LAB-AIDS Correlations to Georgia Science Standards of Excellence 2016

for EDC *Earth Science*

ABOUT EDC EARTH SCIENCE

EDC Earth Science is a full year, activity-driven high school earth science course developed by the Education Development Center (EDC), with support from the National Science Foundation, and is fully aligned to the (NRC, 2010). *EDC Earth Science* is designed around the belief that students are capable of rigorous and in-depth explorations in science when given adequate support, structure, and motivation for learning.

EDC Earth Science features the following design components:

- **In-depth treatment of content** based on recommendations in national standards and representative state frameworks
- **Developmentally appropriate lessons** featuring Earth Science concepts that build on previous learning and prepare students for more advanced courses
- **Using historical, newsworthy, and fictionalized stories** to draw students into the earth science content, to motivate them to acquire the knowledge for solving problems, and to serve as a framework around which students build conceptual understanding
- **Differentiated instructional strategies** and activities that help students construct meaning from their experiences and that serve as bridges between concrete and abstract thinking
- **Support for developing literacy skills** and the use of formative assessment technique. Each reading in the EDC Earth Science book is supported by at least one addition literacy technique, such as a science fact triangle, 3-2-1 reading guide, or anticipation guide. Each chapter of *EDC Earth Science* is a cluster of activities that addresses a specific set of concepts and skills, and the teacher's guide provides options for literacy support for reading, writing, and oral presentation.
- **Flexible implementation options.** The amount of class time for each chapter will vary. A chapter may range from one to four weeks of classroom sessions. Not shown here are two project-oriented shorter chapters that open and close the course, which taken together require 2-4 weeks for completion. This provides up to 32 weeks of actual instructional time, plus an additional 4 weeks for assessment and related activities.

Unit Title	*Core Science Content*	*Suggested time*
1 Hydrosphere: Water in Earth's Systems	Water cycle; surface water, groundwater, assessing and protecting water supplies, Global patterns of ocean circulation; how wind and density differences drive ocean currents; global conveyor belt; El Niño	3-4 weeks
2 Atmosphere and Climate	Climate and weather; influence of latitude, atmospheric circulation, proximity to ocean, elevation, land features, and prevailing winds on regional climate, Energy balance, albedo effect, greenhouse effect, carbon cycle, positive and negative feedback loops; Paleoclimatology, climate proxies, climate change in Earth's past, Milankovitch cycles, tectonic processes that influence climate, human impact on climate	5-8 weeks
3 Earth's Place in the Universe	Life and death of stars, solar nebular condensation hypothesis, Kepler's Laws, Earth's interior structure and composition, internal sources of heat energy, seismic waves, introduction to plate tectonic theory, driving forces of plate movement	3-4 weeks
4 Plate Tectonics	Transform-fault boundaries, earthquakes, physical and computer models Subduction zones, volcanoes, formation of igneous rocks, field-measurement technologies for volcano monitoring Seafloor spreading, paleo-magnetism, plate tectonics summary, landforms associated with plate boundaries	5-7 weeks
5 The Rock Cycle	Erosion and deposition, deltaic processes, formation of sedimentary rock, The nature of rocks and minerals, rock cycle	3-6 weeks
6 Earth's Resources	The geologic processes by which mineral ores are formed; mineral extraction and processing Fossil fuel formation, petroleum resources and exploration technologies	3-6 weeks

Each TE chapter provides detailed information on support for key earth science core content, practices, and cross cutting concepts. For more information, visit us at www.lab-aids.com.

ALIGNMENT TO GEORGIA SCIENCE STANDARDS OF EXCELLENCE 2016

The following table provides chapter and page number references (e.g., 14: 407-409 indicates the supporting content can be found on pages 407-409 of chapter 14) for the Georgia Science Standards of Excellence. Each chapter of the EDC Earth Science program provides further detailed tables to show where this content is presented in the chapter, how it is presented (reading, lab activity, research project, other method), and how it is assessed using the end-of-chapter questions or the Exam View ® item banks for the course.

Georgia Science Standards of Excellence

High School (9-12) Earth Systems Standards Correlation to

EDC Earth Science

Georgia Science Standard	Location in Textbook	Assessment
SES1. Obtain, evaluate, and communicate information to investigate the composition and formation of Earth systems, including the Earth's place in the solar system.		
a. Construct an explanation of the origins of the solar system from scientific evidence including the composition, distribution and motion of solar system objects. (*Clarification statement:* The nebular hypothesis should be included in this element.)	8- Stars Planets and Everything In Between: Solar System Origins, pp 194-211	pp 200-206: Reading, Activity2, Reading; pp 210-211: Address the Challenge; pp 217-219: Q 1, 6-9, 12, 13, 17-19
b. Ask questions to evaluate evidence for the development and composition of Earth's early systems, including the geosphere (crust, mantle and core), hydrosphere and atmosphere. (*Clarification statement:* The differentiation by density of Earth into crust, mantle and core should be included in this element.)	1-Comparing Earth to Other Worlds, pp 2-9; 8-Stars Planets and Everything In Between: Solar System Origins, pp 202-206; 14-A Solid Foundation: Building Earth's Crust, pp 425-426	pp 6-9: Activity; pp 202- 206: Activity 2, Reading; pp 247-248: Q 1, 2, 9; pp 425-426: Activity 4
c. Develop a model of the physical composition of Earth's layers using multiple types of evidence (e.g., Earth's magnetic field, composition of meteorites and seismic waves). (*Clarification statement:* Earth's layers should include crust, mantle, inner core and outer core.)	8- Stars Planets and Everything In Between: Solar System Origins, pp 195-196; 9-Journey to the Center of the Earth: Exploring Earth's Interior, pp 221-247; 14-A Solid Foundation: Building Earth's Crust, pp 397-426	pp 194-196: What's the Story; pp 227-230: Reading, Activity 1; pp 233-235: Reading; pp 241-245: Reading, Address the Challenge; pp 247-248: Q 1-7, 9; pp 428-430: Q 3-7, 13
SES2. Obtain, evaluate, and communicate information to understand how plate tectonics creates certain geologic features, landforms, Earth materials, and geologic hazards.		
a. Construct an explanation based on evidence that describes the mechanisms causing plate tectonic motion. (*Clarification statement:* The role of radioactive decay as the source of energy that drives the process of convection should be studied as part of this element).	9-Journey to the Center of the Earth: Exploring Earth's Interior, pp 241-244; Unit 4-Plate Tectonics (10-On Shaky Ground: Earthquakes and Transform Boundaries, 11-Sleeping Dragons? Subduction Zone Volcanoes, 12-Clues On the Ocean Floor-	pp 241-244: Reading; pp 247-248: Q 9, 10; pp 255-256: Reading; pp 260-262: Reading; pp 279-281: Address the Challenge; pp 293-297: Reading, Activity 1; pp 317-319: Reading; pp 327: Q 10, 11; pp 338-345: Activity 2, Reading;

Georgia Science Standard	Location in Textbook	Assessment
	Divergent Boundaries), pp 250-355	pp 350-352: Reading; pg 355: Q 10
b. Develop and use models for the different types of plate tectonic settings (convergent, divergent and transform boundaries). (*Clarification statement:* Subduction zones, continental collisions, rift zones, and ocean basins should be included.)	Unit 4-Plate Tectonics (10-On Shaky Ground: Earthquakes and Transform Boundaries, 11-Sleeping Dragons? Subduction Zone Volcanoes, 12-Clues On the Ocean Floor-Divergent Boundaries), pp 250-355	pp 256-260: Activity 1; pp 262-264: Reading; pp 265-279: Activity 3, Reading, Activity 4; pp 285-287: Q 1-5, 10-12 pp 293-301: Reading, Activity 1, Activity 2; pp 317-320: Reading, Activity 6; pp 326-327: Q 9, 10, 12 pp 338-347: Activity 2, Reading, Activities 3-4; pg 348: Address the Challenge pp 350-352: Reading pp 355: Q 10, 11
c. Construct an explanation that communicates the relationship of geologic features, landforms, Earth materials and geologic hazards to each plate tectonic setting.	Unit 4-Plate Tectonics (10-On Shaky Ground: Earthquakes and Transform Boundaries, 11-Sleeping Dragons? Subduction Zone Volcanoes, 12-Clues On the Ocean Floor-Divergent Boundaries), pp 250-355	pp 250-355: Chapter 10-On Shaky Ground: Earthquakes and Transform Boundaries, Chapter 11-Sleeping Dragons? Subduction Zone Volcanoes, Chapter 12-Clues On the Ocean Floor-Divergent Boundaries
d. Ask questions to compare and contrast the relationship between transformation processes of all rock types (sedimentary, igneous, and metamorphic) and specific plate tectonic settings. (*Clarification statement:* The plate tectonic settings to be considered here are continental collision, subduction zone, mid-ocean ridge, transformation fault, hot spot, and passive zone.)	Unit 4-Plate Tectonics (10-On Shaky Ground: Earthquakes and Transform Boundaries, 11-Sleeping Dragons? Subduction Zone Volcanoes, 12-Clues On the Ocean Floor-Divergent Boundaries), pp 250-355; 14-A Solid Foundation: Building Earth's Crust, pp 397-426	pp 255-256: Reading; pp 265-268: Activity 3; pp 289-325: Chapter 11; pp 336-352: Reading, Activity 2, Reading, Activities 3-4, Address the Challenge, Reading pp 399-405: What's the Story, Task; pp 415-422: Activity 3, Address the Challenge
e. Construct an argument using multiple forms of evidence that supports the theory of plate tectonics (e.g., fossils, paleomagnetism, seafloor age, etc.).	Unit 4-Plate Tectonics (10-On Shaky Ground: Earthquakes and Transform Boundaries, 11-Sleeping Dragons? Subduction Zone Volcanoes, 12-Clues On the Ocean Floor-Divergent Boundaries), pp 250-355	pp 250-355: Chapter 10-On Shaky Ground: Earthquakes and Transform Boundaries, Chapter 11-Sleeping Dragons? Subduction Zone Volcanoes, Chapter 12-Clues On the Ocean Floor-Divergent Boundaries
SES3. Obtain, evaluate, and communicate		

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information to explore the actions of water, wind, ice, and gravity as they relate to landscape change.		
a. Plan and carry out an investigation that demonstrates how surface water and groundwater act as the major agents of physical and chemical weathering.	2-Life's Blood: Seeking Water From the Earth, pp 28-35; 13-Mississippi Blues: Sedimentary Processes in a Delta, pp 368-370	pp 28-35: Activity 2; pp 368-370: Activity 2
b. Develop a model of the processes and geologic hazards that result from both sudden and gradual mass wasting.	11-Sleeping Dragons? Subduction Zone Volcanoes, pp 298-310; 13-Mississippi Blues: Sedimentary Processes in a Delta, pp 368-370	pp 298-303: Activities 2-3; pp 308-310: Reading pp 368-370: Activity 2
c. Construct an explanation that relates the past and present actions of ice, wind, and water to landform distribution and landscape change.	13-Mississippi Blues: Sedimentary Processes in a Delta, pp 358-394	13-Mississippi Blues: Sedimentary Processes in a Delta, pp 358-394
d. Construct an argument based on evidence that relates the characteristics of the sedimentary materials to the energy by which they were transported and deposited.	13-Mississippi Blues: Sedimentary Processes in a Delta, pp 364-386	pp 364-370: Reading, Activity 2; pp 376-383: Reading, Activity 4; pp 395-396: Q 2, 5, 6, 10, 11
SES4. Obtain, evaluate, and communicate information to understand how rock relationships and fossils are used to reconstruct the Earth's past.		
a. Use mathematics and computational thinking to calculate the absolute age of rocks using a variety of methods (e.g., radiometric dating, rates of erosion, rates of deposition, and varve count).	8- Stars Planets and Everything In Between: Solar System Origins, pp 197-199; 14-A Solid Foundation: Building Earth's Crust, pp 423-425	pp 197-199: Activity 1; pp 423-425: Reading; pp 430: Q 10
b. Construct an argument applying principles of relative age (superposition, original horizontality, cross-cutting relations, and original lateral continuity) to interpret a geologic cross-section and describe how unconformities form.	13-Mississippi Blues: Sedimentary Processes in a Delta, pp 376-383;14-A Solid Foundation: Building Earth's Crust, pp 422-425	pp 380-383: Activity 4; pp 423: Discuss; pp 425: About the Reading; pp 396: Q 10, 11
c. Analyze and interpret data from rock and fossil succession in a rock sequence to interpret major events in Earth's history such as mass extinction, major climatic change, and tectonic events.	6-The Longest Experiment: Climate Change in Earth's History, pp 149-154; 14-A Solid Foundation: Building Earth's Crust, pp 420-425	pp 152-154: Activity 2; pp 420-425: Address the Challenge
d. Construct an explanation applying the principle of uniformitarianism to show the relationship between sedimentary rocks and their fossils to	6-The Longest Experiment: Climate Change in Earth's	pp 142-145: Reading; pp 149-154: Reading, Activity 2;

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the environments in which they were formed.	History, pp 142-154; 14-A Solid Foundation: Building Earth's Crust, pp 422-425	pp 422-425: Discuss, Reading
e. Construct an argument using spatial representations of Earth data that interprets major transitions in Earth's history from the fossil and rock record of geologically defined areas. (*Clarification statement:* Students should use maps and cross-sections with a focus on Georgia.)	LOCAL	LOCAL
SES5. Obtain, evaluate, and communicate information to investigate the interaction of solar energy and Earth's systems to produce weather and climate.		
a. Develop and use models to explain how latitudinal variations in solar heating create differences in air pressure, global wind patterns, and ocean currents that redistribute heat globally.	3-Rivers of the Sea: Ocean Currents, pp 58-78; 4-Local Connections: Regional Climate, pp 97-110	pp 58-71: Activities 2-3, Reading, Address the Challenge; pp 77-78: Q 2, 3, 11, 12 pp 97-98: Reading pp 102-103: Activity 5 pp 109-110: Q 4, 5, 8
b. Analyze and interpret data (e.g., maps, meteograms, and weather apps) that demonstrate how the interaction and movement of air masses creates weather.	Not specifically addressed	
c. Construct an argument that predicts weather patterns based on interactions among ocean currents, air masses, and topography.	3-Rivers of the Sea: Ocean Currents, pp 58-78; 4-Local Connections: Regional Climate, pp 80-109;	pp 58-71: Activities 2-3, Reading, Address the Challenge; pp 77-78: Q 2, 3, 11, 12 pp 92-107: Activities 2-3, Reading, Activities 4-5, Reading, Address the Challenge; pp 109-110: Q 4-11
d. Analyze and interpret data to show how temperature and precipitation produce the pattern of climate regions (zones) on Earth.	4-Local Connections: Regional Climate, pp 80-96	pp 85-96: Activities 1-3
e. Construct an explanation that describes the conditions that generate extreme weather events (e.g., hurricanes, tornadoes, and thunderstorms) and the hazards associated with these events.	13-Mississippi Blues: Sedimentary Processes in a Delta *Note: addresses hazards only*	pp 358-361: What's the Story
f. Construct an argument relating changes in global climate to variation to Earth/sun relationships and atmospheric composition.	5-The Bigger Picture: Global Climate, pp 111-138; 6-The Longest Experiment: Climate Change in Earth's History, pp 155-175	pp 115-120: Reading, Activity 1; pp 127-136: Activity 4, Reading, Address the Challenge pp 139-140: Q 1, 5-9, 12-13 pp 155-175: Activity 3, Reading, Reading,

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		Activity 4 pp 183-185: Q 4-10
SES6. Obtain, evaluate, and communicate information about how life on Earth responds to and shapes Earth's systems.		
a. Construct an argument from evidence that describes how life has responded to major events in Earth's history (e.g., major climatic change, tectonic events) through extinction, migration, and/or adaptation.	6-The Longest Experiment: Climate Change in Earth's History, pp 141-154 ; 14-A Solid Foundation: Building Earth's Crust, pp 425-426	pp 141-146: What's the Story; pp 149-154: Reading, Activity 2; pp 425-426: Activity 4
b. Construct an explanation that describes how biological processes have caused major changes in Earth's systems through geologic time (e.g., nutrient cycling, atmospheric composition, and soil formation).	5-The Bigger Picture: Global Climate, pp 124-137 ; 6-The Longest Experiment: Climate Change in Earth's History, pp 160-181; 14-A Solid Foundation: Building Earth's Crust, pp 425-426	pp 124-137: Activities 3-4, Reading; pp 139-140: Q 6, 7; pp 160 -163: Reading; pp 175 -181: Reading; pp 425-426: Activity 4
c. Ask questions to investigate and communicate how humans depend on Earth's land and water resources, which are distributed unevenly around the planet as a result of past geological and environmental processes.	1-Comparing Earth to Other Worlds, pp 2-12; 2-Life's Blood: Seeking Water From the Earth, pp 14-44; 15-Hidden Treasures in Rocks: Mineral Resources, pp 432-457; 16-The Mystery of the Rub' Al Khali: Energy Resources in Earth's Crust, pp 461-	pp 2-12: What's the Story, Activity; pp 14-44: What's the Story, Task, Task, Activity 1, Reading, Activity 2, Reading, Activities 3-4, Reading, Address the Challenge; pp 48-50: Q 1-14; pp 432-457: What's the Story, Task, Activity 1, Reading, Activity 2, Reading, Activity 3, Address the Challenge, Reading, pp 459-460: Q 1-13; pp 461-485: Task, What's the Story, Activity 1, Reading, Reading, Activity 2, Address the Challenge, Reading; pp 488-490: Q 1-10
d. Analyze and interpret data that relates changes in global climate to natural and anthropogenic modification of Earth's atmosphere and oceans.	5-The Bigger Picture: Global Climate, pp 124-136 ; 6-The Longest Experiment: Climate Change in Earth's History, pp 141-178	pp 124-136: Activities 3-4, Reading, Address the Challenge; pp 139-140: Q 6, 8; pp 141-154:What's the Story, Activity 1, Reading, Activity 2; pp 160-178: Reading,

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		Reading, Activity 4, Reading; pp183-185: Q 6, 7, 9