

# Correlation to New Jersey Science Standards 2009

## Foundations of Physical Science, 3rd ed. Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.1.12.A.2 12	5.1 Science Practices	A. Understand Scientific Explanations	Develop and use mathematical, physical, and computational tools to build evidence-based models and to pose theories.	4 measurement and units 10 measurement 43 making graphical model from data 44 creating graphical model from data 46 constructing graph from data 46 know that scientific knowledge can be in the form of models 47 constructing a graph 70 prototypes as working models 87 graphs 88 making and evaluating graphs 119 a model for friction 220 prosthetic models 264 energy study models 315 atomic models 559 harmonic motion graphs 614 RGB color model	1 selecting tools of measurement 3 how close were predictions 11 graph mass vs. volume 23 create a graph 25 predict what graph will look like 27 compare prediction to graph 29 make graph from data 35 graphical models 36 construct algebraic model from data 38 explaining 42 create a graph 59 compare prediction to results 64 collect observational data 71 graph pressure vs volume 73 graph pressure vs temperature 97 present results to the class 99 study the graph 104 create a solubility curve

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					163 create a graph of your data 167 explaining 204 make a graph of mass vs. time 204 make a graph of mass vs. temperature 233 measuring 234 measuring 235 measuring 236 measuring 239 measurements 240 measurements 241 measurements 248 lab notebook 249 making graphs

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.1.12.A.3 12	5.1 Science Practices	A. Understand Scientific Explanations	Use scientific principles and theories to build and refine standards for data collection, posing controls, and presenting evidence.	20	accuracy and precision and resolution	3	how close were predictions
				21	significant differences	3	precision and accuracy
				42	interpretation of patterns from graphs and tables	7	unit canceling
				9	precision		
				11	making graphical model from data	11	graph mass vs. volume
				19	creating graphical model from data	19	recognizing controlling variables
				23	analysis of trends from data	23	create a graph
				25	constructing graph from data	25	predict what graph will look like
				27	interpretation of patterns in data	27	compare prediction to graph
				29	analyze trends from data	29	make graph from data
				35	constructing a graph	35	graphical models
				35	recognizing and controlling variables in observations and experiments	35	analyze trends from data
				35		35	recognizing and controlling variables
				38		38	explaining
				42		42	derive a formula
				42		42	create a graph
				45		45	create a mathematical model
45		45	analyze block and tackle data				
50		50	controlling variables				

# Correlation to New Jersey Science Standards 2009

## Foundations of Physical Science, 3rd ed. Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
				88	making and evaluating graphs	50	controlling variables
				88	interpretations of patterns in data	51	analyze lever equilibrium data
				114	using algebraic formulas	51	analyze trends from data
				128	using algebraic model	51	find math rule for lever equilibrium
				136	interpret patterns in data from tables	59	compare prediction to results
				145	using algebraic models	71	derive Boyles law
				170	kinetic energy formula	71	graph pressure vs volume
				192	kinetic energy formula	73	graph pressure vs temperature
				197	the power equation		
				256	the heat equation	97	present results to the class
				271	density formula	99	study the graph
				304	pressure and temperature relationship	104	create a solubility curve
				381	communicating—graphs	129	collect mass and amplitude data
				488	equation for Ohm's law	129	analyze pendulum data
				559	harmonic motion graphs	133	give an equation that describes your observations
				564	calculating wave speeds		
						156	analyzing measurement data
						157	using geometry to answer a question

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					159 looking for significant differences in data sets
					163 create a graph of your data
					167 explaining
					170 useful algebraic relationships for data interpretation
					204 make a graph of mass vs. temperature
					204 make a graph of mass vs. time
					230 formal lab report
					231 lab reports
					231 writing up results
					231 communicating results is essential to science
					232 lab report
					232 writing up results
					248 lab report
					248 lab notebook
					249 making graphs
					249 making graphs

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.1.12.B.1 12	5.1 Science Practices	B. Generate Scientific Evidence Through Active Investigations	Design investigations, collect evidence, analyze data, and evaluate evidence to determine measures of central tendencies, causal/correlational relationships, and anomalous data.	20	accuracy and precision and resolution	2	data table
				21	significant differences	3	how close were predictions
				21	finding estimated error	3	precision and accuracy
				42	interpretation of patterns from graphs and tables	7	unit canceling
				43	using data tables	9	precision
				45	analysis of trends from data	10	how do results compare
				46	make predictions	12	slope of line
				46	make predictions	12	data table
				46	estimating from a graph	12	use graph to predict mass of six objects
				47	analyze trends from data	13	data table
				47	interpretation of patterns in data	13	data tables
				59	construct explanations supported by direct and indirect evidence	14	make predictions based on observations
				65	writing lab procedures	15	find average time
				88	interpretations of patterns in data	17	data tables
				88	analyze trends from data	17	data tables
				88	analyze trends from data	18	make predictions
				89	determining slope of a line	19	analysis of errors
91	determining slope	19	data tables				
114	using algebraic formulas	23	use graph to make prediction				
128	using algebraic model	23	data table				

# Correlation to New Jersey Science Standards 2009

## Foundations of Physical Science, 3rd ed. Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
				136	interpret patterns in data from tables	23	explain any differences you see
				145	using algebraic models	24	calculate percent error
				170	kinetic energy formula	25	predict what graph will look like
				192	kinetic energy formula	26	data tables
				197	the power equation	27	compare prediction to graph
				256	the heat equation	29	analyze trends from data
				271	density formula	29	data tables
				304	pressure and temperature relationship	31	data tables
				469	design experiment—including choosing equipment	35	data tables
				488	equation for Ohm's law	35	data tables
				564	calculating wave speeds	35	analyze trends from data
						36	construct reasonable explanations back by scientific evidence
						42	derive a formula
						45	analyze block and tackle data
						45	create a mathematical model
						51	analyze trends from data
						51	find math rule for lever equilibrium

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					51 analyze lever equilibrium data
					53 make predictions based on data
					57 sketch the shape of the graph
					59 compare prediction to results
					69 data tables
					69 make predictions on observed data
					71 derive Boyles law
					71 predict the pressure
					95 data tables
					96 data tables
					97 design a data table
					97 plan procedures and select materials
					125 constructing explanations
					129 analyze pendulum data
					129 collect mass and amplitude data
					130 use data to predict best string length for a pendulum clock



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## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					133 give an equation that describes your observations
					156 analyzing measurement data
					157 using geometry to answer a question
					159 looking for significant differences in data sets
					161 estimating error
					163 create a best fit line on your graph and analyze
					170 useful algebraic relationships for data interpretation
					193 make predictions based on inferences from data
					204 create a best fit line
					208 predict the effect of changing a resistor
					230 design experiment that someone else can follow
					232 data tables
					236 data tables
					248 data tables

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.1.12.B.2	5.1 Science Practices	B. Generate Scientific Evidence Through Active Investigations	Build, refine, and represent evidence-based models using mathematical, physical, and computational tools.	5	measuring with SI units	2	data table
				5	English vs SI	7	unit canceling
				6	understanding units for length and mass	8	mass measurements
				11	mass measurements		
				6	understanding units for length and mass	12	data table
				13	data table		
				10	understand length measurements in metric units	13	data tables
				15	Data Collector and probes		
				10	understand length measurement	15	timers
				16	timers and photogates		
				11	length measurement	16	Data Collector and probes
				17	data tables		
				18	significant digits	17	data tables
				30	measuring mass	17	data tables
				33	graduated cylinder	19	data tables
				43	using data tables	19	photogates and timers
				46	know that scientific knowledge can be in the form of models	21	Data Collector and probes
23	data table						
26	data tables						
60	understand sensitivity of measuring tools	28	understand the sensitivity of a measuring tool				
70	prototypes as working models	28	force in newtons and pounds				
78	photogates	28	balances				
79	length units	28	force scales				

# Correlation to New Jersey Science Standards 2009

## Foundations of Physical Science, 3rd ed. Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
				82	timers	29	balances
				83	maps	29	data tables
				114	using algebraic formulas	29	analyze trends from data
				119	a model for friction	30	timers and photogates
				128	using algebraic model	31	photogates
				145	using algebraic models	31	data tables
				170	kinetic energy formula	35	data tables
				192	kinetic energy formula	35	data tables
				197	the power equation	39	Data Collector and photogates
				220	prosthetic models	42	derive a formula
				256	the heat equation	45	measure and record the force
				264	energy study models	45	create a mathematical model
				271	density formula	47	use force scale
				304	pressure and temperature relationship	47	measure height difference
				315	atomic models	51	find math rule for lever equilibrium
				484	using a multimeter to measure current	52	force scales
				488	equation for Ohm's law	54	Data Collector and temperature probe
				564	calculating wave speeds	56	Data Collector and temperature probe
				614	RGB color model	57	sketch the shape of the graph

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					59 Data Collector and temperature probe
					69 data tables
					71 Data Collector and gas pressure sensor
					71 derive Boyles law
					95 mass measurements
					95 using balances
					95 data tables
					96 data tables
					97 design a data table
					118 use a multimeter
					129 make precise length measurements
					133 give an equation that describes your observations
					146 use a laser and mirror to study law of reflection
					155 making metric length measurements
					155 significant digits and measuring length
					155 precision and measurements
					157 using geometry to answer a question

# Correlation to New Jersey Science Standards 2009

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Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					170 useful algebraic relationships for data interpretation
					176 force scales
					207 use the multimeter
					226 goggles
					227 goggles and aprons
					228 goggles
					232 data tables
					233 metric and English rulers
					233 understanding length measurements
					234 metric rulers
					235 metric rulers
					235 length measurements
					236 metric rulers
					236 data tables
					237 temperature measuring devices
					238 beakers
					238 thermometers
					239 rulers
					243 graduated cylinders
					244 balances
					245 balances

## Correlation to New Jersey Science Standards 2009

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Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					245 mass in kg and g 246 balances 246 mass in kg and g 248 data tables
5.1.12.B.3 12	5.1 Science Practices	B. Generate Scientific Evidence Through Active Investigations	Revise predictions and explanations using evidence, and connect explanations/argumen ts to established scientific knowledge, models, and theories.	5 trace the development of measurement 59 construct explanations supported by direct and indirect evidence 60 review theories based on observations 62 trace development of theories 62 scientific theories 63 critique based on evidence 315 history of atomic theory 335 history of periodic table development 475 Benjamin Franklin	10 how do results compare 23 explain any differences you see 24 test your prediction 36 construct reasonable explanations back by scientific evidence 97 perform the experiment you designed 125 constructing explanations 129 investigate variables that affect the period of a pendulum

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.1.12.B.4 12	5.1 Science Practices	B. Generate Scientific Evidence Through Active Investigations	Develop quality controls to examine data sets and to examine evidence as a means of generating and reviewing explanations.	21 finding estimated error 21 significant differences 42 interpretation of patterns from graphs and tables 47 interpretation of patterns in data 59 construct explanations supported by direct and indirect evidence 88 interpretations of patterns in data 136 interpret patterns in data from tables	3 how close were predictions 10 how do results compare 19 analysis of errors 23 explain any differences you see 24 test your prediction 24 calculate percent error 27 compare prediction to graph 36 construct reasonable explanations back by scientific evidence 59 compare prediction to results 97 present results to the class 97 perform the experiment you designed 125 constructing explanations 129 investigate variables that affect the period of a pendulum 159 looking for significant differences in data sets 161 estimating error

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.1.12.C.1 12	5.1 Science Practices	C. Reflect on Scientific Knowledge	Reflect on and revise understandings as new evidence emerges.	59  68	construct explanations supported by direct and indirect evidence  science and peer review  10 how do results compare 23 explain any differences you see 36 construct reasonable explanations back by scientific evidence 125 constructing explanations



# Correlation to New Jersey Science Standards 2009

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Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.1.12.C.2 12	5.1 Science Practices	C. Reflect on Scientific Knowledge	Use data representations and new models to revise predictions and explanations.	43	making graphical model from data	7	unit canceling
				44	creating graphical model from data	11	graph mass vs. volume
				46	identifying cause and effect relationships	17	identify cause and effect relationships
				46	estimating from a graph	19	cause and effect relationships
				46	constructing graph from data	23	create a graph
				47	constructing a graph	25	predict what graph will look like
				87	graphs	29	make graph from data
				88	making and evaluating graphs	35	graphical models
				88	identify cause and effect relationships	42	derive a formula
				114	using algebraic formulas	42	create a graph
				128	using algebraic model	45	create a mathematical model
				145	using algebraic models	51	find math rule for lever equilibrium
				170	kinetic energy formula	71	derive Boyles law
				192	kinetic energy formula	71	does the graph support hypothesis
				197	the power equation	71	graph pressure vs volume
				256	the heat equation	73	graph pressure vs temperature
				271	density formula	99	study the graph
				304	pressure and temperature relationship	104	create a solubility curve
488	equation for Ohm's law						

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
				559	harmonic motion graphs	129	evaluate statistical significance
				564	calculating wave speeds	133	give an equation that describes your observations
						157	using geometry to answer a question
						163	create a graph of your data
						163	create a best fit line on your graph and analyze
						170	useful algebraic relationships for data interpretation
						204	make a graph of mass vs. temperature
						204	create a best fit line
						204	make a graph of mass vs. time
						248	lab notebook
						249	making graphs

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.1.12.C.3 12	5.1 Science Practices	C. Reflect on Scientific Knowledge	Consider alternative theories to interpret and evaluate evidence-based arguments.	5 trace the development of measurement 60 review theories based on observations 62 trace development of theories 62 scientific theories 63 critique based on evidence 325 quantum theory	24 test your prediction 97 perform the experiment you designed 129 investigate variables that affect the period of a pendulum
5.1.12.D.1 12	5.1 Science Practices	D. Participate Productively in Science	Engage in multiple forms of discussion in order to process, make sense of, and learn from others' ideas, observations, and experiences.	65 write up results 68 scientific journals 381 communicating—graphs	3 Internet search 38 explaining 97 present results to the class 167 explaining 231 communicating results is essential to science 231 writing up results 232 writing up results 249 making graphs

# Correlation to New Jersey Science Standards 2009

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Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.1.12.D.2	5.1 Science Practices	D. Participate Productively in Science	Represent ideas using literal representations, such as graphs, tables, journals, concept maps, and diagrams.	43	using data tables	2	data table
				43	making graphical model from data	11	graph mass vs. volume
				44	creating graphical model from data	12	data table
				45	reading graphs and tables	13	data table
				46	constructing graph from data	13	data tables
				46	constructing graph from data	17	data tables
				47	reading graphs and tables	17	data tables
				47	reading graphs and tables	19	data tables
				47	constructing a graph	23	create a graph
				87	graphs	23	data table
				88	making and evaluating graphs	25	predict what graph will look like
				127	create and interpret dimensional drawings	26	data tables
				129	dimensioned drawings	29	make graph from data
				150	diagrams	29	analyze trends from data
				559	harmonic motion graphs	29	data tables
						31	data tables
		35	graphical models				
		35	data tables				
		35	data tables				
		38	diagrams				
		42	create a graph				
		50	drawings and diagrams				

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					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 design a data table
					99 study the graph
					104 create a solubility curve
					163 create a graph of your data
					204 make a graph of mass vs. temperature
					204 make a graph of mass vs. time
					215 sketches
					215 sketch the wave fronts
					232 data tables
					236 data tables
					248 lab notebook
					248 data tables

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					249 reading graphs 249 making graphs

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.1.12.D.3 12	5.1 Science Practices	D. Participate Productively in Science	Demonstrate how to use scientific tools and instruments and knowledge of how to handle animals with respect for their safety and welfare.	<p>Extensive lab safety guidelines, safety quiz, and safety contract are found in investigation manual on pages 224 - 229.</p> <p>Lab safety symbols and instructions are found in investigation manual on the page before TOC.</p> <p>10 metric rulers</p> <p>33 graduated cylinder</p> <p>78 photogates</p> <p>82 timers</p> <p>83 maps</p> <p>484 using a multimeter to measure current</p>	<p>15 timers</p> <p>15 Data Collector and probes</p> <p>16 timers and photogates</p> <p>16 Data Collector and probes</p> <p>19 photogates and timers</p> <p>21 Data Collector and probes</p> <p>28 balances</p> <p>28 force scales</p> <p>29 balances</p> <p>30 timers and photogates</p> <p>31 photogates</p> <p>39 Data Collector and photogates</p> <p>44 ropes and pulley safety</p> <p>47 use force scale</p> <p>52 force scales</p> <p>54 Data Collector and temperature probe</p> <p>56 Data Collector and temperature probe</p> <p>59 Data Collector and temperature probe</p> <p>71 Data Collector and gas pressure sensor</p> <p>95 using balances</p>

# Correlation to New Jersey Science Standards 2009

## *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					118 use a multimeter
					146 use a laser and mirror to study law of reflection
					174 ropes and pulley safety
					176 force scales
					207 use the multimeter
					224 lab safety
					225 lab safety
					226 lab safety
					226 goggles
					227 goggles and aprons
					227 lab safety
					228 lab safety
					228 goggles
					229 lab safety
					233 metric and English rulers
					234 metric rulers
					235 metric rulers
					236 metric rulers
					237 temperature measuring devices
					238 thermometers
					238 beakers
					239 rulers



## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
					243 graduated cylinders 244 balances 245 balances 246 balances

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.A.1 12	5.2 Physical Science	A. Properties of Matter	Use atomic models to predict the behaviors of atoms in interactions.	314	atoms are made up of protons and neutrons and electrons	75	atomic symbol and atomic number and mass number
				315	protons neutrons and electrons	75	Bohr model
				316	basic properties of an atom and the three subatomic particles	75	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	78	understand the structure of an atom based on protons and neutrons and electrons
				321	three subatomic particles and their charge	79	identify symbols and atomic number and mass number
				326	electron shells	82	identify symbol and atomic number and mass number of elements
				335	common chemical properties in relation to the periodic table	85	review subatomic particles
				335	idea of atomic mass	86	modeling valence electrons
				337	atomic number on the periodic table	86	build model of Na and Cl atoms and explain why they bond to form a molecule
				338	common chemical properties of elements based on relation to periodic table	87	modeling valence electrons and chemical bonds
						87	oxidation numbers and ions

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

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				339	explain common chemical properties in relation to placement on periodic table	89	predicting ions
				342	how electron interactions create bonds	89	how are elements grouped according to number of valence electrons?
				342	properties in relation to periodic table	191	investigate the reactivity of metals
				343	chemical properties in relation to periodic table	201	build atomic models
				347	describe characteristics based on place in periodic table		
				354	how electrons are involved in bonds		
				355	how ions are formed		
				355	how electrons are involved in bonds		
				356	properties of elements in relation to the periodic table		
				356	how electron interactions help create chemical bonds		
				357	explain the chemical properties of elements in relation to periodic table		
				357	how electrons are involved in bonds		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				358	
					explain chemical properties based on location in periodic table
				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
				362	
					periodic table and oxidation numbers
				363	
					explain why ions are formed
				368	
					qualitative understanding of how electron interactions create bonds
				456	
					how ions are formed

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.A.2 12	5.2 Physical Science	A. Properties of Matter	Account for the differences in the physical properties of solids, liquids, and gases.	38 physical differences between states of matter 126 relationship between real materials and concepts of atoms 240 physical differences between phases of matter 240 phases of matter 242 phase changes 277 explain matter states based on arrangement of atoms 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	57 phase change graphs 64 compare solids and liquids 71 investigate properties of gases 73 investigate properties of gases

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.A.3 12	5.2 Physical Science	A. Properties of Matter	Predict the placement of unknown elements on the Periodic Table based on their physical and chemical properties.	335	common chemical properties in relation to the periodic table	77	periodic table
				335	recognizing groups or families on the periodic table	80	build and describe periodic table
				335	describe periodic table	83	identify metals and nonmetals and metalloids
				336	identify metals and nonmetals on the periodic table	83	recognizing groups or families
				338	recognizing metals and nonmetals and and metalloids	83	periodic table
				338	recognizing groups and families of periodic table	84	periodic table
				338	describing periodic table	86	build model of Na and Cl atoms and explain why they bond to form a molecule
				338	common chemical properties of elements based on relation to periodic table	191	investigate the reactivity of metals
				339	explain common chemical properties in relation to placement on periodic table		
				340	recognizing groups and families and periodic table		
				340	describe periodic table		
				342	properties in relation to periodic table		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				342	
				describe periodic table	
				343	
				groups on periodic table	
				343	
				chemical properties in relation to periodic table	
				347	
				describe characteristics based on place in periodic table	
				356	
				properties of elements in relation to the periodic table	
				357	
				explain the chemical properties of elements in relation to periodic table	
				358	
				explain chemical properties based on location in periodic table	
				362	
				periodic table and oxidation numbers	

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.A.4 12	5.2 Physical Science	A. Properties of Matter	Explain how the properties of isotopes, including half-lives, decay modes, and nuclear resonances, lead to useful applications of isotopes.	320	basic concepts of radioactivity and decay	75	what isotopes are
				320	explain what isotopes are	76	radioactivity
				321	radioactivity	79	radioactivity
				321	explain what isotopes are	79	what isotopes are
				337	explain what isotopes are	198	investigate coin toss and decay simulation
				423	radioactivity	199	build a radioactive atom
				427	radioisotopes in science and medicine	199	research and investigate carbon-14
						200	play nuclear reactions game and identify isotopes



## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.A.5 12	5.2 Physical Science	A. Properties of Matter	Describe the process by which solutes dissolve in solvents.	436	why water is a nearly universal solvent	103	solubility and temperature
				440	solvent affects solubility	104	solubility curve
				444	factors such as particle size that influence rate of dissolving	203	investigate the solubility of carbon dioxide
				444	various factors influence solubility—including temperature		
				445	identify how factors influence solubility—including nature of solvent		
				445	factors that affect solubility—including the solute		
				447	solubility curve		
				450	describe the dissolving process at the molecular level		
				451	factors that affect solubility—solute		
				451	various factors affect solubility—including pressure		
				451	various factors affect solubility—temperature		
				453	factors that affect solubility—temperature		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.A.6 12	5.2 Physical Science	A. Properties of Matter	Relate the pH scale to the concentrations of various acids and bases.	454 differentiate between acids and bases 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	105 create a pH scale 106 identify solution as acid or base 107 pH indicators and daily life 107 using pH indicators

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.B.1 12	5.2 Physical Science	B. Changes in Matter	Model how the outermost electrons determine the reactivity of elements and the nature of the chemical bonds they tend to form.	326	electron shells	75	Bohr model
				335	common chemical properties in relation to the periodic table	86	build model of Na and Cl atoms and explain why they bond to form a molecule
				338	common chemical properties of elements based on relation to periodic table	86	modeling valence electrons
				339	explain common chemical properties in relation to placement on periodic table	87	oxidation numbers and ions
				342	how electron interactions create bonds	87	modeling valence electrons and chemical bonds
				342	properties in relation to periodic table	89	predicting ions
				343	chemical properties in relation to periodic table	89	how are elements grouped according to number of valence electrons?
				347	describe characteristics based on place in periodic table	191	investigate the reactivity of metals
				354	how electrons are involved in bonds		
				355	how electrons are involved in bonds		
				355	how ions are formed		
				356	how electron interactions help create chemical bonds		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				356	
					properties of elements in relation to the periodic table
				357	
					explain the chemical properties of elements in relation to periodic table
				357	
					how electrons are involved in bonds
				358	
					explain chemical properties based on location in periodic table
				358	
					how electrons are involved in bonding
				359	
					know how to draw Lewis dot structures
				359	
					how electrons are involved in bonding
				360	
					Lewis dot structure
				361	
					electron transfer and oxidation number
				362	
					chemical bonding and the periodic table
				362	
					periodic table and oxidation numbers
				363	
					explain why ions are formed
				363	
					bonding and electronegativity

## Correlation to New Jersey Science Standards 2009

### Foundations of Physical Science, 3rd ed. Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				368 qualitative understanding of how electron interactions create bonds 368 electronegativity 437 water is a polar molecule 438 hydrogen bonding in water 456 how ions are formed	
5.2.12.B.2 12	5.2 Physical Science	B. Changes in Matter	Describe oxidation and reduction reactions, and give examples of oxidation and reduction reactions that have an impact on the environment, such as corrosion and the burning of fuel.	322 identify chemicals by using spectral lines 327 identify elements by spectral analysis 334 simple chemical changes—rusting 380 understand that carbon and hydrogen and nitrogen combine to form biomolecules 394 chemical reactions in living systems 394 heartburn reaction	192 carbon and hydrogen and nitrogen and oxygen combine to form biomolecules 193 understand that carbon and hydrogen and nitrogen and oxygen combine to form biomolecules
5.2.12.B.3 12	5.2 Physical Science	B. Changes in Matter	Balance chemical equations by applying the law of conservation of mass.	388 history of law of conservation of mass 391 balanced chemical equations 392 balancing chemical equations	95 investigate law of conservation of mass 96 law of conservation of mass

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.C.1 12	5.2 Physical Science	C. Forms of Energy	Use the kinetic molecular theory to describe and explain the properties of solids, liquids, and gases.	38 physical differences between states of matter  126 relationship between real materials and concepts of atoms  240 physical differences between phases of matter  242 heat energy and molecular motion  242 phase changes  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	57 phase change graphs

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.C.2 12	5.2 Physical Science	C. Forms of Energy	Account for any trends in the melting points and boiling points of various compounds.	242 boiling and melting points 243 table of melting and boiling points 270 physical properties of matter 273 hardness is a physical property of matter 273 tensile strength 274 malleability is a physical property of matter 342 melting and boiling points of different materials 346 define and identify melting and boiling points	54 investigate melting point 56 investigate melting and freezing points
5.2.12.D.1 12	5.2 Physical Science	D. Energy Transfer and Conservation	Model the relationship between the height of an object and its potential energy.	169 potential energy explained 169 calculating potential energy 170 kinetic energy explained 170 calculating kinetic energy 177 law of conservation of energy 178 using energy conservation to solve problems 192 calculating kinetic energy	41 potential and kinetic energy 42 conservation of energy 170 find kinetic energy of car

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.D.2	5.2 Physical Science	D. Energy Transfer and Conservation	Describe the potential commercial applications of exothermic and endothermic reactions.	356 energy changes that accompany chemical reactions	98 chemical reactions and energy
				410 explain how energy is manifested in chemical reactions—exothermic and endothermic	98 exothermic and endothermic reactions
				411 analyze energy changes that accompany chemical reactions	99 exothermic and endothermic reactions
				411 how energy is manifested in chemical reactions	
				413 endothermic reactions	



## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.D.3 12	5.2 Physical Science	D. Energy Transfer and Conservation	Describe the products and potential applications of fission and fusion reactions.	320	know types of radioactive decay	76	radioactivity
				320	basic concepts of radioactivity and decay	79	carbon-14
				321	radioactivity	79	radioactivity
				422	nuclear reactions	198	carbon-14
				423	radioactivity	198	investigate coin toss and decay simulation
				424	fusion and fission	199	carbon-14
				427	molecular clocks with carbon and uranium	199	build a radioactive atom
				427	carbon dating		
				427	radioactive dating procedures		
				427	radioisotopes in science and medicine		
5.2.12.D.4 12	5.2 Physical Science	D. Energy Transfer and Conservation	Measure quantitatively the energy transferred between objects during a collision.	152	momentum defined	38	investigate momentum and the 3rd law of motion
				152	calculating momentum		
				152	law of conservation of momentum	167	investigate collisions with energy car
				153	understanding the law of conservation of momentum		
				154	solving momentum problems		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.D.5 12	5.2 Physical Science	D. Energy Transfer and Conservation	Model the change in rate of a reaction by changing a factor.	419 reaction rate	190 investigate reactivity of metals

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.E.1 12	5.2 Physical Science	E. Force and Motion	Compare the calculated and measured speed, average speed, and acceleration of an object in motion, and account for differences that may exist between calculated and measured values.	78	concept of speed	20	finding speed
				79	average vs instantaneous speed	22	find speed of car
				79	calculating speed	27	calculate car's acceleration
				81	speed	31	compare speeds of cars
				87	changes in motion can be represented graphically	33	positive and negative acceleration
				87	calculating speed	33	calculate speed of car
				89	changes in motion can be shown graphically	36	quantitative understanding of force as a rate of change of velocity
				89	calculating speed		
				90	changes in motion can be represented graphically	36	calculate acceleration
				91	calculations for speed	36	conceptual idea of acceleration as change in speed
				91	constant velocity		
				92	conceptual understanding of acceleration as describing change in speed	39	find speed of car
						163	calculate speed of car
						164	investigate the effect of gravity on falling objects
						165	calculate acceleration of falling object
						96	effect of gravity on motion
		98	projectile explained				

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
				99	
				quantitative understanding of acceleration as change in speed	
				113	
				effect of gravity on objects	
				124	
				compare and contrast constant and changing velocity	
				126	
				effects of gravity	
				138	
				compare and contrast constant and changing velocity	
				143	
				concept of acceleration	
				143	
				acceleration is a rate of change of speed	
				147	
				conceptual understanding of acceleration as change in speed	
				190	
				work and gravity	

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page
5.2.12.E.2 12	5.2 Physical Science	E. Force and Motion	Compare the translational and rotational motions of a thrown object and potential applications of this understanding.	83 coordinate systems 84 coordinate systems 86 two-dimensional coordinate plane 96 effect of gravity on motion 98 projectile explained 113 effect of gravity on objects 126 effects of gravity 190 work and gravity	164 investigate the effect of gravity on falling objects

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.E.3 12	5.2 Physical Science	E. Force and Motion	Create simple models to demonstrate the benefits of seatbelts using Newton's first law of motion.	108	forces needed to change motion	35	change the car's inertia
				119	changes in motion require application of force	36	what happens when you double the car's inertia?
				126	change in motion require force	36	how does Newton's 1st law apply to the car's motion?
				127	quantitative understanding of force changing motion		
				138	changes in motion require force		
				139	understand that inertia is the ability to judge motion		
				139	change in motion requires force		
				141	inertia		
				148	inertia as the ability to resist motion		
				153	inertia		
				154	Newton's laws in terms of real situations—sports and cars		
				555	inertia and pendulums		

## Correlation to New Jersey Science Standards 2009

### *Foundations of Physical Science, 3rd ed.* Student Text and Investigation Manual

Standard #: By the end of gr	Standard	Strand	Cumulative Progress Indicator	Volume 1 Student Text page	Volume 2 Investigation Manual page		
5.2.12.E.4 12	5.2 Physical Science	E. Force and Motion	Measure and describe the relationship between the force acting on an object and the resulting acceleration.	99	Newton's second law	34	investigate the 2nd law of motion
				125	balanced and unbalanced forces	34	second law of motion
				127	use concepts of balanced or unbalanced forces	34	qualitative understanding of $F = ma$
				129	unbalanced forces cause motion	37	qualitative understanding of Newton's third law
				143	Newton's second law	38	Newton's second law
				144	Newton's second law—qualitative	168	apply the 2nd law of motion to data interpretation
				144	Newton's second law—qualitative	168	Newton's second law
				144	Newton's second law—qualitative		
				148	understand and use concept of balanced and unbalanced forces to create motion		
				149	balanced and unbalanced forces		
				152	Newton's second law—qualitative		