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

Missouri

Life Science

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STANDARDS	PAGE REFERENCES
Grade 6	
Strand 3: Characteristics and Interactions of Living Organisms	
1. There is a fundamental unity underlying the diversity of all living organisms	
A. Organisms have basic needs for survival	
Scope and Sequence – Characteristics of Living Organisms a. Describe the common life processes of living organisms (i.e., growth, reproduction, life span, response to stimuli, energy use, exchange of gases, use of water, and elimination of waste)	**Student Edition:** 14-18, 72, 81 **Teacher Wraparound Edition:** AC 17; ATP 4; DIF 17; RT 18; SJ 16; TFYI 16; TTPK 14 **Teacher Resources:** *Exploring and Classifying Life* 26, 30
C. Cells are the fundamental units of structure and function of all living things	
Scope and Sequence – Characteristics of Living Organisms a. Recognize all organisms are composed of cells, the fundamental units of life, which carry on all life processes	**Student Edition:** 14, 38-45, 51 **Teacher Wraparound Edition:** TC 36; TTPK 38 **Teacher Resources:** *Exploring and Classifying Life* 18 (#5), 26 (#12)

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

STANDARDS	PAGE REFERENCES
E. Biological classifications are based on how organisms are related	
Scope and Sequence – Characteristics of Living Organisms a. Recognize most of the organisms on Earth are unicellular (e.g., bacteria, protists) and other organisms, including humans, are multi-cellular	**Student Edition:** 14, 36, 38-39, 45, 186, 210, 222, 240-241, 330 *Section Review* 45 (#4)
b. Identify examples of unicellular (e.g., bacteria, some protists, fungi) and multicellular organisms (e.g., some fungi, plants, animals)	**Student Edition:** 186, 210-213, 222-225, 240-241, 330, 336-341, 360, 365, 370, 399 *Lab* 192, 221, 343, 379 *MiniLab* 218 **Teacher Resources:** *Bacteria* 23, 41 *Protists and Fungi* 15, 40, 43 *Introduction to Animals* 28
2. Living organisms carry out life processes in order to survive	
A. The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means	
Scope and Sequence – Characteristics of Living Organisms a. Compare and contrast the following plant and animal cell structures: cell membrane, nucleus, cell wall, chloroplast and cytoplasm	**Student Edition:** 39-40, 41, 42 *Lab* 46 *Section Review* 45 (#5) **Teacher Wraparound Edition:** AS 45; QD 39; RT 45; VL 41 **Teacher Resources:** *Cells* 13-16, 17, 19, 47-48
b. Recognize the chloroplast as the cell structure where food is produced in plants and some unicellular organisms (e.g., algae, some protists)	**Student Edition:** 42, 82, 211, 304-305 **Teacher Wraparound Edition:** IM 82 **Teacher Resources:** *Cells* 27 (#7) *Plant Processes* 29 (3.a)

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STANDARDS	PAGE REFERENCES
B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth	
Scope and Sequence – Characteristics of Living Organisms a. Recognize that plants use energy from the Sun to produce food and oxygen through the process of photosynthesis	**Student Edition:** 15, 42, 82, 305-307, 726 **Teacher Wraparound Edition:** UAA 82; USW 83, 305 **Teacher Resources:** *Exploring and Classifying Life* 26 (#9) *Cell Processes* 11-14, 27 (#1-2), 30 *Plant Processes* 17-18
Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments	
1. Organisms are interdependent with one another and with their environment	
A. All populations living together within communities interact with one another and with their environment in order to survive and maintain a balanced ecosystem	
Scope and Sequence – Ecosystems and Populations a. Identify the biotic factors (populations of organisms) and abiotic factors (e.g., quantity of light and water, range of temperatures, soil composition) that make up an ecosystem	**Student Edition:** 685, 686, 688, 698-700, 712-718 *Lab* 719 *Section Review* 718 (#1-3) **Teacher Wraparound Edition:** AC 713; TTPK 712 **Teacher Resources:** *Interactions of Life* 27 *The Nonliving Environment* 17, 19, 27, 32
B. Living organisms have the capacity to produce populations of infinite size but environments and resources are finite	
Scope and Sequence – Ecosystems and Populations a. Identify populations within a community that are in competition with one another for resources	**Student Edition:** 688 **Teacher Wraparound Edition:** RT 695

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STANDARDS	PAGE REFERENCES
b. Recognize the factors that affect the number and types of organisms an ecosystem can support (e.g., food availability, abiotic factors such as quantity of light and water, temperature and temperature range, soil composition, disease, competitions from other organisms, predation)	**Student Edition:** 688, 690-691, 700, 713-716 *Lab: Design Your Own* 702 *MiniLab* 689 *Section Review* 695 (#3-4), 718 (#3) **Teacher Wraparound Edition:** DIF 691; RT 718 **Teacher Resources:** *Interactions of Life* 28 *The Nonliving Environment* 17
c. Predict the possible effects of changes in the number and types of organisms in an ecosystem on the populations of other organisms within that ecosystem	**Student Edition:** 690 *Applying Math* 707 (#32) *Lab* 752 **Teacher Wraparound Edition:** CFU 700 **Teacher Resources:** *Interactions of Life* 13-16, 49
D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	
Scope and Sequence – Ecosystems and Populations a. Describe beneficial and harmful activities of organisms, including humans (e.g., deforestation, overpopulation, water and air pollution, global warming, restoration of natural environments, river bank/coastal stabilization, recycling, channelization, reintroduction of species, depletion of resources) and explain how these activities affect organisms within an ecosystem	**Student Edition:** 214, 745, 751, 754, 755, 778-786, 788-791 *Lab* 787 *Time: Science and Society* 762 **Teacher Wraparound Edition:** AC 783; CFU 786; SJ 214 **Teacher Resources:** *Conserving Resources* 9-12 *The Nonliving Environment* 13-16 *Critical Thinking/Problem Solving* 5, 9, 21, 23

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STANDARDS	PAGE REFERENCES
b. Predict the impact (beneficial or harmful) of a natural environmental change (e.g., forest fire, flood, volcanic eruption, avalanche) on the organisms in an ecosystem	**Student Edition:** 740-741, 743 *National Geographic* 742 **Teacher Wraparound Edition:** AS 743; DI 741 **Teacher Resources:** *Ecosystems* 25
c. Describe possible solutions to potentially harmful environmental changes within an ecosystem	**Student Edition:** 772-776, 779, 788-791 *Applying Science* 790 *Section Review* 791 (#1) **Teacher Wraparound Edition:** DIF 790 **Teacher Resources:** *Critical Thinking/Problem Solving* 5, 9, 23
2. Matter and energy flow through an ecosystem	
A. As energy flows through the ecosystem, all organisms capture a portion of that energy and transform it to a form they can use	
Scope and Sequence –Ecosystems and Populations a. Diagram and describe the transfer of energy in an aquatic food web and a land food web with reference to producers, consumers, decomposers, scavengers, and predator/prey relationships	**Student Edition:** 696-697, 727-729 **Teacher Wraparound Edition:** AC 727; AS 729; CFU 729; DIF 727 **Teacher Resources:** *Ecosystems* 29, 47-48
b. Classify populations of unicellular and multi-cellular organisms as producers, consumers, and decomposers by the role they serve in the ecosystem	**Student Edition:** 696-697, 727 *Chapter Review* 706 (#18) **Teacher Wraparound Edition:** DIF 727 **Teacher Resources:** *Cell Processes* 44 *Interactions of Life* 9-11, 29 *Ecosystems* 29, 47-48

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STANDARDS	PAGE REFERENCES
3. Genetic variation sorted by the natural selection process explains evidence of biological evolution	
A. Evidence for the nature and rates of evolution can be found in anatomical and molecular characteristics of organisms and in the fossil record	
Scope and Sequence –Ecosystems and Populations a. Identify fossils as evidence that some types of organisms (e.g., dinosaurs, trilobites, mammoths, giant tree ferns) that once lived in the past, and have since become extinct, have similarities with and differences from organisms living today	**Student Edition:** 163, 167, 172-173, 241 *Science Online* 165 *Section Review* 169 (#2) **Teacher Wraparound Edition:** DIF 241; VL 241 **Teacher Resources:** *Adaptations over Time* 43, 44
C. Natural selection is the process of sorting individuals based on their ability to survive and reproduce within their ecosystem	
Scope and Sequence – Ecosystems and Populations a. Relate examples of adaptations (specialized structures or behaviors) within a species to its ability to survive in a specific environment (e.g., hollow bones/flight, hollow hair/insulation, dense root structure/compact soil, seeds/food protection for plant embryo vs. spores, fins/movement in water)	**Student Edition:** 158, 187, 242-243, 288, 332, 413, 429-431, 438, 750 *Lab* 162 *MiniLab* 288, 332, 438, 748 *Section Review* 161 (#5), 751 (#6) **Teacher Wraparound Edition:** AL 748; VL 333 **Teacher Resources:** *Adaptations Over Time* 11-14, 25, 43 *Birds and Mammals* 11-13
b. Predict how certain adaptations, such as behavior, body structure, or coloration, may offer a survival advantage to an organism in a particular environment	**Student Edition:** 158 *Lab* 162 *MiniLab* 288, 332, 438, 748 *Section Review* 161 (#5) **Teacher Wraparound Edition:** VL 333 **Teacher Resources:** *Adaptations Over Time* 11-14, 25, 43

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STANDARDS	PAGE REFERENCES
Grade 8	
Strand 3: Characteristics and Interactions of Living Organisms	
1. There is a fundamental unity underlying the diversity of all living organisms	
A. Organisms have basic needs for survival	
Scope and Sequence – Cells and Body Systems a. Recognize that most plants and animals require food and oxygen (needed to release the energy from that food)	**Student Edition:** 15, 42, 81-85, 305-309, 331 *Lab* 86-87 *Section Review* 309 (#2) **Teacher Wraparound Edition:** UAA 307 **Teacher Resources:** *Exploring and Classifying Life* 18 (#7) *Cell Processes* 27
D. Plants and animals have different structures that serve similar functions necessary for the survival of the organism	
Scope and Sequence – Cells and Body Systems a. Identify and contrast the structures of plants and animals that serve similar functions (e.g., taking in water and oxygen, support, response to stimuli, obtaining energy, circulation, digestion, excretion, reproduction)	**Student Edition:** 242, 255, 274-275, 302-303, 311-314, 496-497, 541-545, 568-571, 622-623 *Integrate Health* 255 **Teacher Wraparound Edition:** USW 243 **Teacher Resources:** *Plants* 26 *Plant Processes* 19, 25-26 *Respiration and Excretion* 17-18

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STANDARDS	PAGE REFERENCES
2. Living organisms carry out life processes in order to survive	
A. The cell contains a set of structures called organelles that interact to carry out life processes through physical and chemical means	
Scope and Sequence – Cells and Body Systems a. Recognize that the cell membrane helps regulate the transfer of materials in and out of the cell	**Student Edition:** 40, 74-78 *National Geographic* 79 **Teacher Wraparound Edition:** TTPK 74 **Teacher Resources:** *Cells* 15 (#7f), 27 (#2)
b. Recognize that the function of the chloroplast is photosynthesis	**Student Edition:** 42, 82, 211, 304-305 **Teacher Wraparound Edition:** IM 82 **Teacher Resources:** *Cells* 15 (#7b), 27 (#7) *Plant Processes* 29 (3.a)
B. Photosynthesis and cellular respiration are complementary processes necessary to the survival of most organisms on Earth	
Scope and Sequence – Cells and Body Systems a. Recognize photosynthesis is a chemical change with reactants (water and carbon dioxide) and products (energy-rich sugar molecules and oxygen) that takes place in the presence of light and chlorophyll	**Student Edition:** 15, 42, 82, 305-307, 726 *Lab* 86 **Teacher Wraparound Edition:** UAA 82; USW 83, 305 **Teacher Resources:** *Exploring and Classifying Life* 26 (#9) *Cell Processes* 11-14, 27 (#1-2), 30 *Plant Processes* 17-18
b. Recognize oxygen is needed by all cells of most organisms for the release of energy from nutrient (sugar) molecules (Do NOT assess the term cellular respiration)	**Student Edition:** 15, 83, 568-569 **Teacher Wraparound Edition:** IM 300F

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STANDARDS	PAGE REFERENCES
c. Describe the importance of the transport and exchange of oxygen and carbon dioxide to the survival of the organism	**Student Edition:** 85, 252-253, 569 **Teacher Wraparound Edition:** IM 300F; VL 85 **Teacher Resources:** *Plant Processes* 25 *Respiration and Excretion* 15, 18
C. Complex multicellular organisms have systems that interact to carry out life processes through physical and chemical means	
Scope and Sequence – Cells and Body Systems a. Identify and give examples of each level of organization (cell, tissue, organ, organ system) in multicellular organisms (plants, animals)	**Student Edition:** 38, 45, 255, 493, 525-529, 540, 595, 597-599 *Integrate Health* 255 *Section Review* 45 (#3)
b. Illustrate and explain the path water and nutrients take as they move through the transport system of a plant	**Student Edition:** 253-255, 302 *MiniLab* 253 **Teacher Wraparound Edition:** AS 301 **Teacher Resources:** *Plants* 9, 26
c. Explain the interactions between the circulatory and digestive systems as nutrients are processed by the digestive system, passed into the blood stream and are transported in and out of the cell	**Student Edition:** 523, 528, 540, 545, 550, 577 **Teacher Wraparound Edition:** TFYI 527 **Teacher Resources:** *Nutrients and Digestion* 33 (#2d) *Circulation* 35 (#2, 3)

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STANDARDS	PAGE REFERENCES
d. Compare and contrast the processes of mechanical and chemical digestion, and their role in providing materials necessary for survival of the cell and organism	**Student Edition:** 523-524, 527, 528, 529 *Section Review* 529 (#1) **Teacher Wraparound Edition:** QD 524; TTPK 523 **Teacher Resources:** *Nutrients and Digestion* 13-15, 21, 33
e. Identify the importance of the transport and exchange of nutrient and waste molecules to the survival of the cell and organism	**Student Edition:** 74-78, 498, 523, 540, 542, 550, 571, 577-580, 581 *National Geographic* 79 *Section Review* 548 (#5); 576 (#2) **Teacher Wraparound Edition:** TFYI 579 **Teacher Resources:** *Respiration and Excretion* 15, 41
f. Explain the interactions between the circulatory and respiratory systems in exchanging oxygen and carbon dioxide between cells and the atmosphere (when oxygen enters the body, passes into the blood stream, and is transported into the cell; carbon dioxide is transported out of the cell, passes into the blood stream, and exits the body)	**Student Edition:** 540, 542-543, 550, 551, 568, 571 Section Review 57 (#2, #4) **Teacher Wraparound Edition:** AR 542; DIF 543; TTPK 568 **Teacher Resources:** *Circulation* 19, 49-50 *Respiration and Excretion* 17, 18
g. Explain the interactions between the nervous and muscular systems when an organism responds to a stimulus	**Student Edition:** 491, 595, 599 *National Geographic* 593 **Teacher Wraparound Edition:** IM 482F; SCB 482; TFYI 493 **Teacher Resources:** *Control and Coordination* 42

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STANDARDS	PAGE REFERENCES
F. Cellular activities and responses can maintain stability internally while external conditions are changing (homeostasis)	
Scope and Sequence – Cells and Body Systems a. Predict the response the body may take to maintain internal balance during an environmental change (e.g., shivering when cold, slowing metabolism when food supply decreases or when dehydrated, adrenaline rush when frightened)	**Student Edition:** 498, 594-595, *Launch Lab* 567 *MiniLab* 498 *National Geographic* 596 *Science Online* 15 **Teacher Wraparound Edition:** AS 567; ATP 566; QD 625; TC 592
G. Life processes can be disrupted by disease (intrinsic failures of the organ systems or by infection due to other organisms)	
Scope and Sequence – Disease a. Explain the cause and effect of diseases (e.g., AIDS, cancer, diabetes, hypertension) on the human body	**Student Edition:** 547, 555, 557, 574-576, 581, 653, 657-658, 661-664, 666-671 *Lab* 665 *National Geographic* 546 *Science Online* 547, 663 **Teacher Wraparound Edition:** LD 547, 574 **Teacher Resources:** *Immunity and Disease* 13-14, 15, 19, 26-27, 29, 30
b. Relate some common diseases (i.e., cold, influenza, strep throat, dysentery, fungal infections) to the organisms that cause them (bacteria, viruses, protists, fungi)	**Student Edition:** 52, 197, 218, 229, 658, 662 *Integrate Health* 217 *Section Review* 664 (#2) *Science Online* 54 **Teacher Wraparound Edition:** ATP 650; DI 197; TTPK 52 **Teacher Resources:** *Cells* 46 *Bacteria* 39 *Immunity and Disease* 19

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STANDARDS	PAGE REFERENCES
c. Differentiate between infectious and noninfectious diseases	**Student Edition:** 657-664, 666-671 **Teacher Wraparound Edition:** TTPK 666 **Teacher Resources:** *Immunity and Disease* 13-14, 15, 19, 26-27
d. Explain the role of antibiotics and vaccines in the treatment and prevention of diseases	**Student Edition:** 54-55, 193, 199, 655 **Teacher Wraparound Edition:** AS 199; TFYI 654; UAA 199 **Teacher Resources:** *Critical Thinking/Problem Solving* 20 *Immunity and Disease* 28
3. There is a genetic basis for the transfer of biological characteristics from one generation to the next through reproductive processes	
A. Reproduction can occur asexually or sexually	
Scope and Sequence – Reproduction and Heredity a. Compare and contrast the processes of asexual and sexual reproduction, including the type and number of cells involved (one body cell in asexual, two sex cells in sexual), and the number of gene sets (body cell has two sets, sex cells have one set each) passed from parent(s) to offspring	**Student Edition:** 101-102, 104-105, 272-273 *MiniLab* 273 *Section Review* 102 (#2), 109 (#5) **Teacher Wraparound Edition:** AS 275; LD 100 **Teacher Resources:** *Cell Reproduction* 32 (F.1-3), 32 (A, B) *Plant Reproduction* 15

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STANDARDS	PAGE REFERENCES
b. Identify examples of asexual reproduction (i.e., plants budding, binary fission of single cell organisms)	**Student Edition:** 101-102, 188, 210, 272, 338 *MiniLab* 273 *Section Review* 102 (#2) **Teacher Wraparound Edition:** LD 100; MAM 188 **Teacher Resources:** *Cell Reproduction* 25 (#10) *Introduction to Animals* 9-10
c. Compare and contrast the reproductive mechanisms of classes of vertebrates (i.e., internal vs. external fertilization)	**Student Edition:** 401, 408, 413, 428, 439
d. Explain how flowering plants reproduce sexually	**Student Edition:** 284-288 **Teacher Wraparound Edition:** RT 291; VL 287 **Teacher Resources:** *Plant Reproduction* 19
C. Chromosomes are components of cells that occur in pairs and carry hereditary information from one cell to daughter cells and from parent to offspring during reproduction	
Scope and Sequence – Reproduction and Heredity a. Identify chromosomes as cellular structures that occur in pairs that carry hereditary information in units called genes	**Student Edition:** 40, 98, 104, 112, 126-127 **Teacher Resources:** *Cell Reproduction* 11-13, 20 (#2, 4)
b. Recognize that when asexual reproduction occurs, the same genetic information found in the parent cell is copied and passed on to each new daughter cell (Assess only the concept – not the term or process of mitosis)	**Student Edition:** 101-102, 188, 210 **Teacher Wraparound Edition:** LD 100 **Teacher Resources:** *Cell Reproduction* 20 (#8), 32 (F)

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STANDARDS	PAGE REFERENCES
c. Recognize that when sexual reproduction occurs, genetic material from both parents is passed on and combined to form the genetic code for the new organism (Assess only the concept – not the term or process of meiosis)	**Student Edition:** 104-105, 126-127 **Teacher Resources:** *Cell Reproduction* 20 (#13), 32 (A)
D. There is heritable variation within every species of organism	
Scope and Sequence – Reproduction and Heredity a. Recognize that when asexual reproduction occurs, the daughter cell is identical to the parent cell (assuming no change in the parent genes)	**Student Edition:** 101-102, 188, 210 **Teacher Wraparound Edition:** LD 100 **Teacher Resources:** *Cell Reproduction* 20 (#8), 32 (F)
b. Recognize that when sexual reproduction occurs, the offspring is not identical to either parent due to the combining of the different genetic codes contained in each sex cell	**Student Edition:** 104-105, 126-127 **Teacher Resources:** *Cell Reproduction* 20 (#13), 32 (A)
Strand 4: Changes in Ecosystems and Interactions of Organisms with their Environments	
D. The diversity of species within an ecosystem is affected by changes in the environment, which can be caused by other organisms or outside processes	
Scope and Sequence – Disease a. Explain the beneficial or detrimental impact that some organisms (i.e., viruses, bacteria, protists, fungi) may have on other organisms (e.g., diseases, antibiotics, breakdown of waste, fermentation)	**Student Edition:** 54, 193-194, 197, 218, 220, 228-229, 657-658 *Lab: Design Your Own* 200-201 *Science Online* 197 **Teacher Wraparound Edition:** AC 220, 228; DI 197; TFYI 194 **Teacher Resources:** *Critical Thinking* 20 *Bacteria* 17, 24 *Immunity and Disease* 28, 29

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STANDARDS	PAGE REFERENCES
2. Matter and energy flow through an ecosystem	
B. Matter is recycled through an ecosystem	
Scope and Sequence – Cells and Body Systems a. Illustrate the oxygen/carbon dioxide cycles	**Student Edition:** 85, 720, 725 *National Geographic* 724 **Teacher Wraparound Edition:** DIF 724; VL 85 **Teacher Resources:** *The Nonliving Environment* 28
b. Describe the processes involved in the recycling of matter in the oxygen/carbon dioxide cycles	**Student Edition:** 720, 725 *National Geographic* 724 **Teacher Wraparound Edition:** DIF 724; VL 85; VTCC 724 **Teacher Resources:** *The Nonliving Environment* 28
Grade 8	
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:** *Lab: Design Your Own* 28-29, 174-175, 200-201, 292-293, 418-419, 672-673, 702-703 **Teacher Wraparound Edition:** AIL 28 **Teacher Resources:** *Exploring and Classifying Life* 9-10

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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:** 8-9 *Lab: Design Your Own* 28-29, 292-293, 702-703 *Science Online* 8 *Section Review* 13 (#2) **Teacher Wraparound Edition:** AIL 292 **Teacher Resources:** *Exploring and Classifying Life* 9-10
c. Design and conduct a valid experiment	**Student Edition:** *Lab: Design Your Own* 28-29, 174-175, 200-201, 292-293, 418-419, 672-673, 702-703 **Teacher Wraparound Edition:** AIL 28, 292 **Teacher Resources:** *Exploring and Classifying Life* 9-10
d. Evaluate the design of an experiment and make suggestions for reasonable improvements or extensions of an experiment	**Student Edition:** *Lab: Design Your Own* 28-29, 174-175, 200-201, 292-293, 418-419, 672-673, 702-703 *Applying Science* 11 **Teacher Wraparound Edition:** AIL 28, 292 **Teacher Resources:** *Exploring and Classifying Life* 9-10

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STANDARDS	PAGE REFERENCES
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:** 7-11 *Lab* 318-319, 730-731, 752 *Lab: Design Your Own* 28-29, 174-175, 350-351, 672-673 *Lab: Model and Invent* 792-793 *Lab: Use the Internet* 446-447 **Teacher Wraparound Edition:** AC 11; TFYI 10 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Ecosystems* 9-10 *The Nonliving Environment* 13-16
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	*Emphasize to students that the scientific method is not a static procedure. **Student Edition:** 7-11 *Lab* 318-319, 730-731 *Lab: Design Your Own* 28-29, 144-145, 350-351, 418-419 **Teacher Wraparound Edition:** AC 11; RT 13; TFYI 10; VL 7 **Teacher Resources:** *Exploring and Classifying Life* 9-10

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:** *Lab* 46, 80, 280, 384-385, 471, 719 *MiniLab* 218, 288, 314, 346, 610 **Teacher Wraparound Edition:** LD 76, 100 **Teacher Resources:** *Cell Processes* 9-10 *Bacteria* 11-12 *Protists and Fungi* 9-10, 28 *Plant Processes* 11-14 *Introduction to Animals* 11-14 *Birds and Mammals* 11-13
b. Determine the appropriate tools and techniques to collect data	**Student Edition:** *Lab: Design Your Own* 28-29, 174-175, 292-293, 418-419, 702-703 **Teacher Wraparound Edition:** AIL 56, 200, 292, 418
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:** *Lab* 46, 603, 642-643, 787 *Lab: Design Your Own* 56-57, 174-175, 418-419 *Lab: Model and Invent* 792-793 *Lab: Use the Internet* 446-447, 502-503 *MiniLab* 9 **Teacher Wraparound Edition:** AS 46; LD 196, 304 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Cells* 9-12, 13-16 *Cell Processes* 11-14 *Protists and Fungi* 11-13

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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:** *Lab* 27, 398, 530-531, 603, 730-731, 787 *Lab: Design Your Own* 174-175 *MiniLab* 9, 247 **Teacher Wraparound Edition:** AS 9; QD 12 **Teacher Resources:** *Plant Processes* 9-10 *Structure and Movement* 13-16 *Circulation* 13-16 *Respiration and Excretion* 13-14
e. Compare amounts/measurements	**Student Edition:** *Lab* 80, 103, 398, 642-643, 730-731 *Lab: Design Your Own* 418-419 **Teacher Resources:** *Cell Processes* 11-14 *Adaptations over Time* 11-14 *Protists and Fungi* 9-10, 11-13 *Plant Processes* 9-10 *Structure and Movement* 13-16
f. Judge whether measurements and computation of quantities are reasonable	**Student Edition:** *Lab* 310, 501, 603, 642-643 *Lab: Design Your Own* 174-175 *MiniLab* 187, 247 **Teacher Resources:** *Cell Processes* 11-14 *Cell Reproduction* 9-10 *Heredity* 11-12 *Plant Processes* 9-10

STANDARDS	PAGE REFERENCES
g. Calculate the range and average/mean of a set of data	**Student Edition:** *Lab* 501, 522, 603, 642-643, 787 *Lab: Design Your Own* 174-175 *Math Skill Handbook* 838-839 *MiniLab* 9 **Teacher Resources:** *Animal Behavior* 9-11 *Structure and Movement* 13-16 *Circulation* 13-16
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:** *Applying Science* 11, 580 *Lab* 310, 318-319, 730-731 *Lab: Design Your Own* 418-419, 672-673, 702-703 **Teacher Wraparound Edition:** LD 76 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Cell Processes* 11-14, 30 *Adaptations Over Time* 11-14 *Bacteria* 11-12 *Protists and Fungi* 9-10
b. Use data as support for observed patterns and relationships, and to make predictions to be tested	**Student Edition:** *Applying Science* 439 *Lab* 133, 530-531 *Lab: Design Your Own* 28-29, 292-293, 418-419 *MiniLab* 136 **Teacher Wraparound Edition:** AIL 418, 530 **Teacher Resources:** *Plant Processes* 11-14 *Animal Behavior* 9-11 *Regulation and Reproduction* 9-11

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STANDARDS	PAGE REFERENCES
c. Recognize the possible effects of errors in observations, measurements, and calculations on the formulation of explanations (conclusions)	**Student Edition:** *Lab* 310 *Lab: Design Your Own* 28-29, 174-175, 292-293, 418-419 **Teacher Wraparound Edition:** CYD 310; EA 29, 175, 293, 703 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Cell Processes* 11-14, 30 *Adaptations Over Time* 11-14 *Bacteria* 11-12 *Protists and Fungi* 9-10
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:** *Lab* 86-87, 318-319, 730-731 *Lab: Design Your Own* 418-419, 672-673, 702-703 **Teacher Wraparound Edition:** LD 76 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Cell Processes* 11-14, 30 *Adaptations Over Time* 11-14 *Bacteria* 11-12 *Protists and Fungi* 9-10

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STANDARDS	PAGE REFERENCES
b. Analyze whether evidence (data) and scientific principles support proposed explanations (hypotheses, laws, theories)	**Student Edition:** *Lab* 86-87, 318-319, 730-731 *Lab: Design Your Own* 418-419, 672-673, 702-703 **Teacher Wraparound Edition:** LD 76 **Teacher Resources:** *Exploring and Classifying Life* 9-10 *Cell Processes* 11-14, 30 *Adaptations Over Time* 11-14 *Bacteria* 11-12 *Protists and Fungi* 9-10
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:** *Lab* 86-87, 642-643 *Lab: Design Your Own* 174-175, 292-293, 418-419 *Lab: Model and Invent* 792-793 *Lab: Use the Internet* 116-117, 446-447 **Teacher Wraparound Edition:** AS 145, 319 **Teacher Resources:** *Cell Reproduction* 9-10 *Adaptations over Time* 11-14 *Protists and Fungi* 9-10 *Plant Processes* 11-14

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STANDARDS	PAGE REFERENCES
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:** *Oops! Accidents in Science* 264, 504 **Teacher Wraparound Edition:** CB 264, 504 **Teacher Resources:** *Critical Thinking/Problem Solving* 15
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:** 47, 50-51 *National Geographic* 48-49 **Teacher Wraparound Edition:** CB 49; SJ 48 **Teacher Resources:** *Critical Thinking/Problem Solving* 3
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:** 141-143, 773-776 *Science and Society* 294 *Section Review* 143 (#3, 5), 776 (#3) **Teacher Wraparound Edition:** DI 294, 773; VSE 777 **Teacher Resources:** *Critical Thinking/Problem Solving* 4

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STANDARDS	PAGE REFERENCES
2. Historical and cultural perspectives of scientific explanations helps 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:** 19, 21, 22-23, 47, 111, 127, 155-157, 658 *Integrate Career* 755 *National Geographic* 659 *Science and History* 58, 176, 560 **Teacher Wraparound Edition:** CC 9; CDIV 10; DIF 114; TFYI 9, 24 **Teacher Resources:** *Exploring and Classifying Life* 31
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:** 19, 51, 155-157 *Science and History* 560 **Teacher Wraparound Edition:** CC 159; TFYI 21
b. Recognize explanations have changed over time as a result of new evidence	**Student Edition:** 19, 21, 22-23, 155-157, 657-658 *National Geographic* 20 *Science and History* 560 **Teacher Wraparound Edition:** CB 560; IM 155

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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:** 141-143, 773-776, 789-791 *Oops! Accidents in Science* 474 *Science and Society* 232, 294, 532, 762 *Science and History* 176 **Teacher Wraparound Edition:** CDIV 142; CFU 143; DI 176, 294 **Teacher Resources:** *Critical Thinking/Problem Solving* 4, 5, 8, 9
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:** 142-143, 773-776, 788-791 *National Geographic* 777 *Science and Society* 232, 532, 762 *Science and History* 176 **Teacher Wraparound Edition:** DIF 775; TFYI 775; VL 142 **Teacher Resources:** *Critical Thinking/Problem Solving* 4, 8, 14

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