



Earth Science

Geology, the Environment, and the Universe

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STANDARDS	PAGE REFERENCES
Earth Science: Embedded Inquiry	
Conceptual Strand <i>Understandings about scientific inquiry and the ability to conduct inquiry are essential for living in the 21st century.</i>	
Guiding Question <i>What tools, skills, knowledge, and dispositions are needed to conduct scientific inquiry?</i>	
Course Level Expectations	
CLE 3204.Inq.1 Recognize that science is a progressive endeavor that reevaluates and extends what is already accepted.	Student Edition: 468-472, 473-479, 480-485, 486-488, 595, 633-637, 796-803 Teacher Wraparound Edition: AC 6, 326; CL 470; DIS 926; ESJ 471; TCS 470, 621, 802
CLE 3204.Inq.2 Design and conduct scientific investigations to explore new phenomena, verify previous results, test how well a theory predicts, and compare opposing theories.	Student Edition: 53 #38 <i>MiniLab</i> 12 <i>Inquiry Extension</i> 21, 77, 243, 853 <i>GeoLab</i> 77, 125, 153, 185, 305, 397, 821 Teacher Wraparound Edition: P 11

STANDARDS	PAGE REFERENCES
CLE 3204.Inq.3 Use appropriate tools and technology to collect precise and accurate data.	Student Edition: 53 #38 <i>GeoLab</i> 21, 77, 103, 125, 153, 185, 243, 305, 367, 397, 429, 519, 821
CLE 3204.Inq.4 Apply qualitative and quantitative measures to analyze data and draw conclusions that are free of bias.	Student Edition: <i>MiniLab</i> 12 <i>GeoLab</i> 21, 77, 103, 125, 153, 185, 243, 305, 367, 397, 429, 519, 821 <i>Problem-Solving Lab</i> 122
CLE 3204.Inq.5 Compare experimental evidence and conclusions with those drawn by others about the same testable question..	Student Edition: <i>GeoLab</i> 21, 125, 153, 821 <i>Writing in Earth Science</i> 103 <i>Problem-Solving Lab</i> 122 <i>Share Your Data</i> 367, 519, 611
CLE 3204.Inq.6 Communicate and defend scientific findings.	Student Edition: 17-19 <i>GeoLab</i> 77, 103, 125, 153, 185, 243, 305, 397, 429, 490-491, 519 <i>Inquiry Extension</i> 77 <i>Share Your Data</i> 367, 611
Checks for Understanding	
3204.Inq.1 Trace the historical development of a scientific principle or theory, such as plate tectonics, evolution of the cosmos, and global change.	Student Edition: 393-395, 468-472, 473-479, 480-485, 486-488, 633-637, 796-803 <i>Earth Science and Society</i> 552 Teacher Wraparound Edition: AC 6, 478; TPK 393
3204.Inq.2 Conduct scientific investigations that include testable questions, verifiable hypotheses, and appropriate variables to explore new phenomena or verify the experimental results of others.	Student Edition: 10-13, 24 #33 <i>MiniLab</i> 12 <i>Inquiry Extension</i> 21, 185 <i>GeoLab</i> 77, 103, 125, 153, 243, 305, 397, 519, 821, 853
3204.Inq.3 Select appropriate tools and technology to collect precise and accurate quantitative and qualitative data.	Student Edition: <i>GeoLab</i> 21, 77, 103, 125, 153, 185, 243, 305, 367, 397, 429, 519, 821
3204.Inq.4 Determine if data supports or contradicts a hypothesis or conclusion.	Student Edition: 10-13 <i>GeoLab</i> 397

STANDARDS	PAGE REFERENCES
<p>3204.Inq.5 Compare or combine experimental evidence from two or more investigations.</p>	<p>Student Edition: <i>GeoLab</i> 21, 125, 153, 821 <i>Writing in Earth Science</i> 103 <i>Problem-Solving Lab</i> 122 <i>Share Your Data</i> 367, 519</p>
<p>3204.Inq.6 Recognize, analyze, and evaluate alternative explanations for the same set of observations.</p>	<p>Student Edition: 633-635, 878-881 <i>Writing in Earth Science</i> 103 <i>Problem-Solving Lab</i> 122 <i>GeoLab</i> 125 <i>Reading for Comprehension</i> 673 Teacher Wraparound Edition: A 637; CFU 637</p>
<p>3204.Inq.7 Evaluate the accuracy and precision of data.</p>	<p>Student Edition: 53 #38 <i>GeoLab</i> 21, 125, 153, 821, 853 Teacher Wraparound Edition: D 15; T 429</p>
<p>3204.Inq.8 Analyze experimental results and identify possible sources of bias or experimental error.</p>	<p>Student Edition: <i>GeoLab</i> 125, 153, 821, 853 <i>Problem-Solving Lab</i> 122 Teacher Wraparound Edition: D 15; T 429</p>
<p>3204.Inq.9 Formulate and revise scientific explanations and models using logic and evidence.</p>	<p>Student Edition: <i>GeoLab</i> 77, 125, 153, 185, 243, 305, 367, 397, 429, 490-491, 519, 553, 611, 667 Teacher Wraparound Edition: A 12</p>

STANDARDS	PAGE REFERENCES
Earth Science: Embedded Technology and Engineering	
Conceptual Strand <i>Society benefits when engineers apply scientific discoveries to design materials and processes that develop into enabling technologies.</i>	
Guiding Question <i>How do science concepts, engineering skills, and applications of technology improve the quality of life?</i>	
Course Level Expectations	
CLE 3204.T/E.1 Explore the impact of technology on social, political, and economic systems.	Student Edition: 769 <i>National Geographic Expeditions</i> 20, 518, 892-897 <i>Earth Science and Technology</i> 47, 184 Teacher Wraparound Edition: ACT 896; TCS 184
CLE 3204.T/E.2 Differentiate among elements of the engineering design cycle: design constraints, model building, testing, evaluating, modifying, and retesting.	Student Edition: <i>GeoLab</i> 725
CLE 3204.T/E.3 Explain the relationship between the properties of a material and the use of the material in the application of a technology.	Student Edition: <i>Earth Science and Technology</i> 76 Teacher Wraparound Edition: AC 100; TCS 76
CLE 3204.T/E.4 Describe the dynamic interplay among science, technology, and engineering within living, earth-space, and physical systems.	Student Edition: 41-46, 324-328, 406-407, 764-769 <i>Figure 1.7</i> 14-15 <i>Figure 2.14</i> 42-43 <i>Earth Science and the Environment</i> 124 <i>Figure 13.16</i> 358-359 <i>National Geographic Expeditions</i> 455, 518 <i>Earth Science and Technology</i> 610, 638 Teacher Wraparound Edition: CL 42, 327; CON 41
Checks for Understanding	
3204.T/E.1 Distinguish among tools and procedures best suited to conduct a specified scientific inquiry.	Student Edition: <i>GeoLab</i> 21, 103, 125, 185, 243, 305, 397, 429, 725 Teacher Wraparound Edition: M 716

STANDARDS	PAGE REFERENCES
<p>3204.T/E.2 Apply the engineering design process to construct a prototype that meets developmentally appropriate specifications.</p>	<p>Student Edition: 557 #41 <i>GeoLab</i> 725 Teacher Wraparound Edition: M 716</p>
<p>3204.T/E.3 Evaluate a protocol to determine the degree to which an engineering design process was successfully applied.</p>	<p>Student Edition: <i>GeoLab</i> 725</p>
<p>3204.T/E.4 Explore how the unintended consequences of new technologies can impact human and non-human communities.</p>	<p>Student Edition: 167, 393-395, 686, 737-742, 743-747, 748-750 <i>Earth Science and the Environment</i> 304 <i>Earth Science and Society</i> 396 Teacher Wraparound Edition: EC 167, 283</p>
<p>3204.T/E.5 Evaluate the overall benefit to cost ratio of a new technology.</p>	<p>Student Edition: 714-719, 720-723 <i>Section Assessment</i> 719 <i>GeoLab</i> 725 Teacher Wraparound Edition: CL 718; EC 723</p>
<p>3204.T/E.6 Present research on current bioengineering technologies that advance health and contribute to improvements in our daily lives.</p>	<p>Student Edition: 719, 742 <i>Earth Science and the Environment</i> 724 Teacher Wraparound Edition: ESJ 739; ITF 741; TCS 724; TS 724</p>
<p>3204.T/E.7 Design a series of multi-view drawings that can be used by other students to construct an adaptive design and test its effectiveness.</p>	<p>Student Edition: <i>GeoLab</i> 725 Teacher Wraparound Edition: M 716</p>

STANDARDS	PAGE REFERENCES
Earth Science: Standard 1 –The Universe	
Conceptual Strand 1 <i>The cosmos is vast and explored well enough to know its basic structure and operational principles.</i>	
Guiding Question 1 <i>What big ideas guide human understanding about the origin and structure of the universe, Earth’s place in the cosmos, and observable motions and patterns in the sky?</i>	
Course Level Expectations	
CLE 3204.1.1 Explore theories for the origin and evolution of the universe.	Student Edition: 873-877, 878-881, 887 #36 <i>MiniLab 873</i> <i>Writing in Earth Science 881</i> Teacher Wraparound Edition: AC 326; CFU 881; CON 880; DI 878; ESJ 879; MI 878; P 880
CLE 3204.1.2 Examine the components of the solar system.	Student Edition: 770-774, 796-803, 804-810, 811-815, 816-819 <i>Earth Science and the Environment 124</i> Teacher Wraparound Edition: A 819; AC 174; CL 804, 805; ESJ 801, 806, R 810, 815; TCS 800
CLE 3204.1.3 Examine the sun, earth, and moon relationships and their gravitational effects.	Student Edition: 424, 775-784, 802-803 <i>MiniLab 776</i> <i>National Geographic 779</i> Teacher Wraparound Edition: AES 777; D 780; DI 777; TCS 425, 779, 780, 783
CLE 3204.1.4 Investigate the history of space exploration.	Student Edition: 764-769, 770 <i>Earth Science Online 761</i> <i>Figure 27.4 766-767</i> <i>Concepts in Motion 767</i> <i>Launch Lab 795</i> <i>Writing in Earth Science 815</i> <i>National Geographic Expeditions 934-939</i> Teacher Wraparound Edition: AC 935; ACT 771; ESJ 767; MI 770; TCS 814, 934

STANDARDS	PAGE REFERENCES
Checks for Understanding	
<p>3204.1.1 Identify the components of the universe: black holes, galaxies, nebulae, solar systems, stars, planets, meteors, comets, and asteroids.</p>	<p>Student Edition: 798-799, 804-810, 816-819, 830-836, 837-846, 847-851, 869-877 <i>Section Assessment</i> 819 <i>Concepts in Motion</i> 844 Teacher Wraparound Edition: A 819; CFU 868; M 819; P 799; TS 817</p>
<p>3204.1.2 Compare explanations for the origin of the universe: Big Bang, nucleosynthesis, galaxy, and star formation..</p>	<p>Student Edition: 847-851, 867-868, 878-881 <i>Concepts in Motion</i> 848 <i>Writing in Earth Science</i> 881 Teacher Wraparound Edition: CFU 881; CON 880; D 866; DI 880; DIS 868; ITU 761; P 880; R 868; TCS 867</p>
<p>3204.1.3 Construct a solar system model that illustrates ratios and proportions of distance and size of planets.</p>	<p>Student Edition: 804-810 <i>Launch Lab</i> 763 <i>GeoLab</i> 821 Teacher Wraparound Edition: CFU 810; DI 805, 830; ESJ 811; MI 811, 830</p>
<p>3204.1.4 Explain the evolution of a star through all stages of its development.</p>	<p>Student Edition: 847-851 <i>Concepts in Motion</i> 848 <i>Section Assessment</i> 851 Teacher Wraparound Edition: A 851; AC 849, 850; CFU 851; DI 848; UST 849</p>
<p>3204.1.5 Classify galaxies according to their shapes.</p>	<p>Student Edition: 863-864, 869-876, 886 #31 <i>National Geographic</i> 871 <i>Concepts in Motion</i> 871 Teacher Wraparound Edition: ACT 871; CL 873, 883; ESJ 863, 871; ITI 871; M 869; MI 869; TCS 864</p>
<p>3204.1.6 Explore the role of astronomical events in the earth's history such as asteroid/meteor impacts, solar flares, and comets.</p>	<p>Student Edition: 390, 628, 631, 659, 671 #36 <i>Writing in Earth Science</i> 659 <i>Reading for Comprehension</i> 673 Teacher Wraparound Edition: AC 390; DI 628; IM 818; R 632; TCS 391, 634, 659</p>

STANDARDS	PAGE REFERENCES
<p>3204.1.7 Compare and contrast the earth to other planets in the solar system.</p>	<p>Student Edition: 632, 804-810, 811-815</p> <p>Teacher Wraparound Edition: CON 807, 808, 811; ESJ 806; MI 804; TCS 806, 807; TPK 808, 812</p>
<p>3204.1.8 Investigate the seasonal relationships between the length of the day and the inclination and relative positions of the sun and earth.</p>	<p>Student Edition: 388, 776-778, 790#26-27 <i>Concepts in Motion</i> 388 <i>MiniLab</i> 776</p> <p>Teacher Wraparound Edition: A 776; D 775; E 778; ITI 777; M 777; RE 778</p>
<p>3204.1.9 Describe the position of the sun, earth, and moon during eclipses and different lunar phases.</p>	<p>Student Edition: 778-784, 791#29-30, 791#34 <i>National Geographic</i> 779 <i>Concepts in Motion</i> 779 <i>Problem-Solving Lab</i> 782 <i>Section Assessment</i> 784</p> <p>Teacher Wraparound Edition: A 784; CFU 784; DI 779; DIS 779, 782; TCS 779; UST 779</p>
<p>3204.1.10 Predict tidal conditions based upon the position of the earth, moon, and sun.</p>	<p>Student Edition: 423-425, 497#9-11, 781, 791#34 <i>Data Analysis Lab</i> 423 <i>Section Assessment</i> 427</p> <p>Teacher Wraparound Edition: A 784; AC 423; CON 424; DI 424; E 780; ITI 425; R 784; TCS 425</p>
<p>3204.1.11 Describe the relationship between the mass of an object and the its gravitational force.</p>	<p>Student Edition: 424, 802-803 <i>Concepts in Motion</i> 802 <i>Section Assessment</i> 803</p> <p>Teacher Wraparound Edition: A 803; TCS 425, 783</p>
<p>3204.1.12 Construct a historical timeline that depicts man's changing perceptions and understanding of astronomy.</p>	<p>Student Edition: <i>Figure 27.4</i> 766-767 <i>Concepts in Motion</i> 767</p> <p>Teacher Wraparound Edition: ACT 771; MI 770</p>

STANDARDS	PAGE REFERENCES
3204.1.13 Understand how telescopes and spectroscopy manipulate light to reveal information about the universe.	Student Edition: 764-769 <i>Reading for Comprehension</i> 793 <i>National Geographic Expeditions</i> 934-939 Teacher Wraparound Edition: A 769; AC 768; CFU 769; CL 935; D 764; DI 765; ESJ 766; IM 768; R 769; TCS 762, 766, 767
3204.1.14 Investigate the history of space exploration.	Student Edition: 764-769, 770 <i>Earth Science Online</i> 761 <i>Figure 27.4</i> 766-767 <i>Concepts in Motion</i> 767 <i>Launch Lab</i> 795 <i>Writing in Earth Science</i> 815 <i>National Geographic Expeditions</i> 934-939 Teacher Wraparound Edition: AC 935; ACT 771; ESJ 767; MI 770; TCS 815, 934
3204.1.15 Research Tennessee's contribution to earth and space science.	Student Edition: 339 #44 Teacher Wraparound Edition: E 99; ITF 64
Earth Science: Standard 2 - Energy in the Earth System	
Conceptual Strand 2 <i>Energy cycles drive the earth system.</i>	
Guiding Question 2 <i>What are the scientific explanations for how energy cycles through the earth system?</i>	
Course Level Expectations	
CLE 3204.2.1 Investigate the principal sources of energy.	Student Edition: 112, 286-288, 314-315, 435 #11-#13, 621-622, 708-713, 714-719 Teacher Wraparound Edition: A 707; BI 706; DIS 717; EC 716; IM 715; ITU 675; R 622
CLE 3204.2.2 Explore pathways of energy transfer.	Student Edition: 286-288, 308 #30, 372 #8-#9, 486-487 <i>Section Assessment</i> 288 Teacher Wraparound Edition: A 288; ACT 293; CON 346; DIS 284; ESJ 716; R 488; TCS 20, 171, 280, 286

STANDARDS	PAGE REFERENCES
<p>CLE 3204.2.3 Evaluate alternative energy sources.</p>	<p>Student Edition: 714-719 <i>Concepts in Motion</i> 717 <i>Section Assessment</i> 719 <i>Earth Science and the Environment</i> 724</p> <p>Teacher Wraparound Edition: A 719; CFU 719; CL 718; DIS 718; EC 716, 722; M 716</p>
Checks for Understanding	
<p>3204.2.1 Differentiate among the various forms of energy.</p>	<p>Student Edition: 708-713, 714-719 <i>Concepts in Motion</i> 717, 718 <i>Figure 25.9</i> 718-719 <i>Data Analysis Lab</i> 722 <i>Writing in Earth Science</i> 719</p> <p>Teacher Wraparound Edition: BI 706; CL 709; D 714; EC 716; ESJ 716; TCS 171, 709</p>
<p>3204.2.2 Illustrate three types of energy transfer: radiation, conduction, and convection.</p>	<p>Student Edition: 286-288, 372 #8-#9, 435 #11-#13, 463 #11-#12, 486-487 <i>Section Assessment</i> 288</p> <p>Teacher Wraparound Edition: A 288; ACT 293; DIS 284; M 284; TCS 286, 291</p>
<p>3204.2.3 Describe different types of energy resources such as fossil fuels, solar, geothermal, nuclear, wind, and hydroelectric.</p>	<p>Student Edition: 708-713, 714-719 <i>Concepts in Motion</i> 717, 718 <i>Section Assessment</i> 719 <i>Writing in Earth Science</i> 719</p> <p>Teacher Wraparound Edition: A 719; CFU 719; CL 718; DIS 718; EC 716; M 716; TCS 709</p>
<p>3204.2.4 Distinguish between renewable and nonrenewable resources in terms of resource conservation.</p>	<p>Student Edition: 678-681, 708-713, 714-719, 720-723, 728 #34 <i>Section Assessment</i> 681</p> <p>Teacher Wraparound Edition: A 681; CFU 681; DI 678; EC 679, 716; ESJ 680; IM 685; TCS 708, 714</p>

STANDARDS	PAGE REFERENCES
<p>3204.2.5 Investigate how the sun provides the major source of earth's surface energy.</p>	<p>Student Edition: 224, 286-288, 314-315, 378, 388, 435 #11-#13, 463 #11-#12 <i>MiniLab</i> 315</p> <p>Teacher Wraparound Edition: A 315; ACT 293; BI 280; E 388; TCS 286</p>
<p>3204.2.6 Explore three primary sources of internal energy: gravitational energy from the earth's original formation, friction, and radioactive decay.</p>	<p>Student Edition: 112, 601, 621-622 <i>Concepts in Motion</i> 601 <i>Section Assessment</i> 622</p> <p>Teacher Wraparound Edition: DIS 717; R 622; TCS 621</p>
<p>3204.2.7 Diagram and evaluate pathways of energy transfer to demonstrate the law of conservation of energy.</p>	<p>Student Edition: 75, 286-288, 372 #8-#9, 435 #11-#13, 463 #11-#12, 673 #11-#13 <i>Launch Lab</i> 707</p> <p>Teacher Wraparound Edition: A 707; ACT 293; E 718</p>
<p>3204.2.8 Describe the energy transfer associated with different geologic events: mantle convection, rock cycle, wind, and ocean currents.</p>	<p>Student Edition: 112-117, 134-137, 145-151, 201-206, 421-427, 486-488</p> <p>Teacher Wraparound Edition: A 136; AC 113, 201; CFU 206; D 202; IM 114; ITP 135; R 488; TPK 421</p>
<p>3204.2.9 Describe the human impact of large scale energy transfer events: hurricanes, photosynthesis, earthquakes, volcanoes, and tsunamis.</p>	<p>Student Edition: 358-360, 513, 545-551 <i>GeoLab</i> 519 <i>Earth Science and Society</i> 552</p> <p>Teacher Wraparound Edition: AC 502; ACT 322; ESJ 512, 547; R 551; TCS 547</p>
<p>3204.2.10 Compare and contrast alternative energy sources and their environmental impact.</p>	<p>Student Edition: 714-719 <i>Figure 25.9</i> 716-717 <i>Concepts in Motion</i> 717, 718 <i>Section Assessment</i> 719 <i>Earth Science and the Environment</i> 724</p> <p>Teacher Wraparound Edition: A 719; CFU 719; CL 718; DIS 718; EC 716; ESJ 716, 718; M 716</p>

STANDARDS	PAGE REFERENCES
<p>3204.2.11 Compare energy sources and heat transfer over geologic time to current patterns of global change.</p>	<p>Student Edition: 390-392, 393-395, 486-487, 620-622, 628-629, 642 #31, 660-661 <i>Section Assessment</i> 622 <i>Earth Science and Technology</i> 751 Teacher Wraparound Edition: IM 390; TCS 284, 391</p>
<p>Earth Science: Standard 3 - Cycles in the Earth System</p>	
<p>Conceptual Strand 3 <i>The earth system consists of interrelated subcycles that act over extended periods of geologic time.</i></p>	
<p>Guiding Question 3 <i>What are the subcycles of the earth system and how do they interact?</i></p>	
<p>Course Level Expectations</p>	
<p>CLE 3204.3.1 Explain the components of the tectonic cycle.</p>	<p>Student Edition: 468-472, 473-479, 480-485, 486-488 <i>National Geographic</i> 478 <i>MiniLab</i> 481 <i>Problem-Solving Lab</i> 484 <i>GeoLab</i> 490-491 Teacher Wraparound Edition: A 472; CFU 485, 488; ITI 477, 480; R 485; TCS 486</p>
<p>CLE 3204.3.2 Investigate the rock cycle.</p>	<p>Student Edition: 112-117, 134-140, 145-151, 158 #7-#8 <i>GeoLab</i> 125, 153 <i>MiniLab</i> 136 <i>Problem-Solving Lab</i> 148 <i>Section Assessment</i> 151 Teacher Wraparound Edition: A 136, 151; CFU 140; DIS 150; ESJ 150; M 146</p>
<p>CLE 3204.3.3 Analyze the hydrologic cycle.</p>	<p>Student Edition: 224, 249 #13, 277 #11-#13, 303, 308 #25 <i>Concepts in Motion</i> 224 <i>Writing in Earth Science</i> 303 Teacher Wraparound Edition: CL 302; IM 224; R 303; TPK 225, 413</p>

STANDARDS	PAGE REFERENCES
<p>CLE 3204.3.4 Interpret data related to the atmospheric cycle.</p>	<p>Student Edition: 282-288, 314-317, 318-323 <i>Launch Lab</i> 313 <i>National Geographic</i> 319 <i>Concepts in Motion</i> 322 Teacher Wraparound Edition: CL 317, 322; ITI 318; R 323; RE 320; TPK 318</p>
<p>CLE 3204.3.5 Differentiate among the geochemical cycles.</p>	<p>Student Edition: 689 <i>National Geographic</i> 415, 689 <i>Concepts in Motion</i> 415, 689 <i>Section Assessment</i> 692</p>
<p>CLE 3204.3.6 Evaluate the impact of living organisms on the earth system cycles.</p>	<p>Student Edition: 393-395, 734-736, 737-742, 743-747, 748-750 <i>Earth Science and the Environment</i> 304 <i>Earth Science and Society</i> 396 <i>MiniLab</i> 741 Teacher Wraparound Edition: A 742, 747; AC 740; CL 750; R 747; TCS 738, 749</p>
<p>CLE 3204.3.7 Investigate how maps can be used to interpret changes in the earth system.</p>	<p>Student Edition: 30-33, 34-50 <i>Concepts in Motion</i> 34 <i>Problem-Solving Lab</i> 37 Teacher Wraparound Edition: A 40; CFU 40; D 34; DI 34; ESJ 39; ITI 39; RE 39; TCS 35, 36</p>
<p>CLE 3204.3.8 Relate earth system cycles to past and current patterns of global change.</p>	<p>Student Edition: 387-392, 393-395, 468-472 <i>Earth Science and Society</i> 396 <i>Reading for Comprehension</i> 403 <i>Concepts in Motion</i> 469 <i>Earth Science and Technology</i> 751 Teacher Wraparound Edition: DI 469, 483; EC 395; IM 387, 469; MI 468</p>

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Checks for Understanding	
3204.3.1 Use models to explain the theory of plate tectonics.	Student Edition: 468-472, 473-479, 480-485, 486-488 <i>MiniLab</i> 481 <i>GeoLab</i> 490-491 Teacher Wraparound Edition: A 485; D 487; DI 469, 480; IM 487; M 470, 473
3204.3.2 Apply mantle convection currents to distinguish between diverging and converging plate boundaries.	Student Edition: 480-485, 486-488, 500-502 <i>Table 17.1</i> 483 <i>Concepts in Motion</i> 488 <i>Section Assessment</i> 488 Teacher Wraparound Edition: A 488; CFU 485, 488; MI 486; TCS 486; TPK 501
3204.3.3 Explain and map the relationship between plate tectonics and mountain building, volcanoes, and earthquakes.	Student Edition: 473-479, 480-485, 500-502, 543-544, 567-573 <i>Launch Lab</i> 467 <i>National Geographic</i> 478 <i>MiniLab</i> 481 <i>Table 17.1</i> 483 <i>Section Assessment</i> 485 Teacher Wraparound Edition: AC 480; ITI 500, 501; P 569; TCS 466
3204.3.4 Distinguish between minerals and rocks.	Student Edition: 86-95, 96-99, 112-117, 145-146 <i>Launch Lab</i> 85, 111 <i>Problem-Solving Lab</i> 122, 148 Teacher Wraparound Edition: A 85, 111; ACT 90; CON 86; D 86; DIS 119; IM 114; ITI 119; UST 99
3204.3.5 Identify minerals according to their properties.	Student Edition: 90-95 <i>MiniLab</i> 92 <i>Data Analysis Lab</i> 94 <i>Section Assessment</i> 95 <i>GeoLab</i> 103 Teacher Wraparound Edition: ACT 90, 93; CL 93; D 90; DI 91, 94; E 95; ESJ 92; IM 91; RE 91

STANDARDS	PAGE REFERENCES
3204.3.6 Distinguish among sedimentary, igneous, and metamorphic rocks.	Student Edition: 112-117, 118-123, 134-140, 141-144, 145-151 <i>MiniLab</i> 115 Teacher Wraparound Edition: A 144; CON 143; DIS 150; R 123; TS 152; UAA 147
3204.3.7 Interpret a diagram of the rock cycle.	Student Edition: 151, 158 #7-#8, 524 #8-#9 Teacher Wraparound Edition: A 151; DIS 150
3204.3.8 Explain a model of the hydrologic cycle.	Student Edition: 224, 303, 309 #43 <i>Concepts in Motion</i> 224 Teacher Wraparound Edition: R 303
3204.3.9 Distinguish between mechanical and chemical weathering.	Student Edition: 164-170 <i>Section Assessment</i> 170 <i>GeoLab</i> 185 Teacher Wraparound Edition: AC 167; AES 166; CFU 170; DI 164, 166; E 166; MI 164; UST 166
3204.3.10 Describe the impact of water on the evolution of landforms.	Student Edition: 170-173, 224-231, 232-237, 259-261, 438-446 <i>Launch Lab</i> 163 <i>MiniLab</i> 172 <i>Section Assessment</i> 231 Teacher Wraparound Edition: D 232; ESJ 171, 443; M 227, 234; P 173; TCS 225
3204.3.11 Collect and interpret basic weather data from meteorological instruments: thermometer, rain gauge, and barometer.	Student Edition: 309 #46-#48 <i>Problem-Solving Lab</i> 294 <i>MiniLab</i> 295 <i>Math in Earth Science</i> 332 <i>Data Analysis Lab</i> 364, 377 Teacher Wraparound Edition: CFU 328; DI 325; ESJ 301; R 328; TCS 325

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<p>3204.3.12 Analyze weather map data to make simple predictions.</p>	<p>Student Edition: 322-323, 329-330 <i>Problem-Solving Lab</i> 330 <i>Writing in Earth Science</i> 333 <i>GeoLab</i> 334-335, 367 <i>Apply Your Skill</i> 334 <i>Reference Handbook</i> 959 Teacher Wraparound Edition: A 323, 332; ACT 330</p>
<p>3204.3.13 Explain the oxygen/carbon dioxide, nitrogen, and carbon biogeochemical cycles.</p>	<p>Student Edition: 395, 629, 687-688 <i>National Geographic</i> 689 <i>Concepts in Motion</i> 689 Teacher Wraparound Edition: AC 629; CL 629; IM 689; ITI 417; M 689; TCS 687; TPK 658</p>
<p>3204.3.14 Recognize the connection between geologic processes such as floods, earthquakes, volcanoes, acid rain, and global warming and human activities.</p>	<p>Student Edition: 167, 230-231, 361, 393-395, 545-551, 743-746 <i>Section Assessment</i> 9 <i>National Geographic Expeditions</i> 20 <i>Reading for Comprehension</i> 221, 403 <i>Writing in Earth Science</i> 395 <i>Earth Science and Society</i> 396 Teacher Wraparound Edition: EC 167; ESJ 364; R 395</p>
<p>3204.3.15 Construct a geological cycle for a physiographic region or geologic time period in Tennessee.</p>	<p>Student Edition: <i>Apply Your Skill</i> 639 Teacher Wraparound Edition: P 468</p>
<p>3204.3.16 Interpret topographic maps.</p>	<p>Student Edition: 36-40 <i>Problem-Solving Lab</i> 37 <i>Concepts in Motion</i> 39 <i>GeoLab</i> 48-49, 270-271, 456-457, 578-579 <i>Reference Handbook</i> 958 Teacher Wraparound Edition: A 40; AC 232; D 38; DI 36; ESJ 36; TCS 36; TPK 236</p>

STANDARDS	PAGE REFERENCES
<p>3204.3.17 Relate current patterns of global change such as sea level change and geographic climate shifts to events that occurred during earth's distant past.</p>	<p>Student Edition: 207, 387-392, 393-95, 649-650, 656, 660-661 <i>Reading for Comprehension</i> 221</p> <p>Teacher Wraparound Edition: DIS 661; E 923; EC 395; IM 387, 390; ITI 651; TCS 207</p>
<p>Earth Science: Standard 4 - Geologic History</p>	
<p>Conceptual Strand 4 <i>The earth has changed over a long period and global change is a continuation of that evolutionary process.</i></p>	
<p>Guiding Question 4 <i>What is the scientific evidence for the evolution of earth and life on earth?</i></p>	
<p>Course Level Expectations</p>	
<p>CLE 3204.4.1 Interpret the nature of geologic time.</p>	<p>Student Edition: 590-594 <i>National Geographic</i> 591 <i>Concepts in Motion</i> 591 <i>Writing in Earth Science</i> 594 <i>GeoLab</i> 611</p> <p>Teacher Wraparound Edition: A 594; ACT 591; DI 591; DIS 593; ESJ 592; IM 590; TCS 591, 592</p>
<p>CLE 3204.4.2 Investigate the evolution of the earth.</p>	<p>Student Edition: 620-622, 623-627, 628-629, 643 #47-#49, 648-652, 655-657 <i>Launch Lab</i> 619 <i>Concepts in Motion</i> 626 <i>GeoLab</i> 639</p> <p>Teacher Wraparound Edition: A 622; CFU 622, 627; D 623; IM 624; TCS 623</p>

STANDARDS	PAGE REFERENCES
<p>CLE 3204.4.3 Interpret the fossil record for evidence of biological evolution.</p>	<p>Student Edition: 606-609, 635-637, 652-654, 658-659 <i>Figure 21.4</i> 592-593 <i>Concepts in Motion</i> 593 <i>National Geographic Expeditions</i> 922-927 Teacher Wraparound Edition: AC 469, 608, 923; CFU 594; ESJ 636; ITF 593; TCS 922</p>
<p>CLE 3204.4.4 Demonstrate the impact of environmental change on the origin and extinction of plant and animal species.</p>	<p>Student Edition: 594, 653-654, 659, 665 <i>MiniLab</i> 653 <i>Concepts in Motion</i> 659 <i>Writing in Earth Science</i> 659 Teacher Wraparound Edition: A 653, 654; DIS 594</p>
<p>Checks for Understanding</p>	
<p>3204.4.1 Explain the law of uniformitarianism.</p>	<p>Student Edition: 595, 642 #35 Teacher Wraparound Edition: AC 6, 595; E 595; IM 596</p>
<p>3204.4.2 Differentiate between absolute and relative time.</p>	<p>Student Edition: 595-600, 601-605 <i>MiniLab</i> 597 <i>Concepts in Motion</i> 598, 602 <i>Problem-Solving Lab</i> 599 <i>Section Assessment</i> 605 Teacher Wraparound Edition: A 605; ACT 603; MI 595, 601; TCS 602</p>
<p>3204.4.3 Compare and contrast how relative and absolute dating techniques are used to interpret the advance of geologic history.</p>	<p>Student Edition: 595-600, 601-605 <i>MiniLab</i> 597 <i>Concepts in Motion</i> 598, 602 <i>Problem-Solving Lab</i> 599 <i>Section Assessment</i> 605 Teacher Wraparound Edition: A 597; ACT 603; D 599; DI 596; M 598; MI 595; R 600; TCS 598</p>

STANDARDS	PAGE REFERENCES
<p>3204.4.4 Construct a geologic timetable for the evolution of earth and the history of life.</p>	<p>Student Edition: 590-594 <i>National Geographic</i> 591 <i>Concepts in Motion</i> 591 <i>Math in Earth Science</i> 594 <i>GeoLab</i> 611 <i>Apply Your Skill</i> 639 Teacher Wraparound Edition: A 594, 665; DI 591; ESJ 592, 620; R 637</p>
<p>3204.4.5 Interpret evidence for plate tectonics such as the fossil record, mountain range formation, rock strata, paleomagnetism, paleoclimates, and configuration of the continents.</p>	<p>Student Edition: 468-472, 473-479 <i>Launch Lab</i> 467 <i>Concepts in Motion</i> 469 <i>GeoLab</i> 490-491 <i>Writing in Earth Science</i> 490 Teacher Wraparound Edition: A 472; AC 469; CFU 472; DI 469; IM 469; M 473; MI 468; R 472; SI 464</p>
<p>3204.4.6 Recognize that fossils contained in sedimentary rock provide evidence of past life forms, changes in life forms, and environmental change.</p>	<p>Student Edition: 606-609, 635-637, 658-659 <i>Launch Lab</i> 133, 589 <i>Section Assessment</i> 609 <i>GeoLab</i> 667 <i>Apply Your Skill</i> 667 Teacher Wraparound Edition: A 133, 589; ACT 607, 608; ESJ 636; ITU 587; MI 606</p>
<p>3204.4.7 Determine the relative age of various fossils in sedimentary rock.</p>	<p>Student Edition: 600, 609, 614#22 <i>Section Assessment</i> 600, 609</p>
<p>3204.4.8 Interpret the sequence of rock strata using superposition, cross cutting relationships, inclusions, the fossil record, and absolute dating techniques.</p>	<p>Student Edition: 595-600, 606-609, 614 #32-#34 <i>MiniLab</i> 597 <i>Concepts in Motion</i> 598, 602 <i>Problem-Solving Lab</i> 599 Teacher Wraparound Edition: A 600; ACT 603; CFU 605; D 598, 599; M 598; TCS 598</p>

STANDARDS	PAGE REFERENCES
<p>3204.4.9 Predict how an environmental change might influence the development of new species or cause the extinction of an existing species.</p>	<p>Student Edition: 594, 653-654, 659, 665 <i>MiniLab</i> 653 <i>Concepts in Motion</i> 659 <i>Writing in Earth Science</i> 659</p> <p>Teacher Wraparound Edition: A 653, 654; DIS 594</p>