

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.01.HS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 10	Understand the atomic nature of matter, how it relates to physical and chemical properties, and serves as the basis for the structure and use of the Periodic Table.	311	protons/neutrons/electrons	132	atomic number determines what element that atom is
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				311	location/size/charge of subatomic particles		
				315	atoms of same element have same atomic number	132	building atom models
				318	proton/electron attraction	133	protons and neutrons
				320	groups of elements	133	location of electrons in atom
				321	groups of elements and valence shells	133	using the periodic table
				321	studying the periodic table	136	model stable and neutral atoms
				329	periodic table columns and valence electrons	136	building and studying the periodic table
				330	bonding and periodic table position	137	importance of atomic number
				332	periodic table and electronegativities	137	build atomic models
				332	metals nonmetals and metalloids	140	find the number of electrons in outermost level
				335	periodic table and oxidation numbers	140	review subatomic particles
				388	showing valence electrons in a diagram	141	build model of Na and Cl atoms and explain why they bond to form a molecule
						142	arrangement of electrons and groups of elements

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.01.MS	Properties:	grade 8	Understand how to use physical and chemical properties to sort and identify substances	278	mixtures can be separated by physical means	114	separating a homogeneous mixture
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.			281	volume and mass contrasted	116	mass and volume measurements
				284	changes of state	118	observe melting process and study quantitatively
				284	melting and boiling points	119	energy and phase changes
				284	melting and boiling point explained	119	melting point of ice
				285	characteristics of matter related to its state	124	build a density column
				285	table of melting and boiling points	126	investigating buoyancy with clay boats
				291	density is independent of amount of substance	128	use CPO viscometer to study viscosity
				292	hardness is a physical property of matter	204	investigating latent heat and thermal buffering
				292	elasticity is a physical property of matter	212	investigate density changes in the oceans as the cause of ocean layering
				293	brittleness is a physical property of matter		
				294	development of Kevlar brand fiber		
				294	tensile strength is a physical property of matter		
				294	malleability is a physical property of matter		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
				295	relationship between mass volume and density		
				406	hydrogen bonding and the gaseous state of water		
				457	engineers use specific heat of substances to design better products		
				498	phases changes in the atmosphere		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.02.HS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 9	Apply an understanding of direction, speed, and acceleration when describing the linear motion of objects	14	how to calculate speed	9	collect data and calculate speed of car
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				15	compare and contrast speed and velocity	10	calculate speed of the car
				20	find speed of bumblebee	12	calculate speed of moving car
				20	calculate speed of car	12	model the car's motion graphically
				24	accurate speed measurements	12	find speed of car at different positions
				29	position vs. time graph discussion	13	make a position vs. time graph
				30	position vs. time graphs	14	calculate acceleration of car on ramp
				32	average speed vs. instantaneous	14	acceleration is the rate at which speed changes
				33	understanding acceleration	14	calculate speed of car at two places on the ramp
				35	how to calculate acceleration	15	make a speed vs. time graph
				36	examples of acceleration	15	changes in motion can be represented graphically
				37	speed vs. time graphs	15	make a speed vs. time graph
				37	speed vs. time graph discussion	17	explore 2nd law and acceleration
				41	find acceleration of car	17	calculate speed of car
				42	calculate speed from distance/time graph	36	find speed of marble
				49	link between force and acceleration		
				53	acceleration due to gravity		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.02.MS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 7	Understand the positions, relative speeds, and changes in speed of objects.	14	how to calculate speed	8	calculating speed
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				15	compare and contrast speed and velocity	9	collect data and calculate speed of car
				20	find speed of bumblebee	10	calculate speed of the car
				20	calculate speed of car	12	find speed of car at different positions
				24	accurate speed measurements	13	make a position vs. time graph
				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	17	caclulate speed of car
				37	speed vs. time graphs	36	find speed of marble
				42	calculate speed from distance/time graph		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.03.HS	Properties:	grade 10	Analyze sound	179	what is a cycle?	83	find speed of a wave
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.		waves, water waves, and light waves, using wave properties including frequency and energy. Understand wave interference	182	concept of frequency explained	86	adjust frequency of a standing wave
				182	concept of period explained	90	what is sound and how do we hear it?
				192	analyze systems to find cycle/period/frequency	94	does sound behave like other waves?
				195	waves transmit energy	101	examine light through diffraction grating
				219	frequency of sound and pitch		
				221	importance of wavelength of sound waves		
				222	effect of medium on speed of sound wave		
				222	effect of temperature on speed of sound wave		
				480	energy and radiation relationships		
626	the sun's energy reaches Earth in the form of electromagnetic waves						

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.03.MS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 8	Understand sound waves, water waves, and light waves, using wave properties including amplitude, wavelength, and speed. Understand wave behaviors including reflection, refraction, transmission, and absorption.	197	transverse and longitudinal waves	82	study wave pulses on elastic cord
				201	waves and refraction	83	find speed of a wave
				201	waves and reflection	84	make different types of waves in a ripple tank
				201	reflection in water waves and light waves	85	observing reflection in water waves
				201	waves and absorption	86	adjust frequency of a standing wave
				202	refraction and eyeglasses	90	what is sound and how do we hear it?
				205	standing waves on a string	94	does sound behave like other waves?
				219	frequency of sound and pitch	95	interference and sound waves
				221	importance of wavelength of sound waves	101	examine light through diffraction grating
				222	effect of medium on speed of sound wave	105	explore relationship between color and wavelength
				222	effect of temperature on speed of sound wave	106	tracing incident and reflected rays
				237	light waves and the electromagnetic spectrum	106	investigate reflection of light
				242	color and frequency of light waves	107	plot reflected rays from a mirror
				245	we see color in terms of reflected light	107	investigate how light interacts with mirrors
				258	refraction in optical systems		
				258	forming images with lenses		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
				260	reflection and mirrors	108	investigate how light interacts with a prism
				261	refraction and lenses		
				263	index of refraction	108	explore refraction with lenses
				263	index of refraction	108	tracing incident and refracted rays
				273	find the angle of reflection		
				480	absorption and emission	108	explore refraction with a prism
						110	finding focal point and focal length of a lens
						111	plotting images formed when light is refracted by a lens
						253	using a refractive telescope
						265	an element's spectral lines correspond to specific wavelengths of light

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.04.HS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 10	Analyze the forms of energy in a system, subsystems, or parts of a system.	91	following an energy transformation	38	explore energy transformations
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				91	understand basic forms of energy	39	make an energy flow chart
				91	energy conversions	39	identify type of energy involved
				454	changes in temperature are directly related to changes in energy	119	investigate temperature and energy transfer in melting process
				455	examples of flow of heat	147	feel the heat generated by chemical reaction
				456	definition of specific heat	188	investigate heating water with an immersion heater
				456	specific heat	188	investigate the increase of temperature of water as thermal energy is added
				458	water's specific heat helps regulate Earth's temperature	188	investigate the increase of temperature of water as thermal energy is added
				459	heat equation	205	investigating how the high specific heat of water helps regulate Earth's temperature
				461	conduction and convection and radiation		
				480	transfer of energy in and out of Earth's atmosphere		
				623	energy from the sun		
				626	harnessing the sun's energy		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.04.MS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 8	Understand that energy is a property of matter, objects, and systems and comes in many forms (i.e., heat [thermal] energy, sound energy, light energy, electrical energy, kinetic energy, potential energy, and chemical energy).	87	concept of energy as stored work	36	energy conservation and the roller coaster
				91	following an energy transformation	38	identify potential/kinetic energy conversions
				91	following an energy transformation	39	make an energy flow chart
				91	understand basic forms of energy	39	identify type of energy involved
				406	hydrogen bonding and the gaseous state of water	204	investigating latent heat and thermal buffering
				537	potential energy transformed to kinetic energy causes earthquakes		
				623	energy from the sun		
				626	harnessing the sun's energy		

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1.1.04.MS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 7	Understand how to classify rocks, soils, air, and water into groups based on their chemical and physical properties.	440	oceans as part of the hydrosphere	212	investigate how the ocean's salinity affects its density
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				440	oceans in the water cycle	225	determining the relative ages of rock formations
				441	sources of salts in the ocean	226	sequencing events in a geologic cross-section
				442	composition of seawater	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				471	description of Earth's atmosphere	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				472	effect of life on Earth's atmosphere	246	understanding and investigating how metamorphic rocks are formed
				477	layers of the atmosphere	247	interpreting how different rock formations were formed
				478	layers of the atmosphere		
				495	global wind patterns		
				502	cold fronts		
				502	effects of moving air masses		
				503	warm fronts		
				503	jet streams		
				522	relative dating		
				523	interpreting rock formations		
				533	activity of Earth's crust at plate boundaries		
				534	balance of creating and consuming Earth's crust		
				559	volcanoes and water vapor		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
				562	constructive and destructive processes		
				562	constructive and destructive processes		
				565	formation of soil		
				569	studying moon rocks on Earth		
				570	properties of minerals		
				571	common minerals		
				572	Mohs hardness scale		
				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		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.1.05.HS	Properties: Understand how properties are used to identify, describe, and categorize substances, materials, and objects; and how characteristics are used to categorize living things.	grade 9	Understand and analyze how the chemical composition of Earth materials (rocks, soils, water, and air) is related to their physical properties.	471	composition of Earth's atmosphere	185	effect of ocean on carbon dioxide levels in the atmosphere
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				481	greenhouse effect and greenhouse gasses	198	detecting ozone which is a protective atmosphere gas against high energy radiation
				525	formation of Earth's layers	202	investigate the temperature effects of greenhouse gases
				526	description of Earth's layers	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				552	formation of magma in Earth's mantle	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				570	properties of minerals	246	understanding and investigating how metamorphic rocks are formed
				571	common minerals	247	interpreting how different rock formations were formed
				572	Mohs hardness scale		
				573	formation of igneous and sedimentary and metamorphic rocks		
				575	identifying igneous and sedimentary and metamorphic rocks		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.2.01.HS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grades 9 and 10	Analyze how systems function; including the inputs, outputs, transfers, transformations, and feedback of a system and its subsystems.	51 84 415 415 429 435 438 460 480	what is equilibrium? work input and output solubility equilibrium equilibrium and solubility the water cycle pond ecosystem and water quality acid rain formation system thermal equilibrium transfer of energy in and out of Earth's atmosphere	31	work output vs. work input
1.2.01.MS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grades 7 and 8	Analyze how the parts of a system interconnect and influence each other.	51 415 415 429 435 438 460	what is equilibrium? solubility equilibrium equilibrium and solubility the water cycle pond ecosystem and water quality acid rain formation system thermal equilibrium		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.2.02.HS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grades 9 and 10	Analyze energy transfers and transformations within a system including energy conservation.	88	potential and kinetic energy explained	36	energy conservation and the roller coaster
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				90	conservation of energy explained	37	investigating conservation of energy with rollercoaster
				91	following an energy transformation	38	identify potential/kinetic energy conversions
				91	energy conversions	38	explore energy transformations
				92	energy transformations and conservation	38	conservation of energy and energy transformations
				93	different forms of energy described		
				96	prove that energy is conserved		
				537	potential energy transformed to kinetic energy causes earthquakes		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.2.02.MS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 8	Understand how various factors affect energy transfers and that energy can be transformed from one form of energy to another.	88	potential and kinetic energy explained	36	energy conservation and the roller coaster
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				90	conservation of energy explained	37	investigating conservation of energy with rollercoaster
				91	energy conversions		
				92	energy transformations and conservation	38	explore energy transformations
				93	different forms of energy described	38	conservation of energy and energy transformations
				96	prove that energy is conserved	192	investigate convection in liquids
				461	thermal conductivity explained		
				462	densely packed solids are good conductors of heat		
				462	heat transfer through air		
				463	warming hands over candle		
				463	convection currents and weather		
				464	convection currents in water		
				465	solid road surface emits radiation		
				465	transfer of heat by radiation		
				482	global warming and heat transfer by radiation		

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				493	apply knowledge of heat transfer to different situations		
1.2.03.HS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 10	Understand the structure of atoms, how atoms bond to form molecules, and that molecules form solutions.	324	use the periodic table to predict chemical formulas	136	ions
				324	which element is more likely to combine with other elements?	141	when an atom ionizes
				324	which element is more likely to combine with other elements?	141	modeling a chemical bond
				330	Lewis dot diagrams	143	ionic compounds
				330	ionic bonds	143	classify ionic compounds
				331	covalent bonds	162	carbon reactions and the environment
				332	distinguishing between ionic and covalent bonds		
				335	chemical bonding and the periodic table		
				364	carbon chains		
				409	dissolving an ionic compound		
				410	solute dissolution depends on chemical bonds		

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1.2.03.MS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 8	Understand that all matter is made of particles called atoms and that atoms may combine to form molecules and that atoms and molecules can form mixtures.	278	mixtures can be separated by physical means	114	separating a homogeneous mixture
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				278	compounds are composed of elements	132	building atom models
				283	atoms and molecules	132	comparing atoms
				311	protons/neutrons/electrons	132	atomic number determines what element that atom is
				311	location/size/charge of subatomic particles	133	location of electrons in atom
				311	all matter is formed from atoms	133	protons and neutrons
				311	all matter is formed from atoms	136	model stable and neutral atoms
				315	atoms of same element have same atomic number	136	ions
				318	proton/electron attraction	137	build atomic models
				324	use the periodic table to predict chemical formulas	137	importance of atomic number
				324	which element is more likely to combine with other elements?	140	find the number of electrons in outermost level
				335	chemical bonding and the periodic table	140	review subatomic particles
				388	showing valence electrons in a diagram	140	why do atoms form chemical bonds?
						141	compare and contrast elements and compounds
						141	modeling a chemical bond
		141	when an atom ionizes				

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						142	why do atoms combine in certain ratios?
						143	ionic compounds
1.2.04.HS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 9	Analyze the patterns and arrangements of Earth systems and subsystems including the core, the mantle, tectonic plates, the hydrosphere, and layers of the atmosphere.	439	illustration of acid rain formation		
				440	oceans as part of the hydrosphere		
				441	the five major oceans		
				447	name the five big oceans on Earth		
				471	description of Earth's atmosphere		
				472	effect of life on Earth's atmosphere		
				477	layers of the atmosphere		
				478	layers of the atmosphere		
				482	changes to the oceans due to increasing global temperatures		
				525	formation of Earth's layers		
				526	description of Earth's layers		
				552	formation of magma in Earth's mantle		
				568	how urban sprawl changes local climate		

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1.2.04.MS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 7	Understand the components and interconnections of Earth's systems.	439	illustration of acid rain formation	228	listing which kind of plate boundary is associated with each geologic feature
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				440	oceans as part of the hydrosphere		
				441	the five major oceans		
				447	name the five big oceans on Earth		
				471	description of Earth's atmosphere		
				472	effect of life on Earth's atmosphere		
				477	layers of the atmosphere		
				478	layers of the atmosphere		
				482	changes to the oceans due to increasing global temperatures		
				525	formation of Earth's layers		
				526	description of Earth's layers		
				528	definition of plate tectonics		
				530	sea-floor spreading and mid-ocean ridges		
				531	magnetic patterns on the sea floor		
				532	theory of plate tectonics		
				533	activity of Earth's crust at plate boundaries		

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				533	describing plate boundaries		
				534	divergent plate boundaries		
				534	balance of creating and consuming Earth's crust		
				535	convergent plate boundaries		
				536	transform plate boundaries		
				552	formation of magma in Earth's mantle		
				562	constructive and destructive processes		
				568	how urban sprawl changes local climate		
				576	the rock cycle		
1.2.05.HS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 10	Understand that the solar system is in a galaxy in a universe composed of an immense number of stars and other celestial bodies.	591	characteristics of the universe		
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				592	calculating and using light years		
				593	light years and time		
				633	what is a star?		
				642	what is a galaxy?		
				643	the structure of the Milky Way Galaxy		
				652	research and describe astronomical objects		

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1.2.05.MS	Structures: Understand how components, structures, organizations, and interconnections describe systems.	grade 8	Understand the structure of the solar system.	472	comparison of Earth's atmosphere to other planets	256	simulate an object in orbit and investigate how orbital period varies within distance
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				612	orbits of planets around the sun	258	setting up a scale model of the solar system
				612	Johannes Kepler	259	determining scale distances for the planets
				613	Kepler's elliptically shaped orbits	260	determining scale sizes of the planets
				613	explanation and illustration of the solar system		
				614	relative sizes and distances within the solar system		
				615	what makes Earth capable of supporting life		
				619	asteroids and comets		
				620	meteors and meteorites and the Kuiper Belt		
				641	the existence of other planetary systems		
641	how the solar system was formed						

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.01.HS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze the forces acting on objects.	45	Newton's first law summarized	14	exploring acceleration on a ramp
				45	Newton's second law summarized	16	2nd law
				45	Newton's third law summarized	16	thinking about force
				46	force has potential to change motion	19	discover 2nd law of motion
				48	Newton's first law in detail	19	find correct relationship between force mass and acceleration
				49	Newton's second law in detail	20	force and motion with car and ramp
				49	force is related to acceleration	22	car and ramp and Newton's 3rd law
				59	Newton's third law in detail	23	using 3rd law to explain common phenomena
				64	solving problems using $f=ma$	24	measure force in newtons
				69	newtons and pounds	27	changing force and distance on a lever
				71	pliers as an example of a lever	30	exploring force and distance with ropes and pulleys
				78	design a toothbrush		
				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 wheelbarrow		

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

Foundations of Physical Science with Earth and Space Science
Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.01.MS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Understand factors that affect the strength and direction of forces.	46	force has potential to change motion	16	unbalanced forces and acceleration of car
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				49	force is related to acceleration	19	find correct relationship between force mass and acceleration
				51	balanced and unbalanced forces	20	investigate effect of gravity on motion
				51	net force explained	21	effect of friction on the car
				52	the effect of gravity	24	measure force in newtons
				56	friction explained	27	changing force and distance on a lever
				64	research effect of friction on human joints	30	exploring force and distance with ropes and pulleys
				69	newtons and pounds		
				71	the human body and simple machines		
				71	pliers as an example of a lever		
				78	design a toothbrush		
				79	analyze block and tackle		
				79	analyze pulleys with different numbers of supporting strings		
				80	analyze wheelbarrow		
				80	analyzing the jaw as a lever		
				106	electrical forces		
				106	electrical force is incredibly strong!		

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.02.HS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze the effects of balanced and unbalanced forces on the motion of an object.	51	balanced and unbalanced forces	16	unbalanced forces and acceleration of car
				51	net force explained		
1.3.02.MS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Understand how balanced and unbalanced forces can change the motion of objects.	45	Newton's second law summarized	16	thinking about force
				49	Newton's second law in detail	16	unbalanced forces and acceleration of car
				51	balanced and unbalanced forces		
				51	net force explained		

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.03.HS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze the factors that affect physical, chemical, and nuclear changes and understand that matter and energy are conserved.	353	physical and chemical changes and digestion	146	investigate and observe chemical and physical changes in the lab
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				355	physical and chemical changes in tire recycling	149	balance these equations
				371	which of the equations is balanced?	150	investigate conservation of mass in effervescent tablet reaction
				372	determine if changes are chemical or physical		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.03.MS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Understand that matter is conserved during physical and chemical changes.	353	physical and chemical changes and digestion	146	investigate and observe chemical and physical changes in the lab
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				354	chemical reactions and digestion	149	balance these equations
				355	physical and chemical changes in tire recycling	150	investigate conservation of mass in effervescent tablet reaction
				357	chemical reactions involve rearrangement of atoms	157	predict the products of double displacement reactions
				361	chemical reactions in living systems	162	investigating combustion reactions
				363	history of law of conservation of mass		
				371	which of the equations is balanced?		
				372	determine if changes are chemical or physical		
				378	combustion reactions		
				378	consumer chemistry		
				381	MRE ration heater reaction		
				395	chemistry of the atmosphere		
				395	chemistry of the atmosphere		
				397	carbon reactions		
				438	chemical reactions and the formation of acid rain		

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Foundations of Physical Science with Earth and Space Science
Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.04.HS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze processes that have caused changes to the features of Earth's surface including plate tectonics.	528	definition of plate tectonics	228	listing which kind of plate boundary is associated with each geologic feature
				528	predicting what Earth might look like in 50 million years	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	describing plate boundaries	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		
				537	earthquakes and plate tectonics		
				537	causes and descriptions of earthquakes		

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				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		
				552	geologic basis for volcanic eruptions		
				552	formation of magma in Earth's mantle		
				553	where volcanic activity occurs		
				554	properties of volcanically formed rock		
				554	figure showing structure of different types of volcanoes		
				554	types and shapes of volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				555	shield volcanoes		
				555	formation of shield volcanoes due to hot spots		

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				555	geologic basis for shield volcanoes		
				556	stratovolcanoes		
				556	formation of stratovolcanoes due to subduction		
				556	geologic basis for stratovolcanoes		
				557	geologic bases for cinder cone volcanoes		
				558	volcanoes shape the Earth		
				559	types of volcanic rock		
				561	describing volcanic rock		
				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		
				566	effect of glaciers on land		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.04.MS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Understand the processes that continually change the surface of the Earth.	440	supply of water to oceans	225	determining the relative ages of rock formations
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				440	oceans in the water cycle	226	sequencing events in a geologic cross-section
				522	relative dating	230	predicting plate movement over 50 million years and the resultant land features
				523	interpreting rock formations	240	estimating the effects of meteor impacts on Earth
				528	predicting what Earth might look like in 50 million years	241	identifying which geologic features on Earth were caused by meteors
				528	definition of plate tectonics	242	understanding how igneous rocks are formed and growing crystals to investigate their formation
				532	theory of plate tectonics	244	understanding how sedimentary rocks are formed and creating sedimentary deposits to investigate them
				533	activity of Earth's crust at plate boundaries	246	understanding and investigating how metamorphic rocks are formed
				534	balance of creating and consuming Earth's crust	247	interpreting how different rock formations were formed
				534	land features resulting from divergent plate boundaries		
				535	resulting land features from subduction		
				536	land features resulting from transform plate boundaries		
				537	earthquakes and plate tectonics		
				547	predict separation of North America and Europe in 75 million years		

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Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				548	predict effects of divergent plate boundaries on Great Rift Valley		
				552	geologic basis for volcanic eruptions		
				552	formation of magma in Earth's mantle		
				553	where volcanic activity occurs		
				555	geologic basis for shield volcanoes		
				555	formation of Hawaiian Islands due to volcanic activity		
				556	geologic basis for stratovolcanoes		
				557	geologic bases for cinder cone volcanoes		
				558	volcanoes shape the Earth		
				559	volcanoes and water vapor		
				562	constructive and destructive processes		
				562	constructive and destructive processes		
				563	mountain-building		
				563	constructive process of mountain building		

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grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				564	changes in land features due to erosion		
				564	the destructive process of erosion		
				565	formation of soil		
				565	wind erosion		
				566	effect of glaciers on land		
				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		
1.3.05.HS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze a variety of evidence, including rock formations, fossils, and radioactive decay to construct a sequence of geologic events.	522	relative dating	225	determining the relative ages of rock formations
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				523	faunal succession	226	sequencing events in a geologic cross-section
				523	interpreting rock formations		
				569	studying moon rocks on Earth		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.05.MS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Understand how fossils and other evidence are used to document life and environmental changes over time.	521	origin of fossils	225	determining the relative ages of rock formations
				522	relative dating		
				523	faunal succession	226	sequencing events in a geologic cross-section
				523	interpreting rock formations		
				569	studying moon rocks on Earth		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.06.HS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 9	Analyze the factors that influence weather and climate	480	distribution of incoming solar radiation	207	research how large bodies of water affect climate
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				481	Earth's "energy budget"	209	investigating factors which cause the seasons
483				global temperature changing over time	213	exploring how temperature-dependent layering creates currents	
485				Earth's internal energy	215	understanding the Atlantic gyre	
492				Earth's tilt causes seasons	223	research a particular biome	
493				convection currents in the atmosphere			
494				the Coriolis effect			
495				global wind patterns			
496				descriptions of ocean currents and their effects on climate			
497				water in the atmosphere affects weather patterns			
502				cold fronts			
502				effects of moving air masses			
503				jet streams			
503				warm fronts			
504				rotation of air masses due to Coriolis effect			
508				causes and effects of the El Nino Southern Oscillation			
510				different types of deserts and how they are formed			

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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				511	how tropical rainforests are formed		
				518	create a model to explain why Earth has seasons		
				528	Earth's surface is changing		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.06.MS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 7	Analyze the relationship between weather and climate, and how ocean currents and global atmospheric circulation affect weather and climate.	440	oceans in the water cycle	207	research how large bodies of water affect climate
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				491	Earth's temperature varies with latitude	207	research how large bodies of water affect climate
				495	global wind patterns	215	understanding the Atlantic gyre
				496	descriptions of ocean currents and their effects on climate	223	research a particular biome
				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 deserts		
				510	different types of deserts and how they are formed		
				511	effect of warm ocean currents on formation of tropical rainforest		
				511	how tropical rainforests are formed		
				513	effect of large bodies of water on climate		
				515	alpine tundra occurs at high altitudes		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				559	volcanoes and water vapor		
				564	landforms shaped by water		
1.3.07.HS Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 10	Understand how stars, solar systems, galaxies, and the universe were formed and how these systems continue to evolve.	638	the life cycle of stars	255	observe and describe the appearance of the moon and Jupiter and its moons
				639	death of small to medium stars results in white dwarfs and planetary nebula and black dwarfs	264	using spectroscopy to analyze the light emitted by stars and identify most common elements
				639	description and illustration of the life cycle of stars		
				640	death of massive stars results in supernovas and neutron stars and black holes		
				640	elements formed by nuclear fusion in stars		
				648	evidence for the Big Bang theory		
				649	evidence for the Big Bang theory		

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Foundations of Physical Science with Earth and Space Science
Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
1.3.07.MS	Changes: Understand how interactions within and among systems cause changes in matter and energy.	grade 8	Understand the effects of the regular and predictable motions of planets and moons in the solar system.	491	the effects of Earth's rotation on daytime heating and nighttime cooling	208	developing a hypothesis about why the seasons occur
Systems: The student knows and applies scientific concepts and principles to understand the properties, structures and changes in physical, earth/space, and living systems.				492	Earth's tilt causes seasons	210	investigating how the distance of Earth from the sun affects its intensity
584				the lunar cycle			
585				Earth's rotation and patterns of day and night	211	investigating how Earth's tilt affects the sun's intensity	
587				axial tilt causes the seasons	238	why studying the moon's surface is useful for understanding Earth	
588				lunar eclipses			
588				solar eclipses			
589				solar eclipses	248	building a sundial to keep track of daily time based on the cycles between Earth and the sun	
589				solar eclipses			
601				identify seasons	250	modeling the lunar cycle	
607				properties of the moon	251	constructing a lunar calendar	
608				the moon as a satellite of Earth			
609				the moon's effect on tides on Earth	256	simulate an object in orbit and investigate how orbital period varies within distance	
610				the Earth-moon system			
611				giant impact theory			
612				orbits of planets around the sun			
612				Johannes Kepler			
613				Kepler's elliptically shaped orbits			

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				619	asteroids and comets		
				620	meteors and meteorites and the Kuiper Belt		

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grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.01.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 9 and 10	Understand how to generate and evaluate 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
				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		
				588	what causes eclipses		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				621	is Pluto a planet		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.01.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 7 and 8	Understand how to generate a question that can be answered through scientific investigation.	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
				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		
				588	what causes eclipses		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				621	is Pluto a planet		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.02.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 9 and 10	Understand how to plan and conduct systematic and complex scientific investigations.	7	experimentation begins with a question	7	doing a controlled experiment
				9	steps in the scientific method	7	variables in an experiment
				10	forming a hypothesis	7	perform your own experiment
				11	control and experimental variables	7	compare results with hypothesis
				12	writing lab procedures	7	design your own experiment
				19	design your own experiment	9	design three experiments and choose technology
				19	which group did the best experiment?	9	design three experiments and choose equipment
				19	design your own experiment	9	design three experiments and choose equipment
				26	independent and dependent variables	9	design three experiments using car and ramp
				42	devise an experiment	9	conduct three experiments with appropriate equipment
				288	find the thickness of a single card	10	selecting ramp and photogates
				448	describe steps you would take to determine whether pH affects frog population	10	conduct car/ramp experiment
				448	forming a hypothesis and testing through experimentation (#5)	12	select equipment and set up experiment
				451	what is temperature	16	decide how to vary the force on the car for this experiment
				452	safety caution on heating jar		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				530	proving hypotheses for sea-floor spreading	16	investigate Newton's 2nd law
				580	form a hypothesis (#7)	18	evaluate graphs as to whether or not they show relationships between variables
				602	identify question, hypothesis, procedure, and results (#1)	20	safety tip for car/ramp setup
						21	evaluate percent change for data collected
						21	choose independent and dependent variables for graph
						24	ropes and pulley safety
						26	what variables can be changed?
						26	safety tip for hanging weights from lever
						27	recognize variables
						30	rigging block and tackle
						34	investigate motion on a rollercoaster
						40	electrical safety
						40	choose circuit parts to light a bulb
						44	short circuit safety warning
						56	short circuit safety warning

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
						58	short circuit safety warning
						75	perform self-designed experiment
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	design pendulum experiment
						75	evaluate statistical significance
						93	decision trees and the advantage of doing multiple trials
						145	plan a procedure and select necessary equipment
						145	carry out procedure and select equipment
						146	safety in the lab
						150	chemistry safety
						151	design experiment to find out if mass is conserved
						151	plan procedures and select materials
						151	select materials from list
						158	wear goggles and apron
						168	safety equipment

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
						170	devise hypothesis and explain
						170	write a procedure
						170	which factor will produce fastest dissolving rate?
						170	what three factors influence dissolving rate?
						170	which method will give fastest dissolving rate?
						171	evaluate method based on data
						172	hot water safety
						178	visit local water supply and perform testing
						179	safety tip for testing local surface water
						180	safety tip for water testing
						182	simulating the effect of acid rain on daphnia
						182	formulate hypothesis
						182	safety tips for observing Daphnia
						186	thermometer safety
						188	conducting investigation of efficiency of immersion heater
						188	heat safety

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
						190	effect of changing mass on collected data
						192	heat safety
						193	conducting experiments on heat transfer
						194	design and construct an aneroid barometer
						196	writing a procedure for constructing a pointer for an aneroid barometer
						198	making qualitative observations of the amount of ozone present in the school environment
						200	evaluating your qualitative ozone strips
						202	safety in greenhouse gas investigation
						205	investigating how specific heat of water regulates Earth's temperature
						208	formulate a hypothesis about why the seasons occur
						209	measuring the intensity of light using an electric meter and solar cell and light bulb
						210	safety using light bulbs

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
						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
						233	identifying how the earthquake model represents an earthquake
						237	develop a research plan for studying volcanoes
						252	identifying the parts of a refracting telescope and making observations of the moon's surface
						256	safety in lab

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.02.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 7 and 8	Understand how to plan and conduct scientific investigations.	7	experimentation begins with a question	7	variables in an experiment
				9	steps in the scientific method	7	compare results with hypothesis
				10	forming a hypothesis	7	design your own experiment
				11	control and experimental variables	7	perform your own experiment
				12	writing lab procedures	7	doing a controlled experiment
				19	design your own experiment	9	design three experiments using car and ramp
				19	which group did the best experiment?	9	design three experiments and choose technology
				19	design your own experiment	9	conduct three experiments with appropriate equipment
				26	independent and dependent variables	9	design three experiments and choose equipment
				42	devise an experiment	9	design three experiments and choose equipment
				288	find the thickness of a single card	10	selecting ramp and photogates
				448	forming a hypothesis and testing through experimentation (#5)	10	conduct car/ramp experiment
				448	describe steps you would take to determine whether pH affects frog population	12	select equipment and set up experiment
				451	what is temperature	16	decide how to vary the force on the car for this experiment
				452	safety caution on heating jar		

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				530	proving hypotheses for sea-floor spreading	16	investigate Newton's 2nd law
				580	form a hypothesis (#7)	18	evaluate graphs as to whether or not they show relationships between variables
				602	identify question, hypothesis, procedure, and results (#1)	20	safety tip for car/ramp setup
						21	choose independent and dependent variables for graph
						21	evaluate percent change for data collected
						24	ropes and pulley safety
						26	what variables can be changed?
						26	safety tip for hanging weights from lever
						27	recognize variables
						30	rigging block and tackle
						34	investigate motion on a rollercoaster
						40	electrical safety
						40	choose circuit parts to light a bulb
						44	short circuit safety warning
						56	short circuit safety warning

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

***Foundations of Physical Science with Earth and Space Science*
Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						58	short circuit safety warning
						75	perform self-designed experiment
						75	plan three experiments to determine which variable affects the period of a pendulum
						75	evaluate statistical significance
						75	design pendulum experiment
						93	decision trees and the advantage of doing multiple trials
						145	carry out procedure and select equipment
						145	plan a procedure and select necessary equipment
						146	safety in the lab
						150	chemistry safety
						151	plan procedures and select materials
						151	design experiment to find out if mass is conserved
						151	select materials from list
						158	wear goggles and apron
						168	safety equipment

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

***Foundations of Physical Science with Earth and Space Science*
Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						170	what three factors influence dissolving rate?
						170	which method will give fastest dissolving rate?
						170	devise hypothesis and explain
						170	write a procedure
						170	which factor will produce fastest dissolving rate?
						171	evaluate method based on data
						172	hot water safety
						178	visit local water supply and perform testing
						179	safety tip for testing local surface water
						180	safety tip for water testing
						182	formulate hypothesis
						182	safety tips for observing Daphnia
						182	simulating the effect of acid rain on daphnia
						186	thermometer safety
						188	conducting investigation of efficiency of immersion heater
						188	heat safety

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						190	effect of changing mass on collected data
						192	heat safety
						193	conducting experiments on heat transfer
						194	design and construct an aneroid barometer
						196	writing a procedure for constructing a pointer for an aneroid barometer
						198	making qualitative observations of the amount of ozone present in the school environment
						200	evaluating your qualitative ozone strips
						202	safety in greenhouse gas investigation
						205	investigating how specific heat of water regulates Earth's temperature
						208	formulate a hypothesis about why the seasons occur
						209	measuring the intensity of light using an electric meter and solar cell and light bulb
						210	safety using light bulbs

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						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
						233	identifying how the earthquake model represents an earthquake
						237	develop a research plan for studying volcanoes
						252	identifying the parts of a refracting telescope and making observations of the moon's surface
						256	safety in lab

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.03.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 9 and 10	Apply understanding of how to construct and revise a scientific explanation using evidence and inferential logic.	20	how will speed change?	6	compare results with other groups
				24	predicting speed from a graph	11	analyze speed change of car
				24	interpretations of patterns in data	11	calculate % error
				27	reading a graph	11	graph speed vs. position
				42	analyze a speed/distance graph	15	interpret a speed vs. time graph
				42	predict the speed of a car	18	study data table for relationship between force and motion
				78	analyze lever diagram		
				476	atmospheric pressure at various altitudes graph	21	construct reasonable explanation based on data
				485	what percentage comes from this source? (problem 4)	25	analyze block and tackle data
				543	determining distance to an epicenter	27	analyze lever equilibrium data
				547	what explains the difference in density? (#5)	35	does data support hypothesis?
				605	how big is Earth?	35	study data and determine importance of height on speed of marble
				645	apparent brightness vs. distance graph	45	analyze data and explain a rule
				651	arrange the items in the table (#3)	45	did battery voltage change?
				651	use the diagram to answer the questions (#4)	76	use data to predict best string length for a pendulum clock
				651	use the diagram to answer the questions (#2)		

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***Foundations of Physical Science with Earth and Space Science*
Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						76	calculate % error
						76	analyze pendulum data
						121	use graph to predict mass of six objects
						147	students analyze chemical change lab results
						156	make predictions about solubility
						197	calculating error between your barometer and a commercial barometer
						199	importance of good record keeping in order to avoid error
						201	predicting areas with high ozone concentration based on your data
						204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
						217	determining relationship between temperature of the atmosphere and relative humidity
						218	interpreting Doppler radar images
						237	finding a pattern of volcanoes on a bathymetric map

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						242	predicting the results of the crystal-growing experiment

**Correlation to Washington Essential Academic Learning Requirements for Science,
grades 7 - 10**

Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.03.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 7 and 8	Apply understanding of how to construct a scientific explanation using evidence and inferential logic.	20	how will speed change?	6	compare results with other groups
				24	predicting speed from a graph	11	analyze speed change of car
				42	predict the speed of a car	11	graph speed vs. position
				42	analyze a speed/distance graph	15	discuss and test ideas with your group
						18	study data table for relationship between force and motion
						19	explain how you arrived at your answer
						21	construct reasonable explanation based on data
						25	analyze block and tackle data
						27	analyze lever equilibrium data
						29	discuss what you learned about gears
						35	study data and determine importance of height on speed of marble
						35	does data support hypothesis?
						45	did battery voltage change?
						45	analyze data and explain a rule

**Correlation to Washington Essential Academic Learning Requirements for Science,
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***Foundations of Physical Science with Earth and Space Science*
Student Text and Investigation Manual**

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						47	discuss an explanation with your group
						76	use data to predict best string length for a pendulum clock
						76	analyze pendulum data
						121	use graph to predict mass of six objects
						129	explain your answer and justify
						147	students analyze chemical change lab results
						156	make predictions about solubility
						201	predicting areas with high ozone concentration based on your data
						204	predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup
						239	estimating the number of meteor collisions on Earth during the last 3.5 billion years
						242	predicting the results of the crystal-growing experiment

**Correlation to Washington Essential Academic Learning Requirements for Science,
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Foundations of Physical Science with Earth and Space Science

Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.04.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 9 and 10	Analyze how physical, conceptual, and mathematical models represent and are used to investigate objects, events, systems, and processes.	23	why make models?	11	draw best fit curve
				24	what is a scientific model?	13	graph distance vs. time
				24	scientific models	13	draw best fit curve
				24	making a graph	15	construct a quantitative graphical model
				26	drawing a best fit curve	37	organize data into a graph of speed vs. height
				26	creating graphs	51	graph voltage vs. current
				41	make a graph	121	graph mass vs. volume
				485	computer modeling to predict greenhouse effects	147	organize observations into a category table
				494	modeling air currents	151	does your experiment agree with law of conservation of mass?
				518	create a model (#1)	185	constructing a graph of drops of acid vs pH
				524	model of Earth's history	187	construct a graphical model
				533	modeling plate boundaries	187	draw a line of best fit through temperature data points
				576	rock cycle model	189	construct a temperature vs. time graph
				614	solar system modeling	197	graphing and drawing a trend line for atmospheric pressure data
				624	model of the sun's anatomy	197	constructing a graph from atmospheric pressure data

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	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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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.04.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 7 and 8	Analyze how models are used to investigate objects, events, systems, and processes.	23	why make models?	13	graph distance vs. time
				24	interpretations of patterns in data	15	interpret a speed vs. time graph
				24	making a graph	15	construct a quantitative graphical model
				24	what is a scientific model?	25	create a mathematical model
				24	scientific models	25	create a mathematical model
				26	creating graphs	27	find math rule for lever equilibrium
				27	reading a graph	27	find math rule for lever equilibrium
				41	make a graph	28	derive a math formula
				42	interpreting distance/time graph	37	organize data into a graph of speed vs. height
				78	analyze lever diagram	51	graph voltage vs. current
				459	heat equation	121	graph mass vs. volume
				476	atmospheric pressure at various altitudes graph	147	organize observations into a category table
				485	computer modeling to predict greenhouse effects	151	does your experiment agree with law of conservation of mass?
				494	modeling air currents	185	constructing a graph of drops of acid vs pH
				518	create a model (#1)	187	construct a graphical model
				524	model of Earth's history	187	construct a graphical model
				533	modeling plate boundaries	187	find equation for trend line
				576	rock cycle model	189	construct a temperature vs. time graph
				614	solar system modeling	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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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				645	apparent brightness vs. distance graph	202	modeling the effect of greenhouse gases on Earth's temperature
				645	inverse square law		
				651	use the diagram to answer the questions (#2)	203	graphing water and ice temperature readings
				651	arrange the items in the table (#3)	206	constructing a graph of time vs. temperature
				651	use the diagram to answer the questions (#4)	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
						258	setting up a scale model of the solar system

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						268	discovering the mathematical relationship between apparent brightness and distance

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.05.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 9 and 10	Apply understanding of how to report complex scientific investigations and explanations of objects, events, systems, and processes, and how to evaluate scientific reports.	20	explain your reasoning	9	reporting on an experiment
				27	how to read a graph	9	present conclusions to the class
						15	discuss and test ideas with your group
						19	explain how you arrived at your answer
						29	discuss what you learned about gears
						37	describe the flow of energy based on experimental graph
						39	give a brief presentation to the class
						47	present and defend an explanation
						47	discuss an explanation with your group
						78	reading harmonic motion data tables and graphs
						129	explain your answer and justify
						145	present findings and methods used
						145	present findings to the class
						151	present results to the class

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
						163	evaluating choice of favorite car
						179	create water quality report
						181	write paragraph to explain results
						183	write summary of findings

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grades 7 - 10**

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.1.05.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Investigating Systems: Develop the knowledge and skills necessary to do scientific inquiry.	grades 7 and 8	Apply understanding of how to report investigations and explanations of objects, events, systems, and processes.	20	explain your reasoning	9	present conclusions to the class
				27	how to read a graph	9	reporting on an experiment
						13	make a distance vs. time graph
						37	describe the flow of energy based on experimental graph
						39	give a brief presentation to the class
						47	present and defend an explanation
						78	reading harmonic motion data tables and graphs
						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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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.01.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 9 and 10	Analyze and explain why curiosity, honesty, openness, and skepticism are integral to scientific inquiry.	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
				320	the quests of alchemists		
				391	scientific discovery and the atomic age	181	study water filtration device claims
				448	study claims made by bottled water companies	198	contributions of Schönbein
				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		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.01.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 7 and 8	Apply curiosity, honesty, skepticism, and openness when considering explanations and conducting investigations.	34	Aristotle vs. Newton	198	contributions of Schönbein
				45	Newton's Laws of Motion		
				54	Newton and the force of gravity		
				105	Benjamin Franklin		
				107	Charles-Augustin Coulomb		
				110	research Franklin's electricity experiments		
				312	contributions of Fermi		
				320	the quests of alchemists		
				321	contributions of Mendeleev		
				370	research Lavoisier's contributions		
				391	scientific discovery and the atomic age		
				393	contributions of Marie and Pierre Curie		
				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		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.02.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 9 and 10	Analyze scientific theories for logic, consistency, historical and current evidence, limitations, and for capacity to be investigated and modified.	473	why do ears pop	6	asking questions and learning about natural world
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	39	critique group's explanation of energy transformations
				521	relative dating and modern geology based on Steno's theories	39	review energy theory in context of everyday scenarios
				524	Kelvin's calculations of Earth's age	39	analyze energy transformations in different scenarios
				528	theory of plate tectonics		
				529	critiquing Wegener's theories of continental drift	77	show how energy loss data could be applied to designing a real clock
				563	Darwin's theories of the Andes formation	77	compare law of conservation of energy to motion of pendulum
				566	what causes ice ages		
				611	theories of origin of the moon	215	the food paradox of the oceans
				612	early theories of the solar system		
				647	Big Bang theory		
				648	evidence for Big Bang theory		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.02.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 7 and 8	Understand that scientific theories explain facts using inferential logic.	473	why do ears pop	6	asking questions and learning about natural world
				504	meteorologists use atmospheric pressure data to understand movement of weather systems	39	critique group's explanation of energy transformations
				521	relative dating and modern geology based on Steno's theories	39	review energy theory in context of everyday scenarios
				524	Kelvin's calculations of Earth's age	39	analyze energy transformations in different scenarios
				528	theory of plate tectonics		
				529	critiquing Wegener's theories of continental drift	77	show how energy loss data could be applied to designing a real clock
				563	Darwin's theories of the Andes formation	77	compare law of conservation of energy to motion of pendulum
				566	what causes ice ages		
				611	theories of origin of the moon	215	the food paradox of the oceans
				612	early theories of the solar system		
				647	Big Bang theory		
				648	evidence for Big Bang theory		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.03.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 9 and 10	Evaluate inconsistent or unexpected results from scientific investigations using scientific explanations.	10	process of reviewing hypothesis explained	21	construct reasonable explanation based on data
				521	relative dating and modern geology based on Steno's theories	35	what evidence is there in support of your hypothesis?
				524	Kelvin's calculations of Earth's age	35	study data and determine importance of height on speed of marble
				528	theory of plate tectonics	39	critique group's explanation of energy transformations
				529	critiquing Wegener's theories of continental drift	39	review energy theory in context of everyday scenarios
				563	Darwin's theories of the Andes formation	39	analyze energy transformations in different scenarios
				566	what causes ice ages	45	analyze data and explain a rule
				611	theories of origin of the moon	77	show how energy loss data could be applied to designing a real clock
				612	early theories of the solar system	77	compare law of conservation of energy to motion of pendulum
				647	Big Bang theory	151	review your hypothesis
						151	do the data support the hypothesis
						171	did you prove or disprove your hypothesis?

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
						171	what was happening at molecular level?
2.2.03.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 7 and 8	Analyze inconsistent results from scientific investigations to determine how the results can be explained.	10 524	process of reviewing hypothesis explained Kelvin's calculations of Earth's age	21 35 35 39 45 77 151 151 157 171 171 197	construct reasonable explanation based on data what evidence is there in support of your hypothesis? study data and determine importance of height on speed of marble analyze energy transformations in different scenarios analyze data and explain a rule compare law of conservation of energy to motion of pendulum review your hypothesis do the data support the hypothesis add new rules to list based on findings did you prove or disprove your hypothesis? what was happening at molecular level? evaluating your aneroid barometer design

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.04.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 9 and 10	Analyze scientific investigations for validity of method and reliability of results.	11	control and experimental variables	7	doing a controlled experiment
				19	which group did the best experiment?	18	evaluate graphs as to whether or not they show relationships between variables
				26	independent and dependent variables	21	evaluate percent change for data collected
						21	choose independent and dependent variables for graph
						27	recognize variables
						75	evaluate statistical significance
						171	evaluate method based on data
						190	effect of changing mass on collected data
						200	evaluating your qualitative ozone strips
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.04.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 7 and 8	Understand how to make the results of scientific investigations reliable and how to make the method of investigation valid.	11	control and experimental variables	7	variables in an experiment
				26	independent and dependent variables	7	doing a controlled experiment
				448	forming a hypothesis and testing through experimentation (#5)	21	choose independent and dependent variables for graph
				602	identify question, hypothesis, procedure, and results (#1)	27	recognize variables
						190	effect of changing mass on collected data
						211	determining whether distance from light source or axial tilt plays a more significant role in causing the seasons

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.05.HS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 9 and 10	Understand how scientific knowledge evolves.	312	history of atomic theory	7	variables in an experiment
				313	development of atomic theory	101	how could you extend the investigation to explore materials that give off light when heated?
				324	research and create a poster to illustrate development of atomic model	117	how could you find the volume of one drop of water?
				343	Avogadro's number	130	investigate Rutherford's gold foil experiment
				363	history of law of conservation of mass	183	specifying how the daphnia experiment could be improved
				393	history of nuclear chemistry		
				448	forming a hypothesis and testing through experimentation (#5)		
				468	research the history of heat and temperature		
				602	identify question, hypothesis, procedure, and results (#1)		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
2.2.05.MS Inquiry: The student knows and applies the skills, and processes, and nature of scientific inquiry	Nature of Science: Understand the nature of scientific inquiry	grades 7 and 8	Understand that increased comprehension of systems leads to new inquiry.	34	Aristotle vs. Newton	101	how could you extend the investigation to explore materials that give off light when heated?
				45	Newton's Laws of Motion		
				54	Newton and the force of gravity	117	how could you find the volume of one drop of water?
				105	Benjamin Franklin		
				107	Charles-Augustin Coulomb	130	investigate Rutherford's gold foil experiment
				312	history of atomic theory		
				312	contributions of Fermi	183	specifying how the daphnia experiment could be improved
				313	development of atomic theory		
				321	contributions of Mendeleev		
				324	research and create a poster to illustrate development of atomic model		
				343	Avogadro's number		
				363	history of law of conservation of mass		
				393	history of nuclear chemistry		
				393	contributions of Marie and Pierre Curie		
				468	research the history of heat and temperature		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.1.01.HS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.	grades 9 and 10	Analyze local, regional, national, or global problems or challenges in which scientific design can be or has been used to design a solution.	333	problems with disposing of plastics	163	economic impact of end-product of combustion reaction
				355	recycling tires	163	too much CO ₂
				356	recycling discarded tires	163	consider a vehicle's fuel economy
				364	petroleum	163	research how trees offset accumulation of CO ₂
				368	limiting reactants	163	research how trees offset accumulation of CO ₂
				379	hydrogen-powered cars and the environment	163	research how trees offset accumulation of CO ₂
				379	research economic impact of fuel cells	163	can trees compensate for manmade CO ₂ from vehicles and industry?
				379	research environmental impact of fuel cells	164	perform water quality tests
				379	research fuel cells	178	wise use of water supply
				379	research fuel cells	179	maintaining water supply quality
				392	storage of nuclear waste	180	save water for houseplants
				395	fossil fuels	180	perform water quality tests
				400	economic impact of reducing air pollution	182	investigate effect of acid rain on microorganisms
				400	economic impact of pollution	201	research the causes of ozone in the lower atmosphere
				400	problems caused by airborne pollutants		
				414	effect of electrical generating facilities on dissolved oxygen in water		
				432	water cycle and conservation		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				433	wise use of water		
				435	water usage and quality		
				436	effect of excess nitrates on environment		
				437	acid rain explained		
				448	research economic impact of producing gases that cause acid rain		
				448	research the issue of acid rain		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.1.01.MS	Designing Solutions:	grades 7 and 8	Analyze common problems or challenges in which scientific design can be or has been used to design solutions.	73	relationship between science and technology	70	using engineering design cycle
Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.			172	generating electric power	262	determine the efficiency of a photovoltaic cell
				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 earthquakes allows engineers to design safer buildings		
				560	description of geothermal energy		
				597	using satellite technology		
				599	how the space shuttle works		
				599	space shuttle		
				627	the efficiency of photovoltaic cells		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.1.02.HS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.	grades 9 and 10	Evaluate the scientific design process used to develop and implement solutions to problems or challenges.	74	sample engineering problem	70 70 71 71 194	designing and testing different electric motors proposing and comparing different electric motor designs which motor gave the highest speed and why? did draining the batteries affect motor speed? design and construct an aneroid barometer
3.1.02.MS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.	grades 7 and 8	Apply the scientific design process to develop and implement solutions to problems or challenges.	74	sample engineering problem	70 70 71 71 194	designing and testing different electric motors proposing and comparing different electric motor designs which motor gave the highest speed and why? did draining the batteries affect motor speed? design and construct an aneroid barometer

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.1.03.HS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.	grades 9 and 10	Evaluate consequences, constraints, and applications of solutions to a problem or challenge.	172 333 379 379 379 391 395 400 400 436 437 448 560 627	generating electric power plastics hydrogen-powered cars and the environment research fuel cells research environmental impact of fuel cells impact of nuclear energy fossil fuels reducing pollution problems caused by airborne pollutants effect of excess nitrates on environment acid rain explained research the issue of acid rain description of geothermal energy the efficiency of photovoltaic cells	52 163 163 163 182 201 262	the cost of using electrical appliances too much CO ₂ research how trees offset accumulation of CO ₂ research how trees offset accumulation of CO ₂ investigate effect of acid rain on microorganisms research the causes of ozone in the lower atmosphere determine the efficiency of a photovoltaic cell

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.1.03.MS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Designing Solutions: Apply knowledge and skills of science and technology to design solutions to human problems or meet challenges.	grades 7 and 8	Analyze multiple solutions to a problem or challenge.			70	proposing and comparing different electric motor designs
						71	testing a motor for performance

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.01.HS	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 9 and 10	Analyze how scientific knowledge and technological advances discovered and developed by individuals and communities in all cultures of the world contribute to changes in societies.	45	Newton's Principia		
				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		
				160	Faraday's contributions		
				312	Dalton's contributions		
				321	Mendeleev's periodic table		
				332	Linus Pauling and electronegativities		
				363	Antoine Lavoisier		
				370	research Lavoisier's contributions		
				393	accomplishments of Marie Curie		
				393	Marie and Pierre Curie		
				455	contributions of Joule		
				457	Joseph Black		
				599	how the space shuttle works		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.01.MS	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 7 and 8	Analyze how science and technology have been developed, used, and affected by many diverse individuals, cultures, and societies throughout human history.	45	Newton's Principia		
				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		
				160	Faraday's contributions		
				312	Dalton's contributions		
				321	Mendeleev's periodic table		
				332	Linus Pauling and electronegativities		
				363	Antoine Lavoisier		
				370	research Lavoisier's contributions		
				393	Marie and Pierre Curie		
				393	accomplishments of Marie Curie		
				455	contributions of Joule		
				457	Joseph Black		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.02.HS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 9 and 10	Analyze how the scientific enterprise and technological advances influence and are influenced by human activity.	34	Newton's research impacted mathematics	198	contributions of Schönbein
				73	impact of technology		
				214	ultrasound technology		
				220	voice recognition technology		
				294	invention of Kevlar		
				320	the quests of alchemists		
				391	scientific discovery and the atomic age		
				400	clean air act of 1970		
				429	governments managing water resources		
				433	the clean water act		
				439	catalytic converters and scrubbing reduce acid rain		
				448	is acid rain a problem in your community?		
				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	London Agreement of 1991		
				483	hydrogen powered cars		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				483	should governments enforce changes for lowering greenhouse gas levels		
				538	what we can learn from seismographs		
				542	studying seismic waves leads to information used in oil and gas exploration		
				544	understanding earthquakes allows engineers to design safer buildings		
				545	predicting tsunamis		
				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		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.02.MS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 7 and 8	Analyze scientific inquiry and scientific design and understand how science supports technological development and vice versa.	73 73 530 597 599	relationship between science and technology impact of Da Vinci's work using echo sounders to map the sea floor using satellite technology space shuttle	70	using engineering design cycle
3.2.03.HS Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 9 and 10	Analyze the scientific, mathematical, and technological knowledge, training, and experience needed for occupational/career areas of interest.	452 457 542 548 561	civil engineers and bridge design engineers design better products when they know specific heat seismologists describe the work of a geologist and paleontologist and seismologist volcanologists	177 178 178 222	chemistry and photography water quality testing water quality specialist zoo exhibit designers

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.03.MS	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 7 and 8	Analyze the use of science, mathematics, and technology within occupational/career areas of interest.	45	Newton's Principia	178	water quality specialist
Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.				55	Newton and the apple legend	222	zoo exhibit designers
				73	Leonardo DaVinci		
				86	James Watt		
				115	Volta's batteries		
				131	Georg Ohm's work with circuits		
				160	Faraday's contributions		
				312	Dalton's contributions		
				321	Mendeleev's periodic table		
				332	Linus Pauling and electronegativities		
				363	Antoine Lavoisier		
				393	Marie and Pierre Curie		
				393	accomplishments of Marie Curie		
				452	civil engineers and bridge design		
				455	contributions of Joule		
				457	Joseph Black		
				457	engineers design better products when they know specific heat		
				542	seismologists		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				548	describe the work of a geologist and paleontologist and seismologist		
				561	volcanologists		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.04.HS	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 9 and 10	Analyze the effects human activities have on Earth's capacity to sustain biological diversity.	391	nuclear vs. fossil fuels	178	predict the quality of surface water to be tested and justify your answer
Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.				411	effects of PCB's in Great Lakes	179	address what you can do to maintain or improve the water quality at the test site
				414	environmental impact of electrical generating facilities	182	the effects of acid rain on organisms in aquatic environments
				433	The Clean Water Act	182	the effects of acid rain on organisms in aquatic environments
				435	water quality testing	185	effect of ocean on carbon dioxide levels in the atmosphere
				436	water quality testing	202	investigate the temperature effects of greenhouse gases
				437	acid rain	262	solar energy can be used to generate electricity without producing pollution
				437	acid rain		
				438	causes and health effects of acid rain		
				438	impact of using fossil fuels		
				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		
				481	greenhouse effect and greenhouse gasses		
				485	computer modeling to predict greenhouse effects		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
				504	temperature inversion		
				627	using photovoltaic cells		

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Student Text and Investigation Manual

Standard #:	Component	level	GLE	student text	detail	investigation	detail
3.2.04.MS	Science, Technology and Society: Analyze how science and technology are human endeavors, interrelated to each other, to society, and to the workplace and the environment.	grades 7 and 8	Analyze how human societies' use of natural resources affects the quality of life and the health of ecosystems.	364	petroleum	163	economic impact of end-product of combustion reaction
Application: The student knows and applies science concepts and skills to develop solutions to human problems in societal contexts.				368	limiting reactants	163	too much CO ₂
				379	research fuel cells	163	consider a vehicle's fuel economy
				379	research environmental impact of fuel cells	163	research how trees offset accumulation of CO ₂
				379	research fuel cells	163	research how trees offset accumulation of CO ₂
				379	hydrogen-powered cars and the environment	163	research how trees offset accumulation of CO ₂
				379	research economic impact of fuel cells	163	can trees compensate for manmade CO ₂ from vehicles and industry?
				395	fossil fuels	164	perform water quality tests
				400	economic impact of pollution	178	actions to take to improve water quality
				400	economic impact of reducing air pollution	178	predict the quality of surface water to be tested and justify your answer
				400	problems caused by airborne pollutants	178	wise use of water supply
				414	effect of electrical generating facilities on dissolved oxygen in water	179	maintaining water supply quality
				414	effect of electrical generating facilities on dissolved oxygen in water	180	save water for houseplants
				432	water cycle and conservation	180	perform water quality tests
				433	wise use of water		
				435	water usage and quality		

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Standard #:	Component	level	GLE	student text	detail	investigation	detail
				436	effect of excess nitrates on environment	182	investigate effect of acid rain on microorganisms
				437	acid rain explained	201	research the causes of ozone in the lower atmosphere
				437	effects of acid rain on natural environments		
				437	effects of acid rain on the soil		
				443	impact of increased CO2 in oceans		
				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	effects of burning fossil fuels		
				515	permafrost		