

Correlation to Connecticut Science Framework: New Draft
Foundations of Physical Science with Earth and Space Science
Student Text and Investigation Manual

Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
HS1.11.a Alternative Energy Resources	9 - 10	The total matter and energy of the universe is constant. Energy cannot be created or destroyed, but it can be changed from one form to another.	Describe the transformation and conservation of kinetic and potential energy in mechanical, chemical and electrical systems.	91 537	following an energy transformation potential energy transformed to kinetic energy causes earthquakes	36 38	energy conservation and the roller coaster identify potential/kinetic energy conversions

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
HS1.11.b Alternative Energy Resources	9 - 10	The total matter and energy of the universe is constant. Energy cannot be created or destroyed, but it can be changed from one form to another.	Explore and describe how electricity is generated, transferred and used in modern technologies.	101	concept of electric current	44	investigate concept of voltage
				102	concept of electric circuits	45	battery chemicals and electrical charge
				103	circuit diagrams	46	investigate concept of electric current
				113	battery uses chemical energy to produce electrical charge	48	measuring resistance
				114	voltage and potential energy	50	Ohm's law
				115	how to measure voltage	52	the cost of using electrical appliances
				117	electrical current explained	56	build a parallel circuit
				119	how to measure current	56	build a series circuit
				120	ground fault circuit interrupter	57	compare brightness of bulbs in series vs. parallel
				123	understand the concept of electrical resistance	58	build a series circuit and find total resistance
				128	find and investigate circuit breakers in the home	60	parallel circuit and Ohm's law
				131	Ohm's law explained	61	compare current and voltage and resistance in each type of circuit
				132	using Ohm's law to analyze circuits	62	describing forces that magnets exert on each other
				136	potentiometer explained	64	testing materials to see if they are affected by magnets
				145	single path vs. branching paths	66	build an electromagnet
				145	parallel circuit defined		
				145	series circuit defined		

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				145	holiday lights as series or parallel	66	compare electromagnets and permanent magnets
				146	household wiring	67	find out what happens to strength of electromagnet when current is increased
				147	current and voltage in series circuits		
				151	voltage and resistance in parallel circuits	68	investigate how an electric motor works
				155	analyze a parallel circuit	73	exploring electric generators
				156	analyze a series circuit		
				159	magnetism explained	73	use magnetic induction to create an electric field
				163	understanding magnetic fields	262	solar energy can be used to generate electricity without producing pollution
				164	what is an electromagnet?		
				166	building an electromagnet	262	determine the efficiency of a photovoltaic cell
				166	increased current vs. strength of magnetic field		
				168	how electric motors work		
				170	dissecting an electric motor		
				171	electromagnetic induction explained		
				172	generating electric power		
				391	nuclear vs. fossil fuels		
				391	impact of nuclear energy		
				400	reducing pollution		

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				414	environmental impact of electrical generating facilities		
				438	impact of using fossil fuels		
				560	description of geothermal energy		
				627	the efficiency of photovoltaic cells		
				627	using photovoltaic cells		
HS1.21.c Alternative Energy Resources	9 - 10	Radioactive elements decay and emit radiation which can be both beneficial and/or hazardous.	Describe how radioactive isotopes spontaneously decay to produce different atoms and emit radiation.	316	isotopes explained	133	exploring isotopes
				387	fusion and fission explained	136	understanding isotopes
				393	radioisotopes in science and medicine	138	fusion and fission
				393	carbon dating	160	radioactive decay
				400	research pros and cons of nuclear technology	161	research pros and cons of uses for radioactive elements
				623	nuclear fusion and the sun		
HS1.21.d Alternative Energy Resources	9 - 10	Radioactive elements decay and emit radiation which can be both beneficial and/or hazardous.	Describe how nuclear fission reactions are used to produce heat in nuclear plants.	387	fusion and fission explained	138	fusion and fission
				623	nuclear fusion and the sun		

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HS1.21.e Alternative Energy Resources	9 - 10	Radioactive elements decay and emit radiation which can be both beneficial and/or hazardous.	Explore the benefits and risks of using radioactive materials and radiation in modern technologies (e.g., energy production in nuclear plants, food preservation by irradiation).	391 393 393 400 414 438 627	nuclear vs. fossil fuels radioisotopes in science and medicine carbon dating research pros and cons of nuclear technology environmental impact of electrical generating facilities impact of using fossil fuels using photovoltaic cells	161 262	research pros and cons of uses for radioactive elements solar energy can be used to generate electricity without producing pollution
HS1.31.f Alternative Energy Resources	9 - 10	Current fuel resources are limited and renewable energy sources should be explored.	Investigate the advantages and disadvantages of using fossil fuels, nuclear energy, winds, sunlight, hydrogen and alcohols as sources of energy.	172 391 391 400 414 438 560 627 627	generating electric power nuclear vs. fossil fuels impact of nuclear energy reducing pollution environmental impact of electrical generating facilities impact of using fossil fuels description of geothermal energy using photovoltaic cells the efficiency of photovoltaic cells	52 262 262	the cost of using electrical appliances solar energy can be used to generate electricity without producing pollution determine the efficiency of a photovoltaic cell

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HS2.12.a A Balanced Environment	9 - 10	Living things have the capacity to produce populations of infinite size, but environments and resources are finite and therefore limit population size.	Explore the factors that affect the growth patterns, density and distribution of populations.	411	effects of PCB's in Great Lakes	178	actions to take to improve water quality
				414	effect of electrical generating facilities on dissolved oxygen in water	178	predict the quality of surface water to be tested and justify your answer
				433	The Clean Water Act		
				435	water quality testing	178	predict the quality of surface water to be tested and justify your answer
				436	water quality testing		
				437	acid rain		
				437	effects of acid rain on natural environments	179	address what you can do to maintain or improve the water quality at the test site
				437	acid rain		
				438	causes and health effects of acid rain	182	the effects of acid rain on organisms in aquatic environments
				439	illustration of acid rain formation		
				443	impact of increased CO2 in oceans	182	the effects of acid rain on organisms in aquatic environments
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 on oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				471	nitrogen cycle		

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				479	effects of CFC's on the ozone layer		
				482	effects of burning fossil fuels		
				482	changes to the oceans due to increasing global temperatures		
				504	temperature inversion		
				515	permafrost		
				568	how urban sprawl changes local climate		
				568	environmental impact of urban sprawl		
HS2.12.b A Balanced Environment	9 - 10	Living things have the capacity to produce populations of infinite size, but environments and resources are finite and therefore limit population size.	Explore how human beings use technology to increase the carrying capacity of their environment (e.g., agriculture, medicine, transportation).	433	the clean water act		
				439	catalytic converters and scrubbing reduce acid rain		
				483	hydrogen powered cars		
				538	what we can learn from seismographs		
				544	understanding earthquakes allows engineers to design safer buildings		

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HS2.22.c A Balanced Environment	9 - 10	Atoms react with each other to form molecules, and the configuration of atoms and molecules determines the properties of the new materials.	Describe how atoms combine to produce compounds with new properties through the transfer or sharing of electrons.	324 324 335	use the periodic table to predict chemical formulas which element is more likely to combine with other elements? chemical bonding and the periodic table	136 141 141 143	ions whan an atom ionizes modeling a chemical bond ionic compounds

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HS2.22.d A Balanced Environment	9 - 10	Atoms react with each other to form molecules, and the configuration of atoms and molecules determines the properties of the new materials.	Explore reactants and products (e.g., CO, NOx, SO2, Ozone, particulates) in combustion reactions.	354	new substances are formed when a chemical change occurs	148	reactants and products
				357	chemical reactions involve rearrangement of atoms	148	chemical equations
				357	combustion reaction	149	balance these equations
				359	balancing chemical equations	149	practice balancing equations
				361	chemical reactions in living systems	152	write the balanced equation
				361	heartburn reaction	152	predict how much product formed given the reactants
				371	which of the equations is balanced?	157	predict the products of double displacement reactions
				378	combustion reactions	162	investigating combustion reactions
				378	consumer chemistry		
				381	MRE ration heater reaction		
				395	chemistry of the atmosphere		
				395	chemistry of the atmosphere		
				397	carbon reactions		
				419	dissociation of water		
				438	chemical reactions and the formation of acid rain		

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
HS2.32.f A Balanced Environment	9 - 10	The environment becomes degraded due to the increase consumption of natural resources and use of synthetic materials.	Explore and explain the causes of air pollution and the possible effects on human health and the environment.	414 437 438 443 504	effect of electrical generating facilities on dissolved oxygen in water acid rain causes and health effects of acid rain impact of increased CO2 on oceans temperature inversion	182	the effects of acid rain on organisms in aquatic environments
HS2.32.g A Balanced Environment	9 - 10	The environment becomes degraded due to the increase consumption of natural resources and use of synthetic materials.	Explore the quality of a local water resource (e.g., level of metal and non-metal ions, pH, concentration of gases), and what can be done to preserve the quality of water resources.	364 411 432 433 433 434 435 436 437 443 444 445	petroleum effects of PCB's in Great Lakes water cycle and conservation water quality standards The Clean Water Act importance of water analysis water quality testing water quality testing acid rain impact of increased CO2 on oceans pollution and the ocean food chain pollution and the ocean food chain	163 178 179 179 180 182	consider a vehicle's fuel economy predict the quality of surface water to be tested and justify your answer address what you can do to maintain or improve the water quality at the test site maintaining water supply quality save water for houseplants the effects of acid rain on organisms in aquatic environments

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HS4.14.a Organic & Synthetic Polymers	9 - 10	The atoms and molecules of all matter are perpetually in motion, and changes in their average energy of motion result in changes in the temperature of the matter.	Describe the structure and motion of particles in solids, liquids and gases.	284 285 405	states of matter and arrangement of molecules characteristics of matter related to its state molecular structure of ice	118 118 118 118	observe melting process and study quantitatively investigate melting molecules in a liquid think of melting process at molecular level
HS4.14.b Organic & Synthetic Polymers	9 - 10	The atoms and molecules of all matter are perpetually in motion, and changes in their average energy of motion result in changes in the temperature of the matter.	Explore how changes in the amount of thermal energy in solids, liquids and gases affect their properties.	284 284 284 285 451 452 455 461 498	melting and boiling points melting and boiling point explained changes of state table of melting and boiling points increasing temperature means increasing motion of molecules molecular motion increases when temperature increases examples of flow of heat conduction and convection and radiation phases changes in the atmosphere	119 119 119 119 119 119 188 203 204	melting point of ice investigate melting and create a graph adding heat energy to melt an ice cube create a temperature vs. time graph of phase change energy and phase changes investigate heating water with an immersion heater investigate the temperature/time curves as water is cooled through a phase change to ice compare the shape of the water line and the ice line on the temperature/time graph

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HS4.24.c Organic & Synthetic Polymers	9 - 10	Carbon atoms can bond to one another in chains, rings and branching networks to form a variety of structures, including synthetic polymers, oils, and the large molecules essential to life.	Describe the structure of the carbon atom and simple hydrocarbon compounds (e.g., ethane, ethylene and ethanol).	364	carbon chains	162	carbon reactions and the environment
HS4.24.d Organic & Synthetic Polymers	9 - 10	Carbon atoms can bond to one another in chains, rings and branching networks to form a variety of structures, including synthetic polymers, oils, and the large molecules essential to life.	Explore how simple monomers are combined to create plastics (e.g., polyethylene, polyvinyl chloride, polystyrene).	333	plastics		

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
HS4.24.e Organic & Synthetic Polymers	9 - 10	Carbon atoms can bond to one another in chains, rings and branching networks to form a variety of structures, including synthetic polymers, oils, and the large molecules essential to life.	Explore the structure of biopolymers such as proteins and carbohydrates.	357 361	combustion reaction heartburn reaction		
HS4.34.f Organic & Synthetic Polymers	9 - 10	Advances in chemistry have personal and societal costs and benefits.	Explore and explain the properties and uses of common synthetic polymers such as polyethylene, polyvinyl chloride, and polystyrene.	333	plastics		

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HS5.15.a The Physics of Modern Technologies	9 - 10	Waves have energy and can transfer energy when they interact with matter.	Explore and explain how the properties of waves depend on the frequency and amplitude of the waves.	179 180 182 182 192 197 198 205 215 221 242 538	what is a cycle? oscillators explained concept of frequency explained concept of period explained analyze systems to find cycle/period/frequency transverse and longitudinal waves frequency and wavelength and amplitude standing waves on a string properties of sound waves importance of wavelength of sound waves properties of light waves body waves	82 83 83 84 86 86	study wave pulses on elastic cord measure speed of a wave pulse find speed of a wave make different types of waves in a ripple tank investigate frequency and wavelength adjust frequency of a standing wave

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HS5.15.b The Physics of Modern Technologies	9 - 10	Waves have energy and can transfer energy when they interact with matter.	Describe different classifications within the electromagnetic spectrum in terms of their wavelengths, frequency and energy.	196 237 237 237 250 272 480	waves are all around us light waves and the electromagnetic spectrum radio and television signals microwave ovens identify uses of electromagnetic waves identify uses of electromagnetic waves electromagnetic radiation		

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HS5.15.c The Physics of Modern Technologies	9 - 10	Waves have energy and can transfer energy when they interact with matter.	Explore and explain how heat can be transferred through materials and across space.	461 462 462 463 463 464 465 465 482 493	thermal conductivity explained densely packed solids are good conductors of heat heat transfer through air convection currents and weather warming hands over candle convection currents in water solid road surface emits radiation transfer of heat by radiation global warming and heat transfer by radiation apply knowledge of heat transfer to different situations	192	investigate convection in liquids
HS5.25.d The Physics of Modern Technologies	9 - 10	Technology based on the electromagnetic spectrum is used to collect and interpret evidence about the structure of the universe.	Describe how stars evolved from a cloud of light elements that was condensed by gravity.	638 639 640	the life cycle of stars description and illustration of the life cycle of stars elements formed by nuclear fusion in stars	255	observe and describe the appearance of the moon and Jupiter and its moons

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HS5.25.e The Physics of Modern Technologies	9 - 10	Technology based on the electromagnetic spectrum is used to collect and interpret evidence about the structure of the universe.	Explore and describe how the measurement of energy produced by stars provides evidence for the current theory about the birth, development and death of stars.	594 595 596 597 598 634 638 639 640	history of the telescope types and uses of telescopes types and uses of telescopes satellites as tools of astronomy spacecraft as tools of astronomy the use of spectroscopy to analyze stars the life cycle of stars description and illustration of the life cycle of stars elements formed by nuclear fusion in stars	255 264 268	observe and describe the appearance of the moon and Jupiter and its moons understand why spectroscopy is an important tool of astronomers measuring apparent brightness to calculate the distance to stars and galaxies
HS5.35.f The Physics of Modern Technologies	9 - 10	Important modern technologies are designed based on our understanding of the properties of electromagnetic radiation.	Investigate the use of electromagnetic radiation in communication technologies (e.g., radio, TV, cellular phones).	196 237 237 250 272	waves are all around us radio and television signals microwave ovens identify uses of electromagnetic waves identify uses of electromagnetic waves		

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HS6.26.e Understanding Evolution	9 - 10	Interactions among the solid Earth, the oceans, the atmosphere and organisms have resulted in the ongoing evolution of the Earth system.	Explore and explain how geological history can be determined using evidence from fossils, radioactive dating and rock sequences.	521 522 523 569	origin of fossils relative dating interpreting rock formations studying moon rocks on Earth	225 226	determining the relative ages of rock formations sequencing events in a geologic cross-section
HS6.36.g Understanding Evolution	9 - 10	Energy within the Earth creates forces that drive the movement of plates, which results in changes in the Earth's surface.	Describe how the outward transfer of Earth's internal heat drives convection and circulation in the mantle that propels the Earth's surface plates.	525 526 552	formation of Earth's layers description of Earth's layers formation of magma in Earth's mantle		

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HS6.36.h Understanding Evolution	9 - 10	Energy within the Earth creates forces that drive the movement of plates, which results in changes in the Earth's surface.	Explore and explain how earthquakes, volcanic eruptions and mountain building are explained by the theory of plate tectonics.	528	predicting what Earth might look like in 50 million years	228	listing which kind of plate boundary is associated with each geologic feature
				528	definition of plate tectonics	229	identifying tectonic plates and plate boundaries
				530	sea-floor spreading and mid-ocean ridges	230	predicting plate movement over 50 million years and the resultant land features
				531	magnetic patterns on the sea floor	236	understanding the Volcanic Explosivity Index
				532	theory of plate tectonics	237	finding a pattern of volcanoes related to the locations of plate boundaries
				533	activity of Earth's crust at plate boundaries		
				533	describing plate boundaries		
				534	balance of creating and consuming Earth's crust	237	examining the magma chemistry of volcanoes and how it relates to a volcano's location
				534	land features resulting from divergent plate boundaries	240	estimating the effects of meteor impacts on Earth
				534	divergent plate boundaries	241	identifying which geologic features on Earth were caused by meteors
				535	resulting land features from subduction		
				535	convergent plate boundaries		
				536	land features resulting from transform plate boundaries		
				536	transform plate boundaries		

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				537	causes and descriptions of earthquakes		
				539	earthquakes rating scales		
				547	predict separation of North America and Europe in 75 million years		
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				551	structure of a volcano		
				554	properties of volcanically formed rock		
				554	types and shapes of volcanoes		
				554	figure showing structure of different types of volcanoes		
				555	formation of shield volcanoes due to hot spots		
				555	shield volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				556	stratovolcanoes		
				556	formation of stratovolcanoes due to subduction		

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				558	volcanoes shape the Earth		
				559	types of volcanic rock		
				561	describing volcanic rock		
				562	constructive and destructive processes		
				563	constructive process of mountain building		
				563	mountain-building		
				564	the destructive process of erosion		
				564	changes in land features due to erosion		
				565	wind erosion		
				566	effect of glaciers on land		
				576	the rock cycle		

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SRC9-10.a Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Identify questions that can be answered through scientific investigations	7	experimentation begins with a question	6	how do we ask questions and get answers from nature?
				10	the research question and hypothesis	7	design your own experiment
				19	design your own experiment	9	design three experiments using car and ramp
				42	devise an experiment	16	decide how to vary the force on the car for this experiment
				429	why haven't we run out of water	26	what variables can be changed?
				434	what is in your tap water	75	design pendulum experiment
				437	what is acid rain	93	decision trees and the advantage of doing multiple trials
				441	why are oceans salty	151	design experiment to find out if mass is conserved
				451	what is temperature	170	which method will give fastest dissolving rate?
				456	asking questions pertaining to specific heat and heat flow	170	what three factors influence dissolving rate?
				472	why is Earth's atmosphere different from other planets	233	identifying how the earthquake model represents an earthquake
				473	why do ears pop		
				492	why does Earth have seasons		
				501	how does rain form		
				509	how do animals survive in the desert		
				515	what is a carbon sink		
				534	why doesn't Earth get bigger and bigger		

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				588	what causes eclipses		
				621	is Pluto a planet		
SRC9-10.b Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Seek relevant information in books, magazines and electronic sources of information.	110	research Franklin's electricity experiments		
				370	research Lavoisier's contributions		
				400	research the Clean Air Act of 1970 and 1990		
				448	research local water supply history		
				468	research the history of heat and temperature		

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SRC9-10.c Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Design and conduct scientific investigations, including controlled lab experiments.	7	experimentation begins with a question	6	predict which car will move fastest
				9	steps in the scientific method	7	compare results with hypothesis
				10	forming a hypothesis	7	test the effect of one other variable
				11	control and experimental variables	7	doing a controlled experiment
				19	design your own experiment	7	design your own experiment
				19	design your own experiment	7	perform your own experiment
				26	independent and dependent variables	9	devise a hypothesis
				42	devise an experiment	9	design three experiments using car and ramp
				288	find the thickness of a single card	9	design three experiments and choose equipment
				448	describe steps you would take to determine whether pH affects frog population	9	design three experiments and choose technology
						9	design three experiments and choose equipment
						10	conduct car/ramp experiment
						16	investigate Newton's 2nd law
						16	decide how to vary the force on the car for this experiment

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						21	choose independent and dependent variables for graph
						26	what variables can be changed?
						27	think about the variables
						27	recognize variables
						34	investigate motion on a rollercoaster
						34	where does the marble move the fastest?
						43	how did A and B tapes acquire different charge?
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	perform self-designed experiment
						75	investigate variables that affect the period of a pendulum
						75	design pendulum experiment
						93	decision trees and the advantage of doing multiple trials
						145	plan a procedure and select necessary equipment

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						151	explain how hypothesis compares to results
						151	perform the experiment you designed
						151	design experiment to find out if mass is conserved
						151	plan procedures and select materials
						170	devise hypothesis and explain
						170	what three factors influence dissolving rate?
						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
						190	effect of changing mass on collected data
						193	conducting experiments on heat transfer
						194	design and construct an aneroid barometer
						205	investigating how specific heat of water regulates Earth's temperature

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						208 testing hypothesis of why seasons occur against your observations in the investigation 211 determining whether distance from light source or axial tilt plays a more significant role in causing the seasons 233 identifying how the earthquake model represents an earthquake 237 develop a research plan for studying volcanoes	

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SRC9-10.d Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Use appropriate tools and techniques to gather, analyze and interpret data.	5	make measurements with precision		data tables and graphs can be created on computer or graphing calculator
				5	measuring distance		
				12	importance of reliable and accurate data collection	4	difference between precise and accurate data
				24	using an electronic timer	5	measuring metric and english lengths
				42	analyze a speed/distance graph	5	making measurements with precision
				435	making observations and asking questions	6	electronic timer and release technique
				486	observing an aurora	6	measure time
				630	use the data to answer the questions	6	compare results with other groups
				630	what evidence was used to predict the existence of the Kuiper Belt?	7	use a ruler to make a measurement
				652	analysis with a spectrometer (#4)	7	record time interval
						7	measure and record variables
						9	construct a data table
						9	collect speed data
							11
			11	analyze speed change of car			
			12	understand and use data table			
			12	using photogates			

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						14	using photogates
						14	record three different time intervals
						16	measure force
						16	use a force scale
						17	record times
						17	measure the force
						17	use photogates to study car on ramp
						17	record results in data table
						17	measure the force
						18	study data table for relationship between force and motion
						18	organize different combinations of data
						18	use a balance to find mass of car
						24	collect weight data
						24	use data table to record results
						25	analyze block and tackle data
						25	collect force data
						25	measure and record the force

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						27	use data table to record results
						27	write down the number of weights you use
						27	analyze lever equilibrium data
						30	record ropes and pulley data in table
						30	measure height difference
						30	use force scale
						35	does data support hypothesis?
						36	organize data into a table
						36	collect precise speed and height data
						36	make precise height measurements
						44	measure voltage
						44	using electrical meter
						45	did battery voltage change?
						46	using electrical meter
						46	measure current
						48	measure resistance
						48	using electrical meter
						50	using electrical meter

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						63	making measurements with precision
						75	collect mass and amplitude data
						75	create data table for self-designed experiment
						75	make precise length measurements
						76	analyze pendulum data
						86	use CPO Timer to measure frequency
						87	measure wavelength
						116	measure mass
						117	measure volume
						146	record detailed observations
						147	students analyze chemical change lab results
						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
						176	measure pH

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						181	organize water quality data into a table
						182	making detailed observations
						182	observing daphnia and recording movements and behavior
						184	collecting pH readings while adding carbon dioxide
						186	collecting temperature data
						186	measure temperature
						189	collecting time and temperature data
						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

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						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	
SRC9-10.e Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Use mathematical operations to analyze the data.	42 459 547 618 645	interpreting distance/time graph heat equation average density (#5) average distance from the sun inverse square law	21 25 27 28 129 171 187 257 268	think about percent change create a mathematical model find math rule for lever equilibrium derive a math formula find average velocity average dissolving rate find equation for trend line inverse square law discovering the mathematical relationship between apparent brightness and distance

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
SRC9-10.f Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Develop descriptions, explanations, predictions and models based on evidence and logical thinking	23	why make models?	13	graph distance vs. time
				24	scientific models	15	construct a quantitative graphical model
				24	what is a scientific model?	21	construct reasonable explanation based on data
				24	making a graph	35	study data and determine importance of height on speed of marble
				26	creating graphs	37	organize data into a graph of speed vs. height
				41	make a graph	45	analyze data and explain a rule
				485	computer modeling to predict greenhouse effects	51	graph voltage vs. current
				494	modeling air currents	121	graph mass vs. volume
				518	create a model (#1)	147	organize observations into a category table
				524	model of Earth's history	151	does your experiment agree with law of conservation of mass?
				533	modeling plate boundaries	185	constructing a graph of drops of acid vs pH
				576	rock cycle model	187	construct a graphical model
				614	solar system modeling	189	construct a temperature vs. time graph
				624	model of the sun's anatomy	197	constructing a graph from atmospheric pressure data

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						202 modeling the effect of greenhouse gases on Earth's temperature	
						203 graphing water and ice temperature readings	
						206 constructing a graph of time vs. temperature	
						212 modeling underwater rivers and waterfalls and springs	
						231 evaluating your completed bathymetric map	
						232 construct a model that simulates an earthquake	
						247 evaluate your ability to interpret rock formations	
						258 setting up a scale model of the solar system	

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
SRC9-10.g Core Scientific Reasoning and Communication Skills	9 - 10	Scientific Inquiry is a thoughtful and coordinated attempt to search out, describe and explain the natural world.	Analyze, critique and communicate investigations by words, graphs and drawings.	20 24 26 27 41	explain your reasoning making a graph creating graphs how to read a graph make a graph	students are encouraged to keep a lab notebook 9 9 13 13 15 37 37 39 41 47 51 78 121 145	present conclusions to the class reporting on an experiment make a distance vs. time graph graph distance vs. time construct a quantitative graphical model describe the flow of energy based on experimental graph organize data into a graph of speed vs. height give a brief presentation to the class drawing and interpreting circuit diagrams present and defend an explanation graph voltage vs. current reading harmonic motion data tables and graphs graph mass vs. volume present findings and methods used

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
						145	present findings to the class
						147	organize observations into a category table
						151	present results to the class
						179	create water quality report
						181	write paragraph to explain results
						183	write summary of findings
						183	writing up a lab report
						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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SRC9-10.h Core Scientific Reasoning and Communication Skills	9 - 10	Literacy in science education includes speaking, listening, presenting, interpreting, reading and writing about science.	Communicate ideas and support arguments about science-related matters using relevant science vocabulary, evidence and logic.	20	explain your reasoning		
							vocabulary is presented in context of investigations
						9	present conclusions to the class
						9	reporting on an experiment
						37	describe the flow of energy based on experimental graph
						39	give a brief presentation to the class
						47	present and defend an explanation
						145	present findings and methods used
						145	present findings to the class
						151	present results to the class
						179	create water quality report
						181	write paragraph to explain results
						183	write summary of findings

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
SRC9-10.i Core Scientific Reasoning and Communication Skills	9 - 10	Literacy in science education includes speaking, listening, presenting, interpreting, reading and writing about science.	Develop the interpretive, analytical and critical capacities needed for reading and writing various scientific texts.	24	interpretations of patterns in data	6	compare results with other groups
				27	reading a graph	6	asking questions and learning about natural world
				42	analyze a speed/distance graph	11	calculate % error
				58	Newton on a skateboard	11	analyze speed change of car
				78	analyze lever diagram	11	graph speed vs. position
				78	describe a problem that would be solved by an engineer	15	interpret a speed vs. time graph
				110	study appliance labels and instructions	18	study data table for relationship between force and motion
				120	circuits in your house	25	analyze block and tackle data
				142	create pamphlet on utility's energy saver programs	27	analyze lever equilibrium data
				448	study claims made by bottled water companies	35	does data support hypothesis?
				452	balloons expands or contracts due to thermal expansion	35	what evidence is there in support of your hypothesis?
				454	temperature vs. thermal energy for a cup or pot of soup	39	critique group's explanation of energy transformations
				461	understanding thermal energy through cocoa example	39	study energy transformations in daily life scenarios
				463	convection and sea breezes		

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
				465	examples of reflectors and absorbers	45	did battery voltage change?
				473	why do ears pop	76	calculate % error
				473	why do ears pop	76	analyze pendulum data
				476	atmospheric pressure at various altitudes graph	76	analyze watch manufacturer's claims
				476	atmospheric pressure in Denver	77	show how energy loss data could be applied to designing a real clock
				485	what percentage comes from this source? (problem 4)	147	students analyze chemical change lab results
				489	patterns of heating and cooling on Earth	162	inferences from promotional materials for vehicles
				490	using the North Star to estimate your latitude	163	evaluating choice of favorite car
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	179	create water quality report
				508	patterns in storm activity across the globe	179	researching and preparing for a field trip to test surface water
				509	how do animals survive in the desert	181	write paragraph to explain results
				529	critiquing Wegener's theories of continental drift	181	study water filtration device claims
				533	patterns of earthquakes and volcanoes	183	write summary of findings
						197	calculating error between your barometer and a commercial barometer

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
				536	analogy of plate movements	197	evaluating the relationship between atmospheric pressure and weather
				540	boundaries of tectonic plates	199	importance of good record keeping in order to avoid error
				543	determining distance to an epicenter	201	suggesting ways that ozone concentrations could be reduced
				547	what explains the difference in density? (#5)	204	connecting the latent heat investigation to Earth
				553	the Ring of Fire	215	the food paradox of the oceans
				584	lunar cycles	217	determining relationship between temperature of the atmosphere and relative humidity
				605	how big is Earth?	218	interpreting Doppler radar images
				609	tides	218	understanding Doppler radar
				612	early theories of the solar system	237	finding a pattern of volcanoes on a bathymetric map
				637	categorizing stars with H-R diagrams		
				645	apparent brightness vs. distance graph		
				648	evidence for Big Bang theory		
				651	arrange the items in the table (#3)		
				651	use the diagram to answer the questions (#2)		
				651	use the diagram to answer the questions (#4)		

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Standard #: Topic	Grades	Content Standard	Expected Performances	student text pg	detail	investigation pg	detail
SRC9-10.j Core Scientific Reasoning and Communication Skills	9 - 10	Literacy in science education includes speaking, listening, presenting, interpreting, reading and writing about science.	Learn how to efficiently use web search engines, and how to examine the relevance, credibility and validity of on-line information sources.	110 370 400 448 468	research Franklin's electricity experiments research Lavoisier's contributions research the Clean Air Act of 1970 and 1990 research local water supply history research the history of heat and temperature		
SRC9-10.k Core Scientific Reasoning and Communication Skills	9 - 10	Mathematics provides useful tools for the description, analysis and presentation of scientific data and ideas.	Use mathematics to analyze, interpret and present relationships between variables in various forms.	42 459 645	interpreting distance/time graph heat equation inverse square law	25 27 28 187 257 268	create a mathematical model find math rule for lever equilibrium derive a math formula find equation for trend line inverse square law discovering the mathematical relationship between apparent brightness and distance
SRC9-10.l Core Scientific Reasoning and Communication Skills	9 - 10	Mathematics provides useful tools for the description, analysis and presentation of scientific data and ideas.	Use computer-based tools to collect, graph and analyze data.				data tables and graphs can be created on computer or graphing calculator