



# Earth Science

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STANDARDS	PAGE REFERENCES
<p><b>Standard 5.1 (Scientific Processes) All students will develop problem-solving, decision-making and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.</b></p>	
<p><b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b></p>	
<p><b>A. Habits of Mind</b></p>	
<p>1. Evaluate the strengths and weaknesses of data, claims, and arguments.</p>	<p><b>Student Edition:</b> 9, 15 <i>Lab 23</i>, 110-111 <i>Applying Science</i> 140 <b>Teacher Wraparound Edition:</b> A 22, 53; Act 65; CYD 45; D 69</p>
<p>2. Communicate experimental findings to others.</p>	<p><b>Student Edition:</b> <i>Lab 23</i>, 45, 80-81, 98, 110-111 <i>Model and Invent Lab</i> 142-143 <b>Teacher Wraparound Edition:</b> A 23; CD 41; CYD 67, 171; DI 19; Res 174</p>
<p>3. Recognize that the results of scientific investigations are seldom exactly the same and that replication is often necessary.</p>	<p><b>Student Edition:</b> 11 <i>Lab 23</i>, 24-25, 320-321, 376, 608 <i>Launch Lab</i> 209 <b>Teacher Wraparound Edition:</b> AYD 229; CC 11; CYD 201; EA 111</p>

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<p>4. Recognize that curiosity, skepticism, open-mindedness, and honesty are attributes of scientists.</p>	<p><b>Student Edition:</b>  6, 15-16, 21-22  <i>Integrate Career</i> 20, 197  <i>Science and Language</i> 26  <i>Science and History</i> 82  <i>Science and Society</i> 592  <b>Teacher Wraparound Edition:</b>  A 23; SJ 20, 466; TFYI 20</p>
<p><b>B. Inquiry and Problem Solving</b></p>	
<p>1. Identify questions and make predictions that can be addressed by conducting investigations.</p>	<p><b>Student Edition:</b>  7-8, 51, 69  <i>Lab</i> 24-25, 80-81, 98, 136  <i>Design Your Own Lab</i> 52-53  <i>Applying Science</i> 140  <i>MiniLAB</i> 363  <b>Teacher Wraparound Edition:</b>  A 732; Da 72, 97; SJ 4</p>
<p>2. Design and conduct investigations incorporating the use of a control.</p>	<p><b>Student Edition:</b>  9-10  <i>Integrate Life Science</i> 10  <i>MiniLAB</i> 11  <i>Lab</i> 24-25, 260-261, 320-321, 680-681  <i>Design Your Own Lab</i> 228-229  <b>Teacher Wraparound Edition:</b>  VL 10</p>
<p>3. Collect, organize, and interpret the data that result from experiments.</p>	<p><b>Student Edition:</b>  <i>Lab</i> 24-25, 67, 80-81, 110-111, 136, 504  <i>Applying Science</i> 140  <i>Model and invent Lab</i> 142-143  <b>Teacher Wraparound Edition:</b>  A 67; CYD 681; IL 41</p>
<p><b>C. Safety</b></p>	
<p>1. Know when and how to use appropriate safety equipment with all classroom materials.</p>	<p><b>Student Edition:</b>  <i>Launch Lab</i> 33  <i>Lab</i> 67, 80-81, 110-111, 136, 444, 608, 733  <i>Design Your Own Lab</i> 616-617  <b>Teacher Wraparound Edition:</b>  SP 80</p>

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2. Understand and practice safety procedures for conducting science investigations.	<b>Student Edition:</b> 54 <i>Launch Lab</i> 33 <i>Design Your Own Lab</i> 52-53 <i>MiniLAB</i> 63 <i>Lab</i> 67, 98, 136, 434 <b>Teacher Wraparound Edition:</b> SP 110; TFYI 128
<p><b>Standard 5.2 (Science and Society) All students will develop an understanding of how people of various cultures have contributed to the advancement of science and technology, and how major discoveries and events have advanced science and technology.</b></p> <hr/> <p><b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b></p> <hr/> <p><b>A. Cultural Contributions</b></p>	
1. Recognize that scientific theories: <ul style="list-style-type: none"> <li>• develop over time,</li> <li>• depend on the contributions of many people, and</li> <li>• reflect the social and political climate of their time.</li> </ul>	<b>Student Edition:</b> 6-7, 15-16, 18, 637, 643, 647 <i>Science and Society</i> 112, 652 <i>Science and History</i> 618 <b>Teacher Wraparound Edition:</b> CB 82; CC 638; TPK 15
2. Know that scientists are men and women of many cultures who often work together to solve scientific and technological problems.	<b>Student Edition:</b> 18 <i>Science and Language</i> 26 <i>Science and History</i> 82, 618 <i>Science and Society</i> 262, 476, 592, 652 <b>Teacher Wraparound Edition:</b> DI 35; TFYI 17, 77
3. Describe how different people in different cultures have made and continue to make contributions to science and technology.	<b>Student Edition:</b> 3, 15-16, 151 <i>Science and Language</i> 26 <i>Model and Invent Lab</i> 142-143 <i>Science and History</i> 682 <b>Teacher Wraparound Edition:</b> CD 74, 122, 704; TFYI 77; TPK 130

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<b>B. Historical Perspectives</b>	
1. Describe the impact of major events and people in the history of science and technology, in conjunction with other world events.	<b>Student Edition:</b> 18, 69, 637 <i>National Geographic</i> 13 <i>Integrate Physics</i> 19 <i>Integrate Social Studies</i> 77 <b>Teacher Wraparound Edition:</b> Act 13; MG 144; TFYI 18, 19
2. Describe the development and exponential growth of scientific knowledge and technological innovations.	<b>Student Edition:</b> 16-17, 79, 631, 635-638 <i>Integrate Career</i> 131 <i>Model and Invent Lab</i> 142-143 <i>Accidents in Science</i> 144, 352 <i>National Geographic</i> 639 <b>Teacher Wraparound Edition:</b> DI 516; FF 132
<p><b>Standard 5.3 (Mathematical Applications) All students will integrate mathematics as a tool for problem-solving in science, and as a means of expressing and/or modeling scientific theories.</b></p> <p><b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b></p>	
<b>A. Numerical Operations</b>	
1. Express quantities using appropriate number formats, such as: <ul style="list-style-type: none"> <li>• decimals.</li> <li>• percents.</li> <li>• scientific notation.</li> </ul>	<b>Student Edition:</b> <i>Launch Lab</i> 5 <i>Lab</i> 24-25, 45, 136 <i>Applying Math</i> 54, 108 <i>Applying Science</i> 140 <i>Use the Internet Lab</i> 650-651 <i>Science Stats</i> 748 <b>Teacher Wraparound Edition:</b> AM 192
<b>B. Geometry and Measurement</b>	
1. Perform mathematical computations using labeled quantities and express answers in correctly derived units.	<b>Student Edition:</b> <i>Lab</i> 45 <i>Applying Math</i> 47, 108 <i>Design Your Own Lab</i> 52-53 <i>Science Stats</i> 230, 322, 416 <b>Teacher Wraparound Edition:</b> AM 192; CC 727

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<b>C. Patterns and Algebra</b>	
1. Express physical relationships in terms of mathematical equations derived from collected data.	<b>Student Edition:</b> <i>Applying Math</i> 47, 108, 700 <i>MiniLAB</i> 699 <b>Teacher Wraparound Edition:</b> CC 727; DI 726; FF 49
<b>D. Data Analysis and Probability</b>	
1. Represent and describe mathematical relationships among variables using: <ul style="list-style-type: none"> <li>• graphs.</li> <li>• tables.</li> </ul>	<b>Student Edition:</b> 38, 69 <i>Lab</i> 24-25, 136 <i>MiniLAB</i> 43 <i>Applying Science</i> 70 <i>Accidents in Science</i> 144 <b>Teacher Wraparound Edition:</b> A 66, 72; CC 125; DI 43; R 66
2. Analyze experimental data sets using measures of central tendency: <ul style="list-style-type: none"> <li>• mean.</li> <li>• mode.</li> <li>• median.</li> </ul>	<b>Student Edition:</b> <i>Lab</i> 24-25, 45, 279, 407, 590-591 <i>Design Your Own Lab</i> 616-617 <b>Teacher Wraparound Edition:</b> EO 53
3. Construct and use a graph of experimental data to draw a line of best fit and identify a linear relationship between variables.	<b>Student Edition:</b> <i>Lab</i> 136, 444-445, 680-681 <b>Teacher Wraparound Edition:</b> Act 50; CYD 321
4. Use computer spreadsheets, graphing and database applications to assist in quantitative analysis of data.	<b>Teacher Wraparound Edition:</b> CYD 53, 111, 136, 229, 351, 445, 681
<b>Standard 5.4 (Nature and Process of Technology) All students will understand the interrelationships between science and technology and develop a conceptual understanding of the nature and process of technology.</b>	
<b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b>	
<b>A. Science and Technology</b>	
1. Compare and contrast science with technology, illustrating similarities and differences between these two human endeavors.	<b>Student Edition:</b> 8-9, 12, 14, 128, 134-135, 630-631, 637 <i>Integrate Career</i> 106 <i>Integrate Chemistry</i> 138 <b>Teacher Wraparound Edition:</b> Act 126; AS 140; SJ 631

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<b>B. Nature of Technology</b>	
1. Analyze a product or system to determine the problem it was designed to solve, the design constraints, trade-offs and risks involved in using the product or system, how the product or system might fail, and how the product or system might be improved.	<b>Student Edition:</b> 131-135 <i>National Geographic</i> 126 <i>MiniLAB</i> 139 <i>Model and Invent Lab</i> 142-143 <b>Teacher Wraparound Edition:</b> A 143; AS 140; DI 75; IH 37
<b>C. Technological Design</b>	
1. Recognize how feedback loops are used to control systems.	<b>Student Edition:</b> <i>MiniLAB</i> 127
<b>Standard 5.8 (Earth Science) All students will gain an understanding of the structure, dynamics, and geophysical systems of the earth.</b>	
<b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b>	
<b>A. Earth's Properties and Materials</b>	
1. Observe that most rocks and soils are made of several substances or minerals.	<b>Student Edition:</b> 35, 62, 68, 90, 95 <i>Integrate Earth Science</i> 26 <i>Launch Lab</i> 61 <i>National Geographic</i> 92 <b>Teacher Wraparound Edition:</b> SCB 88E
2. Observe that the properties of soil vary from place to place and will affect the soil's ability to support life.	<b>Student Edition:</b> 107, 188, 190, 193-194 <i>Integrate Life Science</i> 121 <i>Science and History</i> 174 <i>National Geographic</i> 189 <i>Lab</i> 195 <i>MiniLAB</i> 250 <b>Teacher Wraparound Edition:</b> DI 189; SCB 32E
3. Recognize that fossils provide evidence about the plants and animals that lived long ago and the nature of the environment at that time.	<b>Student Edition:</b> 362, 365, 367-369 <i>Integrate Life Science</i> 121, 368 <i>MiniLAB</i> 363 <b>Teacher Wraparound Edition:</b> D 366; SJ 367

<b>B. Atmosphere and Water</b>	
1. Describe conditions in the atmosphere that lead to weather systems and how these systems are represented on weather maps.	<p><b>Student Edition:</b> 170, 454-456, 462-464, 466, 471-472 <i>Launch Lab</i> 453 <i>Lab</i> 473 <i>Model and Invent Lab</i> 474-475</p> <p><b>Teacher Wraparound Edition:</b> AP 32; CC 459, 464; CD 460</p>
<b>C. Processes that Shape the Earth</b>	
1. Explain how Earth's landforms and materials are created through constructive and destructive processes.	<p><b>Student Edition:</b> 91, 93, 95, 99-100, 122-123 <i>Integrate Chemistry</i> 97 <i>Integrate Life Science</i> 121</p> <p><b>Teacher Wraparound Edition:</b> A 109; DI 91; SCB 88F; TC 88; TFYI 93; TPK 90</p>
2. Show how successive layers of sedimentary rock and the fossils contained in them can be used to confirm the age, history, changing life forms, and geology of Earth.	<p><b>Student Edition:</b> 103, 105-106, 367-369, 371 <i>MiniLAB</i> 91, 104</p> <p><b>Teacher Wraparound Edition:</b> DI 368; SCB 88F; SJ 105; TFYI 374</p>
<b>D. How We Study the Earth</b>	
1. Utilize data gathered from emerging technologies (e.g., geographic information systems (GIS) and global positioning systems (GPS)) to create representations and describe processes of change on the Earth's surface.	<p><b>Student Edition:</b> 170, 470 <i>Launch Lab</i> 153 <i>MiniLAB</i> 156 <i>Integrate Physics</i> 166 <i>Model and Invent Lab</i> 172-173</p> <p><b>Teacher Wraparound Edition:</b> AP 152; TFYI 520</p>
2. Explain how technology designed to investigate features of the Earth's surface impacts how scientists study the Earth.	<p><b>Student Edition:</b> 18, 170 <i>National Geographic</i> 64, 167 <i>Chapter Preview</i> 152, 688 <i>Applying Science</i> 169</p> <p><b>Teacher Wraparound Edition:</b> AP 688; SJ 631</p>

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<p><b>Standard 5.9 (Astronomy and Space Science) All students will gain an understanding of the origin, evolution, and structure of the universe.</b></p>	
<p><b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b></p>	
<p><b>A. Earth, Moon, Sun System</b></p>	
<p>1. Investigate the Earth, moon, and sun as a system and explain how the motion of these bodies results in the phases of the moon and eclipses.</p>	<p><b>Student Edition:</b> 667-670 <i>Launch Lab</i> 659 <i>Integrate Career</i> 671 <i>Lab</i> 675 <b>Teacher Wraparound Edition:</b> A 675; Act 670; D 670; SCB 658E; TC 658</p>
<p>2. Explain how the regular and predictable motions of the Earth and moon produce tides.</p>	<p><b>Student Edition:</b> 527-530 <b>Teacher Wraparound Edition:</b> Act 528; QD 527; TFYI 528, 529</p>
<p>3. Explain how the tilt, rotation, and orbital pattern of the Earth relative to the sun produce seasons and weather patterns.</p>	<p><b>Student Edition:</b> 484, 663-665 <i>MiniLAB</i> 485 <i>Integrate Life Science</i> 661 <i>Lab</i> 680-681 <b>Teacher Wraparound Edition:</b> QD 484, 664; TPK 484</p>
<p><b>B. Solar System</b></p>	
<p>1. Describe the physical characteristics of the planets and other objects within the solar system and compare Earth to the rest of the planets.</p>	<p><b>Student Edition:</b> 660-665, 671, 690-691, 694, 696-698 <i>National Geographic</i> 672 <i>Lab</i> 680-681, 695 <i>Launch Lab</i> 689 <i>Model and Invent Lab</i> 714-715 <b>Teacher Wraparound Edition:</b> TC 688</p>

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<b>C. Stars</b>	
1. Understand that the sun is a star and that it shares characteristics with other stars.	<b>Student Edition:</b> 692, 724, 729-732, 738-739 <i>MiniLAB</i> 667 <i>Applying Science</i> 726 <i>Lab</i> 733 <i>Design Your Own Lab</i> 746-747 <b>Teacher Wraparound Edition:</b> IM 693; SCB 722E
<b>D. Galaxies and Universe</b>	
1. Know that the universe consists of many billions of galaxies, each including billions of stars.	<b>Student Edition:</b> 631, 740-741 <i>Launch Lab</i> 723 <i>MiniLAB</i> 742 <b>Teacher Wraparound Edition:</b> CC 742; SCB 722F; TFYI 737
<p><b>Standard 5.10 (Environmental Studies) All students will develop an understanding of the environment as a system of interdependent components affected by human activity and natural phenomena.</b></p> <p>-----</p> <p><b>Building upon knowledge and skills gained in preceding grades, by the end of Grade 8, students will:</b></p> <p>-----</p>	
<b>A. Natural Systems and Interactions</b>	
1. Investigate the impact of catastrophic events such as forest fires, floods, and hurricanes on the environment of New Jersey.	<b>Student Edition:</b> 247, 465-466, 468-469, 496, 499-500 <i>National Geographic</i> 467 <b>Teacher Wraparound Edition:</b> A 503; CC 468
<b>B. Human Interactions and Impact</b>	
1. Compare and contrast practices that affect the use and management of natural resources.	<b>Student Edition:</b> 130-135, 141, 576-577 <i>Applying Science</i> 140, 581 <i>Model and Invent Lab</i> 142-143 <i>Lab</i> 585 <b>Teacher Wraparound Edition:</b> TFYI 134, 138