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Grades 5-8

correlated to

Arkansas Science Curriculum Framework

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YOUR ARKANSAS GREAT SOURCE REPRESENTATIVES

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correlated to
Arkansas Science Curriculum Framework
Grade 5

Strand 1: Nature of Science

Standard 1: Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Processes of Science NS.1.5.1 Make accurate observations	**Teacher's Edition:** 19-20, 43, 46, 47, 50, 51, 63, 71, 101, 103, 110, 112, 113, 120, 125, 127, 133, 134, 135, 151, 178, 187, 192, 194, 200, 221, 226, 227, 228, 231, 234, 244, 247, 268, 275, 278, 281
NS.1.5.2 Identify and define components of experimental design used to produce empirical evidence: • hypothesis • replication • sample size • appropriate use of control • use of standardized variables	**Teacher's Edition:** 17-27, 175, 182, 199, 205, 206, 269, 271
NS.1.5.3 Calculate mean, median, mode, and range from scientific data using SI units	**Teacher's Edition:** 81
NS.1.5.4 Interpret scientific data using • data tables/charts • bar graphs • circle graphs • line graphs • stem and leaf plots • Venn diagrams	**Teacher's Edition:** 24, 25, 26, 46, 47, 50, 55, 62, 63, 67, 68, 74, 76, 77, 91, 96, 98, 99, 101, 103, 127, 131, 134, 146, 147, 150, 151, 168, 170, 175, 176, 177, 178, 182, 199, 205, 230, 235, 239, 242, 254, 275, 278, 287, 288, 290, 297, 302
NS.1.5.5 Communicate results and conclusions from scientific inquiry	**Teacher's Edition:** 17, 18, 23, 25, 26, 31, 35, 39, 43, 50, 51, 67, 74, 99, 101, 103, 110, 111, 112, 122, 123, 125, 134, 135, 168, 170, 182, 183, 221, 226, 227, 228, 230, 231, 234, 235, 247, 254, 268, 275, 281, 290, 291, 302, 303

Student Learning Expectations, Grade 5	ACCESS Science
NS.1.5.6 Develop and implement strategies for long-term, accurate data collection	**Teacher's Edition:** 19, 22-23, 67, 71, 76
Characteristics of Science NS.1.5.7 Summarize the characteristics of science	**Teacher's Edition:** 16-25, 31, 43, 47, 50, 55, 74, 79, 82, 91, 103, 110, 112, 122, 139, 175, 182, 187, 199, 206, 227, 235, 247, 271, 278, 295
NS.1.5.8 Explain the role of observation in the development of a theory	**Teacher's Edition:** 31, 34-35, 38, 204
NS.1.5.9 Define and give examples of hypotheses	**Teacher's Edition:** 17-21, 23, 25, 26, 175, 182, 199, 205, 206, 271

Strand 2: Life Science

Standard 2: Living Systems: Characteristics, Structure, and Function

Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Structure and Function LS.2.5.2 Examine cells on a microscopic level	**Teacher's Edition:** 129, 130, 137, 139, 140, 141, 142, 143, 144, 149, 150, 153
LS.2.5.3 Describe the similarities of basic cell functions in all organisms	**Teacher's Edition:** 129-133, 136-147, 148-159
LS.2.5.4 Model and identify the parts of animal cells and plant cells: • cell wall • cell membrane • nucleus • cytoplasm • chloroplast	**Teacher's Edition:** 130, 137, 140-142, 146, 147
LS.2.5.5 Compare and contrast plant and animal cells	**Teacher's Edition:** 130, 137, 140-142, 146, 147

Student Learning Expectations, Grade 5	ACCESS Science
Structure and Function LS.2.5.7 Identify the role of chlorophyll in the process of photosynthesis	**Teacher's Edition:** 165
LS.2.5.8 Explain and illustrate photosynthesis	**Teacher's Edition:** 164-166, 171
LS.2.5.9 Explain cellular respiration	**Teacher's Edition:** 166, 167, 171
LS.2.5.10 Conduct investigations demonstrating the process of cellular respiration	**Teacher's Edition:** 171
LS.2.5.11 Investigate careers, scientists, and historical breakthroughs related to cells	**Teacher's Edition:** 131, 144

Standard 4: Populations and Ecosystems

Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Populations and Ecosystems LS.4.5.1 Distinguish among and model • organisms • populations • communities • ecosystems • biosphere	**Teacher's Edition:** 112-123
LS.4.5.2 Identify the transfer of energy using energy pyramids: • terrestrial • aquatic	**Teacher's Edition:** 120
LS.4.5.3 Design food webs in specific habitats to show the flow of energy within communities: • terrestrial • aquatic	**Teacher's Edition:** 121, 122

Student Learning Expectations, Grade 5	ACCESS Science
LS.4.5.4 Evaluate food webs under conditions of stress: • overgrazing • overpopulation • natural disaster • introduction of non-native species • human impact/urban development	**Teacher's Edition:** 101, 105-108, 110, 111, 115, 117, 197
LS.4.5.5 Examine the role of limiting factors on the carrying capacity of an ecosystem: • food • space • water • shelter	**Teacher's Edition:** 117, 122, 200, 201, 203
LS.4.5.6 Describe and diagram the nitrogen cycle in ecosystems	**Teacher's Edition:** 118, 119
LS.4.5.7 Describe and diagram the carbon cycle in ecosystems	**Teacher's Edition:** 118, 119
LS.4.5.8 Describe and diagram the carbon dioxide-oxygen cycle in ecosystems	**Teacher's Edition:** 118, 119, 161
LS.4.5.9 Conduct investigations demonstrating the role of the carbon dioxide-oxygen cycle in ecosystems	**Teacher's Edition:** 118, 119
LS.4.5.10 Analyze the concept of conservation of mass as related to the amount of matter in an ecosystem	**Teacher's Edition:** 210
LS.4.5.13 Construct, compare, and contrast environments in open and closed aquaria	**Teacher's Edition:** 123
LS.4.5.14 Categorize organisms by the function they serve in ecosystems and food webs: • predator/prey • parasitism • producer/consumer/decomposer • scavenger • herbivore/carnivore/omnivore	**Teacher's Edition:** 120-121, 123, 132, 161, 201

Student Learning Expectations, Grade 5	ACCESS Science
LS.4.5.15 Conduct field studies identifying and categorizing organisms in a given area of an ecosystem	**Teacher's Edition:** 134
LS.4.5.16 Evaluate positive and negative human effects on ecosystems	**Teacher's Edition:** 100-111
LS.4.5.17 Describe and illustrate various symbiotic relationships: • parasitism • mutualism • commensalism	**Teacher's Edition:** 112, 113, 120, 132
LS.4.5.18 Investigate careers, scientists, and historical breakthroughs related to populations and ecosystems	**Teacher's Edition:** 131

Strand 3: Physical Science

Standard 5: Matter and Changes

Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Properties of Matter PS.5.5.1 Identify the relationship of atoms to all matter	**Teacher's Edition:** 117, 208-209, 212, 213-214, 215, 216-217
PS.5.5.2 Conduct scientific investigations on physical properties of objects	**Teacher's Edition:** 228, 230, 231, 236, 242, 243
PS.5.5.3 Identify common examples of physical properties: • length • mass • area • perimeter • texture • taste • odor • color • elasticity	**Teacher's Edition:** 228-229, 234-239, 242-243

Student Learning Expectations, Grade 5	ACCESS Science
PS.5.5.4 State characteristics of physical changes	**Teacher's Edition:** 226-227, 230, 231
PS.5.5.5 Identify characteristics and common examples of physical changes	**Teacher's Edition:** 226-227, 229, 230, 231
PS.5.5.6 Explain how heat influences the states of matter of a substance: • solid • liquid • gas • plasma	**Teacher's Edition:** 226-227, 230-231
PS.5.5.7 Demonstrate the effect of changes in the physical properties of matter	**Teacher's Edition:** 226-229, 234, 236-237, 242-243
PS.5.5.8 Model the motion and position of molecules in solids, liquids, and gases in terms of kinetic energy	**Teacher's Edition:** 224-227, 230
PS.5.5.10 Investigate scientists, careers, and historical breakthroughs related to physical properties, physical changes, and states of matter	**Teacher's Edition:** 214, 231, 232

Standard 6: Motion and Forces

Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Motions and Forces PS.6.5.1 Classify simple machines	**Teacher's Edition:** 270-271
PS.6.5.4 Compare and contrast potential energy and kinetic energy as applied to motion	**Teacher's Edition:** 258, 260-261, 262, 263, 266
PS.6.5.5 Classify real world examples as potential energy or kinetic energy as applied to motion	**Teacher's Edition:** 258, 260-261, 262, 263, 266

Student Learning Expectations, Grade 5	ACCESS Science
PS.6.5.6 Conduct investigations using potential energy and kinetic energy	**Teacher's Edition:** 262, 267
PS.6.5.7 Investigate careers, scientists, and historical breakthroughs related to simple machines and potential and kinetic energy	**Teacher's Edition:** 264, 267, 276-277, 279

Standard 7: Energy and Transfer of Energy

Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Energy PS.7.5.1 Summarize how light can interact with matter through absorption, refraction, and reflection	**Teacher's Edition:** 281, 287
PS.7.5.2 Investigate how light travels and interacts with an object or material	**Teacher's Edition:** 280, 281, 282, 284-287, 291
PS.7.5.3 Conduct investigations demonstrating how an object can be seen	**Teacher's Edition:** 282
PS.7.5.5 Investigate physical interactions of light and matter and the effect on color perception: • refraction • absorption • transmission • scattering	**Teacher's Edition:** 281, 286, 287
PS.7.5.6 Investigate careers, scientists, and historical breakthroughs related to light energy	**Teacher's Edition:** 287

Strand 4: Earth and Space Systems

Standard 8: Earth Systems

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Structure and Properties ESS.8.5.1 Identify some basic elements composing minerals: • silicon • oxygen • iron • sodium • chlorine • calcium • carbon • hydrogen • aluminum	**Teacher's Edition:** 48, 168
ESS.8.5.2 Investigate the growth of crystals	**Teacher's Edition:** 46, 47, 50
ESS.8.5.3 Identify characteristics of minerals	**Teacher's Edition:** 48, 93, 168, 199
ESS.8.5.4 Conduct investigations on mineral properties: • luster • hardness • streak • acid test for calcite • fluorescence	**Teacher's Edition:** 50
ESS.8.5.5 Identify the following minerals: • halite (salt) • feldspar • sulfur • quartz • diamonds • gypsum • calcite • talc • hematite (iron) • precious metals (gold, silver)	**Teacher's Edition:** 56, 48, 93, 168, 215, 233, 237, 238

Student Learning Expectations, Grade 5	ACCESS Science
ESS.8.5.6 Identify minerals found in Arkansas: • bauxite • diamonds • quartz • galena	**Teacher's Edition:** 48
ESS.8.5.7 Identify characteristics of sedimentary, igneous, and metamorphic rocks	**Teacher's Edition:** 40-44, 46-51, 53
ESS.8.5.8 Compare and contrast by investigation characteristics of the three basic types of rocks: • sedimentary • igneous • metamorphic	**Teacher's Edition:** 41, 43, 46, 47, 50, 51
ESS.8.5.9 Classify the three basic types of rocks	**Teacher's Edition:** 40-44, 46-51, 53
ESS.8.5.10 Investigate careers, scientists, and historical breakthroughs related to minerals and rocks	**Teacher's Edition:** 44, 47, 48
Cycles ESS.8.5.11 Investigate the formation of soil	**Teacher's Edition:** 56, 57, 93, 102, 103, 115, 120
ESS.8.5.12 Conduct investigations on sedimentation	**Teacher's Edition:** 46, 50, 57, 58, 60, 61
ESS.8.5.13 Describe and illustrate the rock cycle	**Teacher's Edition:** 48-49, 51

Standard 9: Earth's History: Changes in Earth and Sky

Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Earth's History ESS.9.5.1 Explain and give examples of how physical evidence from fossils supports the theory that Earth has changed over time	**Teacher's Edition:** 196, 197, 198-199, 200, 204-205

Student Learning Expectations, Grade 5	ACCESS Science
ESS.9.5.2 Analyze fossil record evidence about plants and animals that lived long ago	**Teacher's Edition:** 196, 197, 198-199, 200, 204-205
ESS.9.5.3 Infer the nature of ancient environments based on fossil record evidence	**Teacher's Edition:** 197, 204

Standard 10: Objects in the Universe

Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 5	ACCESS Science
Solar system: Sun, Earth, Moons, Planets, Galaxies ESNS.10.5.1 Compare the physical characteristics of the sun to other stars: • size • color • brightness	**Teacher's Edition:** 292, 293, 294, 298-299
ESNS.10.5.2 Demonstrate the order of planets and other space objects in our solar system	**Teacher's Edition:** 293, 294, 297, 299-301, 302, 303
ESNS.10.5.3 Compare the properties of planets in our solar system: • size • shape • density • atmosphere • distance from the sun • orbital path • moons • surface • composition	**Teacher's Edition:** 293, 295, 299-303
ESNS.10.5.4 Distinguish between mass and weight	**Teacher's Edition:** 210, 228, 229
ESNS.10.5.5 Compare the human body's mass to weight on Earth, the moon, and other planets in our solar system	**Teacher's Edition:** 210
ESNS.10.5.6 Investigate careers, scientists, and historical breakthroughs related to planets	**Teacher's Edition:** 297, 298, 301, 302

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Grade 6

Strand 1: Nature of Science

Standard 1: Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Processes of Science NS.1.6.1 Verify accuracy of observations	**Teacher's Edition:** 19-20, 43, 46, 47, 50, 51, 63, 71, 101, 103, 110, 112, 113, 120, 125, 127, 133, 134, 135, 151, 178, 187, 192, 194, 200, 221, 226, 227, 228, 231, 234, 244, 247, 268, 275, 278, 281
NS.1.6.2 Apply components of experimental design used to produce empirical evidence: • hypothesis • replication • sample size • appropriate use of control • use of standardized variables	**Teacher's Edition:** 17-27, 175, 182, 199, 205, 206, 269, 271
NS.1.6.3 Compare scientific data using mean, median, mode, and range using SI units	**Teacher's Edition:** 81
NS.1.6.4 Construct and interpret scientific data using • data tables/charts • bar and double bar graphs • line graphs • stem and leaf plots • line graphs	**Teacher's Edition:** 24, 25, 26, 46, 47, 50, 67, 68, 74, 76, 77, 101, 103, 127, 131, 134, 150, 151, 168, 170, 175, 176, 177, 178, 182, 199, 205, 230, 235, 239, 242, 254, 275, 278, 287, 288, 290, 297
NS.1.6.5 Communicate results and conclusions from scientific inquiry	**Teacher's Edition:** 17, 18, 23, 25, 26, 31, 35, 39, 43, 50, 51, 67, 74, 99, 101, 103, 110, 111, 112, 122, 123, 125, 134, 135, 168, 170, 182, 183, 221, 226, 227, 228, 230, 231, 234, 235, 247, 254, 268, 275, 281, 290, 291, 302, 303

Student Learning Expectations, Grade 6	ACCESS Science
NS.1.6.6 Develop and implement strategies for long-term, accurate data collection	**Teacher's Edition:** 19, 22-23, 67, 71, 76
Characteristics of Science NS.1.6.7 Distinguish between scientific fact and opinion	**Teacher's Edition:** 18, 21, 25, 26
NS.1.6.8 Explain the role of prediction in the development of a theory	**Teacher's Edition:** 21, 25, 26, 27, 31, 34-35, 67, 74, 175, 182
NS.1.6.9 Define and give examples of laws and theories	**Teacher's Edition:** 31, 34-35, 38, 39, 204, 269, 276-277

Strand 2: Life Science

Standard 2: Living Systems: Characteristics, Structure, and Function

Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Structure and Function LS.2.6.1 Observe, describe, and illustrate plant and animal tissues: • muscle • blood • skin • xylem • phloem	**Teacher's Edition:** 149-159
LS.2.6.2 Illustrate the hierarchical relationships of cells, tissues, and organs	**Teacher's Edition:** 148-159
LS.2.6.3 Investigate the functions of tissues	**Teacher's Edition:** 149, 153-154, 157

Student Learning Expectations, Grade 6	ACCESS Science
LS.2.6.4 Model and explain the functions of animal organs: • heart • lung • kidneys • eyes • ears • skin • teeth	**Teacher's Edition:** 149, 150, 152, 153, 154, 155, 157, 158, 159, 179
LS.2.6.5 Model and explain the function of plant organs: • leaves • roots • stems • flowers	**Teacher's Edition:** 119, 133, 150, 153, 156, 164, 165, 174-175, 178, 187, 189
LS.2.6.6 Dissect organs, including but not limited to • heart • eye • lung • stem • root	**Teacher's Edition:** 149, 150, 156, 282
LS.2.6.7 Describe the relationship between organ function and the following needs of cells: • oxygen • food • water • waste removal	**Teacher's Edition:** 137, 141, 142, 143, 150, 152, 154-157, 158
LS.2.6.8 Investigate careers, scientists, and historical breakthroughs related to tissues and organs	**Teacher's Edition:** 153, 156

Standard 3: Life Cycles, Reproduction, and Heredity

Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Heredity and Reproduction LS.3.6.3 Relate the development of Earth's present-day complex species from earlier, distinctly different simpler species	**Teacher's Edition:** 196, 197, 200-205

Student Learning Expectations, Grade 6	ACCESS Science
LS.3.6.4 Investigate careers, scientists, and historical breakthroughs related to adaptations and selective breeding	**Teacher's Edition:** 196, 197, 202, 203
Regulation and Behavior LS.3.6.5 Describe behavioral adaptations of organisms to the environment: • hibernation • estivation • tropism • territorial behavior • migration	**Teacher's Edition:** 200, 201, 202, 206
LS.3.6.6 Differentiate between innate behaviors: • migration • web spinning • defensive posture • communication • imprinting and learned behaviors • speaking a language • using tools • hunting skills	**Teacher's Edition:** 173, 175, 178, 200-201, 204
LS.3.6.7 Describe the following structural adaptations for survival in the environment: • coloration • mimicry • odor glands • beaks • feet • wings • fur • ears • spines • teeth • thorns • characteristics of seeds	**Teacher's Edition:** 176, 178, 197, 198, 199, 200-203, 207
LS.3.6.8 Investigate careers, scientists, and historical breakthroughs related to learned and innate behaviors	**Teacher's Edition:** 203, 204

Standard 4: Populations and Ecosystems

Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Populations and Ecosystems LS.4.6.1 Recognize environmental adaptations of plants and animals	**Teacher's Edition:** 176, 178, 197, 198, 199, 200-203, 207
LS.4.6.2 Conduct simulations demonstrating competition for resources within an ecosystem	**Teacher's Edition:** 197, 198, 203
LS.4.6.3 Conduct simulations demonstrating natural selection	**Teacher's Edition:** 197, 198, 199, 202, 203
LS.4.6.4 Analyze natural selection	**Teacher's Edition:** 197, 198, 199, 202, 203

Strand 3: Physical Science

Standard 5: Matter and Changes

Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Properties of Matter PS.5.6.1 Identify common examples of chemical properties: • ability to burn • ability to produce light • ability to react with other substances	**Teacher's Edition:** 234, 236, 239, 240, 245-251, 254, 255
PS.5.6.2 Compare and contrast characteristics of physical and chemical properties	**Teacher's Edition:** 228-229, 232-243, 244-255
PS.5.6.4 Apply skills of scientific investigation to determine density using SI units	**Teacher's Edition:** 228, 231
PS.5.6.6 Use a density column to test the density of various solid objects (e.g., piece of candy, cork, candle, paper clip, egg)	**Teacher's Edition:** 228

Student Learning Expectations, Grade 6	ACCESS Science
PS.5.6.7 Identify characteristics of chemical changes: • burning • production of a new substance • production of light • color change • endothermic and exothermic reactions • reactivity	**Teacher's Edition:** 244-255
PS.5.6.8 Conduct investigations comparing and contrasting physical and chemical changes	**Teacher's Edition:** 228, 230, 234, 236, 246, 247, 250
PS.5.6.9 Demonstrate the law of the conservation of matter	**Teacher's Edition:** 251
PS.5.6.10 Investigate scientists, careers, and historical breakthroughs related to chemical properties and chemical changes	**Teacher's Edition:** 240, 242, 252, 254

Standard 6: Motion and Forces

Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Motions and Forces PS.6.6.1 Compare and contrast simple machines and compound machines	**Teacher's Edition:** 270-271
PS.6.6.2 Identify and analyze the simple machines that make up a compound machine	**Teacher's Edition:** 270-271
PS.6.6.3 Conduct investigations of various forces using SI units (newton)	**Teacher's Edition:** 272-273
PS.6.6.4 Recognize and give examples of different types of forces: • gravitational forces • magnetic forces • friction	**Teacher's Edition:** 210, 269, 272, 274, 275, 277

Student Learning Expectations, Grade 6	ACCESS Science
PS.6.6.5 Understand why objects have weight	**Teacher's Edition:** 210
PS.6.6.6 Compare and contrast weight and mass	**Teacher's Edition:** 210, 212, 219
PS.6.6.7 Describe the effects of force: • move a stationary object • speed up, slow down or change the direction of motion • change the shape of objects	**Teacher's Edition:** 268-270, 272-279
PS.6.6.8 Conduct investigations to demonstrate change in direction caused by force	**Teacher's Edition:** 268, 278, 279
PS.6.6.9 Conduct investigations to calculate the change in speed caused by applying forces to an object	**Teacher's Edition:** 275, 278
PS.6.6.10 Investigate careers, scientists, and historical breakthroughs related to compound machines and forces	**Teacher's Edition:** 270, 272, 276

Standard 7: Energy and Transfer of Energy

Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Energy PS.7.6.1 Classify examples of energy forms: • chemical • electromagnetic • mechanical • thermal • nuclear	**Teacher's Edition:** 95, 96, 98, 222, 252-253, 256, 257, 258, 261-265, 286
PS.7.6.2 Summarize the application of the law of conservation of energy in real world situations: • electrical energy into mechanical energy • electrical energy into heat • chemical energy into mechanical energy • chemical energy into light	**Teacher's Edition:** 253, 257, 258-259, 263, 265

Student Learning Expectations, Grade 6	ACCESS Science
PS.7.6.3 Conduct investigations demonstrating how energy can be converted from one form to another	**Teacher's Edition:** 261, 265
PS.7.6.4 Investigate the transfer of energy in real world situations: • conduction • convection • radiation	**Teacher's Edition:** 214, 265
PS.7.6.5 Investigate careers, scientists, and historical breakthroughs related to energy forms and conversions	**Teacher's Edition:** 214, 252, 264, 266

Strand 4: Earth and Space Systems

Standard 8: Earth Systems

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Structure and Properties ESS.8.6.1 Identify and diagram the layers of the Earth: • crust • mantle • inner and outer core	**Teacher's Edition:** 29, 30, 32, 37, 42
ESS.8.6.2 Model the layers of the Earth	**Teacher's Edition:** 29, 30, 32, 42
ESS.8.6.3 Model how convection currents in the mantle affect lithosphere movement	**Teacher's Edition:** 28, 29, 32, 34-35, 37, 39, 55
ESS.8.6.4 Conduct investigations to identify the variables within volcanoes that cause different types of eruptions	**Teacher's Edition:** 32, 36
ESS.8.6.5 Diagram and explain how volcanoes work	**Teacher's Edition:** 29, 31, 36, 38, 42, 44-45
ESS.8.6.6 Explain how volcanic activity relates to mountain formation	**Teacher's Edition:** 38, 44-45

Student Learning Expectations, Grade 6	ACCESS Science
ESS.8.6.8 Compare and contrast the different land forms caused by Earth's internal forces: • mountains • plateaus • trenches • islands	**Teacher's Edition:** 30, 31, 34-35, 37, 38, 39, 55
ESS.8.6.10 Identify the effects of earthquakes on Earth's surface: • tsunamis • floods • changes in natural and man-made structures	**Teacher's Edition:** 29, 37, 38, 39
ESS.8.6.11 Investigate and map patterns of earthquake and volcanic activity	**Teacher's Edition:** 33, 35, 36
ESS.8.6.12 Locate earthquake belts on Earth: • Mediterranean-Trans-Asiatic • Circum-Pacific (Ring of Fire)	**Teacher's Edition:** 31, 36
ESS.8.6.14 Model the effect of major geological events on land and ocean features: • mountain building • ocean trenches • island formation • mid-ocean ridges	**Teacher's Edition:** 30, 31, 34-35, 37, 38, 39, 45, 55
ESS.8.6.15 Investigate careers, scientists, and historical breakthroughs related to internal forces that change the Earth	**Teacher's Edition:** 31, 35, 36

Standard 9: Earth's History: Changes in Earth and Sky

Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Earth's History ESS.9.6.1 Research methods of determining geologic time: • fossil records • mountain building • rock sequencing	**Teacher's Edition:** 31, 34-35, 40-42, 46-49, 60, 61, 196, 197, 198-199, 204
ESS.9.6.2 Model rock layer sequencing based on characteristics of fossils	**Teacher's Edition:** 198-199
ESS.9.6.3 Analyze evidence that supports the theory of plate tectonics: • matching coastlines • similar rock types • fossil record	**Teacher's Edition:** 28, 31, 34-35, 38, 39

Standard 10: Objects in the Universe

Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	ACCESS Science
Solar system: Sun, Earth, Moons, Planets, Galaxies ESNS.10.6.2 Compare the distance of the following: • from the sun to Earth (light minutes) • from the next nearest star to Earth (light years)	**Teacher's Edition:** 296
ESNS.10.6.3 Describe how astronomers measure distance to stars	**Teacher's Edition:** 296
ESNS.10.6.5 Explain the effect of the sun on comets	**Teacher's Edition:** 294
ESNS.10.6.6 Compare and contrast comets, meteors, and asteroids by • size • orbits • nucleus • mass	**Teacher's Edition:** 294-295

Student Learning Expectations, Grade 6	ACCESS Science
ESNS.10.6.7 Model moon phases demonstrating the position of Earth, moon, and sun	**Teacher's Edition:** 77, 78-79, 84, 86, 87
ESNS.10.6.8 Compare and contrast solar eclipse and lunar eclipse	**Teacher's Edition:** 85, 86, 87
ESNS.10.6.9 Investigate careers, scientists, and historical breakthroughs related to the sun and space travel	**Teacher's Edition:** 80, 83, 297, 298, 302

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Grade 7

Strand 1: Nature of Science

Standard 1: Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Processes of Science NS.1.7.1 Interpret evidence based on observations	**Teacher's Edition:** 19-20, 31, 38-39, 43, 46, 47, 50, 51, 63, 71, 101, 103, 110, 112, 113, 120, 125, 127, 133, 134, 135, 151, 178, 187, 192, 194, 200, 221, 226, 227, 228, 231, 234, 244, 247, 268, 275, 278, 281
NS.1.7.2 Analyze components of experimental design used to produce empirical evidence: • hypothesis • replication • sample size • appropriate use of control • use of standardized variables	**Teacher's Edition:** 17-27, 175, 182, 199, 205, 206, 269, 271
NS.1.7.3 Interpret scientific data using mean, median, mode, and range using SI units	**Teacher's Edition:** 81
NS.1.7.4 Construct and interpret scientific data using • histograms • circle graphs • scatter plots • double line graphs • line graphs by approximating line of best fit	**Teacher's Edition:** 24, 25, 91, 96, 98, 99, 275
NS.1.7.5 Communicate results and conclusions from scientific inquiry	**Teacher's Edition:** 17, 18, 23, 25, 26, 31, 35, 39, 43, 50, 51, 67, 74, 99, 101, 103, 110, 111, 112, 122, 123, 125, 134, 135, 168, 170, 182, 183, 221, 226, 227, 228, 230, 231, 234, 235, 247, 254, 255, 268, 275, 281, 290, 291, 302, 303

Student Learning Expectations, Grade 7	ACCESS Science
NS.1.7.6 Develop and implement strategies for long-term, accurate data collection	**Teacher's Edition:** 19, 22-23, 67, 71, 76
NS.1.7.7 Distinguish between questions that can and cannot be answered by science	**Teacher's Edition:** 20-21, 271
NS.1.7.8 Explain the role of testability and modification in the development of a theory	**Teacher's Edition:** 20-25
NS.1.7.9 Compare and contrast hypotheses, laws, and theories	**Teacher's Edition:** 17-25, 31, 34-35, 38, 39, 175, 182, 199, 204, 205, 206, 269, 271, 276-277

Strand 2: Life Science

Standard 2: Living Systems: Characteristics, Structure, and Function

Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Structure and Function LS.2.7.1 Illustrate the hierarchical relationships of cells, tissues, organs, and organ systems	**Teacher's Edition:** 148-159, 179
LS.2.7.2 Analyze how two or more organs work together to perform a function (e.g., mouth and stomach to digest food)	**Teacher's Edition:** 150-159, 179
LS.2.7.3 Identify organ systems in vertebrates and plants	**Teacher's Edition:** 148-159, 178, 179
LS.2.7.4 Analyze the structure and function of tissues, organs, and organ systems of a vertebrate and an angiosperm using various models or methods of dissection	**Teacher's Edition:** 148-159
LS.2.7.5 Compare and contrast vertebrate systems and plant organ systems	**Teacher's Edition:** 156-157, 186-187

Student Learning Expectations, Grade 7	ACCESS Science
LS.2.7.6 Identify human body systems: • nervous • digestive • circulatory • respiratory • excretory • integumentary • skeletal/muscular • endocrine • reproductive	**Teacher's Edition:** 148-159, 178, 179
LS.2.7.7 Relate the structure of vertebrate and plant body systems to their functions	**Teacher's Edition:** 148-159, 178, 179
LS.2.7.8 Investigate functions of human body systems	**Teacher's Edition:** 148-159, 178, 179
LS.2.7.9 Describe interactions between major organ systems	**Teacher's Edition:** 148-159, 179
LS.2.7.10 Investigate careers, scientists, and historical breakthroughs related to life systems	**Teacher's Edition:** 153, 156

Standard 3: Life Cycles, Reproduction, and Heredity

Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Heredity and Reproduction LS.3.7.1 Explain that the fertilized egg cell carries genetic information from each parent and multiplies to form a complete organism	**Teacher's Edition:** 186-187, 189-191
LS.3.7.2 Distinguish between sperm cells and egg cells	**Teacher's Edition:** 186, 189
LS.3.7.3 Compare and contrast the structure and function of the sperm cell and the egg cell in vertebrates and plants and their role in sexual reproduction	**Teacher's Edition:** 186-187, 189

Student Learning Expectations, Grade 7	ACCESS Science
LS.3.7.6 Dissect a flower to analyze the reproductive system of angiosperms (e.g., paper, plastic, or clay models; virtual dissection; or specimen dissection)	**Teacher's Edition:** 187
LS.3.7.7 Differentiate between sexual and asexual reproduction in • vertebrates • plants	**Teacher's Edition:** 186-189, 191
LS.3.7.8 Identify the number and source of chromosomes in human body cells	**Teacher's Edition:** 143, 190, 191
LS.3.7.9 Identify the number and source of chromosomes in human sex cells	**Teacher's Edition:** 190, 191
LS.3.7.10 Explain the role of cell division	**Teacher's Edition:** 136-139, 143-145, 191
LS.3.7.11 Investigate careers, scientists, and historical breakthroughs related to reproduction	**Teacher's Edition:** 144, 192
Regulation and Behavior LS.3.7.12 Summarize the interactions between organ systems in the maintenance of homeostasis	**Teacher's Edition:** 176-177

Standard 4: Populations and Ecosystems

Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Populations and Ecosystems LS.4.7.1 Explain the role of reproduction in the continuation of a species	**Teacher's Edition:** 197, 198, 200-201, 202

Strand 3: Physical Science

Standard 5: Matter and Changes

Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Properties of Matter PS.5.7.1 Explain how a small number of naturally-occurring elements can result in the large variety of substances found in the world	**Teacher's Edition:** 232-243
PS.5.7.2 Create models of common compounds: • water • carbon dioxide • salt • iron oxide • ammonia	**Teacher's Edition:** 164, 165, 216, 217, 245, 246, 248, 249, 250, 251, 254, 255
PS.5.7.3 Identify compounds as substances consisting of two or more elements chemically combined	**Teacher's Edition:** 209, 217, 219, 248-251, 254-255
PS.5.7.4 Compare and contrast properties of compounds to those of the elements that compose them: • salt: sodium, chlorine • water: hydrogen, oxygen • carbon dioxide: carbon, oxygen	**Teacher's Edition:** 216, 217, 245, 246, 248-251, 254-255
PS.5.7.5 Demonstrate techniques for forming and separating mixtures: • mixing • magnetic attraction • evaporation • filtration • chromatography • settling	**Teacher's Edition:** 217, 219
PS.5.7.6 Classify substances as • elements • compounds • mixtures	**Teacher's Edition:** 96, 209, 215, 217, 219, 229, 232-243, 251

Student Learning Expectations, Grade 7	ACCESS Science
PS.5.7.10 Investigate scientists, careers, and historical breakthroughs related to elements, mixtures, and compounds	**Teacher's Edition:** 214, 229, 240

Standard 6: Motion and Forces

Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Motions and Forces PS.6.7.1 Compare and contrast Newton's three laws of motion	**Teacher's Edition:** 269, 276-277
PS.6.7.2 Conduct investigations demonstrating Newton's first law of motion	**Teacher's Edition:** 276, 277, 278
PS.6.7.3 Demonstrate Newton's second law of motion	**Teacher's Edition:** 276, 277, 278
PS.6.7.4 Conduct investigations of Newton's third law of motion	**Teacher's Edition:** 276, 277, 279
PS.6.7.5 Explain how Newton's three laws of motion apply to real world situations (e.g., sports, transportation)	**Teacher's Edition:** 276-279
PS.6.7.6 Investigate careers, scientists, and historical breakthroughs related to laws of motion	**Teacher's Edition:** 276, 277, 279

Standard 7: Energy and Transfer of Energy

Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Energy PS.7.7.1 Identify natural resources used to supply energy needs	**Teacher's Edition:** 89, 90-92, 94-98

Student Learning Expectations, Grade 7	ACCESS Science
PS.7.7.2 Describe alternatives to the use of fossil fuels: • solar energy • geothermal energy • wind • hydroelectric power • nuclear energy • biomass	**Teacher's Edition:** 89, 92, 94-97
PS.7.7.3 Conduct investigations to identify types of potential energy and kinetic energy	**Teacher's Edition:** 262, 266, 267
PS.7.7.4 Investigate alternative energy sources	**Teacher's Edition:** 89, 92, 94-97
PS.7.7.5 Investigate careers, scientists, and historical breakthroughs related to natural resources, alternative resources, electricity, and magnetism	**Teacher's Edition:** 89, 99

Strand 4: Earth and Space Systems

Standard 8: Earth Systems

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Structure and Properties ESS.8.7.1 Describe the composition and physical characteristics of the atmosphere	**Teacher's Edition:** 68, 108
ESS.8.7.2 Investigate the influence of global patterns on local weather: • movement of air masses • Coriolis effect • jet stream • global wind belts	**Teacher's Edition:** 72-73
ESS.8.7.3 Conduct investigations demonstrating the effects of solar energy on the atmosphere	**Teacher's Edition:** 65, 68, 69, 108
ESS.8.7.4 Investigate the effect that oceans have on climate	**Teacher's Edition:** 68-69

Student Learning Expectations, Grade 7	ACCESS Science
ESS.8.7.5 Identify elements of weather: • temperature • air pressure • wind speed • wind direction • humidity	**Teacher's Edition:** 66-67, 72-74, 75
ESS.8.7.6 Conduct investigations using weather measurement devices: • anemometers • barometers • sling psychrometers • thermometers	**Teacher's Edition:** 67
ESS.8.7.7 Predict weather conditions using data on the following: • temperature • air pressure: highs, lows, fronts • clouds • wind speed • wind direction • humidity	**Teacher's Edition:** 67, 74
ESS.8.7.8 Identify the causes and effects of weather-related phenomena: • thunderstorms • tornadoes/hurricanes/cyclones/typhoons • drought • acid precipitation	**Teacher's Edition:** 72-73, 107
ESS.8.7.9 Explain tornado belt weather patterns using a map of the United States	**Teacher's Edition:** 72
ESS.8.7.11 Describe and map climates of major Earth regions	**Teacher's Edition:** 69, 82
ESS.8.7.12 Analyze the effect of the shape of Earth and the tilt of Earth's axis on climate	**Teacher's Edition:** 82-83, 86
ESS.8.7.13 Identify and explain the effects that human activities have on weather and atmosphere	**Teacher's Edition:** 107-108

Student Learning Expectations, Grade 7	ACCESS Science
ESS.8.7.14 Describe causes and effects of acid precipitation	**Teacher's Edition:** 107
ESS.8.7.15 Investigate careers, scientists, and historical breakthroughs related to atmosphere and weather	**Teacher's Edition:** 72
Cycles ESS.8.7.16 Conduct investigations demonstrating the water cycle	**Teacher's Edition:** 70, 71, 75
ESS.8.7.17 Explain the relationship between the water cycle and ground water	**Teacher's Edition:** 70-71, 75
ESS.8.7.18 Investigate cloud formation	**Teacher's Edition:** 70, 71, 72
ESS.8.7.19 Conduct investigations demonstrating the greenhouse effect	**Teacher's Edition:** 108
ESS.8.7.20 Research how human activities may contribute to global warming	**Teacher's Edition:** 107-108

Standard 9: Earth's History: Changes in Earth and Sky

Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Earth's History ESS.9.7.1 Analyze charts to infer past atmospheric conditions based on the organisms found in the fossil record	**Teacher's Edition:** 197, 204
ESS.9.7.4 Analyze evidence of sea floor spreading: • magnetic reversal • molten material • drilling samples	**Teacher's Edition:** 45

Standard 10: Objects in the Universe

Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	ACCESS Science
Solar system: Sun, Earth, Moons, Planets, Galaxies ESS.10.7.1 Identify and model the causes of night and day	**Teacher's Edition:** 77, 80-81, 87
ESNS.10.7.2 Compare and contrast Earth's day to those of other planets in our solar system	**Teacher's Edition:** 84, 300
ESNS.10.7.3 Identify and model the cause of planetary years	**Teacher's Edition:** 300
ESNS.10.7.4 Compare and contrast Earth's year to those of other planets in our solar system	**Teacher's Edition:** 300
ESNS.10.7.5 Identify and model the causes of seasons	**Teacher's Edition:** 82-83, 86
ESNS.10.7.6 Investigate careers, scientists, and historical breakthroughs related to rotations and revolutions of bodies in space	**Teacher's Edition:** 295, 297, 298, 302

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correlated to
Arkansas Science Curriculum Framework
Grade 8

Strand 1: Nature of Science

Standard 1: Characteristics and Processes of Science

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Processes of Science NS.1.8.1 Justify conclusions based on appropriate and unbiased observations	**Teacher's Edition:** 19-20, 25, 31, 38-39, 43, 46, 47, 50, 51, 63, 71, 101, 103, 110, 111, 112, 113, 120, 125, 127, 133, 134, 135, 151, 178, 187, 192, 194, 200, 221, 226, 227, 228, 231, 234, 244, 247, 255, 268, 275, 278, 281
NS.1.8.2 Evaluate the merits of empirical evidence based on experimental design: • hypothesis • replication • sample size • appropriate use of control • use of standardized independent and dependent variables	**Teacher's Edition:** 17-27, 175, 182, 199, 205, 206, 269, 271
NS.1.8.3 Formulate a testable problem using experimental design	**Teacher's Edition:** 22-25, 27
NS.1.8.4 Analyze a set of scientific data using mean, median, mode, and range using SI units	**Teacher's Edition:** 81
NS.1.8.5 Suggest solutions to real world problems by analyzing scientific data in • data tables/charts • histograms • circle graphs • scatter plots • stem and leaf plots • line and double line graphs by approximating line of best fit	**Teacher's Edition:** 24, 25, 26, 46, 47, 50, 67, 68, 74, 76, 77, 101, 103, 127, 131, 134, 150, 151, 168, 170, 175, 176, 177, 178, 182, 199, 205, 230, 235, 239, 242, 254, 275, 278, 287, 288, 290, 297

Student Learning Expectations, Grade 8	ACCESS Science
NS.1.8.6 Formulate inferences based on scientific data	**Teacher's Edition:** 103, 111, 247, 255
NS.1.8.7 Communicate results and conclusions from scientific inquiry following peer review	**Teacher's Edition:** 17, 18, 23, 25, 26, 31, 35, 39, 43, 50, 51, 67, 74, 99, 101, 103, 110, 111, 112, 122, 123, 125, 134, 135, 168, 170, 182, 183, 221, 226, 227, 228, 230, 231, 234, 235, 247, 254, 255, 268, 275, 281, 290, 291, 302, 303
NS.1.8.8 Develop and implement strategies for long-term, accurate data collection	**Teacher's Edition:** 19, 22-23, 67, 71, 76
Characteristics of Science NS.1.8.9 Generate questions that can and cannot be answered by science	**Teacher's Edition:** 20-21, 271
NS.1.8.10 Explain the role of peer review, evidence, and modification in the development of a theory	**Teacher's Edition:** 20-25, 31, 39
NS.1.8.11 Evaluate the merit of hypotheses, laws, and theories	**Teacher's Edition:** 17-25, 31, 34-35, 38, 39, 175, 182, 199, 204, 205, 206, 269, 271, 276-277

Strand 2: Life Science

Standard 2: Living Systems: Characteristics, Structure, and Function

Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Structure and Function LS.2.8.1 Illustrate the hierarchical relationships of cells, tissues, organs, organ systems, and organisms	**Teacher's Edition:** 148-159, 179
LS.2.8.2 Identify different types of single-celled organisms: • protists • bacteria	**Teacher's Edition:** 125, 131-132

Student Learning Expectations, Grade 8	ACCESS Science
LS.2.8.5 Use a dichotomous key to classify organisms found in pond water	**Teacher's Edition:** 115
LS.2.8.6 Compare and contrast characteristics of unicellular organisms and multi-cellular organisms	**Teacher's Edition:** 127, 129-133
LS.2.8.7 Classify cells as eukaryotic or prokaryotic	**Teacher's Edition:** 129-132
LS.2.8.9 Investigate careers, scientists, and historical breakthroughs related to organisms	**Teacher's Edition:** 132

Standard 3: Life Cycles, Reproduction, and Heredity

Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Heredity and Reproduction LS.3.8.1 Identify and explain why inherited characteristics of living things depend on genes	**Teacher's Edition:** 184-187, 189-193
LS.3.8.2 Differentiate between dominant and recessive traits	**Teacher's Edition:** 193-195
LS.3.8.3 Observe and classify traits as dominant or recessive: • tongue rolling • detached earlobes • widow's peak • hitchhiker's thumb • dimples • unibrow	**Teacher's Edition:** 185
LS.3.8.4 Differentiate among observed inherited traits and acquired traits of plants and animals	**Teacher's Edition:** 185, 195, 197-203, 205-207
LS.3.8.5 Interpret simple genetic crosses using Punnett Squares	**Teacher's Edition:** 192-195

Student Learning Expectations, Grade 8	ACCESS Science
LS.3.8.6 Predict patterns that emerge from simple genetic crosses	**Teacher's Edition:** 192, 194-195
LS.3.8.7 Conduct investigations demonstrating that the phenotype of a genetic trait is the result of genotype	**Teacher's Edition:** 195
LS.3.8.8 Explain how genetic variation within a species is a result of dominant traits and recessive traits	**Teacher's Edition:** 192-193
LS.3.8.11 Investigate careers, scientists, and historical breakthroughs related to genetics	**Teacher's Edition:** 187, 192
Regulation and Behavior LS.3.8.12 Compare the theory of evolution to the characteristics of a scientific theory	**Teacher's Edition:** 31, 204
LS.3.8.13 Identify basic ideas related to biological evolution: • diversity of species • variations within species • adaptations • natural selection • extinction of a species	**Teacher's Edition:** 117, 185, 188, 192-193, 196-207
LS.3.8.14 Explain that the fossil record provides evidence of life forms' appearance, diversification, and extinction	**Teacher's Edition:** 196, 197, 204-205
LS.3.8.15 Explain the process of natural selection	**Teacher's Edition:** 197, 198, 202, 203, 207
LS.3.8.16 Identify genetic traits that make organisms more likely to survive and reproduce in a particular environment	**Teacher's Edition:** 198, 200-203
LS.3.8.17 Investigate careers, scientists, and historical breakthroughs related to natural selection and the fossil record	**Teacher's Edition:** 202, 204

Standard 4: Populations and Ecosystems

Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Populations and Ecosystems LS.4.8.1 Analyze the effect of changes in environmental conditions on the survival of individual organisms and entire species	**Teacher's Edition:** 176, 178, 197, 198, 199, 200-203, 207

Strand 3: Physical Science

Standard 5: Matter and Changes

Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Properties of Matter PS.5.8.2 Explain the structure of atoms	**Teacher's Edition:** 211, 213-214, 218, 237-241
PS.5.8.3 Determine the number of protons, neutrons, and electrons in an atom	**Teacher's Edition:** 211, 213, 214, 218, 237-239, 243
PS.5.8.4 Create atomic models of common elements	**Teacher's Edition:** 214, 215, 218, 237, 241, 243, 245, 249
PS.5.8.5 Investigate scientists, careers, and historical breakthroughs related to the atomic theory	**Teacher's Edition:** 214, 240

Standard 6: Motion and Forces

Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Motions and Forces PS.6.8.1 Model how motion and forces change Earth's surface: • compression • tension • weathering • erosion	**Teacher's Edition:** 29, 34-37, 38, 39, 41, 42, 44, 46-49, 52-63, 103

Student Learning Expectations, Grade 8	ACCESS Science
PS.6.8.2 Conduct investigations demonstrating the field force (lines of force) in magnetic fields	**Teacher's Edition:** 210
PS.6.8.3 Design and conduct investigations applying variables affecting the strength of an electromagnet	**Teacher's Edition:** 210
PS.6.8.4 Analyze and compare the relationship between electricity and magnetism	**Teacher's Edition:** 210
PS.6.8.5 Investigate careers, scientists, and historical breakthroughs related to motion and forces that change Earth's surface	**Teacher's Edition:** 31, 34-35, 38, 57

Standard 7: Energy and Transfer of Energy

Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Energy PS.7.8.4 Conduct investigations demonstrating the characteristics of a wave: • wavelength • frequency • speed • amplitude	**Teacher's Edition:** 280-291
PS.7.8.5 Conduct investigations of longitudinal and transverse waves to determine how they are different	**Teacher's Edition:** 281, 284, 285
PS.7.8.6 Explain how energy is transferred through waves: • seismic waves • sound waves • water waves • electromagnetic waves	**Teacher's Edition:** 281-286, 288-289
PS.7.8.7 Describe how waves travel through different kinds of media	**Teacher's Edition:** 282, 288, 289, 291

Student Learning Expectations, Grade 8	ACCESS Science
PS.7.8.8 Differentiate among reflection, refraction, and absorption of various types of waves	**Teacher's Edition:** 286-287
PS.7.8.9 Describe and diagram the electromagnetic spectrum	**Teacher's Edition:** 286, 291
PS.7.8.10 Analyze the electromagnetic spectrum	**Teacher's Edition:** 286, 291
PS.7.8.11 Investigate examples of real world uses of the electromagnetic spectrum	**Teacher's Edition:** 287
PS.7.8.12 Conduct investigations demonstrating the separation of white light into its spectrum using refraction	**Teacher's Edition:** 286
PS.7.8.13 Compare ways to transfer information: • sound • light • radio • microwave energy	**Teacher's Edition:** 262, 281, 284-289
PS.7.8.14 Investigate careers, scientists, and historical breakthroughs related to waves and the electromagnetic spectrum	**Teacher's Edition:** 287

Strand 4: Earth and Space Systems

Standard 8: Earth Systems

Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Structure and Properties ESS.8.8.1 Analyze the causes and predict the consequences of global warming on the following: • weather • temperature • ocean water levels	**Teacher's Edition:** 108

Student Learning Expectations, Grade 8	ACCESS Science
ESS.8.8.3 Conduct investigations to compare and contrast different landforms found on Earth: • mountains • plateaus • plains	**Teacher's Edition:** 34-35, 39
ESS.8.8.4 Synthesize and model the result of both constructive and destructive forces on land forms: • deposition • erosion • weathering • crustal deformation	**Teacher's Edition:** 35, 39, 51, 57, 58, 59, 60, 63
ESS.8.8.5 Compare and contrast the different landforms caused by Earth's external forces: • plains • canyons • deltas • valleys • swamps	**Teacher's Edition:** 60, 95
ESS.8.8.7 Use topographic maps to identify surface features of Earth	**Teacher's Edition:** 33
ESS.8.8.8 Demonstrate an understanding of the agents of erosion: • gravity • water • ice • wind • animals, including humans	**Teacher's Edition:** 52-54, 58-59, 61, 62, 63, 103, 106
ESS.8.8.9 Using models of rivers, predict changes when variables, such as load, slope, amount of water, or the composition of a stream bed, are changed through erosion or deposition	**Teacher's Edition:** 58, 60
ESS.8.8.11 Investigate careers, scientists, and historical breakthroughs related to external forces that change the Earth	**Teacher's Edition:** 44, 58, 63

Student Learning Expectations, Grade 8	ACCESS Science
Cycles ESS.8.8.12 Investigate the types of weathering involved in the breakdown of organic and inorganic components of Earth's surface	**Teacher's Edition:** 46, 48-49, 52-63
ESS.8.8.13 Illustrate soil profiles	**Teacher's Edition:** 56, 93, 102-103, 115
ESS.8.8.15 Investigate the formation of soil types	**Teacher's Edition:** 56, 93, 102-103, 115
ESS.8.8.16 Identify components of soil as inorganic or organic through investigations	**Teacher's Edition:** 56
ESS.8.8.17 Identify the basic nutrients needed by plants that are present in soils: • nitrogen • phosphorous • potassium	**Teacher's Edition:** 119
ESS.8.8.18 Identify ways plants use organic and inorganic components in the soil	**Teacher's Edition:** 56, 93, 119
ESS.8.8.19 Investigate and analyze the composition of a variety of soils	**Teacher's Edition:** 56, 63

Standard 9: Earth's History: Changes in Earth and Sky

Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Earth's History ESS.9.8.1 Explain processes that have changed Earth's surface that have resulted from sudden events (e.g., earthquakes and volcanoes) and gradual changes (e.g., uplift, erosion, and weathering)	**Teacher's Edition:** 29, 30, 31, 34-39, 42-49, 52-63
ESS.9.8.2 Analyze how rock sequences may be disturbed by the following: • erosion • deposition • igneous intrusion • folding • faulting • uplifting	**Teacher's Edition:** 35, 39, 48-49, 51, 57, 58, 59, 60, 63

Standard 10: Objects in the Universe

Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	ACCESS Science
Solar system: Sun, Earth, Moons, Planets, Galaxies ESS.10.8.1 Summarize the effects of gravity on bodies in space	**Teacher's Edition:** 84, 210, 294, 299
ESNS.10.8.2 Identify variables that affect the amount of gravitational force between two objects: • mass of the objects • distance between the objects	**Teacher's Edition:** 210, 299
ESNS.10.8.3 Relate the effects of the moon's gravitational force on Earth's ocean tides	**Teacher's Edition:** 84
ESNS.10.8.4 Identify the causes of the following: • high tides • low tides • spring tides • neap tides	**Teacher's Edition:** 84

Student Learning Expectations, Grade 8	ACCESS Science
ESNS.10.8.5 Define the terms galaxy and universe	**Teacher's Edition:** 292, 296-297
ESNS.10.8.6 Illustrate the appearance of galaxies as seen through a telescope: • clarity • shape	**Teacher's Edition:** 297
ESNS.10.8.7 Compare and contrast the Milky Way Galaxy to other galaxies	**Teacher's Edition:** 297
ESNS.10.8.9 Investigate careers, scientists, and historical breakthroughs related to gravity, galaxies, and the universe	**Teacher's Edition:** 295, 296, 297, 298, 300, 302

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