Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.1.1 9 - 12	Unifying Concepts and Processes	Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.	Students will develop an understanding of systems, order, and organization.	51	what is equilibrium?	87	changing frequency in standing waves
				59	equilibrium/action reaction		
				164	electromagnets reverse current and switch polarity		
				180	harmonic motion in natural systems		
				258	optical systems		
				261	change in optical systems		
				278	system of classifying matter		
				407	a solute and a solvent make up a system		
				415	solubility equilibrium		
				415	equilibrium and solubility		
				422	change in pH values		
				429	the water cycle		
				435	pond ecosystem and water quality		
				438	acid rain formation system		
				460	thermal equilibrium		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.1.2 9 - 12	Unifying Concepts and Processes	Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.	Students will develop an understanding of evidence, models, and explanation.	11	controlling variables in experiments	7	what variables should be controlled?
				19	did you run a controlled experiment?	11	calculate % error
				20	what factors could explain the variability in their data?	13	graph distance vs. time
				23	why make models?	15	interpret a speed vs. time graph
				24	making a graph	15	construct a quantitative graphical model
				24	interpretations of patterns in data	21	construct reasonable explanation based on data
				24	what is a scientific model?	21	think about percent change
				24	scientific models	25	create a mathematical model
				26	creating graphs	27	find math rule for lever equilibrium
				27	reading a graph	28	derive a math formula
				41	make a graph	35	study data and determine importance of height on speed of marble
				42	interpreting distance/time graph	37	organize data into a graph of speed vs. height
				78	analyze lever diagram	45	analyze data and explain a rule
				459	heat equation	51	graph voltage vs. current
				476	atmospheric pressure at various altitudes graph	76	calculate % error
				485	what percentage comes from this source? (problem 4)	121	graph mass vs. volume
				485	computer modeling to predict greenhouse effects		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				494	modeling air currents	129	control the height of the liquid
				518	create a model (#1)	147	organize observations into a category table
				524	model of Earth's history	151	do the data support the hypothesis
				533	modeling plate boundaries	151	does your experiment agree with law of conservation of mass?
				543	determining distance to an epicenter	169	why was plain water tested?
				547	what explains the difference in density? (#5)	169	what does the word control mean?
				576	rock cycle model	171	what was happening at molecular level?
				605	how big is Earth?	185	constructing a graph of drops of acid vs pH
				614	solar system modeling	187	construct a graphical model
				624	model of the sun's anatomy	187	find equation for trend line
				645	inverse square law	189	construct a temperature vs. time graph
				645	apparent brightness vs. distance graph	197	calculating error between your barometer and a commercial barometer
				651	use the diagram to answer the questions (#2)	197	constructing a graph from atmospheric pressure data
				651	arrange the items in the table (#3)		
				651	use the diagram to answer the questions (#4)		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						199	importance of good record keeping in order to avoid error
						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
						217	determining relationship between temperature of the atmosphere and relative humidity
						218	interpreting Doppler radar images
						231	evaluating your completed bathymetric map
						232	construct a model that simulates an earthquake
						237	finding a pattern of volcanoes on a bathymetric map
						247	evaluate your ability to interpret rock formations
						257	inverse square law

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						258	setting up a scale model of the solar system
						268	discovering the mathematical relationship betwen apparent brightness and distance

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.1.3 9 - 12	Unifying Concepts and Processes	Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.	Students will develop an understanding of change, constancy, and measurement	5	measuring distance	5	measuring metric and english lengths
				11	controlling variables in experiments	6	measure time
				19	did you run a controlled experiment?	6	compare results with other groups
				20	what factors could explain the variability in their data?	7	what variables should be controlled?
				42	analyze a speed/distance graph	11	graph speed vs. position
				485	what percentage comes from this source? (problem 4)	11	calculate % error
				543	determining distance to an epicenter	11	analyze speed change of car
				547	average density (#5)	16	measure force
				547	what explains the difference in density? (#5)	18	study data table for relationship between force and motion
				590	astronomic numbers expressed in scientific notation	25	analyze block and tackle data
				592	calculating light year using scientific notation	27	analyze lever equilibrium data
				601	converting numbers to scientific notation	35	does data support hypothesis?
				605	how big is Earth?	44	measure voltage
				606	determining Earth's mass using scientific notation	45	did battery voltage change?
						46	measure current
						48	measure resistance
						76	calculate % error

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				618	average distance from the sun	76	analyze pendulum data
						87	measure wavelength
						116	measure mass
						117	measure volume
						129	find average velocity
						129	control the height of the liquid
						147	students analyze chemical change lab results
						169	what does the word control mean?
						169	why was plain water tested?
						171	average dissolving rate
						186	measure temperature
						197	calculating error between your barometer and a commercial barometer
						199	importance of good record keeping in order to avoid error
						271	calculating solar brightness units (SBU) from kilometers in scientific notation

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.1.4 9 - 12	Unifying Concepts and Processes	Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.	Students will develop an understanding of form and function.	80	form and function of wheelbarrow and sailboat and human jaw	68	form and function of different electric motor configurations
				509	how do animals survive in the desert?	108	form and function of human eye, prism, and lenses
				512	how do savanna animals survive the periodic fires?		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.1.5 9 - 12	Unifying Concepts and Processes	Unifying concepts and processes help students think about and integrate a range of basic ideas which builds an understanding of the natural world.	students will develop an understanding of change over a period of time.	59	equilibrium/action reaction	87	changing frequency in standing waves
				164	electromagnets reverse current and switch polarity	209	investigating factors which cause the seasons
				261	change in optical systems	230	predicting plate movement over 50 million years and the resultant land features
				422	change in pH values		
				492	Earth's tilt causes seasons		
				518	create a model to explain why Earth has seasons		
				524	table and description of the geologic time scale		
				528	predicting what Earth might look like in 50 million years		
				528	definition of plate tectonics		
				532	theory of plate tectonics		
				534	land features resulting from divergent plate boundaries		
				535	resulting land features from subduction		
				536	land features resulting from transform plate boundaries		
				547	predict separation of North America and Europe in 75 million years		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				563	mountain-building		
				564	changes in land features due to erosion		
				566	ice ages		
				566	effect of glaciers on land		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.2.1 9 - 12	Science as Inquiry	Science as inquiry requires students to combine processes and scientific knowledge with scientific reasoning and critical thinking to develop their understanding of science.	students will develop the abilities needed to do scientific inquiry.	7	experimentation begins with a question	6	how do we ask questions and get answers from nature?
				9	steps in the scientific method	6	predict which car will move fastest
				10	the research question and hypothesis	7	compare results with hypothesis
				10	forming a hypothesis	7	variables in an experiment
				11	control and experimental variables	7	design your own experiment
				12	writing lab procedures	7	perform your own experiment
				19	design your own experiment	7	doing a controlled experiment
				19	design your own experiment	7	test the effect of one other variable
				19	which group did the best experiment?	9	design three experiments using car and ramp
				20	finding variability in data	9	design three experiments and choose equpiment
				26	independent and dependent variables	9	design three experiments and choose technology
				28	identifying cause and effect relationships	9	devise a hypothesis
				41	identify cause and effect	9	conduct three experiments with appropriate equipment
				42	devise an experiment	9	design three experiments and choose equipment
				79	look at force data and decide the usefulness of a machine		
				288	find the thickness of a single card		

Correlation to Nebraska Science Standards

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Student Text and Investigation Manual

Standard #: Topic/Subject Standard Benchmark Grades	student text pg	detail	investigation pg	detail
	372	observe chemical changes	10	selecting ramp and photogates
	429	why haven't we run out of water	10	conduct car/ramp experiment
	434	what is in your tap water	12	select equipment and set up experiment
	437	what is acid rain	16	investigate Newton's 2nd law
	438	what causes acid rain	16	decide how to vary the force on the car for this experiment
	441	why are oceans salty	18	use data to describe relationship between force and motion
	448	describe steps you would take to determine whether pH affects frog population	18	evaluate graphs as to whether or not they show relationships between variables
	448	forming a hypothesis and testing through experimentation (#5)	19	use data to infer correct relationship between variables
	451	what is temperature	20	safety tip for car/ramp setup
	452	safety caution on heating jar	21	choose independent and dependent variables for graph
	456	determining effect of changing mass on temperature changes	21	determine effect of increasing mass
	456	asking questions pertaining to specific heat and heat flow	21	evaluate percent change for data collected
	460	thermal equilibrium		
	472	why is Earth's atmosphere different from other planets		
	473	why do ears pop		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				492	why does Earth have seasons	24	ropes and pulley safety
				497	factors that shape the weather	26	what variables can be changed?
				501	how does rain form	26	safety tip for hanging weights from lever
				509	how do animals survive in the desert	27	think about the variables
				515	what is a carbon sink	27	recognize variables
				530	proving hypotheses for sea-floor spreading	30	interpret block and tackle data
				534	why doesn't Earth get bigger and bigger	30	rigging block and tackle
				580	form a hypothesis (#7)	34	investigate motion on a rollercoaster
				588	what causes eclipses	34	where does the marble move the fastest?
				602	identify question, hypothesis, procedure, and results (#1)	40	choose circuit parts to light a bulb
				608	relationship between orbital speed and distance between two objects	40	electrical safety
				621	is Pluto a planet	43	how did A and B tapes acquire different charge?
				627	research space solar power	44	short circuit safety warning
						56	short circuit safety warning
						58	short circuit safety warning
						75	investigate variables that affect the period of a pendulum

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						75	perform self-designed experiment
						75	evaluate statistical significance
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	design pendulum experiment
						93	decision trees and the advantage of doing multiple trials
						100	observe glow-in-the-dark paper
						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?
						141	build models of Na and Cl and use them to explain bonding
						145	plan a procedure and select necessary equipment
						145	carry out procedure and select equipment

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						146	observe evidence of chemical change
						146	safety in the lab
						150	chemistry safety
						151	select materials from list
						151	perform the experiment you designed
						151	plan procedures and select materials
						151	design experiment to find out if mass is conserved
						151	explain how hypothesis compares to results
						157	add new rules to list based on findings
						158	observe temperature changes in chemical reactions
						158	wear goggles and apron
						168	safety equipment
						169	observe Tyndall effect
						170	devise hypothesis and explain
						170	what three factors influence dissolving rate?
						170	which factor will produce fastest dissolving rate?
						170	write a procedure

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						170	which method will give fastest dissolving rate?
						170	devise hypothesis and explain
						171	evaluate method based on data
						172	observe dissolving process
						172	hot water safety
						177	research pH indicators
						178	visit local water supply and perform testing
						179	make observations about local surface water
						179	safety tip for testing local surface water
						180	researching where your water comes from
						180	safety tip for water testing
						182	making hypotheses and testing them against observations
						182	formulate hypothesis
						182	safety tips for observing Daphnia
						182	simulating the effect of acid rain on daphnia

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						183	specifying how the daphnia experiment could be improved
						185	analyzing the results of the buffered acid experiment
						186	sensing temperature with fingers
						186	thermometer safety
						188	heat safety
						188	conducting investigation of efficiency of immersion heater
						190	effect of changing mass on collected data
						190	effect of changing mass on data
						192	observing forced convection through liquids
						192	heat safety
						192	observe convection currents
						193	explaining efficiency of heat transfer based on data
						193	conducting experiments on heat transfer
						194	design and construct an aneroid barometer

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						196	writing a procedure for constructing a pointer for an aneroid barometer
						197	evaluating your aneroid barometer design
						197	identifying relationships between air pressure and weather
						198	making qualitative observations of the amount of ozone present in the school environment
						200	evaluating your qualitative ozone strips
						201	researching the causes of ozone
						202	using your hand to sense temperature differences
						202	safety in greenhouse gas investigation
						205	investigating how specific heat of water regulates Earth's temperature
						206	identifying relationship between percent of Earth covered in water and temperature range
						207	researching how bodies of water affect climate

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Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						208	formulate a hypothesis about why the seasons occur
						208	testing hypothesis of why seasons occur against your observations in the investigation
						209	measuring the intensity of light using an electric meter and solar cell and light bulb
						210	safety using light bulbs
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons
						214	develop a procedure to create an underwater spring
						216	safety in swinging thermometers
						222	researching an animal that is adapted to live in the biome you studied
						224	reconstruct a series of events from clues
						224	sequencing events
						227	researching forensic science

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Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						233	identifying how the earthquake model represents an earthquake
						235	interpreting how the drumming affects the intensity of the earthquake in the model
						235	concluding which conditions affect the timeing and duration and intensity of an earthquake based on observation
						237	develop a research plan for studying volcanoes
						241	justify which scenario was most likely
						252	identifying the parts of a refracting telescope and making observations of the moon's surface
						256	safety in lab
						256	investigation discovering relationship between orbital speed and distance

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.1 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of the structure of the atom.	311	protons/neutrons/electrons	132	building atom models
				311	location/size/charge of subatomic particles	132	atomic number determines what element that atom is
				315	atomic number discussed	133	exploring isotopes
				315	atoms of same element have same atomic number	133	location of electrons in atom
				316	mass number discussed	133	protons and neutrons
				316	isotopes explained	133	identify element symbol and name
				318	proton/electron attraction	133	identify mass number
				322	atomic number on the periodic table	133	identify atomic number
				322	chemical symbols and element names	136	strong force
				322	atomic mass on the periodic table	136	atomic number
				322	mass number on the periodic table	136	mass number
				387	fusion and fission explained	136	model stable and neutral atoms
				388	nuclear vs chemical reactions	136	understanding isotopes
				388	showing valence electrons in a diagram	137	build atomic models
				389	forces in the nucleus	137	importance of atomic number
				389	electromagnetic force	138	nuclear reactions
				389	strong nuclear force	138	fusion and fission
						140	find the number of electrons in outermost level

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Standard #: Grades	Topic/Subject Standard	Benchmark	student text pg	detail	investigation pg	detail
			623	nuclear fusion and the sun	140	review subatomic particles
					160	radioactive decay
					160	how do you simulate nuclear decay?

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.2 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of the structure and properties of matter.	278	compounds are composed of elements	118	investigate melting
				284	changes of state	118	molecules in a liquid
				284	states of matter and arrangement of molecules	119	create a temperature vs. time graph of phase change
				320	groups of elements	119	energy and phase changes
				321	groups of elements and valence shells	133	using the periodic table
				321	studying the periodic table	136	ions
				324	which element is more likely to combine with other elements?	136	building and studying the periodic table
				324	use the periodic table to predict chemical formulas	140	why do atoms form chemical bonds?
				329	periodic table columns and valence electrons	141	whan an atom ionizes
				330	bonding and periodic table position	141	modeling a chemical bond
				332	periodic table and electronegativities	141	build model of Na and Cl atoms and explain why they bond to form a molecule
				335	chemical bonding and the periodic table	142	why do atoms combine in certain ratios?
				335	periodic table and oxidation numbers	142	arrangement of electrons and groups of elements
				353	physical and chemical changes and digestion	143	ionic compounds
				355	physical and chemical changes in tire recycling	146	investigate and observe chemical and physical changes in the lab
				364	carbon chains	162	carbon reactions and the environment

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Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				372	determine if changes are chemical or physical	204	compare the shape of the water line and the ice line on the temperature/time graph
				405	molecular structure of ice		
				498	phases changes in the atmosphere		

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Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.3 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of chemical reactions.	321	groups of elements and valence shells	141	build model of Na and Cl atoms and explain why they bond to form a molecule
				329	periodic table columns and valence electrons	142	arrangement of electrons and groups of elements
				330	bonding and periodic table position	143	name chemical compounds
				332	periodic table and electronegativities	143	predict chemical formulas
				335	periodic table and oxidation numbers	145	determine empirical formula
				336	writing a chemical formula	148	chemical equations
				338	summary of chemical formula writing rules	148	reactants and products
				339	naming compounds	149	practice balancing equations
				354	new substances are formed when a chemical change occurs	149	balance these equations
				357	combustion reaction	150	investigate conservation of mass in effervescent tablet reaction
				357	chemical reactions involve rearrangement of atoms	152	predict how much product formed given the reactants
				359	balancing chemical equations	152	write the balanced equation
				361	chemical reactions in living systems	156	predict products in a double displacement reaction
				361	heartburn reaction	156	investigate double displacement reactions
				363	history of law of conservation of mass		

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Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				364	formation of petroleum is a very slow chemical reaction	157	predict the products of double displacement reactions
				371	which of the equations is balanced?	158	investigate energy changes in chemical reactions
				375	synthesis or addition reactions	158	measure energy changes in 3 different reactions
				376	decomposition reactions	162	investigating combustion reactions
				377	double displacement reactions		
				377	single displacement reactions		
				378	combustion reactions		
				378	consumer chemistry		
				381	MRE ration heater reaction		
				381	exothermic reactions and MREs		
				382	endothermic reactions and cold packs		
				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 #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.4 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of motions and forces.	13	speed is relative	8	calculating speed
				14	how to calculate speed	9	collect data and calculate speed of car
				15	compare and contrast speed and velocity	10	calculate speed of the car
				18	what is the speed of an object that is standing still?	12	calculate speed of moving car
						12	find speed of car at different positions
				20	calculate speed of car	12	model the car's motion graphically
				20	find speed of bumblebee	13	make a position vs. time graph
				24	accurate speed measurements	14	exploring acceleration on a ramp
				25	conceptual models of motion	14	acceleration is the rate at which speed changes
				29	position vs. time graph discussion	14	calculate acceleration of car on ramp
				30	position vs. time graphs	14	calculate speed of car at two places on the ramp
				32	average speed vs. instantaneous	15	make a speed vs. time graph
				32	average speed discussed	15	changes in motion can be represented graphically
				33	understanding acceleration	15	make a speed vs. time graph
				35	how to calculate acceleration	16	2nd law
				36	examples of acceleration	16	thinking about force
				37	speed vs. time graphs		
				37	speed vs. time graph discussion		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				41	find acceleration of car	16	unbalanced forces and acceleration of car
				42	calculate speed from distance/time graph	17	explore 2nd law and acceleration
				45	Newton's second law summarized	17	caclulate speed of car
				45	Newton's first law summarized	19	discover 2nd law of motion
				45	Newton's third law summarized	19	find correct relationship between force mass and acceleration
				46	force has potential to change motion	20	force and motion with car and ramp
				47	weight vs. mass	20	investigate effect of gravity on motion
				48	Newton's laws explained and applied	20	weight vs. mass
				48	Newton's first law in detail	21	effect of friction on the car
				49	link between force and acceleration	22	car and ramp and Newton's 3rd law
				49	force is related to acceleration	23	using 3rd law to explain common phenomena
				49	Newton's second law in detail	24	measure force in newtons
				50	Newton's second law applied	25	discover mechanical advantage of ropes and pulleys
				51	net force explained	27	changing force and distance on a lever
				51	balanced and unbalanced forces	27	set up a lever that has mechanical advantage
				52	the effect of gravity		
				52	gravity depends on mass		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				53	how to calculate weight	30	exploring force and distance with ropes and pulleys
				53	acceleration due to gravity	36	find speed of marble
				54	Newton's law of universal gravitation	66	build an electromagnet
				55	calculating gravitational force between objects	67	find out what happens to strength of electromagnet when current is increased
				56	friction explained	257	relating the relationship between orbital speed and distance to the equation of universal gravitation
				59	Newton's third law in detail		
				60	how to calculate momentum		
				60	law of conservation of momentum		
				64	research effect of friction on human joints		
				64	calculate momentum		
				64	solving problems using f=ma		
				67	how simple machines manipulate forces		
				69	newtons and pounds		
				69	how to calculate mechanical advantage		
				70	mechanical advantage of block and tackle		
				71	the human body and simple machines		
				71	parts of a lever		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				71	how a lever works		
				71	pliers as an example of a lever		
				72	mechanical advantage of a lever		
				75	how gears work		
				78	design a toothbrush		
				78	set up a lever with MA greater than 1		
				79	calculate mechanical advantage		
				79	analyze pulleys with different numbers of supporting strings		
				79	analyze block and tackle		
				80	analyze the human jaw as a simple machine		
				80	analyze block and tackle machine on a sailboat		
				80	analyzing the jaw as a lever		
				80	analyze wheelbarrow		
				164	what is an electromagnet?		
				166	increased current vs. strength of magnetic field		
				166	building an electromagnet		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				599	Newton's first law of motion and the space shuttle		
				606	Newton's law of universal gravitation		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.5 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of the conservation of energy and increase in disorder.	68	compound machines	29	design and construct complex gear machines
				84	work input and output	31	work output vs. work input
				85	some input work is converted to heat	36	energy conservation and the roller coaster
				88	potential and kinetic energy explained	37	investigating conservation of energy with rollercoaster
				90	conservation of energy explained	38	identify potential/kinetic energy conversions
				91	energy conversions	38	explore energy transformations
				91	understand basic forms of energy	38	conservation of energy and energy transformations
				91	following an energy transformation	39	make an energy flow chart
				91	following an energy transformation	39	identify type of energy involved
				92	where does "spent" energy go?	192	investigate convection in liquids
				92	energy transformations and conservation	204	investigating latent heat and thermal buffering
				93	different forms of energy described		
				96	explain the "lost" energy		
				96	prove that energy is conserved		
				406	hydrogen bonding and the gaseous state of water		
				462	heat transfer through air		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				462	densely packed solids are good conductors of heat		
				463	convection currents and weather		
				463	warming hands over candle		
				464	convection currents in water		
				465	transfer of heat by radiation		
				465	solid road surface emits radiation		
				482	global warming and heat transfer by radiation		
				493	apply knowledge of heat transfer to different situations		
				537	potential energy transformed to kinetic energy causes earthquakes		
				623	energy from the sun		
				626	harnessing the sun's energy		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.3.6 9 - 12	Physical Science	Physical science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of the interactions of energy and matter.	180	oscillators explained	82	study wave pulses on elastic cord
				184	understanding graphs of harmonic motion	83	measure speed of a wave pulse
				195	waves transmit energy	83	find speed of a wave
				196	waves are all around us	84	make different types of waves in a ripple tank
				197	transverse and longitudinal waves	85	observing reflection in water waves
				198	frequency and wavelength and amplitude	86	investigate frequency and wavelength
				201	waves and reflection	86	adjust frequency of a standing wave
				201	reflection in water waves and light waves	87	investigating resonance
				201	waves and absorption	88	natural frequency and resonance of standing waves on a string
				201	waves and refraction	90	investigate human perception of sound
				202	refraction and eyeglasses	90	investigate human perception of sound
				204	resonance explained	90	what is sound and how do we hear it?
				205	standing waves on a string	94	does sound behave like other waves?
				206	constructive and destructive interference	95	interference and sound waves
				210	can wave interference sink a ship?	95	investigate interference with sound waves
				210	natural frequency of a building and earthquakes		
				213	how the ear works		
				215	properties of sound waves		
				217	loudness and decibels		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Topic/Subject Standard Benchmark Grades	student text pg	detail	investigation pg	detail
	219	frequency of sound and pitch	96	investigating sound resonance
	220	sonograms	98	investigate sound and music
	220	voice recognition programs	101	observing white light through diffraction grating
	220	white noise	101	examine light through diffraction grating
	221	importance of wavelength of sound waves	102	polarization of water waves
	222	effect of temperature on speed of sound wave	102	polarization of a spring wave
	222	effect of medium on speed of sound wave	103	polarization of light
	223	interference of sound waves	108	explore refraction with a prism
	225	consonance and dissonance and beats	134	investigating visible light with a spectrometer
	226	musical instruments	134	what does atomic structure have to do with light and color?
	234	electrons and energy levels and light emission	134	using a spectrometer
	237	visible light and the electromagnetic spectrum	135	observing different light sources with a spectrometer
	237	light waves and the electromagnetic spectrum	265	an element's spectral lines correspond to specific wavelengths of light
	237	microwave ovens		
	237	radio and television signals		
	240	polarization of light		
	242	properties of light waves		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				250	identify uses of electromagnetic waves		
				261	refraction and lenses		
				272	identify uses of electromagnetic waves		
				319	fireworks displays and electron excitation		
				480	electromagnetic radiation		
				480	energy and radiation relationships		
				538	body waves		
				626	the sun's energy reaches Earth in the form of electromagnetic waves		
				648	the Doppler effect		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.5.1 9 - 12	Earth and Space Science	Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of energy in the earth system.	480	distribution of incoming solar radiation	185	effect of ocean on carbon dioxide levels in the atmosphere
				480	transfer of energy in and out of Earth's atmosphere	202	investigate the temperature effects of greenhouse gases
				481	Earth's "energy budget"	207	research how large bodies of water affect climate
				481	greenhouse effect and greenhouse gasses	207	research how large bodies of water affect climate
				483	global temperature changing over time	213	exploring how temperature-dependent layering creates currents
				485	Earth's internal energy	215	understanding the Atlantic gyre
				491	Earth's temperature varies with latitude		
				493	convection currents in the atmosphere		
				495	global wind patterns		
				496	descriptions of ocean currents and their effects on climate		
				496	effects of the Gulf Stream on climate of Great Britain		
				502	effects of moving air masses		
				502	cold fronts		
				503	jet streams		
				503	warm fronts		
				510	effect of cold ocean currents on formation of fog desserts		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				511	effect of warm ocean currents on formation of tropical rainforest		
				513	effect of large bodies of water on climate		
				515	alpine tundra occurs at high altitudes		
				528	Earth's surface is changing		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.5.2 9 - 12	Earth and Space Science	Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop an understanding of geochemical cycles.	522	relative dating	225	determining the relative ages of rock formations
				523	interpreting rock formations	226	sequencing events in a geologic cross-section
				533	activity of Earth's crust at plate boundaries	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				534	balance of creating and consuming Earth's crust	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				562	constructive and destructive processes	246	understanding and investigating how metamorphic rocks are formed
				562	constructive and destructive processes	247	interpreting how different rock formations were formed
				565	formation of soil		
				569	studying moon rocks on Earth		
				573	formation of igneous and sedimentary and metamorphic rocks		
				575	identifying igneous and sedimentary and metamorphic rocks		
				576	the rock cycle		
				576	the rock cycle		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.5.3 9 - 12	Earth and Space Science	Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop a scientific understanding of the origin of the earth system.	491	the effects of Earth's rotation on daytime heating and nighttime cooling	208	developing a hypothesis about why the seasons occur
				492	Earth's tilt causes seasons	210	investigating how the distance of Earth from the sun affects its intensity
				510	using maps to identify mountain ranges	211	investigating how Earth's tilt affects the sun's intensity
				521	origin of fossils	225	determining the relative ages of rock formations
				522	relative dating	226	sequencing events in a geologic cross-section
				523	interpreting rock formations	228	listing which kind of plate boundary is associated with each geologic feature
				523	faunal succession	229	using a globe to identify mountain ranges
				524	extinction of the dinosaurs due to giant meteor hitting Earth	229	identifying tectonic plates and plate boundaries
				524	table and description of the geologic time scale	230	predicting plate movement over 50 million years and the resultant land features
				525	formation of Earth's layers	238	why studying the moon's surface is useful for understanding Earth
				526	description of Earth's layers	240	estimating the effects of meteor impacts on Earth
				528	definition of plate tectonics		
				528	predicting what Earth might look like in 50 million years		
				530	sea-floor spreading and mid-ocean ridges		
				531	magnetic patterns on the sea floor		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Topic/Subject Standard Benchmark Grades	student text pg	detail	investigation pg	detail
	532	theory of plate tectonics	241	identifying which geologic features on Earth were caused by meteors
	533	describing plate boundaries	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
	533	activity of Earth's crust at plate boundaries	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
	534	divergent plate boundaries	246	understanding and investigating how metamorphic rocks are formed
	534	land features resulting from divergent plate boundaries	247	interpreting how different rock formations were formed
	534	balance of creating and consuming Earth's crust	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun
	535	resulting land features from subduction	250	modeling the lunar cycle
	535	convergent plate boundaries	251	constructing a lunar calendar
	536	transform plate boundaries		
	536	land features resulting from transform plate boundaries		
	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		

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				552	formation of magma in Earth's mantle		
				553	using a map to identify volcanoes		
				554	figure showing structure of different types of volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				558	volcanoes shape the Earth		
				562	constructive and destructive processes		
				562	constructive and destructive processes		
				563	mountain-building		
				563	constructive process of mountain building		
				564	changes in land features due to erosion		
				564	the destructive process of erosion		
				565	wind erosion		
				565	formation of soil		
				566	ice ages		
				566	effect of glaciers on land		
				569	studying moon rocks on Earth		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				573	formation of igneous and sedimentary and metamorphic rocks		
				575	identifying igneous and sedimentary and metamorphic rocks		
				576	the rock cycle		
				576	the rock cycle		
				584	the lunar cycle		
				585	Earth's rotation and patterns of day and night		
				587	axial tilt causes the seasons		
				588	solar eclipses		
				588	lunar eclipses		
				589	solar eclipses		
				589	solar eclipses		
				601	identify seasons		
				607	properties of the moon		
				608	the moon as a satellite of Earth		
				609	the moon's effect on tides on Earth		
				610	the Earth-moon system		
				611	giant impact theory		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				619	how an asteroid event may have caused the extinction of dinosaurs		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.5.4 9 - 12	Earth and Space Science	Earth and space science focuses on the science facts, concepts, principles, theories, and models that are important for all students to know, understand, and use.	students will develop a scientific understanding of the origin of the universe.	591	characteristics of the universe	255	observe and describe the appearance of the moon and Jupiter and its moons
				592	calculating and using light years		
				593	light years and time		
				611	historical theories of the origin of the moon		
				612	historical theories about the solar system		
				621	historical theories of which objects were planets		
				633	what is a star?		
				638	the life cycle of stars		
				639	description and illustration of the life cycle of stars		
				640	elements formed by nuclear fusion in stars		
				642	what is a galaxy?		
				647	the Big Bang theory of the origin of the universe		
				648	evidence for the Big Bang theory		
				649	evidence for the Big Bang theory		
				652	research and describe astronomical objects		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.6.1 9 - 12	Science and Technology	An understanding of science and technology establishes connections between the natural and designed world, linking science to technology.	students will develop an understanding of technological design.	20 74	explain your reasoning sample engineering problem	4 9 9 15 19 29 37 39 47 47 70 70 71 71	dimensional diagrams present conclusions to the class reporting on an experiment discuss and test ideas with your group explain how you arrived at your answer discuss what you learned about gears describe the flow of energy based on experimental graph give a brief presentation to the class discuss an explanation with your group present and defend an explanation proposing and comparing different electric motor designs designing and testing different electric motors testing a motor for performance which motor gave the highest speed and why?

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						71	did draining the batteries affect motor speed?
						129	explain your answer and justify
						145	present findings and methods used
						151	present results to the class
						194	design and construct an aneroid barometer
12.6.2 9 - 12	Science and Technology	An understanding of science and technology establishes connections between the natural and designed world, linking science to technology.	students will develop an understanding about science and technology.	73	relationship between science and technology	70	using engineering design cycle
				433	the clean water act		
				439	catalytic converters and scrubbing reduce acid rain		
				483	hydrogen powered cars		
				530	using echo sounders to map the sea floor		
				538	what we can learn from seismographs		
				544	understanding earhquakes allows engineers to design safer buildings		
				597	using satellite technology		
				599	space shuttle		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.7.1 9 - 12	Science in Personal and Social Perspectives	A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.	students will develop an understanding of personal and community health.	333	problems with disposing of plastics	161	research pros and cons of uses for radioactive elements
				355	recycling tires	163	consider a vehicle's fuel economy
				356	recycling discarded tires	163	can trees compensate for manmade CO2 from vehicles and industry?
				364	petroleum	163	research how trees offset accumulation of CO<subscript>2</>
				368	limiting reactants	163	economic impact of end-product of combustion reaction
				379	research environmental impact of fuel cells	163	too much CO2
				379	research fuel cells	163	research how trees offset accumulation of CO2
				379	hydrogen-powered cars and the environment	164	perform water quality tests
				379	research fuel cells	178	predict the quality of surface water to be tested and justify your answer
				379	research economic impact of fuel cells	178	wise use of water supply
				392	storage of nuclear waste	178	predict the quality of surface water to be tested and justify your answer
				393	carbon dating	178	actions to take to improve water quality
				393	radioisotopes in science and medicine		
				395	fossil fuels		
				400	research pros and cons of nuclear technology		
				400	economic impact of pollution		
				400	problems caused by airborne pollutants		
				400	economic impact of reducing air pollution		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Topic/Subject Standard Benchmark Grades	student text pg	detail	investigation pg	detail
	411	effects of PCB's in Great Lakes	179	maintaining water supply quality
	414	effect of electrical generating facilities on dissolved oxygen in water	179	address what you can do to maintain or improve the water quality at the test site
	414	effect of electrical generating facilities on dissolved oxygen in water	180	perform water quality tests
	432	water cycle and conservation	180	save water for houseplants
	433	wise use of water	182	investigate effect of acid rain on microorganisms
	433	The Clean Water Act	182	the effects of acid rain on organisms in aquatic environments
	435	water quality testing	182	the effects of acid rain on organisms in aquatic environments
	435	water usage and quality	201	research the causes of ozone in the lower atmosphere
	436	effect of excess nitrates on environment		
	436	water quality testing		
	437	effects of acid rain on natural environments		
	437	acid rain explained		
	437	effects of acid rain on the soil		
	437	acid rain		
	437	acid rain		
	438	causes and health effects of acid rain		
	439	illustration of acid rain formation		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				443	impact of increased CO2 in oceans		
				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		
				448	research economic impact of producing gases that cause acid rain		
				448	research the issue of acid rain		
				471	nitrogen cycle		
				479	effects of CFC's on the ozone layer		
				482	changes to the oceans due to increasing global temperatures		
				482	effects of burning fossil fuels		
				504	temperature inversion		
				515	permafrost		
				568	how urban sprawl changes local climate		
				568	environmental impact of urban sprawl		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.7.3 9 - 12	Science in Personal and Social Perspectives	A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.	students will develop an understanding of natural resources.	411	effects of PCB's in Great Lakes	178	predict the quality of surface water to be tested and justify your answer
				414	effect of electrical generating facilities on dissolved oxygen in water	178	predict the quality of surface water to be tested and justify your answer
				433	The Clean Water Act	179	address what you can do to maintain or improve the water quality at the test site
				435	water quality testing	182	the effects of acid rain on organisms in aquatic environments
				436	water quality testing	182	the effects of acid rain on organisms in aquatic environments
				437	acid rain		
				437	acid rain		
				438	causes and health effects of acid rain		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 in oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				479	effects of CFC's on the ozone layer		
				482	effects of burning fossil fuels		
				504	temperature inversion		
				515	permafrost		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				542	using seismic waves for oil and gas exploration		
				560	mineral deposits and diamonds		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.7.4 9 - 12	Science in Personal and Social Perspectives	A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.	students will develop an understanding of environmental quality.	333	problems with disposing of plastics	163	research how trees offset accumulation of CO<subscript>2</>
				355	recycling tires	163	can trees compensate for manmade CO2 from vehicles and industry?
				356	recycling discarded tires	163	economic impact of end-product of combustion reaction
				364	petroleum	163	research how trees offset accumulation of CO2
				368	limiting reactants	163	consider a vehicle's fuel economy
				379	research fuel cells	163	too much CO2
				379	research environmental impact of fuel cells	164	perform water quality tests
				379	research fuel cells	178	wise use of water supply
				379	hydrogen-powered cars and the environment	178	actions to take to improve water quality
				379	research economic impact of fuel cells	178	predict the quality of surface water to be tested and justify your answer
				392	storage of nuclear waste	178	predict the quality of surface water to be tested and justify your answer
				395	fossil fuels	179	maintaining water supply quality
				400	economic impact of reducing air pollution		
				400	economic impact of pollution		
				400	problems caused by airborne pollutants		
				411	effects of PCB's in Great Lakes		
				414	effect of electrical generating facilities on dissolved oxygen in water		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				414	effect of electrical generating facilities on dissolved oxygen in water	179	address what you can do to maintain or improve the water quality at the test site
				432	water cycle and conservation	180	save water for houseplants
				433	wise use of water	180	perform water quality tests
				433	The Clean Water Act	182	investigate effect of acid rain on microorganisms
				435	water quality testing	182	the effects of acid rain on organisms in aquatic environments
				435	water usage and quality	182	the effects of acid rain on organisms in aquatic environments
				436	water quality testing	201	research the causes of ozone in the lower atmosphere
				436	effect of excess nitrates on environment		
				437	acid rain		
				437	acid rain		
				437	acid rain explained		
				437	effects of acid rain on the soil		
				437	effects of acid rain on natural environments		
				438	causes and health effects of acid rain		
				439	illustration of acid rain formation		
				443	impact of increased CO2 on oceans		
				443	impact of increased CO2 on oceans		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				443	impact of increased CO2 in oceans		
				444	pollution and the ocean food chain		
				445	pollution and the ocean food chain		
				448	research the issue of acid rain		
				448	research economic impact of producing gases that cause acid rain		
				471	nitrogen cycle		
				479	effects of CFC's on the ozone layer		
				482	changes to the oceans due to increasing global temperatures		
				482	effects of burning fossil fuels		
				504	temperature inversion		
				515	permafrost		
				568	environmental impact of urban sprawl		
				568	how urban sprawl changes local climate		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.7.5 9 - 12	Science in Personal and Social Perspectives	A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.	students will develop an understanding of natural and human-induced hazards.	393	radioisotopes in science and medicine	161	research pros and cons of uses for radioactive elements
				393	carbon dating	178	actions to take to improve water quality
				400	research pros and cons of nuclear technology	178	predict the quality of surface water to be tested and justify your answer
				414	effect of electrical generating facilities on dissolved oxygen in water	219	describe what safety precautions the National Weather Service recommends for tornado conditions
				437	effects of acid rain on natural environments		
				439	illustration of acid rain formation		
				443	impact of increased CO2 in oceans		
				471	nitrogen cycle		
				479	effects of CFC's on the ozone layer		
				482	effects of burning fossil fuels		
				482	changes to the oceans due to increasing global temperatures		
				515	permafrost		
				518	write an action plan to stay safe during a tornado		
				537	earthquakes and plate tectonics		
				552	geologic basis for volcanic eruptions		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				552	formation of magma in Earth's mantle		
				553	where volcanic activity occurs		
				555	geologic basis for shield volcanoes		
				556	geologic basis for stratovolcanoes		
				557	geologic bases for cinder cone volcanoes		
				568	how urban sprawl changes local climate		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.7.6 9 - 12	Science in Personal and Social Perspectives	A personal and social perspective of science helps a student understand and act on personal and social issues. This perspective builds a foundation for future decision making.	students will develop an understanding of the role of science and technology in local, national, and global challenges.	110	study appliance labels and instructions	76	analyze watch manufacturer's claims
				142	create pamphlet on utility's energy saver programs	162	inferences from promotional materials for vehicles
				395	impact of industrial revolution	181	study water filtration device claims
				400	clean air act of 1970		
				429	governments managing water resources		
				443	impact of carbon dioxide on life in the oceans		
				448	is acid rain a problem in your community?		
				448	study claims made by bottled water companies		
				448	how is the government addressing the problem of acid rain?		
				448	what is the history of your community's water supply and treatment		
				479	scientists detect loss of ozone in atmosphere		
				479	London Agreement of 1991		
				482	effects of global warming discovered		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				483	should governments enforce changes for lowering greenhouse gas levels		
				496	tracking ocean currents		
				511	trees and global climate		
				568	urban sprawl		
12.8.1 9 - 12	History and Nature of Science	The history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role that science has played in the development of various cultures.	students will develop an understanding of science as a human endeavor.	73	impact of Da Vinci's work	6	asking questions and learning about natural world
				320	the quests of alchemists	163	evaluating choice of favorite car
				391	scientific discovery and the atomic age	198	contributions of Schönbein
				473	why do ears pop	215	the food paradox of the oceans
				504	meteorologists use atmospheric pressure data to understand movement of weather systems		
				583	history of calendars		
				585	counting the days in a year		
				586	the history of clocks and the division of time		
				589	ancient beliefs about solar eclipses		
				594	history of the telescope		
				648	evidence for Big Bang theory		

Correlation to Nebraska Science Standards

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.8.2 9 - 12	History and Nature of Science	The history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role that science has played in the development of various cultures.	students will develop an understanding of the nature of scientific knowledge.	10	process of reviewing hypothesis explained	6	predict which car will move fastest
				20	finding variability in data	7	test the effect of one other variable
				28	identifying cause and effect relationships	9	devise a hypothesis
				41	identify cause and effect	18	use data to describe relationship between force and motion
				79	look at force data and decide the usefulness of a machine	19	use data to infer correct relationship between variables
				438	what causes acid rain	21	determine effect of increasing mass
				456	determining effect of changing mass on temperature changes	21	construct reasonable explanation based on data
				460	thermal equilibrium	27	think about the variables
				497	factors that shape the weather	30	interpret block and tackle data
				521	relative dating and modern geology based on Steno's theories	34	where does the marble move the fastest?
				524	Kelvin's calculations of Earth's age	35	study data and determine importance of height on speed of marble
				528	theory of plate tectonics	35	what evidence is there in support of your hypothesis?
				529	critiquing Wegener's theories of continental drift	39	review energy theory in context of everyday scenarios
				563	Darwin's theories of the Andes formation		
				566	what causes ice ages		

Correlation to Nebraska Science Standards

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				608	relationship between orbital speed and distance between two objects	39	critique group's explanation of energy transformations
				611	theories of origin of the moon	39	analyze energy transformations in different scenarios
				612	early theories of the solar system	43	how did A and B tapes acquire different charge?
				647	Big Bang theory	45	analyze data and explain a rule
						75	investigate variables that affect the period of a pendulum
						77	compare law of conservation of energy to motion of pendulum
						77	show how energy loss data could be applied to designing a real clock
						141	build models of Na and Cl and use them to explain bonding
						151	explain how hypothesis compares to results
						151	review your hypothesis
						151	perform the experiment you designed
						157	add new rules to list based on findings

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						170	devise hypothesis and explain
						171	did you prove or disprove your hypothesis?
						182	making hypotheses and testing them against observations
						185	analyzing the results of the buffered acid experiment
						190	effect of changing mass on data
						193	explaining efficiency of heat transfer based on data
						197	evaluating your aneroid barometer design
						197	identifying relationships between air pressure and weather
						206	identifying relationship between percent of Earth covered in water and temperature range
						208	testing hypothesis of why seasons occur against your observations in the investigation
						224	reconstruct a series of events from clues
						224	sequencing events

Correlation to Nebraska Science Standards

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
						235	interpreting how the drumming affects the intensity of the earthquake in the model
						235	concluding which conditions affect the timeing and duration and intensity of an earthquake based on observation
						241	justify which scenario was most likely
						256	investigation discovering relationship between orbital speed and distance

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
12.8.3 9 - 12	History and Nature of Science	The history and nature of science illustrates different aspects of scientific inquiry, the human aspects of science, and the role that science has played in the development of various cultures.	students will develop an understanding of the history of science.	34	Newton and the history of physics	130	investigate Rutherford's gold foil experiment
				45	Newton's Principia		
				45	Newton's discovery of the 2nd law		
				46	oldest known standard weight		
				55	Newton and the apple legend		
				73	Leonardo DaVinci		
				86	James Watt		
				110	research Franklin's electricity experiments		
				115	Volta's batteries		
				131	Georg Ohm's work with circuits		
				134	history of superconductivity		
				160	Faraday's contributions		
				161	history of magnetism		
				312	history of atomic theory		
				312	Dalton's contributions		
				313	development of atomic theory		
				321	Mendeleev's periodic table		

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Student Text and Investigation Manual

Standard #: Grades	Topic/Subject	Standard	Benchmark	student text pg	detail	investigation pg	detail
				324	research and create a poster to illustrate development of atomic model		
				332	Linus Pauling and electronegativities		
				343	Avogadro's number		
				363	Antoine Lavoisier		
				363	history of law of conservation of mass		
				370	research Lavoisier's contributions		
				393	history of nuclear chemistry		
				393	accomplishments of Marie Curie		
				393	Marie and Pierre Curie		
				400	research the Clean Air Act of 1970 and 1990		
				448	research local water supply history		
				455	contributions of Joule		
				457	Joseph Black		
				468	research the history of heat and temperature		