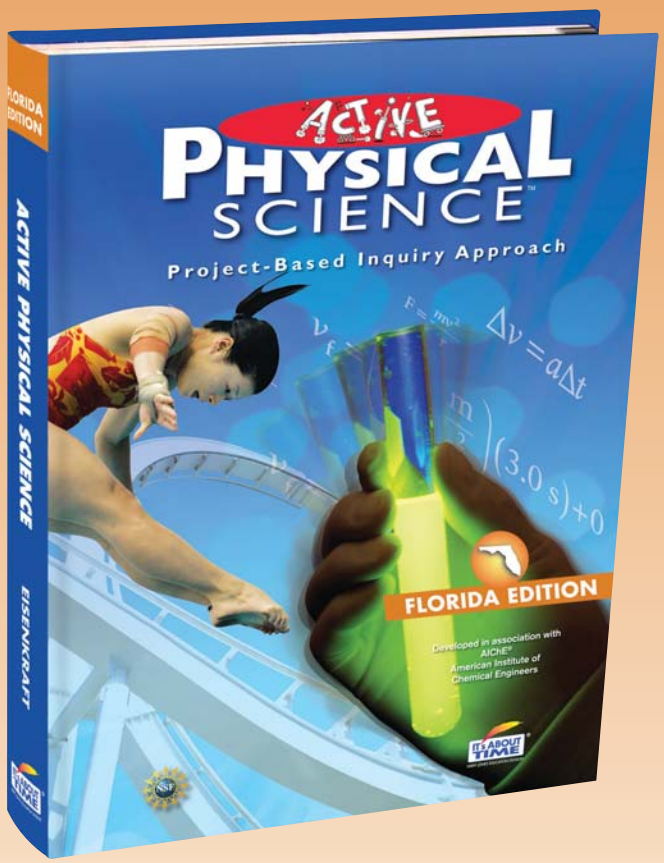
Florida Edition

Active Physical Science

CORRELATION
FLORIDA DEPARTMENT OF EDUCATION
INSTRUCTIONAL MATERIALS CORRELATION
COURSE STANDARDS



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Correlation of Florida Next Generation Sunshine State Standards to *Active Physical Science*

Florida Next Generation Sunshine State Standards Scheme and Descriptor	*Active Physical Science*
Standard 1: The Practice of Science	
A: Scientific inquiry is a multifaceted activity; The processes of science include the formulation of scientifically investigable questions, construction of investigations into those questions, the collection of appropriate data, the evaluation of the meaning of those data, and the communication of this evaluation.	
B: The processes of science frequently do not correspond to the traditional portrayal of "the scientific method."	
C: Scientific argumentation is a necessary part of scientific inquiry and plays an important role in the generation and validation of scientific knowledge.	
D: Scientific knowledge is based on observation and inference; it is important to recognize that these are very different things. Not only does science require creativity in its methods and processes, but also in its questions and explanations.	
SC.912.N.1.1 Define a problem based on a specific body of knowledge, for example: biology, chemistry, physics, and earth/space science, and do the following: 1. pose questions about the natural world, 2. conduct systematic observations, 3. examine books and other sources of information to see what is already known, 4. review what is known in light of empirical evidence, 5. plan investigations, 6. use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), 7. pose answers, explanations, or descriptions of events, 8. generate explanations that explicate or describe natural phenomena (inferences), 9. use appropriate evidence and reasoning to justify these explanations to others, 10. communicate results of scientific investigations, and 11. evaluate the merits of the explanations produced by others.	1. pose questions about the natural world, *Questions about the natural world are posed throughout the book. Examples include the following:* Chapter 1, Section 1, pp. 7-10; Section 2, pp. 22-24 Chapter 2, Section 2, p. 49; Section 4, p. 68 Chapter 3, *Section 4, p. 179* Chapter 4, Section 2, p. 257 Chapter 5, Section 6, p. 379; Section 8, p. 400 Chapter 6, Section 7, pp. 519-523 Chapter 7, Section 7, pp. 624-626 Chapter 8, Section 4, pp. 709-710 Chapter 9, Section 1, pp. 811-812 2. conduct systematic observations, *Nearly all Investigates include instructions for conducting systematic observations. Examples include the following:* Chapter 1, *Section 2, pp. 22-25* Chapter 2, Section 2, pp. 49-52 Chapter 3, Section 4, pp. 182-183; Section 7, p. 212 Chapter 4, Section 1, pp. 249-251; Section 4, pp. 275-278 Chapter 5, Section 2, pp. 341-342 Chapter 6, Section 1, pp. 423-425; Section 2, p. 437 Chapter 7, Section 1, pp. 547-555; Section 2, pp. 559-561; Section 4, pp. 588-590 Chapter 8, Section 2, pp. 687-689; Section 6, pp. 733-736; Section 8, pp. 763-764 Chapter 9, Section 1, pp. 811-812; Section 4, pp. 835-836; Section 7, pp. 877-878

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	3. examine books and other sources of information to see what is already known, *Other sources are examined throughout the book. Examples include the following:* Chapter 1, Section 1, p. 20 Chapter 2, Section 4, p. 76 Chapter 3, Section 7, p. 220 Chapter 4, Section 3, p. 274 Chapter 5, Section 5, p. 378 Chapter 6, Section 2, p. 447 Chapter 7, Section 6, p. 618 Chapter 8, Section 1, p. 677; Section 2, p. 697 Chapter 9, Section 1, p. 817 4. review what is known in light of empirical evidence, *Reviews of empirical evidence gathered in investigations appear throughout the book in* Chapter Challenges *and* Mini-Challenges. *Examples include the following:* Chapter 1, Mini-Challenge, pp. 40-41 Chapter 2, Chapter Challenge, pp. 135-137 Chapter 3, Chapter Challenge, pp. 237-239 Chapter 4, Chapter Challenge, pp. 321-323 Chapter 5, Chapter Challenge, pp. 407-409 Chapter 6, Chapter Challenge, pp. 534-535 Chapter 7, Chapter Challenge, pp. 662-663 Chapter 8, Chapter Challenge, pp. 798-799 Chapter 9, Chapter Challenge, pp. 914-915 5. plan investigations, *Student-planned investigations appear throughout the book. Examples include the following:* Chapter 1, Section 2, p. 34 Chapter 2, Section 6, p. 99 Chapter 3, Section 3, p. 178; Section 4, p. 189 Chapter 4, Section 2, p. 256; Section 5, p. 296 Chapter 5, Section 1, pp. 335, 340 Chapter 6, Section 5, pp. 489-491 Chapter 7, Section 7, p. 625; Section 8, p. 635 Chapter 8, Section 3, p. 699 Chapter 9, Section 4, p. 836; Section 6, p. 873

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	6. use tools to gather, analyze, and interpret data, *Students use equipment to measure data and graphs to analyze it throughout the book. Examples include the following:* Chapter 1, Section 2, pp. 22-25 Chapter 2, Section 3, pp. 58-60 Chapter 3, Section 5, p. 193; Section 6, pp. 200-201 Chapter 4, Section 1, pp. 249-251 Chapter 5, Section 2, pp. 341-343; Section 7, pp. 387-389 Chapter 6, Section 2, pp. 437-438; Section 5, p. 491 Chapter 7, Section 2, pp. 559-562; Section 9, p. 651 Chapter 8, Section 2, p. 689; Section 3, p. 700; Section 5, pp. 394-395, Section 8, p. 438 Chapter 9, Section 4, pp. 835-836 7. pose answers, explanations, or other descriptions of events, *Students give detailed answers and descriptions of investigation results throughout the book. Examples include the following:* Chapter 1, Section 3, pp. 35-36 Chapter 2, Section 4, p. 70 Chapter 3, Section 4, pp. 182-183 Chapter 4, Section 1, p. 251; Section 3, p. 267 Chapter 5, Section 6, pp. 380-381 Chapter 6, Section 6, pp. 504-511 Chapter 7, Section 6, pp. 612-614 Chapter 8, Section 8, pp. 762-764 Chapter 9, Section 5, pp. 843-844 8. generate explanations that explicate or describe natural phenomena (inferences), *Examples appear throughout the text in Investigates and in* Essential Questions. *Examples include the following:* Chapter 1, Section 3. p. 38 Chapter 2, Section 5, p. 84; Section 6, p. 93 Chapter 3, Section 1, p. 150; Section 4, p. 187 Chapter 4, Section 2, p. 263; Section 4, p. 282 Chapter 5, Section 4, p. 366; Section 8, p. 404 Chapter 6, Section 5, p. 491 Chapter 7, Section 5, pp. 600-601; Section 6, pp. 612-614 Chapter 8, Section 8, pp. 762-764 Chapter 9, Section 2, pp. 819-821

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	9. Use appropriate evidence and reasoning to justify these explanations to others, *Evidence and reasoning are used to justify results throughout the book. Examples include the following:* Chapter 1, Section 1, p. 16 Chapter 2, Section 8, p. 111 Chapter 3, Section 6, p. 203 Chapter 4, Section 7, p. 306 Chapter 5, Section 1, p. 335 Chapter 6, Section 5, p. 491 Chapter 7, Section 5, pp. 600-601; Section 6, pp. 612-614 Chapter 8, Section 8, pp. 762-764 Chapter 9, Section 2, pp. 607-609 10. communicate results of scientific investigations, *Students are asked to share their work with their groups or class throughout the book, including their* Mini-Challenges, Chapter Challenges, *and answers to* What Do You Think (Now)? *questions. Examples of the last include the following:* Chapter 1, Section 3, p. 38 Chapter 2, Section 3, p. 60; Mini-Challenge, pp. 86-87 Chapter 3, Section 4, p. 186; Mini-Challenge, pp. 190-191 Chapter 4, Mini-Challenge, pp. 284-285; Section 5, p. 294 Chapter 5, Mini-Challenge, pp. 368-369; Section 7, p. 396 Chapter 6, Section 1, p. 425; Section 7, p. 526 Chapter 7, Section 4, p. 595 Chapter 8, Section 6, p. 743 Chapter 9, Section 4, p. 839 11. evaluate the merits of the explanations produced by others, *Explanations are presented as part of the learning process throughout the book; evaluating them is an integral part of each* chapter's Mini-Challenge. *Examples include the following:* Chapter 1, Mini-Challenge, pp. 40-41 Chapter 2, Mini-Challenge, pp. 86-87 Chapter 3, Mini-Challenge, pp. 190-191 Chapter 4, Mini-Challenge, pp. 284-285 Chapter 5, Mini-Challenge, pp. 368-369 Chapter 6, Mini-Challenge, pp. 486-487 Chapter 7, Mini-Challenge, pp. 610-611 Chapter 8, Mini-Challenge, pp. 730-731 Chapter 9, Mini-Challenge, pp. 874-875

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SC.912.N.1.2 Describe and explain what characterizes science and its methods.	*Scientific methods are elucidated throughout the book, and each section of each Chapter contains a highlighting in terms of the* Essential Questions*. Examples include the following:* Nature of Science pp. NS2, NS3, NS7 Chapter 1, Section 3. p. 38 Chapter 2, Section 5, pp. 84-85 Chapter 3, Section 1, p. 155 Chapter 4, Section 4, p. 282 Chapter 5, Section 7, p. 397 Chapter 6, Section 2, p. 445; Section 3, p. 462 Section 7, *p. 527* Chapter 7, Section 2, p. 567; Section 5, p. 607 Chapter 8, Section 3, p. 705; Section 5, p. 727 Chapter 9, Section 7, p. 887
SC.912.N.1.3 Recognize that the strength or usefulness of a scientific claim is evaluated through scientific argumentation, which depends on critical and logical thinking, and the active consideration of alternative scientific explanations to explain the data presented.	*Students are required to apply logic and critical thinking, evaluating the usefulness of argumentation in scientific inquiry throughout the book. Examples include the following:* Nature of Science pp. NS2, NS7 Chapter 1, Section 2, p. 32 Chapter 2, Section 3, p. 65 Chapter 3, Section 4, p. 189; Section 5, p. 198 Chapter 4, Section 6, p. 302 Chapter 5, Section 5, p. 376 Chapter 6, Section 5, p. 491 Chapter 7, Section 5, pp. 600-601; Section 6, pp. 612-614 Chapter 8, Section 8, pp. 762-764 Chapter 9, Section 2, pp. 819-821
SC.912.N.1.4 Identify sources of information and assess their reliability according to the strict standards of scientific investigation.	*Throughout the book, students are asked to seek various external information sources, such as online educational sites and government sites, to complete their work, ascertaining their reliability. Examples include the following:* Nature of Science pp. NS2, NS3, NS5, NS7 Chapter 1, Section 1, p. 20 Chapter 2, Section 4, p. 76 Chapter 3, Section 5, p. 199 Chapter 4, Section 3, p. 274 Chapter 5, Section 5, p. 378; Section 8, p. 405 Chapter 6, Section 5, p. 503 Chapter 7, Section 3, p. 587 Chapter 8, Section 6, p. 745 Chapter 9, Section 1, p. 817
SC.912.N.1.5 Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.	Nature of Science p. NS2 Chapter 2, Scenario, p. 45; Section 3, pp. 61-64, 66; Section 4, pp. 71-73; Section *7, pp. 105-106* Chapter 8, Section 4, p. 709

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SC.912.N.1.6 Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.	*Scientific inference is a key component of* Active Physical Science*, and students are required to observe and report their findings throughout the book. Examples include the following:* Nature of Science pp. NS2, NS3, NS4, NS5, NS7 Chapter 1, Section 2, pp. 22-25 Chapter 2, Section 6, pp. 88-92 Chapter 3, Section 5, pp. 192-193 Chapter 4, Section 5, pp. 286-288 Chapter 5, Section 3, pp. 350-351 Chapter 6, Section 1, p. 427; Section 5, p. 491 Chapter 7, Section 5, pp. 600-601; Section 6, pp. 612-614 Chapter 8, Section 8, pp. 762-764 Chapter 9, Section 2, pp. 819-821
SC.912.N.1.7 Recognize the role of creativity in constructing scientific questions, methods and explanations.	Active Physical Science *emphasizes the role creativity plays in scientific discovery, and each* Chapter Challenge *contains a creative component as well as a written component to provide students an opportunity to create unique solutions to presented problems. Students must then clearly communicate their results. Examples include the following*: Nature of Science pp. NS1, NS2, NS8 Chapter 1, Mini-Challenge, pp. 40-41 Chapter 2, Section 1, p. 48; Chapter Challenge, pp. 135-137 Chapter 3, Section 6, p. 209; Section 8, p. 235; Chapter Challenge, *pp. 237-239* Chapter 4, Section 1, p. 256 Section 8, p. 319; Chapter Challenge, *pp. 321-323* Chapter 5, Section 1, p. 340; Section 5, p. 378, Section 6, p. 386; Chapter Challenge, *pp. 407-409* Chapter 6, Section 4, p. 472; Chapter Challenge, pp. 534-535 Chapter 7, Chapter Challenge, pp. 662-663 Chapter 8, Chapter Challenge, pp. 798-799 Chapter 9, Chapter Challenge, pp. 914-915
Standard 2: The Characteristics of Scientific Knowledge	
A: Scientific knowledge is based on empirical evidence, and is appropriate for understanding the natural world, but it provides only a limited understanding of the supernatural, aesthetic, or other ways of knowing, such as art, philosophy, or religion.	
B: Scientific knowledge is durable and robust, but open to change.	
C: Because science is based on empirical evidence it strives for objectivity, but as it is a human endeavor the processes, methods, and knowledge of science include subjectivity, as well as creativity and discovery.	
SC.912.N.2.1 Identify what is science, what clearly is not science, and what superficially resembles science (but fails to meet the criteria for science).	Nature of Science pp. NS2, NS4, NS6 Chapter 7, Extending the Connection, pp. 664A-664B

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SC.912.N.2.2 Identify which questions can be answered through science and which questions are outside the boundaries of scientific investigation, such as questions addressed by other ways of knowing, such as art, philosophy, and religion.	Nature of Science p. NS6 Chapter 6, Section 6, p. 512
SC.912.N.2.3 Identify examples of pseudoscience (such as astrology, phrenology) in society.	Nature of Science p. NS6 Chapter 7, Extending the Connection, pp. 664A-664B
SC.912.N.2.4 Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability.	*The durability of scientific knowledge is indicated throughout the book, for example, when detailing historical discoveries and their present-day applications or making comparisons between real-world events and equivalent behavior in models. Examples include the following:* Nature of Science pp. NS2, NS5, NS7 Chapter 1, Section 2, p. 29 Chapter 2, Section 2, p. 53; Section 3, pp. 61-64; Section 4, pp. 71-73; Section 5, pp. 81-84; Section 6, pp. 95-96; Section 7, pp. 105-106; Section 9, p. 124 Chapter 3, Section 2, p. 162; Section 8, pp. 227-228 Chapter 4, Section 2, p. 262, Section 4, pp. 279-281; Section 6, p. 301; Section 7, pp. 307-309 Chapter 5, Section 7, pp. 390-391 Chapter 6, Section 6, pp. 512-514 Chapter 7, Section 1, pp. 548-549; Section 3, pp. 574-581 Chapter 8, Section 3, pp. 700-703; Section 4, pp. 711-715; Section 5, pp. 722-725; Section 6, pp. 741-742 Chapter 9, Section 4, pp. 837-838; Section 5, pp. 845-849
SC.912.N.2.5 Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.	Nature of Science pp. NS2, NS7 Chapter 1, Section 2, p. 29 Chapter 2, Section 3, pp. 61-64; Section 4, pp. 71-73; Section 5, pp. 81-84; Section 6, pp. 95-96; Section 7, pp. 105-106; Section 9, p. 124 Chapter 3, Section 2, p. 162 Chapter 4, Section 2, p. 262; Section 4, pp. 279-281; Section 6, p. 301 Chapter 5, Section 7, pp. 390-391

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Standard 3: The Role of Theories, Laws, Hypotheses, and Models	
The terms that describe examples of scientific knowledge, for example: "theory," "law," "hypothesis" and "model" have very specific meanings and functions within science.	
SC.912.N.3.1 Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.	Nature of Science pp. NS2, NS3, NS4, NS5, NS6, NS7 Chapter 1, Section 3, pp. 26-31 Chapter 2, Section 3, pp. 61-64; Section 4, pp. 71-73; Section 5, pp. 81-84; Section 6, pp. 95-96; Section 7, pp. 105-106; Section 9, pp. 124-130 Chapter 3, Section 2, p. 162 Chapter 4, Section 2, pp. 260-263; Section 4, pp. 279-281; Section 6, pp. 300-301 Chapter 5, Section 5, p. 374; Section 7, pp. 390-391 Chapter 8, Section 4, pp. 714-715
SC.912.N.3.2 Describe the role consensus plays in the historical development of a theory in any one of the disciplines of science.	Nature of Science pp. NS3, NS5 Chapter 1, Section 2, p. 28 Chapter 2, Section 2, p. 53; Section 3, pp. 61-63; Section 4, pp. 71-73; Section 5, pp. 81-84; Section 6, pp. 95-96; Section 7, pp. 105-106; Section 9, pp. 124 Chapter 3, Section 2, p. 162, Section 3, pp. 174-175 Chapter 4, Section 4, pp. 279-280; Section 6, p. 301 Chapter 5, Section 5, p. 374; Section 7, pp. 390-391
SC.912.N.3.3 Explain that scientific laws are descriptions of specific relationships under given conditions in nature, but do not offer explanations for those relationships.	*Students learn throughout the book that scientific laws describe specific relationship under given conditions, but do not explain why this happens. Examples include the following:* Nature of Science pp. NS3, NS4, NS5 Chapter 1, Section 2, pp. 27-29 Chapter 2, Section 3, pp. 61-64 Chapter 3, Section 2, p. 162; Section 8, pp. 225, 227-228 Chapter 4, Section 3, p. 268-271; Section 4, pp. 279-281; Section 5, pp. 289-293; Section 6, pp. 300-301; Section 7, pp. 306-309 Chapter 5, Section 5, p. 374 Chapter 7, Section 6, pp. 615-619 Chapter 8, Section 6, pp. 741-742 Chapter 9, Section 4, p. 837
SC.912.N.3.4 Recognize that theories do not become laws, nor do laws become theories; theories are well supported explanations and laws are well supported descriptions.	Nature of Science pp. NS3, NS4, NS5, NS6, NS7 Chapter 2, Section 4, p. 74 Chapter 7, Extending the Connection, pp. 664A-664B

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SC.912.N.3.5 Describe the function of models in science, and identify the wide range of models used in science.	Examples of models in science are identified throughout the book. Examples include the following: Nature of Science p. NS5 Chapter 2, Section 4, pp. 71, 73; Section 5, p. 81 Chapter 3, Section 1, p. 153; Section 2, pp. 158, 163; Section 3, pp. 166-167 Chapter 4, Section 2, pp. 257-258, 260, 262 Chapter 6, Section 6, pp. 504-514 Chapter 7, Section 5, pp. 600-601
Standard 4: Science and Society	
As tomorrow's citizens, students should be able to identify issues about which society could provide input, formulate scientifically investigable questions about those issues, construct investigations of their questions, collect and evaluate data from their investigations, and develop scientific recommendations based upon their findings.	
SC.912.N.4.1 Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society's decision making.	Nature of Science pp. NS2, NS7, NS8 Chapter 3, Extending the Connection, pp. 240A-240B Chapter 5, Section 5, p. 372; Section 8, pp. 403-405; Extending the Connection, pp. 410A-410B Chapter 9, Section 8, pp. 898-902; Section 9, p. 911
SC.912.N.4.2 Weigh the merits of alternative strategies for solving a specific societal problem by comparing a number of different costs and benefits, such as human, economic, and environmental.	Nature of Science pp. NS7, NS8 Chapter 2, Extending the Connection, pp. 138A-138B Chapter 7, Extending the Connection, pp. 662-663 Chapter 9, Section 8, p. 902; Section 9, pp. 903-906, 911
Standard 8: Properties of Matter	
A: A working definition of matter is that it takes up space, has mass, and has measurable properties. Matter is comprised of atomic, subatomic, and elementary particles.	
B: Electrons are key to defining chemical and some physical properties, reactivity, and molecular structures. Repeating (periodic) patterns of physical and chemical properties occur among elements that define groups of elements with similar properties. The periodic table displays the repeating patterns, which are related to the atom's outermost electrons. Atoms bond with each other to form compounds.	
C: In a chemical reaction, one or more reactants are transformed into one or more new products. Many factors shape the nature of products and the rates of reaction.	
D: Carbon-based compounds are building-blocks of known life forms on earth and numerous useful natural and synthetic products.	
SC.912.P.8.1 Differentiate among the four states of matter.	Chapter 4, Section 2, pp. 260-261
SC.912.P.8.2 Differentiate between physical and chemical properties and physical and chemical changes of matter.	Chapter 2, Section 2, pp. 53-54 Chapter 5, Section 1, p. 336; Section 2, pp. 341-346

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SC.912.P.10.2 Explore the Law of Conservation of Energy by differentiating among open, closed, and isolated systems and explain that the total energy in an isolated system is a conserved quantity.	Chapter 3, Section 8, p. 225 Chapter 5, Section 5, p. 374 Chapter 7, Section 8, pp. 636–638; Section 9, pp. 648-655 Chapter 8, Section 2, pp. 689-699, 696-697; Section 3, pp. 698-707; Section 9, pp. 774-775, 777-779, 782-783; Section 10, pp. 791, 794 Chapter 9, Section 7, pp. 878-886; Section 8, pp. 891-896
SC.912.P.10.3 Compare and contrast work and power qualitatively and quantitatively.	Chapter 8, Section 8, pp. 767-768 Chapter 9, Section 8, pp. 892, 898-901; Section 9, pp. 904-906
SC.912.P.10.4 Describe heat as the energy transferred by convection, conduction, and radiation, and explain the connection of heat to change in temperature or states of matter.	Chapter 9, Section 9, pp. 906-907; Extending the Connection, pp. 916A-916B
SC.912.P.10.5 Relate temperature to the average molecular kinetic energy.	Chapter 4, Section 4, pp. 280-281 Chapter 8, Extending the Connection, pp. 800A-800B Chapter 9, Section 7, p. 881; Section 8, pp. 892-896
SC.912.P.10.7 Distinguish between endothermic and exothermic chemical processes.	Chapter 3, Section 7, pp. 214-217 Chapter 5, Section 5, pp. 372-373, 377
SC.912.P.10.10 Compare the magnitude and range of the four fundamental forces (gravitational, electromagnetic, weak nuclear, strong nuclear).	Chapter 2, Section 9, pp. 125-127
SC.912.P.10.11 Explain and compare nuclear reactions (radioactive decay, fission and fusion), the energy changes associated with them and their associated safety issues.	Chapter 2, Section 9, pp. 127-129
SC.912.P.10.12 Differentiate between chemical and nuclear reactions.	Chapter 2, Section 9, p. 129
SC.912.P.10.14 Differentiate among conductors, semiconductors, and insulators.	Chapter 9, Section 5, p. 847
SC.912.P.10.15 Investigate and explain the relationships among current, voltage, resistance, and power.	Chapter 9, Section 2, pp. 818-825; Section 3, pp. 827-834; Section 4, pp. 835-842; Section 5, pp. 843-855; Section 6, pp. 856-868; Section 8, pp. 893-894
SC.912.P.10.18 Explore the theory of electromagnetism by comparing and contrasting the different parts of the electromagnetic spectrum in terms of wavelength, frequency, and energy, and relate them to phenomena and applications.	Chapter 3, Section 5, pp. 193-195
SC.912.P.10.21 Qualitatively describe the shift in frequency in sound or electromagnetic waves due to the relative motion of a source or a receiver.	Chapter 6, Section 3, pp. 458-460; Extending the Connection, pp. 536A-536B

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Standard 12: Motion of Objects	
A: Motion can be measured and described qualitatively and quantitatively. Net forces create a change in motion. When objects travel at speeds comparable to the speed of light, Einstein's special theory of relativity applies.	
B: Momentum is conserved under well-defined conditions. A change in momentum occurs when a net force is applied to an object over a time interval.	
C: The law of Universal Gravitation states that gravitational forces act on all objects irrespective of their size and position.	
D: Gases consist of great numbers of molecules moving in all directions. The behavior of gases can be modeled by the kinetic molecular theory.	
E: Chemical reaction rates change with conditions under which they occur. Chemical equilibrium is a dynamic state in which forward and reverse processes occur at the same rates.	
SC.912.P.12.2 Analyze the motion of an object in terms of its position, velocity, and acceleration (with respect to a frame of reference) as functions of time.	Chapter 6, Section 1, pp. 429, 433-434; Section 2, p. 438; Section 3, pp. 448-457, 461, 463-465; Section 4, pp. 466-480, 482-485; Section 5, pp. 489-503; Section 6, pp. 504-518; Extending the Connection, pp. 536A-536B Chapter 7, Section 2, pp. 559-570; Section 4, pp. 589-597; Section 5, pp. 599-603; Extending the Connections, pp. 664A-664B Chapter 8, Section 1, pp. 677-682, 684-685; Section 2, pp. 687-689
SC.912.P.12.3 Interpret and apply Newton's three laws of motion.	Chapter 6, Section 7, pp. 519-529 Chapter 7, Section 1, pp. 548-550; Section 3, pp. 571-587; Section 6, pp. 612-623; Section 7, pp. 626-627 Chapter 8, Section 5, pp. 718-726; Section 6, pp. 732-741, 744-745; Section 7, pp. 746-761; Section 10, pp. 785-795
SC.912.P.12.4 Describe how the gravitational force between two objects depends on their masses and the distance between them.	Chapter 8, Section 4, pp. 708-713, 716-717
SC.912.P.12.7 Recognize that nothing travels faster than the speed of light in vacuum which is the same for all observers no matter how they or the light source are moving.	Chapter 7, Section 1, p. 552
SC.912.P.12.10 Interpret the behavior of ideal gases in terms of kinetic molecular theory.	Chapter 4, Section 3, pp. 268-271; Section 4, pp. 279-281; Section 6, pp. 300-301; Section 7, pp. 306-307
SC.912.P.12.11 Describe phase transitions in terms of kinetic molecular theory.	Chapter 4, Section 2, pp. 260-261
SC.912.P.12.12 Explain how various factors, such as concentration, temperature, and presence of a catalyst affect the rate of a chemical reaction.	Chapter 3, Section 7, p. 217 Chapter 5, Section 6, pp. 382-383

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Standard 17: Interdependence	
A: The distribution and abundance of organisms is determined by the interactions between organisms, and between organisms and the non-living environment.	
B: Energy and nutrients move within and between biotic and abiotic components of ecosystems via physical, chemical and biological processes.	
C: Human activities and natural events can have profound effects on populations, biodiversity and ecosystem processes.	
SC.912.L.15.2 Discuss the use of molecular clocks to estimate how long ago various groups of organisms diverged evolutionarily from one another.	Chapter 4, Extending the Connection, pp. 324A-324B
SC.912.L.16.10 Evaluate the impact of biotechnology on the individual, society and the environment, including medical and ethical issues.	Chapter 3, Extending the Connection, pp. 240A-240B
SC.912.L.17.11 Evaluate the costs and benefits of renewable and nonrenewable resources, such as water, energy, fossil fuels, wildlife, and forests.	Chapter 9, Section 7 - 9, pp. 876-911
SC.912.L.17.15 Discuss the effects of technology on environmental quality.	Chapter 8, Extending the Connection, pp. 800A-800B
SC.912.L.17.16 Discuss the large-scale environmental impacts resulting from human activity, including waste spills, oil spills, runoff, greenhouse gases, ozone depletion, and surface and groundwater pollution.	Chapter 5, Extending the Connection, pp. 410A-410B
SC.912.L.17.19 Describe how different natural resources are produced and how their rates of use and renewal limit availability.	Chapter 2, Extending the Connection, p. 138A
SC.912.L.17.20 Predict the impact of individuals on environmental systems and examine how human lifestyles affect sustainability.	Chapter 2, Extending the Connection, p. 138B

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Standard 18: Matter and Energy Transformations	
A: All living things are composed of four basic categories of macromolecules and share the same basic needs for life.	
B: Living organisms acquire the energy they need for life processes through various metabolic pathways (primarily photosynthesis and cellular respiration).	
C: Chemical reactions in living things follow basic rules of chemistry and are usually regulated by enzymes.	
D: The unique chemical properties of carbon and water make life on Earth possible.	
SC.912.L.18.12 Discuss the special properties of water that contribute to Earth's suitability as an environment for life: cohesive behavior, ability to moderate temperature, expansion upon freezing, and versatility as a solvent.	Chapter 9, Extending the Connection, pp. 916A-916B
Standard 2: Nonfiction	
LA.910.2.2.3 The student will organize information to show understanding or relationships among facts, ideas, and events (e.g., representing key points within text through charting, mapping, paraphrasing, summarizing, comparing, contrasting, or outlining);	*Students are required to organize information and give proof of understanding relationships among facts, ideas, and events throughout the book. Examples include the following:* Chapter 1, Section 2, p. 32 Chapter 2, Section 3, p. 65 Chapter 3, Section 7, p. 218 Chapter 4, Section 3, p. 272 Chapter 5, Section 6, pp. 383-384 Chapter 6, Section 1, pp. 425, 434; Section 2, pp. 437-438; Section 5, p. 491 Chapter 7, Section 2, pp. 559-562; Section 9, p. 651 Chapter 8, Section 1, p. 675; Section 2, pp. 688-689; Section 3, p. 700; Section 5, pp. 720-721; Section 8, p. 764; Section 9, pp. 774-775 Chapter 9, Section 4, pp. 835-836; Section 9, p. 904
Standard 2: Informative	
LA.910.4.2.2 The student will record information and ideas from primary and/or secondary sources accurately and coherently, noting the validity and reliability of these sources and attributing sources of information;	*Primary and secondary sources are used throughout the book. Examples include the following:* Chapter 1, Section 1, p. 20 Chapter 2, Section 4, p. 76 Chapter 3, Section 5, p. 199 Chapter 4, Section 3, p. 274 Chapter 5, Section 5, p. 378; Section 8, p. 405 Chapter 6, Section 2, p. 447 Chapter 7, Section 6, p. 618 Chapter 8, Section 1, p. 677; Section 2, p. 697 Chapter 9, Section 1, p. 817