



EARTH SCIENCE

*Geology, the Environment,
and the Universe*

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STANDARDS	PAGE REFERENCES
Core High School Nature of Science	
Indicator 1: Understand the nature and origin of scientific knowledge.	
Bloom's Taxonomy Level: Evaluation	
9-12.N.1.1. Students are able to evaluate a scientific discovery to determine and describe how societal, cultural, and personal beliefs influence scientific investigations and interpretations.	
Examples: telescope, birth control pill, penicillin, electricity	
<ul style="list-style-type: none"> Recognize scientific knowledge is not merely a set of static facts but is dynamic and affords the best current explanations. Examples: spontaneous generation, relativity, geologic time 	<p>Student Edition: 19 (Chapter 1, Section 3) 443-447 (Chapter 17, Section 1) 448-454 (Chapter 17, Section 2) 455-459 (Chapter 17, Section 3) 460-463 (Chapter 17, Section 4) 589-593 (Chapter 22, Section 4) 775-779 (Chapter 29, Section 1) 847-851 (Chapter 31, Section 1)</p> <p>Teacher Wraparound Edition: CB 4C (Chapter 1, Chapter Opener) CB 578 (Chapter 22, Section 1)</p>

STANDARDS	PAGE REFERENCES
<ul style="list-style-type: none"> Discuss how progress in science can be affected by social issues. 	<p>Student Edition: 37-41 (Chapter 2, Section 3) <i>Science & Technology</i> 22 (Chapter 1, Section 3) <i>Science in the News</i> 294 (Chapter 11, Section 3) <i>Science & Technology</i> 324 (Chapter 12, Section 4) <i>Science & Technology</i> 854 (Chapter 31, Section 3)</p> <p>Teacher Wraparound Edition: EC 39 (Chapter 2, Section 3)</p>
<p>Bloom's Taxonomy Level: Synthesis</p>	
<p>9-12.N.1.2. Students are able to describe the role of observation and evidence in the development and modification of hypotheses, theories, and laws.</p>	
<ul style="list-style-type: none"> Research, communicate, and support a scientific argument. 	<p>Student Edition: <i>Science in the News</i> 142 (Chapter 6, Section 3) <i>Science & the Environment</i> 176 (Chapter 7, Section 3) <i>Science & the Environment</i> 234 (Chapter 9, Section 3) <i>Science & Technology</i> 324 (Chapter 12, Section 4)</p> <p>Teacher Wraparound Edition: DI 32 (Chapter 2, Section 2) A 593 (Chapter 22, Section 4) P 631 (Chapter 24, Section 2) D 632 (Chapter 24, Section 2) AC 633 (Chapter 24, Section 2) A 634 (Chapter 24, Section 2) D 848 (Chapter 31, Section 3)</p>
<ul style="list-style-type: none"> Recognize and analyze alternative explanations and models. 	<p>Student Edition: 847-851 (Chapter 31, Section 3) <i>Science & the Environment</i> 176 (Chapter 7, Section 3) <i>National Geographic Expeditions!</i> 892-897</p> <p>Teacher Wraparound Edition: DI 32 (Chapter 2, Section 2) CFU 447 (Chapter 17, Section 1) ACT 589 (Chapter 22, Section 4) A 593 (Chapter 22, Section 4) P 631 (Chapter 24, Section 2) D 632 (Chapter 24, Section 2) AC 633 (Chapter 24, Section 2)</p>

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<ul style="list-style-type: none"> Evaluate the scientific accuracy of information relevant to a specific issue (pseudo-science). 	<p>Student Edition: <i>Science in the News</i> 596 (Chapter 22, Section 4)</p> <p>Teacher Wraparound Edition: TPK 11 (Chapter 1, Section 2)</p>
<p>Indicator 2: Apply the skills necessary to conduct scientific investigations.</p>	
<p>Bloom's Taxonomy Level: Synthesis</p>	
<p>9-12.N.2.1. Students are able to apply science process skills to design and conduct student investigations.</p>	
<ul style="list-style-type: none"> Identify the questions and concepts to guide the development of hypotheses. 	<p>Student Edition: 11-16 (Chapter 1, Section 2) <i>GeoLab</i> 70-71 (Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>Design Your Own GeoLab</i> 378-379 (Chapter 14, Section 4) <i>Design Your Own GeoLab</i> (Chapter 29, Section 797)</p> <p>Teacher Wraparound Edition: A 12 (Chapter 1, Section 2) P 13 (Chapter 1, Section 2) A 71 (Chapter 3, Section 3) E 103 (Chapter 5, Section 1) A 163 (Chapter 7, Section 2)</p>
<ul style="list-style-type: none"> Analyze primary sources of information to guide the development of the procedure. 	<p>Student Edition: 13 (Chapter 1, Section 2) <i>GeoLab</i> 70-71 (Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>GeoLab</i> 114-115 (Chapter 5, Section 2) <i>GeoLab</i> 292-293 (Chapter 11, Section 3) <i>Design Your Own GeoLab</i> 378-379 (Chapter 14, Section 4) <i>Design Your Own GeoLab</i> 798-799 (Chapter 29, Section 4)</p>

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<ul style="list-style-type: none"> Select and use appropriate instruments to extend observations and measurements. 	<p>Student Edition: <i>MiniLab</i> 12 (Chapter 1, Section 2) <i>GeoLab</i> 20-21 (Chapter 1, Section 3) <i>GeoLab</i> 70-71 Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>GeoLab</i> 114-115 (Chapter 5, Section 2) <i>Design Your Own GeoLab</i> 378-379 (Chapter 14, Section 4) <i>GeoLab</i> 406-407 (Chapter 15, Section 3) <i>Design Your Own GeoLab</i> 676-677 (Chapter 25, Section 4)</p>
<ul style="list-style-type: none"> Revise explanations and models based on evidence and logic. 	<p>Student Edition: <i>Discovery Lab</i> 27 (Chapter 2, Section 1) <i>Design Your Own GeoLab</i> 676-677 (Chapter 25, Section 4) <i>Design Your Own GeoLab</i> 798-799 (Chapter 29, Section 4) <i>GeoLab</i> 826-827 (Chapter 30, Section 3)</p> <p>Teacher Wraparound Edition: IM 34 (Chapter 2, Section 2) IM 100 (Chapter 5, Section 1) IM 603 (Chapter 23, Section 1)</p>
<ul style="list-style-type: none"> Use technology and mathematic skills to enhance investigations, communicate results, and defend conclusions. Examples: Computer-based data collection, Graphical analysis and representation, Use appropriate technology to display data (i.e. spreadsheets, PowerPoint, web). 	<p>Student Edition: <i>GeoLab</i> 20-21 (Chapter 1, Section 3) <i>Science & Math</i> 44 (Chapter 2, Section 3) <i>Science & Math</i> 206 (Chapter 8, Section 3) <i>GeoLab</i> 232-233 (Chapter 9, Section 3) <i>Internet GeoLab</i> 352-353 (Chapter 13, Section 4) <i>Internet GeoLab</i> 488-489 (Chapter 18, Section 3) <i>Internet GeoLab</i> 642-643 (Chapter 24, Section 4) <i>Design Your Own GeoLab</i> 798-799 (Chapter 29, Section 4) <i>Internet GeoLab</i> 852-853 (Chapter 31, Section 3)</p>

STANDARDS	PAGE REFERENCES
Bloom's Taxonomy Level: Application	
9-12.N.2.2. Students are able to practice safe and effective laboratory techniques.	
<ul style="list-style-type: none"> Handle hazardous materials properly. 	<p>Student Edition: 12-13 (Chapter 1, Section 2) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>Design Your Own GeoLab</i> 378-379 (Chapter 14, Section 4) <i>Appendix B</i> 910-911 (Appendix)</p>
<ul style="list-style-type: none"> Use safety equipment correctly. 	<p>Student Edition: 12-13 (Chapter 1, Section 2) <i>GeoLab</i> 70-71 (Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>GeoLab</i> 114-115 (Chapter 5, Section 2) <i>Appendix B</i> 910-911 (Appendix)</p>
<ul style="list-style-type: none"> Practice emergency procedure. 	<p>Student Edition: 12-13 (Chapter 1, Section 2) <i>Appendix B</i> 910-911 (Appendix)</p>
<ul style="list-style-type: none"> Wear appropriate attire. 	<p>Student Edition: 12-13 (Chapter 1, Section 2) <i>MiniLab</i> 12 (Chapter 1, Section 2) <i>GeoLab</i> 70-71 (Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>GeoLab</i> 114-115 (Chapter 5, Section 2) <i>Design Your Own GeoLab</i> 676-677 (Chapter 25, Section 4)</p>
<ul style="list-style-type: none"> Practice safe behaviors. 	<p>Student Edition: 12-13 (Chapter 1, Section 2) <i>MiniLab</i> 12 (Chapter 1, Section 2) <i>GeoLab</i> 70-71 (Chapter 3, Section 3) <i>Design Your Own GeoLab</i> 92-93 (Chapter 4, Section 2) <i>GeoLab</i> 114-115 (Chapter 5, Section 2) <i>Design Your Own GeoLab</i> 378-379 (Chapter 14, Section 4) <i>Appendix B</i> 910-911 (Appendix)</p>

STANDARDS	PAGE REFERENCES
Core High School Earth/Space Science	
Indicator 1: Analyze the various structures and processes of the Earth system.	
Bloom's Taxonomy Level: Comprehension	
9-12.E.1.1. Students are able to explain how elements and compounds cycle between living and non-living systems.	
<ul style="list-style-type: none"> Diagram and describe the N, C, O and H₂O cycles. 	<p>Student Edition: 211-212 (Chapter 9, Section 1) 239-240 (Chapter 10, Section 1) 290-291 (Chapter 11, Section 3) 664-665 (Chapter 25, Section 3) <i>MiniLab</i> 290 (Chapter 11, Section 3)</p> <p>Teacher Wraparound Edition: A 240 (Chapter 10, Section 1) CB 270D (Chapter 11, Chapter Opener) R 291 (Chapter 11, Section 3) TPK 392 (Chapter 15, Section 2) AC 720 (Chapter 27, Section 2)</p>
<ul style="list-style-type: none"> Describe the importance of the N, C, O and H₂O cycles to life on this planet. Examples: water cycle including evaporation, cloud formation, condensation. 	<p>Student Edition: 239-240 (Chapter 10, Section 1) 290-291 (Chapter 11, Section 3) 664-665 (Chapter 25, Section 3)</p> <p>Teacher Wraparound Edition: AC 720 (Chapter 27, Section 2)</p>
Bloom's Taxonomy Level: Application	
9-12.E.1.2. Students are able to describe how atmospheric chemistry may affect global climate.	
<p>Examples: Greenhouse Effect, ozone depletion, ocean's effects on weather</p>	<p>Student Edition: 270-273 (Chapter 11, Section 1) 281 (Chapter 11, Section 2) 374 (Chapter 14, Section 3) 375-377 (Chapter 14, Section 4) 664-668 (Chapter 25, Section 3) <i>Science in the News</i> 294 (Chapter 11, Section 3) <i>Science & Math</i> 380 (Chapter 14, Section 4) <i>Science & the Environment</i> 490 (Chapter 18, Section 3)</p> <p>Teacher Wraparound Edition: EC 273 (Chapter 11, Section 1)</p>

STANDARDS	PAGE REFERENCES
<p>Bloom's Taxonomy Level: Analysis</p>	
<p>9-12.E.1.3. Students are able to assess how human activity has changed the land, ocean, and atmosphere of Earth.</p>	
<p>Examples: forest cover, chemical usage, farming, urban sprawl, grazing</p>	<p>Student Edition: 229-231 (Chapter 9, Section 3) 254-257 (Chapter 10, Section 3) 375-377 (Chapter 14, Section 4) 711-715 (Chapter 27, Section 1) 716-723 (Chapter 27, Section 2) 724-729 (Chapter 27, Section 3) 730-733 (Chapter 27, Section 4) <i>Problem-Solving Lab</i> 665 (Chapter 25, Section 3)</p> <p>Teacher Wraparound Edition: DI 255 (Chapter 10, Section 3) DI 376 (Chapter 14, Section 4) A 723 (Chapter 27, Section 2) P 727 (Chapter 27, Section 3) A 729 (Chapter 27, Section 3)</p>
<p>Indicator 2: Analyze essential principles and ideas about the composition and structure of the universe.</p>	
<p>Bloom's Taxonomy Level: Comprehension</p>	
<p>9-12.E.2.1. Students are able to recognize how Newtonian mechanics can be applied to the study of the motions of the solar system.</p>	
<ul style="list-style-type: none"> Given a set of possible explanations of orbital motion (revolution), identify those that make use of gravitational forces and inertia. 	<p>Student Edition: 775-779 (Chapter 29, Section 1)</p> <p>Teacher Wraparound Edition: IM 751 (Chapter 28, Section 1) DE 778 (Chapter 29, Section 1) A 779 (Chapter 29, Section 1) CFU 779 (Chapter 29, Section 1)</p>

STANDARDS	PAGE REFERENCES
<p>Core High School Science, Technology, Environment, and Society</p>	
<p>Indicator 1: Analyze various implications/effects of scientific advancement within the environment and society.</p>	
<p>Bloom's Taxonomy Level: Application</p>	
<p>9-12.S.1.1. Students are able to explain ethical roles and responsibilities of scientists and scientific research.</p>	
<p>Examples: Sharing of data, Accuracy of data, Acknowledgement of sources, Following laws, Animal research, Human research, Managing hazardous materials and wastes</p>	<p>Student Edition: <i>Science in the News</i> 596 (Chapter 22, Section 4) Teacher Wraparound Edition: CB 4D (Chapter 1, Chapter Opener)</p>
<p>Bloom's Taxonomy Level: Evaluation</p>	
<p>9-12.S.1.2. Students are able to evaluate and describe the impact of scientific discoveries on historical events and social, economic, and ethical issues.</p>	
<p>Examples: cloning, stem cells, gene splicing, nuclear power, patenting new life forms, emerging diseases, AIDS, resistant forms of bacteria, biological and chemical weapons, global warming, and alternative fuels</p>	<p>Student Edition: 690-697 (Chapter 26, Section 2) <i>Science & Technology</i> 324 (Chapter 12, Section 4) <i>Earth Science Online</i> 694 (Chapter 26, Section 2) <i>Science & the Environment</i> 736 (Chapter 27, Section 4) Teacher Wraparound Edition: R 377 (Chapter 14, Section 4) CL 695 (Chapter 27, Section 2) E 720 (Chapter 27, Section 2)</p>

STANDARDS	PAGE REFERENCES
<p>Indicator 2: Analyze the relationships/interactions among science, technology, environment, and society.</p>	
<p>Bloom's Taxonomy Level: Evaluation</p>	
<p>9-12.S.2.1. Students are able to describe immediate and long-term consequences of potential solutions for technological issues.</p>	
<p>Examples: environmental, communication, internet, entertainment, construction, manufacturing, power and transportation, energy sources, health technology, and biotechnology issues</p>	<p>Student Edition: 672-675 (Chapter 25, Section 4) 690-697 (Chapter 26, Section 2) 698-703 (Chapter 26, Section 3) 722-723 (Chapter 27, Section 2) 728-729 (Chapter 27, Section 3) 732-733 (Chapter 27, Section 4) <i>Science & the Environment</i> 706 (Chapter 26, Section 3) <i>Science & the Environment</i> 736 (Chapter 27, Section 4) Teacher Wraparound Edition: AC 686 (Chapter 26, Section 1)</p>
<ul style="list-style-type: none"> Describe how the pertinent technological system operates. Example: waste management facility 	<p>Student Edition: <i>Design Your Own GeoLab</i> 676-677 (Chapter 25, Section 4) <i>Design Your Own GeoLab</i> 704-705 (Chapter 26, Section 3) Teacher Wraparound Edition: A 675 (Chapter 25, Section 4) CFU 675 (Chapter 25, Section 4) M 692 (Chapter 26, Section 2) M 695 (Chapter 26, Section 2) ACT 722 (Chapter 27, Section 2) EC 732 (Chapter 27, Section 4)</p>
<p>Bloom's Taxonomy Level: Analysis</p>	
<p>9-12.S.2.2. Students are able to analyze factors that could limit technological design.</p>	
<p>Examples: ethics, environmental impact, manufacturing processes, operation, maintenance, replacement, disposal, and liability</p>	<p>Student Edition: <i>Design Your Own GeoLab</i> 704-705 (Chapter 26, Section 3) <i>Science & the Environment</i> 736 (Chapter 27, Section 4) Teacher Wraparound Edition: DI 656 (Chapter 25, Section 1) CFU 675 (Chapter 25, Section 4) CB 736 (Chapter 27, Section 4)</p>

STANDARDS	PAGE REFERENCES
<p>Bloom's Taxonomy Level: Synthesis</p>	
<p>9-12.S.2.3. Students are able to analyze and describe the benefits, limitations, cost, and consequences involved in using, conserving, or recycling resources.</p>	
<p>Examples: mining, agriculture, medicine, school science labs, forestry, energy, disposable diapers, computers, tires</p>	<p>Student Edition: 655-658 (Chapter 25, Section 1) 659-663 (Chapter 25, Section 2) 664-668 (Chapter 25, Section 3) 698-703 (Chapter 26, Section 3) 716-723 (Chapter 27, Section 2) 724-729 (Chapter 27, Section 3) 730-733 (Chapter 27, Section 4) <i>Science & the Environment</i> 706 (Chapter 26, Section 3)</p> <p>Teacher Wraparound Edition: CL 672 (Chapter 25, Section 4)</p>