



STANDARDS	PAGE REFERENCES
<p>EALR 1: Systems Big Idea: Systems (SYS) Core Content: <i>Inputs, Outputs, Boundaries, and Flows</i></p>	
<p>In prior grades students learned about the functioning of simple systems, including inputs and outputs. In grades 6-8 students learn how to use systems thinking to simplify and analyze complex situations. Systems concepts that students learn to apply at this level include choosing system boundaries, determining if a system is open or closed, measuring the flow of matter and energy through a system, and applying systems thinking to a complex societal issue that involves science and technology. These insights and abilities can help students see the connections between and among the domains of science and among science, technology, and society.</p>	
<p>6-8 SYSA Any system may be thought of as containing subsystems and as being a subsystem of a larger system.</p>	<p>Student Edition: 24-25, 41, 50-56, 61, 74-84, 86-95, 314-322 <i>Nature of Science</i> 4-5 <i>Inquiry Lab</i> 96-97, 338-339 Teacher Edition: DI 53; GQ 4, 24, 62; SCB 38E-F, 72E-F, 312E-F; VL 25</p>

STANDARDS	PAGE REFERENCES
<p>6-8 SYSB</p> <p>The boundaries of a system can be drawn differently depending on the features of the system being investigated, the size of the system, and the purpose of the investigation.</p>	<p>Student Edition: 24-25, 41, 61, 74-84, 314-322 <i>Nature of Science</i> 4-5 <i>Inquiry Lab</i> 96-97, 338-339</p> <p>Teacher Edition: GQ 63, 76; IM 38H: SCB 38E-F, 72E-F, 312E</p>
<p>6-8 SYSC</p> <p>The output of one system can become the input of another system.</p>	<p>Student Edition: 26, 74-84, 86-95, 322-337 <i>Nature of Science</i> 4-5 <i>Inquiry Lab</i> 96-97, 338-339</p> <p>Teacher Edition: GQ 4, 26, 72, 86, 89, 90; SCB 38E-F, 72E-F; VL 4</p>
<p>6-8 SYSD</p> <p>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.</p>	<p>Student Edition: 86-95, 103#13, 322-337, 403 <i>Inquiry Lab</i> 96-97, 338-339 <i>Launch Lab</i> 333 <i>MiniLab</i> 403</p> <p>Teacher Edition: GQ 92, 333; IM 72H; SCB 72E-F, 312F, 382F; VL 87, 88, 94</p>
<p>6-8 SYSE</p> <p>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.</p>	<p>Student Edition: 77, 86-95, 322-337, 403, 430 <i>Inquiry Lab</i> 96-97, 338-339 <i>Launch Lab</i> 333 <i>MiniLab</i> 403</p> <p>Teacher Edition: GQ 77, 89; SCB 72E-F, 312F, 382F; VL 87</p>
<p>6-8 SYSF</p> <p>The natural and designed world is complex; it is too large and complicated to investigate and comprehend all at once. Scientists and students learn to define small portions for the convenience of investigation. The units of investigation can be referred to as —systems. □</p>	<p>Student Edition: 41, 50-56, 61, 74-84, 314-322 <i>Nature of Science</i> 4-5 <i>Inquiry Lab</i> 96-97, 338-339</p> <p>Teacher Edition: DI 77; GQ 75; SCB 6F, 38E-F, 72E-F, 312E-F</p>

STANDARDS	PAGE REFERENCES
<p>EALR 2: Inquiry Big Idea: Inquiry (INQ) Core Content: <i>Questioning and Investigating</i></p>	
<p>In prior grades students learned to plan investigations to match a given research question. In grades 6-8 students learn to revise questions so they can be answered scientifically and then to design an appropriate investigation to answer the question and carry out the study. Students learn to think critically and logically to make connections between prior science knowledge and evidence produced from their investigations. Students can work well in collaborative teams and communicate the procedures and results of their investigations, and are expected to critique their own findings as well as the findings of others.</p>	
<p>6-8 INQA Question Scientific inquiry involves asking and answering questions and comparing the answer with what scientists already know about the world.</p>	<p>Student Edition: <i>Nature of Science</i> 4-11 <i>Inquiry Lab</i> NOS 28-29, 96-97, 132-133, 174-175, 206-207, 514-515 <i>Inquiry Skill Practice</i> 56, 123, 259 <i>Launch Lab</i> 107, 124, 397 <i>MiniLab</i> 221, 265, 301, 389 <i>Science Skill Handbook</i> SR2-10 Teacher Edition: ACT NOS 7; DI NOS 7; GQ NOS 2; VL NOS 6</p>
<p>6-8 INQB Investigate Different kinds of questions suggest different kinds of scientific investigations.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 20-27, NOS 31#8, NOS 31#10, 4-11 <i>Inquiry Skill Practice</i> 56, 123 <i>Inquiry Lab</i> 64-65, 96-97, 132-133, 174-175, 268-269, 476-477 <i>Launch Lab</i> 107 <i>MiniLab</i> 221, 265, 301, 389 <i>Science Skill Handbook</i> SR2-10 Teacher Edition: ACT NOS 23; DI NOS 25; GQ NOS 2, NOS 21, NOS 24, NOS 25; RS NOS 25; VL NOS 24</p>

STANDARDS	PAGE REFERENCES
<p>6-8 INQC Investigate Collecting, analyzing, and displaying data are essential aspects of all investigations.</p>	<p>Student Edition: <i>Inquiry Skill Practice</i> NOS 19, 56, 123, 323, 395, 427 <i>Nature of Science</i> NOS 20-27, NOS 31#8, NOS 31#10, 4-11 <i>Inquiry Lab</i> NOS 28-29, 96-97, 132-133, 174-175, 206-207, 232-233, 406-407 <i>Launch Lab</i> 107, 124, 446 <i>MiniLab</i> 221, 265, 335 <i>Science Skill Handbook</i> SR2-10</p> <p>Teacher Edition: GQ NOS 7; VL NOS 25</p>
<p>6-8 INQD Investigate For an experiment to be valid, all (controlled) variables must be kept the same whenever possible, except for the manipulated (independent) variable being tested and the responding (dependent) variable being measured and recorded. If a variable cannot be controlled, it must be reported and accounted for.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 20-21, NOS 27#2, NOS 27#4, NOS 31#7, NOS 31#10 <i>Science Skill Handbook</i> SR6</p> <p>Teacher Edition: GQ NOS 21; V NOS 20; VL NOS 25</p>
<p>6-8 INQE Model 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.</p>	<p>Student Edition: 8-16, 18-29 <i>Inquiry Skill Practice</i> 17 <i>Inquiry Lab</i> 96-97, 232-233, 268-269, 338-339, 374-375 <i>MiniLab</i> 370 <i>Science Skill Handbook</i> SR5</p> <p>Teacher Edition: DI 125, 201; GQ 6, 9, 15; IM 6H</p>
<p>6-8 INQF Explain It is important to distinguish between the results of a particular investigation and general conclusions drawn from these results.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 20-27, 6-7 <i>Inquiry Lab</i> NOS 28-29, 96-97, 174-175, 232-233, 268-269, 436-437 <i>Science Skill Handbook</i> SR2-10</p> <p>Teacher Edition: GQ NOS 2, NOS 26</p>
<p>6-8 INQG Communicate Clearly Scientific reports should enable another investigator to repeat the study to check the results.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 7 <i>Science Skill Handbook</i> SR10</p> <p>Teacher Edition: GQ NOS 2; VL NOS 7</p>

STANDARDS	PAGE REFERENCES
<p>6-8 INQH Intellectual Honestly Science advances through openness to new ideas, honesty, and legitimate skepticism. Asking thoughtful questions, querying other scientists' explanations, and evaluating one's own thinking in response to the ideas of others are abilities of scientific inquiry.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 4-11 <i>Inquiry Lab</i> NOS 28-29, 96-97, 132-133, 232-233, 268-269, 436-437 <i>Science Skill Handbook</i> SR2-10 Teacher Edition: IM NOS 2H; SCB NOS 2E</p>
<p>6-8 INQI Consider Ethics Scientists and engineers have ethical codes governing animal experiments, research in natural ecosystems, and studies that involve human subjects.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 10-11* <i>Inquiry Skill Practice</i> 151 <i>Science Skill Handbook</i> SR10 Teacher Edition: ACT NOS 11; GQ NOS 10; SCB NOS 2E; VL NOS 10</p> <ul style="list-style-type: none"> • These page references discuss how to recognize and avoid bias in scientific investigations, as well as the kinds of questions science can and cannot answer.
<p>EALR 3: Application Big Idea: Application (APP) Core Content: Science, Technology, and Problem Solving</p> <p>In prior grades students learned to work individually and collaboratively to produce a product of their own design. In grades 6-8 students work with other members of a team to apply the full process of technological design, combined with relevant science concepts, to solve problems. In doing so they learn to define a problem, conduct research on how others have solved similar problems, generate possible solutions, test the design, and communicate the results. Students also investigate professions in which science and technology are required so they can learn how the abilities they are developing in school are valued in the world of work.</p>	
<p>6-8 APPA People have always used technology to solve problems. Advances in human civilization are linked to advances in technology.</p>	<p>Student Edition: 24-28, 152-155, 498 <i>Unit 1</i> 2-3 <i>Green Science</i> 49 <i>How It Works</i> 85, 113, 365 <i>Unit 4</i> 414-415 Teacher Edition: FF 89; GQ 2, 24, 25, 160; SCB 140E; TA 111</p>

STANDARDS	PAGE REFERENCES
<p>6-8 APPB</p> <p>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.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 8 <i>MiniLab</i> 5</p> <p>Teacher Edition: CIS 157</p>
<p>6-8 APPC</p> <p>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.</p>	<p>Student Edition: 24-28 <i>Nature of Science</i> NOS 8, 348-349 <i>Unit 1</i> 2-3</p> <p>Teacher Edition: DI NOS 9; GQ NOS 8, 2, 24, 27, 348; SCB NOS 2E; TD NOS 9; VL NOS 8</p>
<p>6-8 APPD</p> <p>The process of technological design begins by defining a problem and identifying criteria for a successful solution, followed by research to better understand the problem and brainstorming to arrive at potential solutions.</p>	<p>Student Edition: <i>MiniLab</i> 5, 349 <i>It's Your Turn</i> 49, 167 <i>Inquiry Lab</i> 436-437, 476-477, 514-515 <i>Inquiry Skill Practice</i> 493 <i>Launch Lab</i> 495</p> <p>Teacher Edition: DI NOS 9</p>
<p>6-8 APPE</p> <p>Scientists and engineers often work together to generate creative solutions to problems and decide which ones are most promising.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 8, 348-349</p> <p>Teacher Edition: DI NOS 9; GQ 414</p>
<p>6-8 APPF</p> <p>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.</p>	<p>Student Edition: <i>Inquiry Lab</i> 436-437, 476-477, 514-515 <i>Inquiry Skill Practice</i> 493 <i>Launch Lab</i> 495</p>
<p>6-8 APPG</p> <p>The benefits of science and technology are not available to all the people in the world.</p>	<p>Student Edition: <i>Green Science</i> 49* <i>How It Works</i> 85 <i>It's Your Turn</i> 85 <i>Science & Society</i> 251</p> <p>Teacher Edition: FF 327</p> <p>*These page references discuss the unequal distribution of resources as it relates to technology or the prohibitive cost of some technology.</p>

STANDARDS	PAGE REFERENCES
<p>6-8 APPH People in all cultures have made and continue to make contributions to society through science and technology.</p>	<p>Student Edition: <i>Nature of Science</i> NOS 20-27 <i>Unit 1</i> 2-3 <i>Green Science</i> 167 <i>Unit 2</i> 182-183 <i>Careers in Science</i> 197, 294 <i>Unit 3</i> 346-347 <i>Unit 4</i> 414-415 Teacher Edition: CD 459, 461, 509; DI NOS 25; FF NOS 17, 195, 403; GQ NOS 4, NOS 23, 346</p>
<p>EALR 4: Physical Science Big Idea: Force and Motion (PS1) Core Content: Balanced and Unbalanced Forces</p> <p>In prior grades students learned to use basic tools to measure force, time, and distance. In grades 6-8 students learn to measure, record, and calculate the average speed of objects and to tabulate and graph the results. They also develop a qualitative understanding of inertia. Students learn to predict the motion of objects subject to opposing forces along the line of travel. If the forces are balanced, the object will continue moving with the same speed and direction, but if the forces are not balanced, the object's motion will change. These concepts and principles prepare students for a more formal understanding of mechanics in high school and help them make sense of the world around them.</p>	
<p>6-8 PS1A Average speed is defined as the distance traveled in a given period of time.</p>	<p>Student Edition: <i>*Inquiry Lab</i> 64-65 Teacher Edition: DI 431</p> <p>*These page references discuss the orbital speeds of planets and the speed of objects entering Earth's atmosphere.</p>
<p>6-8 PS1B Friction is a force that can help objects start moving, stop moving, slow down or can change the direction of the object's motion.</p>	<p>Student Edition: 431 Teacher Edition: DI 431; FF 431; GQ 431; IM 418H: TD 431; VL 431</p>
<p>6-8 PS1C Unbalanced forces will cause changes in the speed or direction of an object's motion. The motion of an object will stay the same when forces are balanced.</p>	<p>Student Edition: 42, 71#9</p>

STANDARDS	PAGE REFERENCES
<p>6-8 PS1D</p> <p>The same unbalanced force will change the motion of an object with more mass more slowly than an object with less mass.</p>	<p>See <i>Integrated iScience</i>, Course 2 © 2012.</p> <p>Student Edition: 705, 710-713 <i>Chapter Review</i> 720-721 <i>Figure 14 & 15</i> 705 <i>Figure 17 & 18</i> 711 <i>Lab</i> 717 <i>Mini Lab</i> 710 <i>Table 1</i> 714</p> <p>Teacher Edition: DI 705, 711; E 705, 710, 713; L 716B-717; TT 705, 711</p>
<p>EALR 4: Physical Science Big Idea: Matter: Properties and Change (PS2) Core Content: Atoms and Molecules</p>	
<p>In prior grades students learned the scientific meaning of the word matter, and about changes of state. In grades 6-8 students learn the basic concepts behind the atomic nature of matter. This includes the idea that elements are composed of a single kind of atom. Atoms chemically combine with each other or with atoms of other elements to form compounds. When substances are combined in physical mixtures, their chemical properties do not change; but when they combine chemically, the new product has different physical and chemical properties from any of the reacting substances. When substances interact in a closed system, the amount of mass does not change. Atomic theory also explains the ways that solids, liquids, and gases behave. These concepts about the nature of matter are fundamental to all sciences and technologies.</p>	
<p>6-8 PS2A</p> <p>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.</p>	<p>Student Edition: 388-390, 392-394 <i>Inquiry Skill Practice</i> 57, 395 <i>MiniLab</i> 389 <i>Inquiry Lab</i> 406-407</p> <p>Teacher Edition: DI 389; FF 393; GQ 388, 389, 391; IM 350H, 382H; SCB 382E; TD 389</p>
<p>6-8 PS2B</p> <p>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.</p>	<p>Student Edition: 354-364, 381#12-13 <i>MiniLab</i> 358 <i>Figure 11</i> 363</p> <p>Teacher Edition: DI 359, 361; GQ 354, 356, 358, 359, 360,361; RS 355, 357, 359, 361; SCB 350F; VL 356, 359, 363</p>

STANDARDS	PAGE REFERENCES
<p>6-8 PS2C</p> <p>All matter is made of atoms. Matter made of only one type of atom is called an element.</p>	<p>Student Edition: 353-355, 364#10, 366-373, 381#12 <i>MiniLab</i> 358 <i>Figure 11</i> 363</p> <p>Teacher Edition: DI 355, 359; GQ 355, 367; IM 350H; SCB 350E; TA 355; V 366; VL 363</p>
<p>6-8 PS2D</p> <p>Compounds are composed of two or more kinds of atoms, which are bound together in well-defined molecules or crystals.</p>	<p>Student Edition: 381#12 <i>MiniLab</i> 358 <i>Inquiry Lab</i> 374-375</p> <p>Teacher Edition: DI 357, 359; GQ 356, 357; RS 357; SCB 350E; VL 356, 357</p>
<p>6-8 PS2E</p> <p>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.</p>	<p>Student Edition: 386-387, 399</p> <p>Teacher Edition: DI 399; GQ 387; IM 382H; SCB 382E; TD 387, 399; VL 387, 399</p>
<p>6-8 PS2F</p> <p>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.</p>	<p>Student Edition: 87-89, 92-94, 103#13, 333, 403, 411#17 <i>MiniLab</i> 403</p> <p>Teacher Edition: DI 403; GQ 92, 403; SCB 72F, 312F, 382F; SOE 143; TD 403; VL 88</p>

STANDARDS

PAGE REFERENCES

EALR 4: Physical Science

Big Idea: Energy: Transfer, Transformation, and Conservation (PS3)

Core Content: *Interactions of Energy and Matter*

In prior grades students learned how heat, light, sound, and electrical energy are generated and can be transferred from place to place. In grades 6-8 students learn how energy and matter interact in various settings. Heat (thermal energy) always moves from a warmer to a cooler place through solids (by conduction) and through liquids and gases (mostly by convection or mechanical mixing). Light energy interacts with matter and with our eyes and allows us to see things. Electrical energy provides a convenient way to transfer energy to where and when the energy is needed. Sound is yet another form of energy produced by a vibrating object. These fundamental concepts of how matter and energy interact have broad application in all of the other sciences.

<p>6-8 PS3A</p> <p>Energy exists in many forms which include: 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.</p>	<p>Student Edition: 87, 143-150, 152-158, 192, 203, 420-426, 428-434 <i>MiniLab</i> 157, 433 <i>Table 1</i> 425 <i>Inquiry Skill Practice</i> 427 <i>Inquiry Lab</i> 436-437</p> <p>Teacher Edition: DI 155, 425, 431; GQ 144, 148, 153, 154, 155, 333, 425, 428, 429; IM 140H, 418H; SCB 312F, 418E-F; VL 87, 154</p>
<p>6-8 PS3B</p> <p>Heat (thermal energy) flows from warmer to cooler objects until both reach the same temperature. Conduction, radiation, and convection, or mechanical mixing, are means of energy transfer.</p>	<p>Student Edition: 111, 459-461* <i>Table 1</i> 425</p> <p>Teacher Edition: GQ 111; SCB 444E; VL 461</p> <p>* Some of these page references describe electromagnetic waves from the Sun without identifying the waves as radiation.</p>
<p>6-8 PS3C</p> <p>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.</p>	<p>Student Edition: 399, 490</p> <p>Teacher Edition: DI 399, 491; GQ 399, 490, 499; IWS 484D; RS 491; TD 399; VL 399</p>
<p>6-8 PS3D</p> <p>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.</p>	<p>Student Edition: 457-467 <i>Launch Lab</i> 458 <i>MiniLab</i> 464</p> <p>Teacher Edition: DI 463, 465; GQ 465, 466; SCB 444E; TD 463; VL 463, 466</p>

STANDARDS	PAGE REFERENCES
<p>6-8 PS3E</p> <p>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.</p>	<p>Student Edition: 143-150, 152-158, 423-433, 494-503 <i>Launch Lab</i> 143 <i>Inquiry Skill Practice</i> 159 <i>Green Science</i> 435 <i>Science & Society</i> 504</p> <p>Teacher Edition: DI 155; GQ 144, 148, 154, 155, 425, 498; IM 140H; RS 471; SCB 418F; VL 154, 498</p>
<p>6-8 PS3F</p> <p>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.</p>	<p>Student Edition: 28, 115-117, 446-455, 469-475, 483#9 <i>MiniLab</i> 451 <i>Inquiry Skill Practice</i> 456 <i>Inquiry Lab</i> 514-515</p> <p>Teacher Edition: GQ 28, 115, 446, 447, 469, 473, 474; IM 444H; SCB 444E-F; TA 117; VL 450</p>
<p>EALR 4: Earth and Space Science Big Idea: Earth in Space (ES1) Core Content: The Solar System</p> <p>In prior years, students learned the implications of the spherical-Earth concept and Earth's relationship to the Sun. In grades 6-8 students study the Moon's changing phases and learn to distinguish between phases and eclipses. They also learn about other objects in the Solar System and how they are held together by a force called —gravity. □ Students also learn about the Sun's position in the Milky Way, which is just one of many galaxies in the universe. This broad overview of Earth in space will provide a useful framework for students to understand new discoveries in astronomy and new milestones in the exploration of space.</p>	
<p>6-8 ES1A</p> <p>The Moon's monthly cycle of phases can be explained by its changing relative position as it orbits Earth. An eclipse of the Moon occurs when the Moon enters Earth's shadow. An eclipse of the Sun occurs when the Moon is between the Earth and Sun, and the Moon's shadow falls on the Earth.</p>	<p>Student Edition: 44-48 <i>MiniLab</i> 47</p> <p>Teacher Edition: ACT 45; DI 45, 47; GQ 40, 44; SCB 38E; TA 47; VL 45, 47</p>

STANDARDS	PAGE REFERENCES
<p>6-8 ES1B</p> <p>Earth is the third planet from the sun in a system that includes the Moon, the Sun, seven other major planets and their moons, and smaller objects such as asteroids, plutoids, dwarf planets and comets. These bodies differ in many characteristics (e.g., size, composition, relative position).</p>	<p>Student Edition: 50-56 <i>Launch Lab</i> 41, 51 <i>Inquiry Skill Practice</i> 57 <i>Inquiry Lab</i> 64-65 <i>Writing in Science</i> 69</p> <p>Teacher Edition: ACT 53, 55; DI 53, 55; GQ 50, 52, 53, 54, 55; IM 38H: SCB 38F; VL 54, 55</p>
<p>6-8 ES1C</p> <p>Most objects in the Solar System are in regular and predictable motion. These motions explain such phenomena as the day, the year, phases of the Moon, and eclipses.</p>	<p>Student Edition: 40-48, 51-53 <i>MiniLab</i> 47 <i>Inquiry Lab</i> 64-65</p> <p>Teacher Edition: DI 43, 45, 47; GQ 38, 42, 44, 46, 51, 52; SCB 38E; VL 45, 47</p>
<p>6-8 ES1D</p> <p>Gravity is the force that keeps planets in orbit around the Sun and governs the rest of the motion in the Solar System. Gravity alone holds us to the Earth's surface.</p>	<p>Student Edition: 41-42, 46, 51, 128 <i>Launch Lab</i> 51</p> <p>Teacher Edition: DI 47; GQ 41, 42, 46; RS 47; SCB 38F; TD 51</p>
<p>6-8 ES1E</p> <p>Our Sun is one of hundreds of billions of stars in the Milky Way galaxy. Many of these stars have planets orbiting around them. The Milky Way galaxy is one of hundreds of billions of galaxies in the universe.</p>	<p>Student Edition: 58-63</p> <p>Teacher Edition: ACT 59; FF 61; GQ 60, 62; SCB 38F</p>
<p>EALR 4: Earth and Space Science Big Idea: Earth Systems, Structures, and Processes (ES2) Core Content: <i>Cycles in Earth Systems</i></p>	
<p>In prior grades students learned how Earth materials change and how they can be used for various purposes. In grades 6-8 students learn about planet Earth as an interacting system of solids, liquids, and gases. Solar energy powers the water cycle and drives the weather system and ocean currents. Energy from within the planet drives the rock cycle and moves huge plates on the Earth's surface, causing earthquakes and volcanoes. The landforms we see today result from processes that build up and break down Earth structures. These fundamental ideas will enable students to understand the history of their planet, Earth processes occurring today, and future geologic events.</p>	
<p>6-8 ES2A</p> <p>The atmosphere is a mixture of nitrogen, oxygen, and trace gases that include water vapor. The atmosphere has different properties at different elevations.</p>	<p>Student Edition: 77-78, 103#9</p> <p>Teacher Edition: DI 79; GQ 77, 78; IM 72H; SCB 72E; VL 77, 78</p>

STANDARDS	PAGE REFERENCES
<p>6-8 ES2B</p> <p>The Sun is the major source of energy for phenomena on Earth’s surface, such as winds, ocean currents, and the water cycle.</p>	<p>Student Edition: 87-89, 153 <i>MiniLab</i> 89</p> <p>Teacher Edition: GQ 155; SOE 143; TWC 87</p>
<p>6-8 ES2C</p> <p>In the water cycle, water evaporates from Earth’s surface, rises and cools, condenses to form clouds and falls as rain or snow and collects in bodies of water.</p>	<p>Student Edition: 86-89 <i>MiniLab</i> 89</p> <p>Teacher Edition: DI 89; GQ 88, 89; VL 87, 88; SCB 72F; TD 89</p>
<p>6-8 ES2D</p> <p>Water is a solvent. As it passes through the water cycle, it dissolves minerals and gases and carries them to the oceans.</p>	<p>Student Edition: 93, 102#6, 127, 129, 398</p> <p>Teacher Edition: GQ 94, 129, 398; VL 127</p>
<p>6-8 ES2E</p> <p>The solid Earth is composed of a relatively thin crust, a dense metallic core, and a layer called the mantle between the crust and core that is very hot and partially melted.</p>	<p>Student Edition: 83, 108, 111</p> <p>Teacher Edition: DI 83; GQ 83; SCB 72E, 104E; TD 83; VL 83, 111</p>
<p>6-8 ES2F</p> <p>The crust is composed of huge crustal plates on the scale of continents and oceans which move centimeters per year, pushed by convection in the upper mantle, causing earthquakes, volcanoes, and mountains.</p>	<p>Student Edition: 106-112, 114-122 <i>MiniLab</i> 110, 118 <i>Inquiry Skill Practice</i> 123</p> <p>Teacher Edition: ACT 109; DI 109, 111, 117, 119; GQ 107, 108, 111, 115, 118, 120, 121, 130; SCB 104E; VL 109, 111, 116, 117</p>
<p>6-8 ES2G</p> <p>Landforms are created by processes that build up structures and processes that break down and carry away material through erosion and weathering.</p>	<p>Student Edition: 114-122, 124-131 <i>Launch Lab</i> 107, 125 <i>MiniLab</i> 115, 128 <i>Inquiry Lab</i> 132-133</p> <p>Teacher Edition: ACT 129; DI 127, 129; FF 127; GQ 93, 107, 116, 119, 120, 126, 127, 128; IM 104H; SCB 104E-F; VL 120, 126, 129</p>
<p>6-8 ES2H</p> <p>The rock cycle describes the formation of igneous rock from magma or lava, sedimentary rock from compaction of eroded particles, and metamorphic rock by heating and pressure.</p>	<p>Student Edition: 92-94, 101#16 <i>Launch Lab</i> 125</p> <p>Teacher Edition: ACT 93; DI 93; GQ 92, 93, 94; SCB 72F; VL 93</p>

STANDARDS	PAGE REFERENCES
<p>EALR 4: Earth and Space Science Big Idea: Earth History (ES3) Core Content: Evidence of Change</p>	
<p>In prior grades students learned that fossils provide evidence of environmental conditions that existed long ago. In grades 6-8 students learn a few of the methods that have made it possible to uncover the history of our planet. This history includes both slow, gradual changes and rapid, catastrophic events, such as an asteroid or comet striking the Earth. It is possible to read a great deal of that history from rocks, including layers of sedimentary rock, some of which contain fossils. Understanding Earth's history is a valuable complement to the study of biological evolution.</p>	
<p>6-8 ES3A Our understanding of Earth history is based on the assumption that processes we see today are similar to those that occurred in the past.</p>	<p>Student Edition: 110-111 <i>Inquiry Skill Practice</i> 123 Teacher Edition: DI 119; GQ 104, 106, 117, 118; MA 111; VL 110</p>
<p>6-8 ES3B Thousands of layers of sedimentary rock provide evidence that allows us to determine the age of Earth's changing surface and to estimate the age of fossils found in the rocks.</p>	<p>Student Edition: 144-145* Teacher Edition: DI 145; E 144; FF 63</p> <p>*Some of these page references describe the formation of fossil fuels.</p>
<p>6-8 ES3C In most locations sedimentary rocks are in horizontal formations with the oldest layers on the bottom. However, in some locations, rock layers are folded, tipped, or even inverted, providing evidence of geologic events in the distant past.</p>	<p>Student Edition: 23, 92-93* Teacher Edition: ATP 124; GQ 23, 92; VL 23, 93</p> <p>*Some of these page references describe uplift in general.</p>
<p>6-8 ES3D Earth has been shaped by many natural catastrophes, including earthquakes, volcanic eruptions, glaciers, floods, storms, tsunamis, and the impacts of asteroids.</p>	<p>Student Edition: 114-119, 130 <i>Launch Lab</i> 115 <i>Inquiry Lab</i> 132-133 Teacher Edition: GQ 104, 116; FF 131, 321; SCB 104E-F; TA 117; TD 321; VL 119, 130</p>
<p>6-8 ES3E Living organisms have played several critical roles in shaping landforms that we see today.</p>	<p>Student Edition: 93, 103#14; 126, 146, 160-166 Teacher Edition: GQ 93, 164; SCB 140F; TD 129; VL 126</p>

STANDARDS	PAGE REFERENCES
<p>EALR 4: Life Science Big Idea: Structure and Function of Living Organisms (LS1) Core Content: <i>From Cells to Organisms</i></p>	
<p>In prior grades students learned how structures in the body work together to respond to internal and external needs. In grades 6-8 students learn that all living systems are composed of cells which make up tissues, organs, and organ systems. At each level of organization, the structures enable specific functions required by the organism. Lifestyle choices and environmental conditions can affect parts of the human body, which may affect the health of the body as a whole. Understanding how organisms operate as systems helps students understand the commonalities among life forms, provides an introduction to further study of biology, and offers scientific insights into the ways that personal choices may affect health.</p>	
<p>6-8 LS1A All organisms are composed of cells, which carry on the many functions needed to sustain life.</p>	<p>Student Edition: 190-192, 198-205 <i>Launch Lab</i> 199 <i>MiniLab</i> 202 Teacher Edition: DI 281; GQ 198; IWS 186D; SCB 186F</p>
<p>6-8 LS1B One-celled organisms must contain parts to carry out all life functions.</p>	<p>Student Edition: 190-191, 200 Teacher Edition: DI 201; GQ 190, 191; RS 201</p>
<p>6-8 LS1C Multicellular organisms have specialized cells that perform different functions. These cells join together to form tissues that give organs their structure and enable the organs to perform specialized functions within organ systems.</p>	<p>Student Edition: 191, 198-205, 211#12 Teacher Edition: DI 203, 281; GQ 191, 201, 202, 204; IWS 186D; RS 191; SCB 186F</p>
<p>6-8 LS1D Both plant and animal cells must carry on life functions, so they have parts in common, such as nuclei, cytoplasm, cell membranes, and mitochondria. But plants have specialized cell parts, such as chloroplasts for photosynthesis and cell walls, which provide plants their overall structure.</p>	<p>Student Edition: 198-205, 242, 252, 267#7 Teacher Edition: DI 203; GQ 201, 202, 204, 243, 262; IM 186H; IWS 186D; SCB 186F, 240E; TD 263</p>
<p>6-8 LS1E In classifying organisms, scientists consider both internal and external structures and behaviors.</p>	<p>Student Edition: 188-196, 211#20-21, 246-250, 278-281, 286-293, 295-303 <i>MiniLab</i> 184, 246 <i>Inquiry Lab</i> 206-207 Teacher Edition: BP 189; DI 195; FF 195; GQ 182, 186, 195, 246, 249; IM 276H; SCB 186E; TD 195; V 188; VL 194, 249</p>

STANDARDS	PAGE REFERENCES
<p>6-8 LS1F</p> <p>Lifestyle choices and living environments can damage structures at any level of organization of the human body and can significantly harm the whole organism.</p>	<p>Student Edition: 147-148, 170</p> <p>Teacher Edition: GQ 164; SCB 140F</p>
<p>EALR 4: Life Science Big Idea: Ecosystems (LS2) Core Content: Flow of Energy Through Ecosystems</p> <p>In prior grades students learned how ecosystems change and how these changes affect the capacity of an ecosystem to support populations. In grades 6-8 students learn to apply key concepts about ecosystems to understand the interactions among organisms and the nonliving environment. Essential concepts include the process of photosynthesis used by plants to transform the energy of sunlight into food energy, which is used by other organisms, and possible causes of environmental change. Students also learn to investigate environmental issues and to use science to evaluate different solutions to problems. Knowledge of how energy flows through ecosystems is a critical aspect of students' understanding of how energy sustains life on the planet, including human life.</p>	
<p>6-8 LS2A</p> <p>An ecosystem consists of all the populations living within a specific area and the nonliving factors they interact with. One geographical area may contain many ecosystems.</p>	<p>Student Edition: 314-322, 343#13 <i>MiniLab</i> 318 <i>Inquiry Lab</i> 338-339</p> <p>Teacher Edition: DI 317; GQ 314, 315, 317; SCB 312E; TD 315; VL 317</p>
<p>6-8 LS2B</p> <p>Energy flows through an ecosystem from producers (plants) to consumers to decomposers. These relationships can be shown for specific populations in a food web.</p>	<p>Student Edition: 332-337, 343#16-17 <i>MiniLab</i> 335 <i>Inquiry Lab</i> 338-339 <i>Writing in Science</i> 343</p> <p>Teacher Edition: DI 335; GQ 334, 335, 336; IM 312H; RWS 335; SCB 312F; VL 336</p>
<p>6-8 LS2C</p> <p>The major source of energy for ecosystems on Earth's surface is sunlight. Producers transform the energy of sunlight into the chemical energy of food through photosynthesis. This food energy is used by plants, and all other organisms to carry on life processes. Nearly all organisms on the surface of Earth depend on this energy source.</p>	<p>Student Edition: 192, 250-263, 316, 334-337 <i>Inquiry Lab</i> 338-339</p> <p>Teacher Edition: DI 262, 335; GQ 192, 261, 262, 263, 316; SCB 186F, 240F, 312F; TD 243; VL 334</p>

STANDARDS	PAGE REFERENCES
<p>6-8 LS2D</p> <p>Ecosystems are continuously changing. Causes of these changes include nonliving factors such as the amount of light, range of temperatures, and availability of water, as well as living factors such as the disappearance of different species through disease, predation, habitat destruction and overuse of resources or the introduction of new species.</p>	<p>Student Edition: 146-147, 164, 186, 320, 328 <i>Green Science</i> 331</p> <p>Teacher Edition: DI 165; GQ 164, 318; RS 321; RWS 327; TD 329</p>
<p>6-8 LS2E</p> <p>Investigations of environmental issues should uncover factors causing the problem and relevant scientific concepts and findings that may inform an analysis of different ways to address the issue.</p>	<p>Student Edition: 27-28, 146-149, 156-157, 164-165, 172 <i>Inquiry Skill Practice</i> 159 <i>Green Science</i> 167, 331, 435 <i>Inquiry Lab</i> 174-175 <i>Science & Society</i> 224</p> <p>Teacher Edition: ACT 165; DI 147, 165, 193, 319; FF 29; GQ 148, 164, 165, 172; RWS 157; SCB 140F, 276E; TA 147</p>
<p>EALR 4: Life Science Big Idea: Biological Evolution (LS3) Core Content: <i>Inheritance, Variation, and Adaptation</i></p>	
<p>In prior years, students learned that differences in inherited characteristics might help organisms survive and reproduce. In grades 6-8 students learn how the traits of organisms are passed on through the transfer of genetic information during reproduction and how inherited variations can become adaptations to a changing environment. Sexual reproduction produces variations because genes are inherited from two parents. Variations can be either physical or behavioral, and some have adaptive value in a changing environment. In the theory of biological evolution the processes of inheritance, variation, and adaptation explain both the diversity and unity of all life.</p>	
<p>6-8 LS3A</p> <p>The scientific theory of evolution underlies the study of biology and explains both the diversity of life on Earth and similarities of all organisms at the chemical, cellular, and molecular level. Evolution is supported by multiple forms of scientific evidence.</p>	<p>Teacher Edition: DI 195; RS 283; TD 243, 281</p>
<p>6-8 LS3B</p> <p>Every organism contains a set of genetic information (instructions) to specify its traits. This information is contained within genes in the chromosomes in the nucleus of each cell.</p>	<p>Student Edition: 216-223 <i>Launch Lab</i> 217 <i>Math Skills</i> 219 <i>Inquiry Lab</i> 232-233</p> <p>Teacher Edition: DI 219; GQ 218, 219, 220; SCB 214E; VL 219, 220</p>

STANDARDS	PAGE REFERENCES
<p>6-8 LS3C</p> <p>Reproduction is essential for every species to continue to exist. Some plants and animals reproduce sexually while others reproduce asexually. Sexual reproduction leads to greater diversity of characteristics because offspring inherit genes from both parents.</p>	<p>Student Edition: 252-258</p> <p>Teacher Edition: GQ 253; SCB 240F; VL 255, 256</p>
<p>6-8 LS3D</p> <p>In sexual reproduction the new organism receives half of its genetic information from each parent, resulting in offspring that are similar but not identical to either parent.</p> <p>In asexual reproduction just one parent is involved, and genetic information is passed on nearly unchanged.</p>	<p>Student Edition: 191, 252-258, 275#14 <i>Launch Lab</i> 253</p> <p>Teacher Edition: GQ 191, 253; SCB 240F</p>
<p>6-8 LS3E</p> <p>Adaptations are physical or behavioral changes that are inherited and enhance the ability of an organism to survive and reproduce in a particular environment.</p>	<p>Student Edition: 224-231, 282-283 <i>MiniLab</i> 229 <i>Inquiry Lab</i> 304-305</p> <p>Teacher Edition: DI 193, 227, 229; FF 227, 229; GQ 214, 225, 226, 227, 228, 229, 282; SCB 214F; TD 227, 283; VL 227, 230</p>
<p>-8 LS3F</p> <p>Extinction occurs when the environment changes and the adaptive characteristics of a species, including its behaviors, are insufficient to allow its survival.</p>	<p>Student Edition: 227, 237#13 <i>Inquiry Extension</i> 305</p>
<p>6-8 LS3G</p> <p>Evidence for evolution includes similarities among anatomical and cell structures, and patterns of development make it possible to infer degree of relatedness among organisms.</p>	<p>Teacher Edition: DI 195; TD 281</p>