



**ARIZONA**  
**Science Standards High School**  
***Earth Science: Geology, the Environment,***  
***and the Universe* © 2005**

OBJECTIVES	PAGE REFERENCES
<b>Strand 1: Inquiry Process</b>	
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.	
<b>Concept 1: Observations, Questions, and Hypotheses</b>	
Formulate predictions, questions, or hypotheses based on observations. Evaluate appropriate resources.	
PO 1. Evaluate scientific information for relevance to a given problem.	SE: <i>Design Your Own GeoLab</i> 92-93, 378-379 <i>GeoLab</i> 406-407 <i>Mapping GeoLab</i> 734-735, 768-769 TWE: ACT 275
PO 2. Develop questions from observations that transition into testable hypotheses.	SE: <i>Discovery Lab</i> 471 <i>MiniLab</i> 845 TWE: CL 215, 667 M 240 A 271, 299, 329, 428, 523, 761, 766 P 685
PO 3. Formulate a testable hypothesis.	SE: <i>Design Your Own GeoLab</i> 92-93, 378-379, 570-571, 704-705, 798-799 <i>Internet GeoLab</i> 352-353, 488-489, 642-643, 852-853 TWE: P 685
PO 4. Predict the outcome of an investigation based on prior evidence, probability, and/or modeling (not guessing or inferring).	SE: <i>MiniLab</i> 254, 290, 688 <i>GeoLab</i> 292-293 TWE: A 12, 141, 329, 523
<b>Concept 2: Scientific Testing (Investigating and Modeling)</b>	
Design and conduct controlled investigations.	
PO 1. Demonstrate safe and ethical procedures (e.g., use and care of technology, materials, organisms) and behavior in all science inquiry.	SE: <i>GeoLab</i> 70-71, 114-115, 174-175, 292-293 <i>Design Your Own GeoLab</i> 92-93, 378-379, 676-677, 704-705 <i>Discovery Lab</i> 471 <i>Appendix B</i> 910-911 TWE: P 685
PO 2. Identify the resources needed to conduct an investigation.	SE: <i>Design Your Own GeoLab</i> 92-93, 378-379, 676-677, 704-705, 798-799 TWE: A 71, 474, 587, 688 P 685

OBJECTIVES	PAGE REFERENCES
<p>PO 3. Design an appropriate protocol (written plan of action) for testing a hypothesis:</p> <ul style="list-style-type: none"> <li>• Identify dependent and independent variables in a controlled investigation.</li> <li>• Determine an appropriate method for data collection (e.g., using balances, thermometers, microscopes, spectrophotometer, using qualitative changes).</li> <li>• Determine an appropriate method for recording data (e.g., notes, sketches, photographs, videos, journals (logs), charts, computers/calculators).</li> </ul>	<p>SE: <i>Design Your Own GeoLab</i> 92-93, 378-379, 704-705</p> <p>TWE: P 13, 685 A 71, 115, 163, 474, 587, 688 M 130</p>
<p>PO 4. Conduct a scientific investigation that is based on a research design.</p>	<p>SE: <i>Design Your Own GeoLab</i> 92-93, 378-379, 704-705</p> <p>TWE: A 71, 115, 163, 587, 688 P 685</p>
<p>PO 5. Record observations, notes, sketches, questions, and ideas using tools such as journals, charts, graphs, and computers.</p>	<p>SE: <i>Design Your Own GeoLab</i> 92-93, 570-571, 704-705 <i>Internet GeoLab</i> 352-353, 488-489, 642-643, 852-853</p> <p>TWE: ACT 158 ITI 305 CL 308, 667 A 316, 398, 663 R 363 P 693</p>
<p><b>Concept 3: Analysis, Conclusions, and Refinements</b> Evaluate experimental design, analyze data to explain results and propose further investigations. Design models.</p>	
<p>PO 1. Interpret data that show a variety of possible relationships between variables, including:</p> <ul style="list-style-type: none"> <li>• positive relationship</li> <li>• negative relationship</li> <li>• no relationship</li> </ul>	<p>SE: <i>GeoLab</i> 70-71, 114-115, 174-175, 232-233, 292-293 <i>Design Your Own GeoLab</i> 378-379 <i>MiniLab</i> 428</p> <p>TWE: DI 512</p>
<p>PO 2. Evaluate whether investigational data support or do not support the proposed hypothesis.</p>	<p>SE: <i>Design Your Own GeoLab</i> 378-379</p>
<p>PO 3. Critique reports of scientific studies (e.g., published papers, student reports).</p>	<p>SE: <i>Design Your Own GeoLab</i> 676-677, 704-705, 798-799</p> <p>TWE: DI 13 CL 215 CFU 227, 593 A 588 ACT 589 P 631 AC 633</p>

OBJECTIVES	PAGE REFERENCES
PO 4. Evaluate the design of an investigation to identify possible sources of procedural error, including: <ul style="list-style-type: none"> <li>• sample size</li> <li>• trials</li> <li>• controls</li> <li>• analyses</li> </ul>	SE: <i>Problem-Solving Lab</i> 110, 843 <i>GeoLab</i> 140-141, 174-175, 826-827 <i>MiniLab</i> 456 TWE: A 21, 423, 791 P 218
PO 5. Design models (conceptual or physical) of the following to represent "real world" scenarios: <ul style="list-style-type: none"> <li>• carbon cycle</li> <li>• water cycle</li> <li>• phase change</li> <li>• collisions</li> </ul>	SE: <i>MiniLab</i> 290 <i>Skill Review</i> 291 TWE: DI 67, 754 TPK 212 R 291 D 755
PO 6. Use descriptive statistics to analyze data, including: <ul style="list-style-type: none"> <li>• mean</li> <li>• frequency</li> <li>• range</li> </ul> (See MHS-S2C1-10)	SE: <i>Problem-Solving Lab</i> 401, 423, 637 <i>MiniLab</i> 456 <i>Mapping GeoLab</i> 464-465, 540-541 TWE: ACT 158, 403 A 637
PO 7. Propose further investigations based on the findings of a conducted investigation.	SE: <i>MiniLab</i> 163, 348 TWE: A 290, 302, 329, 474, 523, 688
<b>Concept 4: Communication</b> Communicate results of investigations.	
PO 1. For a specific investigation, choose an appropriate method for communicating the results.	SE: <i>Design Your Own GeoLab</i> 92-93, 378-379 <i>Internet GeoLab</i> 352-353, 488-489, 852-853 TWE: ACT 158 A 571 CL 667
PO 2. Produce graphs that communicate data. (See MHS-S2C1-02)	SE: <i>GeoLab</i> 232-233, 292-293, 406-407 <i>Discovery Lab</i> 271, 299, 526 <i>Design Your Own GeoLab</i> 378-379 <i>Science &amp; Math</i> 380 <i>Problem-Solving Lab</i> 401, 486, 699, 843 TWE: A 163, 711 ACT 275
PO 3. Communicate results clearly and logically.	SE: <i>GeoLab</i> 70-71 <i>Design Your Own GeoLab</i> 92-93, 378-379, 570-571 <i>Internet GeoLab</i> 352-353, 488-489, 642-643, 852-853 TWE: A 175 CL 667 M 702
PO 4. Support conclusions with logical scientific arguments.	SE: <i>GeoLab</i> 70-71, 174-175, 826-827 <i>Design Your Own GeoLab</i> 92-93, 378-379, 570-571 <i>Internet GeoLab</i> 352-353, 488-489, 642-643, 852-853 TWE: A 175 CL 667 M 702

OBJECTIVES	PAGE REFERENCES
<b>Strand 2: History and Nature of Science</b>	
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.	
<b>Concept 1: History of Science as a Human Endeavor</b>	
Identify individual, cultural, and technological contributions to scientific knowledge.	
PO 1. Describe how human curiosity and needs have influenced science, impacting the quality of life worldwide.	SE: <i>Science &amp; Technology</i> 22, 72, 354, 466 <i>Science in the News</i> 142 <i>Science &amp; the Environment</i> 234
PO 2. Describe how diverse people and/or cultures, past and present, have made important contributions to scientific innovations.	SE: 443-447, 775-779 TWE: AC 28 CD 30, 57, 105, 168, 287, 313, 335, 416, 450, 818 E 68 CB 437
PO 3. Analyze how specific changes in science have affected society.	SE: 37-41, 752 <i>Science in the News</i> 142 <i>Science &amp; Technology</i> 324 TWE: AC 842
PO 4. Analyze how specific cultural and/or societal issues promote or hinder scientific advancements.	SE: <i>Science &amp; Technology</i> 116, 324, 854 <i>Science &amp; the Environment</i> 176 <i>Science in the News</i> 294
<b>Concept 2: Nature of Scientific Knowledge</b>	
Understand how science is a process for generating knowledge.	
PO 1. Specify the requirements of a valid, scientific explanation (theory), including that it be: <ul style="list-style-type: none"> <li>• logical</li> <li>• subject to peer review</li> <li>• public</li> <li>• respectful of rules of evidence</li> </ul>	SE: 17-19 TWE: CB 4D CFU 19
PO 2. Explain the process by which accepted ideas are challenged or extended by scientific innovation.	SE: 11-13, 17-19, 443-447, 448-454, 455-459, 589-591
PO 3. Distinguish between pure and applied science.	See Glencoe's <i>Science Level Blue</i> © 2005 Chapter 1, Section 3 <i>Science and Technology</i> , pages 24-27.
PO 4. Describe how scientists continue to investigate and critically analyze aspects of theories.	SE: 11-13, 460-463, 756-757, 847-851 <i>Science in the News</i> 596 TWE: CB 4C-D UAA 13 TPK 375 A 588 ACT 589

OBJECTIVES	PAGE REFERENCES
<p align="center"><b>Strand 3: Science in Personal and Social Perspectives</b></p> <p>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.</p>	
<p><b>Concept 1: Changes in Environments</b> Describe the interactions between human populations, natural hazards, and the environment.</p>	
<p>PO 1. Evaluate how the processes of natural ecosystems affect, and are affected by, humans.</p>	<p>SE: 157-158, 228-231 <i>Science &amp; the Environment</i> 176, 234, 706 TWE: P 727</p>
<p>PO 2. Describe the environmental effects of the following natural and/or human-caused hazards:</p> <ul style="list-style-type: none"> <li>• flooding</li> <li>• drought</li> <li>• earthquakes</li> <li>• fires</li> <li>• pollution</li> <li>• extreme weather</li> </ul>	<p>SE: 157-158, 219-221, 254-257, 334-340, 341-346, 347-351, 664-668 <i>Earth Science Online</i> 220 <i>Science in the News</i> 294 TWE: EC 158 TS 234 ESJ 256 DI 281</p>
<p>PO 3. Assess how human activities (e.g., clear cutting, water management, tree thinning) can affect the potential for hazards.</p>	<p>SE: 254-257, 664-668, 669-673, 716-723, 724-729, 730-733 <i>Science &amp; the Environment</i> 234, 260 <i>Science in the News</i> 294 TWE: ESJ 256 CFU 675</p>
<p>PO 4. Evaluate the following factors that affect the quality of the environment:</p> <ul style="list-style-type: none"> <li>• urban development</li> <li>• smoke</li> <li>• volcanic dust</li> </ul>	<p>SE: 374, 721-722 <i>Science &amp; the Environment</i> 490 TWE: EC 9, 189 A 374 CB 490 CFU 723</p>
<p>PO 5. Evaluate the effectiveness of conservation practices and preservation techniques on environmental quality and biodiversity.</p>	<p>SE: 257, 698-703, 728-729, 732-733 <i>Science &amp; the Environment</i> 260 <i>Science in the News</i> 294 TWE: A 91, 733 EC 273 R 377 CFU 733</p>
<p><b>Concept 2: Science and Technology in Society</b> Develop viable solutions to a need or problem.</p>	
<p>PO 1. Analyze the costs, benefits, and risks of various ways of dealing with the following needs or problems:</p> <ul style="list-style-type: none"> <li>• various forms of alternative energy</li> <li>• storage of nuclear waste</li> <li>• abandoned mines</li> <li>• greenhouse gases</li> <li>• hazardous wastes</li> </ul>	<p>SE: 375-377, 690-697, 717, 725-726 <i>Science &amp; Math</i> 380 <i>Earth Science Online</i> 694 <i>Skill Review</i> 697 <i>Science &amp; the Environment</i> 736 TWE: CFU 377 TS 380 CB 717 P 725</p>

OBJECTIVES	PAGE REFERENCES
PO 2. Recognize the importance of basing arguments on a thorough understanding of the core concepts and principles of science and technology.	SE: <i>Science in the News</i> 142 <i>Science &amp; the Environment</i> 176, 234 TWE: DIS 848
PO 3. Support a position on a science or technology issue.	SE: <i>Science in the News</i> 142 <i>Science &amp; the Environment</i> 176, 234 TWE: AES 186 R 197 A 593, 634 DIS 632, 848 AC 633 CL 672, 695 E 712
PO 4. Analyze the use of renewable and nonrenewable resources in Arizona: <ul style="list-style-type: none"> <li>• water</li> <li>• land</li> <li>• soil</li> <li>• minerals</li> <li>• air</li> </ul>	SE: 254-257, 655-658, 659-663, 664-668, 669-675 <i>National Geographic Expeditions</i> 870-873 TWE: E 90 EC 90 TS 234, 260 P 657 CL 667
PO 5. Evaluate methods used to manage natural resources (e.g., reintroduction of wildlife, fire ecology).	SE: 672-675, 722-723 <i>Science &amp; the Environment</i> 176, 234 TWE: A 91
<b>Concept 3: Human Population Characteristics</b> Analyze factors that affect human populations.	
PO 1. Analyze social factors that limit the growth of a human population, including: <ul style="list-style-type: none"> <li>• affluence</li> <li>• education</li> <li>• access to health care</li> <li>• cultural influences</li> </ul>	SE: 711-715
PO 2. Describe biotic (living) and abiotic (nonliving) factors that affect human populations.	SE: 711-715
PO 3. Predict the effect of a change in a specific factor on a human population.	TWE: CFU 715 A 715
<b>Strand 6: Earth and Space Science</b> 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.	
<b>Concept 1: Geochemical Cycles</b> Analyze the interactions between the Earth's structures, atmosphere, and geochemical cycles.	
PO 1. Identify ways materials are cycled within the earth system (i.e., carbon cycle, water cycle, rock cycle).	SE: 138-139, 211-212, 239-240, 290-291, 664-665 TWE: R 243, 291 CB 270D A 377 TPK 392 AC 720

OBJECTIVES	PAGE REFERENCES
PO 2. Demonstrate how dynamic processes such as weathering, erosion, sedimentation, metamorphism, and orogenesis relate to redistribution of materials within the earth system.	SE: 121-127, 133-138, 153-161, 162-166, 181-190, 191-197, 198-203, 211-221, 222-227 <i>Discovery Lab</i> 153 <i>GeoDigest</i> 264-266 TWE: ITP 123 EC 124
PO 3. Explain how the rock cycle is related to plate tectonics.	SE: 99-106, 133-138, 471-475, 476-479, 484-487 <i>Discovery Lab</i> 471
PO 4. Demonstrate how the hydrosphere links the biosphere, lithosphere, cryosphere, and atmosphere.	SE: 211-221, 222-227, 228-231, 244-248, 283-284, 285-291 <i>MiniLab</i> 229, 290 <i>Discovery Lab</i> 271 TWE: IM 212 A 240 CB 270D DI 272 CL 289
*PO 5. Describe factors that impact current and future water quantity and quality including surface, ground, and local water issues.	SE: 254-257, 669-675, 730-733 <i>MiniLab</i> 674 <i>National Geographic Expeditions</i> 870-873 TWE: DI 255, 732 CB 255 ESJ 256 CFU 675 R 675, 733 M 731 P 732
PO 6. Analyze methods of reclamation and conservation of water.	SE: 257, 672-675, 732-733 <i>Earth Science Online</i> 256 TWE: CFU 675, 733 R 675 E 731 DI 732 EC 732 A 733
PO 7. Explain how the geochemical processes are responsible for the concentration of economically valuable minerals and ores in Arizona and worldwide.	SE: 77-83, 89-91, 99-106, 111-113, 132 TWE: CB 76C, 98C-D, 112 E 78 P 82 AC 112
<b>Concept 2: Energy in the Earth System (Both Internal and External)</b>	
Understand the relationships between the Earth's land masses, oceans, and atmosphere.	
*PO 1. Describe the flow of energy to and from the Earth.	SE: 275-277 TWE: M 276 A 277
*PO 2. Explain the mechanisms of heat transfer (convection, conduction, radiation) among the atmosphere, land masses, and oceans.	SE: 275-277, 299 #18 TWE: CFU 277
*PO 3. Distinguish between weather and climate.	SE: 300, 359-360

OBJECTIVES	PAGE REFERENCES
<p><b>Internal Energy:</b> PO 4. Demonstrate the relationship between the Earth's internal convective heat flow and plate tectonics.</p>	<p>SE: 460-463 TWE: D 460 ESJ 462 R 463</p>
<p>PO 5. Demonstrate the relationships among earthquakes, volcanoes, mountain ranges, mid-oceanic ridges, deep sea trenches, and tectonic plates.</p>	<p>SE: 455-459, 484-487, 495-499, 509-510 <i>MiniLab</i> 456 <i>Discovery Lab</i> 495 TWE: AC 457 CB 457 ITI 485, 509 CFU 487 IM 497</p>
<p>PO 6. Distinguish among seismic S, P, and surface waves.</p>	<p>SE: 498-499, 500-504 TWE: CB 498, 501 D 498 ACT 498 A 501 ITI 501 R 504</p>
<p>PO 7. Analyze the seismic evidence (S and P waves) used to determine the structure of the Earth.</p>	<p>SE: 502-504, 521 #22 TWE: CB 503 DI 503 CFU 504 A 504</p>
<p>PO 8. Describe how radioactive decay maintains the Earth's internal temperature.</p>	<p>SE: 578-579 TWE: R 579</p>
<p><b>External Energy:</b> PO 9. Explain the effect of heat transfer on climate and weather.</p>	<p>SE: 275-277, 285, 300-304, 305-311, 329-333, 341-344 <i>Skill Review</i> 277 TWE: CB 300 CON 330 TPK 343 ITI 362 E 367</p>
<p>PO 10. Demonstrate the effect of the Earth's rotation (i.e., Coriolis effect) on the movement of water and air.</p>	<p>SE: 305-307, 403-404 <i>Section Assessment</i> 311 TWE: CON 343 A 405 TPK 787</p>
<p>PO 11. Describe the origin, life cycle, and behavior of weather systems (i.e., air mass, front, high and low systems, pressure gradients).</p>	<p>SE: 301-304, 305-311 <i>Earth Science Online</i> 309 TWE: R 304, 311 CL 308 ACT 310 CFU 311 A 311</p>

OBJECTIVES	PAGE REFERENCES
PO 12. Describe the conditions that cause severe weather (e.g., hurricanes, tornadoes, thunderstorms).	SE: 329-333, 334-340, 341-346, 347-351 TWE: CON 330 DIS 332 A 333 ITI 338 UST 338 CFU 340 CB 342 R 346
PO 13. Propose appropriate safety measures that can be taken in preparation for severe weather.	SE: 336, 339-340, 346 <i>Earth Science Online</i> 336 TWE: AES 337 A 346 R 351
PO 14. Analyze how weather is influenced by both natural and artificial earth features (e.g., mountain ranges, bodies of water, cities, air pollution).	SE: 278-284, 285-286, 299-304, 331, 370-371 TWE: DI 281, 331 ITP 281 UST 282 ITI 330 CON 371
PO 15. List the factors that determine climate (e.g., altitude, latitude, water bodies, precipitation, prevailing winds, topography).	SE: 359-363, 364-368 <i>Skill Review</i> 363 <i>Design Your Own GeoLab</i> 378-379 TWE: CFU 363 CB 365 DIS 366 D 367 CON 437
PO 16. Explain the causes and/or effects of climate changes over long periods of time (e.g., glaciation, desertification, solar activity, greenhouse effect).	SE: 369-374 TWE: ITI 369 P 369 CB 373 D 725
PO 17. Investigate the effects of acid rain, smoke, volcanic dust, urban development, and greenhouse gases on climate change over various periods of time.	SE: 367-368, 374, 375-377, 724-728 <i>Science &amp; Math</i> 380 <i>Earth Science Online</i> 725 TWE: EC 273, 367 A 368, 374, 377 M 373 ESJ 726
<b>Concept 3: Origin and Evolution of the Earth System</b> Analyze the factors used to explain the history and evolution of the Earth.	
<b>Earth Origin/System:</b> PO 1. Describe the scientific theory of the origin of the solar system (solar nebular hypothesis).	SE: 793-797 TWE: TPK 793, 794 AC 794 UAA 794 DI 796 CFU 797

OBJECTIVES	PAGE REFERENCES
PO 2. Describe the characteristics, location, and motions of the various kinds of objects in our solar system, including the Sun, planets, satellites, comets, meteors, and asteroids.	SE: 775-779, 780-785, 786-792, 795-797 <i>MiniLab 777</i> <i>Problem-Solving Lab 791</i> TWE: ESJ 776, 782 CB 776 DI 777 D 778 A 779, 785 R 785, 792
PO 3. Explain the phases of the Moon, eclipses (lunar and solar), and the interaction of the Sun, Moon, and Earth (tidal effect).	SE: 402-403, 762-767 <i>Earth Science Online 765</i> <i>Problem-Solving Lab 766</i> TWE: ITI 403 A 763, 767 CB 763 DI 763 E 764 R 767 CFU 767
<b>Earth History/Evolution:</b> PO 4. Interpret a geologic time scale.	SE: 553-556 <i>Earth Science Online 555</i> <i>Design Your Own GeoLab 570-571</i> TWE: CB 552C, 555 DI 554 A 556 CFU 556
PO 5. Distinguish between relative and absolute geologic dating techniques.	SE: 557-561, 562-565 <i>MiniLab 558</i> <i>Problem-Solving Lab 560</i> TWE: CB 552C-D, 563 M 559 R 561 A 561, 565 ESJ 564
PO 6. Investigate scientific theories of how life originated on Earth (high temperature, low oxygen, clay catalyst model).	SE: 589-593 <i>Section Assessment 593</i> TWE: CB 590
PO 7. Describe how life on Earth has influenced the evolution of the Earth's systems.	SE: 584-588
PO 8. Sequence major events in the Earth's evolution (e.g., mass extinctions, glacial episodes) using relative and absolute dating data.	SE: 601-604, 605-608, 612-615 <i>Design Your Own GeoLab 570-571</i> <i>Mapping GeoLab 594-595</i> TWE: A 560, 583 CFU 561 D 563 DI 563 CB 563 P 582

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PO 9. Analyze patterns in the fossil record related to the theory of organic evolution.	SE: 566-569, 609-611, 615-617, 628-634, 639-641 <i>Science in the News</i> 572 <i>GeoLab</i> 618-619 <i>Discovery Lab</i> 625 <i>National Geographic Expeditions</i> 892-897 TWE: CL 568, 615 CB 576D
<b>Concept 4: Origin and Evolution of the Universe</b> Analyze the factors used to explain the origin and evolution of the universe.	
*PO 1. Describe the Big Bang Theory as an explanation for the origin of the universe.	SE: 847-851 <i>Section Assessment</i> 851 TWE: DIS 848
PO 2. Describe the fusion process that takes place in stars.	SE: 809-810, 821, 831 TWE: E 811
PO 3. Analyze the evolution of various types of stars using the Hertzsprung-Russell (HR) diagram.	SE: 819-820, 821-825 TWE: IM 804D UAA 822 DI 822 CFU 825 A 825
PO 4. Compare the evolution (life cycles) of stars of different masses (low and high mass).	SE: 821-825, 831 #22 TWE: CB 823 R 825
PO 5. Explain the formation of the light elements in stars and the heavier elements (what astronomers call “metals”) in supernova explosions.	SE: 821-825 TWE: E 823 AC 824 A 837
PO 6. Explain the evolution and life cycles of galaxies.	SE: 833-838, 839-846 TWE: CB 837, 840 A 838 R 838 ITP 842

## Codes Used for TWE Pages

A	Assessment
AC	Across the Curriculum
ACT	Activity
AES	Applying Earth Science
CB	Content Background
CD	Cultural Diversity
CFU	Check for Understanding
CL	Collaborative Learning
CON	Concept Development
D	Demo
DI	Differentiated Instruction
DIS	Discussion
E	Enrichment
EC	Environmental Connection
ESJ	Earth Science Journal
IM	Identifying Misconceptions
ITI	Interpreting the Illustration
ITP	Interpreting the Photo
M	Modeling
P	Project
R	Reteach
TPK	Tying to Previous Knowledge
TS	Teaching Strategies
UAA	Using an Analogy
UST	Using Scientific Terms