Performance Expectations at a Glance

In this unit, students will discover and practice the Science and Engineering Practices, Disciplinary Core Ideas, and Crosscutting Concepts needed to perform the following Performance Expectations.

Performance Expectations	Module: **Classification and States of Matter**	Module: **Matter: Properties and Changes**
MS-PS1-1	●	
MS-PS1-2		●
MS-PS1-4	●	
MS-PS1-5		●
MS-PS1-6		●
MS-ETS1-1		●
MS-ETS1-2		●
MS-ETS1-3		●
MS-ETS1-4		●

Correlations by Module to the NGSS

MODULE: Classification and States of Matter

MS-PS1	Matter and its Interactions	
MS-PS1-1.	**MS-PS1-1. Develop models to describe the atomic composition of simple molecules and extended structures.** [Clarification Statement: Emphasis is on developing models of molecules that vary in complexity. Examples of simple molecules could include ammonia and methanol. Examples of extended structures could include sodium chloride or diamonds. Examples of molecular-level models could include drawings, 3D ball and stick structures, or computer representations showing different molecules with different types of atoms.] [*Assessment Boundary: Assessment does not include valence electrons and bonding energy, discussing the ionic nature of subunits of complex structures, or a complete description of all individual atoms in a complex molecule or extended structure is not required.*]	97–104

Labs and investigations are in italics.

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SEP Science and Engineering Practices	
Developing and Using Models* Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop a model to predict and/or describe phenomena. (MS–PS1–1) *Other aspects of this SEP are integrated throughout this module and are listed in the *Also Integrates* section.	*12–13, 22–23,* 25, 26, 37, 40, *41–42,* 43, *44–45,* 47, 49, 54, *67, 78–79, 84–85,* 92, 97–104, PhET Interactive Simulation *States of Matter: Basics* (online)
DCI Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter • Substances are made from different types of atoms, which combine with one another in various ways. Atoms form molecules that range in size from two to thousands of atoms. (MS-PS1-1)	19–21, *22–23,* 23, 26–27, 78–79, 79, 82–83, *84–85,* 86–87, 88, *88–89,* 89, *89–90,* 90, 92, 94, 97–104
• Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals). (MS-PS1-1)	83, 85–86, 88, *88–89,* 91–92
CCC Crosscutting Concepts	
Scale, Proportion, and Quantity • Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small. (MS-PS1-1)	*15,* 16–18, 37, 40, *44–45,* 47, 49, 54, *67, 78–79,* 82–83, *84–85,* 97–104, PhET Interactive Simulation *States of Matter: Basics* (online)
CCSS ELA/Literacy Connections	
ELA RST.6–8.7	19, 25, 37, 43, 47, 52, Literacy Skill Handbook (online)
CCSS Math Connections	
Math MP.2	16–17, *22–23*, Math Skill Handbook (online)
Math MP.4	*22–23, 60–61, 63–65*, Math Skill Handbook (online)
Math 6.RP.A.3	*22–23,* Math Skill Handbook (online)

MS-PS1	Matter and its Interactions	
MS-PS1-4.	**Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed.** [Clarification Statement: Emphasis is on qualitative molecular-level models of solids, liquids, and gases to show that adding or removing thermal energy increases or decreases kinetic energy of the particles until a change of state occurs. Examples of models could include drawings and diagrams. Examples of particles could include molecules or inert atoms. Examples of pure substances could include water, carbon dioxide, and helium.]	97–104

Labs and investigations are in italics.

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SEP Science and Engineering Practices	
Developing and Using Models* Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop a model to predict and/or describe phenomena. (MS-PS1-4) *Other aspects of this SEP are integrated throughout this module and are listed in the *Also Integrates* section.	*12–13, 22–23,* 25, 26, 37, 40, *41–42,* 43, *44–45,* 47, 49, 54, 97–104, PhET Interactive Simulation *States of Matter: Basics* (online)
DCI Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter • Gases and liquids are made of molecules or inert atoms that are moving about relative to each other. (MS-PS1-4)	*10–11, 12–13,* 14, 19, 21, 24, 36, 42–43, 45–49, 80, 97–104
• In a liquid, the molecules are constantly in contact with others; in a gas, they are widely spaced except when they happen to collide. In a solid, atoms are closely spaced and may vibrate in position but do not change relative locations. (MS-PS1-4)	*10–11, 12–13,* 14, 26, 27, 42–43, 45–49, 96, 97–104
• The changes of state that occur with variations in temperature or pressure can be described and predicted using these models of matter. (MS-PS1-4)	46–49, 53, 97–104, PhET Interactive Simulation *States of Matter: Basics* (online), Video *Melting* (online)
PS3.A: Definitions of Energy • The term "heat" as used in everyday language refers both to thermal energy (the motion of atoms or molecules within a substance) and the transfer of that thermal energy from one object to another. In science, heat is used only for this second meaning; it refers to the energy transferred due to the temperature difference between two objects. (secondary to MS-PS1-4)	*15,* 18, 40
• The temperature of a system is proportional to the average internal kinetic energy and potential energy per atom or molecule (whichever is the appropriate building block for the system's material). The details of that relationship depend on the type of atom or molecule and the interactions among the atoms in the material. Temperature is not a direct measure of a system's total thermal energy. The total thermal energy (sometimes called the total internal energy) of a system depends jointly on the temperature, the total number of atoms in the system, and the state of the material. (secondary to MS-PS1-4)	*15,* 16–18, 26, 28, 46–49, 97–104, PhET Interactive Simulation *States of Matter: Basics* (online), Video *Melting* (online)
CCC Crosscutting Concepts	
Cause and Effect • Cause and effect relationships may be used to predict phenomena in natural or designed systems. (MS-PS1-4)	37, 45, 49, 66, 71–72, 97–104
CCSS ELA/Literacy Connections	
ELA RST.6-8.7	19, 25, 37, 43, 47, , 52, Literacy Skill Handbook (online)
CCSS Math Connections	
Math 6.NS.C.5	Math Skill Handbook (online)

Labs and investigations are in italics.

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ALSO INTEGRATES:	
SEP Asking Questions and Defining Problems	7, 105
SEP Developing and Using Models	*15,* 19, *21–22,* 27, 37, 43, 47, 95
SEP Planning and Carrying Out Investigations	*10–11, 38–39,* 105
SEP Analyzing and Interpreting Data	26, *60–61, 63–65, 80–82, 86–87*
SEP Using Mathematics and Computational Thinking	*34–35,* 66, 72
SEP Constructing Explanations and Designing Solutions	8–9, *10–11,* 14, 28, 32–33, 37, 43, 49–50, 54, 58–59, 68, 71, 76–77, *80–82, 86–87,* 97–104
SEP Engaging in Argument from Evidence	54, 83, 92
SEP Obtaining, Evaluating, and Communicating Information	23A–23B, 93
Connections to Nature of Science Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena	62
DCI ESS2.C: The Role of Water on Earth's Surface Processes	50
DCI PS3.A: Definitions of Energy	*15,* 16, 18, 31, *34–35,* 36–37, 47–51, 97–104, 105
CCC Patterns	*10–11,* 11, *12–13,* 14, *15,* 16–18, *24, 60–61, 63–65, 80–82, 86–87*
CCC Systems and System Models	*12–13, 15,* 40, 49, 53, 83, 92
CCC Energy and Matter	*15,* 16–18, 28, 37, 40, 47, 49–50, 68, 97–104
CCC Structure and Function	*12–13,* 14, *80–82, 86–87,* 91–93, 95
CCSS ELA 6.SL.7.4	93
CCSS ELA 6.SL.7.5	51, 93, 97–104
CCSS ELA 6.SL.7.6	93
CCSS ELA RST.6–8.1	8–9, 32–33, 58–59, 76–77, 91
CCSS ELA RST.6–8.3	*10–11, 34–35, 38–39, 41–42, 44–45, 60–61, 63–65, 80–82, 86–87*
CCSS ELA RST.6–8.10	23A–23B, 51, 69, 91, 93
CCSS ELA WHST.6–8.2	69
CCSS ELA WHST.6–8.4	23A–23B, 69
CCSS ELA WHST.6–8.6	20, 23A–23B, 51, 69

Labs and investigations are in italics.

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CCSS ELA WHST.6–8.7	23A–23B, 51, 69
CCSS ELA WHST.6–8.9	93
CCSS Math 6.RP.A.1	*22–23*
CCSS Math 6.RP.A.2	*22–23*
CCSS Math 6.RP.A.3	*22–23*
CCSS Math 7.RP.A.2	*34–35,* 36, 43, *60–61, 63–65*, 65–66
CCSS Math 8.EE.A.3	20

MODULE: Matter: Properties and Changes

MS-PS1	Matter and its Interactions	
MS-PS1-2.	**Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.** [Clarification Statement: Examples of reactions could include burning sugar or steel wool, fat reacting with sodium hydroxide, and mixing zinc with hydrogen chloride.] [*Assessment Boundary: Assessment is limited to analysis of the following properties: density, melting point, boiling point, solubility, flammability, and odor.*]	*142–143*, 177–182

SEP Science and Engineering Practices	
Analyzing and Interpreting Data* Analyzing data in 6–8 builds on K–5 and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. • Analyze and interpret data to determine similarities and differences in findings. (MS-PS1-2) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.	*114–115*, *119–121*, *126–127*, 135, *145–146*, *164–165*, *168–171*, 177–182
Connections to Nature of Science **Scientific Knowledge is Based on Empirical Evidence** • Science knowledge is based upon logical and conceptual connections between evidence and explanations. (MS-PS1-2)	147, 171

DCI Disciplinary Core Ideas	
PS1.A: Structure and Properties of Matter • Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it. (MS-PS1-2)	114, *114–115*, 116–117, *119–121*, 122–123, *124*, 125, *126–127*, 128, *129–131*, 131–132, 134–136

Labs and investigations are in italics.

MS-ETS1	Engineering Design	
MS-ETS1-2.	**Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.**	*168–171*, 177–182
SEP Science and Engineering Practices		
Engaging in Argument from Evidence* Engaging in argument from evidence in 6–8 builds on K–5 experiences and progresses to constructing a convincing argument that supports or refutes claims for either explanations or solutions about the natural and designed world. • Evaluate competing design solutions based on jointly developed and agreed-upon design criteria. (MS-ETS1-2) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.		*168–171*, 177–182
DCI Disciplinary Core Ideas		
ETS1.B: Developing Possible Solutions • There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-2) possible solutions. (MS-ETS1-1)		*168–171*, 177–182, , Science and Engineering Practices Handbook (online)
CCSS ELA/Literacy Connections		
ELA RST.6–8.1		112–113, 140–141, 160–161, 167, Literacy Skill Handbook (online)
ELA RST.6–8.9		118, 122, *145–146*, *168–171*, 177–182, Literacy Skill Handbook (online)
ELA WHST.6–8.7		153, 173, Literacy Skill Handbook (online)
ELA WHST.6–8.9		167, 173, 177–182, Literacy Skill Handbook (online)
CCSS Math Connections		
Math MP.2		118, *119–121*, 122–123, *124*, 155, Math Skill Handbook (online)
Math 7.EE.A.3		*73–78, Math Skill Handbook (online)*

Labs and investigations are in italics.

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PS1.B: Chemical Reactions • Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-2)	*142–143*, 144, *147*, 148, *148–149*, 150, 154–156, 177–182
CCC Crosscutting Concepts	
Patterns • Macroscopic patterns are related to the nature of microscopic and atomic-level structure. (MS-PS1-2)	116–118, 122–123, 144, *145–146*, *147*, 148, *148–149*, 150, 177–182
CCSS ELA/Literacy Connections	
ELA RST.6–8.1	112–113, 140–141, 160–161, 167
ELA RST.6–8.7	134, *151*, 154, 163, 174–176, 177–182
CCSS Math Connections	
Math MP.2	118, *119–121*, 122–123, *124*, 155
Math 6.RP.A.3	*124*
Math 6.SP.B.4	Math Skill Handbook (online)
Math 6.SP.B.5	*119–121*

MS-PS1	Matter and its Interactions	
MS-PS1-5.	**Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.** [Clarification Statement: Emphasis is on law of conservation of matter and on physical models or drawings, including digital forms, that represent atoms.] [*Assessment Boundary: Assessment does not include the use of atomic masses, balancing symbolic equations, or intermolecular forces*.]	*145–146, 151*, 177–182
SEP Science and Engineering Practices		
Developing and Using Models* Modeling in 6–8 builds on K–5 and progresses to developing, using and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop a model to describe unobservable mechanisms. (MS-PS1-5) *Other aspects of this SEP are integrated throughout this module and are listed in the *Also Integrates* section.		118, *145–146*, *151*, 163, 174, 176, 177–182
Connections to Nature of Science **Science Models, Laws, Mechanisms, and Theories Explain Natural Phenomena** • Laws are regularities or mathematical descriptions of natural phenomena. (MS-PS1-5)		147, 171

Labs and investigations are in italics.

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DCI **Disciplinary Core Ideas**	
PS1.B: Chemical Reactions • Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants. (MS-PS1-5)	*142–143*, 144, *147*, 148, *148–149*, 150, 154–156, 177–182
• The total number of each type of atom is conserved, and thus the mass does not change. (MS-PS1-5)	*145–146*, *147*, 147–148, *148–149*, 150, *151*, 153–156, 177–182
CCC **Crosscutting Concepts**	
Energy and Matter • Matter is conserved because atoms are conserved in physical and chemical processes. (MS-PS1-5)	*145–146*, *147*, 147–148, *148–149*, 150, 153–156, 177–182
CCSS ELA/Literacy Connections	
ELA RST.6–8.7	134, *151*, 154, 163, 174–176, 177–182, Literacy Skill Handbook (online)
CCSS Math Connections	
Math MP.2	118, *119–121*, 122–123, *124*, 155, Math Skill Handbook (online)
Math MP.4	*119–121*, 122–123, *151*, 152, 155, Math Skill Handbook (online)
Math 6.RP.A.3	*124,* Math Skill Handbook (online)

MS-PS1	**Matter and its Interactions**	
MS-PS1-6.	**Undertake a design project to construct, test, and modify a device that either releases or absorbs thermal energy by chemical processes.** [Clarification Statement: Emphasis is on the design, controlling the transfer of energy to the environment, and modification of a device using factors such as type and concentration of a substance. Examples of designs could involve chemical reactions such as dissolving ammonium chloride or calcium chloride.] [*Assessment Boundary: Assessment is limited to the criteria of amount, time, and temperature of substance in testing the device*.]	*168–171*, 177–182

Labs and investigations are in italics.

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SEP Science and Engineering Practices	
Constructing Explanations and Designing Solutions* Constructing explanations and designing solutions in 6–8 builds on K–5 experiences and progresses to include constructing explanations and designing solutions supported by multiple sources of evidence consistent with scientific knowledge, principles, and theories. • Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints. (MS-PS1-6) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.	*168–171*, 177–182
DCI Disciplinary Core Ideas	
PS1.B: Chemical Reactions • Some chemical reactions release energy, others store energy. (MS-PS1-6)	144, *162*, 163, *164–165*, 166–167, *168–171*, 171–176
ETS1.B: Developing Possible Solutions • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (secondary to MS-PS1-6)	*168–171*, 177–182, Science and Engineering Practices Handbook (online)
ETS1.C: Optimizing the Design Solution • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of the characteristics may be incorporated into the new design. (secondary to MS-PS1-6)	*168–171*, 177–182, Science and Engineering Practices Handbook (online)
• The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (secondary to MS-PS1-6)	*168–171*, 177–182, Science and Engineering Practices Handbook (online)
CCC Crosscutting Concepts	
Energy and Matter • The transfer of energy can be tracked as energy flows through a designed or natural system. (MS-PS1-6)	163, 166–167, *168–171*, 171–172, 177–182
CCSS ELA/Literacy Connections	
ELA RST.6–8.3	*114–115*, *126–127*, *129–131*, *142–143*, *164–165*, Literacy Skill Handbook (online)
ELA WHST.6–7	153, 173, Literacy Skill Handbook (online)

Labs and investigations are in italics.

MS-ETS1	Engineering Design	
MS-ETS1.	**Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.**	*64–67*, 73–87
SEP Science and Engineering Practices		
Asking Questions and Defining Problems* Asking questions and defining problems in grades 6–8 builds on grades K–5 experiences and progresses to specifying relationships between variables, clarifying arguments and models. • Define a design problem that can be solved through the development of an object, tool, process or system and includes multiple criteria and constraints, including scientific knowledge that may limit possible solutions. (MS-ETS1-1) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.		*168–171*, 177–182
DCI Disciplinary Core Ideas		
ETS1.A: Defining and Delimiting Engineering Problems • The more precisely a design task's criteria and constraints can be defined, the more likely it is that the designed solution will be successful. Specification of constraints includes consideration of scientific principles and other relevant knowledge that are likely to limit possible solutions. (MS-ETS1-1)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
CCC Crosscutting Concepts		
Connections to Science, Technology, Society and the Environment **Influence of Science, Engineering, and Technology on Society and the Natural World** • All human activity draws on natural resources and has both short and long-term consequences, positive as well as negative, for the health of people and the natural environment. (MS-ETS1-1)		153A–153B
• The uses of technologies and limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. (MS-ETS1-1)		153A–153B
CCSS ELA/Literacy Connections		
ELA RST.6–8.1		112–113, 140–141, 160–161, 167, Literacy Skill Handbook (online)
ELA WHST.6–8.8		133, 173, Literacy Skill Handbook (online)
CCSS Math Connections		
Math MP.2		118, *119–121*, 122–123, *124*, 155, Math Skill Handbook (online)
Math 7.EE.A.3		73–78, Math Skill Handbook (online)

Labs and investigations are in italics.

MS-ETS1	Engineering Design	
MS-ETS1-3.	**Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.**	*168–171*, 177–182
SEP Science and Engineering Practices		
Analyzing and Interpreting Data* Analyzing data in 6–8 builds on K–5 experiences and progresses to extending quantitative analysis to investigations, distinguishing between correlation and causation, and basic statistical techniques of data and error analysis. • Analyze and interpret data to determine similarities and differences in findings. (MS-ETS1-3) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.		*114–115*, *119–121*, *126–127*, 135, *145–146*, *164–165*, *168–171*, 177–182
DCI Disciplinary Core Ideas		
ETS1.B: Developing Possible Solutions • There are systematic processes for evaluating solutions with respect to how well they meet the criteria and constraints of a problem. (MS-ETS1-3)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
• Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors. (MS-ETS1-3)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
ETS1.C: Optimizing the Design Solution • Although one design may not perform the best across all tests, identifying the characteristics of the design that performed the best in each test can provide useful information for the redesign process—that is, some of those characteristics may be incorporated into the new design. (MS-ETS1-3)		*145–146*, *168–171*, 177–182, Science and Engineering Practices Handbook (online)
CCSS ELA/Literacy Connections		
ELA RST.6–8.1		112–113, 140–141, 160–161, 167, Literacy Skill Handbook (online)
ELA RST.6–8.7		134, *151*, 155, 163, 174–176 177–182, Literacy Skill Handbook (online)
ELA RST.6–8.9		118, 122, *145–146*, *168–171*, 177–182, Literacy Skill Handbook (online)
CCSS Math Connections		
Math MP.2		118, *119–121*, 122–123, *124*, 155
Math 7.EE.A.3		73–78, Math Skill Handbook (online)

Labs and investigations are in italics.

MS-ETS1	Engineering Design	
MS-ETS1-4.	**Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.**	177–182
SEP Science and Engineering Practices		
Developing and Using Models* Modeling in 6–8 builds on K–5 experiences and progresses to developing, using, and revising models to describe, test, and predict more abstract phenomena and design systems. • Develop a model to generate data to test ideas about designed systems, including those representing inputs and outputs. (MS-ETS1-4) *Other aspects of this SEP are integrated throughout this module and are listed in the Also Integrates section.		*145–146*, 177–182
DCI Disciplinary Core Ideas		
ETS1.B: Developing Possible Solutions • A solution needs to be tested, and then modified on the basis of the test results, in order to improve it. (MS-ETS1-4)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
• Models of all kinds are important for testing solutions. (MS-ETS1-4)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
ETS1.C: Optimizing the Design Solution • The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution. (MS-ETS1-4)		*168–171*, 177–182, Science and Engineering Practices Handbook (online)
CCSS ELA/Literacy Connections		
ELA SL.8.5		69, 73-78, Literacy Skill Handbook (online)
CCSS Math Connections		
Math MP.2		118, *119–121*, 122–123, *124*, 155
Math 7.SP.C.7		Math Skill Handbook (online)

ALSO INTEGRATES:	
SEP Asking Questions and Defining Problems	183
SEP Developing and Using Models	177–182
SEP Planning and Carrying Out Investigations	*114–115*, *119–121*, *126–127*, *129–131*, 132, *145–146*, *168–171*, 177–182

Labs and investigations are in italics.

Continued from previous page.

SEP Analyzing and Interpreting Data	*119–121*, *124*, *168–171*, 177–182
SEP Using Mathematics and Computational Thinking	*119–121*, *124*, 152, 155, Lab *Density Column* (online), Lab *Do heavy objects always sink and light objects always float?* (online)
SEP Constructing Explanations and Designing Solutions	112–113, 123, 136, 140–141, *148–149*, 156, 160–161, 172, 176, 177–182
SEP Engaging in Argument from Evidence	166, *168–171*, 177–182
SEP Obtaining, Evaluating, and Communicating Information	167, 177–182
DCI PS3.D: Energy in Chemical Processes and Everyday Life	167, 172, 175
DCI LS1.C: Organization for Matter and Energy Flow in Organisms	167, 172, 175
DCI LS2.B: Cycle of Matter and Energy Transfer in Ecosystems	172
DCI ESS2.A: Earth's Materials and Systems	150
CCC Cause and Effect	*142–143*
CCC Scale Proportion, and Quantity	*151*, 152, 155
CCC Systems and System Models	*151*, 152, 155, *162*, 163, 177–182
CCC Structure and Function	*151*, 177–182
CCC Stability and Change	*142–143*
CCSS ELA RST.6-8.10	29, 49, 49A-49-B, 63, 69
CCSS ELA WHST.6–8.1	118
CCSS ELA WHST.6–8.2	153
CCSS ELA WHST.6–8.4	153
CCSS ELA WHST.6–8.6	133
CCSS ELA WHST.6–8.10	118, 133
CCSS ELA SL.7.4	173
CCSS ELA SL.7.5	173, 177–182
CCSS MATH 7.EE.A.4	*124,* 135
CCSS MATH 7.RP.A.2	*119–121*, *124*

Labs and investigations are in italics.