



Investigating Earth Systems Correlations to the Arizona 7th Grade Earth Science Standards

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	Performance Standards	Location/Page where Standard is found
Concept 1: Observations, Questions, and Hypotheses: Formulate predictions, questions, or hypotheses based on observations. Locate appropriate resources.	PO 1. Formulate questions based on observations that lead to the development of a hypothesis.	RL: 6,7-14, 15-28, 34-44, 45-51, 52-57 DP: 1-7, 8-21, 22-29, 30-40 F: 1-7; A: 1-4, 15-25 S: 1-5, 6-11, 12-16, 26-34 O: 1-8; MM: 9-22 W: 21-31; ER: 1-9
	PO 2. Select appropriate resources for background information related to a question, for use in the design of a controlled investigation.	RL: 7-14, 52-57; DP: 61-69 F: 1-7; A: 1-4, 55-72, 73-77 S: 1-5, 42-46; O: 59-63; ER: 1-9
	PO 3. Explain the role of a hypothesis in a scientific inquiry.	RL: 15-28; DP: 1-7; A: 1-4; S: 1-5

<p>Concept 2: Scientific Testing (Investigating and Modeling) Design and conduct controlled investigations.</p>	<p>PO 1. Demonstrate safe behavior and appropriate procedures (e.g., use and care of technology, materials, organisms) in all science inquiry.</p>	<p><u>RL:</u> 15-28, 29-33; <u>DP:</u> 8-21, 22-29; <u>A:</u> 15-25; <u>S:</u> 1-5, 12-16, 26-34; <u>O:</u> 1-8; <u>MM:</u> 9-12; <u>W:</u> 21-31; <u>ER:</u> 1-9</p>
	<p>PO 2. Design an investigation to test individual variables using scientific processes.</p>	<p><u>RL:</u> 15-28, 45-51, <u>DP:</u> 1-7, 8-21, 22-29, 30-40 <u>A:</u> 15-25; <u>S:</u> 1-5, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31</p>
	<p>PO 3. Conduct a controlled investigation, utilizing multiple trials, to test a hypothesis using scientific processes.</p>	<p><u>RL:</u> 15-28, 34-44, 45-51 <u>DP:</u> 8-21, 22-29, 30-40 <u>A:</u> 15-25; <u>S:</u> 1-5, 12-16, 26-34, <u>MM:</u> 9-22; <u>W:</u> 21-31</p>
	<p>PO 4. Perform measurements using appropriate scientific tools (e.g., balances, microscopes, probes, micrometers).inferences and conclusions potential bias.</p>	<p><u>RL:</u> 15-28, 34-44, 45-51 <u>DP:</u> 8-21, 22-29 <u>A:</u> 15-25; <u>S:</u>1-5, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31</p>
	<p>PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.</p>	<p><u>RL:</u> 1-6, 15-28, 45-51, 52-57, <u>DP:</u> 1-7, 8-21, 22-29, 30-40, 61-69; <u>F:</u> 1-7 <u>A:</u> 1-4, 15-25, 46-54 <u>S:</u> 1-5, 12-16, 26-34; <u>O:</u> 29-38 <u>MM:</u> 9-22; <u>W:</u> 21-31</p>
<p>Concept 3: Analysis and Conclusions. Analyze and interpret data to explain correlations and results; formulate new questions.</p>	<p>PO 1. Analyze data obtained in a scientific investigation to identify trends.</p>	<p><u>RL:</u> 1-6, 7-14, 15-28, 45-51, 52-57 <u>DP:</u> 8-21, 22-29, 30-40, 61-69 <u>F:</u> 1-7; <u>A:</u> 15-25, 55-72 <u>S:</u> 1-5, 26-34; <u>O:</u> 1-8 <u>MM:</u> 9-22,; <u>W:</u> 21-31</p>

	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).	<u>RL:</u> 7-14, 15-28, 34-44 <u>DP:</u> 8-21, 22-29, 30-40 <u>F:</u> 1-7; A1-4, A15-25, 46-54 <u>S:</u> 1-5, 12-16, 26-34 <u>O:</u> 1-8; <u>MM:</u> 9-22 <u>W:</u> 21-31
	PO 3. Analyze results of data collection in order to accept or reject the hypothesis.	<u>RL:</u> 7-14, 15-28, 34-44, 45-51 <u>DP:</u> 8-21, 22-29, 30-40, <u>A:</u> 15-25; <u>S:</u> 1-5, 12-16, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31
	PO 4. Determine validity and reliability of results of an investigation.	<u>RL:</u> 15-28 <u>DP:</u> 61-69
	PO 5. Formulate a conclusion based on data analysis.	<u>RL:</u> 1-6, 15-28, 45-51 <u>DP:</u> 8-21, 22-29, 30-40, 61-69 <u>F:</u> 1-7; A15-25 <u>S:</u> 1-5, 12-16, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31
	PO 6. Refine hypotheses based on results from investigations.	<u>RL:</u> 15-28, 29-33; <u>DP:</u> 1-7, 8-21 <u>A:</u> 1-4, 15-25; <u>S:</u> 1-5, 26-34, <u>MM:</u> 9-22; <u>W:</u> 21-31
	PO 7. Formulate new questions based on the results of a previous investigation.	<u>RL:</u> 15-28, 29-33 <u>DP:</u> 8-21, 61-69; <u>A:</u> 1-4, 15-25 <u>S:</u> 1-5, <u>S:</u> 26-34; <u>MM:</u> 9-22 <u>W:</u> 21-31

<p>Concept 4: Communication. Communicate results of investigations.</p>	<p>PO 1. Choose an appropriate graphic representation for collected data:</p> <ul style="list-style-type: none"> • line graph • double bar graph • stem and leaf plot • histogram 	<p><u>RL:</u> 7-14, 15-28, <u>DP:</u> 8-21, 22-29,30-40, <u>A:</u> 1-4, 15-25, 26-32, 33-45 <u>S:</u> 1-5, 6-11, 26-34 <u>O:</u> 29-38; <u>MM:</u> 9-22 <u>W:</u> 21-31; <u>ER:</u> 10-20</p>
	<p>PO 2. Display data collected from a controlled investigation.</p>	<p><u>RL:</u> 15-28 <u>DP:</u> 8-21, 22-29 <u>A:</u> 15-25, 33-45 <u>S:</u> 1-5, 26-34; <u>MM:</u> 9-22 <u>W:</u> 21-31; <u>ER:</u> 10-20</p>
	<p>PO 3. Communicate the results of an investigation with appropriate use of qualitative and quantitative information.</p>	<p><u>RL:</u> 15-28 <u>DP:</u> 8-21, 22-29, 30-40 <u>A:</u> 1-4, 15-25, 26-32, 33-45, 46-54; <u>S:</u> 1-5, 12-16, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31 <u>ER:</u> 10-20; <u>F:</u> 1-7</p>
	<p>PO 4. Write clear, step-by-step instructions for following procedures (without the use of personal pronouns).</p>	<p><u>RL:</u> 15-28 <u>DP:</u> 8-21 <u>S:</u> 1-5</p>
	<p>PO 5. Communicate the results and conclusion of the investigation.</p>	<p><u>RL:</u> 15-28 <u>DP:</u> 8-21, 22-29, 30-40 <u>A:</u> 1-4, 15-25, 26-32, 33-45, 46-54; <u>S:</u> 1-5, 12-16, 26-34 <u>MM:</u> 9-22; <u>W:</u> 21-31 <u>ER:</u> 10-20; <u>F:</u> 1-7</p>

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	Performance Standards	Location/Page where Standard is found
<p>Concept 1: History of Science as a Human Endeavor: Identify individual, cultural, and technological contributions to scientific knowledge.</p>	<p>PO 1. Identify how diverse people and/or cultures, past and present, have made important contributions to scientific innovations</p>	<p><u>DP:</u> 51-60, 61-69 <u>A:</u> 1-4, 55-72, 73-77 <u>O:</u> 29-38; <u>W:</u> 48-56 <u>CW:</u> 79-87</p>
	<p>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).</p>	<p><u>DP:</u> 51-60, 61-69 <u>A:</u> 1-4, 55-72, 73-77 <u>O:</u> 29-38; <u>MM:</u> 23-32 <u>CW:</u> : 37-47, 79-87 <u>W:</u> 48-56</p>
	<p>PO 3. Analyze the impact of a major scientific development occurring within the past decade.</p>	<p><u>DP:</u> 61-69 <u>A:</u> 1-4, 55-72, 73-77 <u>O:</u> 29-38</p>
	<p>PO 4. Analyze the use of technology in science-related careers.</p>	<p><u>DP:</u> 51-60, <u>A:</u> 1-4, 55-72 <u>O:</u> 29-38; <u>MM:</u> 23-32</p>
<p>Concept 2: Nature of Scientific Knowledge. Understand how science is a process for generating knowledge.</p>	<p>PO 1. Describe how science is an ongoing process that changes in response to new information and discoveries.</p>	<p><u>DP:</u> 8-21, 51-60, 61-69 <u>A:</u> 1-4, <u>A:</u> 55-72, <u>A:</u> 73-77 <u>O:</u> 29-38; <u>CW:</u> 79-87</p>

	<p>PO 2. Describe how scientific knowledge is subject to change as new information and/or technology challenges prevailing theories.</p>	<p><u>RL:</u> 52-57 <u>DP:</u> 51-60, 61-69 <u>A:</u> 1-4, 55-72, 73-77 <u>O:</u> 29-38; <u>MM:</u> 23-32 <u>W:</u> 48-56; <u>CW:</u> 79-87</p>
	<p>PO 3. Apply the following scientific processes to other problem solving or decision making situations:</p> <ul style="list-style-type: none"> • observing • questioning • communicating • comparing • measuring • classifying • predicting • organizing data • inferring • generating hypotheses • identifying variables 	<p><u>RL:</u> 1-6, 7-14, 15-28, 29-33, 34-44; <u>DP:</u> 8-21 <u>A:</u> 26-32, 33-45, 55-72 <u>O:</u> 29-38, 47-58 <u>MM:</u> 9-22 <u>W:</u> 21-31, 57-62</p>

Strand 3: Science in Personal and Social Perspectives

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

Concept	Performance Standards	Location/Page where Standard is found
Concept 1: Changes in Environments. Describe the interactions between human populations, natural hazards, and the environment.	PO 1. Analyze environmental risks (e.g., pollution, destruction of habitat) caused by human interaction with biological or geological systems.	<u>RL:</u> 45-51, 52-57, 58-63 <u>DP:</u> 41-50, 61-69 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 9-18, 47-58, 59-63 <u>W:</u> 1-8, 42-47, 48-56, 57-62
	PO 2. Analyze environmental benefits of the following human interactions with biological or geological systems: <ul style="list-style-type: none"> • reforestation • habitat restoration • construction of dams 	<u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 9-18, 47-58, 59-63 <u>W:</u> 1-8, 42-47, 48-56, 57-62 <u>MM:</u> 23-32
	PO 3. Propose possible solutions to address the environmental risks in biological or geological systems.	<u>DP:</u> 41-50, 61-69 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 9-18, 47-58, 59-63 <u>W:</u> 1-8, 42-47, 48-56, 57-62
Concept 2: Science and Technology in Society. Develop viable solutions to a need or problem.	PO 1. Propose viable methods of responding to an identified need or problem.	<u>DP:</u> 61-69 <u>A:</u> 55-72, 73-77 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 47-58, 59-63 <u>W:</u> 1-8, 42-47, 48-56, 57-62

	PO 2. Compare possible solutions to best address an identified need or problem.	<u>DP:</u> 61-69; <u>A:</u> 55-72 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 59-63, <u>W:</u> 57-62
	PO 3. Design and construct a solution to an identified need or problem using simple classroom materials.	<u>DP:</u> 61-69, <u>A:</u> 55-72 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 29-38, 59-63 <u>W:</u> 57-62; <u>MM:</u> 23-32 <u>CW:</u> 37-47
	PO 4. Describe a scientific discovery that influences technology.	<u>DP:</u> 61-69, <u>A:</u> 55-72 <u>S:</u> 26-34, 35-41, 42-46 <u>O:</u> 29-38, <u>O:</u> 59-63 <u>W:</u> 57-62; <u>MM:</u> 23-32 <u>CW:</u> 37-47

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	Performance Standards	Location/Page where Standard is found
<p>Concept 1: Structure of the Earth. Describe the composition and interactions between the structure of the Earth and its atmosphere.</p>	<p>PO 1. Classify rocks and minerals by the following observable properties:</p> <ul style="list-style-type: none"> • grain • color • texture • hardness 	<p><u>RL:</u> 1-6, 7-14, 15-28, 29-33; <u>F:</u> 8-18 <u>S:</u> 1-5, 6-11, 17-25, 26-34, 35-41, <u>MM:</u> 1-8, 9-22, 23-32, 33-46, 56-65</p>
	<p>PO 2. Explain the properties and composition of the following major layers of the Earth:</p> <ul style="list-style-type: none"> • crust • mantle • core 	<p><u>DP:</u> 8-21, 41-50, 51-60 <u>S:</u> 17-25; <u>O:</u> 19-28, 39-46 <u>ER:</u> 21-29, 40-48</p>
	<p>PO 3. Explain the following processes involved in the formation of the Earth's structure:</p> <ul style="list-style-type: none"> • erosion • deposition • plate tectonics • volcanism 	<p><u>RL:</u> 7-14, 15-28, 29-33, 34-44, 45-51, 52-57, 58-62 <u>DP:</u> 8-21, 51-60, 61-69 <u>S:</u> 6-11, 17-25, 26-34, 35-41 <u>O:</u> 9-18, 39-46; <u>MM:</u> 47-55 <u>W:</u> 9-14, 15-20, 21-31</p>

	PO 4. Describe how the rock and fossil record show that environmental conditions have changed over geologic and recent time.	<u>DP:</u> 51-60, 61-69 <u>F:</u> 1-7, 8-18; <u>S:</u> 17-25 <u>O:</u> 39-46; <u>MM:</u> 1-8 <u>CW:</u> 69-78, 79-87 <u>ER:</u> 21-29
Concept 2: Earth's Processes and Systems. Understand the processes acting on the Earth and their interaction with the Earth systems.	PO 1. Explain the rock cycle.	<u>RL:</u> 1-6, 7-14 <u>DP:</u> 8-21, 61-69 <u>F:</u> 8-18; <u>S:</u> 1-5, 17-25 <u>O:</u> 39-46; <u>MM:</u> 47-55 <u>ER:</u> 21-29, 40-48
	PO 2. Distinguish the components and characteristics of the rock cycle for the following types of: <ul style="list-style-type: none"> • igneous • metamorphic • sedimentary 	<u>RL:</u> 1-6, 7-14, 15-28 <u>DP:</u> 8-21, 22-29, 41-50, 61-69 <u>F:</u> 8-18; <u>S:</u> 1-5, 26-34 <u>MM:</u> 9-22, 47-55 <u>ER:</u> 21-29, 40-48
	PO 3. Analyze the evidence that lithospheric plate movements occur.	<u>DP:</u> 8-21, 22-29, 30-40, 41-50, 51-60, 61-69 <u>O:</u> 19-28, 39-46 <u>CW:</u> 69-78, 79-87
	PO 4. Explain lithospheric plate movement as a result of convection.	<u>DP:</u> 8-21, 22-29, 30-40, 61-69 <u>O:</u> 19-28, 39-46
	PO 5. Relate plate boundary movements to their resulting landforms, including: <ul style="list-style-type: none"> • mountains • faults • rift valleys • trenches • volcanoes 	<u>DP:</u> 8-21, 22-29, 30-40, 41-50, 51-60, 61-69 <u>O:</u> 19-28, 39-46 <u>W:</u> 15-20

	PO 6. Describe how earthquakes are measured.	<u>DP:</u> 8-21, 30-40, 41-50
Concept 3: Earth in the Solar System. Understand the relationships of the Earth and other objects in the solar system.	PO 1. Explain the phases of the Moon in terms of the relative positions of the Earth, Sun, and Moon.	<u>A:</u> 5-9, 33-45
	PO 2. Construct a model for the relative positions of the Earth, Sun, and Moon as they relate to corresponding eclipses.	<u>A:</u> 5-9, 33-45
	PO 3. Explain the interrelationship between the Earth's tides and the Moon.	<u>A:</u> 15-25
	PO 4. Explain the seasons in the Northern and Southern Hemispheres in terms of the tilt of the Earth's axis relative to the Earth's revolution around the Sun.	<u>A:</u> 26-32, 33-45
	PO 5. Identify the following major constellations visible (seasonally) from the Northern Hemisphere: <ul style="list-style-type: none"> • Orion • Ursa Major (Great Bear) • Cygnus • Scorpius • Cassiopeia 	<u>A:</u> 26-32, 46-54, 55-72
	PO 6. Explain the relationship among common objects in the solar system, galaxy, and the universe.	<u>A:</u> 5-9, 15-25, 26-32, 33-45, 46-54, 55-72, 73-77

Key:

A: Astronomy
CW: Climate & Weather
DP: Dynamic Planet
ER: Energy Resources
F: Fossils

MM: Materials & Minerals
O: Oceans
RL: Rocks & Landforms
S: Soil
W: Water