescope
SPS09.e Physical Science	Content	Students will investigate the properties of waves.	Relate the speed of sound to different mediums.	219 223	how the ear works loudness and decibels	90	investigate human perception of sound
SPS09.f Physical Science	Content	Students will investigate the properties of waves.	Explain the Doppler Effect in terms of everyday interactions.	228 228 654	effect of temperature on speed of sound wave effect of medium on speed of sound wave the Doppler effect	94	does sound behave like other waves?
SPS10.a Physical Science	Content	Students will investigate the properties of electricity and magnetism.	Investigate static electricity in terms of friction induction conduction	111 112 113 114 114	charge is a fundamental property of matter static charge discussed explanation of coulomb how an electroscope works electroscopes	42	investigate electric charge

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Standard #: Course	Co-Requisite	Standard	Learning Goal	Volume 1 Student Text Page	Volume 2 Investigation Manual Page		
SPS10.b Physical Science	Content	Students will investigate the properties of electricity and magnetism.	Explain the flow of electrons in terms of alternating and direct current. the relationship among voltage, resistance and current. simple series and parallel circuits.	107	concept of electric current	44	investigate concept of voltage
				108	concept of electric circuits	45	battery chemicals and electrical charge
				109	circuit diagrams	46	investigate concept of electric current
				119	battery uses chemical energy to produce electrical charge	48	measuring resistance
				120	voltage and potential energy	50	Ohm's law
				121	how to measure voltage	56	build a parallel circuit
				123	electrical current explained	56	build a series circuit
				125	how to measure current	57	compare brightness of bulbs in series vs. parallel
				126	alternating current	58	build a series circuit and find total resistance
				126	direct current	60	parallel circuit and Ohm's law
				129	understand the concept of electrical resistance	61	compare current and voltage and resistance in each type of circuit
				135	Ohm's law explained		
				138	using Ohm's law to analyze circuits		
				141	potentiometer explained		
				151	single path vs. branching paths		
				151	parallel circuit defined		
				151	series circuit defined		
				151	holiday lights as series or parallel		
				152	household wiring		

Correlation to Georgia Performance Standards: Science (revised 2006)
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				153 157 161 162	
SPS10.c Physical Science	Content	Students will investigate the properties of electricity and magnetism.	Investigate applications of magnetism and/or its relationship to the movement of electrical charge as it relates to electromagnets.	170 172 172 174 176 177	66 67 68 73 73
				current and voltage in series circuits voltage and resistance in parallel circuits analyze a parallel circuit analyze a series circuit	build an electromagnet find out what happens to strength of electromagnet when current is increased investigate how an electric motor works use magnetic induction to create an electric field exploring electric generators