

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ1.1 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Observing - Senses are used to develop an awareness of events or objects and their properties	46 make predictions	12 use graph to predict mass of six objects 14 make predictions based on observations 17 observing 18 make predictions 23 use graph to make prediction 25 predict what graph will look like 53 make predictions based on data 69 make predictions on observed data 71 predict the pressure 130 use data to predict best string length for a pendulum clock 193 make predictions based on inferences from data 247 observations

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ1.2 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Questioning - Development of an inquisitive mind and the effective use of questioning techniques furthers the acquisition of information	46 make predictions 61 review scientific hypothesis based on comparison with evidence 63 formulate a testable hypothesis 64 analyze hypothesis based on data 297 why is Earth's atmosphere different from other planets	12 use graph to predict mass of six objects 14 make predictions based on observations 18 formulate a testable hypothesis 18 make predictions 19 analyze scientific hypothesis based on scientific evidence 21 make a hypothesis 23 use graph to make prediction 25 predict what graph will look like 31 formulate a testable hypothesis 32 analyze hypothesis based on comparison with evidence 36 analyze hypothesis based on data 53 make predictions based on data 69 make predictions on observed data 71 predict the pressure 97 do the data support the hypothesis

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					97 review your hypothesis 130 use data to predict best string length for a pendulum clock 193 make predictions based on inferences from data

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
INQ1.3 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Collecting Data - Acquiring, recording, arranging and storing of information must be performed in a complete, accurate, concise, and user-friendly manner	4	measurement and units	1	selecting tools of measurement
				10	measurement	2	data table
				20	accuracy and precision and resolution	3	precision and accuracy
				43	using data tables	9	precision
						12	data table
						13	data tables
						13	data table
						17	data tables
						17	data tables
						19	data tables
						23	data table
						26	data tables
						29	analyze trends from data
						29	data tables
						31	data tables
						35	data tables
						35	data tables
						36	construct algebraic model from data
						45	collect force data
						57	sketch the shape of the graph
						64	collect observational data

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					69 data tables 95 data tables 96 data tables 97 design a data table 129 collect mass and amplitude data 232 data tables 233 measuring 234 measuring 235 measuring 236 data tables 236 measuring 239 measurements 240 measurements 241 measurements 248 data tables

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations		Volume 1 Student Text page	Volume 2 Investigation Manual page	
INQ1.4 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Analyzing - Data should be examined to find patterns that may suggest cause and effect relationships or support inferences and hypotheses	21	finding estimated error	11	graph mass vs. volume
				21	significant differences	19	analysis of errors
				42	interpretation of patterns from graphs and tables	23	create a graph
				43	making graphical model from data	24	calculate percent error
				44	creating graphical model from data	25	predict what graph will look like
				45	analysis of trends from data	29	make graph from data
				46	constructing graph from data	35	graphical models
				47	interpretation of patterns in data	35	analyze trends from data
				47	analyze trends from data	42	create a graph
				47	constructing a graph	45	analyze block and tackle data
				87	graphs	51	analyze trends from data
				88	interpretations of patterns in data	51	analyze lever equilibrium data
				88	making and evaluating graphs	71	graph pressure vs volume
				88	analyze trends from data	73	graph pressure vs temperature
				136	interpret patterns in data from tables	99	study the graph
				559	harmonic motion graphs	104	create a solubility curve
		129	analyze pendulum data				
		248	lab notebook				
		249	making graphs				

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
INQ1.5 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Explaining - Phenomena and related information are made understandable through discussion that culminates in a higher level of learning	60	review theories based on observations	38	explaining
				61	review scientific hypothesis based on comparison with evidence	97	present results to the class
				63	critique based on evidence	97	review your hypothesis
				381	communicating—graphically	167	explaining
						231	communicating results is essential to science

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
INQ1.6 Science	Processes of Science	To enable students to apply the processes of science by posing questions and investigating phenomena through the language, methods, and instruments of science	Communicating - Essential to science is the act of accurately and effectively conveying oral, written, graphic, or electronic information	43	making graphical model from data	2	data table
				43	using data tables	10	how do results compare
				44	creating graphical model from data	11	graph mass vs. volume
				46	constructing graph from data	12	data table
				47	constructing a graph	13	data table
				59	construct explanations supported by direct and indirect evidence	13	data tables
				65	writing lab procedures	17	data tables
				65	lab report	17	data tables
				65	write up results	19	data tables
				87	graphs	23	data table
				88	making and evaluating graphs	23	explain any differences you see
				150	diagrams	23	create a graph
				381	communicating—graphically	24	test your prediction
				559	harmonic motion graphs	25	predict what graph will look like
						26	data tables
						29	analyze trends from data
						29	data tables
		29	make graph from data				
		31	data tables				
		35	graphical models				
		35	data tables				
		35	data tables				

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					36 construct reasonable explanations back by scientific evidence 38 explaining 38 diagrams 42 create a graph 50 drawings and diagrams 53 making sketches and diagrams 57 sketch the shape of the graph 69 data tables 71 graph pressure vs volume 73 graph pressure vs temperature 95 data tables 96 data tables 97 present results to the class 97 perform the experiment you designed 97 design a data table 99 study the graph 104 create a solubility curve 125 constructing explanations

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					129 investigate variables that affect the period of a pendulum 167 explaining 215 sketches 230 design experiment that someone else can follow 230 formal lab report 231 lab reports 231 communicating results is essential to science 231 writing up results 232 lab report 232 data tables 232 writing up results 236 data tables 248 data tables 248 lab report 248 lab notebook 249 making graphs 249 making graphs

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
INQ2.1 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Scale and Models - Models provide a conceptual bridge between the concrete and the abstract, while the application of scale allows for understanding the difference in magnitude between the model and the target item	46	know that scientific knowledge can be in the form of models	3	how close were predictions
				114	using algebraic formulas	7	unit canceling
				128	using algebraic model	27	compare prediction to graph
				145	using algebraic models	42	derive a formula
				170	kinetic energy formula	45	create a mathematical model
				192	kinetic energy formula	51	find math rule for lever equilibrium
				197	the power equation	59	compare prediction to results
				256	the heat equation	71	derive Boyles law
				271	density formula	133	give an equation that describes your observations
				304	pressure and temperature relationship		
				488	equation for Ohm's law		
				564	calculating wave speeds		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
INQ2.2 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Form and Function - Form is linked to the function of materials and systems, and function may alter form	240	phases of matter	64	compare solids and liquids
				277	explain matter states based on arrangement of atoms	75	understand the structure of an atom based on protons and neutrons and electrons
				314	atoms are made up of protons and neutrons and electrons	78	understand the structure of an atom based on protons and neutrons and electrons
				318	understand how atomic structure determines the identity of elements—atomic number	78	structure of an atom
				319	structure of an atom and three smaller particles	85	review subatomic particles
				335	idea of atomic mass	201	build atomic models
				436	a water molecule is v shaped		
				436	water structure and its function as a solvent		
				453	water as universal solvent		
				456	water as universal solvent		
				535	electromagnets reverse current and switch polarity		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
INQ2.3 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Organization - Everything is organized into related systems or subsystems	126 127 129 450 555 555	how systems may reach equilibrium equilibrium equilibrium recognize and describe how systems may reach equilibrium restoring forces and equilibrium equilibrium and harmonic motion	
INQ2.4 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Interactions - Within all living and non-living systems, matter and energy interact	61 164 165 166 166 175 242 388 388 434 535	basic forms of energy—heat understanding energy forms of energy describe forms of energy from origin forms of energy different forms of energy heat energy and molecular motion conservation of mass conservation of mass atoms and nuclear energy electromagnets reverse current and switch polarity	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ2.5 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Change - Interactions within and among systems result in changes in their properties, position, movement, form, or function	240 phases of matter 242 heat energy and molecular motion 242 phase changes 277 explain matter states based on arrangement of atoms 388 conservation of mass 388 conservation of mass 434 atoms and nuclear energy 535 electromagnets reverse current and switch polarity	64 compare solids and liquids
INQ2.6 Science	Unifying Concepts of Science	To enable students to acquire and integrate scientific knowledge by applying major concepts, theories, principles, and laws from the life, environmental, physical, and earth and space sciences	Conservation - In any natural system, form may change but nothing is lost	174 energy transformations and conservation 181 conservation of energy in a broader context 388 history of law of conservation of mass 388 conservation of mass 388 conservation of mass	40 energy in a system 63 conservation of energy

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
INQ3.1 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Historical and Cultural Perspective - Scientific understanding evolves over time as an approximation of truth and within a cultural context	60	historical context and perspective of discoveries	
				68	science and peer review	
				323	atomic theory of matter development	
				324	contributions of Heisenberg	
				335	history of periodic table development	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
INQ3.2 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Assumption - Establishing the validity of an argument through data and differentiating between fact and assumption are vital parts of the scientific process	45	analysis of trends from data	10	how do results compare
				46	identifying cause and effect relationships	17	identify cause and effect relationships
				47	analyze trends from data	19	cause and effect relationships
				59	recognize that repeatability of investigations is necessary	19	analyze scientific hypothesis based on scientific evidence
				59	construct explanations supported by direct and indirect evidence	23	explain any differences you see
				60	review theories based on observations	32	analyze hypothesis based on comparison with evidence
				61	review scientific hypothesis based on comparison with evidence	35	analyze trends from data
						36	analyze hypothesis based on data
				63	recognize repeatability of investigation is necessary for verification of evidence	36	construct reasonable explanations back by scientific evidence
				63	critique based on evidence	45	analyze block and tackle data
				64	analyze hypothesis based on data	51	analyze trends from data
				68	importance of repeatability	51	analyze lever equilibrium data
				88	identify cause and effect relationships	71	does the graph support hypothesis
				88	analyze trends from data	97	do the data support the hypothesis
		97	review your hypothesis				

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					125 constructing explanations 129 evaluate statistical significance 129 analyze pendulum data

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
INQ3.3 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Estimation and Computation - Scientists evaluate the level of precision needed to make a reasonable response and perform necessary calculations	4 10 15 20 21	measurement and units measurement dimensional analysis accuracy and precision and resolution finding estimated error	1 3 4 9 15 19 24 45 47 129 129 233 234 235 236 236 239 240 241	selecting tools of measurement precision and accuracy dimensional analysis precision find average time analysis of errors calculate percent error measure and record the force measure height difference collect mass and amplitude data make precise length measurements measuring measuring measuring scientific notation measuring measurements measurements measurements

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
INQ3.4 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Methods - Scientists use a variety of techniques to describe and solve problems	46	identifying cause and effect relationships	17	identify cause and effect relationships
				58	recognizing that scientific knowledge is a process of learning	18	formulate a testable hypothesis
				62	describe steps of the scientific method	19	cause and effect relationships
				62	recognition that science is a process	19	recognizing controlling variables
				63	formulate a testable hypothesis	21	make a hypothesis
				64	recognizing and controlling variables in observations and experiments	31	formulate a testable hypothesis
				65	writing lab procedures	35	recognizing and controlling variables
				78	variables	50	controlling variables
				88	identify cause and effect relationships	50	controlling variables
				469	scientific method	230	design experiment that someone else can follow

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page	
INQ3.5 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Science and Technology - Science and technology are separate but interdependent	5 7 50 62 69 70 120 121 121 582	trace the development of measurement bytes and SI prefixes steps of design cycle trace development of theories science and technology sample engineering problem relationship between science and technology—maglev trains applications of science can affect the lives of individuals relationship between science and applied technology recording sound	192 Internet research

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page	
INQ3.6 Science	Habits of Mind	To enable students to think and act in a manner consistent with the practice and the nature of science; and exhibit an awareness of the historical and cultural contributions of science	Creative Enterprise - Ideas and inventions contribute to the creative expression of science	7 69 120 121 475 582	bytes and SI prefixes science and technology relationship between science and technology—maglev trains relationship between science and applied technology Benjamin Franklin recording sound	97 design experiment to find out if mass is conserved 129 design pendulum experiment
INQ4.1 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Attitudes - Scientific progress and the attitudes of society influence one another	59 62 63 68 68 401	recognize that repeatability of investigations is necessary evaluate how research shapes scientific knowledge recognize repeatability of investigation is necessary for verification of evidence importance of repeatability science and peer review research environmental impact of fuel cells	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ4.2 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Personal Goals - Applications of science can affect the quality of life for individuals	121 applications of science can affect the lives of individuals 179 energy usage and conservation 426 storage of nuclear waste	
INQ4.3 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Career Goals - Development of scientific skills may lead to rewarding careers and productive contributions to society	121 seeing connections between classroom learning and real life 127 seeing connections between what is learned in science and observations of real world	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ4.4 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Societal Needs - Science and technology combine to meet the needs of a society	50 50 70 179 315 401	solving design problems steps of design cycle sample engineering problem energy usage and conservation design and test model research environmental impact of fuel cells
INQ4.5 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Economics - Scientific knowledge provides a basis for understanding the economic value of applied technology	120 401	economic value of applied technology research economic impact of fuel cells

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
INQ4.6 Science	Science in Society	To enable students to demonstrate positive attitudes toward science necessary for solving problems and making personal decisions about issues that affect individuals, society, and the environment	Politics - Sound scientific understanding should guide political decisions	179 energy usage and conservation 401 research economic impact of fuel cells 401 research environmental impact of fuel cells 425 nuclear vs. fossil fuels 425 impact of nuclear energy 426 storage of nuclear waste 462 acid rain	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS1.1 Physics	Force and Motion	The student will explore the concepts of force and motion.	investigate the relationship between speed, velocity, and acceleration	78	concept of speed	20	finding speed
				79	calculating speed	22	find speed of car
				81	speed	26	position vs time graph
				81	compare and contrast speed and velocity	27	speed vs time graph
				82	compare and contrast speed and velocity	27	calculate car's acceleration
				87	calculating speed	31	compare speeds of cars
				87	changes in motion can be represented graphically	33	positive and negative acceleration
				89	changes in motion can be shown graphically	33	calculate speed of car
				89	position vs. time graphs	36	quantitative understanding of force as a rate of change of velocity
				89	calculating speed	36	calculate acceleration
				90	changes in motion can be represented graphically	36	conceptual idea of acceleration as change in speed
				90	speed vs. time graph	39	find speed of car
				91	constant velocity		
				91	calculations for speed		
				91	compare and contrast speed and velocity		
				91	speed vs. time graph		
				92	conceptual understanding of acceleration as describing change in speed		
95	speed vs. time graph						

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				99 quantitative understanding of acceleration as change in speed	
				124 compare and contrast constant and changing velocity	
				138 compare and contrast constant and changing velocity	
				143 acceleration is a rate of change of speed	
				143 concept of acceleration	
				147 conceptual understanding of acceleration as change in speed	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS1.2 Physics	Force And Motion	The student will explore the concepts of force and motion.	analyze and apply Newton's three laws of motion	93	quantitative understanding of acceleration as a rate of change of velocity	34	investigate the 2nd law of motion
						34	second law of motion
				99	Newton's second law	34	qualitative understanding of $F = ma$
				108	forces needed to change motion	37	qualitative understanding of Newton's third law
				108	understand force as an action with potential to change motion	38	Newton's third law—action and reaction
				119	changes in motion require application of force	38	Newton's second law
				124	net force	168	Newton's third law—action and reaction
				125	balanced and unbalanced forces	168	Newton's second law
				126	change in motion require force		
				126	concept of net force		
				127	quantitative understanding of force changing motion		
				127	use concepts of balanced or unbalanced forces		
				129	net force		
				129	unbalanced forces cause motion		
				129	net force		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				138	
					conceptual understanding of a force as the action with the potential to change motion
				138	changes in motion require force
				139	change in motion requires force
				139	concept of net force
				139	concept of net force
				141	force is an action with potential to change motion
				143	Newton's second law
				143	concept of net force
				144	Newton's second law—qualitative
				144	Newton's second law—qualitative
				144	Newton's second law—qualitative
				145	concept of net force
				147	net force
				148	understand and use concept of balanced and unbalanced forces to create motion
				149	Newton's third law—action and reaction

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				149	
					balanced and unbalanced forces
				150	
					Newton's third law—qualitative
				152	
					Newton's second law—qualitative
				154	
					Newton's laws in terms of real situations—sports and cars
				155	
					Newton's third law
				168	
					understanding of force as the ability to change motion

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page	
PS1.3 Physical Science	Force and Motion	The student will explore the concepts of force and motion.	relate gravitational force to mass and distance	59	difference between weight and mass	67 mass vs weight
				96	effect of gravity on motion	
				98	projectile explained	
				109	use of force in units of newtons and pounds	
				113	use of newtons	
				113	effect of gravity on objects	
				113	difference between weight and mass	
				116	force in newtons	
				126	effects of gravity	
				139	difference between weight and mass	
				154	Newton's laws in terms of real situations—sports and cars	
				190	work and gravity	
				284	qualitative understanding of the differences between weight and mass	
				285	qualitative understanding of mass and weight are different	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS1.4 Physical Science	Force and Motion	The student will explore the concepts of force and motion.	demonstrate the relationship between work, power, and machines	168	calculating work done on objects	45	discover mechanical advantage of ropes and pulleys
				188	calculating work	48	calculate work done on block
				190	work done by or against gravity	49	investigate how simple machines work
				194	efficiency explained	51	investigate simple machines—input and output force
				197	maximum power output of a person	52	demonstrate how simple machines work
				197	calculating power	52	analyze result of changing force of distance in a lever as demonstrated by arm
				206	simple machines	52	investigate how simple machines work
				207	simple machines and forces	53	demonstrate how simple machines work—mechanical advantage
				213	how a rope and pulley system works	176	work out cannot be more than work in
				216	how simple machines manipulate forces		
				217	pliers as an example of a lever		

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
PS1.5 Physical Science	Force and Motion	The student will explore the concepts of force and motion.	examine the law of conservation of momentum in everyday situations	152	law of conservation of momentum	38	investigate momentum and the 3rd law of motion
				152	calculating momentum		
				152	momentum defined		
				153	understanding the law of conservation of momentum		
				154	solving momentum problems		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS2.1 Physical Science	Structure and Properties of Matter	The student will examine the structure, properties, and classes of matter.	classify and identify matter as pure substances or mixtures	228	matter is composed of atoms	54	mixtures vs pure substances
				229	definition of atom	75	what isotopes are
				229	what are elements	75	atomic symbol and atomic number and mass number
				230	understanding mixtures	75	understand the structure of an atom based on protons and neutrons and electrons
				230	definition of compound	78	understand the structure of an atom based on protons and neutrons and electrons
				230	compare and contrast elements and compounds and molecules	78	structure of an atom
				314	atoms are made up of protons and neutrons and electrons	79	what isotopes are
				315	protons neutrons and electrons	79	identify symbols and atomic number and mass number
				316	basic properties of an atom and the three subatomic particles	82	identify symbol and atomic number and mass number of elements
				318	understand how atomic structure determines the identity of elements—atomic number	85	review subatomic particles
				319	structure of an atom and three smaller particles	201	build atomic models
				320	explain what isotopes are	234	length measurements
				321	three subatomic particles and their charge		
				321	explain what isotopes are		
				335	idea of atomic mass		

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				337	
				337	
				355	
				360	
				443	
				472	
				473	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS2.2 Physical Science	Structure and Properties of Matter	The student will examine the structure, properties, and classes of matter.	explore matter in terms of specific properties	33	compare objects based on volume	11	density of objects
				33	investigate density of fluid	12	finding the density
				36	compare objects using mass and density	13	density
				36	density of fluids	14	volume and mass are different
				37	compare objects based on density	14	investigating density
				37	compare objects based on density	14	compare mass and volume and density
				38	physical differences between states of matter	54	investigate melting point
				38	density of fluids	64	colloidal suspension
				126	relationship between real materials and concepts of atoms	64	compare solids and liquids
				136	compare densities	68	apparent density
				240	phases of matter	239	volume
				240	physical differences between phases of matter	241	volume
				240	physical differences between phases of matter	242	volume
				242	phase changes	243	volume
				270	chemical properties of matter	244	mass
				270	physical properties of matter	245	mass
				271	density is a physical property of matter	246	mass
				271	why density varies		
273	tensile strength						

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				273	
					hardness is a physical property of matter
				274	
					malleability is a physical property of matter
				276	
					density of fluids
				277	
					explain matter states based on arrangement of atoms
				284	
					identify properties of fluids—buoyancy
				285	
					investigate buoyancy
				286	
					investigate properties—including buoyancy
				286	
					compare objects using density
				287	
					compare objects based on density
				287	
					density of fluids
				288	
					properties of fluids—density
				288	
					compare objects based on density
				289	
					compare objects based on density
				289	
					investigate buoyancy
				340	
					physical and chemical properties

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				341 relationship between materials and idea of atoms and molecules	
				344 relationship between real materials and arrangement of atoms	
				345 relationship between real materials and arrangements of atoms	
				347 melting and boiling points	
				347 classify by chemical and physical properties	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS3.1 Physical Science	Interactions of Matter	The student will investigate the interactions of matter.	investigate chemical and physical changes	334	difference between chemical and physical changes	92	chemical equations
				334	simple chemical changes—rusting	93	practice balancing equations
				356	energy changes that accompany chemical reactions	96	investigate and recognize that the chemical reactions can be represented as systems with reactants and products
				391	chemical equations	98	exothermic and endothermic reactions
				394	chemical reactions in living systems	99	exothermic and endothermic reactions
				394	heartburn reaction		
				398	synthesis or addition reactions		
				399	decomposition reactions		
				400	double displacement reactions		
				400	single displacement reactions		
				410	explain how energy is manifested in chemical reactions—exothermic and endothermic		
				411	analyze energy changes that accompany chemical reactions		
				411	how energy is manifested in chemical reactions		
				413	endothermic reactions		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
PS3.2 Physical Science	Energy	The student will compare and contrast the various forms of energy	compare and contrast ionic and covalent bonds	342	how electron interactions create bonds
				354	how electrons are involved in bonds
				354	difference between covalent and ionic bonds
				355	how ions are formed
				355	how electrons are involved in bonds
				356	how electron interactions help create chemical bonds
				357	how electrons are involved in bonds
				358	how electrons are involved in bonding
				359	how electrons are involved in bonding
				361	electron transfer and oxidation number
				362	chemical bonding and the periodic table
				363	explain why ions are formed
				363	distinguish between ionic compounds and covalent molecules
363	bonding and electronegativity				

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				368 electronegativity	
				368 qualitative understanding of how electron interactions create bonds	
				437 water is a polar molecule	
				438 hydrogen bonding in water	
				456 how ions are formed	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS3.3 Physical Science	Interactions of Matter	The student will investigate the interactions of matter.	analyze chemical equations	315	protons neutrons and electrons	75	what isotopes are
				316	basic properties of an atom and the three subatomic particles	75	atomic symbol and atomic number and mass number
				318	understand how atomic structure determines the identity of elements—atomic number	77	periodic table
						79	what isotopes are
						79	identify symbols and atomic number and mass number
				320	explain what isotopes are	80	build and describe periodic table
				321	three subatomic particles and their charge	82	identify symbol and atomic number and mass number of elements
				321	explain what isotopes are		
				322	qualitative concept of absorption and emission of light by electrons	83	identify metals and nonmetals and metalloids
				323	qualitative concept of absorption and emission of light by electrons	83	recognizing groups or families
						83	periodic table
				323	idea that electrons are in set energy levels	84	periodic table
				324	quantum theory explained		
				325	quantum theory—idea that electrons are in fixed energy levels		
				326	energy levels		
327	quantum theory—electrons in specific energy levels						

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				327	
					emission of light by electrons
				335	
					recognizing groups or families on the periodic table
				335	
					idea of atomic mass
				335	
					describe periodic table
				336	
					identify metals and nonmetals on the periodic table
				337	
					explain what isotopes are
				337	
					atomic number on the periodic table
				338	
					describing periodic table
				338	
					recognizing groups and families of periodic table
				338	
					recognizing metals and nonmetals and metalloids
				339	
					relate quantum theory to the idea that electrons exist at set energy levels
				340	
					describe periodic table
				340	
					recognizing groups and families and periodic table
				340	
					quantum theory to the idea that electrons at energy levels

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				342	
					how electron interactions create bonds
				342	describe periodic table
				343	groups on periodic table
				346	concepts of absorption and emission of light by atomic electrons
				354	how electrons are involved in bonds
				355	how ions are formed
				355	how electrons are involved in bonds
				356	how electron interactions help create chemical bonds
				357	relate the term quantum theory to the idea that electrons exist at set energy levels
				357	how electrons are involved in bonds
				358	relate quantum theory to the fact that electrons exist at set energy levels
				358	how electrons are involved in bonding
				359	relate quantum theory to electrons in energy levels

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				359	
					how electrons are involved in bonding
				360	
					relate quantum theory to the idea that electrons exist at set energy levels
				361	
					electron transfer and oxidation number
				362	
					chemical bonding and the periodic table
				363	
					explain why ions are formed
				368	
					qualitative understanding of how electron interactions create bonds
				389	
					mole calculations
				417	
					percent yield
				424	
					fusion and fission
				440	
					compare covalent and ionic bonds
				456	
					how ions are formed

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page	
PS3.4 Physical Science	Interactions of Matter	The student will investigate the interactions of matter.	compare and contrast acids and bases	454	differentiate between acids and bases	105 create a pH scale
				455	differentiate between acids and bases	
				457	determine pH ranges of solutions	
				460	pH range	
				461	pH ranges	
				462	acids and bases	
				463	pH ranges	
				463	differentiate between acids and bases	
PS3.5 Physical Science	Interactions of Matter	The student will investigate the interactions of matter.	explore the law of conservation of mass	388	conservation of mass	95 investigate law of conservation of mass
				388	conservation of mass	
				388	history of law of conservation of mass	96 law of conservation of mass

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
PS4.1 Physical Science	Energy	The student will compare and contrast the various forms of energy.	investigate the properties and behaviors of waves	560 resonance explained 562 waves transmit energy 563 frequency and amplitude and wavelength of waves 569 longitudinal waves 569 transverse waves 570 destructive interference 581 wavelength and frequency 586 wavelength of sound 587 standing waves and resonance 594 frequency of sound and beats	131 investigate frequency and wavelength 132 investigating resonance 133 natural frequency and resonance of standing waves on a string 133 waves carry energy from one place to another 136 investigate interference with sound waves 137 investigating sound resonance 213 demonstrate waves using slinky 213 wavelength and frequency and speed of waves 214 demonstrate waves using slinky 214 wavelength and frequency and speed of waves 215 wave characteristics through water 215 categorize waves by how they move 215 making circular waves in a ripple tank

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS4.2 Physical Science	Energy	The student will compare and contrast the various forms of energy.	explore and explain the nature of sound and light	322	explain how we see color in terms of reflected or emitted light	132	investigating resonance
				450	factors that affect solubility	133	natural frequency and resonance of standing waves on a string
				560	resonance explained	136	investigate interference with sound waves
				568	refracted waves	137	investigating sound resonance
				568	reflected waves	144	investigate RGB and CMYK models of color
				570	destructive interference	147	investigate law of reflection
				579	acoustics	149	study refraction in a prism
				580	speed of sound	149	study reflection in a prism
				581	sound as a wave	214	reflection
				582	how sound is recorded		
				584	sound as a wave		
				587	standing waves and resonance		
				588	acoustics of concert halls		
				593	pitch and the musical scale		
				594	frequency of sound and beats		
				604	seeing and reflected light		
				605	light is produced by atoms		
				606	white light is a mixture of colors		
				608	wavelength and frequency of visible light		

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				608	
				609	
				610	
				612	
				613	
				614	
				615	
				615	
				616	
				617	
				617	
				619	
				620	
				620	
				620	
				621	
				621	
				622	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
PS4.3 Physical Science	Energy	The student will compare and contrast the various forms of energy.	examine the applications and effects of heat	60 observe and explain that objects at different temperatures reach an intermediate temperature 234 converting between Fahrenheit and Celsius 234 measuring temperature 238 Kelvin and Celsius scales 252 understanding the difference between heat and temperature 252 flow of thermal energy is heat 253 heat and work 254 specific heat explained 255 specific heat 258 heat conduction 258 thermal equilibrium 259 thermal conductivity 260 natural and forced convection 261 thermal radiation 262 apply knowledge of heat transfer to different situations	58 how heat and temperature are different 60 concept of specific heat 62 investigate specific heat 63 specific heat 237 making temperature measurements 238 temperature changes 238 make Fahrenheit and Celsius measurements

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS4.4 Physical Science	Energy	The student will compare and contrast the various forms of energy.	probe the fundamental principles and applications of electricity.	314	Coulomb's law	108	concept of electrical charge
				321	Coulomb's law	108	construct simple circuits
				472	understanding electric charge	109	circuit diagrams
				473	charged objects and static electricity	109	electrical conductivity of various materials
				473	what causes shocks	109	simple circuits
				476	electric current	109	series circuit
				477	examples of electric circuits in nature	110	explore the concept of voltage
				477	electric circuits	112	apply the concept of electrical resistance
				478	circuit diagrams	118	build a parallel circuit
				478	resistors		
				479	open and closed circuits		
				479	battery circuits		
				481	current in simple circuits		
				482	understanding voltage		
				484	measuring current with a multimeter		
				486	understanding electrical resistance		
				487	measuring resistance		
				488	Ohm's law		
				490	resistance of common objects		

Correlation to Tennessee Science Learning Expectations
***Foundations of Physical Science* Student Text and Investigation Manual**

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				491	
				491	
				492	
				500	
				501	
				501	
				503	
				504	
				507	
				507	
				508	
				511	
				511	
				518	
				518	
				519	
				519	
				519	

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
				519 electrical safety and circuit breakers 520 transformers 529 using magnetic forces 609 relationship between electricity and magnetism in the formation of electromagnetic waves 610 relationship between electricity and magnetism in making electromagnetic waves	
PS4.5 Physical Science	Energy	The student will compare and contrast the various forms of energy.	distinguish between nuclear fission and nuclear fusion	320 basic concepts of radioactivity and decay 321 radioactivity 422 nuclear reactions 423 radioactivity 424 fusion and fission	76 radioactivity 79 radioactivity

Correlation to Tennessee Science Learning Expectations
Foundations of Physical Science Student Text and Investigation Manual

Standard #: Course	Topic	Standard	Learning Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page		
PS4.6 Physical Science	Energy	The student will compare and contrast the various forms of energy.	investigate the law of conservation of energy	61	basic forms of energy—heat	40	energy in a system
				164	understanding energy	41	potential and kinetic energy
				165	forms of energy	42	conservation of energy
				166	forms of energy	63	conservation of energy
				169	potential energy explained		
				170	potential to kinetic energy conversions		
				170	kinetic energy explained		
				174	energy transformations and conservation		
				177	potential to kinetic energy conversions		
				177	law of conservation of energy		
				178	using energy conservation to solve problems		
181	conservation of energy in a broader context						