Science Daybooks
Grades 4-8

correlated to

Arizona
Academic Content Standards
Science Standard Articulated by Grade Level

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Arizona Academic Content Standards
Science Standard Articulated by Grade Level
Grade 4

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

Observe, ask questions, and make predictions.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Differentiate inferences from observations.	**Teacher's Guide:** 48
PO 2. Formulate a relevant question through observations that can be tested by an investigation. (See M04-S2C1-01)	**Teacher's Guide:** 66, 67, 94, 111, 124, 132
PO 3. Formulate predictions in the realm of science based on observed cause and effect relationships.	**Teacher's Guide:** 19, 21, 43, 89, 91, 94, 119, 124, 132, 139, 143
PO 4. Locate information (e.g., book, article, website) related to an investigation. (See W04-S3C6-01 and R04-S3C1-05)	**Teacher's Guide:** 41, 46, 71, 91, 105, 109, 116, 149

Concept 2: Scientific Testing (Investigating and Modeling)

Participate in planning and conducting investigations, and recording data.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.	**Teacher's Guide:** 66, 67, 87b, 111, 115

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 2. Plan a simple investigation that identifies the variables to be controlled.	**Teacher's Guide:** 34, 35, 36, 66, 67
PO 3. Conduct controlled investigations (e.g., related to erosion, plant life cycles, weather, magnetism) in life, physical, and Earth and space sciences.	**Teacher's Guide:** 34, 35, 36, 66, 67, 132
PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary). (See M04-S4C4-03 and M04-S4C4-07)	**Teacher's Guide:** 11b, 45, 49b, 66, 67, 68, 86, 87b, 87c, 156, 145b
PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). (See W04-S3C2-01 and W04-S3C3-01)	**Teacher's Guide:** 25, 28, 31, 34, 35, 36, 57, 60, 63, 66, 69, 71, 73, 89, 91, 93, 94, 111, 113, 123, 131, 136, 143, 147, 174, 175, 176, 177, 179

Concept 3: Analysis and Conclusions

Organize and analyze data; compare to predictions.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M04-S2C1-03)	**Teacher's Guide:** 66, 67, 68
PO 2. Formulate conclusions based upon identified trends in data. (See M04-S2C1-03)	**Teacher's Guide:** 66, 67, 68
PO 3. Determine that data collected is consistent with the formulated question.	**Teacher's Guide:** 31, 36, 63, 66, 68
PO 4. Determine whether the data supports the prediction for an investigation.	**Teacher's Guide:** 34, 35
PO 5. Develop new questions and predictions based upon the data collected in the investigation.	**Teacher's Guide:** 47, 91, 94

Concept 4: Communication

Communicate results of investigations.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Communicate verbally or in writing the results of an inquiry. (See W04-S3C3-01)	**Teacher's Guide:** 73, 85, 86, 91, 132

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 2. Choose an appropriate graphic representation for collected data: • bar graph • line graph • Venn diagram • model (See M04-S2C1-02)	**Teacher's Guide:** 35, 53, 55, 83, 86, 164
PO 3. Communicate with other groups or individuals to compare the results of a common investigation.	**Teacher's Guide:** 56, 68, 121, 131, 138

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 and cultural contributions to scientific knowledge.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Margaret Mead [anthropologist], supports Strand 4; Nikola Tesla [engineer, inventor] supports Strand 5; Michael Faraday [scientist], supports Strand 5; Benjamin Franklin [scientist], supports Strand 5).	**Teacher's Guide:** 57, 76, 77, 78, 96, 97, 153
PO 2. Describe science-related career opportunities.	**Teacher's Guide:** 63, 154, 165

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Explain the role of experimentation in scientific inquiry.	**Teacher's Guide:** 99, 155
PO 2. Describe the interaction of components in a system (e.g., flashlight, radio).	**Teacher's Guide:** 137

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 3. Explain various ways scientists generate ideas (e.g., observation, experiment, collaboration, theoretical and mathematical models).	**Teacher's Guide:** 57, 76, 77, 78, 96, 97, 153

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 4	Science Daybook, Grade 4
PO 1. Describe how natural events and human activities have positive and negative impacts on environments (e.g., fire, floods, pollution, dams).	**Teacher's Guide:** 51, 52, 53, 54, 143
PO 2. Evaluate the consequences of environmental occurrences that happen either rapidly (e.g., fire, flood, tornado) or over a long period of time (e.g., drought, melting ice caps, the greenhouse effect, erosion).	**Teacher's Guide:** 51, 52, 53, 54, 55, 56

Concept 2: Science and Technology in Society

Understand the impact of technology.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Describe how science and technology (e.g., computers, air conditioning, medicine) have improved the lives of many people.	**Teacher's Guide:** 153, 154, 155, 156, 157, 158
PO 2. Describe benefits (e.g., easy communications, rapid transportation) and risks (e.g., pollution, destruction of natural resources) related to the use of technology.	**Teacher's Guide:** 150, 152, 153, 154, 155, 156, 157, 158
PO 3. Design and construct a technological solution to a common problem or need using common materials.	**Teacher's Guide:** 136, 138, 144, 156, 157, 158

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: Characteristics of Organisms

Understand that basic structures in plants and animals serve a function.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Compare structures in plants (e.g., roots, stems, leaves, flowers) and animals (e.g., muscles, bones, nerves) that serve different functions in growth and survival.	**Teacher's Guide:** 20, 21, 34, 35, 36
PO 2. Classify animals by identifiable group characteristics: • vertebrates – mammals, birds, fish, reptiles, amphibians • invertebrates – insects, arachnids	**Teacher's Guide:** 17

Concept 3: Organisms and Environments

Understand the relationships among various organisms and their environment.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Describe ways various resources (e.g., air, water, plants, animals, soil) are utilized to meet the needs of a population.	**Teacher's Guide:** 127, 128, 129, 130, 131
PO 2. Differentiate renewable resources from nonrenewable resources.	**Teacher's Guide:** 137
PO 3. Analyze the effect that limited resources (e.g., natural gas, minerals) may have on an environment.	**Teacher's Guide:** 137
PO 4. Describe ways in which resources can be conserved (e.g., by reducing, reusing, recycling, finding substitutes).	**Teacher's Guide:** 133, 134, 135, 136, 137, 138

Concept 4: Diversity, Adaptation, and Behavior

Identify plant and animal adaptations.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Recognize that successful characteristics of populations are inherited traits that are favorable in a particular environment.	**Teacher's Guide:** 13, 14, 15, 16, 17, 18
PO 2. Give examples of adaptations that allow plants and animals to survive. • camouflage – horned lizards, coyotes • mimicry – Monarch and Viceroy butterflies • physical – cactus spines • mutualism – species of acacia that harbor ants, which repel other harmful insects	**Teacher's Guide:** 13, 14, 15, 16, 17, 18

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: Energy and Magnetism

Investigate different forms of energy.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Demonstrate that electricity flowing in circuits can produce light, heat, sound, and magnetic effects.	**Teacher's Guide:** 113, 114, 115
PO 2. Construct series and parallel electric circuits.	**Teacher's Guide:** 117
PO 3. Explain the purpose of conductors and insulators in various practical applications.	**Teacher's Guide:** 114, 115
PO 4. Investigate the characteristics of magnets (e.g., opposite poles attract, like poles repel, the force between two magnet poles depends on the distance between them).	**Teacher's Guide:** 111, 112
PO 5. State cause and effect relationships between magnets and circuitry.	**Teacher's Guide:** 107-118

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 2: Earth's Processes and Systems

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

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Identify the Earth processes that cause erosion.	**Teacher's Guide:** 58
PO 2. Describe how currents and wind cause erosion and land changes.	**Teacher's Guide:** 58
PO 3. Describe the role that water plays in the following processes that alter the Earth's surface features: • erosion • deposition • weathering	**Teacher's Guide:** 58
PO 4. Compare rapid and slow processes that change the Earth's surface, including: • rapid – earthquakes, volcanoes, floods • slow – wind, weathering	**Teacher's Guide:** 51, 52, 53, 54, 55, 56, 58
PO 5. Identify the Earth events that cause changes in atmospheric conditions (e.g., volcanic eruptions, forest fires).	**Teacher's Guide:** 51, 52, 53, 54, 55, 56
PO 6. Analyze evidence that indicates life and environmental conditions have changed (e.g., tree rings, fish fossils in desert regions, ice cores).	**Teacher's Guide:** 43, 44, 45, 46, 47, 48

Concept 3: Changes in the Earth and Sky

Understand characteristics of weather conditions and climate.

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 1. Identify the sources of water within an environment (e.g., ground water, surface water, atmospheric water, glaciers).	**Teacher's Guide:** 98, 99

Performance Objectives, Grade 4	Science Daybook, Grade 4
PO 3. Differentiate between weather and climate as they relate to the southwestern United States.	**Teacher's Guide:** 68, 69
PO 4. Measure changes in weather (e.g., precipitation, wind speed, barometric pressure).	**Teacher's Guide:** 66, 67
PO 5. Interpret the symbols on a weather map or chart to identify the following: • temperatures • fronts • precipitation	**Teacher's Guide:** 67, 71, 73
PO 6. Compare weather conditions in various locations (e.g., regions of Arizona, various U.S. cities, coastal vs. interior geographical regions).	**Teacher's Guide:** 68, 69, 70, 71, 72, 73, 74

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Arizona Academic Content Standards
Science Standard Articulated by Grade Level
Grade 5

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 5	Science Daybook, Grade 5
PO 1. Formulate a relevant question through observations that can be tested by an investigation. (See M05-S2C1-01)	**Teacher's Guide:** 78, 79, 93, 94, 156
PO 2. Formulate predictions in the realm of science based on observed cause and effect relationships.	**Teacher's Guide:** 125a, 125b, 138, 143, 151, 152
PO 3. Locate information (e.g., book, article, website) related to an investigation. (See W05-S3C6-01 and R05-S3C1-05)	**Teacher's Guide:** 84, 131, 141, 143, 149, 151, 153

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.	**Teacher's Guide:** 87b, 94, 136

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 2. Plan a simple investigation that identifies the variables to be controlled.	**Teacher's Guide:** 60, 61, 78, 79, 93, 94, 125a, 125b
PO 3. Conduct simple investigations (e.g., related to forces and motion, Earth processes) based on student-developed questions in life, physical, and Earth and space sciences.	**Teacher's Guide:** 49b, 53, 54, 60, 61, 78, 79, 111, 157
PO 4. Measure using appropriate tools (e.g., ruler, scale, balance) and units of measure (i.e., metric, U.S. customary). (See M05-S4C4-01)	**Teacher's Guide:** 60, 87a, 87d, 94, 97, 103, 107, 108-109, 110, 111, 112, 116, 117, 149
PO 5. Record data in an organized and appropriate format (e.g., t-chart, table, list, written log). (See W05-S3C2-01 and W05-S3C3-01)	**Teacher's Guide:** 61, 62, 94, 116, 117

Concept 3: Analysis and Conclusions

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

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Analyze data obtained in a scientific investigation to identify trends and form conclusions. (See M05-S2C1-03)	**Teacher's Guide:** 49b, 60, 61, 62, 116
PO 2. Analyze whether the data is consistent with the proposed explanation that motivated the investigation.	**Teacher's Guide:** 49b, 123, 124
PO 3. Evaluate the reasonableness of the outcome of an investigation.	**Teacher's Guide:** 109, 123, 124
PO 4. Develop new investigations and predictions based on questions that arise from the findings of an investigation.	**Teacher's Guide:** 109, 111, 117, 125a, 125b, 143
PO 5. Identify possible relationships between variables in simple investigations (e.g., time and distance; incline and mass of object).	**Teacher's Guide:** 116, 117

Concept 4: Communication

Communicate results of investigations.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Communicate verbally or in writing the results of an inquiry. (See W05-S3C3-01)	**Teacher's Guide:** 30, 109, 117, 121, 124, 155
PO 2. Choose an appropriate graphic representation for collected data: • *bar graph* • *line graph* • *Venn diagram* • *model* *(See M05-S2C1-02)*	**Teacher's Guide:** 73, 78, 116
PO 3. Communicate with other groups or individuals to compare the results of a common investigation.	**Teacher's Guide:** 30, 117, 124, 155

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 5	Science Daybook, Grade 5
PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations (e.g., Percy Lavon Julian [scientist], supports Strand 4; Niels Bohr [scientist], supports Strand 5; Edwin Hubble [scientist], supports Strand 6).	**Teacher's Guide:** 71, 108, 109, 148, 149, 154, 155

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Provide examples that support the premise that science is an ongoing process that changes in response to new information and discoveries (e.g., space exploration, medical advances).	**Teacher's Guide:** 74, 154, 155, 156, 157, 164
PO 2. Explain the cycle by which new scientific knowledge generates new scientific inquiry.	**Teacher's Guide:** 74, 156
PO 3. Describe how scientific knowledge is subject to modification and/or change as new information/technology challenges prevailing theories.	**Teacher's Guide:** 74, 154, 155, 156, 157, 164
PO 4. Compare collaborative approaches that scientists use for investigations (e.g., teams, individual with peer review).	**Teacher's Guide:** 74, 154, 155, 156, 157, 163, 164
PO 5. Describe qualities of the scientists' habits of mind (e.g., openness, skepticism, integrity, tolerance).	**Teacher's Guide:** 165

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 5	Science Daybook, Grade 5
PO 1. Explain the impacts of natural hazards on habitats (e.g., global warming, floods, asteroid or large meteor impacts).	**Teacher's Guide:** 52, 53, 76, 77
PO 2. Propose a solution, resource, or product that addresses a specific human, animal, or habitat need.	**Teacher's Guide:** 32, 33, 80, 156, 157

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 3. Evaluate the possible strengths and weaknesses of a proposed solution to a specific problem relevant to human, animal, or habitat needs.	**Teacher's Guide:** 80, 156, 157

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Describe the relationship between science and technology.	**Teacher's Guide:** 150, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 165
PO 2. Explain how scientific knowledge, skills, and technological capabilities are integral to a variety of careers.	**Teacher's Guide:** 150, 163, 165
PO 3. *Design and construct a technological solution to a common problem or need using common materials.*	**Teacher's Guide:** 150, 151, 152, 157

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 5	Science Daybook, Grade 5
PO 3. Identify the functions and parts of the nervous system: • control center – brain • relay mechanism – spinal cord • transport messages – nerves	**Teacher's Guide:** 20, 21

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 of Matter

Understand physical and chemical properties of matter.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Identify that matter is made of smaller units called: • molecules (e.g., H_2O, CO_2) • atoms (e.g., H, N, Na)	**Teacher's Guide:** 93
PO 2. Distinguish between mixtures and compounds.	**Teacher's Guide:** 93
PO 3. Describe changes of matter: • physical – cutting wood, ripping paper, freezing water • chemical – burning of wood, rusting of iron, milk turning sour	**Teacher's Guide:** 93, 98, 99, 100

Concept 2: Motion and Forces

Understand the relationship between force and motion.

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Describe the following forces: • gravity • friction	**Teacher's Guide:** 107, 111, 112
PO 2. Describe the various effects forces can have on an object (e.g., cause motion, halt motion, change direction of motion, cause deformation).	**Teacher's Guide:** 107
PO 3. Examine forces and motion through investigations using simple machines (e.g., wedge, plane, wheel and axle, pulley, lever).	**Teacher's Guide:** 105, 106, 107, 108, 109, 110, 111, 112
PO 4. Demonstrate effects of variables on an object's motion (e.g., incline angle, friction, applied forces).	**Teacher's Guide:** 111, 112

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 2: Earth's Processes and Systems

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

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Describe how the Moon's appearance changes during a four-week lunar cycle.	**Teacher's Guide:** 82, 84
PO 4. Describe the role of gravity as an attractive force between celestial objects.	**Teacher's Guide:** 168

Concept 3: Earth in the Solar System

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

Performance Objectives, Grade 5	Science Daybook, Grade 5
PO 1. Identify the known planets of the solar system.	**Teacher's Guide:** 81, 82
PO 2. Describe the distinguishing characteristics of the known planets in the solar system.	**Teacher's Guide:** 84
PO 3. Describe various objects in the sky (e.g., asteroids, comets, stars, meteors/shooting stars).	**Teacher's Guide:**81, 83
PO 4. Describe the change in position and motion of the following objects in the sky over time: • real motion – Moon, planets • apparent motion (due to the motion of the Earth) – Sun, Moon, stars	**Teacher's Guide:** 82, 83, 84
PO 5. Explain the apparent motion of the Sun and stars.	**Teacher's Guide:** 83, 86
PO 6. Describe efforts to explore space (e.g., Apollo missions, space shuttles, Hubble space telescope, space probes). (See Strand 2)	**Teacher's Guide:** 85

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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	Science Daybooks
PO 1. Differentiate among a question, hypothesis, and prediction.	**Earth Science Daybook Teacher's Guide:** 67, 81, 83, 146-147, 163 **Life Science Daybook Teacher's Guide:** 26, 35 **Physical Science Daybook Teacher's Guide:** 18-19, 133
PO 2. Formulate questions based on observations that lead to the development of a hypothesis. (See M06-S2C1-01)	**Earth Science Daybook Teacher's Guide:** 27, 84-85, 174-175 **Life Science Daybook Teacher's Guide:** 26-27, 137-139, 141, 144-145, 191, 216-217 **Physical Science Daybook Teacher's Guide:** 55, 184-185, 205-207

Performance Objectives, Grade 6	Science Daybooks
PO 3. Locate research information, not limited to a single source, for use in the design of a controlled investigation. (See W06-S3C6-01, R06-S3C1-06, and R06-S3C2-03)	**Earth Science Daybook Teacher's Guide:** 23, 25, 45, 48, 59, 68, 83, 86, 87, 89, 97, 103, 105, 107, 112, 113, 126, 127, 132, 133, 140, 141, 142, 145, 147, 151, 159, 161, 168, 169, 175, 193, 199, 203, 205, 207, 209, 213 **Life Science Daybook Teacher's Guide:** 11, 12, 23, 29, 33, 35, 39, 43, 45, 49, 53, 61, 65, 67, 70, 81, 83, 85, 99, 102, 103, 105, 111, 114, 119, 121, 139, 151, 152, 164, 167, 184, 185, 189, 191, 193, 198, 200, 201, 204, 207, 211, 215 **Physical Science Daybook Teacher's Guide:** 36, 39, 40B, 43, 45, 47, 57, 60, 63, 67, 71, 77, 103, 120, 127, 131, 132, 143, 149, 151, 153, 155, 167, 169, 178, 189, 190, 193, 194, 196, 197, 203, 211, 214

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 6	Science Daybooks
PO 1. *Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.*	**Earth Science Daybook Teacher's Guide:** 13, 29, 20A, 30A, 30B, 35, 40A, 52A, 62A, 72A, 82A, 94A, 114A, 120-121, 124A, 136A, 156A, 166A, 198A **Life Science Daybook Teacher's Guide:** 10A, 20A, 30A, 52A, 72A, 94A, 124A, 136A, 144, 146A, 156A, 166A, 198A, 208A, 216-217 **Physical Science Daybook Teacher's Guide:** 10A, 20A, 30A, 37, 72A, 104A, 114A, 124A, 136A, 146A, 150-151, 156A, 178A, 184-185, 188A, 197, 198A, 201, 206-207, 208A, 229
PO 2. Design an investigation to test individual variables using scientific processes.	**Earth Science Daybook Teacher's Guide:** 27, 63, 67, 77, 78, 99, 113, 123, 129, 172-174 **Life Science Daybook Teacher's Guide:** 129, 136-137, 139, 158, 161 **Physical Science Daybook Teacher's Guide:** 18-19, 103, 150-151, 181, 213

Performance Objectives, Grade 6	Science Daybooks
PO 3. Conduct a controlled investigation using scientific processes.	**Earth Science Daybook Teacher's Guide:** 10B, 17, 21, 27, 20B, 30B, 40B, 41, 52B, 53, 63, 67, 77, 78, 94B, 97, 99, 113, 114B, 115, 123, 124B, 125, 129, 136B, 143, 146B, 147, 156B, 157, 166B, 172-174, 188B, 189, 206 **Life Science Daybook Teacher's Guide:** 10B, 20B, 24, 25, 40B, 41, 82B, 94B, 94, 95-96, 102-103, 124, 129, 136-137, 139, 144-145, 158, 161, 173, 188B, 188, 190-191, 193, 198B, 220 **Physical Science Daybook Teacher's Guide:** 10B, 15, 18-19, 21, 25, 29, 30B, 31, 37, 40B, 43, 55, 62, 66-67, 77, 89, 95, 103, 104B, 105, 109, 114B, 115, 117, 119, 124B, 125, 136B, 138, 139, 141, 147, 148, 150-151, 156-157, 166B, 169, 173, 181, 184-185, 197, 201, 209, 213, 220
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers). (See M06-S4C4-02)	**Earth Science Teacher's Guide:** 12, 13, 24, 25, 29, 30B, 31, 35, 63, 67, 89, 101, 114B, 115, 119, 120-121,129, 136, 137, 143, 149, 151, 166B, 173, 202, 203, 204, 206, 212, 218 **Life Science Teacher's Guide:** 10, 27, 29, 44-46, 95, 96, 106, 114, 122-123, 144, 160, 167, 216-217 **Physical Science Teacher's Guide:** 28, 37, 53, 150-151, 184-185, 197, 201, 206, 207, 208A, 229
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)	**Earth Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Life Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Physical Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217

Concept 3: Analysis and Conclusions

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

Performance Objectives, Grade 6	Science Daybooks
PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M06-S2C1-03)	**Earth Science Daybook Teacher's Guide:** 144-145, 162 **Life Science Daybook Teacher's Guide:** 65, 120, 132-133, 139, 152, 159-161, 190, 193, 213, 217 **Physical Science Daybook Teacher's Guide:** 108, 110, 149, 151, 157, 197, 204, 206-207, 216, 217
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).	**Earth Science Daybook Teacher's Guide:** 10-11, 24, 28, 45, 52, 53, 59, 60, 61, 62, 63, 64, 66, 70, 71, 77, 82, 85, 86, 100, 101, 106, 109, 121, 123, 137, 140, 145, 149, 150, 151, 153, 155, 164, 170, 171, 182, 183, 192, 197, 208, 212, 213 **Life Science Daybook Teacher's Guide:** 10, 18, 19, 44, 45, 48, 49, 58, 63, 64, 67, 69, 76, 78-79, 94-95, 98-99, 102, 103, 131, 132-133, 140, 141, 154-155, 156, 158, 161, 178, 180, 181, 182, 186, 187, 196, 197, 201, 207, 208, 211, 212, 214, 217 **Physical Science Daybook Teacher's Guide:** 10, 11, 13, 20, 23, 24, 28, 29, 47, 53, 56, 61, 62, 72, 73, 74, 77, 82, 94, 104, 105, 120, 162, 167, 173, 179, 186, 187, 188, 191, 198, 199, 205
PO 3. Evaluate the observations and data reported by others.	**Physical Science Daybook Teacher's Guide:** 217
PO 4. Interpret simple tables and graphs produced by others.	**Earth Science Daybook Teacher's Guide:** 16, 19, 20, 38, 39, 44, 60, 86, 87, 117, 130, 139, 116, 150, 152, 200 **Life Science Daybook Teacher's Guide:** 34, 138, 152, 156, 158, 160, 190-191, 200, 202, 204, 212-213 **Physical Science Daybook Teacher's Guide:** 88, 90, 91, 94, 97, 154, 167, 192, 194, 210
PO 5. Analyze the results from previous and/or similar investigations to verify the results of the current investigation.	**Earth Science Daybook Teacher's Guide:** 43, 45, 47, 72B, 174 **Life Science Daybook Teacher's Guide:** 159, 190 **Physical Science Daybook Teacher's Guide:** 217

Performance Objectives, Grade 6	Science Daybooks
PO 6. Formulate new questions based on the results of a completed investigation.	**Earth Science Daybook Teacher's Guide:** 67, 91, 105, 107, 163 **Life Science Daybook Teacher's Guide:** 139 **Physical Science Daybook Teacher's Guide:** 103, 181, 185

Concept 4: Communication

Communicate results of investigations.

Performance Objectives, Grade 6	Science Daybooks
PO 1. Choose an appropriate graphic representation for collected data: • line graph • double bar graph • stem and leaf plot • histogram (See M06-S2C1-02)	**Earth Science Daybook Teacher's Guide:** 79, 138, 140, 152, 162, 196 **Life Science Daybook Teacher's Guide:** 35, 124, 126-127, 136, 139, 150, 152, 167, 200, 212, 213, 218 **Physical Science Daybook Teacher's Guide:** 160
PO 2. Display data collected from a controlled investigation. (See M06-S2C1-02)	**Earth Science Daybook Teacher's Guide:** 16, 20, 21, 38, 39, 41, 44, 69, 79, 85, 119, 130, 138, 140, 146, 149, 152, 162, 196-197 **Life Science Daybook Teacher's Guide:** 24-25, 35, 48, 49, 58, 81, 82, 84, 86-87, 101, 110, 118, 124, 126-127, 128, 136, 138, 139, 144, 150, 152, 162, 164, 167, 187, 198, 200, 201, 208, 210, 212, 213, 218 **Physical Science Daybook Teacher's Guide:** 18-19, 88, 90, 91, 160
PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information. (See W06-S3C2-01)	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 28, 29, 30, 33, 39, 49, 52, 60, 61, 64, 66, 71, 81, 88, 91, 96, 99, 103, 107, 109, 111, 113, 117, 121, 124, 128, 130, 142, 150, 153, 155, 217 **Life Science Daybook Teacher's Guide:** 14, 17, 18, 19, 20, 24-25, 30, 31, 33, 52, 53, 76, 79, 107, 110, 113, 115, 118, 121, 139, 141, 142, 145, 173, 178, 181, 182, 185, 192, 193, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 155, 171, 193, 209, 211

Performance Objectives, Grade 6	Science Daybooks
PO 4. Create a list of instructions that others can follow in carrying out a procedure (without the use of personal pronouns). (See W06-S3C3-01)	**Earth Science Daybook Teacher's Guide:** 123 **Life Science Daybook Teacher's Guide:** 167 **Physical Science Daybook Teacher's Guide:** 63
PO 5. Communicate the results and conclusion of the investigation. (See W06-S3C6-02)	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217 **Life Science Daybook Teacher's Guide:** 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217

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	Science Daybooks
PO 1. 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).	**Earth Science Daybook Teacher's Guide:** 30-31, 40-43, 76-79, 138-141, 167, 200-201 **Life Science Daybook Teacher's Guide:** 54-57, 122, 188-191, 192-195 **Physical Science Daybook Teacher's Guide:** 36-37, 43, 46-49, 62-65, 68-69, 83-85, 88-89, 114-115, 138-140, 198-199, 208-211

Performance Objectives, Grade 6	Science Daybooks
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).	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 54-57, 58-61, 166-169 **Physical Science Daybook Teacher's Guide:** 204-205, 208A-208B, 208-209, 212-215
PO 3. Analyze the impact of a major scientific development occurring within the past decade.	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 18 **Physical Science Daybook Teacher's Guide:** 43, 204-205, 208A-208B, 208-209, 212-215
PO 4. Describe the use of technology in science-related careers.	**Earth Science Daybook Teacher's Guide:** 9, 16, 41, 48, 49, 80-81, 88-91, 111, 125-127, 128, 146-149, 152-153, 166, 167-169, 176, 179, 198, 223 **Life Science Daybook Teacher's Guide:** 25, 58, 70, 77, 82-83, 85, 86, 95, 114-117, 121, 122, 123, 181, 192, 207, 219 **Physical Science Daybook Teacher's Guide:** 10, 28, 35, 36-39, 40-41, 43, 62-65, 66, 125, 130, 143, 183, 198, 209, 220

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 6	Science Daybooks
PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.	**Earth Science Daybook Teacher's Guide:** 24, 27, 79, 81, 129, 172-175 **Life Science Daybook Teacher's Guide:** 86-89 **Physical Science Daybook Teacher's Guide:** 82-91, 138-141, 207, 212-213
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.	**Earth Science Daybook Teacher's Guide:** 24, 27, 79, 81, 129, 172-175 **Life Science Daybook Teacher's Guide:** 86-89 **Physical Science Daybook Teacher's Guide:** 82-91, 138-141, 207, 212-213

Performance Objectives, Grade 6	Science Daybooks
PO 3. Apply the following scientific processes to other problem solving or decision making situations: • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables	**Earth Science Daybook Teacher's Guide:** 10, 12, 13, 17, 18, 19, 20, 21, 24, 25, 27, 28-29, 30, 31, 33, 34, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 52, 53, 55, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 70, 71, 72-73, 74, 75, 76, 79, 80-81, 82, 83, 84-85, 86-87, 88, 90, 91, 95, 96, 97, 99, 100, 103, 105, 106, 107, 108, 109,110, 111, 113, 114, 115, 116, 117, 118, 119, 120-121, 123, 124, 125, 126, 128, 129, 130, 131, 132, 137, 138, 139, 140, 141, 142, 143, 146, 149, 150-151, 152, 153, 154, 155, 156, 157, 160, 162, 163, 164, 165, 167, 168, 169, 170, 171, 172, 173, 174, 175, 178, 179, 180, 181, 187, 188, 190, 191, 192, 193, 195, 198, 199, 201, 202, 203, 205, 206, 207, 208, 209, 211, 213, 215, 216, 217, 220, 222 **Life Science Daybook Teacher's Guide:** 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 24, 25, 26-27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 40, 43, 44, 47, 48-49, 52, 53, 54, 55, 58, 63, 64, 67, 68, 70, 72-75, 76, 77, 79, 80, 81, 82-85, 86-89, 90-91, 94, 95, 97, 98, 101, 102, 104, 105, 107, 108, 109, 110, 112, 113, 114, 115, 116-117, 118, 119, 120, 121, 122-123, 124, 127, 128, 129, 130, 132-133, 136, 137, 138, 139, 140-141, 142, 143, 145, 146, 148-149, 150, 151, 153, 154-155, 156-157, 158, 161, 162, 164, 165, 169, 171, 173, 178, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 208, 209, 210-211, 212, 213, 214, 215, 216, 217, 219, 223, 224 **Physical Science Daybook Teacher's Guide:** 10, 14, 16, 18-19, 20, 23, 24, 25, 26, 28-29, 30, 31, 34-35, 36, 37, 38, 40-41, 42, 43, 44, 45, 46, 48, 49, 52, 54, 55, 57, 59, 61, 62, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 85, 89, 94, 95, 97, 99, 101, 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 119, 120, 124, 125, 127, 128, 129, 131, 132, 133, 136, 138, 139, 141, 144, 145, 146, 149, 150, 151, 152, 153, 155, 157, 162, 163, 165, 166-167, 169, 171, 172, 174, 175, 178, 180, 181, 182, 183, 185, 186, 187, 188-190, 191, 192, 193, 194, 197, 198, 199, 203, 206-207, 209, 211, 212, 215, 217, 222

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	Science Daybooks
PO 1. Evaluate the effects of the following natural hazards: • sandstorm • hurricane • tornado • ultraviolet light • lightning-caused fire	**Earth Science Daybook Teacher's Guide:** 56-59, 143-145, 150-153, 154-155, 156-157 **Physical Science Daybook Teacher's Guide:** 52B, 56-59, 99, 100-101, 152-155
PO 2. Describe how people plan for, and respond to, the following natural disasters: • drought • flooding • tornadoes	**Earth Science Daybook Teacher's Guide:** 114A-114B, 114-117, 156-159

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 6	Science Daybooks
PO 1. Propose viable methods of responding to an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 77, 174, 207 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 2. Compare possible solutions to best address an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 119, 130, 141 **Life Science Daybook Teacher's Guide:** 77, 174 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 174 **Physical Science Daybook Teacher's Guide:** 35, 49

Performance Objectives, Grade 6	Science Daybooks
PO 4. Describe a technological discovery that influences science.	**Earth Science Daybook Teacher's Guide:** 16-19, 80-81 **Life Science Daybook Teacher's Guide:** 18-19, 24-25 **Physical Science Daybook Teacher's Guide:** 30-33, 36-39, 40-41, 62-65, 78-80, 82-91, 114-115

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	Science Daybooks
PO 1. Explain the importance of water to organisms.	**Earth Science Daybook Teacher's Guide:** 114A, 116 **Life Science Daybook Teacher's Guide:** 14, 15, 22, 24, 29
PO 2. Describe the basic structure of a cell, including: • cell wall • cell membrane • nucleus	**Life Science Daybook Teacher's Guide:** 10-17, 20, 40, 42, 218
PO 3. Describe the function of each of the following cell parts: • cell wall • cell membrane • nucleus	**Life Science Daybook Teacher's Guide:** 10-17, 20, 40, 42, 218
PO 4. Differentiate between plant and animal cells.	**Life Science Daybook Teacher's Guide:** 20-29, 200
PO 5. Explain the hierarchy of cells, tissues, organs, and systems.	**Life Science Daybook Teacher's Guide:** 40-43, 44-47, 48-49

Performance Objectives, Grade 6	Science Daybooks
PO 6. Relate the following structures of living organisms to their functions: Animals • respiration – gills, lungs • digestion – stomach, intestines • circulation – heart, veins, arteries, capillaries • locomotion – muscles, skeleton Plants • transpiration – stomata, roots, xylem, phloem • absorption – roots, xylem, phloem • response to stimulus (phototropism, hydrotropism, geotropism) – roots, xylem, phloem	**Life Science Daybook Teacher's Guide:** 24-29, 102, 135B, 146-149, 150-153, 154-155
PO 7. Describe how the various systems of living organisms work together to perform a vital function: • respiratory and circulatory • muscular and skeletal • digestive and excretory	**Life Science Daybook Teacher's Guide:** 83, 135B, 136-139, 146-149, 150-153, 154-155

Concept 3: Populations of Organisms in an Ecosystem

Analyze the relationships among various organisms and their environment.

Performance Objectives, Grade 6	Science Daybooks
PO 1. Explain that sunlight is the major source of energy for most ecosystems. (See Strand 5 Concept 3 and Strand 6 Concept 2)	**Life Science Daybook Teacher's Guide:** 24-25 **Physical Science Daybook Teacher's Guide:** 98
PO 2. Describe how the following environmental conditions affect the quality of life: • water quality • climate • population density • smog	**Earth Science Daybook Teacher's Guide:** 104, 105, 113-115, 170-171, 172-175 **Life Science Daybook Teacher's Guide:** 204-205

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	Science Daybooks
PO 1. Identify various ways in which electrical energy is generated using renewable and nonrenewable resources (e.g., wind, dams, fossil fuels, nuclear reactions).	**Earth Science Daybook Teacher's Guide:** 30-33, 34-37, 38-39, 130-133
PO 2. Identify several ways in which energy may be stored.	**Physical Science Daybook Teacher's Guide:** 14-17
PO 3. Compare the following ways in which energy may be transformed: • mechanical to electrical • electrical to thermal	**Earth Science Daybook Teacher's Guide:** 39, 130-133 **Physical Science Daybook Teacher's Guide:** 94-97
PO 4. Explain how thermal energy (heat energy) can be transferred by: • conduction • convection • radiation	**Earth Science Daybook Teacher's Guide:** 34-35 **Physical Science Daybook Teacher's Guide:** 128-129, 132-133, 182-183

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	Science Daybooks
PO 1. Describe the properties and the composition of the layers of the atmosphere.	**Earth Science Daybook Teacher's Guide:** 94A, 94, 136A, 136B, 136-145, 218
PO 2. Explain the composition, properties, and structure of the Earth's lakes and rivers.	**Earth Science Daybook Teacher's Guide:** 114, 115, 116, 117
PO 3. Explain the composition, properties, and structures of the oceans' zones and layers.	**Earth Science Daybook Teacher's Guide:** 114, 118, 124A, 124-125, 126, 127, 132
PO 4. Analyze the interactions between the Earth's atmosphere and the Earth's bodies of water (water cycle).	**Earth Science Daybook Teacher's Guide:** 94-97
PO 5. Describe ways scientists explore the Earth's atmosphere and bodies of water. (See Strand 2 Concept 1)	**Earth Science Daybook Teacher's Guide:** 88-91, 94-97

Concept 2: Earth's Processes and Systems

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

Performance Objectives, Grade 6	Science Daybooks
PO 1. Explain how water is cycled in nature.	**Earth Science Daybook Teacher's Guide:** 94-97
PO 2. Identify the distribution of water within or among the following: • atmosphere • lithosphere • hydrosphere	**Earth Science Daybook Teacher's Guide:** 94-95

Performance Objectives, Grade 6	Science Daybooks
PO 4. Analyze the following factors that affect climate: • ocean currents • elevation • location	**Earth Science Daybook Teacher's Guide:** 126, 130-131
PO 5. Analyze the impact of large-scale weather systems on the local weather.	**Earth Science Daybook Teacher's Guide:** 142-145
PO 6. Create a weather system model that includes: • the Sun • the atmosphere • bodies of water	**Earth Science Daybook Teacher's Guide:** 148, 158

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correlated to
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	Science Daybooks
PO 1. Formulate questions based on observations that lead to the development of a hypothesis. (See M07-S2C1-01)	**Earth Science Daybook Teacher's Guide:** 27, 84-85, 174-175 **Life Science Daybook Teacher's Guide:** 26-27, 137-139, 141, 144-145, 191, 216-217 **Physical Science Daybook Teacher's Guide:** 55, 184-185, 205-207
PO 2. Select appropriate resources for background information related to a question, for use in the design of a controlled investigation. (See W07-S3C6-01, R07-S3C1-06, and R07-S3C2-03)	**Earth Science Daybook Teacher's Guide:** 23, 25, 45, 48, 59, 68, 83, 86, 87, 89, 97, 103, 105, 107, 112, 113, 126, 127, 132, 133, 140, 141, 142, 145, 147, 151, 159, 161, 168, 169, 175, 193, 199, 203, 205, 207, 209, 213 **Life Science Daybook Teacher's Guide:** 11, 12, 23, 29, 33, 35, 39, 43, 45, 49, 53, 61, 65, 67, 70, 81, 83, 85, 99, 102, 103, 105, 111, 114, 119, 121, 139, 151, 152, 164, 167, 184, 185, 189, 191, 193, 198, 200, 201, 204, 207, 211, 215 **Physical Science Daybook Teacher's Guide:** 36, 39, 40B, 43, 45, 47, 57, 60, 63, 67, 71, 77, 103, 120, 127, 131, 132, 143, 149, 151, 153, 155, 167, 169, 178, 189, 190, 193, 194, 196, 197, 203, 211, 214

Performance Objectives, Grade 7	Science Daybooks
PO 3. Explain the role of a hypothesis in a scientific inquiry.	**Earth Science Daybook Teacher's Guide:** 27, 72-73, 163 **Life Science Daybook Teacher's Guide:** 26-27, 35 **Physical Science Daybook Teacher's Guide:** 10B, 18-19, 119, 124

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 7	Science Daybooks
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.	**Earth Science Daybook Teacher's Guide:** 13, 29, 20A, 30A, 30B, 35, 40A, 52A, 62A, 72A, 82A, 94A, 114A, 120-121, 124A, 136A, 156A, 166A, 198A **Life Science Daybook Teacher's Guide:** 10A, 20A, 30A, 52A, 72A, 94A, 124A, 136A, 144, 146A, 156A, 166A, 198A, 208A, 216-217 **Physical Science Daybook Teacher's Guide:** 10A, 20A, 30A, 37, 72A, 104A, 114A, 124A, 136A, 146A, 150-151, 156A, 178A, 184-185, 188A, 197, 198A, 201, 206-207, 208A, 229
PO 2. Design an investigation to test individual variables using scientific processes.	**Earth Science Daybook Teacher's Guide:** 27, 63, 67, 77, 78, 99, 113, 123, 129, 172-174 **Life Science Daybook Teacher's Guide:** 129, 136-137, 139, 158, 161 **Physical Science Daybook Teacher's Guide:** 18-19, 103, 150-151, 181, 213
PO 3. Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.	**Earth Science Daybook Teacher's Guide:** 10B, 17, 21, 27, 20B, 30B, 40B, 41, 52B, 53, 63, 67, 77, 78, 94B, 97, 99, 113, 114B, 115, 123, 124B, 125, 129, 136B, 143, 146B, 147, 156B, 157, 166B, 172-174, 188B, 189, 206 **Life Science Daybook Teacher's Guide:** 10B, 20B, 24, 25, 40B, 41, 82B, 94B, 94, 95-96, 102-103, 124, 129, 136-137, 139, 144-145, 158, 161, 173, 188B, 188, 190-191, 193, 198B, 220 **Physical Science Daybook Teacher's Guide:** 10B, 15, 18-19, 21, 25, 29, 30B, 31, 37, 40B, 43, 55, 62, 66-67, 77, 89, 95, 103, 104B, 105, 109, 114B, 115, 117, 119, 124B, 125, 136B, 138, 139, 141, 147, 148, 150-151, 156-157, 166B, 169, 173, 181, 184-185, 197, 201, 209, 213, 220

Performance Objectives, Grade 7	Science Daybooks
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).	**Earth Science Teacher's Guide:** 12, 13, 24, 25, 29, 30B, 31, 35, 63, 67, 89, 101, 114B, 115, 119, 120-121,129, 136, 137, 143, 149, 151, 166B, 173, 202, 203, 204, 206, 212, 218 **Life Science Teacher's Guide:** 10, 27, 29, 44-46, 95, 96, 106, 114, 122-123, 144, 160, 167, 216-217 **Physical Science Teacher's Guide:** 28, 37, 53, 150-151, 184-185, 197, 201, 206, 207, 208A, 229
PO 5. 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)	**Earth Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Life Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Physical Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217

Concept 3: Analysis and Conclusions

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

Performance Objectives, Grade 7	Science Daybooks
PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M07-S2C1-07 and M07-S2C1-08)	**Earth Science Daybook Teacher's Guide:** 144-145, 162 **Life Science Daybook Teacher's Guide:** 65, 120, 132-133, 139, 152, 159-161, 190, 193, 213, 217 **Physical Science Daybook Teacher's Guide:** 108, 110, 149, 151, 157, 197, 204, 206-207, 216, 217

Performance Objectives, Grade 7	Science Daybooks
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).	**Earth Science Daybook Teacher's Guide:** 10-11, 24, 28, 45, 52, 53, 59, 60, 61, 62, 63, 64, 66, 70, 71, 77, 82, 85, 86, 100, 101, 106, 109, 121, 123, 137, 140, 145, 149, 150, 151, 153, 155, 164, 170, 171, 182, 183, 192, 197, 208, 212, 213 **Life Science Daybook Teacher's Guide:** 10, 18, 19, 44, 45, 48, 49, 58, 63, 64, 67, 69, 76, 78-79, 94-95, 98-99, 102, 103, 131, 132-133, 140, 141, 154-155, 156, 158, 161, 178, 180, 181, 182, 186, 187, 196, 197, 201, 207, 208, 211, 212, 214, 217 **Physical Science Daybook Teacher's Guide:** 10, 11, 13, 20, 23, 24, 28, 29, 47, 53, 56, 61, 62, 72, 73, 74, 77, 82, 94, 104, 105, 120, 162, 167, 173, 179, 186, 187, 188, 191, 198, 199, 205
PO 3. Analyze results of data collection in order to accept or reject the hypothesis.	**Earth Science Daybook Teacher's Guide:** 27, 63, 67, 77, 78, 99, 113, 123, 129, 144-145, 162, 172-174 **Life Science Daybook Teacher's Guide:** 26-27, 65, 120, 129, 132-133, 136-137, 139, 152, 158, 159-161, 190, 193, 213, 217 **Physical Science Daybook Teacher's Guide:** 18-19, 103, 108, 110, 149, 150-151, 157, 181, 197, 204, 206-207, 213, 216, 217
PO 4. Determine validity and reliability of results of an investigation.	**Earth Science Daybook Teacher's Guide:** 153, 171 **Life Science Daybook Teacher's Guide:** 27, 137, 190-191
PO 5. Formulate a conclusion based on data analysis.	**Earth Science Daybook Teacher's Guide:** 20-, 24, 25, 27, 28, 29, 40-41, 56, 59, 79, 82, 85, 97, 99, 100, 118, 119, 142, 145, 171, 174-175, 187, 189, 195, 196, 197, 213 **Life Science Daybook Teacher's Guide:** 13, 17, 20, 22, 24, 26-27, 44, 46, 48, 49, 55, 59, 64, 66-67, 86, 88, 94, 97, 103, 110, 111, 113, 121, 122-123, 139, 144-145, 146, 147, 149, 155, 158, 166-169, 179, 188, 191, 192, 193-194 **Physical Science Daybook Teacher's Guide:** 17, 18-19, 62, 65, 66, 67, 68, 71, 75, 81, 87, 113, 121, 128, 129, 133, 145, 146, 149, 150, 151, 155, 156, 157, 159, 168, 187, 199, 204, 207, 212, 215, 216-217

Performance Objectives, Grade 7	Science Daybooks
PO 6. Refine hypotheses based on results from investigations.	**Earth Science Daybook Teacher's Guide:** 173 **Life Science Daybook Teacher's Guide:** 27 **Physical Science Daybook Teacher's Guide:** 119, 190-191
PO 7. Formulate new questions based on the results of a previous investigation.	**Earth Science Daybook Teacher's Guide:** 67, 91, 105, 107, 163 **Life Science Daybook Teacher's Guide:** 139 **Physical Science Daybook Teacher's Guide:** 103, 181, 185

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 7	Science Daybooks
PO 1. Choose an appropriate graphic representation for collected data: • *line graph* • *double bar graph* • *stem and leaf plot* • *histogram (See M07-S2C1-03)*	**Earth Science Daybook Teacher's Guide:** 79, 138, 140, 152, 162, 196 **Life Science Daybook Teacher's Guide:** 35, 124, 126-127, 136, 139, 150, 152, 167, 200, 212, 213, 218 **Physical Science Daybook Teacher's Guide:** 160
PO 2. Display data collected from a controlled investigation. (See M07-S2C1-03)	**Earth Science Daybook Teacher's Guide:** 16, 20, 21, 38, 39, 41, 44, 69, 79, 85, 119, 130, 138, 140, 146, 149, 152, 162, 196-197 **Life Science Daybook Teacher's Guide:** 24-25, 35, 48, 49, 58, 81, 82, 84, 86-87, 101, 110, 118, 124, 126-127, 128, 136, 138, 139, 144, 150, 152, 162, 164, 167, 187, 198, 200, 201, 208, 210, 212, 213, 218 **Physical Science Daybook Teacher's Guide:** 18-19, 88, 90, 91, 160

Performance Objectives, Grade 7	Science Daybooks
PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information. (See W07-S3C2-01)	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 28, 29, 30, 33, 39, 49, 52, 60, 61, 64, 66, 71, 81, 88, 91, 96, 99, 103, 107, 109, 111, 113, 117, 121, 124, 128, 130, 142, 150, 153, 155, 217 **Life Science Daybook Teacher's Guide:** 14, 17, 18, 19, 20, 24-25, 30, 31, 33, 52, 53, 76, 79, 107, 110, 113, 115, 118, 121, 139, 141, 142, 145, 173, 178, 181, 182, 185, 192, 193, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 155, 171, 193, 209, 211
PO 4. Write clear, step-by-step instructions for following procedures (without the use of personal pronouns). (See W07-S3C3-01)	**Earth Science Daybook Teacher's Guide:** 123 **Life Science Daybook Teacher's Guide:** 167 **Physical Science Daybook Teacher's Guide:** 63
PO 5. Communicate the results and conclusion of the investigation. (See W07-S3C6-02)	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217 **Life Science Daybook Teacher's Guide:** 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217

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	Science Daybooks
PO 1. 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).	**Earth Science Daybook Teacher's Guide:** 30-31, 40-43, 76-79, 138-141, 167, 200-201 **Life Science Daybook Teacher's Guide:** 54-57, 122, 188-191, 192-195 **Physical Science Daybook Teacher's Guide:** 36-37, 43, 46-49, 62-65, 68-69, 83-85, 88-89, 114-115, 138-140, 198-199, 208-211
PO 2. Describe how a major milestone in science or technology has revolutionized the thinking of the time (e.g., global positioning system, telescopes, seismographs, photography).	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 54-57, 58-61, 166-169 **Physical Science Daybook Teacher's Guide:** 82-91, 204-205, 208A-208B, 208-209, 212-215
PO 3. Analyze the impact of a major scientific development occurring within the past decade.	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 18 **Physical Science Daybook Teacher's Guide:** 43, 204-205, 208A-208B, 208-209, 212-215
PO 4. Analyze the use of technology in science-related careers.	**Earth Science Daybook Teacher's Guide:** 9, 16, 41, 48, 49, 80-81, 88-91, 111, 125-127, 128, 146-149, 152-153, 166, 167-169, 176, 179, 198, 223 **Life Science Daybook Teacher's Guide:** 25, 58, 70, 77, 82-83, 85, 86, 95, 114-117, 121, 122, 123, 181, 192, 207, 219 **Physical Science Daybook Teacher's Guide:** 10, 28, 35, 36-39, 40-41, 43, 62-65, 66, 125, 130, 143, 183, 198, 209, 220

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 7	Science Daybooks
PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.	**Earth Science Daybook Teacher's Guide:** 24, 27, 79, 81, 129, 172-175 **Life Science Daybook Teacher's Guide:** 86-89 **Physical Science Daybook Teacher's Guide:** 138-141
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.	**Earth Science Daybook Teacher's Guide:** 24, 27, 79, 81, 129, 172-175 **Life Science Daybook Teacher's Guide:** 86-89 **Physical Science Daybook Teacher's Guide:** 138-141

Performance Objectives, Grade 7	Science Daybooks
PO 3. Apply the following scientific processes to other problem solving or decision making situations: • *observing* • *questioning* • *communicating* • *comparing* • *measuring* • *classifying* • *predicting* • *organizing data* • *inferring* • *generating hypotheses* • *identifying variables*	**Earth Science Daybook Teacher's Guide:** 10, 12, 13, 17, 18, 19, 20, 21, 24, 25, 27, 28-29, 30, 31, 33, 34, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 52, 53, 55, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 70, 71, 72-73, 74, 75, 76, 79, 80-81, 82, 83, 84-85, 86-87, 88, 90, 91, 95, 96, 97, 99, 100, 103, 105, 106, 107, 108, 109,110, 111, 113, 114, 115, 116, 117, 118, 119, 120-121, 123, 124, 125, 126, 128, 129, 130, 131, 132, 137, 138, 139, 140, 141, 142, 143, 146, 149, 150-151, 152, 153, 154, 155, 156, 157, 160, 162, 163, 164, 165, 167, 168, 169, 170, 171, 172, 173, 174, 175, 178, 179, 180, 181, 187, 188, 190, 191, 192, 193, 195, 198, 199, 201, 202, 203, 205, 206, 207, 208, 209, 211, 213, 215, 216, 217, 220, 222 **Life Science Daybook Teacher's Guide:** 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 24, 25, 26-27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 40, 43, 44, 47, 48-49, 52, 53, 54, 55, 58, 63, 64, 67, 68, 70, 72-75, 76, 77, 79, 80, 81, 82-85, 86-89, 90-91, 94, 95, 97, 98, 101, 102, 104, 105, 107, 108, 109, 110, 112, 113, 114, 115, 116-117, 118, 119, 120, 121, 122-123, 124, 127, 128, 129, 130, 132-133, 136, 137, 138, 139, 140-141, 142, 143, 145, 146, 148-149, 150, 151, 153, 154-155, 156-157, 158, 161, 162, 164, 165, 169, 171, 173, 178, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 208, 209, 210-211, 212, 213, 214, 215, 216, 217, 219, 223, 224 **Physical Science Daybook Teacher's Guide:** 10, 14, 16, 18-19, 20, 23, 24, 25, 26, 28-29, 30, 31, 34-35, 36, 37, 38, 40-41, 42, 43, 44, 45, 46, 48, 49, 52, 54, 55, 57, 59, 61, 62, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 85, 89, 94, 95, 97, 99, 101, 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 119, 120, 124, 125, 127, 128, 129, 131, 132, 133, 136, 138, 139, 141, 144, 145, 146, 149, 150, 151, 152, 153, 155, 157, 162, 163, 165, 166-167, 169, 171, 172, 174, 175, 178, 180, 181, 182, 183, 185, 186, 187, 188-190, 191, 192, 193, 194, 197, 198, 199, 203, 206-207, 209, 211, 212, 215, 217, 222

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	Science Daybooks
PO 1. Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems.	**Earth Science Daybook Teacher's Guide:** 38-39, 104-105, 113-115 **Life Science Daybook Teacher's Guide:** 206-207, 208B, 208-209, 212-213
PO 2. Analyze environmental benefits of the following human interactions with biological or geological systems: • reforestation • habitat restoration • construction of dams	**Life Science Daybook Teacher's Guide:** 197, 206, 210, 212
PO 3. Propose possible solutions to address the environmental risks in biological or geological systems.	**Earth Science Daybook Teacher's Guide:** 112-113 **Life Science Daybook Teacher's Guide:** 207, 211

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 7	Science Daybooks
PO 1. Propose viable methods of responding to an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 77, 174, 207 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 2. Compare solutions to best address an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 119, 130, 141 **Life Science Daybook Teacher's Guide:** 77, 174 **Physical Science Daybook Teacher's Guide:** 35, 49

Performance Objectives, Grade 7	Science Daybooks
PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 174 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 4. Describe a scientific discovery that influences technology.	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 54-57, 58-61, 166-169 **Physical Science Daybook Teacher's Guide:** 204-205, 208A-208B, 208-209, 212-215

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 3: Populations of Organisms in an Ecosystem

Analyze the relationships among various organisms and their environment.

Performance Objectives, Grade 7	Science Daybooks
PO 1. Compare food chains in a specified ecosystem and their corresponding food web.	**Life Science Daybook Teacher's Guide:** 188-192, 196
PO 2. Explain how organisms obtain and use resources to develop and thrive in: • niches • predator/prey relationships	**Life Science Daybook Teacher's Guide:** 188-189, 192, 194-195
PO 3. Analyze the interactions of living organisms with their ecosystems: • limiting factors • carrying capacity	**Life Science Daybook Teacher's Guide:** 192-195
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.	**Life Science Daybook Teacher's Guide:** 206-207, 210 **Physical Science Daybook Teacher's Guide:** 59

Performance Objectives, Grade 7	Science Daybooks
PO 5. Predict how environmental factors (e.g., floods, droughts, temperature changes) affect survival rates in living organisms.	**Earth Science Daybook Teacher's Guide:** 114A-114B, 114-117, 156-159
PO 6. Create a model of the interactions of living organisms within an ecosystem.	**Life Science Daybook Teacher's Guide:** 189, 195-196

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	Science Daybooks
PO 1. Classify rocks and minerals by the following observable properties: • grain • color • texture • hardness	**Earth Science Daybook Teacher's Guide:** 20-23
PO 2. Describe the properties and the composition of the following major layers of the Earth: • crust • mantle • core	**Earth Science Daybook Teacher's Guide:** 20, 72A, 72B, 72-81, 83
PO 3. Explain the following processes involved in the formation of the Earth's structure: • erosion • deposition • plate tectonics • volcanism	**Earth Science Daybook Teacher's Guide:** 20-23, 63, 71
PO 4. Describe how the rock and fossil record show that environmental conditions have changed over geologic and recent time.	**Earth Science Daybook Teacher's Guide:** 44-45

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	Science Daybooks
PO 1. Explain the rock cycle.	**Earth Science Daybook Teacher's Guide:** 21-22, 23
PO 2. Distinguish the components and characteristics of the rock cycle for the following types of rocks: • igneous • metamorphic • sedimentary	**Earth Science Daybook Teacher's Guide:** 20-23
PO 3. Analyze the evidence that lithospheric plate movements occur.	**Earth Science Daybook Teacher's Guide:** 23, 72-81
PO 4. Explain lithospheric plate movement as a result of convection.	**Earth Science Daybook Teacher's Guide:** 72-81
PO 5. Relate plate boundary movements to their resulting landforms, including: • mountains • faults • rift valleys • trenches • volcanoes	**Earth Science Daybook Teacher's Guide:** 23, 72-81
PO 6. Describe how earthquakes are measured.	**Earth Science Daybook Teacher's Guide:** 89

Concept 3: Earth in the Solar System

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

Performance Objectives, Grade 7	Science Daybooks
PO 6. Explain the relationship among common objects in the solar system, galaxy, and the universe.	**Earth Science Daybook Teacher's Guide:** 178

Earth Science Daybook © 2003
Life Science Daybook © 2003
Physical Science Daybook © 2003
correlated to
Arizona Academic Content Standards
Science Standard Articulated by Grade Level
Grade 8

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	Science Daybooks
PO 1. Formulate questions based on observations that lead to the development of a hypothesis. (See M08-S2C1-01)	**Earth Science Daybook Teacher's Guide:** 27, 84-85, 174-175 **Life Science Daybook Teacher's Guide:** 26-27, 137-139, 141, 144-145, 191, 216-217 **Physical Science Daybook Teacher's Guide:** 55, 184-185, 205-207
PO 2. Use appropriate research information, not limited to a single source, to use in the development of a testable hypothesis. (See W08-S3C6-01, R08-S3C1-06, and R08-S3C2-03)	**Earth Science Daybook Teacher's Guide:** 23, 25, 45, 48, 59, 68, 83, 86, 87, 89, 97, 103, 105, 107, 112, 113, 126, 127, 132, 133, 140, 141, 142, 145, 147, 151, 159, 161, 168, 169, 175, 193, 199, 203, 205, 207, 209, 213 **Life Science Daybook Teacher's Guide:** 11, 12, 23, 29, 33, 35, 39, 43, 45, 49, 53, 61, 65, 67, 70, 81, 83, 85, 99, 102, 103, 105, 111, 114, 119, 121, 139, 151, 152, 164, 167, 184, 185, 189, 191, 193, 198, 200, 201, 204, 207, 211, 215 **Physical Science Daybook Teacher's Guide:** 36, 39, 40B, 43, 45, 47, 57, 60, 63, 67, 71, 77, 103, 120, 127, 131, 132, 143, 149, 151, 153, 155, 167, 169, 178, 189, 190, 193, 194, 196, 197, 203, 211, 214

Performance Objectives, Grade 8	Science Daybooks
PO 3. Generate a hypothesis that can be tested.	**Earth Science Daybook Teacher's Guide:** 163, 171, 174 **Life Science Daybook Teacher's Guide:** 26-27, 35 **Physical Science Daybook Teacher's Guide:** 18-19, 76, 119, 124, 150-151, 181

Concept 2: Scientific Testing (Investigating and Modeling)

Design and conduct controlled investigations.

Performance Objectives, Grade 8	Science Daybooks
PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.	**Earth Science Daybook Teacher's Guide:** 13, 29, 20A, 30A, 30B, 35, 40A, 52A, 62A, 72A, 82A, 94A, 114A, 120-121, 124A, 136A, 156A, 166A, 198A **Life Science Daybook Teacher's Guide:** 10A, 20A, 30A, 52A, 72A, 94A, 124A, 136A, 144, 146A, 156A, 166A, 198A, 208A, 216-217 **Physical Science Daybook Teacher's Guide:** 10A, 20A, 30A, 37, 72A, 104A, 114A, 124A, 136A, 146A, 150-151, 156A, 178A, 184-185, 188A, 197, 198A, 201, 206-207, 208A, 229
PO 2. Design a controlled investigation to support or reject a hypothesis.	**Earth Science Daybook Teacher's Guide:** 27, 63, 67, 77, 78, 99, 113, 123, 129, 172-174 **Life Science Daybook Teacher's Guide:** 129, 136-137, 139, 158, 161 **Physical Science Daybook Teacher's Guide:** 18-19, 103, 150-151, 181, 213
PO 3. Conduct a controlled investigation to support or reject a hypothesis.	**Earth Science Daybook Teacher's Guide:** 10B, 17, 21, 27, 20B, 30B, 40B, 41, 52B, 53, 63, 67, 77, 78, 94B, 97, 99, 113, 114B, 115, 123, 124B, 125, 129, 136B, 143, 146B, 147, 156B, 157, 166B, 172-174, 188B, 189, 206 **Life Science Daybook Teacher's Guide:** 10B, 20B, 24, 25, 40B, 41, 82B, 94B, 94, 95-96, 102-103, 124, 129, 136-137, 139, 144-145, 158, 161, 173, 188B, 188, 190-191, 193, 198B, 220 **Physical Science Daybook Teacher's Guide:** 10B, 15, 18-19, 21, 25, 29, 30B, 31, 37, 40B, 43, 55, 62, 66-67, 77, 89, 95, 103, 104B, 105, 109, 114B, 115, 117, 119, 124B, 125, 136B, 138, 139, 141, 147, 148, 150-151, 156-157, 166B, 169, 173, 181, 184-185, 197, 201, 209, 213, 220

Performance Objectives, Grade 8	Science Daybooks
PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).	**Earth Science Teacher's Guide:** 12, 13, 24, 25, 29, 30B, 31, 35, 63, 67, 89, 101, 114B, 115, 119, 120-121,129, 136, 137, 143, 149, 151, 166B, 173, 202, 203, 204, 206, 212, 218 **Life Science Teacher's Guide:** 10, 27, 29, 44-46, 95, 96, 106, 114, 122-123, 144, 160, 167, 216-217 **Physical Science Teacher's Guide:** 28, 37, 53, 150-151, 184-185, 197, 201, 206, 207, 208A, 229
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)	**Earth Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Life Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217 **Physical Science Daybook Teacher's Guide:** 10-19, 20-29, 30-39, 40-49, 52-61, 62-71, 72-81, 82-91, 94-103, 104-113, 114-123, 124-133, 136-145, 146-155, 156-165, 166-175, 178-187, 188-197, 198-207, 208-217

Concept 3: Analysis and Conclusions

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

Performance Objectives, Grade 8	Science Daybooks
PO 1. Analyze data obtained in a scientific investigation to identify trends. (See M08-S2C1-08)	**Earth Science Daybook Teacher's Guide:** 144-145, 162 **Life Science Daybook Teacher's Guide:** 65, 120, 132-133, 139, 152, 159-161, 190, 193, 213, 217 **Physical Science Daybook Teacher's Guide:** 108, 110, 149, 151, 157, 197, 204, 206-207, 216, 217

Performance Objectives, Grade 8	Science Daybooks
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).	**Earth Science Daybook Teacher's Guide:** 10-11, 24, 28, 45, 52, 53, 59, 60, 61, 62, 63, 64, 66, 70, 71, 77, 82, 85, 86, 100, 101, 106, 109, 121, 123, 137, 140, 145, 149, 150, 151, 153, 155, 164, 170, 171, 182, 183, 192, 197, 208, 212, 213 **Life Science Daybook Teacher's Guide:** 10, 18, 19, 44, 45, 48, 49, 58, 63, 64, 67, 69, 76, 78-79, 94-95, 98-99, 102, 103, 131, 132-133, 140, 141, 154-155, 156, 158, 161, 178, 180, 181, 182, 186, 187, 196, 197, 201, 207, 208, 211, 212, 214, 217 **Physical Science Daybook Teacher's Guide:** 10, 11, 13, 20, 23, 24, 28, 29, 47, 53, 56, 61, 62, 72, 73, 74, 77, 82, 94, 104, 105, 120, 162, 167, 173, 179, 186, 187, 188, 191, 198, 199, 205
PO 3. Interpret data that show a variety of possible relationships between two variables, including: • positive relationship • negative relationship • no relationship	**Earth Science Daybook Teacher's Guide:** 140-141, 196 **Life Science Daybook Teacher's Guide:** 190, 205
PO 4. Formulate a future investigation based on the data collected.	**Earth Science Daybook Teacher's Guide:** 67, 91, 107, 163 **Life Science Daybook Teacher's Guide:** 139 **Physical Science Daybook Teacher's Guide:** 103, 181, 185
PO 5. Explain how evidence supports the validity and reliability of a conclusion.	**Earth Science Daybook Teacher's Guide:** 128-129, 173-175 **Life Science Daybook Teacher's Guide:** 137, 139, 190-191 **Physical Science Daybook Teacher's Guide:** 18-19, 49, 141, 208-211
PO 6. Identify the potential investigational error that may occur (e.g., flawed investigational design, inaccurate measurement, computational errors, unethical reporting).	**Earth Science Daybook Teacher's Guide:** 154-155, 174-175 **Life Science Daybook Teacher's Guide:** 137 **Physical Science Daybook Teacher's Guide:** 140-141
PO 7. Critique scientific reports from periodicals, television, or other media.	**Earth Science Daybook Teacher's Guide:** 133 **Physical Science Daybook Teacher's Guide:** 175

Performance Objectives, Grade 8	Science Daybooks
PO 8. Formulate new questions based on the results of a previous investigation.	**Earth Science Daybook Teacher's Guide:** 67, 91, 105, 107, 163 **Life Science Daybook Teacher's Guide:** 139 **Physical Science Daybook Teacher's Guide:** 103, 181, 185

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	Science Daybooks
PO 1. Communicate the results of an investigation.	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 28, 29, 30, 33, 39, 49, 52, 60, 61, 64, 66, 71, 81, 88, 91, 96, 99, 103, 107, 109, 111, 113, 117, 121, 124, 128, 130, 142, 150, 153, 155, 217 **Life Science Daybook Teacher's Guide:** 14, 17, 18, 19, 20, 24-25, 30, 31, 33, 52, 53, 76, 79, 107, 110, 113, 115, 118, 121, 139, 141, 142, 145, 173, 178, 181, 182, 185, 192, 193, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 155, 171, 193, 209, 211
PO 2. Choose an appropriate graphic representation for collected data: • *line graph* • *double bar graph* • *stem and leaf plot* • *histogram (See M08-S2C1-03)*	**Earth Science Daybook Teacher's Guide:** 79, 138, 140, 152, 162, 196 **Life Science Daybook Teacher's Guide:** 35, 124, 126-127, 136, 139, 150, 152, 167, 200, 212, 213, 218 **Physical Science Daybook Teacher's Guide:** 160
PO 3. Present analyses and conclusions in clear, concise formats. (See W08-S3C6-02)	**Earth Science Daybook Teacher's Guide:** 13, 14, 20, 24, 25, 27, 28, 29, 40-41, 56, 59, 65, 79, 82, 85, 97, 99, 100, 117, 118, 119, 130, 132, 140, 142, 145, 149, 157, 171, 174-175, 187, 189, 195, 196, 197, 213 **Life Science Daybook Teacher's Guide:** 24, 25, 26-27, 56, 59, 64, 66-67, 86, 88, 94, 97, 103, 110, 111, 113, 121, 122-123, 139, 144-145, 146, 147, 149, 155, 158, 166-169, 179, 188, 191, 192, 193-194 **Physical Science Daybook Teacher's Guide:** 17, 18-19, 24, 62, 65, 66, 67, 68, 71, 75, 81, 87, 108, 110, 113, 121, 128, 129, 133, 145, 146, 149, 150, 151, 155, 156, 157, 159, 168, 187, 197, 199, 204, 206-207, 212, 215, 216-217

Performance Objectives, Grade 8	Science Daybooks
PO 4. Write clear, step-by-step instructions for conducting investigations or operating equipment (without the use of personal pronouns). (See W08-S3C3-01)	**Earth Science Daybook Teacher's Guide:** 123 **Life Science Daybook Teacher's Guide:** 167 **Physical Science Daybook Teacher's Guide:** 63
PO 5. Communicate the results and conclusion of the investigation. (See W08-S3C6-02)	**Earth Science Daybook Teacher's Guide:** 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217 **Life Science Daybook Teacher's Guide:** 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214 **Physical Science Daybook Teacher's Guide:** 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217

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	Science Daybooks
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).	**Earth Science Daybook Teacher's Guide:** 30-31, 40-43, 76-79, 138-141, 167, 200-201 **Life Science Daybook Teacher's Guide:** 54-57, 122, 188-191, 192-195 **Physical Science Daybook Teacher's Guide:** 36-37, 43, 46-49, 62-65, 68-69, 83-85, 88-89, 114-115, 138-140, 198-199, 208-211

Performance Objectives, Grade 8	Science Daybooks
PO 2. Evaluate the effects of the following major scientific milestones on society: • Mendelian Genetics • Newton's Laws	**Life Science Daybook Teacher's Guide:** 54-57, 60 **Physical Science Daybook Teacher's Guide:** 10-13, 24-27, 28-29
PO 3. Evaluate the impact of a major scientific development occurring within the past decade.	**Earth Science Daybook Teacher's Guide:** 80-81, 89, 202-204, 206 **Life Science Daybook Teacher's Guide:** 18 **Physical Science Daybook Teacher's Guide:** 43, 204-205, 208A-208B, 208-209, 212-215
PO 4. Evaluate career opportunities related to life and physical sciences.	**Earth Science Daybook Teacher's Guide:** 9, 16, 41, 48, 49, 80-81, 88-91, 111, 125-127, 128, 146-149, 152-153, 166, 167-169, 176, 179, 198, 223 **Life Science Daybook Teacher's Guide:** 25, 58, 70, 77, 82-83, 85, 86, 95, 114-117, 121, 122, 123, 181, 192, 207, 219 **Physical Science Daybook Teacher's Guide:** 10, 28, 35, 36-39, 40-41, 43, 62-65, 66, 125, 130, 143, 183, 198, 209, 220

Concept 2: Nature of Scientific Knowledge

Understand how science is a process for generating knowledge.

Performance Objectives, Grade 8	Science Daybooks
PO 1. Apply the following scientific processes to other problem solving or decision making situations: • *observing* • *questioning* • *communicating* • *comparing* • *measuring* • *classifying* • *predicting* • *organizing data* • *inferring* • *generating hypotheses* • *identifying variables*	**Earth Science Daybook Teacher's Guide:** 10, 12, 13, 17, 18, 19, 20, 21, 24, 25, 27, 28-29, 30, 31, 33, 34, 35, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 49, 52, 53, 55, 57, 58, 59, 60, 61, 62, 64, 65, 66, 67, 70, 71, 72-73, 74, 75, 76, 79, 80-81, 82, 83, 84-85, 86-87, 88, 90, 91, 95, 96, 97, 99, 100, 103, 105, 106, 107, 108, 109,110, 111, 113, 114, 115, 116, 117, 118, 119, 120-121, 123, 124, 125, 126, 128, 129, 130, 131, 132, 137, 138, 139, 140, 141, 142, 143, 146, 149, 150-151, 152, 153, 154, 155, 156, 157, 160, 162, 163, 164, 165, 167, 168, 169, 170, 171, 172, 173, 174, 175, 178, 179, 180, 181, 187, 188, 190, 191, 192, 193, 195, 198, 199, 201, 202, 203, 205, 206, 207, 208, 209, 211, 213, 215, 216, 217, 220, 222 **Life Science Daybook Teacher's Guide:** 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 24, 25, 26-27, 28, 29, 30, 31, 33, 34, 36, 37, 38, 39, 40, 43, 44, 47, 48-49, 52, 53, 54, 55, 58, 63, 64, 67, 68, 70, 72-75, 76, 77, 79, 80, 81, 82-85, 86-89, 90-91, 94, 95, 97, 98, 101, 102, 104, 105, 107, 108, 109, 110, 112, 113, 114, 115, 116-117, 118, 119, 120, 121, 122-123, 124, 127, 128, 129, 130, 132-133, 136, 137, 138, 139, 140-141, 142, 143, 145, 146, 148-149, 150, 151, 153, 154-155, 156-157, 158, 161, 162, 164, 165, 169, 171, 173, 178, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 208, 209, 210-211, 212, 213, 214, 215, 216, 217, 219, 223, 224 **Physical Science Daybook Teacher's Guide:** 10, 14, 16, 18-19, 20, 23, 24, 25, 26, 28-29, 30, 31, 34-35, 36, 37, 38, 40-41, 42, 43, 44, 45, 46, 48, 49, 52, 54, 55, 57, 59, 61, 62, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 76, 77, 78, 79, 80, 81, 82, 83, 85, 89, 94, 95, 97, 99, 101, 102, 103, 104, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 119, 120, 124, 125, 127, 128, 129, 131, 132, 133, 136, 138, 139, 141, 144, 145, 146, 149, 150, 151, 152, 153, 155, 157, 162, 163, 165, 166-167, 169, 171, 172, 174, 175, 178, 180, 181, 182, 183, 185, 186, 187, 188-190, 191, 192, 193, 194, 197, 198, 199, 203, 206-207, 209, 211, 212, 215, 217, 222
PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.	**Earth Science Daybook Teacher's Guide:** 24, 27, 79, 81, 129, 172-175 **Life Science Daybook Teacher's Guide:** 86-89 **Physical Science Daybook Teacher's Guide:** 138-141

Performance Objectives, Grade 8	Science Daybooks
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.	**Physical Science Daybook Teacher's Guide:** 65, 199
PO 4. Explain why scientific claims may be questionable if based on very small samples of data, biased samples, or samples for which there was no control.	**Earth Science Daybook Teacher's Guide:** 154-155, 172-173, 174-175 **Life Science Daybook Teacher's Guide:** 137, 167 **Physical Science Daybook Teacher's Guide:** 140-141

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	Science Daybooks
PO 1. Analyze the risk factors associated with natural, human induced, and/or biological hazards, including: • waste disposal of industrial chemicals • greenhouse gases	**Earth Science Daybook Teacher's Guide:** 38-39, 104-105, 113-115
PO 2. Analyze possible solutions to address the environmental risks associated with chemicals and biological systems.	**Earth Science Daybook Teacher's Guide:** 38-39, 104-105, 113-115

Concept 2: Science and Technology in Society

Develop viable solutions to a need or problem.

Performance Objectives, Grade 8	Science Daybooks
PO 1. Propose viable methods of responding to an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 174 **Physical Science Daybook Teacher's Guide:** 35, 49

Performance Objectives, Grade 8	Science Daybooks
PO 2. Compare solutions to best address an identified need or problem.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 174 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	**Earth Science Daybook Teacher's Guide:** 130, 141 **Life Science Daybook Teacher's Guide:** 174 **Physical Science Daybook Teacher's Guide:** 35, 49
PO 4. Compare risks and benefits of the following technological advances: • radiation treatments • genetic engineering (See Strand 4 Concept 2) • airbags (See Strand 5 Concept 2)	**Life Science Daybook Teacher's Guide:** 61

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	Science Daybooks
PO 1. Explain the purposes of cell division: • growth and repair • reproduction	**Life Science Daybook Teacher's Guide:** 30A-30B, 30-33, 34-37
PO 2. Explain the basic principles of heredity using the human examples of: • eye color • widow's peak • blood type	**Life Science Daybook Teacher's Guide:** 52, 70
PO 3. Distinguish between the nature of dominant and recessive traits in humans.	**Life Science Daybook Teacher's Guide:** 57, 59, 62-63, 64-67, 77-79

Concept 4: Diversity, Adaptation, and Behavior

Identify structural and behavioral adaptations.

Performance Objectives, Grade 8	Science Daybooks
PO 1. Explain how an organism's behavior allows it to survive in an environment.	**Life Science Daybook Teacher's Guide:** 72A, 72-75 **Physical Science Daybook Teacher's Guide:** 146-148
PO 3. Determine characteristics of organisms that could change over several generations.	**Life Science Daybook Teacher's Guide:** 58-61
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).	**Life Science Daybook Teacher's Guide:** 124-127, 128-131, 132-133
PO 5. Analyze the following behavioral cycles of organisms: • hibernation • migration • dormancy (plants)	**Life Science Daybook Teacher's Guide:** 110-113 **Physical Science Daybook Teacher's Guide:** 146
PO 6. Describe the following factors that allow for the survival of living organisms: • protective coloration • beak design • seed dispersal • pollination	**Life Science Daybook Teacher's Guide:** 124-126

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	Science Daybooks
PO 1. Identify different kinds of matter based on the following physical properties: • states • density • boiling point • melting point • solubility	**Physical Science Daybook Teacher's Guide:** 124-127, 139, 146-149, 150-151, 152-155
PO 2. Identify different kinds of matter based on the following chemical properties: • reactivity • pH • oxidation (corrosion)	**Physical Science Daybook Teacher's Guide:** 169
PO 3. Identify the following types of evidence that a chemical reaction has occurred: • formation of a precipitate • generation of gas • color change • absorption or release of heat	**Physical Science Daybook Teacher's Guide:** 101, 168-171, 186-187
PO 4. Classify matter in terms of elements, compounds, or mixtures.	**Physical Science Daybook Teacher's Guide:** 137, 147, 148, 160, 168-170
PO 5. Classify mixtures as being homogeneous or heterogeneous.	**Physical Science Daybook Teacher's Guide:** 160
PO 6. Explain the systematic organization of the periodic table.	**Physical Science Daybook Teacher's Guide:** 140, 141, 166, 167, 172, 174
PO 7. Investigate how the transfer of energy can affect the physical and chemical properties of matter.	**Physical Science Daybook Teacher's Guide:** 52-55, 56-59, 96-97

Concept 2: Motion and Forces

Understand the relationship between force and motion.

Performance Objectives, Grade 8	Science Daybooks
PO 1. Demonstrate velocity as the rate of change of position over time.	**Physical Science Daybook Teacher's Guide:** 28, 224
PO 2. Identify the conditions under which an object will continue in its state of motion (Newton's 1st Law of Motion).	**Physical Science Daybook Teacher's Guide:** 10-13, 20-23
PO 3. Describe how the acceleration of a body is dependent on its mass and the net applied force (Newton's 2nd Law of Motion).	**Physical Science Daybook Teacher's Guide:** 24-27
PO 4. Describe forces as interactions between bodies (Newton's 3rd Law of Motion).	**Physical Science Daybook Teacher's Guide:** 28-29

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