Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPA Science, Technology, and Solving Problems	6-8	People have always used technology to solve problems. Advances in human civilization are linked to advances in technology.	Describe how a technology has changed over time in response to societal challenges (e.g., population increase created a need for mass communication).	7	relationship between science and technology	
				8	engineers design practical devices for solving problems	
				32	evaluate how research shapes scientific knowledge	
				90	relationship between science and technology—maglev trains	
				91	relationship between science and applied technology	
				122	rocket technology	
				123	new technologies	
				338	connection between science and technology	
				359	societal impact of scientific knowledge	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPB Science, Technology, and Solving Problems	6-8	Scientists and technological designers (including engineers) have different goals. Scientists answer questions about the natural world; technological designers solve problems that help people reach their goals.	Investigate several professions in which an understanding of science and technology is required. Explain why that understanding is necessary for success in each profession.	7	relationship between science and technology	
				8	engineers design practical devices for solving problems	
				90	relationship between science and technology—maglev trains	
				91	relationship between science and applied technology	
				122	rocket technology	
				123	new technologies	
				292	materials scientists	
				338	connection between science and technology	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPC Science, Technology, and Solving Problems	6-8	Science and technology are interdependent. Science drives technology by demanding better instruments and suggesting ideas for new designs. Technology drives science by providing instruments and research methods.	Give examples to illustrate how scientists have helped solve technological problems (e.g., how the science of biology has helped sustain fisheries) and how engineers have aided science (e.g., designing telescopes to discover distant planets).	7	relationship between science and technology	
				8	engineers design practical devices for solving problems	
				8	contributions of scientists in chemistry	
				30	historical context and perspective of discoveries	
				31	historical context of specific scientific discovery	
				90	relationship between science and technology—maglev trains	
				91	relationship between science and applied technology	
				122	rocket technology	
				123	new technologies	
				338	connection between science and technology	
				338	contributions of scientists in chemistry	
				359	societal impact of scientific knowledge	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPD Science, Technology, and Solving Problems	6-8	The process of technological design begins by defining a problem, identifying criteria for a successful solution, followed by research to better understand the problem, and brainstorming potential solutions.	Formulate a problem that can be solved by the technological design process, and identify criteria for success. Research how others have solved similar problems. Brainstorm different solutions.	8	contributions of scientists in physics	
				28	recognizing that scientific knowledge is a process of learning	
				32	trace development of theories	
				32	recognition that science is a process	
				46	connections between classroom learning and real life	
				47	connections between classroom learning and real life	
				91	seeing connections between classroom learning and real life	
				97	seeing connections between what is learned in science and observations of real world	
				292	creativity and discoveries of Charles Goodyear	
				359	societal impact of scientific knowledge	
				359	seeing connections between learning and real world	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
				379	history of an invention		
6-8 APPE Science, Technology, and Solving Problems	6-8	Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.	Collaborate with other students to generate creative solutions to a problem, and apply methods for making trade-offs to choose the best solution.*a	29 269	communication is important to science communication as essential to science	32 93	communicating as essential to science communicating results is essential to science

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 APPF Science, Technology, and Solving Problems	6-8	Solutions must be tested to determine whether or not they will solve the problem. Results are used to modify the design, and the best solution must be communicated persuasively.	Test the best solution by building a model or other representation, and using it with the intended audience. Redesign if necessary. Present the recommended design using models or drawings and an engaging presentation.*b	28	asking scientific questions	2	experiment to answer questions
				29	construct explanations supported by direct and indirect evidence	6	construct reasonable explanations supported by direct and indirect data
				102	design experiments	7	test hypothesis against observations
				242	explanations based on observations	8	which ramp is the fastest?
				318	oral presentation of results	9	test hypothesis against observations
				401	design experiment—including choosing equipment	13	conduct car/ramp experiment
				404	construct explanations based on data	13	selecting ramp and photogates
				411	design experiment with appropriate equipment	13	what kind of motion happens?
				444	explanations based on evidence	14	explain using data
						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?

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					31 why does it look like the moon's shape changes?
					38 construct explanations based on evidence
					39 what are the properties of magnetism?
					40 constructing explanations
					43 what variables affect the pendulum?
					46 how is color created?
					49 explanations based on evidence
					50 how are temperature and heat related?
					58 conduct scientific vocabulary
					65 background research
					75 what is pH?
					82 background research

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPG Science, Technology, and Solving Problems	6-8	The benefits of science and technology are not available to all the people in the world.	Contrast the benefits of science and technology enjoyed by people in industrialized and developing nations.	7	relationship between science and technology	
				30	historical context and perspective of discoveries	
				31	historical context of specific scientific discovery	
				32	evaluate how research shapes scientific knowledge	
				90	economic value of applied technology	
				90	relationship between science and technology—maglev trains	
				91	relationship between science and applied technology	
				122	rocket technology	
				123	new technologies	
				338	connection between science and technology	

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 APPH Science, Technology, and Solving Problems	6-8	People in all cultures have made and continue to make contributions to society through science and technology.	Describe scientific or technological contributions to society by people in various cultures.	7	relationship between science and technology	
				8	engineers design practical devices for solving problems	
				32	evaluate how research shapes scientific knowledge	
				90	economic value of applied technology	
				90	relationship between science and technology—maglev trains	
				91	relationship between science and applied technology	
				122	rocket technology	
				123	new technologies	
				334	contributions of Heisenberg	
				338	connection between science and technology	
				339	contributions in history	
				359	societal impact of scientific knowledge	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQA Questioning and Investigating	6-8	Scientific inquiry involves asking and answering questions and comparing the answer with what scientists already know about the world.	Generate a question that can be answered through scientific investigation. This may involve refining or refocusing a broad and ill-defined question.	28	asking scientific questions	2	experiment to answer questions
						7	test hypothesis against observations
						8	which ramp is the fastest?
						9	test hypothesis against observations
						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	what variables affect the pendulum?
						43	design scientific experiments
						46	how is color created?

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					50 how are temperature and heat related? 75 what is pH?

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQB.1 Questioning and Investigating	6-8	Different kinds of questions suggest different kinds of scientific investigations.	Plan and conduct a scientific investigation (e.g., field study, systematic observation, controlled experiment, model, or simulation) that is appropriate for the question being asked.	28	asking scientific questions	2	experiment to answer questions
				102	design experiments	7	test hypothesis against observations
				401	design experiment—including choosing equipment	8	which ramp is the fastest?
				411	design experiment with appropriate equipment	9	test hypothesis against observations
						13	what kind of motion happens?
						13	conduct car/ramp experiment
						13	selecting ramp and photogates
						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?

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					43 what variables affect the pendulum? 43 design scientific experiments 46 how is color created? 50 how are temperature and heat related? 58 conduct scientific vocabulary 75 what is pH?

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQB.2 Questioning and Investigating	6-8	Different kinds of questions suggest different kinds of scientific investigations.	Propose a hypothesis and give a reason for the hypothesis and explain how the planned investigation will test the hypothesis.	28	asking scientific questions	2	experiment to answer questions
				33	formulate a testable hypothesis	3	identify cause and effect relationships
				44	identifying cause and effect relationships	3	identifying cause and effect relationships
				61	identify cause and effect relationships—real and hypothesized	6	formulate testable hypothesis
				62	identifying cause and effect relationships	8	which ramp is the fastest?
				63	identifying cause and effect relationships	9	formulate testable hypothesis
						9	make hypothesis
						13	what kind of motion happens?
						13	conduct car/ramp experiment
						18	how does friction affect motion?
						19	formulate a testable hypothesis
						21	what happens when force is applied?
						23	how does acceleration depend on force and mass?
						24	cause and effect relationships

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					26 make testable hypothesis 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? 58 conduct scientific vocabulary 75 what is pH?
6-8 INQB.3 Questioning and Investigating	6-8	Different kinds of questions suggest different kinds of scientific investigations.	Work collaboratively with other students to carry out the investigations.		66 divide up responsibility

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQC.1 Questioning and Investigating	6-8	Collecting, analyzing, and displaying data are essential aspects of all investigations.	Communicate results using pictures, tables, charts, diagrams, graphic displays, and text that are clear, accurate, and informative. *a		featured in Ancillary Skillsheet "Using Computer Spreadsheets"	3	identify cause and effect relationships
					featured in Ancillary Skillsheet "Dimensional Analysis", "Ratios and Proportions", "Gear Ratios"	3	identifying cause and effect relationships
						3	data tables
						3	data tables
						4	data tables
				24	percent of error	5	analysis of errors in measurement
				31	review scientific hypothesis based on comparison with evidence	6	data tables
				36	using algebraic models	9	data tables
				41	analyze hypothesis based on data	9	calculate speed
				43	analysis of error	10	data tables
				44	identifying cause and effect relationships	10	analyze hypothesis based on observation
				44	analysis of errors in both measurements and interpretation	11	data tables
				45	analysis of errors in measurement	14	data tables
				45	analyze scientific hypotheses based on evidence	15	data tables
				48	data tables	17	data tables
				61	analyze trends from data	17	analyze trends from data
						18	data tables
						19	data tables

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
				61	interpretations of patterns in data	20	analyze hypothesis based on comparison with evidence
				61	identify cause and effect relationships—real and hypothesized	22	data tables
				62	identifying cause and effect relationships	22	data tables
				63	identifying cause and effect relationships	24	data tables
				63	estimating from a graph	24	cause and effect relationships
				76	line graphs	27	calculate speed
				76	data tables	27	data tables
				83	using algebraic formulas	28	data tables
				86	using algebraic models	29	data tables
				98	using algebraic model	29	find the mechanical advantage
				102	sketches	30	data tables
				115	using algebraic models	34	data tables
				119	diagrams	38	diagrams
				138	the power equation	39	data tables
				150	sketches	41	making sketches
				184	interpretations of patterns from data	42	data tables
				200	equation for Ohm's law	45	sketches
				227	calculating wave speeds	47	data tables
						49	data tables
						50	data tables

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
				318	data tables	51	data tables
				318	oral presentation of results	53	data tables
				318	write up results	54	data tables
				340	line graphs	56	find the mass/volume ratio
				340	data tables	56	data tables
				364	common chemical reactions—rust	57	data tables
						65	data tables
				380	writing up results	69	data tables
				404	data tables	73	data tables
				424	data tables	76	data tables
				444	reading data tables	78	making observations
				444	use % to make conclusions	78	data tables
						79	data tables
						80	data tables
						83	data tables
						84	data tables
						93	writing up results
						94	writing up results
						94	data tables
						98	data tables
						110	data tables
						111	reading graphs

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page	Volume 2 Investigation Manual page
					111 making graphs

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQC.2 Questioning and Investigating	6-8	Collecting, analyzing, and displaying data are essential aspects of all investigations.	Recognize and interpret patterns – as well as variations from previously learned or observed patterns – in data, diagrams, symbols, and words.*a	28	interpreting observations and proposing explanations	6	construct reasonable explanations supported by direct and indirect data
				29	construct explanations supported by direct and indirect evidence	7	interpreting observations and proposing explanations
				31	review scientific hypothesis based on comparison with evidence	10	analyze hypothesis based on observation
						14	explain using data
				41	analyze hypothesis based on data	14	construct a graphical model
				45	analyze scientific hypotheses based on evidence	15	construct a graphical model
				60	graphs	17	make graph from data
				61	analyze trends from data	20	analyze hypothesis based on comparison with evidence
				61	interpretations of patterns in data	22	make model from data
				61	making and evaluating graphs	27	making a graph from data
				62	constructing a graph	38	construct explanations based on evidence
				63	constructing graph from data	40	constructing explanations
				184	interpretations of patterns from data	49	explanations based on evidence
				222	harmonic motion graphs	58	interpret observations
						76	interpret observations

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
				242	explanations based on observations	80	interpret observations
				270	interpreting observations and making explanations	110	lab notebook
				294	making a graph	111	making graphs
				340	make and evaluate graphs		
				404	construct explanations based on data		
				444	explanations based on evidence		
6-8 INQC.3 Questioning and Investigating	6-8	Collecting, analyzing, and displaying data are essential aspects of all investigations.	Use statistical procedures (e.g., median, mean, or mode) to analyze data and make inferences about relationships.*b	42	basic statistical analysis of data—average	23	making measurements
				45	basic statistical analysis		
				48	averages		
				63	estimating from a graph		

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQD Questioning and Investigating	6-8	Controlled variables must be held constant except independent variables being tested and dependent variables being measured. Uncontrolled variables must be reported.	Plan and conduct a controlled experiment to test a hypothesis about a relationship between two variables. *c Determine the control, independent and dependent variables. Report variables not controlled and explain how they might affect results.	32	describe steps of the scientific method	3	identifying cause and effect relationships
				34	recognizing variables	3	identify cause and effect relationships
				41	recognizing and controlling variables in observations and experiments	10	recognize and control variables
						13	conduct car/ramp experiment
				44	identifying cause and effect relationships	24	cause and effect relationships
				45	identifying cause and effect relationships	24	control variables
				54	variables	43	recognizing and controlling variables
				61	identify cause and effect relationships—real and hypothesized	43	design scientific experiments
				62	identifying cause and effect relationships	58	conduct scientific vocabulary
				63	identifying cause and effect relationships	80	recognizing and controlling variables
				401	scientific method		

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQE Questioning and Investigating	6-8	Models are used to represent objects, events, systems, and processes. Models can be used to test hypotheses and better understand phenomena, but they have limitations.	Create a model or simulation to represent the behavior of objects, events, systems, or processes. Explore the relationship between two variables and point out how the model or simulation is similar to or different from the actual phenomenon.	102 401 411	design experiments design experiment—including choosing equipment design experiment with appropriate equipment	13 13 43 58	selecting ramp and photogates conduct car/ramp experiment design scientific experiments conduct scientific vocabulary

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQF Questioning and Investigating	6-8	It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.	Generate a scientific conclusion from an investigation, using inferential logic, and clearly distinguish between results (e.g., evidence) and conclusions (e.g., explanation). Describe the difference between an objective summary and inferences.	28	interpreting observations and proposing explanations	3	identifying cause and effect relationships
				34	recognizing variables	3	identify cause and effect relationships
				41	analyze hypothesis based on data	7	interpreting observations and proposing explanations
				41	recognizing and controlling variables in observations and experiments	7	test hypothesis against observations
				44	identifying cause and effect relationships	9	test hypothesis against observations
				45	analyze scientific hypotheses based on evidence	10	recognize and control variables
				45	identifying cause and effect relationships	10	analyze hypothesis based on observation
				54	variables	13	conduct car/ramp experiment
				61	analyze trends from data	20	analyze hypothesis based on comparison with evidence
				61	interpretations of patterns in data	24	control variables
				61	identify cause and effect relationships—real and hypothesized	24	cause and effect relationships
				62	identifying cause and effect relationships	43	recognizing and controlling variables
				63	identifying cause and effect relationships	58	interpret observations

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
				184	interpretations of patterns from data	58	conduct scientific vocabulary
				270	interpreting observations and making explanations	76	interpret observations
						80	recognizing and controlling variables
						80	interpret observations
6-8 INQG Questioning and Investigating	6-8	Scientific reports should enable another investigator to repeat the study to check the results.	Write a report of an investigation- clearly describe the question being investigated, the investigation, and objectively summarize the results. Accept or reject the hypothesis; explain the relationship between the variables; and identify limitations.	28	inquiry process	7	develop procedure someone else could follow
				29	objective, repeatable evidence	12	design a procedure others can follow
				32	why the scientific method works	92	formal lab report
				102	design an experiment that others could follow	92	design experiment that someone else can follow
				318	write up results	93	lab reports
				380	writing up results	93	writing up results
						94	lab report
						94	writing up results
						110	lab report
						111	making graphs

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQH.1 Questioning and Investigating	6-8	Science advances through openness to new ideas, honesty, and legitimate skepticism. Ask questions, critique scientific explanations, evaluate personal thinking in response to ideas of others: inquiry.	Recognize flaws in scientific claims, such as uncontrolled variables, overgeneralizations from limited data, and experimenter bias.*c	24 43 44 45 184	error in experiments analysis of error analysis of errors in both measurements and interpretation analysis of errors in measurement systematic error	5 5	errors in data analysis of errors in measurement

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQH.2 Questioning and Investigating	6-8	Science advances through openness to new ideas, honesty, and legitimate skepticism. Ask questions, critique scientific explanations, evaluate personal thinking in response to ideas of others: inquiry.	Listen actively and respectfully to research reports by other students. Critique their presentations respectfully, using logical argument and evidence. *c	24	error in experiments	5	errors in data
				29	communication is important to science	10	recognize and control variables
				34	recognizing variables	24	control variables
				41	recognizing and controlling variables in observations and experiments	32	communicating as essential to science
						43	recognizing and controlling variables
				45	identifying cause and effect relationships	80	recognizing and controlling variables
				54	variables	92	formal lab report
				184	systematic error	93	communicating results is essential to science
				269	communication as essential to science	93	lab reports
				318	oral presentation of results	93	writing up results
				318	write up results	94	lab report
				380	writing up results	94	writing up results
						110	lab report
						111	making graphs

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 INQH.3 Questioning and Investigating	6-8	Science advances through openness to new ideas, honesty, and legitimate skepticism. Ask questions, critique scientific explanations, evaluate personal thinking in response to ideas of others: inquiry.	Engage in reflection and self-evaluation.	28 28 91 270	interpreting observations and proposing explanations asking scientific questions applications of science can affect the lives of individuals interpreting observations and making explanations	2 5 7 8 13 18 21 23 26 31 39 43 46 50	experiment to answer questions collaboration interpreting observations and proposing explanations which ramp is the fastest? what kind of motion happens? how does friction affect motion? what happens when force is applied? how does acceleration depend on force and mass? where does the marble move the fastest? why does it look like the moon's shape changes? what are the properties of magnetism? what variables affect the pendulum? how is color created? how are temperature and heat related?

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
						58	interpret observations
						75	what is pH?
						76	interpret observations
						80	interpret observations
6-8 INQI Questioning and Investigating	6-8	Scientists and engineers have ethical codes governing animal experiments, research in natural ecosystems, and studies that involve human subjects.	Demonstrate ethical concerns and precautions in response to scenarios of scientific investigations involving animal experiments, research in natural ecosystems, and studies that involve human subjects.	8 30 31 359	engineers design practical devices for solving problems historical context and perspective of discoveries historical context of specific scientific discovery societal impact of scientific knowledge		

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS1A Balanced and Unbalanced Forces	6-8	Average speed is defined as the distance traveled in a given period of time.	Measure the distance an object travels in a given interval of time and calculate the object's average speed, using S = d/t.*a Describe the motion of an object using a position vs. time or speed vs. time graph.*b	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	compare and contrast speed and velocity	14	construct distance vs. time graph
				55	speed	15	construct speed vs. time graph
				56	compare and contrast speed and velocity	15	calculate speed of a moving object
				56	speed	22	calculate speed
				60	calculating speed	27	calculate speed of a moving object
				64	position vs. time graphs	31	calculate speed of the car
				64	calculating speed		
				65	speed vs. time graph		
				66	calculations for speed		
				66	compare and contrast speed and velocity		
				66	speed vs. time graph		
				69	speed vs. time graph		
				75	speed		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				76	speed	
				76	position vs time graphs	
				76	average speed	
				177	concept of speed	

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS1B Balanced and Unbalanced Forces	6-8	Friction is a force that acts to slow or stop the motion of objects.	Demonstrate and explain the frictional force acting on an object with the use of a physical model.	17	force as ability to change motion	18	investigate the effects of friction on motion of objects
				80	understand force as an action with potential to change motion	19	investigate effects of friction on motion
				87	effect of friction on motion	20	effects of friction
				88	effects of friction on motion of objects	21	force as an action that changes motion
				89	effects of friction on motion		
				90	effects of friction on motion		
				91	effects of friction		
				92	effects of friction		
				93	effects of friction on motion		
				99	effect of friction on motion		
				101	effects of friction (drag) on motion of planes		
				101	concept of forces		
				102	investigate how friction affects motion		
				108	conceptual understanding of a force as the action with the potential to change motion		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				111	force is an action with potential to change motion	
				121	effect of friction on objects	
				124	force as ability to change motion	
				136	understanding of force as the ability to change motion	
				142	friction and machines	
				221	friction and damping	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS1C Balanced and Unbalanced Forces	6-8	Unbalanced forces will cause changes in the speed or direction of an object's motion.	Determine whether forces on an object are balanced or unbalanced and justify with observational evidence. Given a description of forces on an object, predict the object's motion.*c	17	force as ability to change motion	11	vectors have magnitude and direction
				29	difference between weight and mass	14	calculate speed of an object
				60	changes in motion can be represented graphically	21	balanced or unbalanced forces causing changes in motion
				64	changes in motion can be shown graphically	21	force as an action that changes motion
				65	changes in motion can be represented graphically	23	Newton's second law
				68	quantitative understanding of acceleration as a rate of change of velocity		
				79	changes in motion require force		
				80	identify types of forces		
				80	forces needed to change motion		
				80	understand force as an action with potential to change motion		
				81	use of force in units of newtons and pounds		
				82	use of newtons		
				84	quanitative understanding of force as a vector		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				85	identify forces	
				86	force in newtons	
				88	identify forces	
				89	changes in motion require application of force	
				94	net force	
				95	force as vector	
				95	balanced and unbalanced forces	
				96	concept of net force	
				96	change in motion require force	
				97	use concepts of balanced or unbalanced forces	
				97	quantitative understanding of force changing motion	
				98	net force	
				98	balanced and unbalanced forces	
				99	unbalanced forces cause motion	
				99	net force	
				99	identify forces	
				99	force as vector	

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				99	net force	
				100	Newton's first law	
				100	force as vector	
				100	Newton's laws applied to real situations	
				101	concept of forces	
				101	net force	
				101	Newton's laws applied to planes	
				108	conceptual understanding of a force as the action with the potential to change motion	
				108	changes in motion require force	
				109	change in motion requires force	
				109	concept of net force	
				110	concept of net force	
				110	conceptual understanding of force as a vector	
				111	force is an action with potential to change motion	
				111	identify forces	
				113	concept of net force	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				115	concept of net force	
				116	net force	
				117	understand and use concept of balanced and unbalanced forces to create motion	
				118	balanced and unbalanced forces	
				120	Newton's laws in terms of real situations—sports and cars	
				123	Newton's laws and space travel	
				124	Newton's first law	
				124	force as ability to change motion	
				136	understanding of force as the ability to change motion	

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS1D Balanced and Unbalanced Forces	6-8	The same unbalanced force will change the motion of an object with more mass more slowly than an object with less mass.	Given two different masses that receive the same unbalanced force, predict which will move more quickly.	4	Newton's second law qualitative	11	vectors have magnitude and direction
				17	force as ability to change motion	18	investigate the effects of friction on motion of objects
				67	conceptual understanding of acceleration as describing change in speed	19	investigate effects of friction on motion
				68	quantitative understanding of acceleration as a rate of change of velocity	20	effects of friction
				73	Newton's second law	21	balanced or unbalanced forces causing changes in motion
				79	changes in motion require force	21	force as an action that changes motion
				80	forces needed to change motion	22	acceleration as change in speed
				80	understand force as an action with potential to change motion	23	Newton's second law
				87	effect of friction on motion	24	quantitative understanding of Newton's second law
				88	effects of friction on motion of objects	25	Newton's second law
				89	effects of friction on motion		
				89	changes in motion require application of force		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				90	effects of friction on motion	
				91	effects of friction	
				92	effects of friction	
				93	effects of friction on motion	
				94	net force	
				95	balanced and unbalanced forces	
				96	concept of net force	
				96	change in motion require force	
				97	use concepts of balanced or unbalanced forces	
				97	quantitative understanding of force changing motion	
				98	balanced and unbalanced forces	
				98	net force	
				99	net force	
				99	net force	
				99	force as vector	
				99	effect of friction on motion	

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				99	unbalanced forces cause motion	
				100	force as vector	
				100	Newton's first law	
				101	concept of forces	
				101	net force	
				101	effects of friction (drag) on motion of planes	
				102	investigate how friction affects motion	
				108	conceptual understanding of a force as the action with the potential to change motion	
				108	changes in motion require force	
				109	understand that inertia is the ability to judge motion	
				109	concept of net force	
				109	change in motion requires force	
				110	conceptual understanding of force as a vector	
				110	concept of net force	
				111	inertia	

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				111	force is an action with potential to change motion	
				113	Newton's second law	
				113	concept of net force	
				113	concept of acceleration	
				114	Newton's second law—qualitative	
				114	Newton's second law—qualitative	
				114	Newton's second law—qualitative	
				115	concept of net force	
				115	acceleration is a change in speed	
				115	Newton's second law—quantitative	
				116	net force	
				116	conceptual understanding of acceleration as change in speed	
				117	understand and use concept of balanced and unbalanced forces to create motion	
				117	inertia as the ability to resist motion	

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				118	balanced and unbalanced forces	
				120	Newton's second law—qualitative	
				120	Newton's laws in terms of real situations—sports and cars	
				120	inertia	
				121	effect of friction on objects	
				124	Newton's second law	
				124	force as ability to change motion	
				124	Newton's first law	
				136	understanding of force as the ability to change motion	
				142	friction and machines	
				219	inertia and pendulums	
				221	friction and damping	

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS2A Atoms and Molecules	6-8	Substances have characteristic intrinsic properties, such as density, solubility, boiling point, and melting point, all of which are independent of the amount of the sample.	Use characteristic intrinsic properties such as density, boiling point, and melting point to identify an unknown substance.	4	mass	56	compare objects based on mass and volume and density
				5	physical properties of matter	74	compare materials based on density
				5	mass and volume	74	how various factors influence solubility—including temperature
				24	mass of objects	~~101~~	~~volume~~
				174	compare materials—density and mass	~~103~~	~~volume~~
				298	compare objects using properties—mass and density	~~104~~	~~volume~~
				299	compare objects based on volume	~~105~~	~~volume~~
				300	compare objects based on density	~~106~~	~~mass~~
				301	compare objects using density	~~107~~	~~mass~~
				303	physical properties of matter	~~108~~	~~mass~~
				303	compare objects and materials using mass and volume and density		
				306	compare objects using density		
				307	compare objects based on density		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				308	compare objects based on density	
				309	compare objects based on density	
				316	classify materials based on physical properties	
				317	classify materials based on properties	
				344	chemical and physical properties	
				350	physical and chemical properties	
				357	classify by chemical and physical properties	
				357	melting and boiling points	
				358	physical properties of gold	
				387	various factors influence solubility—including temperature	
				391	various factors affect solubility—temperature	
				393	factors that affect solubility—temperature	

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 PS2B Atoms and Molecules	6-8	Mixtures are combinations of substances whose chemical properties are preserved. Compounds are substances that are chemically formed and have different physical and chemical properties from the reacting substances.	Separate a mixture using differences in properties of the substances used to make the mixture. Demonstrate that the properties of a compound are different from the properties of the reactants from which it was formed.	5	physical properties of matter	
				303	understand that a substance has characteristic properties	
				303	physical properties of matter	
				316	classify materials based on physical properties	
				317	classify materials based on properties	
				344	chemical and physical properties	
				350	physical and chemical properties	
				357	melting and boiling points	
				357	classify by chemical and physical properties	
				358	physical properties of gold	
				364	describe how mixtures can be separated using physical means	
				370	mixtures can be separated by physical means	

Correlation to Washington Essential Academic Learning Requirements for Science, grades 6-8

CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS2C Atoms and Molecules	6-8	All matter is made of atoms. Matter made of only one type of atom is called an element.	Explain that all matter is made of atoms, and give examples of common elements—substances composed of just one kind of atom.	18	matter is composed of atoms	61	periodic table
				19	describe matter as composed of atoms	64	build and describe periodic table
				20	matter as composed of atoms	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	recognizing metals and nonmetals and metalloids	67	periodic table
				348	recognizing groups and families of periodic table	68	periodic table
				348	describing periodic table		
				350	recognizing groups and families and periodic table		
				350	describe periodic table		
				352	describe periodic table		
				353	groups on periodic table		

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 PS2D Atoms and Molecules	6-8	Compounds are composed of two or more kinds of atoms, which are bound together in well-defined molecules or arrays.	Demonstrate with a labeled diagram and explain the relationship among atoms, molecules, elements, and compounds.	18	matter is composed of atoms	
				19	describe matter as composed of atoms	
				20	matter as composed of atoms	
				20	elements combine in constant proportions	
				20	recognize that compounds are composed of elements	
				314	compounds composed of elements	
				363	recognize that compounds are made of elements	
				364	compounds are composed of elements	
				366	understand that atoms combine in constant proportions to form compounds	
				367	elements combine in certain proportions to form compounds	
				368	understand that elements combine in constant proportions to form compounds	

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				368	difference between ionic and covalent bonds	
				370	understand that elements combine in constant proportions in compounds	
				371	elements combine in constant proportions in compounds	

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS2E Atoms and Molecules	6-8	Solids, liquids, and gases differ in the motion of individual particles. In solids, particles are packed in a nearly rigid structure; in liquids, particles move around one another; and in gases, particles move almost independently.	Describe how solids, liquids, and gases behave when put into a container (e.g., a gas fills the entire volume of the container). Relate these properties to the relative movement of the particles in the three states of matter.	5	properties of solids and liquids and gas	52	common phase changes
				96	relationship between real materials and concepts of atoms	53	states of matter based on arrangement and motion of atoms
				280	physical differences between phases of matter	53	phase changes
				280	phases of matter		
				281	phase changes		
				301	physical differences between states 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		

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS2F Atoms and Molecules	6-8	When substances within a closed system interact, the total mass of the system remains the same. This concept, called conservation of mass, applies to all physical and chemical changes.	Apply the concept of conservation of mass to correctly predict changes in mass before and after chemical reactions, including reactions that occur in closed containers, and reactions that occur in open containers where a gas is given off.*a	344	difference between chemical and physical changes	77	difference between chemical and physical changes
				407	differences between chemical and physical change	79	investigate law of conservation of mass
				408	difference between physical and chemical change	80	law of conservation of mass
				411	conservation of mass		
				413	difference between chemical and physical change		
				420	conservation of mass		

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS3A Interactions of Energy and Matter	6-8	Energy exists in many forms: heat, light, chemical, electrical, motion of objects, and sound. Energy can be transformed from one form to another and transferred from one place to another.	List different forms of energy. Describe ways in which energy is transformed from one form to another and transferred from one place to another	5	conversion of energy types	26	transformation of energy from one form to another
				6	energy conversions	27	transformation of energy from one form to another
				10	conversion of energy	78	how energy is manifested in chemical reactions
				15	types and forms of energy		
				15	conversion of energy from one form to another		
				16	forms of energy from origination at sun to use in living things		
				16	conversion of energy from one form to another		
				17	energy as stored work		
				31	basic forms of energy—heat		
				130	basic forms of energy		
				131	conservation of energy		
				131	conversion of energy from potential to kinetic		
				132	different forms of energy		
				134	conservation of energy in a broader context		
				136	concept of energy as stored work		
				137	energy is stored work		

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
				148	forms of energy (i.e. wind)	
				149	conversions of energy	
				150	energy conversions	
				225	waves transmit energy	
				287	heat conduction	
				289	natural and forced convection	
				290	thermal radiation	
				369	energy changes that accompany chemical reactions	
				370	energy changes that accompany chemical changes	
				414	explain how energy is manifested in chemical reactions—exothermic and endothermic	
				415	analyze energy changes that accompany chemical reactions	
				415	how energy is manifested in chemical reactions	
				421	energy manifested in chemical reactions	
				422	energy changes in chemical reactions	

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS3B Interactions of Energy and Matter	6-8	Heat (thermal energy) flows from warmer to cooler objects until both reach the same temperature. Conduction, radiation, and convection, or mechanical mixing, are the means of heat transfer.	Use everyday examples of conduction, radiation, and convection, or mechanical mixing, to illustrate the transfer of heat energy from warmer objects to cooler ones, until the objects reach the same temperature.	30 283 284 287 287 289 290	observe and explain that objects at different temperatures reach an intermediate temperature flow of thermal energy is heat heat and work heat conduction thermal equilibrium natural and forced convection thermal radiation	50 50 52 100	change of temperature is energy transfer objects at different temperatures reach an intermediate temperature temperature change means heat transfer has occurred temperature changes
6-8 PS3C Interactions of Energy and Matter	6-8	Heat (thermal energy) consists of random motion and the vibrations of atoms and molecules. The higher the temperature, the greater the atomic or molecular motion. Thermal insulators are materials that resist the flow of heat.	Explain how various types of insulation slow transfer of heat energy, based on the atomicmolecular model of heat (thermal energy).	18 19 278 279 283 283 286 303	kinetic theory kinetic theory kinetic theory and temperature absolute zero understanding the difference between heat and temperature flow of thermal energy is heat kinetic theory kinetic theory—average kinetic energy and temperature	51 52 53 74	how heat and temperature are different kinetic theory kinetic energy kinetic theory

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CPO Science Physical Science (Middle School)

Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS3D Interactions of Energy and Matter	6-8	Visible light from the Sun is made up of a mixture of all colors of light. To see an object, light emitted or reflected by that object must enter the eye.	Describe how to demonstrate that visible light from the Sun is made up of different colors. Draw and label a diagram illustrating that to see an object, light must come directly from the object or an external reflected source and enter the eye.	46	how light helps us see	46	reflected vs emitted light
				74	how light helps us see	46	RGB model of color
				75	how light helps us see	46	how light helps us see
				246	seeing and reflected light	47	RGB and CMYK color models
				248	white light is a mixture of colors	47	investigate RGB and CMYK models of color
				250	energy and color of light		
				254	how the human eye sees light		
				255	how the human eye sees color		
				256	the RGB color process		
				257	color as reflected light		
				257	how light helps us see		
				257	subtractive color process		
				258	the CMYK color process		
				259	color seen as reflected light		
				259	explain how colors of light relate to wavelength		
				262	how light helps us see		
				332	explain how we see color in terms of reflected or emitted light		

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS3E Interactions of Energy and Matter	6-8	Energy from a variety of sources can be transformed into electrical energy, and then to almost any other form of energy. Electricity can also be distributed quickly to distant locations.	Illustrate the transformations of energy in an electric circuit when heat, light, and sound are produced. Describe the transformation of energy in a battery within an electric circuit.	15	types and forms of energy	35	construct simple circuits
				31	basic forms of energy—heat	36	simple circuits
						37	simple circuits
				130	basic forms of energy		
				148	forms of energy (i.e. wind)		
				192	electric current		
				193	understanding voltage		
				194	current in simple circuits		
				194	how batteries work		
				196	electric circuits		
				198	calculating power in a circuit		
				199	concept of voltage		
				199	concept of current		
				209	electromagnetic induction explained		
				212	voltage		
				212	current		
				213	current		

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page	
6-8 PS3F Interactions of Energy and Matter	6-8	Energy can be transferred from one place to another through waves. Waves include vibrations in materials. Sound and earthquake waves are examples. These and other waves move at different speeds in different materials.	Contrast a light wave with a sound wave by identifying that both have characteristic wavelengths, but light waves can travel through a vacuum while sound waves cannot. Explain that sound results from the vibration of an object.	225	waves transmit energy	44	wavelength and frequency and speed of waves
				226	frequency and amplitude and wavelength of waves	44	wave as oscillation in a medium
				227	the speed of waves	45	categorize waves by how they move
				228	longitudinal waves	45	making circular waves in a ripple tank
				228	transverse waves		
				234	speed of sound		
				235	wavelength and frequency		
				235	sound as a wave		
				236	sound as a wave		
				236	sound waves and different media		
				237	wavelength of sound		
				240	why sound is a wave		
				240	waves that require substances to move		
				242	sound as a wave		
				249	speed of light		
				251	nature of light in terms of waves and energy info flow		
				252	properties of electromagnetic waves with different wavelengths		

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 SYSC Inputs, Outputs, Boundaries and Flows	6-8	The output of one system can become the input of another system.	Give an example of how output of matter or energy from a system can become input for another system (e.g., household waste goes to a landfill).*a	16 356 431	how energy flows in an ecosystem how carbon cycles through an ecosystem how carbon cycles in an ecosystem	
6-8 SYSD Inputs, Outputs, Boundaries and Flows	6-8	In an open system, matter flows into and out of the system. In a closed system, energy may flow into or out of the system, but matter stays within the system.	Given a description of a system, analyze and defend whether it is open or closed.	96 97 98 99 129 134 219 219 390	how systems may reach equilibrium equilibrium equililbrium equilibrium defining a system understand concept of system restoring forces and equilibrium equilibrium and harmonic motion recognize and describe how systems may reach equilibrium	

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 SYSE Inputs, Outputs, Boundaries and Flows	6-8	If the input of matter or energy is the same as the output, then the amount of matter or energy in the system won't change; but if the input is more or less than the output, then the amount of matter or energy in the system will change.	Measure the flow of matter into and out of an open system and predict how the system is likely to change (e.g., a bottle of water with a hole in the bottom, an ecosystem, an electric circuit).*b	96	how systems may reach equilibrium	
				97	equilibrium	
				98	equililbrium	
				99	equilibrium	
				129	defining a system	
				134	understand concept of system	
				219	restoring forces and equilibrium	
				219	equilibrium and harmonic motion	
				367	form and function	
				390	recognize and describe how systems may reach equilibrium	

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Standard #: EALR	Content Standards	Grade Level	Performance Expectations	Volume 1 Student Text page		Volume 2 Investigation Manual page
6-8 SYSF Inputs, Outputs, Boundaries and Flows	6-8	Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as “systems.”	Given a complex issue with strong science and technology components (overfishing, global warming), describe the issue from a systems point of view, highlighting how changes in one part of the system are likely to influence other parts of the system.	129 129 134 134	parts of a car and ramp system defining a system identify and describe parts of a system in nature understand concept of system	