Correlation of *Introductory Physical Science 9th Edition* with the Next Generation Sunshine State Science Standards

COURSE TITLE: **M/J Physical Science, Advanced**

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SUBMISSION TITLE: ***Introductory Physical Science 9th Edition***

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BENCHMARKS		
Number	**Descriptor**	**Pages or Location Where Taught**
LA.6.2.2.3	The student will organize information to show understanding (e.g., representing main ideas within text through charting, mapping, paraphrasing, summarizing, or comparing/contrasting).	Virtually every experiment (50) in the text calls for this activity. The TGRB provides explicit suggestions on how students should do so in their notebooks.
LA.6.4.2.2	The student will record information (e.g., observations, notes, lists, charts, legends) related to a topic, including visual aids to organize and record information and include a list of sources used.	Virtually every experiment (50) in the text calls for this activity. The TGRB provides explicit suggestions on how students should do so in their notebooks.
MA.6.A.3.6	Construct and analyze tables, graphs, and equations to describe linear functions and other simple relations using both common language and algebraic notation.	Exp. 3.9 Freezing and Melting, p. 56. Exp. 7.5 Radioactive Decay, p. 151 Exp. 13.1 Heating Produced by a Slowly Falling Object, p.262 Exp. 13.5 Changing Gravitational Potential Energy to Kinetic Energy p. 274 Exp. 14.3 The Elastic Force: Hooke's Law. P. 289 Exp. 14.4 The Magnetic Force, p.291 Exp. 16.1 The Motion Detector, p.324 Exp. 16.3 Motion Under a Constant Net Force. P.336 Exp. 16.6 Testing a Prediction; The Relationship Between Mass and Change in Velocity, p. 339
MA.6.S.6.2	Select and analyze the measures of central tendency or variability to represent, describe, analyze, and/or summarize a data set for the purposes of answering questions appropriately.	Exp. 2.4 The Mass of Ice and Water, p.36 Exp. 2.5 The Mass of Copper and Sulfur Exp. 2.6 The Mass of a Gas Exp. 3.5 The Density of a Solid Exp, 3.6 The Density of a Liquid Exp, 3.7 The Density of a Gas

SC.6.N.1.1	Define a problem from the sixth grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.	No sixth grade curriculum available. Virtually all experiments in this program call for this type of activity
SC.6.N.1.2	Explain why scientific investigations should be replicable.	All the experiments are done by groups of two – four students resulting in replication of data that are analyzed by the entire class with histograms.
SC.6.N.1.3	Explain the difference between an experiment and other types of scientific investigation, and explain the relative benefits and limitations of each.	N/A
SC.6.N.1.4	Discuss, compare, and negotiate methods used, results obtained, and explanations among groups of students conducting the same investigation.	All the experiments are done by groups of two – four students resulting in replication of data that are analyzed with histograms.
SC.6.N.1.5	Recognize that science involves creativity, not just in designing experiments, but also in creating explanations that fit evidence.	All experiments require the creation of explanations by students and are not provided in the text.
SC.6.N.2.1	Distinguish science from other activities involving thought.	N/A
SC.6.N.2.2	Explain that scientific knowledge is durable because it is open to change as new evidence or interpretations are encountered.	The sequence of experiments in Chapter 6 pages 116 -134 examines the history of the evidence and interpretation of experiments that led to the understanding of elements.
SC.6.N.2.3	Recognize that scientists who make contributions to scientific knowledge come from all kinds of backgrounds and possess varied talents, interests, and goals.	N/A
SC.6.N.3.1	Recognize and explain that a scientific theory is a well-supported and widely accepted explanation of nature and is not simply a claim posed by an individual. Thus, the use of the term theory in science is very different than how it is used in everyday life.	The development of the atomic model/theory is the subject of Chapter 8, pages 158 – 178 provides a detailed example of the use of theory or models to explain nature.
SC.6.N.3.2	Recognize and explain that a scientific law is a description of a specific relationship under given conditions in the natural world. Thus, scientific laws are different from societal laws.	The sequence of experiments in Chapter 2, pages 28 – 41 result in the Law of Conservation of Mass outlines the nature of laws in the natural world vs. those in the social world. Other similar examples are presented for Boyle's Law, Law of Conservation of Energy, and Newton's three

		laws.
SC.6.N.3.3	Give several examples of scientific laws.	Law of Conservation of Mass, pages 28-41 Avogadro's Law, page 199-200 Law of Conservation of Energy, pages 276-278. Newton' Third Law, page 298 Newton's First Law, page 320 Newton's Second Law, page 340
SC.6.N.3.4	Identify the role of models in the context of the sixth grade science benchmarks.	The development of the atomic model is the subject of Chapter 8, pages 158 – 178 provides a detailed example of the use of models to explain nature. The periodic table is treated as a model in Chapter 10, pages 217-219.
SC.6.P.11.1	Explore the Law of Conservation of Energy by differentiating between potential and kinetic energy. Identify situations where kinetic energy is transformed into potential energy and vice versa.	Exp. 13.5, page 274 measures the conversion of gravitational potential energy to kinetic energy and results in the law of conservation of energy on page 276.
SC.6.P.12.1	Measure and graph distance versus time for an object moving at a constant speed. Interpret this relationship.	The series of experiments in Chapter 16; Exp. 16.1 The Motion Detector, Exp. 16.3, page 324, Velocity Graphs, page 330, Motion Under a Constant Force, page 332, Exp. 16.6 Testing a Prediction: The Relationship Between Mass and Change in Velocity all utilize graphs of distance and time.
SC.6.P.13.1	Investigate and describe types of forces including contact forces and forces acting at a distance, such as electrical, magnetic, and gravitational.	Chapter 14, pages 283 -298 include forces of gravity, magnetic, and frictional; including Activity 14.3 The Elastic Force: Hooke's Law, Exp. 14.4 The Magnetic Force, and Exp. 14.5 Sliding Friction.
SC.6.P.13.2	Explore the Law of Gravity by recognizing that every object exerts gravitational force on every other object and that the force depends on how much mass the objects have and how far apart they are.	Exp. 14.2 The Gravitational Force examines gravity. Exp. 16.6 Testing a Prediction; The Relation Between Mass and Change in Velocity examine the effect of gravity on free fall.
SC.6.P.13.3	Investigate and describe that an unbalanced force acting on an object changes its speed, or direction of motion, or both.	The sequence of experiments and reading in Chapter 15, pages 304-320 including Exp. 15.3 Balance Forces in a Plane, page 308 and Exp. 15.6 Forces Acting on Moving Objects, page 317 produce an understanding of what happens when unbalance forces act on a moving object.
SC.7.N.1.1	Define a problem from the seventh grade curriculum, use appropriate reference materials to support scientific understanding, plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables,	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

	and graphics, analyze information, make predictions, and defend conclusions.	
SC.7.N.1.2	Differentiate replication (by others) from repetition (multiple trials).	Students are aware of the difference in virtually all experiments when they compare their results to that of the other groups in their class.
SC.7.N.1.3	Distinguish between an experiment (which must involve the identification and control of variables) and other forms of scientific investigation and explain that not all scientific knowledge is derived from experimentation.	The course provides a wide variety of types of experiments. Variables are carefully controlled in Exp. 13.1 Heating Produced by a Slowly Falling Object, page 262, Exp. 13.5 Changing Gravitational Potential Energy to Kinetic Energy, page 274, and Exp. 6.4 The Synthesis of Zinc Chloride. Page 123. Other activities include the use of mental and physical models in Chapter 8 where the atomic model is introduced and Chapter 9 when molecular motion is added to the model,
SC.7.N.1.4	Identify test variables (independent variables) and outcome variables (dependent variables) in an experiment.	Variables are carefully controlled to make it possible to measure outcome variables in Exp. 13.1 Heating Produced by a Slowly Falling Object, page 262, Exp. 13.5 Changing Gravitational Potential Energy to Kinetic Energy, page 274, and Exp. 6.4 The Synthesis of Zinc Chloride. Page 123.
SC.7.N.1.5	Describe the methods used in the pursuit of a scientific explanation as seen in different fields of science such as biology, geology, and physics.	N/A
SC.7.N.1.6	Explain that empirical evidence is the cumulative body of observations of a natural phenomenon on which scientific explanations are based.	Empirical/experimental evidence is collected as the evidence necessary to produce the scientific explanations in the Law of Conservation of Mass, pages 28-41, Avogadro's Law, page 199-200, Law of Conservation of Energy, pages 276-278, Newton' Third Law, page 298, Newton's First Law, page 320, and Newton's Second Law, page 340.
SC.7.N.1.7	Explain that scientific knowledge is the result of a great deal of debate and confirmation within the science community.	The sequence of experiments in Chapter 6 pages 116 -134 examines the debate between Proust and Berthollet over whether reactions were complete and therefore the law of constant proportion applied
SC.7.N.2.1	Identify an instance from the history of science in which scientific knowledge has changed when new evidence or new interpretations are encountered.	The sequence of experiments in Chapter 6 pages 116 -134 examines the history of the evidence and interpretation of experiments that led to the understanding of elements.
SC.7.N.3.1	Recognize and explain the difference between theories and laws and give several examples of scientific theories and the evidence that	Chapter 9, pages 181-206 explain how the theory of the behavior of gases produced Boyles Law and Avogadro's Law.

	supports them.	
SC.7.N.3.2	Identify the benefits and limitations of the use of scientific models.	The development of the atomic model is the subject of Chapter 8, pages 158 – 178 provides a detailed example of the use of models to explain nature. The periodic table is treated as a model in Chapter 10, pages 217-219 that resulted in the prediction of the properties of several unknown elements
SC.7.P.10.1	Illustrate that the sun's energy arrives as radiation with a wide range of wavelengths, including infrared, visible, and ultraviolet, and that white light is made up of a spectrum of many different colors.	N/A
SC.7.P.10.2	Observe and explain that light can be reflected, refracted, and/or absorbed.	N/A
SC.7.P.10.3	Recognize that light waves, sound waves, and other waves move at different speeds in different materials.	N/A
SC.7.P.11.1	Recognize that adding heat to or removing heat from a system may result in a temperature change and possibly a change of state.	Exp. 5.1 Fractional Distillation, page 96 results in understanding how the change in state from liquid to solid can be used to separate two substances.
SC.7.P.11.2	Investigate and describe the transformation of energy from one form to another.	All of Chapter 12 Heating and Cooling pages 239-257 and Chapter 13 Potential Energy and Kinetic Energy, pages 261-282 involve the transformation of energy from one form to another.
SC.7.P.11.3	Cite evidence to explain that energy cannot be created nor destroyed, only changed from one form to another.	Exp. 13.5, page 274 measures the conversion of gravitational potential energy to kinetic energy and results in the law of conservation of energy on page 276.
SC.7.P.11.4	Observe and describe that heat flows in predictable ways, moving from warmer objects to cooler ones until they reach the same temperature.	Chapter 12 Heating and Cooling, pages 239-257 traces the transfer of heat from one object to another in Exp. 12.2 Mixing Warm and Cool Water. Page 242 and Exp. 12.4 Cooling a Warm Solid in Cool Water, page 248, and Exp. 12.6 Melting Ice. Page 252.
SC.8.N.1.1	Define a problem from the eighth grade curriculum using appropriate reference materials to support scientific understanding, plan and carry out scientific investigations of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.

	predictions, and defend conclusions.	
SC.8.N.1.2	Design and conduct a study using repeated trials and replication.	Most of the experiments in the course requires repeated trials by the class and the analysis through the use of histograms.
SC.8.N.1.3	Use phrases such as "results support" or "fail to support" in science, understanding that science does not offer conclusive 'proof' of a knowledge claim.	Chapter 2 Mass Changes in Closed Systems, pages 27-42 stress this point and states on page 39, "But from these experiments alone, you cannot predict with confidence that there will be no change in mass under other circumstances. This is typical of the language in the text and what the students are taught.
SC.8.N.1.4	Explain how hypotheses are valuable if they lead to further investigations, even if they turn out not to be supported by the data.	The sequence of experiments in Chapter 6 pages 116 -134 examines the different hypotheses of Proust and Berthollet over whether reactions were complete and therefore the law of constant proportion applied. Their debate and disagreement lead to further investigation.
SC.8.N.1.5	Analyze the methods used to develop a scientific explanation as seen in different fields of science.	N/A
SC.8.N.1.6	Understand that scientific investigations involve the collection of relevant empirical evidence, the use of logical reasoning, and the application of imagination in devising hypotheses, predictions, explanations and models to make sense of the collected evidence.	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
SC.8.N.2.1	Distinguish between scientific and pseudoscientific ideas.	N/A
SC.8.N.2.2	Discuss what characterizes science and its methods.	See the *To Student* section on page xiii.
SC.8.N.3.1	Select models useful in relating the results of their own investigations.	The model of molecules in motion in Chapter 9 Molecular Motion, pages 181-205 is an example of the use of a model to explain the evidence from investigations.
SC.8.N.3.2	Explain why theories may be modified but are rarely discarded.	The discussion of Avogadro's Law, page 199 discusses the problems with the acceptance of the law and how it came to be understood and accepted after additional evidence was available.
SC.8.N.4.1	Explain that science is one of the processes that can be used to inform decision making at the community, state, national, and international levels.	N/A
SC.8.N.4.2	Explain how political, social, and economic concerns can affect science, and vice versa.	N/A

SC.8.P.8.1	Explore the scientific theory of atoms (also known as atomic theory) by using models to explain the motion of particles in solids, liquids, and gases.	Chapters 8 The Atomic Model of Matter and Chapter 9 Molecular Motion pages 158- 205 use models to explain the motion of molecules.
SC.8.P.8.2	Differentiate between weight and mass recognizing that weight is the amount of gravitational pull on an object and is distinct from, though proportional to, mass.	Section 14.2 Weight: The Gravitational Force, page 285-286 covers this topic very thoroughly.
SC.8.P.8.3	Explore and describe the densities of various materials through measurement of their masses and volumes.	Three experiments, Exp. 3.5 The Density of a Solid, page 50, Exp. 3.6 The Density of a Liquid, page 51 and Exp. 3.7 The Density of a Gas, page 52 and the discussion of many problems does a thorough job of describing this concept.
SC.8.P.8.4	Classify and compare substances on the basis of characteristic physical properties that can be demonstrated or measured; for example, density, thermal or electrical conductivity, solubility, magnetic properties, melting and boiling points, and know that these properties are independent of the amount of the sample.	Chapter 3 Characteristic Properties pages 43-67 thoroughly covers this topic the five experiments, three that deal with density, one with melting point and one about boiling point.
SC.8.P.8.5	Recognize that there are a finite number of elements and that their atoms combine in a multitude of ways to produce compounds that make up all of the living and nonliving things that we encounter.	The concept and evidence for compounds and elements is developed in Chapter 6 Compounds and Elements, pages 115-134 with three experiments; Exp. 6.2 Decomposition of Water, page 116, Exp. 6.4 The Synthesis of Zinc Chloride, page 123, and Exp. 6.6 Reaction of Copper, page 127 and Exp. 6.7 The Separation of a Mixture of Copper Oxide and Copper.
SC.8.P.8.6	Recognize that elements are grouped in the periodic table according to similarities of their properties.	Chapter 10, pages 207 -219 is devoted to the development of the periodic table.
SC.8.P.8.7	Explore the scientific theory of atoms (also known as atomic theory) by recognizing that atoms are the smallest unit of an element and are composed of sub-atomic particles (electrons surrounding a nucleus containing protons and neutrons).	Chapters 8 The Atomic Model of Matter, pages 157-178 and Chapter 9 Molecular Motion pages 158- 205 develop the atomic models to explain the atom as the particle of elements..
SC.8.P.8.8	Identify basic examples of and compare and classify the properties of compounds, including acids, bases, and salts.	Acids are used in a variety of experiments in the course but are not compared to bases.
SC.8.P.8.9	Distinguish among mixtures (including solutions) and pure substances.	Chapter 5 Separation of Mixtures, pages 95-112 develops the idea of mixtures and how they can be separated into pure substances.

SC.8.P.9.1	Explore the Law of Conservation of Mass by demonstrating and concluding that mass is conserved when substances undergo physical and chemical changes.	The sequence of four experiments in Chapter 2, pages 28 – 41; Exp. 2.4 The Mass of Ice and Water, p.36, Exp. 2.5 The Mass of Copper and Sulfur, Exp. 2.6 The Mass of a Gas result in the Law of Conservation of Mass.
SC.8.P.9.2	Differentiate between physical changes and chemical changes.	Physical changes such as boiling point, solubility, density are used to separate mixtures into their component pure substances. Chemical changes are use to decompose substance and isolate elements.
SC.8.P.9.3	Investigate and describe how temperature influences chemical changes.	Exp. 12.8 Heat of Reactions is used to study the increase in temperature in reactions.
SC.912.P.8.1	Differentiate among the four states of matter.	The four states of matter are presented after the atomic model is introduced in Chapter 8 The Atomic Model of Matter, pages 157- 174. The details of molecular motion are described in Chapter 9 Molecular Motion, pages 181-205.
SC.912.P.8.2	Differentiate between physical and chemical properties and physical and chemical changes of matter.	Physical changes such as boiling point, solubility, density are used to separate mixtures into their component pure substances. Chemical changes are use to decompose substance and isolate elements.
SC.912.P.8.4	Explore the scientific theory of atoms (also known as atomic theory) by describing the structure of atoms in terms of protons, neutrons and electrons, and differentiate among these particles in terms of their mass, electrical charges and locations within the atom.	Chapters 8 The Atomic Model of Matter and Chapter 9 Molecular Motion pages 158- 205 use models to explain the atomic theory and the motion of molecules.
SC.912.P.8.5	Relate properties of atoms and their position in the periodic table to the arrangement of their electrons.	N/A
SC.912.P.8.7	Interpret formula representations of molecules and compounds in terms of composition and structure.	Combining ratios or formula of elements in a variety of compounds is used in Chapter 10, pages 181-205 to help classify the elements into families in the periodic table.
SC.912.P.8.11	Relate acidity and basicity to hydronium and hydroxyl ion concentration and pH.	N/A
SC.912.P.10.1	Differentiate among the various forms of energy and recognize that they can be transformed from one form to others.	Chapters 12 Heating and Cooling, pages 239-257 and 13 Potential Energy and Kinetic Energy, pages 261-279 develop the various forms of energy and their transformations through a series of five experiments.

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 12 Heating and Cooling, pages 239-256 Exp. 12.6 Melting Ice, page 252 and a discussion of heat of vaporization and heat of fusion on pages 253-254.
SC.912.P.10.5	Relate temperature to the average molecular kinetic energy.	Chapter 9 Molecular Motion, pages 181-205 relates the temperature of a gas to the average speed of the molecules.

ACCESS POINTS FOR STUDENTS WITH SIGNIFICANT COGNITIVE DISABILITIES		
Access Point Code	**Access Point Descriptor**	**Pages or Location Where Taught**
SC.6.N.1.In.a.	Identify a problem from the sixth grade curriculum, use reference materials to gather information, carry out an experiment, collect and record data, and report results.	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
SC.6.N.1.Su.b.	Recognize that experiments involve procedures that can be repeated the same way by others.	The consistent procedure in the course is the use of class data wherein groups of two students perform the same experiment.
SC.6.N.1.Pa.c.	Recognize that people conduct activities and share information about science.	The use of class data to reach conclusion on most experiments exemplifies this idea.
SC.6.N.2.In.a.	Identify familiar topics included in the study of science.	The use of real world examples throughout the course makes the study of science relevant.
SC.6.N.2.Su.b.	Recognize that scientific knowledge changes when new things are discovered.	There are a number of examples where new data demonstrate the changing nature of science.
SC.6.N.3.In.a.	Identify that a scientific theory is an explanation of nature supported by evidence.	The development of the atomic model/theory is the subject of Chapter 8, pages 158 – 178 provides a detailed example of the use of theory or models to explain nature.
SC.6.N.3.Su.b.	Recognize events that are based on scientific laws, such as the law of gravity.	A variety of laws are introduced including Law of Conservation of Mass, Newton's three laws and the Law of Conservation of Energy. In all cases the evidence for these laws is carefully presented through experiments that the students conduct.
SC.6.P.11.In.a.	Identify energy as stored (potential) or expressed in motion (kinetic).	Exp. 13.5, page 274 measures the conversion of gravitational potential energy to kinetic energy and results in the law of conservation of energy on page 276.Students have a variety of

		representations of energy and ways in which to document their understanding.
SC.6.P.12.In.a.	Identify that speed describes the distance and time in which an object is moving, such as miles per hour.	The Motion Detector, Exp. 16.3, page 324, Velocity Graphs, page 330 provides both a personal physical experience of their own motion as it is recorded and graphed on the computer.
SC.6.P.13.In.a.	Identify examples of gravitational and contact forces, such as falling objects or push and pull.	The pictures of free falling objects in Section 16.9 coupled with the video of the hammer and feather being dropped on the moon demonstrates in concrete terms the effect of gravity on freely falling objects.
SC.6.P.13.Su.b.	Recognize that force can change the speed and direction of an object in motion.	The sequence of experiments and reading in Chapter 15, pages 304-320 including Exp. 15.3 Balance Forces in a Plane, page 308 and Exp. 15.6 Forces Acting on Moving Objects, page 317 produce an understanding of what happens when unbalance forces act on a moving object.
SC.6.P.13.Pa.c.	Recognize the speed (fast or slow) of a moving object.	The Motion Detector, Exp. 16.3, page 324, Velocity Graphs, page 330 provides both a personal physical experience of students' own motion as it is recorded and graphed on the computer.
SC.7.N.1.In.a.	Identify a problem from the seventh grade curriculum, use reference materials to gather information, carry out an experiment, collect and record data, and report results.	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
SC.7.N.1.Su.b.	Recognize what is tested in a simple experiment (dependent variable).	Variables are carefully controlled to make it possible to measure outcome variables in Exp. 13.1 Heating Produced by a Slowly Falling Object, page 262, Exp. 13.5 Changing Gravitational Potential Energy to Kinetic Energy, page 274, and Exp. 6.4 The Synthesis of Zinc Chloride. Page 123.
SC.7.N.1.Pa.c.	Associate objects and activities with science.	In every experiment the apparatus in germane to the activity resulting in observations and conclusions.
SC.7.N.2.In.a.	Identify an example of a change in scientific knowledge based on new evidence or new interpretations.	There are a number of examples where new data demonstrate the changing nature of science.
SC.7.N.3.In.a.	Identify that scientific theories are explanations and laws describe relationships, and both are supported by evidence.	A variety of laws are introduced including Law of Conservation of Mass, Newton's three laws and the Law of Conservation of Energy. In all cases the evidence for these laws is carefully

		presented through experiments that the students conduct.
SC.7.N.3.Su.b.	Recognize a benefit of using a model to explain how things work.	Models are used in the development of the atomic model of mater in Chapter 8 and in Chapter 9 in the study of molecular motion. In the later example a physical model called a sphere-gas machine is used to simulate molecular motion in a gas.
SC.7.P.10.In.a.	Identify that white (visible) light has many colors, such as when viewed with a prism.	N/A
SC.7.P.10.Su.b.	Recognize that light can be reflected.	N/A
SC.7.P.10.Pa.c.	Match light and sound to their sources.	N/A
SC.7.P.11.In.a.	Identify that when heat is added or taken away, a temperature change occurs.	Chapter 12 Heating and Cooling, pages 239-257 traces the transfer of heat from one object to another in Exp. 12.2 Mixing Warm and Cool Water. Page 242 and Exp. 12.4 Cooling a Warm Solid in Cool Water, page 248, and Exp. 12.6 Melting Ice. Page 252.
SC.7.P.11.Su.b.	Recognize that energy can change forms, such as electricity produces light and heat in a lamp.	Exp. 13.5, page 274 measures the conversion of gravitational potential energy to kinetic energy and results in the law of conservation of energy on page 276.
SC.8.N.1.In.a.	Identify a problem from the eighth grade curriculum, use reference materials to gather information, carry out an experiment, collect and record data, and report results.	All the experiments in the text require students to plan and carry out scientific investigation of various types, such as systematic observations or experiments, identify variables, collect and organize data, interpret data in charts, tables, and graphics, analyze information, make predictions, and defend conclusions.
SC.8.N.1.Su.b.	Recognize a possible explanation (hypothesis) for a science problem.	There are a number of concepts in the course where predictions are made based on a hypothesis; the atomic model, the motion of molecules, the explanation of free fall being independent of the mass of the object.
SC.8.N.2.In.a.	Identify that scientific knowledge must be supported by evidence.	This is the very essence of this course. Little, if any facts or knowledge are presented without prior experimental evidence collected by the students themselves.
SC.8.N.3.In.a.	Identify models used in the context of one's own study of science.	Models are used in the development of the atomic model of mater in Chapter 8 and in Chapter 9 in the study of molecular motion. In the later example a physical model called a sphere-gas machine is used to simulate

SC.8.N.3.Su.b.	Recognize that scientific theories can change.	There are a number of examples where new data demonstrate the changing nature of science.
SC.8.N.4.In.a.	Identify ways that science processes can be used to make informed decisions in the community, state, and nation.	N/A
SC.8.P.8.In.a.	Compare properties of solids, liquids, and gases	The densities of all three phases of matter are measured in Chapter 3. Chapter 8 and 9 use models, diagrams and text to compare the properties of solids, liquids and gases.
SC.8.P.8.Su.b.	Compare the weight of different sized objects.	Section 14.2 Weight: The Gravitational Force, page 285-286 covers this topic very thoroughly.
SC.8.P.8.Pa.c.	Recognize substances by physical properties, such as weight (heavy and light), size (big and small), and temperature (hot and cold).	Chapter 3 Characteristic Properties pages 43-67 thoroughly covers this topic the five experiments, three that deal with density, one with melting point and one about boiling point.
SC.8.P.9.In.a.	Observe and classify changes in matter as physical (reversible) or chemical (irreversible).	Physical changes such as boiling point, solubility, density are used to separate mixtures into their component pure substances. Chemical changes are use to decompose substance and isolate elements.
SC.8.P.9.Su.b.	Observe and recognize changes caused by heat on substances.	Chapter 12 Heating and Cooling, pages 239-257 traces the transfer of heat from one object to another in Exp. 12.2 Mixing Warm and Cool Water. Page 242 and Exp. 12.4 Cooling a Warm Solid in Cool Water, page 248, and Exp. 12.6 Melting Ice. Page 252.
SC.912.P.8.In.a.	Classify states of matter as solid, liquid, and gaseous.	The sphere-gas machine (pages 182- 195) provides a simulation of a gas under pressure or an increase of temperature. Diagrams are used in parallel with the physical simulation.
SC.912.P.8.Su.b.	Identify examples of physical and chemical changes.	Physical change is modeled with distillation (page 96) solubility (page 72) and melting (page 56). Chemical change
SC.912.P.8.Pa.c.	Recognize that the parts of an object can be put together to make a whole.	N/A
SC.912.P.10.In.a.	Identify examples of energy being transformed from one form to another (conserved quantity).	Exp. 13.5, page 274 measures the conversion of gravitational potential energy to kinetic energy and results in the law of conservation of energy on page 276.
SC.912.P.10.Su.b.	Recognize the relationship between work and power, such as power is the amount of work a person or machine does.	N/A
SC.912.P.10.P	Recognize the source and recipient of heat	Chapter 12 Heating and Cooling, pages 239-256 Exp. 12.6 Melting Ice, page 252 and a discussion

a.c.	transfer.	of heat of vaporization and heat of fusion on pages 253-254.