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correlated to

Arizona

**Academic Content Standards:
Science Standard Articulated
by Grade Level
Grades 6-8**



YOUR ARIZONA GREAT SOURCE REPRESENTATIVE

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correlated to

**Arizona Academic Content Standards
Science Standard Articulated by Grade Level
Grade 6**

**Strand 1:
Inquiry Process**

Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 1: Observations, Questions, and Hypotheses

Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Differentiate among a question, hypothesis, and prediction.	Student Book: 17, 18, 19, 20, 21, 25, 26, 27, 74, 175, 182, 235, 242, 243, 271, 278
PO 2. Formulate questions based on observations that lead to the development of a hypothesis. (See M06-S2C1-01)	Student Book: 17, 20, 122, 235, 242, 243, 271

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 6	ACCESS Science
PO 2. Design an investigation to test individual variables using scientific processes.	Student Book: 22, 23, 271, 295
PO 3. Conduct a controlled investigation using scientific processes.	Student Book: 19, 24, 25, 26, 27, 31, 38, 39, 50, 87, 99, 110, 123, 134, 175, 182, 206, 219, 231, 242, 279
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers). (See M06-S4C4-02)	Student Book: 19, 27, 63, 183, 219, 222, 223, 305

Performance Objectives, Grade 6	ACCESS Science
PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs. (See W06-S3C2-01 and W06-S3C3-01)	Student Book: 24, 31, 43, 50, 67, 103, 110, 111, 127, 134, 135, 175, 182, 206, 223, 230, 235, 242, 255, 271

C o n c e p t 3 : A n a l y s i s a n d C o n c l u s i o n s
Analyze and interpret data to explain correlations and results; formulate new questions.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M06-S2C1-03)	Student Book: 24, 31, 39, 67, 74, 103, 111, 247, 255, 295
PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).	Student Book: 67, 74, 110, 115, 122
PO 3. Evaluate the observations and data reported by others.	Student Book: 99, 195
PO 4. Interpret simple tables and graphs produced by others.	Student Book: 26, 67, 74, 98, 194, 302
PO 5. Analyze the results from previous and/or similar investigations to verify the results of the current investigation.	Student Book: 31
PO 6. Formulate new questions based on the results of a completed investigation.	Student Book: 20, 25, 235, 242, 243

C o n c e p t 4 : C o m m u n i c a t i o n
Communicate results of investigations.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Choose an appropriate graphic representation for collected data: <ul style="list-style-type: none"> • line graph • double bar graph • stem and leaf plot • histogram (See M06-S2C1-02) 	Student Book: 24, 25, 26
PO 2. Display data collected from a controlled investigation. (See M06-S2C1-02)	Student Book: 24, 25, 26, 55, 91, 127, 134, 151, 295

Performance Objectives, Grade 6	ACCESS Science
PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information. (See W06-S3C2-01)	Student Book: 25, 26, 99, 110, 219, 239, 255
PO 5. Communicate the results and conclusion of the investigation. (See W06-S3C6-02)	Student Book: 25, 26, 99, 103, 110, 111, 206, 219, 231, 247, 255

Strand 2: History and Nature of Science

Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the inclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor

Identify individual, cultural, and technological contributions to scientific knowledge.

Performance Objectives, Grade 6	ACCESS Science
PO 1. <i>Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Jacques Cousteau [inventor, marine explorer], supports Strand 4; William Beebe [scientist], supports Strand 4; Thor Heyerdahl [anthropologist], supports Strand 6).</i>	Student Book: 22, 132, 269, 276, 297
PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., Cell Theory, sonar, SCUBA, underwater robotics).	Student Book: 22, 132, 297
PO 4. Describe the use of technology in science-related careers.	Student Book: 22, 83, 144, 156, 240, 287

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.	Student Book: 20, 22, 25
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.	Student Book: 31

Performance Objectives, Grade 6	ACCESS Science
<p>PO 3. Apply the following scientific processes to other problem solving or decision making situations:</p> <ul style="list-style-type: none"> • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables 	<p>Student Book: 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 39, 43, 47, 50, 51, 55, 62, 63, 67, 71, 73, 74, 75, 91, 98, 99, 103, 110, 111, 123, 127, 134, 135, 146, 147, 151, 158, 159, 173, 175, 182, 183, 199, 206, 207, 219, 231, 235, 242, 243, 247, 255, 267, 271, 278, 279, 283, 295, 302, 303</p>

**Strand 3:
Science in Personal and Social Perspectives**

Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world – as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

Performance Objectives, Grade 6	ACCESS Science
<p>PO 1. Evaluate the effects of the following natural hazards:</p> <ul style="list-style-type: none"> • sandstorm • hurricane • tornado • ultraviolet light • lightning-caused fire 	<p>Student Book: 73</p>
<p>PO 2. Describe how people plan for, and respond to, the following natural disasters:</p> <ul style="list-style-type: none"> • drought • flooding • tornadoes 	<p>Student Book: 61, 62, 73</p>

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Propose viable methods of responding to an identified need or problem.	Student Book: 97, 99, 100, 109
PO 2. Compare possible solutions to best address an identified need or problem.	Student Book: 97, 99, 109
PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	Student Book: 75
PO 4. Describe a technological discovery that influences science.	Student Book: 22, 132, 297

Strand 4: Life Science

Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 1: Structure and Function in Living Systems

Understand the relationships between structures and functions of organisms.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Explain the importance of water to organisms.	Student Book: 161, 164, 165, 166
PO 2. Describe the basic structure of a cell, including: <ul style="list-style-type: none">• cell wall• cell membrane• nucleus	Student Book: 137, 140, 141, 142, 146
PO 3. Describe the function of each of the following cell parts: <ul style="list-style-type: none">• cell wall• cell membrane• nucleus	Student Book: 140, 141, 142, 146, 147
PO 4. Differentiate between plant and animal cells.	Student Book: 137, 141, 146, 147
PO 5. Explain the hierarchy of cells, tissues, organs, and systems.	Student Book: 149, 150, 151, 152, 153, 154, 155, 156, 157

Performance Objectives, Grade 6	ACCESS Science
<p>PO 6. Relate the following structures of living organisms to their functions:</p> <p>Animals</p> <ul style="list-style-type: none"> • respiration – gills, lungs • digestion – stomach, intestines • circulation – heart, veins, arteries, capillaries • locomotion – muscles, skeleton <p>Plants</p> <ul style="list-style-type: none"> • transpiration – stomata, roots, xylem, phloem • absorption – roots, xylem, phloem • response to stimulus (phototropism, hydrotropism, geotropism) – roots, xylem, phloem 	<p>Student Book: 150, 153, 154, 155, 156, 157, 158</p>
<p>PO 7. Describe how the various systems of living organisms work together to perform a vital function:</p> <ul style="list-style-type: none"> • respiratory and circulatory • muscular and skeletal • digestive and excretory 	<p>Student Book: 149, 153, 154, 155, 156, 157, 158, 179</p>

C o n c e p t 3 : P o p u l a t i o n s o f O r g a n i s m s i n a n E c o s y s t e m

Analyze the relationships among various organisms and their environment.

Performance Objectives, Grade 6	ACCESS Science
<p>PO 1. Explain that sunlight is the major source of energy for most ecosystems. (See Strand 5 Concept 3 and Strand 6 Concept 2)</p>	<p>Student Book: 117, 120</p>
<p>PO 2. Describe how the following environmental conditions affect the quality of life:</p> <ul style="list-style-type: none"> • water quality • climate • population density • smog 	<p>Student Book: 68, 104, 107, 108, 116</p>

Strand 5: Physical Science

Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in a system, and the processes by which energy is transferred between systems and surroundings.

Concept 3: Transfer of Energy

Understand that energy can be stored and transferred.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Identify various ways in which electrical energy is generated using renewable and nonrenewable resources (e.g., wind, dams, fossil fuels, nuclear reactions).	Student Book: 92, 94, 95, 96, 97, 98, 258, 259
PO 2. Identify several ways in which energy may be stored.	Student Book: 92, 258, 262
PO 3. Compare the following ways in which energy may be transformed: <ul style="list-style-type: none"> • mechanical to electrical • electrical to thermal 	Student Book: 257, 258, 259, 263, 264, 265
PO 4. Explain how thermal energy (heat energy) can be transferred by: <ul style="list-style-type: none"> • conduction • convection • radiation 	Student Book: 214, 265

Strand 6: Earth and Space Science

Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understandings of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, students can make informed decisions about issues affecting the planet on which they live.

Concept 1: Structure of the Earth

Describe the composition and interactions between the structure of the Earth and its atmosphere.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Describe the properties and the composition of the layers of the atmosphere.	Student Book: 65, 68, 108, 301

Performance Objectives, Grade 6	ACCESS Science
PO 2. Explain the composition, properties, and structure of the Earth's lakes and rivers.	Student Book: 55, 70
PO 3. Explain the composition, properties, and structures of the oceans' zones and layers.	Student Book: 33, 54, 69, 70
PO 4. Analyze the interactions between the Earth's atmosphere and the Earth's bodies of water (water cycle).	Student Book: 65, 70, 71, 73, 75

C o n c e p t 2 : E a r t h ' s P r o c e s s e s a n d S y s t e m s

Understand the processes acting on the Earth and their interaction with the Earth systems.

Performance Objectives, Grade 6	ACCESS Science
PO 1. Explain how water is cycled in nature.	Student Book: 70, 71, 73, 75
PO 2. Identify the distribution of water within or among the following: <ul style="list-style-type: none"> • atmosphere • lithosphere • hydrosphere 	Student Book: 68, 70, 71
PO 3. Analyze the effects that bodies of water have on the climate of a region.	Student Book: 68, 69
PO 4. Analyze the following factors that affect climate: <ul style="list-style-type: none"> • ocean currents • elevation • location 	Student Book: 69
PO 5. Analyze the impact of large-scale weather systems on the local weather.	Student Book: 72, 73
PO 6. Create a weather system model that includes: <ul style="list-style-type: none"> • the Sun • the atmosphere • bodies of water 	Student Book: 86



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**Arizona Academic Content Standards
Science Standard Articulated by Grade Level
Grade 7**

**Strand 1:
Inquiry Process**

Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 1: Observations, Questions, and Hypotheses

Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

Performance Objectives, Grade 7	ACCESS Science
PO 1. <i>Formulate questions based on observations that lead to the development of a hypothesis. (See M07-S2C1-01)</i>	Student Book: 17, 18, 19, 20, 21, 25, 26, 27, 74, 175, 182, 235, 242, 243, 271, 278
PO 3. Explain the role of a hypothesis in a scientific inquiry.	Student Book: 17, 18, 19, 20, 21, 25, 26, 175, 271

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 7	ACCESS Science
PO 2. <i>Design an investigation to test individual variables using scientific processes.</i>	Student Book: 22, 23, 271, 295
PO 3. Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.	Student Book: 19, 24, 25, 26, 27, 31, 38, 39, 50, 87, 99, 110, 123, 134, 175, 182, 206, 219, 231, 242, 279
PO 4. <i>Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).</i>	Student Book: 19, 27, 63, 183, 219, 222, 223, 305

Performance Objectives, Grade 7	ACCESS Science
PO 5. <i>Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs. (See W07-S3C2-01 and W07-S3C3-01)</i>	Student Book: 24, 31, 43, 50, 67, 103, 110, 111, 127, 134, 135, 175, 182, 206, 223, 230, 235, 242, 255, 271

Concept 3: Analysis and Conclusions
Analyze and interpret data to explain correlations and results; formulate new questions.

Performance Objectives, Grade 7	ACCESS Science
PO 1. <i>Analyze data obtained in a scientific investigation to identify trends. (See M07-S2C1-07 and M07-S2C1-08)</i>	Student Book: 24, 31, 39, 67, 74, 103, 111, 247, 255, 295
PO 2. <i>Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).</i>	Student Book: 67, 74, 110, 115, 122
PO 3. Analyze results of data collection in order to accept or reject the hypothesis.	Student Book: 25, 26, 199
PO 4. Determine validity and reliability of results of an investigation.	Student Book: 26, 31
PO 5. Formulate a conclusion based on data analysis.	Student Book: 17, 20, 25, 26, 103, 110, 111, 247, 255
PO 6. Refine hypotheses based on results from investigations.	Student Book: 25
PO 7. Formulate new questions based on the results of a previous investigation.	Student Book: 20, 25, 235, 242, 243

Concept 4: Communication
Communicate results of investigations.

Performance Objectives, Grade 7	ACCESS Science
PO 1. <i>Choose an appropriate graphic representation for collected data:</i> <ul style="list-style-type: none"> • <i>line graph</i> • <i>double bar graph</i> • <i>stem and leaf plot</i> • <i>histogram (See M07-S2C1-03)</i> 	Student Book: 24, 25, 26
PO 2. <i>Display data collected from a controlled investigation. (See M07-S2C1-03)</i>	Student Book: 24, 25, 26, 55, 91, 127, 134, 151, 295

Performance Objectives, Grade 7	ACCESS Science
PO 3. <i>Communicate the results of an investigation with appropriate use of qualitative and quantitative information. (See W07-S3C2-01)</i>	Student Book: 25, 26, 99, 110, 219, 239, 255
PO 5. <i>Communicate the results and conclusion of the investigation. (See W07-S3C6-02)</i>	Student Book: 25, 26, 99, 103, 110, 111, 206, 219, 231, 247, 255

Strand 2: History and Nature of Science

Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the inclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor

Identify individual, cultural, and technological contributions to scientific knowledge.

Performance Objectives, Grade 7	ACCESS Science
PO 1. <i>Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Rachel Carson [scientist], supports Strand 4; Luis Alvarez [scientist] and Walter Alvarez [scientist], support Strand 6; Percival Lowell [scientist], supports Strand 6; Copernicus [scientist], supports Strand 6).</i>	Student Book: 22, 132, 269, 276, 297
PO 2. <i>Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., global positioning system, telescopes, seismographs, photography).</i>	Student Book: 22, 132, 297
PO 4. <i>Analyze the use of technology in science-related careers.</i>	Student Book: 22, 83, 144, 156, 240, 287

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 7	ACCESS Science
<p>PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.</p>	<p>Student Book: 20, 22, 25</p>
<p>PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</p>	<p>Student Book: 31</p>
<p>PO 3. Apply the following scientific processes to other problem solving or decision making situations:</p> <ul style="list-style-type: none"> • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables 	<p>Student Book: 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 39, 43, 47, 50, 51, 55, 62, 63, 67, 71, 73, 74, 75, 91, 98, 99, 103, 110, 111, 123, 127, 134, 135, 146, 147, 151, 158, 159, 173, 175, 182, 183, 199, 206, 207, 219, 231, 235, 242, 243, 247, 255, 267, 271, 278, 279, 283, 295, 302, 303</p>

Strand 3:

Science in Personal and Social Perspectives

Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world – as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

Performance Objectives, Grade 7	ACCESS Science
<p>PO 1. Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems.</p>	<p>Student Book: 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111</p>
<p>PO 2. Analyze environmental benefits of the following human interactions with biological or geological systems:</p> <ul style="list-style-type: none"> • reforestation • habitat restoration • construction of dams 	<p>Student Book: 109, 117</p>

Performance Objectives, Grade 7	ACCESS Science
PO 3. Propose possible solutions to address the environmental risks in biological or geological systems.	Student Book: 109

C o n c e p t 2 : S c i e n c e a n d T e c h n o l o g y i n S o c i e t y

Develop viable solutions to a need or problem.

Performance Objectives, Grade 7	ACCESS Science
PO 1. Propose viable methods of responding to an identified need or problem.	Student Book: 97, 99, 100, 109
PO 2. Compare solutions to best address an identified need or problem.	Student Book: 97, 99, 109
PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	Student Book: 75
PO 4. Describe a scientific discovery that influences technology.	Student Book: 22, 297

S t r a n d 4 : L i f e S c i e n c e

Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

C o n c e p t 3 : P o p u l a t i o n s o f O r g a n i s m s i n a n E c o s y s t e m

Analyze the relationships among various organisms and their environment.

Performance Objectives, Grade 7	ACCESS Science
PO 1. Compare food chains in a specified ecosystem and their corresponding food web.	Student Book: 121
PO 2. Explain how organisms obtain and use resources to develop and thrive in: <ul style="list-style-type: none"> • niches • predator/prey relationships 	Student Book: 113, 115, 120, 121
PO 3. Analyze the interactions of living organisms with their ecosystems: <ul style="list-style-type: none"> • limiting factors • carrying capacity 	Student Book: 113, 120, 121, 123

Performance Objectives, Grade 7	ACCESS Science
PO 4. Evaluate data related to problems associated with population growth (e.g., overgrazing, forest management, invasion of non-native species) and the possible solutions.	Student Book: 105
PO 5. Predict how environmental factors (e.g., floods, droughts, temperature changes) affect survival rates in living organisms.	Student Book: 108
PO 6. Create a model of the interactions of living organisms within an ecosystem.	Student Book: 115, 122

Strand 6: Earth and Space Science

Earth and Space Science provides the foundation for students to develop an understanding of the Earth, its history, composition, and formative processes, and an understanding of the solar system and the universe. Students study the regularities of the interrelated systems of the natural world. In doing so, they develop understandings of the basic laws, theories, and models that explain the world (NSES, 1995). By studying the Earth from both a historical and current time frame, students can make informed decisions about issues affecting the planet on which they live.

Concept 1: Structure of the Earth

Describe the composition and interactions between the structure of the Earth and its atmosphere.

Performance Objectives, Grade 7	ACCESS Science
PO 1. Classify rocks and minerals by the following observable properties: <ul style="list-style-type: none"> • grain • color • texture • hardness 	Student Book: 43, 46, 47, 50, 51
PO 2. Describe the properties and the composition of the following major layers of the Earth: <ul style="list-style-type: none"> • crust • mantle • core 	Student Book: 29, 30, 32, 34
PO 3. Explain the following processes involved in the formation of the Earth's structure: <ul style="list-style-type: none"> • erosion • deposition • plate tectonics • volcanism 	Student Book: 29, 31, 34, 35, 36, 37, 38, 39, 44, 45, 48, 49, 53, 54, 58, 59, 60, 61, 62, 63
PO 4. Describe how the rock and fossil record show that environmental conditions have changed over geologic and recent time.	Student Book: 42, 44, 49, 204

Concept 2: Earth's Processes and Systems

Understand the processes acting on the Earth and their interaction with the Earth systems.

Performance Objectives, Grade 7	ACCESS Science
PO 1. Explain the rock cycle.	Student Book: 41, 48, 49, 51
PO 2. Distinguish the components and characteristics of the rock cycle for the following types of rocks: <ul style="list-style-type: none">• igneous• metamorphic• sedimentary	Student Book: 41, 42, 46, 47, 48, 49
PO 3. Analyze the evidence that lithospheric plate movements occur.	Student Book: 29, 31, 34, 35, 38, 39, 45
PO 4. Explain lithospheric plate movement as a result of convection.	Student Book: 34, 38
PO 5. Relate plate boundary movements to their resulting landforms, including: <ul style="list-style-type: none">• mountains• faults• rift valleys• trenches• volcanoes	Student Book: 29, 34, 35, 36, 37, 38, 39

Concept 3: Earth in the Solar System

Understand the relationships of the Earth and other objects in the solar system.

Performance Objectives, Grade 7	ACCESS Science
PO 1. Explain the phases of the Moon in terms of the relative positions of the Earth, Sun, and Moon.	Student Book: 78, 79, 84, 87
PO 2. Construct a model for the relative positions of the Earth, Sun, and Moon as they relate to corresponding eclipses.	Student Book: 85, 87
PO 3. Explain the interrelationship between the Earth's tides and the Moon.	Student Book: 84
PO 4. Explain the seasons in the Northern and Southern Hemispheres in terms of the tilt of the Earth's axis relative to the Earth's revolution around the Sun.	Student Book: 82, 83, 86, 87
PO 6. Explain the relationship among common objects in the solar system, galaxy, and the universe.	Student Book: 293, 294, 295, 296,, 297, 299, 301, 303



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Strand 1: Inquiry Process

Inquiry Process establishes the basis for students' learning in science. Students use scientific processes: questioning, planning and conducting investigations, using appropriate tools and techniques to gather data, thinking critically and logically about relationships between evidence and explanations, and communicating results.

Concept 1: Observations, Questions, and Hypotheses

Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Formulate questions based on observations that lead to the development of a hypothesis. (See M08-S2C1-01)	Student Book: 17, 18, 19, 20, 21, 25, 26, 27, 74, 175, 182, 235, 242, 243, 271, 278
PO 3. Generate a hypothesis that can be tested.	Student Book: 17, 18, 21, 27, 175, 271

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 8	ACCESS Science
PO 2. Design a controlled investigation to support or reject a hypothesis.	Student Book: 19, 22, 23, 27
PO 3. Conduct a controlled investigation to support or reject a hypothesis.	Student Book: 19, 24, 25, 26, 27, 31, 38, 39, 50, 87, 99, 110, 123, 134, 175, 182, 206, 219, 231, 242, 279
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).	Student Book: 19, 27, 63, 183, 219, 222, 223, 305
PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs. (See W08-S3C2-01 and W08-S3C3-01)	Student Book: 24, 31, 43, 50, 67, 103, 110, 111, 127, 134, 135, 175, 182, 206, 223, 230, 235, 242, 255, 271

C o n c e p t 3 : A n a l y s i s a n d C o n c l u s i o n s

Analyze and interpret data to explain correlations and results; formulate new questions.

Performance Objectives, Grade 8	ACCESS Science
<i>PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M08-S2C1-08)</i>	Student Book: 24, 31, 39, 67, 74, 103, 111, 247, 255, 295
<i>PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).</i>	Student Book: 67, 74, 110, 115, 122
PO 4. Formulate a future investigation based on the data collected.	Student Book: 20, 25, 235, 242, 243
PO 5. Explain how evidence supports the validity and reliability of a conclusion.	Student Book: 26, 31
<i>PO 8. Formulate new questions based on the results of a previous investigation.</i>	Student Book: 20, 25, 235, 242, 243

C o n c e p t 4 : C o m m u n i c a t i o n

Communicate results of investigations.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Communicate the results of an investigation.	Student Book: 25, 26, 99, 110, 219, 239, 255
<i>PO 2. Choose an appropriate graphic representation for collected data:</i> <ul style="list-style-type: none"> • <i>line graph</i> • <i>double bar graph</i> • <i>stem and leaf plot</i> • <i>histogram (See M08-S2C1-03)</i> 	Student Book: 24, 25, 26
PO 3. Present analyses and conclusions in clear, concise formats. (See W08-S3C6-02)	Student Book: 17, 20, 25, 26, 103, 110, 111, 247, 255
<i>PO 5. Communicate the results and conclusion of the investigation. (See W08-S3C6-02)</i>	Student Book: 25, 26, 99, 103, 110, 111, 206, 219, 231, 247, 255

Strand 2: History and Nature of Science

Scientific investigation grows from the contributions of many people. History and Nature of Science emphasizes the importance of the inclusion of historical perspectives and the advances that each new development brings to technology and human knowledge. This strand focuses on the human aspects of science and the role that scientists play in the development of various cultures.

Concept 1: History of Science as a Human Endeavor

Identify individual, cultural, and technological contributions to scientific knowledge.

Performance Objectives, Grade 8	ACCESS Science
<p>PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Watson and Crick [scientists], support Strand 4; Rosalind Franklin [scientist], supports Strand 4; Charles Darwin [scientist], supports Strand 4; George Washington Carver [scientist, inventor], supports Strand 4; Joseph Priestley [scientist], supports Strand 5; Sir Frances Bacon [philosopher], supports Strand 5; Isaac Newton [scientist], supports Strand 5).</p>	<p>Student Book: 22, 132, 1269, 276, 297</p>
<p>PO 2. Evaluate the effects of the following major scientific milestones on society:</p> <ul style="list-style-type: none"> • Mendelian Genetics • Newton's Laws 	<p>Student Book: 192, 276, 277</p>

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 8	ACCESS Science
<p>PO 1. Apply the following scientific processes to other problem solving or decision making situations:</p> <ul style="list-style-type: none"> • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables 	<p>Student Book: 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 39, 43, 47, 50, 51, 55, 62, 63, 67, 71, 73, 74, 75, 91, 98, 99, 103, 110, 111, 123, 127, 134, 135, 146, 147, 151, 158, 159, 173, 175, 182, 183, 199, 206, 207, 219, 231, 235, 242, 243, 247, 255, 267, 271, 278, 279, 283, 295, 302, 303</p>
<p>PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</p>	<p>Student Book: 31</p>

Performance Objectives, Grade 8	ACCESS Science
PO 3. Defend the principle that accurate record keeping, openness, and replication are essential for maintaining an investigator's credibility with other scientists and society.	Student Book: 24

Strand 3: Science in Personal and Social Perspectives

Science in Personal and Social Perspectives emphasizes developing the ability to design a solution to a problem, to understand the relationship between science and technology, and the ways people are involved in both. Students understand the impact of science and technology on human activity and the environment. This strand affords students the opportunity to understand their place in the world – as living creatures, consumers, decision makers, problem solvers, managers, and planners.

Concept 1: Changes in Environments

Describe the interactions between human populations, natural hazards, and the environment.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including: <ul style="list-style-type: none"> • waste disposal of industrial chemicals • greenhouse gases 	Student Book: 101, 102, 103, 106, 107, 108, 110, 111
PO 2. Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.	Student Book: 109

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 8	ACCESS Science
<i>PO 1. Propose viable methods of responding to an identified need or problem.</i>	Student Book: 97, 99, 100, 109
<i>PO 2. Compare solutions to best address an identified need or problem.</i>	Student Book: 97, 99, 109
<i>PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.</i>	Student Book: 75
PO 4. Compare risks and benefits of the following technological advances: <ul style="list-style-type: none"> • radiation treatments • genetic engineering (See Strand 4 Concept 2) • airbags (See Strand 5 Concept 2) 	Student Book: 214

Strand 4: Life Science

Life Science expands students' biological understanding of life by focusing on the characteristics of living things, the diversity of life, and how organisms and populations change over time in terms of biological adaptation and genetics. This understanding includes the relationship of structures to their functions and life cycles, interrelationships of matter and energy in living organisms, and the interactions of living organisms with their environment.

Concept 2: Reproduction and Heredity

Understand the basic principles of heredity.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Explain the purposes of cell division: <ul style="list-style-type: none"> • growth and repair • reproduction 	Student Book: 136, 137, 138, 139, 143, 144, 145, 189, 191
PO 2. Explain the basic principles of heredity using the human examples of: <ul style="list-style-type: none"> • eye color • widow's peak • blood type 	Student Book: 192, 193, 194, 195
PO 3. Distinguish between the nature of dominant and recessive traits in humans.	Student Book: 193

Concept 4: Diversity, Adaptation, and Behavior

Identify structural and behavioral adaptations.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Explain how an organism's behavior allows it to survive in an environment.	Student Book: 200, 201, 202, 203
PO 2. Describe how an organism can maintain a stable internal environment while living in a constantly changing external environment.	Student Book: 202, 203
PO 3. Determine characteristics of organisms that could change over several generations.	Student Book: 203
PO 4. Compare the symbiotic and competitive relationships in organisms within an ecosystem (e.g., lichen, mistletoe/tree, clownfish/sea anemone, native/non-native species).	Student Book: 113, 120, 121

Performance Objectives, Grade 8	ACCESS Science
PO 5. Analyze the following behavioral cycles of organisms: <ul style="list-style-type: none"> • hibernation • migration • dormancy (plants) 	Student Book: 201
PO 6. Describe the following factors that allow for the survival of living organisms: <ul style="list-style-type: none"> • protective coloration • beak design • seed dispersal • pollination 	Student Book: 113, 187, 189

Strand 5: Physical Science

Physical Science affords students the opportunity to increase their understanding of the characteristics of objects and materials they encounter daily. Students gain an understanding of the nature of matter and energy, including their forms, the changes they undergo, and their interactions. By studying objects and the forces that act upon them, students develop an understanding of the fundamental laws of motion, knowledge of the various ways energy is stored in a system, and the processes by which energy is transferred between systems and surroundings.

Concept 1: Properties and Changes of Properties in Matter

Understand physical and chemical properties of matter.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Identify different kinds of matter based on the following physical properties: <ul style="list-style-type: none"> • states • density • boiling point • melting point • solubility 	Student Book: 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 236, 289
PO 2. Identify different kinds of matter based on the following chemical properties: <ul style="list-style-type: none"> • reactivity • pH • oxidation (corrosion) 	Student Book: 234, 236, 240
PO 3. Identify the following types of evidence that a chemical reaction has occurred: <ul style="list-style-type: none"> • formation of a precipitate • generation of gas • color change • absorption or release of heat 	Student Book: 234, 246, 247, 248, 249, 250, 252, 253, 255
PO 4. Classify matter in terms of elements, compounds, or mixtures.	Student Book: 215, 217

Performance Objectives, Grade 8	ACCESS Science
PO 5. Classify mixtures as being homogeneous or heterogeneous.	Student Book:
PO 6. Explain the systematic organization of the periodic table.	Student Book: 233, 236, 238, 239, 240, 241
PO 7. Investigate how the transfer of energy can affect the physical and chemical properties of matter.	Student Book: 221, 222, 223, 225, 226, 227, 230, 231, 245, 248, 252, 253

C o n c e p t 2 : M o t i o n a n d F o r c e s

Understand the relationship between force and motion.

Performance Objectives, Grade 8	ACCESS Science
PO 1. Demonstrate velocity as the rate of change of position over time.	Student Book: 270, 275
PO 2. Identify the conditions under which an object will continue in its state of motion (Newton's 1 st Law of Motion).	Student Book: 276
PO 3. Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2 nd Law of Motion).	Student Book: 276
PO 4. Describe forces as interactions between bodies (Newton's 3 rd Law of Motion).	Student Book: 277



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