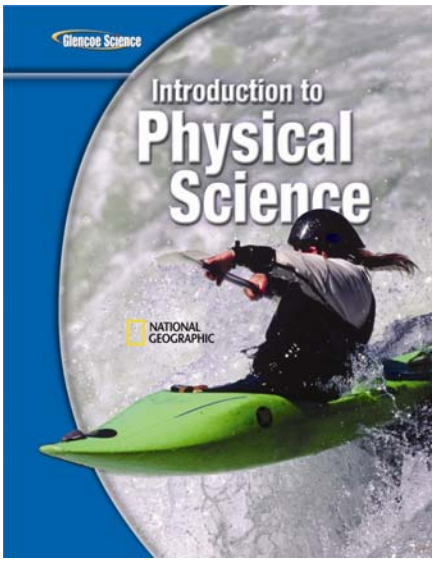
Science Grade-Level Expectations
Grades 6, 7, and 8

Missouri



Introduction to Physical Science

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STANDARDS	PAGE REFERENCES
Grade 6	
Strand 1: Properties and Principles of Matter and Energy	
1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
A. Objects, and the materials they are made of, have properties that can be used to describe and classify them	
Scope and Sequence – Properties of and Changes in Matter a. Recognize matter is anything that has mass and volume	**Student Edition:** 72, 102, 134-136, 139, 143-146 *Launch LAB* 71 *Science and History* 94 **Teacher Wraparound Edition:** A 73; DI 137; TC 70; TPK 143
b. Describe and compare the volumes (the amount of space an object occupies) of objects or substances directly, using a graduated cylinder, and/or indirectly, using displacement methods	**Student Edition:** 52 *LAB* 355 *MiniLAB* 52 *Science Skill Handbook* 676 **Teacher Wraparound Edition:** QD 135

Codes used for Teacher Wraparound Edition pages are the initial caps of headings on that page.

STANDARDS	PAGE REFERENCES
c. Describe and compare the masses (amounts of matter) of objects to the nearest gram using a balance	**Student Edition:** 53 *Science Skill Handbook* 676 **Teacher Wraparound Edition:** UA 53
d. Classify the types of matter in an object into pure substances or mixtures using their specific physical properties	**Student Edition:** 87-91, 218-220 *LAB* 92-93 *MiniLAB* 88 **Teacher Wraparound Edition:** DI 90; DIS 89; QD 220
B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles	
Scope and Sequence – Properties of and Changes in Matter a. Describe the properties of each component in a mixture/solution and their distinguishing properties (e.g., salt water, oil and vinegar, pond water, Kool-Aid)	**Student Edition:** 89-91, 219-223, 224-230, 232-235 *Integrate Earth Science* 91, 252 *Integrate Life Science* 140 *LAB* 92-93, 231, 270-271 *Science Stats* 242 **Teacher Wraparound Edition:** A 220; CD 89; D 225; DI 223
b. Describe appropriate ways to separate the components of different types of mixtures (sorting, evaporation, filtration, magnets, boiling, chromatography, screening)	**Student Edition:** 89-90, 219-220 *Applying Science* 89 **Teacher Wraparound Edition:** DI 89, 221; FF 222; IES 252; QD 90
c. Predict how various solids (soluble/insoluble) behave (e.g., dissolve, settle, float) when mixed with water	**Student Edition:** 120-121, 220, 224-228, 348-354 *LAB* 92-93 **Teacher Wraparound Edition:** CU 230; QD 18, 90

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STANDARDS	PAGE REFERENCES
C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification	
Scope and Sequence – Properties of and Changes in Matter a. Recognize evidence (e.g., diffusion of food coloring in water, light reflecting off of dust particles in the air, condensation of water vapor by increased pressure or decreased temperature) that supports the theory that matter is composed of small particles (atoms, molecules) that are in constant, random motion	**Student Edition:** 102-106, 107-108, 434, 438-439, 492, 556 **Teacher Wraparound Edition:** FYI 112, 142; IL 439; QD 106; TPK 107
D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter	
Scope and Sequence – Earth's Resources a. Describe the relationship between the change in the volume of water and changes in temperature as it relates to the properties of water (i.e., water expands and becomes less dense when frozen)	**Student Edition:** 102-106 *LAB* 115 *National Geographic* 110 **Teacher Wraparound Edition:** TPK 102
E. The atomic model describes the electrically neutral atom	
F. The periodic table organizes the elements according to their atomic structure and chemical reactivity	
G. Properties of objects and states of matter can change chemically and/or physically	
Scope and Sequence – Properties of and Changes in Matter a. Recognize and classify changes in matter as chemical and/or physical	**Student Edition:** 107-114, 143-148, 190 *Integrate Life Science* 193 *LAB* 115, 149, 207, 261 *Launch LAB* 101 *National Geographic* 191 *Science and History* 152, 210 **Teacher Wraparound Edition:** CU 148; D 221; LD 145; MM 147; QD 193

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STANDARDS	PAGE REFERENCES
b. Identify chemical changes (i.e., rusting, oxidation, burning, decomposition by acids, decaying, baking) in common objects (i.e., rocks such as limestone, minerals, wood, steel wool, plants) as a result of interactions with sources of energy or other matter that form new substances with different characteristic properties	**Student Edition:** 145-146, 148, 190, 192, 388 *LAB* 149 *Launch LAB* 189 *National Geographic* 191, 447 *Science and History* 152 *Science and Society* 606 **Teacher Wraparound Edition:** LD 145; QD 193; SJ 196; UA 388
c. Identify physical changes in common objects (e.g., rocks, minerals, wood, water, steel wool, plants) and describe the processes which caused the change (e.g., weathering, erosion, cutting, dissolving)	**Student Edition:** 143-144, 147, 190, 651-652 *Science and History* 210 **Teacher Wraparound Edition:** IM 144; MM 147; UA 146
H. Chemical bonding is the combining of different pure substances (elements, compounds) to form new substances with different properties	
I. Mass is conserved during any physical or chemical change	
Scope and Sequence – Properties of and Changes in Matter a. Demonstrate and provide evidence that mass is conserved during a physical change	**Student Edition:** 143-144, 147, 190
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems	
A. Forms of energy have a source, a means of transfer (work and heat), and a receiver	
Scope and Sequence –- Forms of Energy: Light a. Identify sources of visible light (e.g., the Sun and other stars, flint, bulb, flames, lightning)	**Student Edition:** 466, 520, 524, 528-529, 550, 570-571, 592, 595 *Design Your Own LAB* 540-541 *LAB* 603, 648 **Teacher Wraparound Edition:** CD 536, 592
b. Describe evidence (i.e., cannot bend around walls) that visible light travels in a straight line, using the appropriate tools (i.e., pinhole viewer, ray box, laser pointer)	**Student Edition:** 550, 555, 567-571 *LAB* 561, 572-573 **Teacher Wraparound Edition:** CU 560; MM 570; VL 569

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STANDARDS	PAGE REFERENCES
c. Compare the reflection of visible light by various surfaces (i.e., mirror, smooth and rough surfaces, shiny and dull surfaces, moon)	**Student Edition:** 473, 552, 555-560, 565-566, 569 *LAB* 561 *National Geographic* 559 **Teacher Wraparound Edition:** A 556; IL 558; QD 557; VL 569
d. Compare the refraction of visible light passing through different transparent and translucent materials (e.g., prisms, water, a lens)	**Student Edition:** 474-475, 562-565, 567-568 *Accidents in Science* 574 *LAB* 572-573 **Teacher Wraparound Edition:** CD 563; FYI 565; LD 564
e. Predict how different surfaces (transparent, translucent, opaque) and lenses (convex, concave) affect the behavior of visible light rays and the resulting image of an object	**Student Edition:** 552, 555-556, 563-565, 567-568 *Accidents in Science* 574 *LAB* 572-573 **Teacher Wraparound Edition:** A 556; CU 566
f. Identify receivers of visible light energy (e.g., eye, photocell)	**Student Edition:** 392, 550-551, 570 *Accidents in Science* 574 *Launch LAB* 549 **Teacher Wraparound Edition:** DI 392, 553; MM 570; R 571
g. Recognize that an object is “seen” only when the object emits or reflects light to the eye	**Student Edition:** 466, 551, 625 *Design Your Own LAB* 540-541 *LAB* 648 *MiniLAB* 551 **Teacher Wraparound Edition:** A 552; FF 646; FYI 625
h. Recognize differences in wavelength and energy levels within that range of visible light that can be seen by the human eye are perceived as differences in color	**Student Edition:** 470, 552-554 *MiniLAB* 551

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STANDARDS	PAGE REFERENCES
Scope and Sequence – Forms of Energy: Sound i. Describe how sound energy is transferred by wave-like disturbances that spread away from the source through a medium	**Student Edition:** 462-465, 490-493, 499 **Teacher Wraparound Edition:** D 463; LD 492; QD 491; TPK 490
j. Predict how the properties of the medium (e.g., air, water, empty space, rock) affect the speed of different types of mechanical waves (i.e., earthquake, sound)	**Student Edition:** 471, 492 *Design Your Own LAB* 480-481 **Teacher Wraparound Edition:** AIL 480
B. Mechanical energy comes from the motion (kinetic energy) and/or relative position (potential energy) of an object	
C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth	
Scope and Sequence –- Forms of Energy: Light a. Recognize energy from the Sun is transferred to Earth in a range of wavelengths and energy levels, including visible light, infrared radiation, and ultraviolet radiation	**Student Edition:** 387, 391-392, 466, 520, 527-530 *National Geographic* 532 *Science Stats* 398 **Teacher Wraparound Edition:** FYI 529
Scope and Sequence – Characteristics of Living Organisms b. Recognize the Sun is the source of almost all energy used to produce the food for living organisms	**Student Edition:** 387-388, 391-392, 466, 520, 527-530 *National Geographic* 532 *Science Stats* 398 **Teacher Wraparound Edition:** FYI 529
D. Chemical reactions involve changes in the bonding of atoms with the release or absorption of energy	
E. Nuclear energy is a major source of energy throughout the universe	
F. Energy can change from one form to another within systems, but the total amount remains the same	

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STANDARDS	PAGE REFERENCES
Strand 2: Properties and Principles of Force and Motion	
1. The motion of an object is described by its change in position relative to another object or point	
A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)	
B. An object that is accelerating is speeding up, slowing down, or changing direction	
C. Momentum depends on the mass of the object and the velocity with which it is traveling	
2. Forces affect motion	
A. Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude	
B. Every object exerts a gravitational force on every other object	
C. Magnetic forces are related to electrical forces as different aspects of a single electromagnetic force	
D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion	
E. Perpendicular forces act independently of each other	
F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done	
Strand 7: Scientific Inquiry	
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking	
A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation	
Scope and Sequence: All Units a. Formulate testable questions and hypotheses	**Student Edition:** *Design Your Own LAB* 60-61, 124-125, 150-151, 208-209, 300-301, 330-331, 424-425, 450-451, 480-481, 510-511, 540-541 *LAB* 31, 32-33, 240-241 *Mini LAB* 14 *Science Skill Handbook* 673-674 **Teacher Wraparound Edition:** IL 17

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STANDARDS	PAGE REFERENCES
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *LAB* 32-33, 231, 355, 411, 444, 603 *Science Skill Handbook* 674 **Teacher Wraparound Edition:** D 15, 29; IM 18
c. Design and conduct a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** IM 18
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	**Student Edition:** 12-18, 27-30 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *MiniLAB* 23 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** D 29; DI 16; IM 15, 18
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; and some involve making models)	**Student Edition:** 12-18, 21-26 *Applying Science* 111, 390, 496 *Design Your Own LAB* 124-125, 330-331, 540-541 *LAB* 31, 261, 270-271, 500, 604-605, 620 *Science and History* 34, 210, 542 **Teacher Wraparound Edition:** A 24; D 22; R 26; VL 13

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STANDARDS	PAGE REFERENCES
B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations	
Scope and Sequence: All Units a. Make qualitative observations using the five senses	**Student Edition:** 12-15, 43-44, 495-496, 499, 508-509, 567-569 *Integrate Astronomy* 496 *LAB* 31, 207, 231, 472, 632-633 *National Geographic* 497 *Science Skill Handbook* 674-675 *Use the Internet LAB* 362-363 **Teacher Wraparound Edition:** D 495; LD 14; QD 508; TPK 567
b. Determine the appropriate tools and techniques to collect data	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** FYI 46; IL 48
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 60-61, 124-125, 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** A 43; D 45; IL 48

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STANDARDS	PAGE REFERENCES
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	**Student Edition:** 44-49, 52-54 *Design Your Own LAB* 124-125, 208-209, 424-425, 450-451 *LAB* 55, 355, 444 *Science Skill Handbook* 675-676 **Teacher Wraparound Edition:** A 43; D 45; UA 53
e. Compare amounts/measurements	**Student Edition:** 44-49, 50-54, 56-59 *Design Your Own LAB* 60-61, 450-451 *LAB* 240-241, 355 *Launch LAB* 41, 217, 433 *MiniLAB* 44, 52, 285 **Teacher Wraparound Edition:** FYI 46, 54; IL 48; QD 47; SJ 45
f. Judge whether measurements and computation of quantities are reasonable	**Student Edition:** 28-29, 43-44 *Applying Math* 48, 121, 135, 290, 600 *LAB* 31, 32-33 **Teacher Wraparound Edition:** A 53; FYI 45
C. Evidence is used to formulate explanations	
Scope and Sequence: All Units a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	**Student Edition:** 28-29, 43-44 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	**Student Edition:** 14, 22-25, 56-59, 81-85 *LAB* 86 *Launch LAB* 217 *Math Skill Handbook* 710-711 *National Geographic* 278-279, 370-371 *Reference Handbooks* 712-713 *Science and Society* 452, 606 **Teacher Wraparound Edition:** A 84; D 22; FYI 82; LD 14
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	**Student Edition:** *Design Your Own LAB* 124-125, 150-151, 208-209, 300-301, 424-425, 450-451, 540-541 *LAB* 31, 632-633 *Science and History* 542 *Science and Society* 272, 332 **Teacher Wraparound Edition:** A 302, 332; MM 25, 78
D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)	
Scope and Sequence: All Units a. Evaluate the reasonableness of an explanation (conclusion)	**Student Edition:** 29, 43-44 *Applying Math* 121, 135, 290 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	**Student Edition:** 16, 27-30 *LAB* 31 *Math Skill Handbook* 709-711 *Science and Society* 606 *Science Skill Handbook* 677-678 **Teacher Wraparound Edition:** D 29; IM 15
E. The nature of science relies upon communication of results and justification of explanations	
Scope and Sequence: All Units a. Communicate the procedures and results of investigations and explanations through: • oral presentations • drawings and maps • data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) • graphs (bar, single line, pictographs) • equations and writings	**Student Edition:** 16-17, 56-59 *Applying Math* 121, 409, 600 *Design Your Own LAB* 60-61, 450-451 *LAB* 55, 444 *Math Skill Handbook* 710-711 *Science Skill Handbook* 678 *Technology Skill Handbook* 695-696 **Teacher Wraparound Edition:** D 58; LD 57; R 59

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STANDARDS	PAGE REFERENCES
Grade 7	
Strand 1: Properties and Principles of Matter and Energy	
1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
A. Objects, and the materials they are made of, have properties that can be used to describe and classify them	
B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles	
C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification	
D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter	
Scope and Sequence – Weather and Climate a. Describe the relationship between temperature and the movement of atmospheric gases (i.e., warm air rises due to expansion of the volume of gas, cool air sinks due to contraction of the volume of gas)	**Student Edition:** 119-120, 440 **Teacher Wraparound Edition:** D 440; FF 119
E. The atomic model describes the electrically neutral atom	
F. The periodic table organizes the elements according to their atomic structure and chemical reactivity	
G. Properties of objects and states of matter can change chemically and/or physically	
H. Chemical bonding is the combining of different pure substances (elements, compounds) to form new substances with different properties	
I. Mass is conserved during any physical or chemical change	
Scope and Sequence – Weather and Climate a. Explain that the amount of matter remains constant while being recycled through the water cycle	**Student Edition:** 56, 143-144
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems	
A. Forms of energy have a source, a means of transfer (work and heat), and a receiver	
Scope and Sequence – Forms of Energy: Heat a. Recognize thermal energy as the random motion (kinetic energy) of molecules or atoms within a substance	**Student Edition:** 107-108, 434, 437 **Teacher Wraparound Edition:** IM 383

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STANDARDS	PAGE REFERENCES
b. Use the kinetic molecular model to explain changes in the temperature of a material	**Student Edition:** 108, 434-435 **Teacher Wraparound Edition:** IM 383
c. Recognize thermal energy is transferred as heat from warmer objects to cooler objects until both reach the same temperature (equilibrium)	**Student Edition:** 438-440, 448-449 **Teacher Wraparound Edition:** TPK 438
d. Recognize the type of materials that transfer energy by conduction, convection, and/or radiation	**Student Edition:** 441-442 *Design Your Own LAB* 450-451 **Teacher Wraparound Edition:** MM 442
e. Describe how heat is transferred by conduction, convection, and radiation, and classify examples of each	**Student Edition:** 387, 438-441 **Teacher Wraparound Edition:** DI 441; LD 442; TPK 438
f. Classify common materials (e.g., wood, foam, plastic, glass, aluminum foil, soil, air, water) as conductors or insulators of thermal energy	**Student Edition:** 441-442 *Design Your Own LAB* 450-451 **Teacher Wraparound Edition:** MM 442
g. Predict the differences in temperature over time on different colored (black and white) objects placed under the same heat source	**Student Edition:** 552-553 **Teacher Wraparound Edition:** DI 553
Scope and Sequence – Forms of Energy: Electricity and Magnetism h. Describe the interactions (i.e., repel, attract) of like and unlike charges (i.e., magnetic, static electric, electrical)	**Student Edition:** 584-585, 587-589, 614-619 *LAB* 620 *Launch LAB* 583 **Teacher Wraparound Edition:** ATP 582; DI 587; QD 585; UA 616

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STANDARDS	PAGE REFERENCES
i. Diagram and identify a complete electric circuit by using a source (battery), means of transfer (wires), and receiver (resistance bulbs, motors, fans)	**Student Edition:** 591-593, 596-599 *LAB* 603, 604-605 *MiniLAB* 598 **Teacher Wraparound Edition:** A 592; MM 600; QD 599
j. Observe and describe the evidence of energy transfer in a closed series circuit	**Student Edition:** 592, 598 *MiniLAB* 598 **Teacher Wraparound Edition:** IM 599; VL 598
k. Describe the effects of resistance (number of receivers), amount of voltage (number of energy sources), and kind of transfer materials on the current being transferred through a circuit (e.g., brightness of light, speed of motor)	**Student Edition:** 591-595, 596-599 *LAB* 603 **Teacher Wraparound Edition:** AIL 604; FYI 594
l. Classify materials as conductors or insulators of electricity when placed within a circuit (e.g., wood, pencil lead, plastic, glass, aluminum foil, lemon juice, air, water)	**Student Edition:** 588, 594-595 **Teacher Wraparound Edition:** D 594
m. Diagram and distinguish between complete series and parallel circuits	**Student Edition:** 598-599 *LAB* 603 **Teacher Wraparound Edition:** QD 599; VL 598
n. Identify advantages and disadvantages of series and parallel circuits	**Student Edition:** 598-599 *LAB* 603 **Teacher Wraparound Edition:** QD 599; VL 598

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STANDARDS	PAGE REFERENCES
B. Mechanical energy comes from the motion (kinetic energy) and/or relative position (potential energy) of an object	
C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth	
Scope and Sequence – Weather and Climate a. Identify solar radiation as the primary source of energy for weather phenomena	**Student Edition:** 387, 391, 439-440 *Science Stats* 398
D. Chemical reactions involve changes in the bonding of atoms with the release or absorption of energy	
E. Nuclear energy is a major source of energy throughout the universe	
F. Energy can change from one form to another within systems, but the total amount remains the same	
Scope and Sequence – Energy Transformations a. Identify the different energy transformations that occur between different systems (e.g., chemical energy in battery converted to electricity in circuit converted to light and heat from a bulb)	**Student Edition:** 196-199, 379-385, 387-395, 445-449, 526-529, 535-539, 592, 598-599 *Design Your Own LAB* 540-541 *LAB* 603 *National Geographic* 447 *Science and Society* 606 **Teacher Wraparound Edition:** D 383; SJ 196; TPK 379, 387
b. Recognize that, during an energy transformation, heat is often transferred from one object (system) to another because of a difference in temperature	**Student Edition:** 196-199, 383-385, 388, 438-441, 445-449 *Science and Society* 606 **Teacher Wraparound Edition:** D 383; SJ 196; VL 448
c. Recognize energy is not lost but conserved as it is transferred and transformed	**Student Edition:** 380, 387, 445

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STANDARDS	PAGE REFERENCES
Strand 2: Properties and Principles of Force and Motion	
1. The motion of an object is described by its change in position relative to another object or point	
A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)	
Scope and Sequence – Force, Motion, and Work a. Describe the circular motion of a moving object as the result of a force acting toward the center	**Student Edition:** 320-321 **Teacher Wraparound Edition:** D 320
b. Classify different types of motion (e.g., straight line, projectile, circular, vibrational)	**Student Edition:** 282-287, 320-321 **Teacher Wraparound Edition:** A 283; D 320; R 287; VL 320
c. Given an object in motion, calculate its speed (distance/time)	**Student Edition:** 284-287 *MiniLAB* 285 **Teacher Wraparound Edition:** A 284, 286
d. Interpret a line graph representing an object's motion in terms of distance over time (speed) using metric units	**Student Edition:** 286 **Teacher Wraparound Edition:** CC 286; CU 287
B. An object that is accelerating is speeding up, slowing down, or changing direction	
C. Momentum depends on the mass of the object and the velocity with which it is traveling	
2. Forces affect motion	
A. Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude	
Scope and Sequence – Force, Motion, and Work a. Identify and describe the types of forces acting on an object in motion, at rest, floating/sinking (i.e., type of force, direction, amount of force in Newtons)	**Student Edition:** 116-117, 120-123, 310-311, 312-315, 320-321, 348-351, 359-361 **Teacher Wraparound Edition:** D 117, 120, 313, 320; QD 312; TPK 356

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STANDARDS	PAGE REFERENCES
b. Compare the forces acting on an object by using a spring scale to measure them to the nearest Newton	**Student Edition:** 53 *Design Your Own LAB* 424-425 *LAB* 355 **Teacher Wraparound Edition:** A 53
B. Every object exerts a gravitational force on every other object	
Scope and Sequence – Force, Motion, and Work a. Recognize every object exerts a gravitational force of attraction on every other object	**Student Edition:** 317, 321 **Teacher Wraparound Edition:** D 317, 320
b. Recognize an object's weight is a measure of the gravitational force of a planet/moon acting on that object	**Student Edition:** 53, 317, 327-328 **Teacher Wraparound Edition:** D 317; USW 53
c. Compare the amount of gravitational force acting between objects (which is dependent upon their masses and the distance between them)	This standard falls outside the scope of this text. See Glencoe's *Physical Science with Earth Science* © 2006.
C. Magnetic forces are related to electrical forces as different aspects of a single electromagnetic force	
D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion	
Scope and Sequence – Force, Motion, and Work a. Compare the effects of balanced and unbalanced forces (including magnetic, gravity, friction, push or pull) on an object's motion	**Student Edition:** 311-312 **Teacher Wraparound Edition:** FYI 616; QD 312
b. Explain that when forces (including magnetic, gravity, friction, push or pull) are balanced, objects are at rest or their motion remains constant	**Student Edition:** 310-312 **Teacher Wraparound Edition:** QD 312
c. Explain that a change in motion is the result of an unbalanced force acting upon an object	**Student Edition:** 312 **Teacher Wraparound Edition:** QD 312

STANDARDS	PAGE REFERENCES
d. Explain how the acceleration of a moving object is affected by the amount of net force applied and the mass of the object	**Student Edition:** 316-319 *Applying Math* 319 **Teacher Wraparound Edition:** D 318
E. Perpendicular forces act independently of each other	
F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done	
Scope and Sequence – Force, Motion, and Work a. Recognize examples of work being done on an object (force applied and distance moved in the direction of the applied force) with and without the use of simple machines	**Student Edition:** 406-410, 418-423 *LAB* 411 **Teacher Wraparound Edition:** QD 407
b. Calculate the amount of work done when a force is applied to an object over a distance (W = F x d)	**Student Edition:** 408-410, 418 *LAB* 411 **Teacher Wraparound Edition:** DI 408
c. Explain how simple machines affect the amount of effort force, distance through which a force is applied, and/or direction of force while doing work	**Student Edition:** 417-423 *Design Your Own LAB* 424-425 **Teacher Wraparound Edition:** MM 420
d. Recognize the amount of work output is never greater than the amount of work input, with or without the use of a simple machine	**Student Edition:** 415 **Teacher Wraparound Edition:** DI 413
e. Evaluate simple machine designs to determine which design requires the least amount of effort force and explain why	**Student Edition:** 415, 417-423 *Applying Math* 415 **Teacher Wraparound Edition:** MM 420

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STANDARDS	PAGE REFERENCES
Strand 7: Scientific Inquiry	
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking	
A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation	
Scope and Sequence: All Units a. Formulate testable questions and hypotheses	**Student Edition:** *Design Your Own LAB* 60-61, 124-125, 150-151, 208-209, 300-301, 330-331, 424-425, 450-451, 480-481, 510-511, 540-541 *LAB* 31, 32-33, 240-241 *Mini LAB* 14 *Science Skill Handbook* 673-674 **Teacher Wraparound Edition:** IL 17
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *LAB* 32-33, 231, 355, 411, 444, 603 *Science Skill Handbook* 674 **Teacher Wraparound Edition:** D 15, 29; IM 18
c. Design and conduct a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** IM 18

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STANDARDS	PAGE REFERENCES
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	**Student Edition:** 12-18, 27-30 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *MiniLAB* 23 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** D 29; DI 16; IM 15, 18
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; and some involve making models)	**Student Edition:** 12-18, 21-26 *Applying Science* 111, 390, 496 *Design Your Own LAB* 124-125, 330-331, 540-541 *LAB* 31, 261, 270-271, 500, 604-605, 620 *Science and History* 34, 210, 542 **Teacher Wraparound Edition:** A 24; D 22; R 26; VL 13
f. Acknowledge that there is no fixed procedure called “the scientific method,” but that some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and some imagination in developing hypotheses and other explanations	**Student Edition:** 12-18, 21-26 *Applying Science* 111, 390, 496 *Design Your Own LAB* 124-125, 330-331, 540-541 *LAB* 31, 261, 270-271, 500, 604-605, 620 *Science and History* 34, 210, 542 **Teacher Wraparound Edition:** A 24; D 22; R 26; VL 13

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STANDARDS	PAGE REFERENCES
B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations	
Scope and Sequence: All Units a. Make qualitative observations using the five senses	**Student Edition:** 12-15, 43-44, 495-496, 499, 508-509, 567-569 *Integrate Astronomy* 496 *LAB* 31, 207, 231, 472, 632-633 *National Geographic* 497 *Science Skill Handbook* 674-675 *Use the Internet LAB* 362-363 **Teacher Wraparound Edition:** D 495; LD 14; QD 508; TPK 567
b. Determine the appropriate tools and techniques to collect data	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** FYI 46; IL 48
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 60-61, 124-125, 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** A 43; D 45; IL 48

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STANDARDS	PAGE REFERENCES
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	**Student Edition:** 44-49, 52-54 *Design Your Own LAB* 124-125, 208-209, 424-425, 450-451 *LAB* 55, 355, 444 *Science Skill Handbook* 675-676 **Teacher Wraparound Edition:** A 43; D 45; UA 53
e. Compare amounts/measurements	**Student Edition:** 44-49, 50-54, 56-59 *Design Your Own LAB* 60-61, 450-451 *LAB* 240-241, 355 *Launch LAB* 41, 217, 433 *MiniLAB* 44, 52, 285 **Teacher Wraparound Edition:** FYI 46, 54; IL 48; QD 47; SJ 45
f. Judge whether measurements and computation of quantities are reasonable	**Student Edition:** 28-29, 43-44 *Applying Math* 48, 121, 135, 290, 600 *LAB* 31, 32-33 **Teacher Wraparound Edition:** A 53; FYI 45
g. Calculate the range and average/mean of a set of data	**Student Edition:** *Design Your Own LAB* 208-209, 480-481 **Teacher Wraparound Edition:** D 29
C. Evidence is used to formulate explanations	
Scope and Sequence: All Units a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	**Student Edition:** 28-29, 43-44 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	**Student Edition:** 14, 22-25, 56-59, 81-85 *LAB* 86 *Launch LAB* 217 *Math Skill Handbook* 710-711 *National Geographic* 278-279, 370-371 *Reference Handbooks* 712-713 *Science and Society* 452, 606 **Teacher Wraparound Edition:** A 84; D 22; FYI 82; LD 14
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	**Student Edition:** *Design Your Own LAB* 124-125, 150-151, 208-209, 300-301, 424-425, 450-451, 540-541 *LAB* 31, 632-633 *Science and History* 542 *Science and Society* 272, 332 **Teacher Wraparound Edition:** A 302, 332; MM 25, 78
D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)	
Scope and Sequence: All Units a. Evaluate the reasonableness of an explanation (conclusion)	**Student Edition:** 29, 43-44 *Applying Math* 121, 135, 290 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	**Student Edition:** 16, 27-30 *LAB* 31 *Math Skill Handbook* 709-711 *Science and Society* 606 *Science Skill Handbook* 677-678 **Teacher Wraparound Edition:** D 29; IM 15
E. The nature of science relies upon communication of results and justification of explanations	
Scope and Sequence: All Units a. Communicate the procedures and results of investigations and explanations through: • oral presentations • drawings and maps • data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) • graphs (bar, single line, pictographs) • equations and writings	**Student Edition:** 16-17, 56-59 *Applying Math* 121, 409, 600 *Design Your Own LAB* 60-61, 450-451 *LAB* 55, 444 *Math Skill Handbook* 710-711 *Science Skill Handbook* 678 *Technology Skill Handbook* 695-696 **Teacher Wraparound Edition:** D 58; LD 57; R 59
Grade 8	
Strand 1: Properties and Principles of Matter and Energy	
1. Changes in properties and states of matter provide evidence of the atomic theory of matter	
A. Objects, and the materials they are made of, have properties that can be used to describe and classify them	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Recognize elements (unique atoms) and compounds (molecules or crystals) are pure substances that have characteristic properties	**Student Edition:** 80-85, 87-88, 224, 250-256, 262-269 *LAB* 86 **Teacher Wraparound Edition:** D 89; FYI 82

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STANDARDS	PAGE REFERENCES
b. Describe the physical and chemical properties (e.g., magnetic attraction, conductivity, melting point and boiling point, reactivity) of pure substances (elements or compounds) (e.g., copper wire, aluminum wire, iron, charcoal, sulfur, water, salt, sugar, sodium bicarbonate, galena, quartz, magnetite, pyrite) using appropriate senses and tools	**Student Edition:** 134-136, 139-142, 143-148, 250-256 *LAB* 207, 261, 444 *Launch LAB* 101 *MiniLAB* 112, 145, 440, 618 **Teacher Wraparound Edition:** D 172; FYI 173
B. Properties of mixtures depend upon the concentrations, properties, and interactions of particles	
C. Properties of matter can be explained in terms of moving particles too small to be seen without tremendous magnification	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Describe evidence (e.g., diffusion of colored material into clear material such as water; light reflecting off of dust particles in air; changes in physical properties and reactivity such as gold hammered into foil, oil spreading on the surface of water, decay of organic matter, condensation of water vapor by increased pressure) that supports the theory that matter is composed of moving particles too small to be seen (atoms, molecules)	**Student Edition:** 102-106, 107-108, 434, 438-439, 492, 556 **Teacher Wraparound Edition:** FYI 112, 142; IL 439; QD 106; TPK 107
D. Physical changes in the state of matter that result from thermal changes can be explained by the Kinetic Theory of Matter	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Using the Kinetic Theory model, illustrate and account for the physical properties (i.e., shape, volume, malleability, viscosity) of a solid, liquid, or gas in terms of the arrangement and motion of molecules in a substance	**Student Edition:** 102-106, 107-114, 134-136 *Science and History* 210 **Teacher Wraparound Edition:** FYI 103; UA 104
b. Use the Kinetic Theory model to explain changes in the volume, shape, and viscosity of materials in response to temperature changes during a phase change	**Student Edition:** 107-114, 143-144 *LAB* 115 *Launch LAB* 101 *National Geographic* 110 **Teacher Wraparound Edition:** LD 105

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STANDARDS	PAGE REFERENCES
c. Predict the effect of transfer on the physical properties of a substance as it changes to or from a solid, liquid, or gas (i.e., phase changes that occur during freezing, melting, evaporation, boiling, condensation)	**Student Edition:** 107-114, 143-144, 438-441 *LAB* 115 *Launch LAB* 101 **Teacher Wraparound Edition:** A 113
E. The atomic model describes the electrically neutral atom	
F. The periodic table organizes the elements according to their atomic structure and chemical reactivity	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Recognize more than 100 known elements (unique atoms) exist that may be combined in nature or by man to produce compounds that make up the living and nonliving substances in the environment (Do NOT assess memorization of the Periodic Table)	**Student Edition:** 80-81, 87-88, 162-169, 250-256, 262-269 *Accidents in Science* 126 *Integrate Earth Science* 91, 252 *LAB* 86 *National Geographic* 82, 176, 255 *Science and History* 210 *Science and Society* 272 **Teacher Wraparound Edition:** CD 89, 171; DI 251; FYI 82; TPK 87
G. Properties of objects and states of matter can change chemically and/or physically	
H. Chemical bonding is the combining of different pure substances (elements, compounds) to form new substances with different properties	
I. Mass is conserved during any physical or chemical change	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Provide evidence that mass is conserved during a chemical change in a closed system (e.g., vinegar + baking soda, mold growing in a closed container, steel wool rusting)	**Student Edition:** 74, 194-195 *Applying Math* 196 **Teacher Wraparound Edition:** LD 75; VL 194
Scope and Sequence – Rock Cycle and Plate Tectonics b. Explain that the amount of matter remains constant while being recycled through the rock cycle	This standard falls outside the scope of this text. See Glencoe's *Physical Science with Earth Science* © 2006.

STANDARDS	PAGE REFERENCES
Scope and Sequence – Cells and Body Systems c. Explain that the amount of matter remains constant while being recycled through food chains and food webs	This standard falls outside the scope of this text. See Glencoe's *Physical Science with Earth Science* © 2006.
2. Energy has a source, can be transferred, and can be transformed into various forms but is conserved between and within systems	
A. Forms of energy have a source, a means of transfer (work and heat), and a receiver	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Recognize chemical energy is stored in chemical compounds (e.g., energy stored in and released from food molecules, batteries, nitrogen explosives, fireworks, organic fuels)	**Student Edition:** 196-197, 252, 267-268, 377, 388, 593 *Applying Science* 266 *Integrate Life Science* 381 **Teacher Wraparound Edition:** A 267; D 253; DI 377; FF 381; FYI 266; UA 388
B. Mechanical energy comes from the motion (kinetic energy) and/or relative position (potential energy) of an object	
C. Electromagnetic energy from the Sun (solar radiation) is a major source of energy on Earth	
D. Chemical reactions involve changes in the bonding of atoms with the release or absorption of energy	
E. Nuclear energy is a major source of energy throughout the universe	
F. Energy can change from one form to another within systems, but the total amount remains the same	
Scope and Sequence – Physical and Chemical Properties and Changes of Matter a. Identify the evidence of different energy transformations (e.g., explosion of light, heat, and sound, temperature change, electrical charge) that may occur as chemical energy is released during a chemical reaction	**Student Edition:** 74, 196-198, 200-201, 377, 388, 592-593 *Integrate Life Science* 381 *National Geographic* 191 **Teacher Wraparound Edition:** CC 197; D 377; FF 381; QD 264; SJ 196
Strand 2: Properties and Principles of Force and Motion	
1. The motion of an object is described by its change in position relative to another object or point	
A. The motion of an object is described as a change in position, direction, and speed relative to another object (frame of reference)	
B. An object that is accelerating is speeding up, slowing down, or changing direction	
C. Momentum depends on the mass of the object and the velocity with which it is traveling	

STANDARDS	PAGE REFERENCES
2. Forces affect motion	
A. Forces are classified as either contact forces (pushes, pulls, friction, buoyancy) or non-contact forces (gravity, magnetism), that can be described in terms of direction and magnitude	
B. Every object exerts a gravitational force on every other object	
C. Magnetic forces are related to electrical forces as different aspects of a single electromagnetic force	
D. Newton's Laws of Motion explain the interaction of mass and forces, and are used to predict changes in motion	
E. Perpendicular forces act independently of each other	
F. Simple machines (levers, inclined planes, wheels and axles, pulleys) affect the forces applied to an object and/or direction of movement as work is done	
Strand 7: Scientific Inquiry	
1. Science understanding is developed through the use of science process skills, scientific knowledge, scientific investigation, reasoning, and critical thinking	
A. Scientific inquiry includes the ability of students to formulate a testable question and explanation, and to select appropriate investigative methods in order to obtain evidence relevant to the explanation	
Scope and Sequence: All Units a. Formulate testable questions and hypotheses	**Student Edition:** *Design Your Own LAB* 60-61, 124-125, 150-151, 208-209, 300-301, 330-331, 424-425, 450-451, 480-481, 510-511, 540-541 *LAB* 31, 32-33, 240-241 *MiniLAB* 14 *Science Skill Handbook* 673-674 **Teacher Wraparound Edition:** IL 17
b. Recognize the importance of the independent variable, dependent variables, control of constants, and multiple trials to the design of a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *LAB* 32-33, 231, 355, 411, 444, 603 *Science Skill Handbook* 674 **Teacher Wraparound Edition:** D 15, 29; IM 18

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STANDARDS	PAGE REFERENCES
c. Design and conduct a valid experiment	**Student Edition:** 18 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** IM 18
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	**Student Edition:** 12-18, 27-30 *Design Your Own LAB* 60-61, 124-125, 208-209, 300-301, 424-425, 450-451, 480-481, 540-541 *MiniLAB* 23 *Science Skill Handbook* 674-678 **Teacher Wraparound Edition:** D 29; DI 16; IM 15, 18
e. Recognize that different kinds of questions suggest different kinds of scientific investigations (e.g., some involve observing and describing objects, organisms, or events; some involve collecting specimens; some involve experiments; some involve making observations in nature; some involve discovery of new objects and phenomena; and some involve making models)	**Student Edition:** 12-18, 21-26 *Applying Science* 111, 390, 496 *Design Your Own LAB* 124-125, 330-331, 540-541 *LAB* 31, 261, 270-271, 500, 604-605, 620 *Science and History* 34, 210, 542 **Teacher Wraparound Edition:** A 24; D 22; R 26; VL 13
f. Acknowledge that there is no fixed procedure called “the scientific method,” but that some investigations involve systematic observations, carefully collected and relevant evidence, logical reasoning, and some imagination in developing hypotheses and other explanations	**Student Edition:** 12-18, 21-26 *Applying Science* 111, 390, 496 *Design Your Own LAB* 124-125, 330-331, 540-541 *LAB* 31, 261, 270-271, 500, 604-605, 620 *Science and History* 34, 210, 542 **Teacher Wraparound Edition:** A 24; D 22; R 26; VL 13

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STANDARDS	PAGE REFERENCES
B. Scientific inquiry relies upon gathering evidence from qualitative and quantitative observations	
Scope and Sequence: All Units a. Make qualitative observations using the five senses	**Student Edition:** 12-15, 43-44, 495-496, 499, 508-509, 567-569 *Integrate Astronomy* 496 *LAB* 31, 207, 231, 472, 632-633 *National Geographic* 497 *Science Skill Handbook* 674-675 *Use the Internet LAB* 362-363 **Teacher Wraparound Edition:** D 495; LD 14; QD 508; TPK 567
b. Determine the appropriate tools and techniques to collect data	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** FYI 46; IL 48
c. Use a variety of tools and equipment to gather data (e.g., microscopes, thermometers, analog and digital meters, computers, spring scales, balances, metric rulers, graduated cylinders, stopwatches)	**Student Edition:** 42-49, 52-54 *Design Your Own LAB* 60-61, 124-125, 208-209, 424-425, 450-451, 540-541 *LAB* 270-271, 444, 572-573, 648 *Science Skill Handbook* 674-677 *Technology Skill Handbook* 694-695 **Teacher Wraparound Edition:** A 43; D 45; IL 48

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STANDARDS	PAGE REFERENCES
d. Measure length to the nearest millimeter, mass to the nearest gram, volume to the nearest milliliter, force (weight) to the nearest Newton, temperature to the nearest degree Celsius, time to the nearest second	**Student Edition:** 44-49, 52-54 *Design Your Own LAB* 124-125, 208-209, 424-425, 450-451 *LAB* 55, 355, 444 *Science Skill Handbook* 675-676 **Teacher Wraparound Edition:** A 43; D 45; UA 53
e. Compare amounts/measurements	**Student Edition:** 44-49, 50-54, 56-59 *Design Your Own LAB* 60-61, 450-451 *LAB* 240-241, 355 *Launch LAB* 41, 217, 433 *MiniLAB* 44, 52, 285 **Teacher Wraparound Edition:** FYI 46, 54; IL 48; QD 47; SJ 45
f. Judge whether measurements and computation of quantities are reasonable	**Student Edition:** 28-29, 43-44 *Applying Math* 48, 121, 135, 290, 600 *LAB* 31, 32-33 **Teacher Wraparound Edition:** A 53; FYI 45
g. Calculate the range and average/mean of a set of data	**Student Edition:** *Design Your Own LAB* 208-209, 480-481 **Teacher Wraparound Edition:** D 29
C. Evidence is used to formulate explanations	
Scope and Sequence: All Units a. Use quantitative and qualitative data as support for reasonable explanations (conclusions)	**Student Edition:** 28-29, 43-44 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	**Student Edition:** 14, 22-25, 56-59, 81-85 *LAB* 86 *Launch LAB* 217 *Math Skill Handbook* 710-711 *National Geographic* 278-279, 370-371 *Reference Handbooks* 712-713 *Science and Society* 452, 606 **Teacher Wraparound Edition:** A 84; D 22; FYI 82; LD 14
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	**Student Edition:** *Design Your Own LAB* 124-125, 150-151, 208-209, 300-301, 424-425, 450-451, 540-541 *LAB* 31, 632-633 *Science and History* 542 *Science and Society* 272, 332 **Teacher Wraparound Edition:** A 302, 332; MM 25, 78
D. Scientific inquiry includes evaluation of explanations (hypotheses, laws, theories) in light of scientific principles (understandings)	
Scope and Sequence: All Units a. Evaluate the reasonableness of an explanation (conclusion)	**Student Edition:** 29, 43-44 *Applying Math* 121, 135, 290 *Applying Science* 111, 390, 477, 496 *LAB* 31, 32-33 *Science Skill Handbook* 678 **Teacher Wraparound Edition:** A 53; FYI 45

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STANDARDS	PAGE REFERENCES
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	**Student Edition:** 16, 27-30 *LAB* 31 *Math Skill Handbook* 709-711 *Science and Society* 606 *Science Skill Handbook* 677-678 **Teacher Wraparound Edition:** D 29; IM 15
E. The nature of science relies upon communication of results and justification of explanations	
Scope and Sequence: All Units a. Communicate the procedures and results of investigations and explanations through: • oral presentations • drawings and maps • data tables (allowing for the recording and analysis of data relevant to the experiment, such as independent and dependent variables, multiple trials, beginning and ending times or temperatures, derived quantities) • graphs (bar, single line, pictographs) • equations and writings	**Student Edition:** 16-17, 56-59 *Applying Math* 121, 409, 600 *Design Your Own LAB* 60-61, 450-451 *LAB* 55, 444 *Math Skill Handbook* 710-711 *Science Skill Handbook* 678 *Technology Skill Handbook* 695-696 **Teacher Wraparound Edition:** D 58; LD 57; R 59
Grades 6, 7, 8	
Strand 8: Impact of Science, Technology, and Human Activity	
1. The nature of technology can advance, and is advanced by, science as it seeks to apply scientific knowledge in ways that meet human needs	
A. Designed objects are used to do things better or more easily and to do some things that could not otherwise be done at all	
Scope and Sequence: All Units a. Explain how technological improvements, such as those developed for use in space exploration, the military, or medicine, have led to the invention of new products that may improve lives here on Earth (e.g., new materials, freeze-dried foods, infrared goggles, Velcro, satellite imagery, robotics, lasers)	**Student Edition:** 87, 359-361, 378, 389, 495-496, 526-533, 535-539, 650-659 *National Geographic* 458-459, 623 *Science and History* 34, 542 *Science and Society* 332 **Teacher Wraparound Edition:** CU 539; DI 389; FYI 658; IP 466

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STANDARDS	PAGE REFERENCES
B. Advances in technology often result in improved data collection and an increase in scientific information	
Scope and Sequence: All Units a. Identify the link between technological developments and the scientific discoveries made possible through their development (e.g., Hubble telescope and stellar evolution, composition and structure of the universe; the electron microscope and cell organelles; sonar and the composition of the Earth; manned and unmanned space missions and space exploration; Doppler radar and weather conditions; MRI and CAT-scans and brain activity)	**Student Edition:** 23-26, 87, 359-361, 378, 389-395, 445-449, 495-496, 526-533, 535-539, 650-659 *National Geographic* 68-69, 458-459, 623 *Science and History* 542 *Science and Society* 332, 426 **Teacher Wraparound Edition:** CC 495; CD 448; FYI 25, 658; MM 538
C. Technological solutions to problems often have drawbacks as well as benefits	
Scope and Sequence: All Units a. Describe how technological solutions to problems (e.g., storm water runoff, fiber optics, windmills, efficient car design, electronic trains without conductors, sonar, robotics, Hubble telescope) can have both benefits and drawbacks (e.g., design constraints, unintended consequences, risks) (Assess Locally)	**Student Edition:** 26, 78-79, 389, 495-496, 656-658 *Integrate Astronomy* 51 *Integrate Life Science* 443 *National Geographic* 158-159, 234, 447 *Science and History* 152 *Science and Society* 332 *Use the Internet LAB* 660-661 **Teacher Wraparound Edition:** D 662; DI 389; FYI 46

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STANDARDS	PAGE REFERENCES
2. Historical and cultural perspectives of scientific explanations help to improve understanding of the nature of science and how science knowledge and technology evolve over time	
A. People of different gender and ethnicity have contributed to scientific discoveries and the invention of technological innovations	
Scope and Sequence: All Units a. Describe how the contributions of scientists and inventors, representing different cultures, races, and gender, have contributed to science, technology and human activity (e.g., George Washington Carver, Thomas Edison, Thomas Jefferson, Isaac Newton, Marie Curie, Galileo, Albert Einstein, Mae Jemison, Edwin Hubble, Charles Darwin, Jonas Salk, Louis Pasteur, Jane Goodall, Tom Akers, John Wesley Powell, Rachel Carson) (Assess Locally)	**Student Edition:** 9, 73-79, 121, 122, 312, 359 *Accidents in Science* 574 *Integrate Career* 165 *Integrate History* 317 *National Geographic* 82 *Science and History* 34, 94, 542 *Science and Society* 272 **Teacher Wraparound Edition:** CC 121; FYI 9, 82, 118, 312, 383, 658; FF 353; VL 77
B. Scientific theories are developed based on the body of knowledge that exists at any particular time and must be rigorously questioned and tested for validity	
Scope and Sequence: All Units a. Recognize the difficulty science innovators experience as they attempt to break through accepted ideas (hypotheses, laws, theories) of their time to reach conclusions that may lead to changes in those ideas and serve to advance scientific understanding (e.g., Darwin, Copernicus, Newton)	**Student Edition:** 26, 73-74, 312 *Integrate History* 317, 629 *Science and History* 34, 542 *Science and Society* 272 **Teacher Wraparound Edition:** CC 121, 317, 353, 384; DI 84; FYI 312; IM 15
b. Recognize explanations have changed over time as a result of new evidence	**Student Edition:** 26, 73-79, 312-315, 317-318 **Teacher Wraparound Edition:** A 84; FF 624; FYI 312, 436, 563, 658; IM 15; SJ 359

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STANDARDS	PAGE REFERENCES
3. Science and technology affect, and are affected by, society	
B. Social, political, economic, ethical, and environmental factors strongly influence, and are influenced by, the direction of progress of science and technology	
Scope and Sequence: All Units a. Describe ways in which science and society influence one another (e.g., scientific knowledge and the procedures used by scientists influence the way many individuals in society think about themselves, others, and the environment; societal challenges often inspire questions for scientific research; social priorities often influence research priorities through the availability of funding for research)	**Student Edition:** 30, 262-269, 350-354, 357-361, 384-385, 388-395, 443, 535-539, 642-647, 649-659 *Accidents in Science* 574 *Design Your Own LAB* 300-301 *National Geographic* 234, 278-279 *Science and History* 152, 542 *Science and Society* 272, 332, 426, 606, 662 **Teacher Wraparound Edition:** D 28; DI 265; FYI 29, 357; QD 8
b. Identify and evaluate the physical, social, economic, and/or environmental problems that may be overcome using science and technology (e.g., the need for alternative fuels, human travel in space, AIDS)	**Student Edition:** 10-11, 376-378, 384-385, 388-395, 443, 526-533, 535-539, 629-631 *Integrate Environment* 656 *Science and History* 152 *Science and Society* 272, 662 *Use the Internet LAB* 396-397, 660-661 **Teacher Wraparound Edition:** D 377, 392; MM 394; VL 391
C. Scientific ethics require that scientists must not knowingly subject people or the community to health or property risks without their knowledge and consent	
D. Scientific information is presented through a number of credible sources, but is at times influenced in such a way to become noncredible	

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