A Correlation of

Pearson Earth Science
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To the

South Carolina
Academic Standards for
Earth Science

High School
INTRODUCTION

This document demonstrates how *Pearson Earth Science (Tarbuck/Lutgens) © 2011*, meets the objectives of the South Carolina Academic Standards for Earth Science. Correlation page references are to the Student Edition and Teacher's Edition and are cited at the page level.

Renowned authors Edward Tarbuck and Frederick Lutgens invite students on a journey of observation, explanation, and participation in the study of Earth's processes. An accessible writing style, original artwork by Dennis Tasa, and powerful technology create a fresh new program that leads your diverse classroom on a path to discovery. This new edition is perfectly suited to today's high school curriculum. Bringing content to life, the integrated GEODe Key Concepts CD-ROM connects students to the world through video, animations, and assessment.

Features:

- Virtual Earth Science—a Prentice Hall exclusive—is the most robust interactive lab available.
- Now available with even more teaching and assessment tools!
- Our proven formula for reading success addresses skills before, during, and after every lesson.
- Emmy-Award winning Discovery Education Videos and DVDs provide visual support for every chapter.
- Integrated technology with GEODe Key Concepts CD-ROM connects students to the world through tutorials, videos, animations, and assessment.
- Now available with key Spanish resources! The Spanish Guided Reading and Study Workbook and the Spanish Chapter Tests help you address the needs of today's diverse student population.

Why choose *Prentice Hall Earth Science*?

- ONLY program with built-in reading support
- ONLY program with Checkpoint Questions that provide ongoing self-assessment
- MORE end-of-chapter questions than any other Earth Science program
- RENOWNED author team, Frederick Lutgens and Edward Tarbuck
- MORE instructional transparencies than any other Earth science program
- EXCLUSIVE Discovery Channel SchoolTM videos-An Emmy award-winning program!
- BEST tool for planning, teaching, and assessing
- TeacherEXPRESS® CD-ROM
- BEST INSTRUCTIONAL GRAPHICS by Earth Science illustrator, Dennis Tasa
- ONLY program with full page of Standardized Test Preparation in every chapter
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<td><strong>EARTH SCIENCE</strong></td>
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<tr>
<td><strong>Scientific Inquiry</strong></td>
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<tr>
<td>Standard ES-1: The student will demonstrate an understanding of how scientific inquiry and technological design, including mathematical analysis, can be used appropriately to pose questions, seek answers, and develop solutions.</td>
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<td><strong>Indicators</strong></td>
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</table>
| ES-1.1 Apply established rules for significant digits, both in reading scientific instruments and in calculating derived quantities from measurement. | **SE**: 736-742  
**TE**: Laboratory Manual: 1-16  
**TR**: Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |
| ES-1.2 Use appropriate laboratory apparatuses, technology, and techniques safely and accurately when conducting a scientific investigation. | **SE**: 732-733, 741-742  
**TE only**: Laboratory Manual: xiii-xviii, xxiii-xxiv  
**TR**: Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |
| ES-1.3 Use scientific instruments to record measurement data in appropriate metric units that reflect the precision and accuracy of each particular instrument. | **SE**: 16-17, 25, 56, 117, 269, 332, 352, 406, 454, 549, 635, 678-683, 722, 735-740; Section Assessment: 24.2; Inquiry Activity: Chapter 15, 22; Exploration Lab: Chapter 5, 7, 8, 10, 12, 14-17, 21, 24; Quick Lab: Chapter 9; Application Lab: Chapter 4, 13  
**TE**: Build Science Skills: 17; Facts and Figures: 16; Understanding Earth: 25; Laboratory Manual: xx, 7, 73, 107, 111  
**TR**: Guided Reading and Study Workbook: Section 1.3, Chapter 4, 13; Chapter 4, 13, 15, 22 Tests; Test Prep Resources: Chapter 4, 13, 15, 22; Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Virtual Labs CD: Labs 1-15 |
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<th>South Carolina Academic Standards for Earth Science</th>
<th>Pearson Earth Science (Tarbuck/Lutgens) © 2011</th>
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| **ES-1.4** Design a scientific investigation with appropriate methods of control to test a hypothesis (including independent and dependent variables), and evaluate the designs of sample investigations. | **SE:** 23-24, 728-733; Section Assessment: 1.5; Inquiry Activity: 1, 33, 65, 93, 125, 157, 187, 217, 247, 279, 307, 335, 363, 393, 421, 447, 475, 503, 531, 557, 587, 613, 643, 673, 699; Quick Lab: 82, 251, 287, 412, 590; Exploration Lab: 26, 58, 86, 150, 181, 210, 240, 272, 300, 326, 356, 414, 440, 468, 496, 524, 550, 606, 636, 666, 692, 723; Application Lab: 118, 386, 580; Problem-Solving Activity: 323  
**TE:** 1C-1D; Laboratory Manual: Science Safety Rules, Safety Symbols, Laboratory Safety Contract, Student Safety Test, Lab Skills Checkup 1-5, Labs for Chapters 1-21  
**TR:** Guided Reading and Study Workbook: 1.5; Chapter 1 Test; Test Prep Resources: Chapter 1; Teacher Express CD  
**TECH:** Virtual Labs; Geode CD-Rom; [www.SciLinks.org](http://www.SciLinks.org); [www.phschool.com](http://www.phschool.com) |
| **ES-1.5** Organize and interpret the data from a controlled scientific investigation by using mathematics (including calculations in scientific notation, formulas, and dimensional analysis), graphs, tables, models, diagrams, and/or technology. | **SE:** 2-5, 11-17, 345, 350, 633, 647, 720-721, 729; Exploration Lab: 26-27; Inquiry Activity: 1; Section Assessment: 1.1, 1.3, 9.3  
**TE:** 246C-246D; Build Science Skills: 261; Teacher Demo: 4, 13, 262, 264; Laboratory Manual: Lab Skills Checkup 1-4, Using a Topographic Map to Create a Landform, Modeling a Plate Boundary  
**TR:** Guided Reading and Study Workbook: 1.1, 1.3, 9.3; Chapter Test: 1, 9; Virtual Lab Record Sheets: Labs 1-15; Teacher Express CD  
**TECH:** [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 371, 372, 373; Discovery Channel Videos: Mapping the World; Teacher Express: 1.3, 9.3; Transparencies: 100, 101, 102, 104, 105, 107, 108, 109, 120; Discovery Channel Video Field Trip: Plate Tectonics; Online Text: 1.1, 1.3, 9.3; Computer Test Bank: 1, 9; Virtual Lab CD: Labs 1-15 |
| **ES-1.6** Evaluate the results of a controlled scientific investigation in terms of whether they refute or verify the hypothesis. | **SE:** 23-24, 728-733; Section Assessment: 1.5; Exploration Lab: 26, 58, 86, 150, 181, 210, 240, 272, 300, 326, 356, 414, 440, 468, 496, 524, 550, 606, 636, 666, 692, 723; Application Lab: 118, 386, 580  
**TE:** 1C-1D; Laboratory Manual: Science Safety Rules, Safety Symbols, Laboratory Safety Contract, Student Safety Test, Lab Skills Checkup 1-5, Labs for Chapters 1-21  
**TR:** Guided Reading and Study Workbook: 1.5; Chapter 1 Test; Test Prep Resources: Chapter 1  
**TECH:** Virtual Labs; Geode CD-Rom; [www.SciLinks.org](http://www.SciLinks.org); [www.phschool.com](http://www.phschool.com) |

**SE = Student Edition**  
**TE = Teacher’s Edition**
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|----------------------------------------------------|-------------------------------------------------
| **ES-1.7 Evaluate conclusions based on qualitative and quantitative data (including the impact of parallax, instrument malfunction, or human error) on experimental results.** |
| **SE:** 2-5, 11-17, 24, 345, 350, 633, 647, 720-721, 729, 731; Exploration Lab: 26-27; Inquiry Activity: 1; Section Assessment: 1.1, 1.3, 9.3 |
| **TE:** 246C-246D; Build Science Skills: 261; Teacher Demo: 4, 13, 262, 264; Laboratory Manual: Lab Skills Checkup 1-4, Using a Topographic Map to Create a Landform, Modeling a Plate Boundary |
| **TR:** Guided Reading and Study Workbook: 1.1, 1.3, 9.3; Chapter Test: 1, 9; Virtual Lab Record Sheets: Labs 1-15; Teacher Express CD |
| **TECH:** [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 371, 372, 373; Discovery Channel Videos: Mapping the World; Teacher Express: 1.3, 9.3; Transparencies: 100, 101, 102, 104, 105, 107, 108, 109, 120; Discovery Channel Video Field Trip: Plate Tectonics; Online Text: 1.1, 1.3, 9.3; Computer Test Bank: 1, 9; Virtual Lab CD: Labs 1-15 |

| **ES-1.8 Evaluate a technological design or product on the basis of designated criteria (including cost, time, and materials).** |
| **SE:** 16-17, 25, 56, 117, 269, 332, 352, 406, 454, 549, 635, 678-683, 722; Inquiry Activity: 643, 673, 699; Exploration Lab: 666, 692, 723; Section Assessment: 24.2 |
| **TE:** 1C-1D, 672C-672D; Teacher Demo: 679 |
| **TR:** Guided Reading and Study Workbook: 1.3, 24.2; Build Science Skills: 17; Chapter Test: 1, 24; Teacher Express CD |
| **TECH:** [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 353, 354, 355; Teacher Express: |

| **ES-1.9 Communicate and defend a scientific argument or conclusion.** |
| **SE:** 2-5, 11-17, 345, 350, 633, 647, 720-721, 729; Exploration Lab: 26-27; Inquiry Activity: 1; Section Assessment: 1.1, 1.3, 9.3 |
| **TE:** 246C-246D; Build Science Skills: 261; Teacher Demo: 4, 13, 262, 264; Laboratory Manual: Lab Skills Checkup 1-4, Using a Topographic Map to Create a Landform, Modeling a Plate Boundary |
| **TR:** Guided Reading and Study Workbook: 1.1, 1.3, 9.3; Chapter Test: 1, 9; Virtual Lab Record Sheets: Labs 1-15; Teacher Express CD |
| **TECH:** [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 371, 372, 373; Discovery Channel Videos: Mapping the World; Teacher Express: 1.3, 9.3; Transparencies: 100, 101, 102, 104, 105, 107, 108, 109, 120; Discovery Channel Video Field Trip: Plate Tectonics; Online Text: 1.1, 1.3, 9.3; Computer Test Bank: 1, 9; Virtual Lab CD: Labs 1-15 |

**SE = Student Edition**  
**TE = Teacher’s Edition**
### South Carolina Academic Standards for Earth Science

#### ES-1.10 Use appropriate safety procedures when conducting investigations.

<table>
<thead>
<tr>
<th>Student Edition (SE)</th>
<th>Teacher's Edition (TE)</th>
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<tbody>
<tr>
<td>TE: 1C-1D; Laboratory Manual: Science Safety Rules, Safety Symbols, Laboratory Safety Contract, Student Safety Test, Lab Skills Checkup 1-5, Labs for Chapters 1-21</td>
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<tr>
<td>TR: Guided Reading and Study Workbook: 1.5; Chapter 1 Test; Test Prep Resources: Chapter 1; Teacher Express CD</td>
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<td>TECH: Virtual Labs; Geode CD-Rom; <a href="http://www.SciLinks.org">www.SciLinks.org</a>; <a href="http://www.phschool.com">www.phschool.com</a></td>
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### Astronomy

#### Standard ES-2: Students will demonstrate an understanding of the structure and properties of the universe.

#### Indicators

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<tr>
<th>Indicator</th>
<th>Student Edition (SE)</th>
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<tr>
<td>ES-2.1 Summarize the properties of the solar system that support the theory of its formation along with the planets.</td>
<td>SE: 10, 720-721; Section Assessment: 25.3</td>
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<tr>
<td>TE: 698C-698D; Chapter Test: 25</td>
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<td>TR: Guided Reading and Study Workbook: Ch. 25; Teacher Express CD</td>
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<td>TECH: <a href="http://www.phschool.com">www.phschool.com</a>; <a href="http://www.SciLinks.org">www.SciLinks.org</a>; Teacher Express: 25.3; On-line Text: 25.3; Computer Test Bank: 25</td>
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<th>Indicator</th>
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<tr>
<td>ES-2.2 Identify properties and features of the Moon that make it unique among other moons in the solar system.</td>
<td>SE: 458-460, 626-627, 628-629, 630-634; Inquiry Activity: 447, 613</td>
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<td>TE: 446A-D, 612A-D; Teacher Demo: 451, 618, 620</td>
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<tr>
<td>TR: Chapter Tests: Ch. 16, 22; Computer Test Bank: Ch. 16, 22; Guided Reading and Study Workbook: Ch. 16, 22; Lesson Plans: Ch. 16, 22</td>
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<td>TECH: Transparencies: 202-203, 321-338, 328-332; On-line Text: Chapter 16, 22; <a href="http://www.phschool.com">www.phschool.com</a>; <a href="http://www.SciLinks.org">www.SciLinks.org</a>; Ch. 16, 22; Geode: Earth’s Moon; Teacher Express: Ch. 16, 22</td>
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### South Carolina Academic Standards for Earth Science

| ES-2.3 Summarize the evidence that supports the big bang theory and the expansion of the universe (including the red shift of light from distant galaxies and the cosmic background radiation). | SE: 10, 720-721; Section Assessment: 25.3  
TE: 698C-698D; Chapter Test: 25  
TR: Guided Reading and Study Workbook: Ch. 25; Teacher Express CD  
TECH: www.phschool.com; www.SciLinks.org; Teacher Express: 25.3; On-line Text: 25.3; Computer Test Bank: 25 |
| --- | --- |
| ES-2.4 Explain the formation of elements that results from nuclear fusion occurring within stars or supernova explosions. | SE: 689-690; Section Assessment: 24.3; Exploration Lab: 692-693; Build Science Skills: 687  
TE: Explanation of Figure 18; Laboratory Manual: Measuring the Diameter of the Sun  
TR: Guided Reading and Study Workbook: 24.3; Chapter 24 Test; Teacher Express CD  
TECH: www.phschool.com; www.SciLinks.org; Geode CD-Rom; Transparencies: T-356, T-357; Discovery School Videos: Fireball |
| ES-2.5 Classify stars by using the Hertzsprung-Russell diagram. | SE: 704-705; Section Assessment: 25.1  
TE: Address Misconceptions: 704; Guided Reading and Study Workbook: 25.1; Chapter 25 Test; Laboratory Manual: Resource 21  
TR: Guided Reading and Study Workbook: Chapter 25; Teacher Express  
TECH: www.SciLinks.org; www.phschool.com |
| ES-2.6 Compare the information obtained through the use of x-ray, radio, and visual (reflecting and refracting) telescopes. | SE: 678-683; Section Assessment: 24.2  
TE: Chapter 24 C and D; Teacher Demo: 679  
TR: Teacher Express CD; Guided Reading and Study Workbook: Chapter 24  
| ES-2.7 Summarize the life cycles of stars. | SE: 704-705; Section Assessment: 25.1  
TE: Address Misconceptions: 704; Guided Reading and Study Workbook: 25.1; Chapter 25 Test; Laboratory Manual: Resource 21  
TR: Guided Reading and Study Workbook: Chapter 25; Teacher Express  
TECH: www.SciLinks.org; www.phschool.com |

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| **ES-2.8** Explain how gravity and motion affect the formation and shapes of galaxies (including the Milky Way). | **SE**: 614-621; 622-629; Section Assessments: 22.1, 22.2; Inquiry Activity: 613; Exploration Lab: 636-637  
**TE**: 612A-D; Teacher Demo: 618, 620, 625; Laboratory Manual: Measuring the Angle of the Sun at Noon  
**TR**: Chapter Tests: Ch. 22; Computer Test Bank: Ch. 22; Guided Reading and Study Workbook: Ch. 22; Lesson Plans: Ch. 22  
**TECH**: Transparencies: 315-338; On-line Text: Section 22.1, 22.2; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Ch. 22; Teacher Express: Ch. 22 |

| **ES-2.9** Explain how technology and computer modeling have increased our understanding of the universe. | **SE**: 16-17, 25, 56, 117, 269, 332, 352, 406, 454, 549, 635, 678-683, 722; Inquiry Activity: 643, 673, 699; Exploration Lab: 666, 692, 723; Section Assessment: 24.2  
**TE**: 1C-1D, 672C-672D; Teacher Demo: 679  
**TR**: Guided Reading and Study Workbook: 1.3, 24.2; Build Science Skills: 17; Chapter Test: 1, 24; Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 353, 354, 355; Teacher Express: Ch. 24 |

**Solid Earth**

Standard ES-3: Students will demonstrate an understanding of the internal and external dynamics of solid Earth.

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<tr>
<th>Indicators</th>
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| **ES-3.1** Summarize theories and evidence of the origin and formation of Earth’s systems by using the concepts of gravitational force and heat production. | **SE**: 269-270; Section Assessment: 9.4  
**TE**: Reteach: 277; Build Science Skills: 270  
**TR**: Guided Reading and Study Workbook: 9.4; Chapter 9 Test; Teacher Express CD  
**TECH**: Transparencies: 117, 118; [www.SciLinks.org](http://www.SciLinks.org); [www.phschool.com](http://www.phschool.com); Geode CD-Rom |

| **ES-3.2** Explain the differentiation of the structure of Earth’s layers into a core, mantle, and crust based on the production of internal heat from the decay of isotopes and the role of gravitational energy. | **SE**: 7-10, 234-239; Section Assessment: 8.4  
**TE**: 216A-D; Teacher Demo: 234  
**TR**: Chapter Tests: Ch. 8; Computer Test Bank: Ch. 8; Guided Reading and Study Workbook: Ch. 8; Lesson Plans: Ch. 8  
**TECH**: Transparencies: 92-94; On-line Text: Section 8.4; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Ch. 8; Teacher Express: Ch. 8 |
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</table>
| ES-3.3 Summarize theory of plate tectonics (including the role of convection currents, the action at plate boundaries, and the scientific evidence for the theory). | SE: 261-268, 269-270; Section Assessment: 9.3, 9.4  
TE: 246A-D; Build Science Skills: 261, 270;  
Teacher Demo: 262, 264; Reteach: 277;  
Laboratory Manual: Modeling a Plate Boundary  
TR: Chapter Tests: Ch. 9; Computer Test Bank: Ch. 9; Guided Reading and Study Workbook: Ch. 9; Lesson Plans: Ch. 9  
TECH: Transparencies: 100-109, 117, 118, 120;  
On-line Text: Section 9.3, 9.4;  
www.phschool.com; www.SciLinks.org: Ch. 9;  
Teacher Express: Ch. 9; Geode CD: Forces Within Plate Tectonics; Discovery Channel DVD: Plate Tectonics |
| ES-3.4 Explain how forces due to plate tectonics cause crustal changes as evidenced in earthquake activity, volcanic eruptions, and mountain building. | SE: 9-10, 248-268, 269, 280-285; Exploration Lab: 272-273, 300-301; Inquiry Activity: 247;  
Quick Lab: 252; Section Assessment: 9.1, 9.2, 9.3, 10.1  
TE: Chapter 9 and 10 C and D; Teacher Demo: 249, 258, 262, 264, 284  
TR: Guided Reading and Study Workbook: 9.1, 9.2, 9.3, 10.1; Teacher Express CD: Ch. 9, 10  
TECH: Discovery Channel: Death and Destruction, Plate Tectonics; Geode: Plate Tectonics; Teacher Express: 9.1, 9.2, 9.3, 10.1 |
| ES-3.5 Analyze surface features of Earth in order to identify geologic processes (including weathering, erosion, deposition, and glaciation) that are likely to have been responsible for their formation. | SE: 66-69, 76, 78, 126-132, 133-142, 143-147, 164-167, 199, 208-209, 465-466, 506; Inquiry Activity: 65, 125; Exploration Lab: 150-151, 181; Section Assessment: 3.1, 3.3, 5.1, 5.2, 5.3, 6.2, 16.3  
TE: 64C-64D, 124C-124D, 156C-156D; Teacher Demo: 68, 77, 128, 134, 144, 166; Build Science Skills: 68, 76, 78, 127, 129, 136, 137, 140, 167; Laboratory Manual: Some Facts that Affect Soil Erosion, Rivers That Shape the Land  
TR: Guided Reading and Study Workbook: 3, 5, 6, 16; Chapter 3, 5, 6, 16 Test; Teacher Express CD: Ch. 3, 5, 6, 16; Computer Test Bank: Ch. 3, 5, 6, 16; Guided Reading and Study Workbook: Ch. 3, 5, 6, 16; Lesson Plans: Ch. 3, 5, 6, 16  
TECH: Transparencies: 14, 18, 26-35, 42-49, 375, 376; On-line Text: Section 3.1, 3.3, 5.1, 5.2, 5.3, 6.2, 16.3; Geode: CD-Rom: Sculpturing Earth's Surface; Discovery Channel Video: Dams; www.phschool.com; www.SciLinks.org: Ch. 3, 5, 6, 16 |

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| ES-3.6 Explain how the dynamic nature of the rock cycle accounts for the interrelationships among igneous, sedimentary, and metamorphic rocks. | **SE**: 66-69, 126-132; Inquiry Activity: 65, 125; Exploration Lab: 150-151; Section Assessment: 3.1  
**TE**: Chapter 3 and 5 C and D; Teacher Demo: 68, 128; Build Science Skills: 68, 127, 129  
**TR**: Guided Reading and Study Workbook: 3.1, 5.1; Chapter Tests: Ch. 3, 5; Computer Test Bank: Ch. 3, 5; Lesson Plans: Ch. 3, 5  
**TECH**: Discovery Channel: The Rock Cycle, Weathering and Erosion; Geode: Rock Cycle, External vs. Internal Process; Teacher Express: 3.1, 5.1 |
| ES-3.7 Classify minerals and rocks on the basis of their physical and chemical properties and the environment in which they were formed. | **SE**: 44-49, 50-55, 70-74, 75-79, 80-84; Exploration Lab: 58-59, 86-87; Quick Lab: 82; Section Assessment: 2.2, 2.3, 3.2, 3.3, 3.4  
**TE**: 32C-32D, 64C-64D; Teacher Demo: 45, 46, 72, 77; Build Science Skills: 48, 54, 70, 76, 78; Evaluate Understanding: 55; Address Misconceptions: 76; Laboratory Manual: Crystal Systems, Classifying Rocks Using a Key  
**TR**: Guided Reading and Study Workbook: 2.2, 2.3, 3.2, 3.3, 3.4; Chapter Tests: Ch. 2, 3; Computer Test Bank: Ch. 2, 3; Lesson Plans: Ch. 2, 3  
**TECH**: Transparencies: 9-13, 15-22; On-line Text: 2.2, 2.3, 3.2, 3.3, 3.4; Teacher Express: Ch. 2, 3; Geode CD-Rom: Earth Materials;  
| ES-3.8 Summarize the formation of ores and fossil fuels and the impact on the environment that the use of these fuels has had. | **SE**: 21, 85, 94-97, 110, 113, 410-411, 487, 602-603  
**TE**: Teacher Demo: 96; Build Science Skills: 96  
**TR**: Guided Reading and Study Workbook: Section 4.1; Teacher Express CD; Chapter 16 Test  
**TECH**: Transparencies: 19; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |

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<td><strong>Earth’s Atmosphere</strong></td>
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<tr>
<td>Standard ES-4: The student will demonstrate an understanding of the dynamics of Earth’s atmosphere.</td>
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<td><strong>Indicators</strong></td>
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| ES-4.1 Summarize the thermal structures, the gaseous composition, and the location of the layers of Earth’s atmosphere. | **SE**: 476-482, 484-485, 494-495, 540, 674, 681; Inquiry Activity: 475; Section Assessment: 482  
**TE**: Chapter 17 C and D; Build Science Skills: 479; Teacher Demo: 481; Laboratory Manual: 111  
**TR**: Guided Reading and Study Workbook: Section 17.1; Teacher Express CD  
**TECH**: Transparencies: T-218, T-219; Discovery Channel: Weather; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Geode CD-Rom |
| ES-4.2 Summarize the changes in Earth’s atmosphere over geologic time (including the importance of photosynthesizing organisms to the atmosphere). | **SE**: 4-5, 476-482; Inquiry Activity: 475; Section Assessment: 17.1  
**TE**: 474C-474D; Build Science Skills: 479; Teacher Demo: 481  
**TR**: Guided Reading and Study Workbook: 17.1; Chapter 17 Test; Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 217, 218, 219, 220, 221, 222, 223, 224, 225; Discovery Channel Video: About Weather; Online Text: 17.1; Computer Test Bank: 17.1 |
| ES-4.3 Summarize the cause and effects of convection within Earth’s atmosphere. | **SE**: 476-482, 483-487, 494-495, 588-591, 600-603; Inquiry Activity: 475, 587; Quick Lab: 590; Exploration Lab: 606-607; Section Assessment: 17.1, 17.2, 17.3, 21.1, 21.3  
**TE**: 474C-474D, 586C-586D; Build Science Skills: 479, 484, 486; Teacher Demo: 481, 484, 490, 589, 601; Laboratory Manual: Determining How Temperature Changes with Altitude, Investigating Factors That Control Temperature, Modeling the Greenhouse Effect  
**TR**: Guided Reading and Study Workbook: 17.1, 17.2, 17.3, 21.1, 21.3; Chapter Test: 17, 21; Teacher Express CD  
**TECH**: Transparencies: T217-242; Discovery Channel: Weather; Geode CD-Rom; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |

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| **ES-4.7** Summarize the evidence for the likely impact of human activities on the atmosphere (including ozone holes, greenhouse gases, acid rain, and photochemical smog). | **SE:** 102-107, 108, 112, 113-116; Application Lab: 118-119; Section Assessment: 4.2, 4.3, 4.4  
**TE:** 92C-92D; Build Science Skills: 103; Teacher Demo: 105, 106, 111, 114; Laboratory Manual: Recovering Oil, Desalination by Distillation  
**TR:** Chapter Tests: Ch. 4; Computer Test Bank: Ch. 4; Guided Reading and Study Workbook: Ch. 4; Lesson Plans: Ch. 4  
**TECH:** On-line Text: Ch. 4; Transparencies: 23; Discovery Channel Video: PET Clothes; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org): Ch. 4; Teacher Express: Ch. 4 |

| **ES-4.8** Predict weather conditions and storms (including thunderstorms, hurricanes, and tornados) on the basis of the relationship among the movement of air masses, high and low pressure systems, and frontal boundaries. | **SE:** 476-482, 483-487, 488-493, 494-495, 588-591, 600-603; Inquiry Activity: 475, 587; Quick Lab: 590; Exploration Lab: 606-607; Section Assessment: 17.1, 17.2, 17.3, 21.1, 21.3  
**TE:** 474C-474D, 586C-586D; Build Science Skills: 479, 484, 486; Teacher Demo: 481, 484, 490, 589, 601; Laboratory Manual: Determining How Temperature Changes with Altitude, Investigating Factors That Control Temperature, Modeling the Greenhouse Effect  
**TR:** Guided Reading and Study Workbook: 17.1, 17.2, 17.3, 21.1, 21.3; Chapter Test: 17, 21; Teacher Express CD  
**TECH:** Transparencies: T217-242; Discovery Channel: Weather; Geode CD-Rom; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |

**Earth’s Hydrosphere**

Standard ES-5: The student will demonstrate an understanding of Earth’s freshwater and ocean systems.

**Indicators**

| ES-5.1 Summarize the location, movement, and energy transfers involved in the movement of water on Earth’s surface (including lakes, surface-water drainage basins [watersheds], freshwater wetlands, and groundwater zones). | **SE:** 158-163, 164-170, 171-179; Inquiry Activity: 157; Exploration Lab: 181  
**TE:** 156C-D; Build Science Skills: 159, 167; Teacher Demo: 160, 166, 172; Laboratory Manual: 53, 59  
**TR:** Guided Reading and Study Workbook: 6.1, 6.2, 6.3; Chapter Test: 6; Teacher Express CD  
**TECH:** Transparencies: 36-57; Geode: Hydrologic Cycle, Running Water, Groundwater; Discovery Channel: Dams; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |

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| **ES-5.2 Illustrate the characteristics of the succession of river systems.** | **SE:** 161, 158-163, 164-170; Inquiry Activity: 157; Exploration Lab: 181  
**TE:** 156C-D; Build Science Skills: 159, 167; Teacher Demo: 160, 166; Laboratory Manual: 53  
**TR:** Guided Reading and Study Workbook: 6.1, 6.2; Chapter Test: 6; Teacher Express CD  
**TECH:** Transparencies: 36-57; Geode: Hydrologic Cycle, Running Water, Groundwater; Discovery Channel: Dams; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |
| **ES-5.3 Explain how karst topography develops as a result of groundwater processes.** | **SE:** 178-179  
**TE:** 156C-D; Build Science Skills: 178; Integrate Chemistry: p. 178  
**TR:** Guided Reading and Study Workbook: 6.3; Chapter Test: 6; Teacher Express CD  
**TECH:** [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |
| **ES-5.4 Compare the physical and chemical properties of seawater and freshwater.** | **SE:** 158-160, 422-427; Inquiry Activity: 421  
**TE:** 420C-D; Teacher Demo: 423, 424; Laboratory Manual: 41  
**TR:** Guided Reading and Study Workbook: 15.1; Chapter Test: 15; Teacher Express CD  
**TECH:** Transparencies: 188-193; On-line Text: Section 15.1; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Teacher Express: Ch. 15 |
| **ES-5.5 Explain the results of the interaction of the shore with waves and currents.** | **SE:** 455-457, 461-462, 484-485, 674-677; Section Assessment: 24.1; Inquiry Activity: 673  
**TE:** 672A-D; Teacher Demo: 676  
**TR:** Chapter Tests: Ch. 24; Computer Test Bank: Ch. 24; Guided Reading and Study Workbook: Ch. 24; Lesson Plans: Ch. 24  
**TECH:** Transparencies: 348-352; On-line Text: Section 24.1; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Ch. 24; Teacher Express: Ch. 24 |
| **ES-5.6 Summarize the advantages and disadvantages of devices used to control and prevent coastal erosion and flooding.** | **SE:** 142, 167-170, 208-208, 461-465; Exploration Lab: 181  
**TE:** 156C-D, 446C-D; Teacher Demo: 166; Build Science Skills: 167, 465, 466; Laboratory Manual: 53, 207  
**TR:** Guided Reading and Study Workbook: Ch. 6, 16; Teacher Express CD; Chapter Test: 6, 16  
**TECH:** Transparencies: 42-49, 207-216; Geode: Running Water, Coastal Processes; Discovery Channel Video: Dams; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org) |
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| **ES-5.7** Explain the effects of the transfer of solar energy and geothermal energy on the oceans of Earth (including the circulation of ocean currents and chemosynthesis). | **SE:** 448-454; Inquiry Activity: 447; Exploration Lab: 496  
**TE:** 446C-D; Teacher Demo: 451  
**TR:** Guided Reading and Study Workbook: Ch. 16; Teacher Express CD; Chapter Test: 16  
**TECH:** Transparencies: 202-203; www.phschool.com; www.SciLinks.org |
| **ES-5.8** Analyze environments to determine possible sources of water pollution (including industrial waste, agriculture, domestic waste, and transportation devices). | **SE:** 108-109, 113-116; Application Lab: 118-119  
**TE:** 92C-D; Teacher Demo: 114; Build Science Skills: 109; Laboratory Manual: 41  
**TR:** Guided Reading and Study Workbook: Ch. 4; Teacher Express CD; Chapter Test: 4  
**TECH:** Discovery Channel Video: PET Clothes; www.phschool.com; www.SciLinks.org |

### The Paleobiosphere

**Standard ES-6:** Students will demonstrate an understanding of the dynamic relationship between Earth’s conditions over geologic time and the diversity of its organisms.

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| **ES-6.1** Summarize the conditions of Earth that enable the planet to support life. | **SE:** 476-482, 484-485, 494-495, 540, 674, 681; Inquiry Activity: 475; Section Assessment: 482  
**TE:** Chapter 17 C and D; Build Science Skills: 479; Teacher Demo: 481; Laboratory Manual: 111  
**TR:** Guided Reading and Study Workbook: Section 17.1; Teacher Express CD  
**TECH:** Transparencies: T-218, T-219; Discovery Channel: Weather; www.phschool.com; www.SciLinks.org; Geode CD-Rom |
| **ES-6.2** Recall the divisions of the geologic time scale and illustrate the changes (in complexity and/or diversity) of organisms that have existed across these time units. | **SE:** 336-346; Inquiry Activity: 335; Section Assessment: 12.1, 12.2  
**TE:** Chapter 12 C and D; Teacher Demo: 339, 343; Build Science Skills: 344; Evaluate Understanding: 341  
**TR:** Guided Reading and Study Workbook: 12.1, 12.2; Teacher Express: Ch. 12  
**TECH:** Discovery Channel: Grand Canyon; Geode: Relative Dating; www.phschool.com; www.SciLinks.org |
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| **ES-6.3** Summarize how fossil evidence reflects the changes in environmental conditions on Earth over time. | **SE**: 336-341; Section Assessment: 12.1  
**TE**: 334A-D; Teacher Demo: 339, 341  
**TR**: Chapter Tests: Ch. 12; Computer Test Bank: Ch. 12; Guided Reading and Study Workbook: Ch. 12; Lesson Plans: Ch. 12  
**TECH**: Transparencies: 150-153; On-line Text: Section 12.1; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org): Ch. 12; Teacher Express: Ch. 12; Geode: Relative Dating; Discovery Channel DVD: Grand Canyon |
| **ES-6.4** Match dating methods (including index fossils, ordering of rock layers, and radiometric dating) with the most appropriate application for estimating geologic time. | **SE**: 336-341, 342-346, 347-351; Section Assessment: 12.1, 12.2, 12.3; Inquiry Activity: 335  
**TE**: 334A-D; Teacher Demo: 339, 343, 349; Evaluate Understanding: 341; Build Science Skills: 344; Reteach: 351  
**TR**: Chapter Tests: Ch. 12; Computer Test Bank: Ch. 12; Guided Reading and Study Workbook: Ch.12; Lesson Plans: Ch. 12  
**TECH**: Transparencies: 150-158; On-line Text: Section 12.1; [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Teacher Express: Ch. 12; Geode: Relative Dating, Radiometric Dating; Discovery Channel DVD: Grand Canyon |
| **ES-6.5** Infer explanations concerning the age of the universe and the age of Earth on the basis of scientific evidence. | **SE**: 336-341, 342-346, 347-351; Inquiry Activity: 335; Section Assessment: 12.1, 12.2, 12.3  
**TE**: 334C-334D; Teacher Demo: 343, 349; Build Science Skills: 344; Evaluate Understanding: 341; Reteach: 351  
**TR**: Guided Reading and Study Workbook: 12.1, 12.2, 12.3; Chapter Test: 12; Teacher Express CD  
**TECH**: [www.phschool.com](http://www.phschool.com); [www.SciLinks.org](http://www.SciLinks.org); Transparencies: 150, 151, 152, 153, 154, 155, 156, 157, 158; Discovery Channel Videos: Grand Canyon; Computer Test Bank: 12