

**Correlation to Arizona Science Standards**  
***Introduction to Earth and Space Science***  
**Student Text and Investigation Manual**

| <b>Standard #:<br/>Standard</b>     | <b>Level</b> | <b>Concept</b>   | <b>Performance<br/>Objective</b>                                 | <b>student text<br/>pg</b> | <b>detail</b>  | <b>investigation<br/>pg</b> | <b>detail</b>                            |
|-------------------------------------|--------------|--|--|----------------------------|--|-----------------------------|--|
| 1SC-P1.PO1<br>Science as<br>Inquiry | Proficiency  | Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations | Evaluate scientific information for relevance to a given problem | 8                          | asking questions pertaining to specific heat and heat flow | 16                          | evaluating your qualitative ozone strips |
|                                     |              |  |  | 24                         | why is Earth's atmosphere different from other planets     |                             |  |
|                                     |              |  |  | 25                         | why do ears pop  |                             |  |
|                                     |              |  |  | 44                         | why does Earth have seasons                                |                             |  |
|                                     |              |  |  | 53                         | how does rain form   |                             |  |
|                                     |              |  |  | 61                         | how do animals survive in the desert                       |                             |  |
|                                     |              |  |  | 67                         | what is a carbon sink                                      |                             |  |
|                                     |              |  |  | 73                         | why haven't we run out of water                            |                             |  |
|                                     |              |  |  | 78                         | what is in your tap water                                  |                             |  |
|                                     |              |  |  | 81                         | what is acid rain  |                             |  |
|                                     |              |  |  | 85                         | why are oceans salty                                       |                             |  |
|                                     |              |  |  | 108                        | why doesn't Earth get bigger and bigger                    |                             |  |
|                                     |              |  |  | 162                        | what causes eclipses                                       |                             |  |
|                                     |              |  |  | 195                        | is Pluto a planet  |                             |  |

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|----------------------------------|-------------|--|--|--------------------|--------|---|---|
| 1SC-P1.PO2<br>Science as Inquiry | Proficiency | Propose solutions to practical and theoretical problems by synthesizing and evaluating information gained from scientific investigations | Propose solutions to a problem, based on information gained from scientific investigations |                    |        | 10<br>13<br>38<br>44<br>47<br>48<br>56<br>59<br>70<br>73<br>9 | build your own atmospheric pressure gauge<br>evaluating your aneroid barometer design<br>design a scale model of a zoo<br>making hypotheses and testing them against observations<br>analyzing the results of the buffered acid experiment<br>reconstruct a series of events from clues<br>simulate an earthquake<br>interpreting how the drumming affects the intensity of the earthquake in the model<br>design a metamorphism simulation<br>design a sundial<br>explaining efficiency of heat transfer based on data |

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|----------------------------------|-------------|---|---|---|--|---|--|
| 1SC-P2.PO1<br>Science as Inquiry | Proficiency | Compare observations of the real world to observations of a constructed model (e.g., an aquarium, a terrarium, a volcano) | Assess the capability of a model to represent a "real world" scenario | 11<br>37<br>46<br>70<br>98<br>107<br>150<br>188<br>198<br>219 | heat equation<br>computer modeling to predict greenhouse effects<br>modeling air currents<br>create a model (#1)<br>model of Earth's history<br>modeling plate boundaries<br>rock cycle model<br>solar system modeling<br>model of the sun's anatomy<br>inverse square law | 13<br>18<br>19<br>22<br>28<br>3<br>3<br>47<br>5<br>55<br>56<br>71<br>81<br>82 | constructing a graph from atmospheric pressure data<br>modeling the effect of greenhouse gases on Earth's temperature<br>graphing water and ice temperature readings<br>constructing a graph of time vs. temperature<br>modeling underwater rivers and waterfalls and springs<br>find equation for trend line<br>construct a graphical model<br>constructing a graph of drops of acid vs pH<br>construct a temperature vs. time graph<br>evaluating your completed bathymetric map<br>construct a model that simulates an earthquake<br>evaluate your ability to interpret rock formations<br>inverse square law<br>setting up a scale model of the solar system |

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|-------------------------------------|-------------|--|--|--------------------|---|---|---|
| 1SC-P3.PO1<br>Science as<br>Inquiry | Proficiency | Analyze and<br>evaluate reports<br>of scientific studies | Analyze reports of<br>scientific studies<br>for elements of<br>experimental design | 92<br><br>176      | forming a hypothesis and<br>testing through<br>experimentation (#5)<br><br>identify question,<br>hypothesis, procedure,<br>and results (#1) | 10<br><br>18<br><br>22<br><br>24<br><br>27<br><br>43<br><br>6 | design and construct an<br>aneroid barometer<br><br>investigating the effect of<br>greenhouse gases<br><br>analyzing data<br><br>developing a hypothesis<br><br>determining whether<br>distance from light source<br>or axial tilt plays a more<br>significant role in causing<br>the seasons<br><br>analyzing results and<br>drawing conclusions<br><br>effect of changing mass<br>on collected data |
| 1SC-P3.PO2<br>Science as<br>Inquiry | Proficiency | Analyze and<br>evaluate reports<br>of scientific studies | Compare<br>conclusions to<br>original hypotheses                                   |                    |   | 13  | evaluating your aneroid<br>barometer design   |
| 1SC-P3.PO3<br>Science as<br>Inquiry | Proficiency | Analyze and<br>evaluate reports<br>of scientific studies | Evaluate validity of<br>conclusions  |                    |   | 16  | evaluating your<br>qualitative ozone strips   |

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|----------------------------------|-------------|---|---|--------------------|--|--------------------------------------|--|
| 1SC-P4.PO1<br>Science as Inquiry | Proficiency | Create and defend a written plan of action for a scientific investigation | Design an appropriate protocol (written plan of action) for the investigation of a scientific problem |                    |  | 12<br>21<br>30<br>4<br>44<br>57<br>9 | writing a procedure for constructing a pointer for an aneroid barometer<br>investigating how specific heat of water regulates Earth's temperature<br>develop a procedure to create an underwater spring<br>conducting investigation of efficiency of immersion heater<br>simulating the effect of acid rain on daphnia<br>identifying how the earthquake model represents an earthquake<br>conducting experiments on heat transfer |
| 1SC-P4.PO2<br>Science as Inquiry | Proficiency | Create and defend a written plan of action for a scientific investigation | Justify the protocol in terms of the elements of experimental design                                  | 92<br>92<br>176    | describe steps you would take to determine how pH affects frog population<br>forming a hypothesis and testing through experimentation (#5)<br>identify question, hypothesis, procedure, and results (#1) | 18<br>22<br>24<br>43<br>61           | investigating the effect of greenhouse gases<br>analyzing data<br>developing a hypothesis<br>analyzing results and drawing conclusions<br>develop a research plan for studying volcanoes   |

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|----------------------------------|-------------|--|---|--------------------|---|----------------------|---|
| 1SC-P5.PO1<br>Science as Inquiry | Proficiency | Apply the concepts of equilibrium, form and function to a variety of phenomena | Predict the effects of various factors on the equilibrium of a system   |                    |   | 17<br>20<br>63<br>66 | predicting areas with high ozone concentration based on your data<br>predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup<br>estimating the number of meteor collisions on Earth during the last 3.5 billion years<br>predicting the results of the crystal-growing experiment |
| 1SC-P5.PO2<br>Science as Inquiry | Proficiency | Apply the concepts of equilibrium, form and function to a variety of phenomena | Explain how the relationships between form and function are evident in natural and design systems                       | 61<br>64           | how do animals survive in the desert?<br>how do savanna animals survive the periodic fires? |                      |   |
| 1SC-P5.PO3<br>Science as Inquiry | Proficiency | Apply the concepts of equilibrium, form and function to a variety of phenomena | Describe how present form and function of an object, organism or system could have evolved from prior form and function | 61<br>64           | how do animals survive in the desert?<br>how do savanna animals survive the periodic fires? |                      |   |

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|-------------------------------------|-------------|---|-----------------------------------|--------------------|--|---------------------|---|
| 1SC-P6.PO1<br>Science as<br>Inquiry | Proficiency | Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings | Construct a researchable question | 3                  | what is temperature  | 57                  | identifying how the earthquake model represents an earthquake |
|                                     |             |   |                                   | 8                  | asking questions pertaining to specific heat and heat flow |                     |   |
|                                     |             |   |                                   | 24                 | why is Earth's atmosphere different from other planets     |                     |   |
|                                     |             |   |                                   | 25                 | why do ears pop  |                     |   |
|                                     |             |   |                                   | 44                 | why does Earth have seasons                                |                     |   |
|                                     |             |   |                                   | 53                 | how does rain form   |                     |   |
|                                     |             |   |                                   | 61                 | how do animals survive in the desert                       |                     |   |
|                                     |             |   |                                   | 67                 | what is a carbon sink                                      |                     |   |
|                                     |             |   |                                   | 73                 | why haven't we run out of water                            |                     |   |
|                                     |             |   |                                   | 78                 | what is in your tap water                                  |                     |   |
|                                     |             |   |                                   | 81                 | what is acid rain  |                     |   |
|                                     |             |   |                                   | 85                 | why are oceans salty                                       |                     |   |
|                                     |             |   |                                   | 108                | why doesn't Earth get bigger and bigger                    |                     |   |
|                                     |             |   |                                   | 162                | what causes eclipses                                       |                     |   |
|                                     |             |   |                                   | 195                | is Pluto a planet  |                     |   |

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|-------------------------------------|-------------|---|---|--------------------|---|---------------------|---|
| 1SC-P6.PO2<br>Science as<br>Inquiry | Proficiency | Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings | Employ a research design that incorporates a scientific method to carry out an experiment | 92                 | forming a hypothesis and testing through experimentation (#5)             | 10                  | design and construct an aneroid barometer                               |
|                                     |             |   |   | 92                 | describe steps you would take to determine how pH affects frog population | 12                  | writing a procedure for constructing a pointer for an aneroid barometer |
|                                     |             |   |   | 104                | proving hypotheses for sea-floor spreading                                | 18                  | investigating the effect of greenhouse gases                            |
|                                     |             |   |   | 154                | form a hypothesis   | 22                  | analyzing data  |
|                                     |             |   |   | 176                | identify question, hypothesis, procedure, and results (#1)                | 24                  | developing a hypothesis   |
|                                     |             |   |   |                    |   | 24                  | formulate a hypothesis about why the seasons occur                      |
|                                     |             |   |   |                    |   | 30                  | develop a procedure to create an underwater spring                      |
|                                     |             |   |   |                    |   | 43                  | analyzing results and drawing conclusions                               |
|                                     |             |   |   |                    |   | 44                  | formulate hypothesis  |
|                                     |             |   |   |                    |   | 61                  | develop a research plan for studying volcanoes                          |

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|-------------------------------------|--------------|---|---|---|--|-----------------------------|--|
| 1SC-P6.PO3<br>Science as<br>Inquiry | Proficiency  | Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings | Analyze experimental data                   | 37<br><br>117<br><br>121<br><br>121<br><br>179<br><br>192 | what percentage comes from this source? (problem 4)<br><br>determining distance to an epicenter<br><br>average density (#5)<br><br>what explains the difference in density? (#5)<br><br>how big is Earth?<br><br>average distance from the sun | 13<br><br>15                | calculating error between your barometer and a commercial barometer<br><br>importance of good record keeping in order to avoid error |
| 1SC-P6.PO4<br>Science as<br>Inquiry | Proficiency  | Identify and refine a researchable question, conduct the experiment, collect and analyze data, share and discuss findings | Communicate experimental findings to others |   |  | 41<br><br>43<br><br>45      | create water quality report<br><br>write paragraph to explain results<br><br>write summary of findings                               |

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|---|-------------|---|--|--|---|----------------------|---|
| 2SC-P1.PO1<br>History and<br>Nature of<br>Science | Proficiency | Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought | Define key factors that affect the development of scientific thought                           | 37<br>46<br>70<br>98<br>107<br>150<br>188<br>198 | computer modeling to predict greenhouse effects<br>modeling air currents<br>create a model (#1)<br>model of Earth's history<br>modeling plate boundaries<br>rock cycle model<br>solar system modeling<br>model of the sun's anatomy | 18<br>28<br>56<br>82 | modeling the effect of greenhouse gases on Earth's temperature<br>modeling underwater rivers and waterfalls and springs<br>construct a model that simulates an earthquake<br>setting up a scale model of the solar system |
| 2SC-P1.PO2<br>History and<br>Nature of<br>Science | Proficiency | Identify and describe key factors (e.g., technology, competitiveness, world events, personalities, societal views) that affect the development and acceptance of scientific thought | Describe how different key factors affect the development and acceptance of scientific thought | 37<br>46<br>70<br>98<br>107<br>150<br>188<br>198 | computer modeling to predict greenhouse effects<br>modeling air currents<br>create a model (#1)<br>model of Earth's history<br>modeling plate boundaries<br>rock cycle model<br>solar system modeling<br>model of the sun's anatomy | 18<br>28<br>56<br>82 | modeling the effect of greenhouse gases on Earth's temperature<br>modeling underwater rivers and waterfalls and springs<br>construct a model that simulates an earthquake<br>setting up a scale model of the solar system |
| 2SC-P2.PO1<br>History and<br>Nature of<br>Science | Proficiency | Explain how scientific innovations can challenge accepted ideas   | Describe how an accepted idea could be challenged by scientific innovation                     | 92   | study claims made by bottled water companies  | 43                   | study water filtration device claims  |

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|---|--------------|--|---|--|--|-----------------------------|---|
| 2SC-P3.PO1<br>History and<br>Nature of<br>Science | Proficiency  | Explain the impact on society of major scientific developments (e.g., germ theory, molecular biology, relativity)        | Describe the benefits, limitations, and consequences of major scientific developments in pure and applied science | 134<br>201                             | description of geothermal energy<br>the efficiency of photovoltaic cells   | 17<br>86                    | research the causes of ozone in the lower atmosphere<br>determine the efficiency of a photovoltaic cell |
| 2SC-P3.PO2<br>History and<br>Nature of<br>Science | Proficiency  | Explain the impact on society of major scientific developments (e.g., germ theory, molecular biology, relativity)        | Explain how major scientific developments in pure and applied science have affected, or could affect, society     | 116<br>119                             | studying seismic waves leads to information used in oil and gas exploration<br>predicting tsunamis   |                             |   |
| 2SC-P4.PO1<br>History and<br>Nature of<br>Science | Proficiency  | Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science | Trace the development of a selected invention, theory or discovery from its inception to modern day               | 102<br>103<br>103<br>106<br>186<br>222 | plate tectonic theory development<br>continental drift theory development<br>history of continental drift theory<br>plate tectonic theory<br>changing ideas about the solar system<br>development of Big Bang theory | 54                          | investigate plate tectonics   |

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|---|--------------|--|---|--|--|-----------------------------|-----------------------------|
| 2SC-P4.PO2<br>History and<br>Nature of<br>Science | Proficiency  | Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science | Explain the progression of changes in the invention, theory or discovery                | 102<br>103<br>103<br>106<br>186<br>222 | plate tectonic theory development<br>continental drift theory development<br>history of continental drift theory<br>plate tectonic theory<br>changing ideas about the solar system<br>development of Big Bang theory | 54                          | investigate plate tectonics |
| 2SC-P4.PO3<br>History and<br>Nature of<br>Science | Proficiency  | Trace the development and consequences of an invention, theory or discovery to demonstrate the dynamic nature of science | Describe the impact of the invention, theory or discovery on further scientific thought | 102<br>103<br>103<br>106<br>186<br>222 | plate tectonic theory development<br>continental drift theory development<br>history of continental drift theory<br>plate tectonic theory<br>changing ideas about the solar system<br>development of Big Bang theory | 54                          | investigate plate tectonics |

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|---|--------------|--|---|----------------------------|---|-----------------------------|---|
| 2SC-P5.PO1<br>History and<br>Nature of<br>Science | Proficiency  | Explain how<br>theory, law and<br>fact are<br>developed in<br>science to answer<br>a specific question | Define theory, law<br>and fact                                    | 92                         | forming a hypothesis and<br>testing through<br>experimentation (#5) | 18                          | investigating the effect of<br>greenhouse gases |
|   |              |  |   | 98                         | Kelvin's calculations of<br>Earth's age                             | 22                          | analyzing data                                  |
|   |              |  |   | 176                        | identify question,<br>hypothesis, procedure,<br>and results (#1)    | 24                          | developing a hypothesis                         |
|   |              |  |   |                            |   | 43                          | analyzing results and<br>drawing conclusions    |
| 2SC-P5.PO2<br>History and<br>Nature of<br>Science | Proficiency  | Explain how<br>theory, law and<br>fact are<br>developed in<br>science to answer<br>a specific question | Describe the<br>relationships<br>among theories,<br>laws and fact | 95                         | relative dating and<br>modern geology based<br>on Steno's theories  |                             |   |
|   |              |  |   | 98                         | Kelvin's calculations of<br>Earth's age                             |                             |   |
|   |              |  |   | 102                        | theory of plate tectonics   |                             |   |
|   |              |  |   | 103                        | critiquing Wegener's<br>theories of continental<br>drift            |                             |   |
|   |              |  |   | 137                        | Darwin's theories of the<br>Andes formation                         |                             |   |
|   |              |  |   | 140                        | what causes ice ages  |                             |   |
|   |              |  |   | 185                        | theories of origin of the<br>moon                                   |                             |   |
|   |              |  |   | 186                        | early theories of the solar<br>system                               |                             |   |
|   |              |  |   | 221                        | Big Bang theory   |                             |   |

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|---|-------------|--|--|---|--|---------------------|--------------------------------|
| 2SC-P5.PO3<br>History and<br>Nature of<br>Science | Proficiency | Explain how theory, law and fact are developed in science to answer a specific question    | Explain how theories, laws and facts are used to answer specific questions   | 95<br>98<br>102<br>103<br>137<br>140<br>185<br>186<br>221 | relative dating and modern geology based on Steno's theories<br>Kelvin's calculations of Earth's age<br>theory of plate tectonics<br>critiquing Wegener's theories of continental drift<br>Darwin's theories of the Andes formation<br>what causes ice ages<br>theories of origin of the moon<br>early theories of the solar system<br>Big Bang theory |                     |                                |
| 2SC-P6.PO1<br>History and<br>Nature of<br>Science | Proficiency | Analyze evidence that supports past and current scientific theories about a specific topic | Distinguish between evidence which supports a given scientific theory (e.g., model of the atom, plate tectonics, natural selection) and evidence which does not support the theory | 25<br>56<br>222   | why do ears pop<br>meteorologists use atmospheric pressure data to understand movement of weather systems<br>evidence for Big Bang theory  | 31                  | the food paradox of the oceans |

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|--|-------------|--|--|------------------------------------|--|----------------------------|--|
| 3SC-P1.PO1<br>Personal and<br>Social<br>Perspectives<br>in Science and<br>Technology | Proficiency | Apply scientific<br>thought processes<br>and procedures to<br>personal and<br>social issues  | Apply scientific<br>thought processes<br>of skepticism,<br>empiricism,<br>objectivity and<br>logic seek a<br>solution to personal<br>and social issues | 35<br>77<br>83<br>92<br>112<br>118 | hydrogen powered cars<br>the clean water act<br>catalytic converters and<br>scrubbing reduce acid rain<br>study claims made by<br>bottled water companies<br>what we can learn from<br>seismographs<br>understanding<br>earthquakes allows<br>engineers to design safer<br>buildings | 43                         | study water filtration<br>device claims  |
| 3SC-P1.PO2<br>Personal and<br>Social<br>Perspectives<br>in Science and<br>Technology | Proficiency | Apply scientific<br>thought processes<br>and procedures to<br>personal and<br>social issues  | Apply a scientific<br>method to the<br>solution of personal<br>and social issues   | 92                                 | study claims made by<br>bottled water companies  | 43                         | study water filtration<br>device claims  |
| 3SC-P2.PO1<br>Personal and<br>Social<br>Perspectives<br>in Science and<br>Technology | Proficiency | Propose and test,<br>using computer<br>software or<br>common<br>materials, a<br>solution to an<br>existing problem;<br>or design a<br>product to meet a<br>need, using a<br>model or<br>simulation | Describe a problem<br>or need  |                                    |  | 10<br>38<br>56<br>70<br>73 | build your own<br>atmospheric pressure<br>gauge<br>design a scale model of<br>a zoo<br>simulate an earthquake<br>design a metamorphism<br>simulation<br>design a sundial |

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|--|-------------|---|---|--------------------|--------|----------------------------|---|
| 3SC-P2.PO2<br>Personal and Social Perspectives in Science and Technology | Proficiency | Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation | Propose a solution to the problem or design a product to meet the need                      |                    |        | 10<br>38<br>56<br>70<br>73 | build your own atmospheric pressure gauge<br>desisgn a scale model of a zoo<br>simulate an earthquake<br>design a metamorphism simulation<br>design a sundial |
| 3SC-P2.PO3<br>Personal and Social Perspectives in Science and Technology | Proficiency | Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation | Design a method of testing the solution or design a model or simulation to test the product |                    |        | 10<br>38<br>56<br>70<br>73 | design and construct an aneroid barometer<br>design a scale model of a zoo<br>simulate an earthquake<br>design a metamorphism simulation<br>design a sundial  |
| 3SC-P2.PO4<br>Personal and Social Perspectives in Science and Technology | Proficiency | Propose and test, using computer software or common materials, a solution to an existing problem; or design a product to meet a need, using a model or simulation | Carry out the test of the solution or product   |                    |        | 10<br>38<br>56<br>70<br>73 | design and construct an aneroid barometer<br>design a scale model of a zoo<br>simulate an earthquake<br>design a metamorphism simulation<br>design a sundial  |

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| <b>Standard #:<br/>Standard</b>  | <b>Level</b> | <b>Concept</b>   | <b>Performance<br/>Objective</b>                              | <b>student text<br/>pg</b>                        | <b>detail</b>   | <b>investigation<br/>pg</b> | <b>detail</b>   |
|--|--------------|--|---|---|---|-----------------------------|---|
| 3SC-P2.PO5<br>Personal and<br>Social<br>Perspectives<br>in Science and<br>Technology | Proficiency  | Propose and test,<br>using computer<br>software or<br>common<br>materials, a<br>solution to an<br>existing problem;<br>or design a<br>product to meet a<br>need, using a<br>model or<br>simulation | Evaluate the test<br>results                                  |   |   | 10<br>38<br>56<br>70<br>73  | design and construct an<br>aneroid barometer<br>design a scale model of a<br>zoo<br>simulate an earthquake<br>design a metamorphism<br>simulation<br>design a sundial |
| 3SC-P3.PO1<br>Personal and<br>Social<br>Perspectives<br>in Science and<br>Technology | Proficiency  | Compare and<br>contrast the goals<br>of science and<br>technology  | Define the goals of<br>science and the<br>goals of technology | 35<br>77<br>83<br>104<br>112<br>118<br>171<br>173 | hydrogen powered cars<br>the clean water act<br>catalytic converters and<br>scrubbing reduce acid rain<br>using echo sounders to<br>map the sea floor<br>what we can learn from<br>seismographs<br>understanding<br>earthquakes allows<br>engineers to design safer<br>buildings<br>using satellite technology<br>space shuttle |                             |   |

## Correlation to Arizona Science Standards

### *Introduction to Earth and Space Science*

#### Student Text and Investigation Manual

| Standard #:<br>Standard  | Level       | Concept   | Performance Objective   | student text<br>pg                                | detail  | investigation<br>pg | detail  |
|--|-------------|---|---|---|---|---------------------|---|
| 3SC-P3.PO2<br>Personal and Social Perspectives in Science and Technology | Proficiency | Compare and contrast the goals of science and technology  | Compare the goals of science and the goals of technology                                    | 35<br>77<br>83<br>104<br>112<br>118<br>171<br>173 | hydrogen powered cars<br>the clean water act<br>catalytic converters and scrubbing reduce acid rain<br>using echo sounders to map the sea floor<br>what we can learn from seismographs<br>understanding earthquakes allows engineers to design safer buildings<br>using satellite technology<br>space shuttle |                     |   |
| 3SC-P3.PO3<br>Personal and Social Perspectives in Science and Technology | Proficiency | Compare and contrast the goals of science and technology  | Describe the impact of technology on the life, physical, earth and space sciences           | 81<br>92  | acid rain explained<br>research the issue of acid rain  | 17<br>44            | research the causes of ozone in the lower atmosphere<br>investigate effect of acid rain on microorganisms |
| 3SC-P4.PO1<br>Personal and Social Perspectives in Science and Technology | Proficiency | Identify and describe the basic processes of the natural ecosystems and how these processes affect, and are affected by, humans | Describe the basic processes of the natural ecosystems (e.g., water cycle, nutrient cycles) | 82<br>84<br>133<br>138                            | chemical reactions and the formation of acid rain<br>oceans in the water cycle<br>volcanoes and water vapor<br>landforms shaped by water  | 43<br>46            | testing pH of tap water samples<br>determining pH of water as carbon dioxide dissolves                    |

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| Standard #:<br>Standard  | Level       | Concept   | Performance Objective   | student text<br>pg | detail  | investigation<br>pg | detail  |
|--|-------------|---|---|--------------------|---|---------------------|---|
| 3SC-P4.PO2<br>Personal and Social Perspectives in Science and Technology | Proficiency | Identify and describe the basic processes of the natural ecosystems and how these processes affect, and are affected by, humans | Explain how these processes affect, and are affected by, humans | 23                 | nitrogen cycle  | 40                  | predict the quality of surface water to be tested and justify your answer         |
|  |             |   |   | 31                 | effects of CFC's on the ozone layer                         | 40                  | predict the quality of surface water to be tested and justify your answer         |
|  |             |   |   | 34                 | effects of burning fossil fuels                             | 40                  | actions to take to improve water quality  |
|  |             |   |   | 34                 | changes to the oceans due to increasing global temperatures | 41                  | address what you can do to maintain or improve the water quality at the test site |
|  |             |   |   | 56                 | temperature inversion                                       | 43                  | testing pH of tap water samples   |
|  |             |   |   | 67                 | permafrost  | 44                  | the effects of acid rain on organisms in aquatic environments                     |
|  |             |   |   | 77                 | The Clean Water Act   | 44                  | the effects of acid rain on organisms in aquatic environments                     |
|  |             |   |   | 79                 | water quality testing                                       | 46                  | determining pH of water as carbon dioxide dissolves                               |
|  |             |   |   | 80                 | water quality testing                                       |                     |   |
|  |             |   |   | 81                 | acid rain   |                     |   |
|  |             |   |   | 81                 | effects of acid rain on natural environments                |                     |   |
|  |             |   |   | 81                 | effects of acid rain on the soil                            |                     |   |
|  |             |   |   | 81                 | acid rain   |                     |   |
|  |             |   |   | 82                 | causes and health effects of acid rain                      |                     |   |
|  |             |   |   | 83                 | illustration of acid rain formation                         |                     |   |
|  |             |   |   | 87                 | impact of increased CO2 on oceans                           |                     |   |
|  |             |   |   | 87                 | impact of increased CO2 in oceans                           |                     |   |

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| Standard #:<br>Standard           | Level       | Concept  | Performance<br>Objective   | student text<br>pg | detail                                 | investigation<br>pg | detail  |
|-----------------------------------|-------------|--|--|--------------------|--|---------------------|---|
|                                   |             |  |  | 87                 | impact of increased CO2 on oceans      |                     |   |
|                                   |             |  |  | 88                 | pollution and the ocean food chain     |                     |   |
|                                   |             |  |  | 89                 | pollution and the ocean food chain     |                     |   |
|                                   |             |  |  | 142                | how urban sprawl changes local climate |                     |   |
| 5SC-P5.PO3<br>Physical<br>Science | Proficiency | Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations | Describe physical interactions through use of word equations or formulae |                    |  | 7                   | power of an immersion heater                      |
|                                   |             |  |  |                    |  | 7                   | calculating work input and work output            |
|                                   |             |  |  |                    |  | 87                  | calculate the power output of a photovoltaic cell |

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| <b>Standard #:<br/>Standard</b>   | <b>Level</b> | <b>Concept</b>   | <b>Performance<br/>Objective</b>  | <b>student text<br/>pg</b> | <b>detail</b>                       | <b>investigation<br/>pg</b>     | <b>detail</b>   |
|-----------------------------------|--------------|--|---|----------------------------|-------------------------------------|---------------------------------|---|
| 5SC-P5.PO4<br>Physical<br>Science | Proficiency  | Describe and predict chemical reactions (including combustion and simple chemical reactions) and physical interaction of matter (including velocity, force, work and power), using words or symbolic equations | Predict the results of a physical interaction by using an algebraic formula | 11<br>219                  | heat equation<br>inverse square law | 17<br>20<br>3<br>63<br>66<br>81 | predicting areas with high ozone concentration based on your data<br>predicting what would happen if you place your ice/water test tube into a hot cup or a cold cup<br>find equation for trend line<br>estimating the number of meteor collisions on Earth during the last 3.5 billion years<br>predicting the results of the crystal-growing experiment<br>inverse square law |

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| Standard #:<br>Standard           | Level       | Concept  | Performance Objective  | student text<br>pg | detail  | investigation<br>pg | detail   |
|-----------------------------------|-------------|--|--|--------------------|---|---------------------|--|
| 5SC-P6.PO1<br>Physical<br>Science | Proficiency | Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior) | Demonstrate the use of conceptual models in science (e.g., formulae, diagrams, graphs) | 28                 | atmospheric pressure at various altitudes graph | 13                  | constructing a graph from atmospheric pressure data                                  |
|                                   |             |  |  | 152                | Moh's hardness scale                            | 19                  | graphing water and ice temperature readings  |
|                                   |             |  |  | 219                | apparent brightness vs. distance graph          | 22                  | constructing a graph of time vs. temperature   |
|                                   |             |  |  | 225                | use the diagram to answer the questions (#2)    | 3                   | construct a graphical model  |
|                                   |             |  |  | 225                | arrange the items in the table (#3)             | 33                  | determining relationship between temperature of the atmosphere and relative humidity |
|                                   |             |  |  | 225                | use the diagram to answer the questions (#4)    | 34                  | interpreting Doppler radar images  |
|                                   |             |  |  |                    |   | 47                  | constructing a graph of drops of acid vs pH  |
|                                   |             |  |  |                    |   | 5                   | construct a temperature vs. time graph   |
|                                   |             |  |  |                    |   | 55                  | evaluating your completed bathymetric map  |
|                                   |             |  |  |                    |   | 61                  | finding a pattern of volcanoes on a bathymetric map                                  |
|                                   |             |  |  |                    |   | 71                  | evaluate your ability to interpret rock formations                                   |

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| Standard #:<br>Standard        | Level       | Concept  | Performance Objective   | student text<br>pg                                | detail   | investigation<br>pg  | detail  |
|--------------------------------|-------------|--|---|---|--|----------------------|---|
| 5SC-P6.PO2<br>Physical Science | Proficiency | Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior) | Describe physical interactions of matter and energy (e.g., phase change, gas laws, momentum conservation) | 50<br>197<br>207                                  | phases changes in the atmosphere<br>nuclear fusion on the sun produces energy from matter<br>Einstein's equation   |                      |   |
| 5SC-P6.PO3<br>Physical Science | Proficiency | Describe and explain physical interactions of matter and energy, using conceptual models (e.g., particle model for gaseous behavior) | Justify the validity of known conceptual models applied to physical phenomena                             | 33<br>43<br>44<br>159<br>161<br>162<br>163<br>175 | global warming<br>the effects of Earth's rotation on daytime heating and nighttime cooling<br>Earth's tilt causes seasons<br>Earth's rotation and patterns of day and night<br>axial tilt causes the seasons<br>solar eclipses<br>solar eclipses<br>identify seasons | 24<br>26<br>27<br>72 | developing a hypothesis about why the seasons occur<br>investigating how the distance of Earth from the sun affects its intensity<br>investigating how Earth's tilt affects the sun's intensity<br>building a sundial to keep track of daily time based on the cycles between Earth and the sun |

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| Standard #:<br>Standard                  | Level       | Concept   | Performance Objective   | student text<br>pg   | detail  | investigation<br>pg | detail   |
|--|-------------|---|---|--|---|---------------------|--|
| 6SC-P1.PO1<br>Earth and<br>Space Science | Proficiency | Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution) | Describe the processes explained by prominent scientific theories of the origin of the universe     | 168<br>169<br>170<br>171<br>172<br>185<br>186<br>195<br>208<br>221 | history of the telescope<br>types and uses of telescopes<br>types and uses of telescopes<br>satellites as tools of astronomy<br>spacecraft as tools of astronomy<br>historical theories of the origin of the moon<br>historical theories about the solar system<br>historical theories of which objects were planets<br>the use of spectroscopy to analyze stars<br>the Big Bang theory of the origin of the universe | 88<br>92            | understand why spectroscopy is an important tool of astronomers<br>measuring apparent brightness to calculate the distance to stars and galaxies |
| 6SC-P1.PO2<br>Earth and<br>Space Science | Proficiency | Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution) | Describe the processes explained by prominent scientific theories of the origin of the solar system | 215  | how the solar system was formed   |                     |  |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>  | <b>student text<br/>pg</b> | <b>detail</b>   | <b>investigation<br/>pg</b> | <b>detail</b> |
|--|--------------|---|---|----------------------------|---|-----------------------------|---------------|
| 6SC-P1.PO3<br>Earth and<br>Space Science | Proficiency  | Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution) | Describe the processes explained by prominent scientific theories of the origin of life forms | 24                         | comparison of Earth's atmosphere to other planets                 |                             |               |
|  |              |   |   | 98                         | extinction of the dinosaurs due to giant meteor hitting Earth     |                             |               |
|  |              |   |   | 189                        | what makes Earth capable of supporting life                       |                             |               |
|  |              |   |   | 193                        | how an asteroid event may have caused the extinction of dinosaurs |                             |               |
|  |              |   |   | 215                        | the existence of other planetary systems                          |                             |               |

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| Standard #:<br>Standard                  | Level       | Concept   | Performance<br>Objective   | student text<br>pg | detail  | investigation<br>pg | detail  |
|--|-------------|---|--|--------------------|---|---------------------|---|
| 6SC-P1.PO4<br>Earth and<br>Space Science | Proficiency | Explain prominent scientific theories of the origin of: the universe (Big Bang Theory), the solar system (formation from a nebular cloud of dust and gas), and life forms (evolution) | Relate physical laws to processes explained by prominent scientific theories of the origin of the universe, solar system, and life forms | 165                | characteristics of the universe                         | 79                  | observe and describe the appearance of the moon and Jupiter and its moons |
|  |             |   |  | 166                | calculating and using light years                       | 88                  | light emission and chemical composition                                   |
|  |             |   |  | 167                | light years and time                                    | 91                  | spectral lines and elements   |
|  |             |   |  | 207                | what is a star?   |                     |   |
|  |             |   |  | 212                | the life cycle of stars                                 |                     |   |
|  |             |   |  | 213                | description and illustration of the life cycle of stars |                     |   |
|  |             |   |  | 214                | death of massive stars                                  |                     |   |
|  |             |   |  | 214                | birth of elements                                       |                     |   |
|  |             |   |  | 214                | elements formed by nuclear fusion in stars              |                     |   |
|  |             |   |  | 216                | what is a galaxy?                                       |                     |   |
|  |             |   |  | 217                | the structure of the Milky Way Galaxy                   |                     |   |
|  |             |   |  | 222                | evidence for the Big Bang theory                        |                     |   |
|  |             |   |  | 223                | evidence for the Big Bang theory                        |                     |   |
|  |             |   |  | 226                | research and describe astronomical objects              |                     |   |

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| Standard #:<br>Standard                  | Level       | Concept  | Performance Objective   | student text<br>pg | detail   | investigation<br>pg | detail   |
|--|-------------|--|---|--------------------|--|---------------------|--|
| 6SC-P2.PO1<br>Earth and<br>Space Science | Proficiency | Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days | Describe how the Earth's rotation causes day and night  | 43                 | the effects of Earth's rotation on daytime heating and nighttime cooling | 24                  | developing a hypothesis about why the seasons occur  |
|  |             |  |   | 44                 | Earth's tilt causes seasons  | 26                  | investigating how the distance of Earth from the sun affects its intensity                   |
|  |             |  |   | 159                | Earth's rotation and patterns of day and night                           | 27                  | investigating how Earth's tilt affects the sun's intensity                                   |
|  |             |  |   | 161                | axial tilt causes the seasons  | 72                  | building a sundial to keep track of daily time based on the cycles between Earth and the sun |
|  |             |  |   | 162                | solar eclipses   |                     |  |
|  |             |  |   | 163                | solar eclipses   |                     |  |
|  |             |  |   | 175                | identify seasons   |                     |  |
| 6SC-P2.PO2<br>Earth and<br>Space Science | Proficiency | Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days | Describe how the Earth's tilt on its axis and revolution around the sun cause changes in relative length of days and nights | 43                 | the effects of Earth's rotation on daytime heating and nighttime cooling | 24                  | developing a hypothesis about why the seasons occur  |
|  |             |  |   | 44                 | Earth's tilt causes seasons  | 26                  | investigating how the distance of Earth from the sun affects its intensity                   |
|  |             |  |   | 159                | Earth's rotation and patterns of day and night                           | 27                  | investigating how Earth's tilt affects the sun's intensity                                   |
|  |             |  |   | 161                | axial tilt causes the seasons  | 72                  | building a sundial to keep track of daily time based on the cycles between Earth and the sun |
|  |             |  |   | 162                | solar eclipses   |                     |  |
|  |             |  |   | 163                | solar eclipses   |                     |  |
|  |             |  |   | 175                | identify seasons   |                     |  |

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| Standard #:<br>Standard                  | Level       | Concept  | Performance Objective   | student text<br>pg                                      | detail   | investigation<br>pg        | detail   |
|--|-------------|--|---|---|--|----------------------------|--|
| 6SC-P2.PO3<br>Earth and<br>Space Science | Proficiency | Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days | Describe how the Earth's tilt on its axis and revolution around the sun cause changes in seasons    | 43<br>44<br>44<br>70<br>159<br>161<br>162<br>163<br>175 | the effects of Earth's rotation on daytime heating and nighttime cooling<br>Earth's tilt causes seasons<br>Earth's tilt causes seasons<br>create a model to explain why Earth has seasons<br>Earth's rotation and patterns of day and night<br>axial tilt causes the seasons<br>solar eclipses<br>solar eclipses<br>identify seasons | 24<br>25<br>26<br>27<br>72 | developing a hypothesis about why the seasons occur<br>investigating factors which cause the seasons<br>investigating how the distance of Earth from the sun affects its intensity<br>investigating how Earth's tilt affects the sun's intensity<br>building a sundial to keep track of daily time based on the cycles between Earth and the sun |
| 6SC-P2.PO4<br>Earth and<br>Space Science | Proficiency | Demonstrate an understanding of the Earth's tilt, rotation and revolution and their effects on the season and the length of days | Describe the flow of energy to and from the Earth based on its shape, tilt, rotation and revolution | 32<br>33<br>37<br>45<br>46<br>56                        | distribution of incoming solar radiation<br>Earth's "energy budget"<br>Earth's internal energy<br>convection currents in the atmosphere<br>the Coriolis effect<br>rotation of air masses due to Coriolis effect  | 29                         | exploring how temperature-dependent layering creates currents  |

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| Standard #:<br>Standard                  | Level       | Concept   | Performance Objective   | student text<br>pg | detail  | investigation<br>pg | detail  |
|--|-------------|---|---|--------------------|---|---------------------|---|
| 6SC-P3.PO1<br>Earth and<br>Space Science | Proficiency | Use the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid-oceanic ridges and deep sea trenches | Describe the relationship between the Earth's internal heat and plate tectonics | 99                 | formation of Earth's layers                               | 52                  | listing which kind of plate boundary is associated with each geologic feature         |
|  |             |   |   | 100                | description of Earth's layers                             | 53                  | identifying tectonic plates and plate boundaries                                      |
|  |             |   |   | 102                | predicting what Earth might look like in 50 million years | 54                  | predicting plate movement over 50 million years and the resultant land features       |
|  |             |   |   | 102                | definition of plate tectonics                             |                     |   |
|  |             |   |   | 104                | sea-floor spreading and mid-ocean ridges                  | 61                  | examining the magma chemistry of volcanoes and how it relates to a volcano's location |
|  |             |   |   | 105                | magnetic patterns on the sea floor                        |                     |   |
|  |             |   |   | 106                | theory of plate tectonics                                 |                     |   |
|  |             |   |   | 107                | describing plate boundaries                               |                     |   |
|  |             |   |   | 108                | land features resulting from divergent plate boundaries   |                     |   |
|  |             |   |   | 108                | divergent plate boundaries                                |                     |   |
|  |             |   |   | 109                | convergent plate boundaries                               |                     |   |
|  |             |   |   | 109                | resulting land features from subduction                   |                     |   |
|  |             |   |   | 110                | transform plate boundaries                                |                     |   |
|  |             |   |   | 110                | land features resulting from transform plate boundaries   |                     |   |

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| Standard #:<br>Standard | Level | Concept | Performance<br>Objective | student text<br>pg | detail   | investigation<br>pg | detail |
|-------------------------|-------|---------|--------------------------|--------------------|--|---------------------|--------|
|                         |       |         |                          | 121                | predict separation of North America and Europe in 75 million years |                     |        |
|                         |       |         |                          | 122                | predict effects of divergent plate boundaries on Great Rift Valley |                     |        |
|                         |       |         |                          | 126                | formation of magma in Earth's mantle                               |                     |        |
|                         |       |         |                          | 128                | properties of volcanically formed rock                             |                     |        |
|                         |       |         |                          | 133                | types of volcanic rock   |                     |        |
|                         |       |         |                          | 135                | describing volcanic rock   |                     |        |
|                         |       |         |                          | 137                | mountain-building  |                     |        |
|                         |       |         |                          | 138                | changes in land features due to erosion                            |                     |        |
|                         |       |         |                          | 140                | effect of glaciers on land   |                     |        |

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| Standard #:<br>Standard                  | Level       | Concept   | Performance Objective  | student text<br>pg | detail   | investigation<br>pg | detail  |
|--|-------------|---|--|--------------------|--|---------------------|---|
| 6SC-P3.PO2<br>Earth and<br>Space Science | Proficiency | Use the theory of plate tectonics to explain relationships among earthquakes, volcanoes, mid-oceanic ridges and deep sea trenches | Describe the relationships among earthquakes, volcanoes, mid-oceanic ridges, deep sea trenches and tectonic plates | 104                | sea-floor spreading and mid-ocean ridges                 | 52                  | listing which kind of plate boundary is associated with each geologic feature |
|  |             |   |  | 105                | magnetic patterns on the sea floor                       | 60                  | understanding the Volcanic Explosivity Index                                  |
|  |             |   |  | 111                | conversion of energy in rocks causes seismic waves       | 61                  | finding a pattern of volcanoes related to the locations of plate boundaries   |
|  |             |   |  | 111                | earthquakes and plate tectonics                          |                     |   |
|  |             |   |  | 111                | causes and descriptions of earthquakes                   | 64                  | estimating the effects of meteor impacts on Earth                             |
|  |             |   |  | 112                | seismic waves  | 65                  | identifying which geologic features on Earth were caused by meteors           |
|  |             |   |  | 113                | earthquakes rating scales                                |                     |   |
|  |             |   |  | 125                | structure of a volcano                                   |                     |   |
|  |             |   |  | 126                | formation of magma in Earth's mantle                     |                     |   |
|  |             |   |  | 126                | geologic basis for volcanic eruptions                    |                     |   |
|  |             |   |  | 127                | where volcanic activity occurs                           |                     |   |
|  |             |   |  | 128                | types and shapes of volcanoes                            |                     |   |
|  |             |   |  | 128                | figure showing structure of different types of volcanoes |                     |   |
|  |             |   |  | 129                | formation of Hawaiian Islands due to volcanic activity   |                     |   |
|  |             |   |  | 129                | shield volcanoes   |                     |   |

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| Standard #:<br>Standard | Level | Concept | Performance<br>Objective | student text<br>pg | detail   | investigation<br>pg | detail |
|-------------------------|-------|---------|--------------------------|--------------------|--|---------------------|--------|
|                         |       |         |                          | 129                | formation of shield volcanoes due to hot spots |                     |        |
|                         |       |         |                          | 129                | geologic basis for shield volcanoes            |                     |        |
|                         |       |         |                          | 130                | formation of stratovolcanoes due to subduction |                     |        |
|                         |       |         |                          | 130                | geologic basis for stratovolcanoes             |                     |        |
|                         |       |         |                          | 130                | stratovolcanoes                                |                     |        |
|                         |       |         |                          | 131                | geologic bases for cinder cone volcanoes       |                     |        |
|                         |       |         |                          | 132                | volcanoes shape the Earth                      |                     |        |
|                         |       |         |                          | 137                | constructive process of mountain building      |                     |        |
|                         |       |         |                          | 138                | the destructive process of erosion             |                     |        |
|                         |       |         |                          | 139                | wind erosion                                   |                     |        |

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|--|--------------|--|--|----------------------------|--|-----------------------------|---------------|
| 6SC-P4.PO1<br>Earth and<br>Space Science | Proficiency  | Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time | Provide evidence for changes in Earth's geologic history, using data from relative age-dating techniques                     | 98<br>140                  | table and description of the geologic time scale<br>ice ages   |                             |               |
| 6SC-P4.PO2<br>Earth and<br>Space Science | Proficiency  | Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time | Provide evidence for changes in Earth's geologic history, using data from absolute age-dating techniques                     | 98<br>140                  | table and description of the geologic time scale<br>ice ages   |                             |               |
| 6SC-P4.PO3<br>Earth and<br>Space Science | Proficiency  | Use evidence (e.g., fossils, rock layers, ice cores, radiometric dating) to investigate how Earth has changed or remained constant over short and long periods of time | Describe changes or relative constancy in Earth's geologic history, using evidence gained through geologic dating techniques | 95<br>97<br>98<br>193      | origin of fossils<br>faunal succession<br>extinction of the dinosaurs due to giant meteor hitting Earth<br>how an asteroid event may have caused the extinction of dinosaurs |                             |               |

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| Standard #:<br>Standard                  | Level       | Concept  | Performance Objective   | student text<br>pg | detail   | investigation<br>pg | detail  |
|--|-------------|--|---|--------------------|--|---------------------|---|
| 6SC-P5.PO1<br>Earth and<br>Space Science | Proficiency | Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved | Describe the properties of water that make water a unique and essential substance | 49                 | water in the atmosphere affects weather patterns | 33                  | finding relative humidity   |
|  |             |  |   | 50                 | phase changes in the atmosphere and dewpoint     | 40                  | predict the quality of surface water to be tested and justify your answer         |
|  |             |  |   | 53                 | forms of precipitation                           |                     |   |
|  |             |  |   | 77                 | The Clean Water Act                              | 41                  | address what you can do to maintain or improve the water quality at the test site |
|  |             |  |   | 79                 | water quality testing                            |                     |   |
|  |             |  |   | 80                 | water quality testing                            |                     |   |
|  |             |  |   | 81                 | acid rain  | 44                  | the effects of acid rain on organisms in aquatic environments                     |
|  |             |  |   | 87                 | impact of increased CO2 on oceans                |                     |   |
|  |             |  |   | 88                 | pollution and the ocean food chain               |                     |   |
|  |             |  |   | 89                 | pollution and the ocean food chain               |                     |   |

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| Standard #:<br>Standard                  | Level       | Concept  | Performance Objective  | student text<br>pg                                 | detail  | investigation<br>pg  | detail  |
|--|-------------|--|--|--|---|----------------------|---|
| 6SC-P5.PO2<br>Earth and<br>Space Science | Proficiency | Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved | Describe factors that impact water quality   | 23<br>77<br>79<br>80<br>81<br>81<br>87<br>88<br>89 | nitrogen cycle<br>The Clean Water Act<br>water quality testing<br>water quality testing<br>effects of acid rain on natural environments<br>acid rain<br>impact of increased CO2 on oceans<br>pollution and the ocean food chain<br>pollution and the ocean food chain | 40<br>40<br>41<br>44 | predict the quality of surface water to be tested and justify your answer<br>actions to take to improve water quality<br>address what you can do to maintain or improve the water quality at the test site<br>the effects of acid rain on organisms in aquatic environments |
| 6SC-P5.PO3<br>Earth and<br>Space Science | Proficiency | Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved | Describe factors that influence the reuse, recycling and conservation of water   | 77<br>78   | water quality standards<br>importance of water analysis   |                      |   |
| 6SC-P5.PO4<br>Earth and<br>Space Science | Proficiency | Identify, investigate and predict the factors that influence the quality of water and how it can be reused, recycled and conserved | Predict future trends in water quality control and conservation, based on factors that influence water quality and usage | 77<br>78   | water quality standards<br>importance of water analysis   |                      |   |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>                            | <b>student text<br/>pg</b>   | <b>detail</b>  | <b>investigation<br/>pg</b> | <b>detail</b>  |
|--|--------------|---|---|------------------------------|--|-----------------------------|--|
| 6SC-P6.PO1<br>Earth and<br>Space Science | Proficiency  | Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere | Describe the processes involved in the water cycle          | 84<br>85<br>86<br>133<br>138 | oceans in the water cycle<br>sources of salts in the ocean<br>composition of seawater<br>volcanoes and water vapor<br>landforms shaped by water                        | 28                          | investigate how the ocean's salinity affects its density |
| 6SC-P6.PO2<br>Earth and<br>Space Science | Proficiency  | Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere | Describe the interactions between water and the biosphere   | 23<br>24<br>29<br>30<br>84   | description of Earth's atmosphere<br>effect of life on Earth's atmosphere<br>layers of the atmosphere<br>layers of the atmosphere<br>oceans as part of the hydrosphere |                             |  |
| 6SC-P6-PO3<br>Earth and<br>Space Science | Proficiency  | Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere | Describe the interactions between water and the lithosphere | 23<br>24<br>29<br>30<br>84   | description of Earth's atmosphere<br>effect of life on Earth's atmosphere<br>layers of the atmosphere<br>layers of the atmosphere<br>oceans as part of the hydrosphere |                             |  |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>                           | <b>student text<br/>pg</b> | <b>detail</b>                                    | <b>investigation<br/>pg</b> | <b>detail</b>  |
|--|--------------|---|--|----------------------------|--|-----------------------------|--|
| 6SC-P6-PO4<br>Earth and<br>Space Science | Proficiency  | Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere | Describe the interactions between water and the atmosphere | 23                         | composition of Earth's atmosphere                | 14                          | detecting ozone which is a protective atmosphere gas against high energy radiation |
|  |              |   |  | 23                         | description of Earth's atmosphere                |                             |  |
|  |              |   |  | 24                         | effect of life on Earth's atmosphere             |                             |  |
|  |              |   |  | 29                         | layers of the atmosphere                         |                             |  |
|  |              |   |  | 30                         | layers of the atmosphere                         |                             |  |
|  |              |   |  | 49                         | water in the atmosphere affects weather patterns |                             |  |
|  |              |   |  | 84                         | oceans as part of the hydrosphere                |                             |  |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>                         | <b>student text<br/>pg</b> | <b>detail</b>   | <b>investigation<br/>pg</b> | <b>detail</b>   |
|--|--------------|---|--|----------------------------|---|-----------------------------|---|
| 6SC-P6-PO5<br>Earth and<br>Space Science | Proficiency  | Identify and compare the interactions between water and other Earth systems including the biosphere, lithosphere and atmosphere | Compare the interactions between water and Earth systems | 23                         | description of Earth's atmosphere                           | 28                          | investigate how the ocean's salinity affects its density                  |
|  |              |   |  | 24                         | effect of life on Earth's atmosphere                        | 40                          | predict the quality of surface water to be tested and justify your answer |
|  |              |   |  | 29                         | layers of the atmosphere                                    |                             |   |
|  |              |   |  | 30                         | layers of the atmosphere                                    |                             |   |
|  |              |   |  | 31                         | effects of CFC's on the ozone layer                         |                             |   |
|  |              |   |  | 34                         | effects of burning fossil fuels                             |                             |   |
|  |              |   |  | 34                         | changes to the oceans due to increasing global temperatures |                             |   |
|  |              |   |  | 67                         | permafrost  |                             |   |
|  |              |   |  | 83                         | illustration of acid rain formation                         |                             |   |
|  |              |   |  | 84                         | oceans as part of the hydrosphere                           |                             |   |
|  |              |   |  | 85                         | sources of salts in the ocean                               |                             |   |
|  |              |   |  | 86                         | composition of seawater                                     |                             |   |
|  |              |   |  | 87                         | impact of increased CO2 in oceans                           |                             |   |
|  |              |   |  | 142                        | how urban sprawl changes local climate                      |                             |   |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>   | <b>student text<br/>pg</b> | <b>detail</b>                                       | <b>investigation<br/>pg</b> | <b>detail</b>   |
|--|--------------|---|--|----------------------------|---|-----------------------------|---|
| 6SC-P7.PO1<br>Earth and<br>Space Science | Proficiency  | Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth | Analyze how weather and climate are influenced by heat transferred from the sun to the Earth | 32                         | transfer of energy in and out of Earth's atmosphere | 18                          | investigate the temperature effects of greenhouse gases       |
|  |              |   |  | 32                         | distribution of incoming solar radiation            | 29                          | exploring how temperature-dependent layering creates currents |
|  |              |   |  | 33                         | Earth's "energy budget"                             |                             |   |
|  |              |   |  | 33                         | greenhouse effect and greenhouse gasses             | 35                          | use radar to detect a tornado                                 |
|  |              |   |  | 37                         | Earth's internal energy                             | 36                          | using radar to track a hurricane                              |
|  |              |   |  | 45                         | convection currents in the atmosphere               | 47                          | effect of ocean on carbon dioxide levels in the atmosphere    |
|  |              |   |  | 49                         | factors which influence the weather                 |                             |   |
|  |              |   |  | 51                         | cloud formation                                     |                             |   |
|  |              |   |  | 57                         | description of thunderstorms                        |                             |   |
|  |              |   |  | 58                         | description of hurricanes                           |                             |   |
|  |              |   |  | 59                         | description of tornadoes                            |                             |   |

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| <b>Standard #:<br/>Standard</b>          | <b>Level</b> | <b>Concept</b>  | <b>Performance<br/>Objective</b>   | <b>student text<br/>pg</b> | <b>detail</b>                                      | <b>investigation<br/>pg</b> | <b>detail</b>                    |
|--|--------------|---|--|----------------------------|--|-----------------------------|----------------------------------|
| 6SC-P7.PO2<br>Earth and<br>Space Science | Proficiency  | Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth | Analyze how weather is influenced by both natural and artificial Earth features (e.g., mountain ranges, cities, bodies of water) | 49                         | factors which influence the weather                | 35                          | use radar to detect a tornado    |
|  |              |   |  | 51                         | cloud formation                                    | 36                          | using radar to track a hurricane |
|  |              |   |  | 57                         | description of thunderstorms                       | 39                          | research a particular biome      |
|  |              |   |  | 58                         | description of hurricanes                          |                             |                                  |
|  |              |   |  | 59                         | description of tornadoes                           |                             |                                  |
|  |              |   |  | 62                         | different types of deserts and how they are formed |                             |                                  |
|  |              |   |  | 63                         | how tropical rainforests are formed                |                             |                                  |

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| Standard #:<br>Standard                  | Level       | Concept   | Performance Objective   | student text<br>pg | detail  | investigation<br>pg | detail  |
|--|-------------|---|---|--------------------|---|---------------------|---|
| 6SC-P7.PO3<br>Earth and<br>Space Science | Proficiency | Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth | Analyze how weather is influenced by both natural and artificial dynamic processes (e.g., sunspots, volcanoes, pollution, air and ocean currents) | 43                 | Earth's temperature varies with latitude                    | 23                  | research how large bodies of water affect climate |
|  |             |   |   | 46                 | the Coriolis effect   |                     |   |
|  |             |   |   | 47                 | global wind patterns  | 23                  | research how large bodies of water affect climate |
|  |             |   |   | 48                 | descriptions of ocean currents and their effects on climate |                     |   |
|  |             |   |   | 48                 | effects of the Gulf Stream on climate of Great Britain      | 31                  | understanding the Atlantic gyre                   |
|  |             |   |   | 49                 | factors which influence the weather                         | 35                  | use radar to detect a tornado                     |
|  |             |   |   | 49                 | water in the atmosphere affects weather patterns            | 36                  | using radar to track a hurricane                  |
|  |             |   |   | 51                 | cloud formation   |                     |   |
|  |             |   |   | 54                 | cold fronts   |                     |   |
|  |             |   |   | 54                 | effects of moving air masses                                |                     |   |
|  |             |   |   | 55                 | warm fronts   |                     |   |
|  |             |   |   | 55                 | jet streams   |                     |   |
|  |             |   |   | 56                 | rotation of air masses due to Coriolis effect               |                     |   |
|  |             |   |   | 57                 | description of thunderstorms                                |                     |   |
|  |             |   |   | 58                 | description of hurricanes                                   |                     |   |
|  |             |   |   | 59                 | description of tornadoes                                    |                     |   |

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|--|-------------|---|--|--------------------|---|---------------------|---|
|  |             |   |  | 60                 | causes and effects of the El Nino Southern Oscillation            |                     |   |
|  |             |   |  | 62                 | effect of cold ocean currents on formation of fog deserts         |                     |   |
|  |             |   |  | 63                 | effect of warm ocean currents on formation of tropical rainforest |                     |   |
|  |             |   |  | 65                 | effect of large bodies of water on climate                        |                     |   |
|  |             |   |  | 67                 | alpine tundra occurs at high altitudes                            |                     |   |
| 6SC-P7.PO4<br>Earth and<br>Space Science | Proficiency | Investigate, analyze and evaluate the factors that may influence weather; describe their effects on the environment and daily activities on Earth | Evaluate the effects of various weather factors on the environment and daily activities on Earth | 35                 | global temperature changing over time                             | 25                  | investigating factors which cause the seasons   |
|  |             |   |  | 37                 | computer modeling to predict greenhouse effects                   | 35                  | describe what safety precautions the National Weather Service recommends for tornado conditions |
|  |             |   |  | 44                 | Earth's tilt causes seasons                                       |                     |   |
|  |             |   |  | 70                 | create a model to explain why Earth has seasons                   |                     |   |
|  |             |   |  | 70                 | write an action plan to stay safe during a tornado                |                     |   |
|  |             |   |  | 102                | Earth's surface is changing                                       |                     |   |