

Correlation to Connecticut Core Science Curriculum Framework
CPO Science Physical Science

Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page		
C.01 6	Properties of Matter	Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.	Describe the properties of common elements, such as oxygen, hydrogen, carbon, iron and aluminum	318	write up results	61	periodic table
				343	explain common chemical properties of elements in relation to the periodic table	64	build and describe periodic table
				345	common chemical properties in relation to the periodic table	65	identify groups or families on periodic table
				345	recognizing groups or families on the periodic table	66	periodic table
				345	describe periodic table	67	identify metals and nonmetals and metalloids
				346	identify metals and nonmetals on the periodic table	67	recognizing groups or families
				348	common chemical properties of elements based on relation to periodic table	67	periodic table
				348	recognizing groups and families of periodic table	68	periodic table
				348	recognizing metals and nonmetals and metalloids		
				348	describing periodic table		
				349	explain common chemical properties in relation to placement on periodic table		
				350	recognizing groups and families and periodic table		

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				350 describe periodic table	
				351 explain common chemical properties of elements in relation to periodic table	
				352 properties in relation to periodic table	
				352 describe periodic table	
				353 groups on periodic table	
				353 chemical properties in relation to periodic table	
				357 describe characteristics based on place in periodic table	
				369 properties of elements in relation to the periodic table	
				371 explain the chemical properties of elements in relation to periodic table	
				372 explain chemical properties based on location in periodic table	
				374 chemical properties based on placement in periodic table	

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C.02 6	Properties of Matter	Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.	Describe how the properties of simple compounds, such as water and table salt, are different from the properties of the elements of which they are made.	20 recognize that compounds are composed of elements 314 compounds composed of elements 314 formation of NaCl crystals 363 recognize that compounds are made of elements 364 compounds are composed of elements 367 demonstrate that when two or more substances are combined new properties are seen 368 difference between ionic and covalent bonds 370 new substances are formed when two substances combine and it has new properties	71 new substances are formed when substances combine 77 how new substances are formed in chemical reactions
C.03 6	Properties of Matter	Materials can be classified as pure substances or mixtures, depending on their chemical and physical properties.	Explain how mixtures can be separated by using the properties of the substances from which they are made, such as particle size, density, solubility and boiling point.	364 describe how mixtures can be separated using physical means 370 mixtures can be separated by physical means	

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C.07 6	Energy in the Earth's Systems	Variations in the amount of the sun's energy hitting the Earth's surface affect daily and seasonal weather patterns.	Describe the effect of heating on the movement of molecules in solids, liquids and gases.	96 relationship between real materials and concepts of atoms 280 phases of matter 303 explain the relationship between materials and the concepts of atoms 310 explain matter states based on arrangement of atoms 351 relationship between materials and idea of atoms and molecules 354 relationship between real materials and arrangement of atoms 355 relationship between real materials and arrangements of atoms	53 states of matter based on arrangement and motion of atoms

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page		Volume 2 Investigation Manual page	
C.12 7	Energy Transfer and Transformations	Energy provides the ability to do work and can exist in many forms.	Explain the relationship among force, distance and work, and use the relationship ($W=F \times D$) to calculate work done in lifting heavy objects.	22	efficiency of electric motors	28	simple machines
				22	efficiency of gasoline engine	29	efficiency of simple machines
				135	work defined	29	work out cannot be more than work in
				136	concept of work as force times distance	30	simple machines
				137	calculating work done on objects	30	calculate work
				142	work and simple machines	30	work out cannot be more than work in
				143	output work is always less than input work		
C.13 7	Energy Transfer and Transformations	Energy provides the ability to do work and can exist in many forms.	Explain how simple machines, such as inclined planes, pulleys and levers, are used to create mechanical advantage.	22	efficiency of electric motors	28	simple machines
				22	efficiency of gasoline engine	29	efficiency of simple machines
				140	simple machines	30	simple machines
				141	simple machines and forces		
				144	simple machines and the human body		
				144	how a lever works		
				145	how a rope and pulley system works		
				146	how gears and ramps work		

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page		Volume 2 Investigation Manual page	
C.14 7	Energy Transfer and Transformations	Energy provides the ability to do work and can exist in many forms.	Describe how different types of stored (potential) energy can be used to make objects move.	10	conservation of energy (i.e. potential and kinetic)	26	kinetic and potential energy
C.22 8	Forces and Motion	An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.	Calculate the average speed of a moving object and illustrate the motion of objects in graphs of distance over time.	4	speed	8	determine the speed of an object
				6	speed	8	measurement and calculation of speed
				34	speed	9	determine speed of an object
				35	understand and calculate speed	9	speed calculation
				40	understand concept of speed	10	speed calculation
				54	concept of speed	13	concept of speed
				55	speed	15	calculate speed of a moving object
				56	speed	22	calculate speed
				60	calculating speed	27	calculate speed of a moving object
				64	calculating speed	31	calculate speed of the car
				66	calculations for speed		
				75	speed		
				76	position vs time graphs		
				76	speed		
				177	concept of speed		

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
C.23 8	Forces and Motion	An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.	Describe the qualitative relationships among force, mass and changes in motion.	4 68 73 79 80 89 95 96 97 98 99 100 108 109	21 23 24 25
				Newton's second law qualitative quantitative understanding of acceleration as a rate of change of velocity Newton's second law changes in motion require force forces needed to change motion changes in motion require application of force balanced and unbalanced forces change in motion require force use concepts of balanced or unbalanced forces balanced and unbalanced forces unbalanced forces cause motion Newton's first law changes in motion require force change in motion requires force	balanced or unbalanced forces causing changes in motion Newton's second law quantitative understanding of Newton's second law Newton's second law

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
				113 Newton's second law 114 Newton's second law—qualitative 114 Newton's second law—qualitative 114 Newton's second law—qualitative 115 Newton's second law—quantitative 117 understand and use concept of balanced and unbalanced forces to create motion 118 balanced and unbalanced forces 120 Newton's second law—qualitative 124 Newton's first law 124 Newton's second law	
C.24 8	Forces and Motion	An object's inertia causes it to continue moving the way it is moving unless it is acted upon by a force to change its motion.	Describe the forces acting on an object moving in a circular path.	70 effect of gravity on motion 72 projectile explained 82 effect of gravity on objects 96 effects of gravity 100 how gravity affects motion 156 effect of gravity on motion 160 effect of gravity on motion of objects	

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
C.28 8	Earth in the Solar System	The solar system is composed of planets and other objects that orbit the sun.	Explain the effect of gravity on the orbital movement of planets in the solar system.	70 72 82 96 100 156 157 158 160	effect of gravity on motion projectile explained effect of gravity on objects effects of gravity how gravity affects motion effect of gravity on motion role of gravity in solar system role of gravity in universe effect of gravity on motion of objects

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C.30 8	Science and Technology in Society	In the design of structures there is a need to consider factors such as function, materials, safety, cost and appearance.	Explain how beam, truss and suspension bridges are designed to withstand the forces that act on them.	29 difference between weight and mass 80 identify types of forces 81 use of force in units of newtons and pounds 82 difference between weight and mass 82 use of newtons 84 quantitative understanding of force as a vector 85 identify forces 86 force in newtons 86 difference between weight and mass 88 identify forces 94 net force 95 balanced and unbalanced forces 95 force as vector 96 concept of net force 97 use concepts of balanced or unbalanced forces 98 net force 98 balanced and unbalanced forces 99 force as vector	11 vectors have magnitude and direction 14 calculate speed of an object 21 balanced or unbalanced forces causing changes in motion

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
				99	
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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
				155 weight and acceleration	
				160 difference between mass and weight	
				304 qualitative understanding of the differences between weight and mass	
				305 qualitative understanding of mass and weight are different	

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
C.INQ.01 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Identify questions that can be answered through scientific investigation.	28 asking scientific questions	2 experiment to answer questions 8 which ramp is the fastest? 13 what kind of motion happens? 18 how does friction affect motion? 21 what happens when force is applied? 23 how does acceleration depend on force and mass? 26 where does the marble move the fastest? 31 why does it look like the moon's shape changes? 39 what are the properties of magnetism? 43 design scientific experiments 43 what variables affect the pendulum? 46 how is color created? 50 how are temperature and heat related? 75 what is pH?

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C.INQ.02 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Read, interpret and examine the credibility of scientific claims in different sources of information.	29 construct explanations supported by direct and indirect evidence 33 critique based on evidence 242 explanations based on observations 380 plastics and evaporation 404 construct explanations based on data 424 explore hot and cold pack claims 442 good fats vs. bad fats 444 nutrition labels 444 explanations based on evidence	6 construct reasonable explanations supported by direct and indirect data 14 explain using data 38 construct explanations based on evidence 40 constructing explanations 49 explanations based on evidence
C.INQ.03 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Design and conduct appropriate types of scientific investigations to answer different questions.	32 describe steps of the scientific method 401 scientific method	13 conduct car/ramp experiment 43 design scientific experiments 58 conduct scientific vocabulary

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C.INQ.04 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Identify independent and dependent variables, and those variables that are kept constant, when designing an experiment.	34	recognizing variables	10	recognize and control variables
				41	recognizing and controlling variables in observations and experiments	24	control variables
				45	identifying cause and effect relationships	43	recognizing and controlling variables
				54	variables	80	recognizing and controlling variables

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C.INQ.05 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Use appropriate tools and techniques to make observations and gather data.	featured in Ancillary Skillsheet "Significant Differences in Measurement" 11 balances 11 use and understand mass measurements 12 rulers 12 length measurement 24 balances 24 mass measurements 30 understand sensitivity of measuring tools 35 length units 37 measurements in English and metric units 46 photogates 54 photogates 56 timers 57 maps 76 rulers 81 understand and use units of force 86 understand units of force 97 understand and use units of force	1 timers 2 timers and photogates 3 photogates 4 mass measurements 4 balances 5 length measurement 8 photogates 13 timers and photogates 16 understand the sensitivity of a measuring tool 16 use units of force 16 force scales 16 balances 17 balances 18 timers and photogates 19 photogates 23 photogates 26 photogates 28 units of force 28 force scales 29 force scales 34 length measurements in km 42 photogates

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				277	how a thermometer works	43	photogates
				294	thermometers	51	balances
				299	measure volume of regular and irregular objects using several methods	52	thermometers
				302	volume of regular solids	56	measure volume with a variety of methods
				424	thermometers	56	balances
						73	balances
						79	using balances
						79	mass measurements
						95	metric and English rulers
						95	understanding length measurements
						96	metric rulers
						97	metric rulers
						97	length measurements
						98	metric rulers
						99	temperature measuring devices
						100	thermometers
						101	rulers
						101	measure volume of regular objects
						102	volume of regular objects
						103	measure volume of regular objects

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
					104 measure volume of regular objects 105 measure volume of irregular objects 106 balances 107 mass in kg and gm 107 balances 108 mass in kg and gm 108 balances

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C.INQ.06 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Use mathematical operations to analyze and interpret data.	featured in Ancillary Skillsheet "Dimensional Analysis", "Ratios and Proportions", "Gear Ratios" 36 using algebraic models 42 basic statistical analysis of data—average 43 analysis of error 44 analysis of errors in both measurements and interpretation 45 basic statistical analysis 45 analysis of errors in measurement 48 averages 83 using algebraic formulas 86 using algebraic models 98 using algebraic model 115 using algebraic models 138 the power equation 200 equation for Ohm's law 227 calculating wave speeds	5 analysis of errors in measurement 9 calculate speed 23 making measurements 27 calculate speed 29 find the mechanical advantage 56 find the mass/volume ratio

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C.INQ.07 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Identify and present relationships between variables in appropriate graphs.	60	graphs	14	construct a graphical model
				61	making and evaluating graphs	15	construct a graphical model
				62	constructing a graph	17	make graph from data
				63	constructing graph from data	22	make model from data
				222	harmonic motion graphs	27	making a graph from data
				294	making a graph	110	lab notebook
				340	make and evaluate graphs	111	making graphs

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Standard #: Grade	Core Theme	Content Standards	Expected Performances	Volume 1 Student Text page	Volume 2 Investigation Manual page
C.INQ.08 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Draw conclusions and identify sources of error.	24 error in experiments 24 percent of error 29 construct explanations supported by direct and indirect evidence 43 analysis of error 44 analysis of errors in both measurements and interpretation 45 analysis of errors in measurement 184 systematic error 242 explanations based on observations 404 construct explanations based on data 444 use % to make conclusions 444 explanations based on evidence	5 errors in data 5 analysis of errors in measurement 6 construct reasonable explanations supported by direct and indirect data 14 explain using data 38 construct explanations based on evidence 40 constructing explanations 49 explanations based on evidence

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C.INQ.09 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Provide explanations to investigated problems or questions.	28	interpreting observations and proposing explanations	3	identifying cause and effect relationships
				29	construct explanations supported by direct and indirect evidence	3	identify cause and effect relationships
				44	identifying cause and effect relationships	6	construct reasonable explanations supported by direct and indirect data
				61	identify cause and effect relationships—real and hypothesized	7	interpreting observations and proposing explanations
				62	identifying cause and effect relationships	14	explain using data
				63	identifying cause and effect relationships	24	cause and effect relationships
				242	explanations based on observations	38	construct explanations based on evidence
				270	interpreting observations and making explanations	40	constructing explanations
				404	construct explanations based on data	49	explanations based on evidence
				444	explanations based on evidence	58	interpret observations
					76	interpret observations	
					80	interpret observations	

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C.INQ.10 6, 7, 8	Scientific Inquiry, Literacy, Numeracy		Communicate about science in different formats, using relevant science vocabulary, supporting evidence and clear logic.	29 communication is important to science 269 communication as essential to science 380 writing up results	32 communicating as essential to science 92 formal lab report 93 communicating results is essential to science 93 lab reports 93 writing up results 94 lab report 94 writing up results 110 lab report 111 making graphs