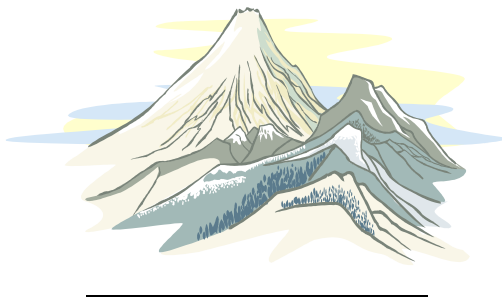


# FRESNO UNIFIED SCHOOL DISTRICT

## INTRODUCTORY EARTH SCIENCE COURSE OF STUDY



### Introduction

The California Science Content Standards include Earth Science, Biology, Chemistry, and Physics. These standards are intended to prepare students for the more formal treatment of concepts, principles, and theories called for at the college level. In the middle school grades students should have developed and enhanced their formal reasoning abilities that reflect science as a way of knowing and acquiring new science content knowledge. In grade 6-8 they connect concrete observations of a rich array of phenomena and unify models that help to simplify the ever-expanding body of science content knowledge. At the ninth grade level these skills will be revisited, reinforced and developed in depth. In the investigation and experimentation strand students are expected to: formulate hypotheses, to design experiments that will enable them to test predictions, and complete independent research projects utilizing the *World Wide Web*. They will also be expected to make oral reports and arguments based on evidence. In designing, carrying out, and reporting the results of experiments, they will be expected to make use of more complex mathematics.

### Teaching and Learning

The National Research Council (1999) in How People Learn has recommended a framework to help guide the design and evaluation of environments that can optimize learning. (National Research Council, 1999, p.19). The framework identifies four interrelated attributes of learning environments that need cultivation:

1. Schools and classrooms must be learner centered. This incorporates prior knowledge, cultural differences, and students' own theories about intelligence and learning (p. 19-20).
2. Attention must be given to what is taught, why it is taught, and what mastery looks like. Many curricula fail to support learning with understanding that knowledge-centered environments emphasize (p. 21).
3. Formative assessments designed to provide evidence of learning are essential. Assessments must be learner friendly and provide the student with opportunities to revise and improve their thinking over a period of time (p. 22).
4. Learning is influenced in fundamental ways by the context in which it takes place. Teachers must design classroom activities and help students organize their work in ways that will build a community of learners. Teachers must also be able to create a community of learners among themselves (p. 22).

## **The Role of Technology**

The use of technology in schools and classrooms will create new opportunities for curriculum and instruction by bringing real-world problems into the classroom. Peck and Dorricott (1994), listed ten reasons for using technology:

1. Students learn and develop at different rates.
2. Graduates must be proficient at accessing, evaluating, and communicating information.
3. Technology can foster an increase in the quantity and quality of students' thinking and writing.
4. Technology can nurture artistic expression.
5. Graduates must be globally aware and able to use resources that exist outside the school.
6. Technology creates opportunities for students to do meaningful work.
7. All students need access to high level and high-interest courses.
8. Graduates must solve complex problems.
9. Students must feel comfortable with the tools of the Information Age.
10. Schools must increase their productivity and efficiency (p. 53).

Science leaders must keep informed about changes in technology and its trends. Rapid changes in communications technology can redefine what the classroom looks like. Technology can also be a powerful pedagogical tool for human interaction that supports learning (National Research Council, 1999; Posner, 1995).

In an effort to establish a consistent content for technology education in schools, the International Technology Education Association (ITEA) has created the Standards for Technological Literacy: Content for the Study of Technology. The standards and associated benchmarks created present a vision of what students should know and be able to do in order to be technologically literate. The intent of the publication is to influence what happens in every K-12 classroom in America through the development of new curricula, textbooks, and student assessments (International Technology Education Association, 2000).

## **Reading and Language Arts Improvement Through Science Curriculum-The Research**

The demand for literacy skills in the U.S. workplace is at an all time high and public schools are attempting to respond by increasing the basic literacy requirements for K-12 students. Despite these efforts, reading scores nationally have not improved over the last 30 years as measured by the National Assessment of Educational Progress (NAEP), and the U.S. continues to lag behind most other countries on international assessments in reading. In addition, the relative poor performance of U.S. students in mathematics and science assessments internationally is believed to also be rooted in their poor performance as readers. The weakness is that reading is seldom effectively integrated across the various content areas in schools. Reading comprehension, in particular, has been identified as a critical skill children must possess to succeed in school beyond grade three. Even though texts remain the primary source of instruction for content, reading is seldom integrated into content area instruction. The development of reading skills is enhanced through the development of classification and oral communication skills and positive attitudes toward science (National Research Council, 2000; Lowery, 1995).

Teaching science in a way that is understandable and meaningful to students, as it promotes increased literacy, can be developed for students using existing science and language arts curricula and recognized best practice strategies (Crandall, 1995). Evidence has been reported that shows inquiry-related teaching effective in fostering ways of thinking, talking, and writing (Fradd & Lee, 1999; Met, 1994; Mohan, 1990; Rosebery et al., 1992).

## **English Learner Student Achievement Will Improve With Science Learning**

Inquiry-oriented science teaching that is contextualized is especially valuable for culturally and linguistically diverse students. Science learning and language acquisition for English Learner students is mutually dependent. Through the contextualized use of language in science inquiry, students develop and practice complex language forms and functions. Through the use of language functions such as description, explanation and discussion in inquiry science, students enhance their conceptual understanding (Merino & Hammond, 1998).

Inquiry-related teaching is also effective in developing vocabulary and conceptual understanding of science. When English Learner students use English to solve a real world science problems their acquisition of the language is more effective (Merino & Hammond, 1998). Learning vocabulary and academic language in context is most effective because only the vocabulary needed is used. English Language Learners, in particular, do not need to practice isolated vocabulary that will never be used (Lloyd & Contreras, 1987). Evidence collected in classrooms shows that students with large science vocabulary knowledge learned through memorization give the false impression they have scientific knowledge. The fact is that they do not understand the meaning of the words at all (Fradd & Lee, 1999; Met, 1994; Mohan, 1990; Rosebery et al., 1992).

## **Reading in the Content Area of Science**

Many studies cite that learning science through the use of the English language develops fluency much more effectively. Language-minority students acquire scientific ways of thinking, talking, and writing through inquiry-oriented teaching (August & Hakuta, 1997; Rosebery et al., 1992; Ballenger, 1997). The research also implies that there is a need for explicit instruction in both academic language and reading to learn through text (Holliday, 1994; Kuehn, 1998; Pressley, et al, 1989; Santa & Alvermann, 1991). How students learn science and how they develop language skills and reading skills are interconnected. The contextualized use of language in science inquiry provides students practice with complex language forms and functions. Further, this type of explicit instruction must be embedded in the natural context of effective science instruction (Casteel & Isom, 1994; Lee, Fradd, & Sutman, (1995); Warren & Rosebery, 1993), and teacher professional development (Diaz, 1994). Parallels between this research and the research on reading comprehension are strong. It is all the more reason that a quality standards-based program is important to include in strategic plans to improve student achievement.

Critical thinking is developed through cognitively demanding context-embedded tasks in which children try to make sense out of the world. Their worldview, influenced by cultural perspective and understanding of words in cultural context, determines what is feasible in a scientific sense. English Learner students often understand science concepts in their primary language and may constitute prior knowledge that is never acknowledged (Met, 1994; Lowery, 1995).

# Fresno Unified Secondary School Science Program

## Natural Sciences Sequence

Science Education Center  
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 559-248-7181  
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### *Middle School*

### *High School*

Grade 6	Grade 7	Grade 8	Grade 9	Grade 10	Grade 11	Grade 12
Earth Science emphasis integrated with Life and Physical Sciences	Life Science emphasis integrated with Earth and Physical Sciences	Physical Science emphasis integrated with Earth and Life Sciences	Introductory Earth Science, or Biology Course of Study	Biology, Chemistry, or Physics Course of Study	Chemistry, Physics, or other standards-based advanced science course	Options include *science electives, honors level, or advanced level coarse

*\*Science Electives: The fourth year of laboratory science may include optional courses such as Physiology, Environmental Science, Ecology, Zoology, or Advanced Topics. Some sites may not offer all elective courses.*

*Advanced Placement coursework that is identified as one of the standards-based course titles qualifies as a “second year” course. For example: Biology and AP Biology, Chemistry and AP Chemistry, Physics, and AP Physics.*

*State augmented assessments as part of the STAR package are available only for Earth, Biology, Chemistry, Physics, and Integrated Science. Only students enrolled in those courses are eligible to take the exams.*

*All students must be enrolled in science in grades 9-11. Students not enrolled in a science course will receive a “below basic” score of 200 in place of the CST Science Test score.*

*The NCLB Science test will be implemented by 2007, which will be in Biology only at the end of grade 10.*

*Algebra is a recommended prerequisite for Grade 9 Earth Science and all other science courses.*

*Some aspects of all four California Content Standards – Biology, Physics, Chemistry, and Earth/Space Science – must be covered in depth. The main goal of the Natural Sciences Sequence is to revisit concepts, principles and theories at successively higher levels of abstraction over six years of schooling.*

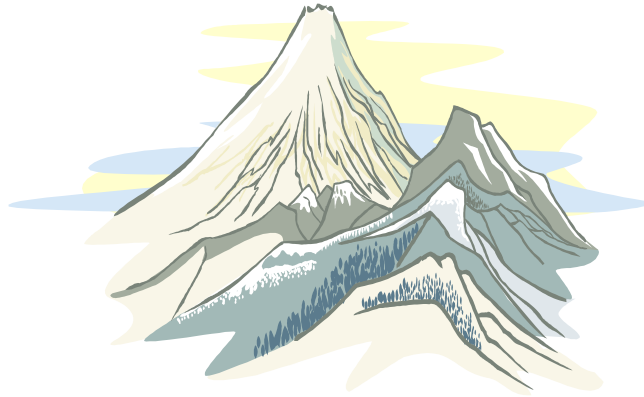
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# INTRODUCTORY EARTH SCIENCE



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*There is a single light of science, and to brighten it anywhere is to brighten it everywhere.*  
*--Isaac Asimov*

## Introductory Earth Science Content Outline

Ninth graders are active and involved in the world around them; they like the outdoors and find powerful events like earthquakes, volcanoes, and floods compelling. Their active imaginations make the movement of continents easy to visualize. They have become environmentally aware and are ready to go beyond a descriptive treatment of ecology to embrace the higher concepts of recycle, reduce, and reuse. These adolescents know the Earth's natural and urban environments are impacted by pollution and can understand the role they play in this process. They have learned about the need for appropriate ways to develop and utilize natural resources and the societal impacts and trade offs and are ready to debate the issues of cause and effect. Grade 9 is one place in the science curricula for 9-12 where Earth sciences are particularly emphasized. It is important that students learn geology and related sciences to the depth called for in the Grade 9 science standards. Much of the ninth grade science content combines observed phenomenon with higher math skills (CDE, 2001).

*“Science is constructed of facts, as a house is of stones. But a collection of facts is no more a science than a heap of stones is a house.”*

*-Henri Poincare (1860-1934), Science and Hypothesis*

**Introduction to Earth Science Courses: This is not listed in the California State Standards, but an introduction to the topic is necessary.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the meaning of Earth Science, the four spheres of the Earth, and are introduced to how these spheres interact with each other to form Earth System Science.</p> <p style="text-align: right;">(Not a standard)</p> <p><b>Assessment</b> (CST)</p>	<p><b>Describe</b> the study of Earth Science.</p> <p><b>Identify</b> the four spheres that make up the Earth System.</p> <p><b>Label</b> the parts of the Earth on a diagram.</p> <p><b>Explain</b> how Earth's spheres interact with each other as a system.</p>	<p>Prentice Hall: Chapter 1.1 Chapter 1.2 Chapter 1.4</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Ch 1.1, Ch 1.2, Ch 1.4</p> <p><b>Transparencies:</b> T-2: Earth's Layers</p> <p><b>Build Vocabulary:</b> Word Parts (Pg 2, 7, &amp; 18)</p> <p><b>Building Science Skills:</b> Inferring (Page 5) Making Judgments (Page 9) Cause &amp; Effect (Page 19) Environmental Problems (Page 22)</p> <p><b>Using Visuals:</b> Earth's Major Spheres (Figure 5, Page 7)</p> <p><b>Build Reading Literacy:</b> Use prior knowledge (Pg 9) Compare &amp; Contrast (Pg19)</p> <p><b>Teacher Demo:</b> Convection (Pg 10)</p>	<p><b>Key Vocabulary:</b></p> <p>Earth Science Geology Oceanography Meteorology Astronomy Solar System Hydrosphere Atmosphere Geosphere Biosphere Core Mantle Crust Resources System</p> <hr/> <p><b>Skills Focus:</b></p> <p>Making Inferences Making Judgments Interpreting Diagrams Drawing Logical Conclusions</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Use Concept Maps Compare &amp; Contrast Analyze word parts Outlining</p> <hr/> <p><b>EL Strategies</b></p> <p>Focus on graphics and visuals to teach the parts of the Earth. Access prior knowledge and focus on word parts to help students understand the new vocabulary. Be careful with the term "meteorology"!</p>	<p>5 days</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>

## Earth Science - Page 2

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students will select and use appropriate tools and technology (such as computer-linked probes, spreadsheets, and graphing calculators) to perform tests, collect data, analyze relationships, and display data.</p> <p style="text-align: right;">( I&amp;E 1a )</p>	<p><b>Demonstrate</b> the use of technology in solving problems related to Earth Science.</p> <p><b>Describe</b> how advanced technology is used to analyze the Earth.</p>	<p>Prentice Hall: Page 16-17 (Ch 1.3) Understanding Earth (Page 25): Studying Earth from Space</p>	<p><b>Key Vocabulary:</b> Weather Satellites Navigation Satellites Landsat Satellites Global Positioning System (GPS) Very Long Baseline Interferometry (VLBI)</p>	<p>First 2 weeks: 1 day</p> <p>Refer to other standards for additional time frames.</p> <p><i>A "day" is a 55-minute period. Adjust for block schedules</i></p>
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Using Visuals</b> Page 16, Figure 17</p> <p><b>Building Science Skills</b> Posing Questions (Pg 17)</p> <p><b>Web Resources</b> All NSTA SciLinks and additional web resources mentioned in this course of study.</p> <p><i>Additional resources beyond what is presented in the text would be helpful in teaching this standard.</i></p>		
<p><b>Assessment</b> (CST)</p>			<p><b>Skills Focus:</b> Using Technology</p> <p><i>Refer to other relevant standards</i></p>	
			<p><b>Literacy Connections:</b> Presenting Research</p>	
			<p><b>EL Strategies</b> Some of the web resources presented may be available in other languages. For example, the website "Windows on the Universe" is available in Spanish and English. (www.windows.ucar.edu/)</p>	

## Earth Science - Page 3

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Recognize the usefulness and limitations of models and theories as scientific representations of reality.</p> <p style="text-align: right;">( I&amp;E 1g )</p>	<p><b>Make connections</b> between the information a model gives them and the concept that the model is trying to explain.</p>	<p>Prentice Hall: Refer to standards 1a, 1c, 3b, 4c, 6a</p>	<p><b>Key Vocabulary:</b> Refer to standards 1a, 1c, 3b, 4c, 6a</p>	<p>Refer to standards 1a, 1c, 3b, 4c, 6a</p>
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Investigation Chap 9:</b> Modeling a Plate Boundary</p> <p><b>Lab Investigation 21:</b> Modeling the Greenhouse Effect</p>	<p><b>Skills Focus:</b> Refer to standards 1a, 1c, 3b, 4c, 6a</p>	
<p><b>Assessment</b> (CST)</p>		<p><b>Inquiry Cavity:</b> How Can You Model the Movement of Air in a Tornado? (p.557)</p> <p><b>Labs</b> Worksheet Chapter 23: Modeling the Solar System (also on p. 666)</p> <p><b>Lab</b> Worksheet Chapter 13: Modeling the Geologic Time Scale (also on p. 386)</p>	<p><b>Literacy Connections:</b> Refer to standards 1a, 1c, 3b, 4c, 6a</p>	
			<p><b>EL Strategies</b> Encourage students to design or "think -up" their own models to explain difficult concepts.</p>	

## Earth Science - Page 4

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time <small>(per 180 days)</small>		
<p>. . . Students will read and interpret topographic and geologic maps.</p> <p style="text-align: right;">( I&amp;E 1h )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Create</b> a landform from a topographic map.</p> <p><b>Read</b> a topographic map.</p> <p><b>Interpret</b> a geologic map.</p>	<p>Prentice Hall: Ch 1.3, pp 14,15</p>	<p><b>Key Vocabulary:</b> topographic map contour line contour interval elevation slope depression scale geologic map latitude longitude rock formation</p>	<p>1 day</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>		
					<p><b>Labs, Demos, Activities &amp; Resources:</b></p>	<p><b>Investigations</b> Investigation 1B: Using a topographic map to create a landform.</p>
		<p><b>Literacy Connections:</b></p> <p>Select Examine Extend</p>				
		<p><b>EL Strategies</b></p> <p>Modeling Visuals Direct vocabulary instruction</p>				

## Earth Science - Page 5

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>1b: Identify and communicate sources of unavoidable error.</p> <p>1c: Identify possible reasons for inconsistent results.</p> <p>1d: Formulate explanations by using logic and evidence.</p> <p style="text-align: center;">( I&amp;E 1b, 1c, 1d )</p>	<p><b>Analyze</b> their own lab work for sources of error.</p> <p><b>Recognize</b> that human error is inherent to most projects in Earth Science.</p> <p><b>Draw Conclusions</b> that are logical and coherent based on their own evidence and work.</p>	<p>Prentice Hall: Refer to standards 3a, 3c, 3d, 5a, 9c Chapter 1.5</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Lab Chapter 8:</b> Locating an Earthquake</p> <hr/> <p><b>Lab Chapter 9:</b> Paleomagnetism and the Ocean Floor</p> <hr/> <p><b>Investigation Chap 3:</b> Classifying Rocks using a Key</p> <hr/> <p><b>Lab 17B:</b> Investigating Factors that Control Temperature</p> <hr/> <p><b>Quicklab:</b> Household Water Usage (Page CA18)</p>	<p><b>Key Vocabulary:</b> Refer to standards 3a, 3c, 3d, 5a, 9c</p> <hr/> <p><b>Skills Focus:</b> Refer to standards 3a, 3c, 3d, 5a, 9c</p> <hr/> <p><b>Literacy Connections:</b> Refer to standards 3a, 3c, 3d, 5a, 9c</p> <hr/> <p><b>EL Strategies</b> Make certain that students understand that many times scientists do not always get the same results, and that it is acceptable to draw different conclusions based on those results if the conclusions are supported by logical evidence.</p>	<p>First 2 Weeks: 2 days</p> <p>Other times: Refer to standards 3a, 3c, 3d, 5a, 9c</p>
<b>Assessment</b>				
(CST)				

## Earth Science - Page 6

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . . Distinguish between hypothesis and theory as scientific terms.</p> <p style="text-align: right;">( I&amp;E 1f )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Write</b> a hypothesis based on logic.</p> <p><b>Distinguish</b> between a theory and a hypothesis.</p> <p><b>Explain</b> what a theory is and how it is formed.</p>	<p>Prentice Hall: Chapter 1.5</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Reading Strategy:</b> Venn Diagram (Pg 23)</p> <hr/> <p><b>Build Reading Literacy:</b> Hypothesis Sequence (flowcharts) Page 23</p> <hr/> <p><b>GRSW:</b> Chapter 1.5</p> <hr/> <p><b>Laboratory Skills Checkup #1-4:</b> Found in the laboratory manual.</p>	<p><b>Key Vocabulary:</b> Hypothesis Theory Scientific Method</p>	<p>1 day</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>
			<p><b>Skills Focus:</b></p>	
			<p>Using the Scientific Method Performing an Experiment Identifying Errors</p>	
			<p><b>Literacy Connections:</b></p>	
			<p>Using Venn Diagrams Using Flowcharts</p>	
			<p><b>EL Strategies</b></p>	
			<p>Have students post their thoughts from the Venn Diagram activity on a bulletin board in the classroom.</p>	

## Earth Science – Page 7

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . . Analyze situations and solve problems that require combining and applying concepts from more than one area of science.</p> <p style="text-align: right;">( I&amp;E 11 )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Integrate</b> various fields of science to find the solution to a problem.</p> <p><b>Recognize</b> that "Earth Science" is a small part of the entire discipline of science.</p>	<p>Prentice Hall: <i>Throughout the textbook, there are several examples that can be used to teach this standard.</i></p>	<p><b>Key Vocabulary:</b> <i>Varies</i></p>	<p><i>Varies</i></p>
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><i>Throughout the book, there are examples where another scientific discipline is integrated into Earth Science in order to better explain a concept. The listing below is an example from Standard 8b:</i></p>		
		<p><b>Integrating Biology:</b> Early organisms. Page 367.</p>	<p><b>Literacy Connections:</b> Accessing prior knowledge</p>	
			<p><b>EL Strategies</b> Create a concept map on a bulletin board that shows how scientists have to draw from all areas of science, math, language, and history to solve a problem. If possible, provide examples of real scientific problems and solutions.</p>	

## Earth Science – Page 8

### 2. Earth-based and space-based astronomy reveal the structure, scale, and changes in stars, galaxies, and the universe over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the galaxies are made of billions of stars and comprise most of the visible mass of the universe.</p> <p style="text-align: right;">( 2b )</p>	<p><b>Differentiate</b> between the three types of galaxies based on shape and size.</p> <p><b>Describe</b> the number of stars found in galaxies.</p> <p><b>Create</b> models of the three types of galaxies.</p> <p><b>Describe</b> the current theories on the formation and possible destruction of the universe.</p>	<p>Prentice Hall: Chapter 25.3 (Page 716-721) Earth's Place in the Universe (Page 6)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> 25.3 (Questions 2 &amp; 3 do not relate directly to this standard)</p> <p><b>Transparencies:</b> 368 (Raisin Bread Analogy)</p> <p><b>Web Resources:</b> NSTA SciLinks on Galaxies Chapter 25 Companion Website: Chapter Web Resources, Online Field Trips, Several on galaxies &amp; the universe</p> <p><b>Building Science Skills:</b> Using Models: Types of Galaxies (Page 717)</p> <p><b>Using Visuals:</b> Types of Galaxies, Figures 18-20 (Page 717)</p> <p><b>Building Reading Literacy:</b> The Big Bang (Page 720)</p> <p><b>Teaching Tips:</b> Earth's Place in the Universe (Page 6)</p>	<p><b>Key Vocabulary:</b> Spiral Galaxies Elliptical Galaxies Irregular Galaxies Clusters Red Shifts Hubble's Law Big Bang Theory Big Crunch</p> <hr/> <p><b>Skills Focus:</b> Using Models Interpreting Diagrams Using Technology</p> <hr/> <p><b>Literacy Connections:</b> Making Flowcharts Using Vocabulary Writing Outlines</p> <hr/> <p><b>EL Strategies:</b> Have students write their "Galactic Address", starting with their seat in class, progressing through their room, school, city, state, country, and planet, then going on to the Solar System, the Milky Way Galaxy, and the universe.</p>	<p>4 days</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science – Page 9

### 2. Earth-based and space-based astronomy reveal the structure, scale, and changes in stars, galaxies, and the universe over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know that stars differ in their life cycles and that visual, radio, and X-ray telescopes may be used to collect data that reveal those differences.</p> <p style="text-align: right;">( 2d )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Classify</b> stars based on their mass, color, size, brightness, and distinguishing characteristics (like pulsars).</p> <p><b>Describe</b> the life cycle of a typical star, like the sun.</p> <p><b>Compare</b> the life cycle of a typical star to the life cycle of stars of different masses.</p> <p><b>Apply</b> tools, such as star charts, to analyze the night sky.</p> <p><b>Explain</b> how simple visual telescopes work.</p> <p><b>Describe</b> the differences between Visual, Radio, and X-Ray Telescopes.</p>	<p>Prentice Hall: Chapter 24.2 Chapter 25.2 Chapter 25.1 (<i>For background information, does not relate to standard directly</i>)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> 25.1, 25.2, 24.2</p> <p><b>Transparencies:</b> 362-365 353-355</p> <p><b>Labs</b> Observing Stars (Page 723)</p> <p><b>Web Resources Chapter 24:</b> Scilinks on Telescopes</p> <p><b>Web Resources Chapter 25:</b> Companion Website, Chapter Resources, "How Stars Work".</p> <p><b>Reading Focus:</b> Making a Concept Map (Page 678 &amp; 707)</p> <p><b>Building Science Skills:</b> Using Analogies (Page 707 &amp; 712)</p> <p><b>Building Reading Literacy:</b> Sequence (Page 709)</p>	<p><b>Key Vocabulary:</b></p> <p>Refracting Telescope Reflecting Telescope Radio Telescope Chandra X-Ray Observatory Focus Concave Amplifier Protostar Supernova White Dwarf Black Dwarf Neutron Star Pulsar Black Hole Nebula Main-Sequence Red Giant Planetary Nebula</p> <hr/> <p><b>Skills Focus:</b></p> <p>Using Analogies Interpreting Diagrams Observing Recording Data Using Available Technology</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Using Concept Maps Using Flow Charts Using Cornell Notes Using Venn Diagrams</p> <hr/> <p><b>EL Strategies:</b></p> <p>Relate the "birth" and "death" of stars to a human life span. Create a visual chart that shows pictures of one person from baby to old age, and relate the life cycle of stars of different masses to the human life cycle.</p>	<p>5 days</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>

## Earth Science - Page 10

### 2. Earth-based and space-based astronomy reveal the structure, scale, and changes in stars, galaxies, and the universe over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the evidence indicating that all elements with an atomic number greater than that of lithium have been formed by nuclear fusion in stars.</p> <p style="text-align: right;">( 2c )</p>	<p><b>Describe</b> how the heavy elements that make up everything in the universe formed by nuclear fusion inside stars.</p>	<p>Prentice Hall: Earth's Place in the Universe (Page 6) Page 712 (Student edition only) Chapter 24.3 (Page 689-690)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><i>At the time of this writing, "Nuclear Synthesis" is found on page 712 of the student edition only. Additional resources and activities will be necessary to teach this standard.</i></p> <hr/> <p><b>Earth's Place in the Universe (Page 6):</b> A small part of this article discusses nuclear fusion and heavier elements, such as oxygen and carbon.</p> <hr/> <p><b>Chapter 24.3, Page 689-690:</b> Background on nuclear fusion inside the sun.</p> <hr/> <p><b>Integrate Chemistry:</b> Formation of Heavy Elements (Page 711)</p>	<p><b>Key Vocabulary:</b> Nucleosynthesis Nuclear Fusion Periodic Table</p> <hr/> <p><b>Skills Focus:</b> Interpreting diagrams</p> <hr/> <p><b>Literacy Connections:</b> Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b> Use a bulletin board to show a sequence of nucleosynthesis in the sun.</p>	<p>1 day</p> <p><i>A day is a 55-minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science - Page 11

### 1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>e. Students know the Sun is a typical star and is powered by nuclear reactions, primarily the fusion of hydrogen to form helium.</p>	<p><b>Define</b> nuclear fusion.</p> <p><b>List</b> elements involved in nuclear fusion.</p> <p><b>Classify</b> the Sun as a medium size star.</p> <p><b>Compare</b> the Sun's exterior to the Sun's interior.</p> <p><b>Describe</b> why Nuclear fusion takes place deep in the Sun's interior.</p>	<p>Prentice Hall: Ch 24.3 pp. 689-690 Ch 25.2 p. 712</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Companion Website</b> Chapter Web Resources: <i>Study Guide Summary, Ch.24</i></p> <hr/> <p><b>Transparencies</b> T-356 <i>Solar Structure</i></p> <hr/> <p><b>GRSW</b> <i>Section 24.3 (The Solar Interior, p.179)</i></p> <hr/> <p><b>NSTA SciLinks</b> <i>What is Fusion?</i> Student Worksheet for Nuclear Fusion in the Sun (top right of SciLinks page)</p>	<p><b>Key Vocabulary:</b></p> <p>Sun Nuclear Fusion Solar interior Energy Nucleosynthesis</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
( 1e )				
<b>Assessment</b>				
(CST)				
			<p><b>Skills Focus:</b></p> <p>Discuss Describe Examine Differentiate</p>	
			<p><b>Literacy Connections:</b></p> <p>List Classify Select</p>	
			<p><b>EL Strategies</b></p> <p>Link to background knowledge Vocabulary instruction Visuals Prediction Unscrambling sentences Illustrate</p>	

## Earth Science - Page 12

### 1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>a. Students know how the differences and similarities among the sun, the terrestrial planets, and the gas planets may have been established during the formation of the solar system.</p> <p style="text-align: right;">( 1a )</p>	<p><b>List</b> the 9 planets.</p> <p><b>Compare and contrast</b> terrestrial and gas planets.</p> <p><b>Describe</b> the formation of the solar system, the physical properties of the planets and the Sun.</p> <p><b>Make</b> a model of the solar system.</p>	<p>Prentice Hall: Ch 1, Ch 23</p>	<p><b>Key Vocabulary:</b></p> <p>Terrestrial Planets Gas Planets Sun Solar System Nebula</p>	<p>12 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies</b> T-1 <i>Formation of the Solar System, Nebular Hypothesis</i> T-5 <i>Formation of Stars and Galaxy</i> T-334 <i>Orbits of the Planets</i> T-335 <i>Planetary Data</i> T-336 <i>Planets Drawn to Scale</i></p> <p><b>GRSW</b> Section 1.1 <i>What is Earth Science?</i> (Formation of the solar system, p.2) Section 23.1 <i>Formation of the Solar System</i> Section 23.2 <i>The Terrestrial Planets</i> Section 23.3 <i>The Outer Planets</i></p> <p><b>Labs</b> Worksheet Chapter 23: <i>Modeling the Solar System</i> (also on p. 666)</p>	<p><b>Skills Focus:</b></p> <p>Use model Observe Interpret data</p>	
<p><b>Assessment</b> (CST)</p>			<p><b>Literacy Connections:</b></p> <p>Compare and Contrast Organize Graphically Summarize</p>	
			<p><b>EL Strategies</b></p> <p>Graphic Representation Building Prior Knowledge Prediction</p>	

## Earth Science - Page 13

### 2. Earth-based and space-based astronomy reveal the structure, scale, and changes in stars, galaxies, and the universe over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time <small>(per 180 days)</small>
<p>. . .</p> <p>Students know the solar system is located in an outer edge of the disc-shaped Milky Way Galaxy, which spans 100,000 light years.</p> <p style="text-align: right;">( 2a )</p> <hr/> <p><b>Assessment</b> (CST)</p>	<p><b>Locate</b> the Solar System on a picture of the Milky Way Galaxy.</p> <p><b>Describe</b> the Milky Way Galaxy in terms of number of stars, shape, and size.</p>	<p>Prentice Hall: Chapter 25.3 (Page 715-716)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies:</b> 367 "Partial Structure of the Milky Way Galaxy"</p> <hr/> <p><b>Building Science Skills:</b> The Milky Way Galaxy (Page 716).</p> <hr/> <p><b>Web Resources:</b> NSTA SciLinks on Galaxies, "Frequently Asked Questions on the Milky Way Galaxy"</p> <hr/> <p><b>Using Visuals:</b> Figure 17: Structure of the Milky Way (Page 716)</p>	<p><b>Key Vocabulary:</b> Milky Way Galaxy Spiral Galaxy Spiral Arms Light-Year Galactic Nucleus Galactic Disk Halo Globular Clusters</p> <hr/> <p><b>Skills Focus:</b> Interpreting Diagrams</p> <hr/> <p><b>Literacy Connections:</b> Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b> Use a poster of bulletin board that shows the location of the star we call "The Sun" in the Milky Way Galaxy. This should help students understand that the Solar System is a tiny part of the Milky Way Galaxy.</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>

## Earth Science - Page 14

### 1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>b. Students know the evidence from Earth and moon rocks indicates that the solar system was formed from a nebular cloud of dust and gas approximately 4.6 billion years ago.</p> <p style="text-align: right;">( 1b )</p>	<p><b>Relate</b> the age of the moon to age of the Earth</p> <p><b>Order</b> the events of the formation of the solar system</p> <p><b>Generalize</b> the age of the Earth from the age of meteorite after impact with the Earth</p>	<p>Prentice Hall: Ch 22.3 p. 633 Ch 23.4 p. 664</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Companion Website</b> Chapter Web Resources: <i>Unit 7: Astronomy, Ch 22, +Web Resources, Earth-Moon-Sun System: Links on eclipses, Earth's moon:</i> <a href="http://earthsci.terc.edu/navigation/chapter25.cfm">http://earthsci.terc.edu/navigation/chapter25.cfm</a>, <i>Exploring Earth: Visualizations</i>, Key code ES 2501 Observe images illustrating the impact theory of the moon's formation.</p> <hr/> <p><b>GRSW</b> Section 22.3 <i>Earth's Moon</i> (Lunar History, p. 164)</p> <p>Section 23.1 <i>Formation of the Solar System</i> (also used for Ca Std 1a)</p> <hr/> <p><b>NSTA SciLinks</b> <i>SciLink on the Outer planets, Our Solar System</i> ( <a href="http://www.windows.ucar.edu/">www.windows.ucar.edu/</a>), <i>Windows to the Universe</i>, Solar System Formation, Formation (in blue text), Exploratur-Evolution of the Solar System, pp. 1-60.</p>	<p><b>Key Vocabulary:</b></p> <p>Moon Nebular Cloud Radiometric dating Stony meteorites Mineral Zircon Planetesimals Debris</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b> (CST)			<b>Skills Focus:</b>	
			<p>Distinguish Infer causes Summarize Collect</p>	
			<b>Literacy Connections:</b>	
			<p>Summarize Complete Graphing Organizer</p>	
			<b>EL Strategies</b>	
			<p>Building prior knowledge Graphic Representation Re-reading Key Phrases Pre-reading (Bold, Italics)</p>	

**1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>d. Students know the evidence indicating that the planets are much closer to Earth than the stars are.</p> <p>( 1d )</p>	<p><b>Interpret</b> apparent movement of stars</p> <p><b>Demonstrate</b> apparent shift of stars compared to the position of the Earth</p> <p><b>Observe</b> different colors and movement of stars.</p> <p><b>Locate</b> stars and planets of the solar system on a Milky Way graphic.</p>	<p>Prentice Hall: Ch 25.1 p 702</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies</b> T-358 <i>Geometry of Stellar Parallax</i> T-319 <i>Period of Revolution and Solar Distances on Planets</i></p> <p><b>GRSW</b> Section 25.1 <i>Properties of Stars</i> ( Measuring distances to Stars, p. 181)</p> <p><b>Lab</b> Worksheet Chapter 25: <i>Observing stars</i> (also on p. 723)</p> <p><b>NSTA SciLink</b> (see Standard 1b)<a href="#">Windows on the Universe</a></p>	<p><b>Key Vocabulary:</b> Parallax</p> <hr/> <p><b>Skills Focus:</b> Observe Interpret Data Summarize</p> <hr/> <p><b>Literacy Connections:</b> Complete Table Outline</p> <hr/> <p><b>EL Strategies</b> Link to Background knowledge Brainstorming Unscrambling sentences Highlighting text</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b></p>				
<p>(CST)</p>				

## Earth Science – Page 16

**Investigation & Experimentation:** Scientific Progress is made by asking meaningful questions and conducting careful investigations.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students will know that when an observation does not agree with an accepted scientific theory, the observation is sometimes mistaken or fraudulent (e.g., unidentified flying objects) and that the theory is sometimes wrong (e.g., the Ptolemaic model of the movement of the Sun, Moon, and planets)</p> <p style="text-align: right;">( I&amp;E 1n )</p>	<p><b>Describe</b> how hypotheses can be proven wrong.</p> <p><b>Explain</b> that science often entails a series "mistakes" before a theory can become established.</p>	<p>Prentice Hall: Ch 22 Ch 9.1</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies</b> T-316 <i>Ptolemy's model</i> T- 96-99 ( various about Continental drift)</p> <hr/> <p><b>GRSW</b> <i>Section 22.1</i> Early Astronomy <i>Section 9.1</i> Continental drift</p> <hr/> <p><b>Lab</b> Worksheet Chapter 9: <i>Paleomagnetism and the Ocean Floor</i> ( also on p. 272)</p>	<p><b>Key Vocabulary:</b></p> <p>Continental drift Pangaea Fossils Climates</p> <p>Geocentric heliocentric Ptolemaic System Retrograde motion</p> <hr/> <p><b>Skills Focus:</b></p> <p>Measuring Interpreting diagrams Calculating</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Label Observe Decide</p> <hr/> <p><b>EL Strategies</b></p> <p>Graphic representation Link to background knowledge Direct vocabulary instruction</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science – Page 17

### 1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>f. Students know the evidence for the dramatic effects that asteroids impacts have had in shaping the surface of planets and their moons and in mass extinctions of life on Earth.</p> <p style="text-align: right;">( 1f )</p>	<p><b>Make</b> a model of a crater.</p> <p><b>Compare and contrast</b> asteroids, comets, meteors, and meteorites.</p> <p><b>Describe</b> mass extinctions of life on Earth caused by asteroid impacts.</p> <p><b>Summarize</b> the events that lead to the extinctions of dinosaurs.</p> <p><b>Infer</b> that comets and asteroids have collided with the Earth frequently based on evidence from the moon's surface.</p> <p><b>Interpret</b> the Torino Impact Scale.</p>	<p>Prentice Hall: Ch 23.4 Ch 13.3, p.381</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies</b> T-343 <i>Orbit of asteroids</i> T-344 <i>Orientation of a comet's tail in orbit</i> T-345 <i>Major meteor showers</i> T-347 <i>World's map of major impact structure</i></p> <hr/> <p><b>GRSW</b> Section 23.4 <i>Minor members of the solar system</i> Section 13.3 <i>Mesozoic Era: Age of Reptiles</i>, p.101, q.8</p> <hr/> <p><b>NSTA SciLinks</b> <i>The outer planets</i> . Our Solar System (<a href="http://www.windows.UCAR.edu/tour/link">www.windows.UCAR.edu/tour/link</a>) . Hands on Investigation: Exploring the planets in the classroom hands-on activities</p> <p><b>Companion Website-Chapter Web Resources</b> <i>Study Guide Summary: Ch 23</i> <i>Web Quest: What killed the dinosaurs?</i> The end of the dinosaurs (also see: Torino Impact Scale)</p>	<p><b>Key Vocabulary:</b> asteroids asteroid impacts collision mass extinctions comet meteor meteorite</p> <hr/> <p><b>Skills Focus:</b> Interpret Discuss Use models Infer Summarize</p> <hr/> <p><b>Literacy Connections:</b> Compare and contrast Summarize Organize graphically Interpret scale</p> <hr/> <p><b>EL Strategies</b> Link to background Visuals Vocabulary instruction NOTE: The <a href="http://WWW.UCAR.edu/tour/link">WWW.UCAR.edu/tour/link</a> website contains text in English and Spanish. The text is also written in three reading levels from beginner to advanced in both Spanish and English.</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science - Page 18

### 1. Astronomy and planetary exploration reveal the solar system's structure, scale, and change over time.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>c. Students know the evidence from geological studies of Earth and other planets suggest that the early Earth was very different from Earth today.</p> <p style="text-align: right;">( 1c )</p>	<p><b>Define</b> Precambrian</p> <p><b>Compare and Contrast</b> the early Earth to the Earth today</p> <p><b>Tell</b> how the Earth formed</p>	<p>Prentice Hall: Ch 13.1</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies</b> T-162 <i>Geologic Time Scale</i> T-163 <i>Remnants of Precambrian Rocks</i></p> <p><b>Lab</b> Worksheet Chapter 13: <i>Modeling the Geologic Time Scale</i> (also on p. 386)</p> <hr/> <p><b>NSTA SciLinks</b> (see Standard 1b) <a href="#">Windows on the Universe</a></p>	<p><b>Key Vocabulary:</b></p> <p>Geologic Time Scale Precambrian Craters</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
			<p><b>Skills Focus:</b></p> <p>Calculate Explain Infer Analyze data</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Identify Order Explain analyze</p> <hr/> <p><b>EL Strategies</b></p> <p>Modeling Graphic Representation Link to past activities Exclusion Brainstorming Direct instruction</p>	
<p><b>Assessment</b></p> <p>(CST)</p>				

## Earth Science - Page 19

**Investigation & Experimentation: Scientific Progress is made by asking meaningful questions and conducting careful investigations.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . . Students will be able to analyze the locations, sequences, or time intervals that are characteristic of natural phenomena (e.g., relative ages of rocks, locations of planets over time, and succession of species in an ecosystem).</p> <p>Students will be able to recognize the cumulative nature of scientific evidence.</p> <p style="text-align: right;">( I&amp;E 1i, 1k )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Make</b> a model of the geologic time scale.</p> <p><b>Explain</b> the events that formed the boundary between Precambrian and Cambrian time.</p>	<p>Prentice Hall: Ch 13.1, p 365</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p>Refer to 1c</p>	<p><b>Key Vocabulary:</b> Geologic Time Scale Precambrian</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
			<p><b>Skills Focus:</b></p> <p>Calculate Explain Infer Analyze data</p>	
			<p><b>Literacy Connections:</b></p> <p>Identify Order Explain analyze</p>	
			<p><b>EL Strategies</b></p> <p>Modeling Graphic Representation Link to past activities Exclusion Brainstorming Direct instruction</p>	

## Earth Science - Page 20

### 3. Plate Tectonics operating over geologic time has changed that patterns of land, sea, and mountains on Earth's surface.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know how to explain the properties of rocks based on the physical and chemical conditions in which they formed, including plate tectonic processes.</p> <p style="text-align: right;">( 3c )</p>	<p><b>Interpret</b> the Rock Cycle.</p> <p><b>Classify</b> types of rocks using a simple key.</p> <p><b>Infer</b> the types of plate boundaries that formed each type of rock through the use of the rock cycle and a rock key.</p>	<p>Prentice Hall: Chapter 3.1</p>	<p><b>Key Vocabulary:</b></p> <p>Rock Igneous Rock Sedimentary Rock Metamorphic Rock Rock Cycle Magma Lava Compaction Cementation Weathering Sediments</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Chapter 3.1</p> <p><b>Investigation Chap 3:</b> Classifying Rocks using a Key</p> <p><b>Transparencies:</b> 14</p> <p><b>Demonstrations:</b> Demo page 68 (Weathering with ice)</p>		
<p><b>Assessment</b> (CST)</p>			<p><b>Literacy Connections:</b></p> <p>Definitions Drawing conclusions</p>	
			<p><b>EL Strategies:</b></p> <p>Model the difference between igneous and metamorphic. Ex: chocolate can be melted and cooled (igneous) or "softened" and bent out of shape by heat and pressure (metamorphic).</p>	

## Earth Science - Page 21

### 3. Plate Tectonics operating over geologic time has changed that patterns of land, sea, and mountains on Earth's surface.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the principal structures that form at the three different kinds of plate boundaries</p> <p style="text-align: right;">( 3b )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Differentiate</b> between the three types of plate boundaries.</p> <p><b>Locate</b> examples of the three types of plate boundaries on a map of the world.</p> <p><b>Describe</b> the formation of rift valleys on continents.</p> <p><b>Calculate</b> the rate of subduction at a convergent plate boundary.</p> <p><b>Infer</b> a graph of earthquake intensity versus depth to determine the type of plate boundary.</p>	<p>Prentice Hall: Chapter 9.2 Chapter 9.3</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Chapter 9.2 (pg 2) Chapter 9.3</p> <p><b>Investigation Chap 9:</b> Modeling a Plate Boundary</p> <p><b>Transparencies:</b> 100, 101, 104, 105, 107, 108</p> <p><b>Web Resources:</b> NSTA SciLinks, Chapter 9 (Plate Tectonics)</p> <p><b>Demonstrations:</b> Demo page 256 (Model convergence) Demo page 260 (Model rifts)</p>	<p><b>Key Vocabulary:</b></p> <p>Tectonic Plate Oceanic Plate Continental Plate Lithosphere Asthenosphere Divergent Boundary Convergent Boundary Transform Boundary Subduction Oceanic Ridge Rift Valley Seafloor Spreading Volcanic Island Arc</p> <hr/> <p><b>Skills Focus:</b></p> <p>Graphing Analyzing Data Calculating Using Models Controlling Variables</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Compare/Contrast Definitions Interpret Diagrams Outlining</p> <hr/> <p><b>EL Strategies</b></p> <p>Handouts and/or bulletin boards that shows the three types of plate boundaries</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>

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### 3. Plate Tectonics operating over geologic time has changed that patterns of land, sea, and mountains on Earth's surface.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know features of the ocean floor (magnetic patterns, age, and sea-floor topography) provide evidence of plate tectonics</p> <p style="text-align: right;">( 3a )</p>	<p><b>Explain</b> how paleomagnetism is recorded in the seafloor.</p> <p><b>Differentiate</b> between normal and reverse polarity on a map of a seafloor transect.</p> <p><b>Interpret</b> a map of the relative ages of different parts of the seafloor.</p> <p><b>Explain</b> how hotspots record the motion of oceanic plates.</p>	<p>Prentice Hall: Chapter 9.2 Chapter 9.4 Chapter 14</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Chapter 9.4 Chapter 14.1 Chapter 14.2</p> <p><b>Lab Chapter 9:</b> Paleomagnetism and the Ocean Floor</p> <p><b>Lab Chapter 14:</b> Modeling Seafloor Depths Transects</p> <p><b>Investigation Chapter 14:</b> Modeling the Ocean Floor</p> <p><b>Transparencies:</b> 100, 101, 111, 113, 116, 175, 179</p> <p><b>Map Masters:</b> Page 256</p>	<p><b>Key Vocabulary:</b> Oceanic Ridge Rift Valley Seafloor Spreading Oceanic Crust Paleomagnetism Normal Polarity Reverse Polarity Hot Spots Topography Sonar Mid-Ocean Ridges</p> <hr/> <p><b>Skills Focus:</b> Measuring Interpreting Calculating Graphing Inferring</p> <hr/> <p><b>Literacy Connections:</b> Making Conclusions Definitions Predicting Outlining</p> <hr/> <p><b>EL Strategies</b> Map of the world's ocean floors on a bulletin board with vocabulary labels</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>	<p><b>Describe</b> sonar technology and how it is used to map the seafloor.</p> <p><b>Graph</b> a transect of the seafloor showing different oceanic depths.</p> <p><b>Create</b> a model of seafloor topography to share with the class.</p>			

## Earth Science - Page 23

### 3. Plate Tectonics operating over geologic time has changed that patterns of land, sea, and mountains on Earth's surface.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time <small>(per 180 days)</small>
<p>. . .</p> <p>Students know how and why earthquakes occur and the scales used to measure their intensity and magnitude.</p> <p style="text-align: right;">( 3d )</p>	<p><b>Describe</b> the ground motion that takes place during an earthquake.</p> <p><b>Differentiate</b> between an earthquake's epicenter and focus.</p> <p><b>Locate</b> an earthquake using seismographic data.</p> <p><b>Classify</b> earthquakes using the Richter Scale, the Mercalli Scale, and Moment Magnitude.</p>	<p>Prentice Hall: Chapter 8.1 Chapter 8.2</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Chapter 8.1 Chapter 8.2</p> <p><b>Investigation Chap 8:</b> Design and Build a Simple Seismograph</p> <p><b>Lab Chapter 8:</b> Locating an Earthquake</p> <p><b>Transparencies:</b> 75-80, 82, 85</p> <p><b>Demonstrations:</b> Demo page 219 (Candy bar stress) Demo page 223 (Slinky waves) QuickLab Page 226 (distance to epicenter)</p>	<p><b>Key Vocabulary:</b></p> <p>Earthquake Focus Epicenter Fault Elastic Rebound Aftershock Foreshock Seismograph Seismogram Surface Wave P Wave S Wave Moment Magnitude Mercalli Scale Richter Scale</p> <hr/> <p><b>Skills Focus:</b></p> <p>Interpreting Data Interpreting Maps Calculating</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Using Flowcharts Outlining Definitions</p> <hr/> <p><b>EL Strategies:</b></p> <p>Use pictures on a bulletin board to show the damage that could take place at different levels of the three scales used to measure earthquakes.</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>	<p><b>Locate</b> the major bands of earthquake activity around the world.</p> <p><b>Connect</b> the locations of earthquake activity to the locations of plate boundaries.</p>			

## Earth Science - Page 24

### 3. Plate Tectonics operating over geologic time has changed that patterns of land, sea, and mountains on Earth's surface.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know there are two types of volcanoes: one kind with violent eruptions producing steep slopes and the other kind with voluminous lava flows producing gentle slopes.</p> <p style="text-align: right;">( 3e )</p> <hr/> <p><b>Assessment</b> (CST)</p>	<p><b>Describe</b> the formations of the two main types of volcanoes.</p> <p><b>Describe</b> the effect silica content has on the viscosity of magma.</p> <p><b>Explain</b> the effect of magma viscosity on the type of eruption and the amount of pressure released during an eruption.</p> <p><b>Differentiate</b> between the different types of volcanoes and the lavas that form them.</p> <p><b>Locate</b> areas where examples of each type of volcano may be found.</p>	<p>Prentice Hall: Chapter 10.1 Chapter 10.3 DK "Effects of Volcanoes" (Pg 298-299)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Chapter 10.1 Chapter 10.3</p> <p><b>Transparencies:</b> 122-124, 129-132</p> <p><b>Demonstrations:</b> Quicklab, Page 281 (Exploding Volcano) Demo, Page 282 (Viscosity) Demo, Page 285 (Build up of pressure) Demo, Page 294 (Model plate motion)</p>	<p><b>Key Vocabulary:</b></p> <p>Viscosity Magma Lava Silica Vent Pyroclastic Material Volcano Crater Shield Volcano Cinder Cone Composite Cone Caldera Intraplate Volcanism</p> <hr/> <p><b>Skills Focus:</b></p> <p>Interpreting Data Interpreting Maps</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Cornell Note-Taking Using Concept Maps Outlining</p> <hr/> <p><b>EL Strategies:</b></p> <p>Demonstrate viscosity using familiar objects, like peanut butter and honey. Students can connect viscosity to the two volcanoes by "building" volcanoes out of these materials with different slopes.</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>

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**7. Each element on Earth moves among reservoirs, which exist in the solid earth, in oceans, in the atmosphere, and within and among organisms as part of biogeochemical cycles.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . . Students know the carbon cycle of photosynthesis and respiration and the nitrogen cycle</p> <p style="text-align: right;">( 7a )</p>	<p><b>Interpret</b> complicated diagrams and charts.</p> <p><b>Describe</b> the roles different types of organisms have in the photosynthesis/respiration cycle and the nitrogen cycle.</p>	<p>Prentice Hall: Page 494-495 (DK Earth's Atmosphere) Page 136-137 (5.2)</p> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Building Science Skills:</b> Using a chart. Page 494. (Photosynthesis &amp; Respiration)</p> <p><b>Figure 13:</b> The Nitrogen Cycle. Page 137. <i>This figure is found only in the student edition. It is not found in the teacher's edition or on the CD-ROMs.</i></p> <p><i>There are few activities in the adopted text for this standard. Supplementary materials will be necessary.</i></p>	<p><b>Key Vocabulary:</b> Photosynthesis Respiration Nitrogen Cycle Amino Acids Nitrogen Fixation Nitrifying Denitrifying Decomposition</p> <p><b>Skills Focus:</b> Understanding Charts Interpreting Diagrams</p> <p><b>Literacy Connections:</b> Definitions</p> <p><b>EL Strategies:</b> A bulletin board or other visual that displays both the photosynthesis/respiration cycle and the nitrogen cycle would help students understand the difference between the two cycles.</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science - Page 26

### 8. Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know how the composition of Earth's atmosphere has evolved over geologic time and know the effect of out gassing, the variations of carbon dioxide concentrations, and the origin of atmospheric oxygen.</p> <p style="text-align: right;">( 8b )</p>	<p><b>Describe</b> the evolution of Earth's atmosphere using a flow-chart.</p> <p><b>Compare and Contrast</b> Earth's early atmosphere to today's atmosphere.</p> <p><b>Analyze</b> data based on geologic time, not "human time".</p>	<p>Prentice Hall: Page 366-367 (13.1)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>GRSW:</b> Chapter 13.1 (Question #8 is a great flowchart that shows the formation of the atmosphere).</p> <hr/> <p><b>Build Reading Literacy:</b> Compare and Contrast early atmosphere with modern atmosphere (Page 366)</p> <hr/> <p><b>Build Reading Literacy:</b> Designing a Flow Chart Sequence. Page 367.</p> <hr/> <p><b>Integrating Biology:</b> Early organisms. Page 367.</p>	<p><b>Key Vocabulary:</b> Precambrian Cyanobacteria Banded Iron Formations Photosynthesis</p> <hr/> <p><b>Skills Focus:</b> "Thinking" on a Geologic Time Scale Drawing logical conclusions Recognizing patterns</p> <hr/> <p><b>Literacy Connections:</b> Compare &amp; Contrast Designing Flowcharts</p> <hr/> <p><b>EL Strategies:</b> Have students design their flow charts (page 367) in groups or partners using pictures instead of words.</p>	<p>3 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b>				
(CST)				

## Earth Science - Page 27

### 8. Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time <small>(per 180 days)</small>
<p>. . .</p> <p>Students know the thermal structure and chemical composition of the atmosphere.</p> <p style="text-align: right;">( 8a )</p>	<p><b>Interpret</b> diagrams of the chemical composition and thermal structure of the atmosphere.</p> <p><b>Analyze</b> the thermal structure of the atmosphere using graphs.</p>	<p>Prentice Hall: Chapter 17.1</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>GRSW:</b> 17.1 (Most of it applies to the standard)</p> <hr/> <p><b>Transparencies:</b> 217-219</p> <hr/> <p><b>Building Science Skills:</b> Height and Pressure in the Atmosphere. Page 479.</p> <hr/> <p><b>Building Reading Literacy:</b> Relating Text &amp; Visuals. Page 480. (Thermal Structure)</p> <hr/> <p><b>Investigation 17a:</b> Determining how Temperature changes with Altitude</p> <hr/> <p><b>Web Resources:</b> NSTA SciLinks Chapter 17, Layers of the Atmosphere.</p>	<p><b>Key Vocabulary:</b></p> <p>Ozone Troposphere Stratosphere Mesosphere Thermosphere Altitude</p> <hr/> <p><b>Skills Focus:</b></p> <p>Interpreting Diagrams Using Models Making Inferences Making Predictions Using Graphs</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Compare &amp; Contrast Relating Text &amp; Visuals</p> <hr/> <p><b>EL Strategies:</b></p> <p>Focus on visuals for these concepts, especially the diagram that shows how temperature varies with altitude and the pie chart that shows the composition of the atmosphere.</p>	<p>3 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b>				
(CST)				

## Earth Science - Page 28

### 8. Life has changed Earth's atmosphere, and changes in the atmosphere affect conditions for life.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . . Students know the location of the ozone layer in the upper atmosphere, its role in absorbing ultraviolet radiation, and the way in which this layer varies both naturally and in response to human activities.</p> <p style="text-align: right;">( 8c )</p>	<p><b>Locate</b> the ozone layer on a cross-sectional diagram of the atmosphere.</p> <p><b>Identify</b> natural and anthropogenic factors that cause the ozone layer to fluctuate.</p> <p><b>Describe</b> the role the ozone layer plays in protecting organisms from UV radiation.</p>	<p>Prentice Hall: Page 478 (17.1) Page 494-495 (DK Earth's Atmosphere)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies:</b> 219, Thermal Structure of the Atmosphere</p> <hr/> <p><b>Addressing Misconceptions:</b> Page 478. (Ozone Hole vs. Global Warming)</p> <hr/> <p><b>Page 495 Figure:</b> Ozone Hole. (Caption for this picture is a great description of the natural and anthropogenic factors that reduces the amount of ozone in the atmosphere).</p> <hr/> <p><b>Web Resources:</b> NSTA SciLinks, Layers of the Atmosphere (2 websites on Ozone).</p>	<p><b>Key Vocabulary:</b></p> <p>Ozone Ozone Layer Ozone Hole Ultraviolet Radiation Stratosphere</p> <hr/> <p><b>Skills Focus:</b></p> <p>Interpreting Diagrams</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Definitions</p> <hr/> <p><b>EL Strategies:</b></p> <p>Have students brainstorm a list of changes people would have to make if they wanted to survive in a world without the ozone layer. (Ex: use lots of sunscreen, don't go outside, etc.)</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science - Page 29

### 4. Energy Enters the Earth system primarily as solar radiation and eventually escapes as heat.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> the relative amount of incoming solar energy compared with Earth's internal energy and the energy used by society.</p> <p style="text-align: right;">( 4a )</p> <p><b>Assessment</b> (CST)</p>	<p><b>Interpret</b> a solar radiation diagram.</p> <p><b>Recognize</b> the sources of Earth's energy.</p> <p><b>Describe</b> Earth's energy resources and alternative energy resources.</p> <p><b>Identify</b> which energy resources are fossil fuels.</p> <p><b>Evaluate</b> the advantages of solar energy.</p>	<p>Prentice Hall: CH 4.1 CH 4.2 CH 17.2</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies:</b> T-228 <i>Distribution of Incoming Solar Radiation</i> T-23 <i>Per Capita Energy Use</i></p> <p><b>GRSW:</b> Section 4.2 <i>Alternative Energy</i></p>	<p><b>Key Vocabulary:</b> renewable, non-renewable, fossil fuel, internal energy, external energy, solar energy, geothermal energy, hydroelectric power, nuclear power</p>	1 day
			<p><b>Skills Focus:</b> Interpret Identify Evaluate Use visual/logical clues</p>	<p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
			<p><b>Literacy Connections:</b> Reflect Definitions Use content to develop stance</p>	
			<p><b>EL Strategies</b> Modeling Cooperative Learning Use of Technology</p>	

## Earth Science - Page 30

### 4. Energy Enters the Earth system primarily as solar radiation and eventually escapes as heat.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> the fate of incoming solar radiation in terms of reflection, absorption and photosynthesis.</p>	<p><b>Compare and contrast</b> reflection, absorption, and photosynthesis.</p> <p><b>Analyze</b> the interactions between solar energy, the solid Earth, the atmosphere, and living things.</p>	<p>Prentice Hall: CH 17.2 pp. 486-487 p. 494</p> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies:</b> T-228 <i>Distribution of Incoming Solar Radiation</i> (Figure 12 - p.486) T-230 <i>Reflection and Scattering</i> T-231 <i>Heating of the Atmosphere</i></p> <p><b>NOTE:</b> <i>Few resources are available for addressing photosynthesis in text as it relates to energy and heat, however it is covered in relation to the oceans. See Standard 5d.</i></p>	<p><b>Key Vocabulary:</b> reflection, scattering, photosynthesis, absorption, greenhouse effect</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
( 4b )			<p><b>Skills Focus:</b> Analyze Apply Concepts Compare &amp; Contrast</p>	
<b>Assessment</b>			<p><b>Literacy Connections:</b> Use graphic organizers Visualization Word parts</p>	
(CST)			<p><b>EL Strategies</b> Diagrams/Visuals Modeling</p>	

## Earth Science - Page 31

### 4. Energy Enters the Earth system primarily as solar radiation and eventually escapes as heat.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time <small>(per 180 days)</small>
<p>. . .</p> <p><i>Students know</i> the different atmospheric gases that absorb the Earth's thermal radiation and the mechanism and significance of the greenhouse effect.</p> <p style="text-align: right;">( 4c )</p>	<p><b>Define and Identify</b> greenhouse gases.</p> <p><b>Explain</b> the greenhouse effect.</p> <p><b>Describe</b> the human activities that have contributed to a strengthening of the greenhouse effect.</p>	<p>Prentice Hall: p. 494 pp.602-603</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Section 21.3 (page 2) <i>Human Impact on Climate Changes</i></p> <p><b>GEODE:</b> <i>Heating the Atmosphere: The Greenhouse Effect</i></p> <p><b>Laboratory:</b> Lab 21 <i>Modeling the Greenhouse Effect</i> Exploration Lab <i>Human Impact on Climate and Weather</i> (text pp. 606-607 and worksheet available in Lab Manual)</p>	<p><b>Key Vocabulary:</b> greenhouse effect, greenhouse gasses, global warming</p> <hr/> <p><b>Skills Focus:</b> Reflect Describe Calculate Analyze data</p> <hr/> <p><b>Literacy Connections:</b> Use vocabulary Outline key concepts Address misconceptions</p> <hr/> <p><b>EL Strategies</b> Modeling Visuals Multimedia Use background knowledge</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b>				
(CST)				

## Earth Science – Page 32

### 5. Heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute heat.</p> <p style="text-align: right;">( 5a )</p>	<p><b>Explain</b> how heat and temperature are related.</p> <p><b>List</b> the three major mechanisms of heat transfer and their effect on the atmosphere.</p> <p><b>Describe</b> how air pressure is exerted on an area and the source for wind.</p> <p><b>Describe</b> how the Coriolis Effect influences freely moving objects.</p> <p><b>Explain</b> how the unequal heating of Earth's surface affects the atmosphere.</p> <p><b>Identify</b> the causes of local winds.</p> <p><b>Define</b> and explain air masses and their classification.</p>	<p>Prentice Hall:</p> <p>pp. 483-493 CH 19.1 CH 19.2</p> <p>pp. 543-544 CH 20.1 CH 20.2 ( Oceans covered in 5d)</p> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Teacher Demos:</b> <i>Heat Conduction</i> (TE p.484) <i>Heating of Land and Water</i> (TE p.490) <i>Measuring the Mass of Air</i> (TE p.532) <i>Air Pressure</i> (TE p 533) <i>Warm Air Rises</i> (TE p.538) <i>Air Masses in a Bottle</i> (TE p.559) <i>Getting to the Point of Fronts</i> (TE p.568)</p> <p><b>GRSW:</b> 17.2 <i>Heating the Atmosphere</i> 19.1 <i>Atmosphere Characteristics</i> 19.2 <i>Pressure Centers and Wind</i> 19.3 <i>Regional Wind</i> 20.1 <i>Air Masses</i></p> <p><b>Laboratory:</b> <i>Exploration Lab Heating Land and Water</i> (p.496-497) <i>Lab 17B Investigating Factors that Control Temperature</i> <i>Exploration Lab Observing Wind Patterns</i> (p.550-551)</p>	<p><b>Key Vocabulary:</b></p> <p>conduction, convection, air pressure, Coriolis effect, jet stream, cyclone, anticyclone, trade winds, westerlies, polar easterlies, polar front, monsoon, air mass, front, warm front, cold front, stationary front, occluded front</p>	<p>4 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>	<p><b>Explain</b> the characteristic features of each air mass class.</p> <p><b>Describe</b> the formation of a front and weather patterns associated with each type of front.</p> <p><b>Compare and contrast</b> the heating of land and water.</p>	<p><b>Laboratory:</b> <i>Exploration Lab Heating Land and Water</i> (p.496-497) <i>Lab 17B Investigating Factors that Control Temperature</i> <i>Exploration Lab Observing Wind Patterns</i> (p.550-551)</p>	<p><b>Skills Focus:</b></p> <p>Summarize Describe Identify Interpret</p> <p><b>Literacy Connections:</b></p> <p>Visualize Make Inferences Cause &amp; Effect Word parts</p> <p><b>EL Strategies</b></p> <p>Use background knowledge and cooperative learning to assist in learning. Also demonstrate more difficult concepts.</p>	

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Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . . continued</p> <p><i>Students know</i> how differential heating of Earth results in circulation patterns in the atmosphere and oceans that globally distribute heat.</p> <p style="text-align: right;">( 5a )</p>	<p><b>Describe</b> the role of differential heating of Earth's Surface</p>	<p>Prentice Hall:</p> <p>pp. 483-493 CH 19.1 CH 19.2 pp. 543-544 CH 20.1 CH 20.2 ( Oceans covered in 5d)</p>	<p><b>Key Vocabulary:</b></p>	
		<p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies:</b> T-226 Three Mechanics of Heat Transfer T-231 Heating of the Atmosphere T-233-236 Monthly Temperatures for various locations T-237 Clouds Reduce Daily Temperatures T-238/239 World Distribution of Mean Temperatures (January/July) T-267 Coriolis Effect T-266 Weather Map of the US (wind) T-268 The Geostrophic Wind T-269 Upper-Air Winds T-271 Cyclonic and Anticyclonic Winds T-285 Air Mass Source Regions T-284 Influence of Canadian Air Masses T-286 cP and mP air masses T-287 Warm Front T-288 Cold Front T-289 Occluded Front</p>		
<p><b>Assessment</b></p> <p>(CST)</p>			<p><b>Skills Focus:</b></p>	
			<p><b>Literacy Connections:</b></p>	
			<p><b>EL Strategies</b></p>	

## Earth Science – Page 34

### 5. Heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> the relationship between the rotation of Earth and the circular motions of ocean currents and air pressure centers.</p> <p style="text-align: right;">( 5b )</p>	<p><b>Describe</b> how the Coriolis Effect influences freely moving objects.</p> <p><b>Explain</b> how surface currents develop.</p>	<p>Prentice Hall: CH 16.1 CH 19.1 CH 19.2</p> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Transparencies:</b> T-267 <i>Coriolis Effect</i> T-273 <i>Global Circulation on Non-Rotating Earth</i> T-202 <i>Surface Ocean Currents</i> T-203 <i>Conveyor Belt Model</i> <b>GRSW:</b> Section 16.1 <i>Ocean Circulation</i></p>	<p><b>Key Vocabulary:</b></p> <p>ocean current, surface current, gyre, Coriolis effect, upwelling, density current</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
			<p><b>Skills Focus:</b></p> <p>Analyze Use Inferences to Draw Conclusions</p>	
<p><b>Assessment</b> (CST)</p>			<p><b>Literacy Connections:</b></p> <p>Incorporate new vocabulary Analyze relationships</p>	
			<p><b>EL Strategies</b></p> <p>Teacher demonstration of the Coriolis effect using a globe as both a demonstration tool and cross-cultural leveling device</p>	

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### 5. Heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know the origin and effects of temperature inversions.</i></p> <p style="text-align: right;">( 5c )</p>	<p><b>Define and describe</b> temperature inversions.</p> <p><b>Describe</b> the interaction between atmospheric stability and air pollution.</p>	<p>Prentice Hall: p. 514 p. 523</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Transparencies:</b> T-262 <i>Temperature Profile for a Surface Inversion</i> T-263 <i>Inversion Conditions</i></p>	<p><b>Key Vocabulary:</b> temperature inversion, pollution</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
			<p><b>Skills Focus:</b> Describe and Analyze Integrate Multiple Sciences</p>	
<p><b>Assessment</b> (CST)</p>			<p><b>Literacy Connections:</b> Discuss Nature vs. Human Impact Link to Local News/Features</p>	
			<p><b>EL Strategies</b> Use visuals and connect to background knowledge of "summer conditions"</p>	

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### 6. Climate is the long-term average of a region's weather and depends on many factors.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere.</i></p>	<p><b>Describe</b> how the atmosphere is affected by heat transfer mechanisms.</p> <p><b>Define</b> weather.</p> <p><b>Define</b> air mass and <b>explain</b> how air masses are classified and their characteristics.</p> <p><b>Describe</b> the formation of a front.</p> <p><b>Differentiate</b> among the formation of a warm front, cold front, stationary front, and occluded front and <b>describe</b> the weather patterns associated with each type of front.</p> <p><b>Describe</b> why water vapor is the most important gas for understanding atmospheric processes.</p> <p><b>Compare and contrast</b> the ability of different air masses to hold water vapor.</p> <p><b>Compare and contrast</b> movements of stable and unstable air.</p> <p><b>Describe</b> the conditions in air that favor condensation of water.</p> <p><b>Describe</b> how clouds are classified and compare and contrast clouds and fog.</p> <p><b>Explain</b> what must happen for precipitation to form and what controls the type of precipitation that reaches Earth's surface.</p> <p><b>Define</b> climate.</p>	<p>Prentice Hall:</p> <p>CH 17.2 (Review of energy transfer)</p> <p>CH 17.3</p> <p>CH 18</p> <p>CH 20</p> <p>CH 21.1 (Climate intro only)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b></p> <p>Section 17.2 <i>Heating the Atmosphere</i></p> <p>Section 17.3 <i>Temperature Controls</i></p> <p>Section 18.1 <i>Water in the Atmosphere</i></p> <p>Section 18.2 <i>Cloud Formation</i></p> <p><b>Transparencies:</b></p> <p>T-233-236 <i>Monthly Temperatures for Various Locations</i></p> <p>T-242 <i>Isothermal Map</i></p> <p>T-243 <i>Changes of State</i></p> <p>T-245 <i>Changing Relative Humidity by Changing Specific Humidity</i></p> <p>T-246 <i>Changing Relative Humidity by Changing Temperature</i></p> <p>T-247 <i>Variations in Temperature and Humidity</i></p> <p>T-378 <i>Dew Point Temperature</i></p> <p>T-250 <i>Adiabatic Rate</i></p> <p>T-251 <i>Four Processes that Lift Air</i></p> <p>T-249 <i>Forms of Precipitation</i></p> <p>T-259 <i>The Collision-Coalescence Process</i></p> <p>T-264 <i>Distribution of Fog</i></p>	<p><b>Key Vocabulary:</b></p> <p>temperature, precipitation, latent heat, evaporation, condensation, humidity, saturated, dew point, hygrometer, orographic lifting, front, temperature inversion, condensation nuclei, warm front, cold front, stationary front, occluded front</p> <hr/> <p><b>Skills Focus:</b></p> <p>Compare &amp; Contrast Cooperative Learning Visual/Special Analyzing data</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Relating Text &amp; Visuals Cause &amp; Effect Using Context Clues Vocabulary Usage</p> <hr/> <p><b>EL Strategies</b></p> <p>Multiple demonstration and hands-on activities. Use bulletin boards with the different diagrams to reinforce vocabulary.</p>	<p>10 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
( 6a )				
<b>Assessment</b> (CST)				

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Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .continued</p> <p><i>Students know</i> weather (in the short run) and climate (in the long run) involve the transfer of energy into and out of the atmosphere.</p> <p style="text-align: right;">( 6a )</p>		<p>Prentice Hall:</p> <p>CH 17.2 (Review of energy transfer)</p> <p>CH 17.3</p> <p>CH 18</p> <p>CH 20</p> <p>CH 21.1 (Climate intro only)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Laboratory:</b>            Exploration Lab <i>Heating Land and Water</i> (p.496 text - Worksheet in Lab Manual)            Exploration Lab <i>Measuring Humidity</i> (p.524 text - Worksheet in lab Manual)            Lab Investigation 17B <i>Investigating Factors that Control Temperature</i>            Lab Investigation 18 <i>Recipe for a Cloud</i>            Inquiry Activity: <i>What Causes Condensation?</i> (p.503)            Inquiry Activity: <i>How Can You Model the Movement of Air in a Tornado?</i> (p.557)</p> <p><b>Teacher Demos:</b>  <i>Water From Plants</i> (p.507)  <i>Compressions and Expansion</i> (p.511)  <i>Air Masses in a Bottle</i> (p.559)  <i>Getting to the Point of Fronts</i> (p.568)</p> <p><b>NSTA SciLinks:</b>            CH 18 Atmospheric Moisture (Sites: <i>Home Meteorology, Atmospheric Moisture</i>)            CH 20 Air Masses            CH 20 Fronts and Severe Weather</p>	<p><b>Key Vocabulary:</b></p>	
<p><b>Assessment</b></p>			<p><b>Skills Focus:</b></p>	
<p>(CST)</p>			<p><b>Literacy Connections:</b></p>	
			<p><b>EL Strategies</b></p>	

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### 5. Heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> rain forests and deserts on Earth are distributed in bands at specific latitudes.</p> <p style="text-align: right;">( 5e )</p>	<p><b>Describe</b> how latitude affects climate.</p> <p><b>Describe</b> humid tropical climates.</p> <p><b>List</b> the characteristics of dry climates.</p>	<p>Prentice Hall: p. 584 CH 21.1 CH 21.2</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>Skills Activity:</b> p. 548 <i>Global Precipitation</i> p. 598 <i>Extent of Dry Climate Zones</i></p> <p><b>Teacher Demo:</b> <i>Heating and Angles (p. 589)</i></p> <p><b>Transparencies:</b> T-303 <i>Climates of the World</i> T-304 <i>Climates of the World</i> T-306 <i>Arid and Semiarid Climates</i> T-307 <i>Climatic Diagrams for Arid and Semiarid Stations</i></p>	<p><b>Key Vocabulary:</b> desert, wet tropical climate, rain forest, latitude</p> <hr/> <p><b>Skills Focus:</b> Recognize Cause &amp; Effect Using Maps</p> <hr/> <p><b>Literacy Connections:</b> Making Inferences Prewriting Visualization</p> <hr/> <p><b>EL Strategies</b> Use teacher demo to address misconceptions and assist in understanding concepts, follow with maps and other visuals as reinforcement.</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b>				
(CST)				

## Earth Science - Page 39

### 6. Climate is the long-term average of a region's weather and depends on many factors.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> the effects on climate of latitude, elevation, topography, and proximity to large bodies of water and cold and warm ocean currents.</p>	<p><b>Describe</b> how ocean currents affect climate.</p> <p><b>Describe</b> how latitude affects climate.</p> <p><b>Describe</b> how elevation and mountain ranges affect climate.</p> <p><b>Describe</b> how large bodies of water affect climate.</p> <p><b>Describe</b> how global winds affect climate.</p>	<p>Prentice Hall: p. 450 (Ocean Currents and Climate) CH 21.1 CH 21.2</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Section 21.1 <i>Factors That Affect Climate</i> Section 21.2 <i>World Climates</i></p> <p><b>Transparencies:</b> T-303-304 <i>Climates of the World</i> T-311 <i>Influence of Elevation on Climate</i> T-302 <i>Koppen System of Climatic Classification</i> T-305 <i>Three Climatic Diagrams</i> T-306 <i>Arid and Semiarid Climates</i> T-307 <i>Climatic Diagrams for Arid and Semiarid Stations</i> T-308 <i>Three Main Types of C Climates</i> T-309 <i>D Climates</i> T-310 <i>Two Basic Types of Polar Climates</i></p> <p><b>NSTA SciLinks:</b> CH 21 <i>Climate of the World: Cycles of the Earth and Atmosphere</i> (2 Activities) (see also <a href="http://www.windows.ucar.edu">www.windows.ucar.edu</a> and click on "Earth" and "Climate")</p> <p><b>Chapter Web Resources:</b> CH 21 Animations: <i>Rain Shadow Effect</i></p>	<p><b>Key Vocabulary:</b> climate, latitude, elevation, topography, vegetation, Koppen climate classification system, wet tropical climate, tropical wet and dry climate, humid subtropical climate, marine west coast climate, dry-summer subtropical climate, sub arctic climate</p>	<p>4 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
( 6b )			<p><b>Skills Focus:</b></p> <p>Drawing Logical Conclusions Investigate</p>	
<p><b>Assessment</b> (CST)</p>	<p><b>Describe</b> how vegetation affects climate.</p> <p><b>Compare and contrast</b> the different climate classifications (Koppen) and the factors determine each class.</p>		<p><b>Literacy Connections:</b></p> <p>Using Resources Effectively Searching Databases Analyzing Internet Content</p>	
			<p><b>EL Strategies</b></p> <p>Integrating technology and use of various forms of information.</p>	

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### 6. Climate is the long-term average of a region's weather and depends on many factors.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> how Earth's climate has changed over time, corresponding to changes in Earth's geography, atmospheric composition, and other factors, such as solar radiation and plate movement.</p> <p style="text-align: right;">( 6c )</p>	<p><b>Describe</b> natural processes that can cause changes in climate.</p> <p><b>Identify</b> the changes in the location of Earth's continents during the Paleozoic that affected the climates of those continents.</p> <p><b>Describe</b> how humans can have an impact on climate changes.</p>	<p>Prentice Hall: CH 13.2 CH 21.3</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><b>GRSW:</b> Section 21.3 <i>Climate Changes</i></p> <p><b>Transparencies:</b> T-165-168 <i>Various Views of Earth During the Paleozoic</i> T-313 <i>Carbon Dioxide Concentrations</i> T-314 <i>Global Temperature Variations</i></p> <p><b>Laboratory:</b> Lab 21 <i>Modeling the Greenhouse Effect</i> Exploration Lab <i>Human Impact on Climate and Weather</i> (pp.606-607 text, Worksheet in Lab Manual)</p> <p><b>Chapter Web Resources:</b> CH 21 Web Quest: <i>Will I Be Treading Water?</i> CH 21 Web Quest: <i>Is Global Warming a Scientific Fact?</i></p>	<p><b>Key Vocabulary:</b> greenhouse effect, global warming, Paleozoic</p> <hr/> <p><b>Skills Focus:</b> Cooperative Learning Summarize Calculate Analyze data</p> <hr/> <p><b>Literacy Connections:</b> Cause &amp; Effect Comparing Visuals to Text</p> <hr/> <p><b>EL Strategies</b> Use maps as context clues to access background knowledge and cultural identity</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

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### 5. Heating of the Earth's surface and atmosphere by the sun drives convection within the atmosphere and oceans, producing winds and ocean currents.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlations)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p><i>Students know</i> properties of ocean water, such as temperature and salinity, can be used to explain the layered structure of the oceans, the generation of horizontal and vertical ocean currents, and the geographic distribution of marine organisms.</p> <p style="text-align: right;">( 5d )</p>	<p><b>Identify</b> the sources of salt in ocean water and the units used to express the salinity.</p> <p><b>Recognize</b> the factors that affect the density of ocean water.</p> <p><b>List</b> the factors that influence a regions photosynthetic productivity.</p> <p><b>Describe</b> the transfers of energy that occur within the ocean.</p> <p><b>Explain</b> how surface currents develop.</p>	<p>Prentice Hall: CH 15 CH 16.1</p> <hr/> <p>Labs, Demos, Activities &amp; Resources:</p> <p><b>Transparencies:</b> T-188 <i>Proportions of Water and Dissolved Salts in Seawater.</i> T-189 <i>Variations in Ocean Surface Temperature and Salinity</i> T-191 <i>Variations in Ocean Water Temperature with Depth</i> T-192 <i>Variations in Ocean Water Density with Depth</i> T-193 <i>Three Layers of the Ocean</i> T-199 <i>Comparing productivities</i> T-200 <i>Ecosystem Energy Flow</i> T-202 <i>Surface Ocean Current</i> T-203 <i>Conveyor Belt Model</i></p> <p><b>GRSW:</b> Section 15.1 Section 15.2 Section 15.3 Section 16.1</p> <p><b>Laboratory:</b> Exploration Lab: <i>How does Temperature Affect Water Density?</i> (Text pp. 440-441 - Worksheet in Lab Manual)</p> <p><b>NSTA SciLinks:</b> <i>Ocean Currents</i></p>	<p><b>Key Vocabulary:</b></p> <p>salinity, thermocline, pycnocline, density, photosynthesis, primary productivity, chemosynthesis, ocean current, surface current, gyre, Coriolis effect, upwelling, density current</p>	4 days
			<p><b>Assessment</b> (CST)</p>	<p><b>State</b> the importance of upwelling.</p> <p><b>Describe</b> the formation of density currents.</p>

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**7. Each element on Earth moves among reservoirs, which exist in the solid earth, in oceans, in the atmosphere, and within and among organisms as part of biogeochemical cycles.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the global carbon cycle: the different physical and chemical forms of carbon in the atmosphere, oceans, biomass, and fossil fuels, and the movement of carbon among these reservoirs.</p> <p style="text-align: right;">( 7b )</p>	<p><b>Identify</b> the four carbon reservoirs.</p> <p><b>Describe</b> how carbon can move from one reservoir to another.</p> <p><b>Interpret</b> a diagram showing the movement of carbon.</p>	<p>Prentice Hall: Page 85 (Earth as a System) Page 95-98 (4.1) Page 110 (4.3)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>Teaching Tips:</b> Earth as a System: The Carbon Cycle. Page 85.</p> <hr/> <p><b>Build Reading Literacy:</b> Page 95. (Fossil Fuels)</p> <hr/> <p><b>Using Visuals:</b> Figure 19, page 110. (Atmospheric Pollution).</p> <p><i>There are few activities in the adopted text for this standard. Supplementary materials will be necessary.</i></p>	<p><b>Key Vocabulary:</b> Carbon Cycle Carbon Reservoir Atmosphere Oceans Fossil Fuels Biomass Combustion</p> <hr/> <p><b>Skills Focus:</b> Interpreting charts and diagrams</p> <hr/> <p><b>Literacy Connections:</b> Using Contextual Clues</p> <hr/> <p><b>EL Strategies:</b> Explain how carbon moves from one reservoir to another by creating a diagram with the students that is similar to the "Rock Cycle".</p>	<p>4 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<b>Assessment</b>				
(CST)				

## Earth Science - Page 43

**7. Each element on Earth moves among reservoirs, which exist in the solid earth, in oceans, in the atmosphere, and within and among organisms as part of biogeochemical cycles.**

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the movement of matter among reservoirs is driven by Earth's external and internal sources of energy</p> <p style="text-align: right;">( 7c )</p>	<p><b>Differentiate</b> between Earth's internal and external sources of energy.</p> <p><b>Describe</b> the movement of materials in terms of internal and external sources of energy.</p> <p><b>Identify</b> examples of internal and external sources of energy.</p>	<p>Prentice Hall: Pages 18-20 (Ch 1.4)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <hr/> <p><b>GRSW:</b> Chapter 1.4 (first page only)</p> <hr/> <p><b>Transparencies:</b> T-3: Hydrologic Cycle (discuss the role the Sun plays in the water cycle)</p> <hr/> <p><b>Build Science Skills:</b> Relating Cause and Effect (Page 19) <i>Relate this activity specifically to sources of energy.</i></p>	<p><b>Key Vocabulary:</b></p> <p>Energy Internal External Sources</p> <hr/> <p><b>Skills Focus:</b></p> <p>Cause &amp; Effect Interpreting Diagrams</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b></p> <p>Provide a word wall that describes Earth's internal and external sources of energy.</p>	<p>1 day</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b></p>				
<p>(CST)</p>				

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### 9. The geology of California underlies the state's wealth of natural resources as well as its natural hazards.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the importance of fresh water to society, the origins of California's fresh water, and the relationship between supply and need.</p> <p style="text-align: right;">( 9c )</p>	<p><b>Analyze</b> data presented to them in a table.</p> <p><b>Predict</b> the new values of this data if they are extrapolated to include more people.</p>	<p>Prentice Hall: Chapter 13A.2 Page CA 12 (California's Central Valley) Chapter 18 (Water Cycle)</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><i>At the time of this project, no demos, activities, or resources were available on the "Teacher Express" CD-ROM or in the teacher editions of the text.</i></p> <p><i>Supplementary materials will be necessary to teach this standard.</i></p> <p><b>Quicklab:</b> Household Water Usage (Page CA18)</p> <p><b>Web Resources:</b> American Ground Water Trust website (<a href="http://www.agwt.org/gwinfo.htm">www.agwt.org/gwinfo.htm</a>)</p>	<p><b>Key Vocabulary:</b></p> <p>Desalination Aqueduct Precipitation Surface Water Groundwater Drainage Basin Water Project Wetlands Irrigation</p> <hr/> <p><b>Skills Focus:</b></p> <p>Analyzing Data Reading Tables Making predictions</p> <hr/> <p><b>Literacy Connections:</b></p> <p>Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b></p> <p>Have students keep a log of how water is used in the own households before performing the quicklab. Have them estimate the amount of water that their households use every day.</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
<p><b>Assessment</b> (CST)</p>				

## Earth Science – Page 45

### 9. The geology of California underlies the state's wealth of natural resources as well as its natural hazards.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the resources of major economic importance in California and their relation to California's geology.</p> <p style="text-align: right;">( 9a )</p> <p><b>Assessment</b> (CST)</p>	<p><i>No activities available (see "Labs, Demos, Activities, and Resources").</i></p>	<p>Prentice Hall: Chapter 13A.1</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><i>At the time of this project, no labs, demos, activities, or resources were available on the "Teacher Express" CD-ROM or in the teacher editions of the text.</i></p> <p><i>Supplementary materials will be necessary to teach this standard.</i></p>	<p><b>Key Vocabulary:</b></p> <p>Source Rocks Reservoir Rocks Geothermal Field Klamath Mountains Cascade Range Modoc Plateau Basin and Range Sierra Nevada Central Valley Coast Ranges Mojave Desert Colorado Desert Evaporite</p> <hr/> <p><b>Skills Focus:</b></p> <p><i>No activities available (see "Labs, Demos, Activities, and Resources").</i></p> <hr/> <p><b>Literacy Connections:</b></p> <p>Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b></p> <p>Use maps on bulletin boards to show students the exact locations of the resources mentioned in this standard. Include familiar landmarks (Fresno, Yosemite, Los Angeles, San Francisco, etc.)</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>

## Earth Science - Page 46

### 9. The geology of California underlies the state's wealth of natural resources as well as its natural hazards.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students know the principal natural hazards in different California regions and the geologic basis of those hazards.</p> <p style="text-align: right;">( 9b )</p> <hr/> <p><b>Assessment</b> (CST)</p>	<p><b>Locate</b> areas of California that experience natural hazards</p> <p><b>Describe</b> the primary natural hazards of California</p>	<p>Prentice Hall: Chapter 13A.3</p> <hr/> <p><b>Labs, Demos, Activities &amp; Resources:</b></p> <p><i>At the time of this project, no demos, activities, or resources were available on the "Teacher Express" CD-ROM or in the teacher editions of the text.</i></p> <p><i>Supplementary materials will be necessary to teach this standard.</i></p> <p><b>Exploration Lab:</b> Mapping Earthquake Hazards (page CA27-CA29). (In student edition only, no teacher's edition or "answer key".)</p>	<p><b>Key Vocabulary:</b> Natural Hazard Seismic Shaking Modified Mercalli Scale Tsunami Liquefaction Landslides Volcanic Field Active Volcano Dormant Volcano Calderas Mudflows Flooding Dams Levees</p> <hr/> <p><b>Skills Focus:</b> Interpreting maps</p> <hr/> <p><b>Literacy Connections:</b> Using Vocabulary</p> <hr/> <p><b>EL Strategies:</b> Use a bulletin board that shows pictures of the different natural hazards and the areas in California where they occur.</p>	<p>5 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>

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**Investigation & Experimentation:** Scientific Progress is made by asking meaningful questions and conducting careful investigations.

Standards and Assessments "Students know . . ."	Task Analysis "Students are able to . . ."	Adopted Textbook Correlation(s)	Connections	Appx Time (per 180 days)
<p>. . .</p> <p>Students will investigate a science-based societal issue by researching the literature, analyzing data, and communicating the findings. Examples of issues include choice of energy sources, and land and water decisions in California.</p> <p style="text-align: right;">( I&amp;E 1m )</p>	<p><b>Find</b> newspaper and magazine articles about a specific societal issue.</p> <p><b>Analyze</b> data.</p> <p><b>Communicate</b> findings.</p>	<p>Prentice Hall: Ch 4.1, Ch 4.2, Ch 13A.1, Ch 13A.2</p>	<p><b><i>Key Vocabulary:</i></b> Refer to Standard 6 c</p>	<p>2 days</p> <p><i>A day is a 55 minute period. Adjust for block schedules.</i></p>
		<p><b><i>Labs, Demos, Activities &amp; Resources:</i></b></p> <p>Refer to Standard 6c.</p>		
<p><b><i>Assessment</i></b> (CST)</p>			<p><b><i>Focus Skills</i></b></p> <p>apply Demonstrate. Collect Identify</p>	
			<p><b><i>Literacy Connections:</i></b></p> <p>Examine Relate Support</p>	
			<p><b><i>EL Strategies</i></b></p> <p>Highlight text Prediction Link to background knowledge Graphic representation</p>	