



EARTH SCIENCE

*Geology, the Environment,
and the Universe*

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STANDARDS	PAGE REFERENCES
<p>Standard 1: Nature of Science</p>	
<p>Students exercise the basic tenets of scientific investigation, make accurate observations, exercise critical thinking skills, apply proper scientific instruments of investigation and measurement tools, and communicate results in problem solving. Students evaluate the validity of information by utilizing the tools of scientific thinking and investigation. Students summarize their findings by creating lab reports using technical writing including graphs, charts, and diagrams to communicate the results of investigations.</p>	
<p>Goal 1.1: Understand Systems, Order, and Organization:</p>	
<p>Objective(s): By the end of Earth Science, the student will be able to:</p>	
<p>8-9.ES.1.1.1 Explain the scientific meaning of system, order, and organization. (648.01a)</p>	<p>Student Edition: 5-10 <i>Earth Science Online 8</i> Teacher Wraparound Edition: R 10</p>

STANDARDS	PAGE REFERENCES
8-9.ES.1.1.2 Apply the concepts of order and organization to a given system. (648.01a)	Student Edition: 5-10, 78-79, 107-113, 128-132, 133-137, 170-173, 271-274, 301-304, 305-311 <i>MiniLab</i> 108 Teacher Wraparound Edition: A 9, 277; CFU 10; CL 8
Goal 1.2: Understand Concepts and Processes of Evidence, Models, and Explanation	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.1.2.1 Use observations and data as evidence on which to base scientific explanations. (648.02a)	Student Edition: <i>MiniLab</i> 12 <i>GeoLab</i> 70-71, 114-115, 140-141, 174-175, 232-233, 618-619 <i>Design Your Own GeoLab</i> 92-93, 378-379, 704-705 <i>Discovery Lab</i> 99, 271 Teacher Wraparound Edition: P 13
8-9.ES.1.2.2 Develop models to explain concepts or systems. (648.02b)	Student Edition: <i>MiniLab</i> 79 <i>GeoLab</i> 114-115, 174-175, 232-233, 406-407 <i>Discovery Lab</i> 121, 153, 181, 495 Teacher Wraparound Edition: DI 85; M 8, 130, 214, 250
8-9.ES.1.2.3 Develop scientific explanations based on knowledge, logic, and analysis. (648.02c)	Student Edition: <i>GeoLab</i> 70-71, 114-115, 140-141, 174-175, 232-233, 292-293, 406-407, 826-827 <i>Design Your Own GeoLab</i> 92-93, 378-379, 570-571 <i>Internet GeoLab</i> 488-489, 642-643

STANDARDS	PAGE REFERENCES
Goal 1.3: Understand Constancy, Change, and Measurement	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.1.3.1 Measure changes that can occur in and among systems. (648.03b)	Student Edition: <i>Using Math</i> 58 <i>MiniLab</i> 163, 376, 428 <i>GeoLab</i> 174-175, 232-233, 406-407 <i>Design Your Own GeoLab</i> 378-379 <i>Science & Math</i> 380
8-9.ES.1.3.2 Analyze changes that can occur in and among systems. (648.03b)	Student Edition: 138-139, 167-173, 211-221, 223-227, 228-231, 249-257, 455-459 <i>Problem-Solving Lab</i> 18 <i>GeoLab</i> 140-141 Teacher Wraparound Edition: A 231; AC 101; CFU 231; EC 9; TL 165
8-9.ES.1.3.3 Measure and calculate using the metric system. (648.03c)	Student Edition: 14-15 <i>Earth Science Online</i> 14 <i>Using Math</i> 14 <i>GeoLab</i> 20-21, 174-175, 232-233, 406-407 <i>MiniLab</i> 163, 348 <i>Science & Math</i> 206 <i>Design Your Own GeoLab</i> 378-379, 798-799 Teacher Wraparound Edition: AC 185; CFU 16
Goal 1.4: Understand the Theory that Evolution is a Process that Relates to the Gradual Changes in the Universe and of Equilibrium as a Physical State	
No objectives in Earth Science.	
Goal 1.5: Understand Concepts of Form and Function	
No objectives in Earth Science.	

STANDARDS		PAGE REFERENCES
Goal 1.6: Understand Scientific Inquiry and Develop Critical Thinking Skills		
Objective(s): By the end of Earth Science, the student will:		
8-9.E.S.1.6.1	Identify questions and concepts that guide scientific investigations. (649.01a)	Student Edition: 11-16 <i>GeoLab</i> 70-71, 114-115, 140-141, 174-175, 232-233, 292-293, 406-407 <i>Design Your Own GeoLab</i> 92-93, 378-379, 704-705 <i>Internet GeoLab</i> 352-353, 488-489, 642-643
8-9.E.S.1.6.2	Utilize the components of scientific problem solving to design, conduct, and communicate results of investigations. (649.01b)	Student Edition: 11-16, 17-19 <i>MiniLab</i> 12 <i>GeoLab</i> 70-71, 114-115, 140-141, 232-233, 292-293, 406-407 <i>Design Your Own GeoLab</i> 92-93, 378-379 Teacher Wraparound Edition: A 71, 115; DI 129
8-9.E.S.1.6.3	Use appropriate technology and mathematics to make investigations. (649.01c)	Student Edition: <i>GeoLab</i> 70-71, 114-115, 140-141, 174-175, 232-233 <i>Design Your Own GeoLab</i> 92-93, 378-379 <i>Internet GeoLab</i> 352-353, 852-853 Teacher Wraparound Edition: A 163; ACT 123, 241, 275; CFU 227; P 213
8-9.E.S.1.6.4	Formulate scientific explanations and models using logic and evidence. (649.01d)	Student Edition: <i>GeoLab</i> 70-71, 114-115, 140-141, 174-175, 232-233, 292-293, 406-407, 618-619 <i>Design Your Own GeoLab</i> 92-93, 378-379 Teacher Wraparound Edition: A 43; M 695
8-9.E.S.1.6.5	Analyze alternative explanations and models. (649.01e)	Student Edition: 443-447, 589-591, 756-757 <i>Design Your Own GeoLab</i> 92-93 <i>GeoLab</i> 292-293 <i>Science in the News</i> 596 Teacher Wraparound Edition: A 593; AC 633; ACT 589; CB 442C, 624D; CFU 593; DIS 632; P 631

STANDARDS	PAGE REFERENCES
8-9.ES.1.6.6 Communicate and defend a scientific argument. (649.01f)	Student Edition: <i>Design Your Own GeoLab</i> 92-93, 378-379 <i>GeoLab</i> 114-115, 140-141, 292-293, 406-407, 618-619 <i>Internet GeoLab</i> 488-489, 642-643 Teacher Wraparound Edition: A 175, 634; AC 633; DIS 632; P 631, 685
8-9.ES.1.6.7 Explain the differences among observations, hypotheses, and theories. (649.01g)	Student Edition: 11-12, 19 <i>Section Assessment</i> 19 <i>Skill Handbook</i> 924, 928-929 Teacher Wraparound Edition: CFU 19; IM 4D: TPK 17; UAA 13
Goal 1.7: Understand That Interpersonal Relationships Are Important in Scientific Endeavors	
No objectives in Earth Science.	
Goal 1.8: Understand Technical Communication	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.1.8.1 Analyze technical writing, graphs, charts, and diagrams. (658.02a)	Student Edition 17 <i>Problem-Solving Lab</i> 18, 423, 665 <i>Design Your Own GeoLab</i> 92-93, 378-379 <i>GeoLab</i> 140-141, 292-293 <i>Science & Math</i> 206, 380 <i>Mapping GeoLab</i> 322-323 <i>Internet GeoLab</i> 352-353 Teacher Wraparound Edition: A 19; CB 4D; DI 13
<u>Standard 2: Physical Science</u>	
No goals or objectives in Earth Science.	
<u>Standard 3: Biology</u>	
No goals or objectives in Earth Science.	

STANDARDS	PAGE REFERENCES
Standard 4: Earth and Space Systems	
Students describe the current theory explaining the formation of the solar system. Students explain earth processes, events (erosion, uplifting, earthquakes, volcanic eruptions, etc.), and geological time. Students explain Earth's heat sources.	
Goal 4.1: Understand Scientific Theories of Origin and Subsequent Changes in the Universe and Earth Systems	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.4.1.1 Explain the current scientific theory that suggests that the solar system formed from a nebular cloud of dust and gas. (654.01a)	Student Edition: 793-797 Teacher Wraparound Edition: AC 794; ITI 795; TPK 793; UAA 794
8-9.ES.4.1.2 Identify methods used to estimate geologic time. (654.01b)	Student Edition: 557-561, 562-565, 566-569 <i>MiniLab</i> 126, 558 <i>Problem-Solving Lab</i> 560 Teacher Wraparound Edition: A 561; CB 552C-D; CL 568; DI 558; M 559; R 561
8-9.ES.4.1.3 Show how interactions among the solid earth, oceans, atmosphere, and organisms have changed the earth system over time. (654.01c)	Student Edition: 153-161, 167-173, 290-291, 341-346, 361-363, 374, 387-388 <i>Science & the Environment</i> 490 Teacher Wraparound Edition: CB 270C-D; ITU 269; M 345; SF 436
Goal 4.2: Understand Geo-chemical Cycles and Energy in the Earth System	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.4.2.1 Explain the internal and external energy sources of the earth (654.02a)	Student Edition: 101, 275-277, 460-461, 578-579, 683-684, 690 Teacher Wraparound Edition: A 277; CB 442C, 578; CFU 277; R 579

STANDARDS	PAGE REFERENCES
Standard 5: Personal and Social Perspectives; Technology	
Students understand that science and technology interact and impact both society and the environment. Students describe issues such as water and air quality, hazardous waste, renewable and nonrenewable resources.	
Goal 5.1: Understand Common Environmental Quality Issues, Both Natural and Human Induced	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.5.1.1 Analyze environmental issues such as water and air quality, hazardous waste, and depletion of natural resources. (656.01a)	Student Edition: 229-231, 254-257, 664-668, 711-715, 716-723, 724-729, 730-733 <i>Science & the Environment</i> 234, 260, 706 <i>Science in the News</i> 294 Teacher Wraparound Edition: A 723, 729; CFU 723; EC 9
Goal 5.2: Understand the Relationship between Science and Technology	
Objective(s): By the end of Earth Science, the student will be able to:	
8-9.ES.5.2.1 Explain how science advances technology. (655.01a)	Student Edition: 37-41, 132, 220-221 <i>Science & Technology</i> 324 <i>Science & the Environment</i> 736 Teacher Wraparound Edition: CB 294
8-9.ES.5.2.2 Explain how technology advances science. (655.01a)	Student Edition: 37-41, 312-316, 385-387, 448-454, 500-504, 747-752 <i>Science & Technology</i> 22, 72, 466 <i>Discovery Lab</i> 775 <i>Science in the News</i> 800 Teacher Wraparound Edition: CB 22, 449; EC 39
8-9.ES.5.2.3 Explain how science and technology are pursued for different purposes. (655.01b)	Student Edition: 10

STANDARDS	PAGE REFERENCES
<p>Goal 5.3: Understand the Importance of Natural Resources and the Need to Manage and Conserve Them</p>	
<p>Objective(s): By the end of Earth Science, the student will be able to:</p>	
<p>8-9.ES.5.3.1 Describe the difference between renewable and nonrenewable resources. (656.03a)</p>	<p>Student Edition: 655-658, 690-697, 698-703 <i>Discovery Lab</i> 655 <i>Earth Science Online</i> 687 <i>Problem-Solving Lab</i> 699 Teacher Wraparound Edition: A 656, 658; CB 682C-D; CL 720</p>