

**SUGGESTED PACING**

**SCIENCE INQUIRY AND APPLICATION**

**Content Statements:** During the years of grades 5-8, all students must use the following scientific processes, with appropriate laboratory safety techniques, to construct their knowledge and understanding in all science content areas:

- Identify questions that can be answered through scientific investigations
- Design and conduct a scientific investigation
- Use appropriate mathematics, tools and techniques to gather data and information
- Analyze and interpret data
- Develop descriptions, models, explanations and predictions
- Think critically and logically to connect evidence and explanations
- Recognize and analyze alternative explanations and predictions
- Communicate scientific procedures and explanations

**STRAND: EARTH AND SPACE SCIENCE (ESS)**

**Topic: Physical Earth**

This topic focuses on the physical features of Earth and how they formed. This includes the interior of Earth, the rock record, plate tectonics and landforms.

**Content Statements:**

- The composition and properties of Earth's interior are identified by the behavior of seismic waves.
- The refraction and reflection of seismic waves as they move through one type of material to another is used to differentiate the layers of Earth's interior. Earth has an inner and outer core, an upper and lower mantle, and a crust.
- The formation of the planet generated heat from gravitational energy and the decay of radioactive elements, which are still present today. Heat released from Earth's core drives convection currents throughout the mantle and the crust.

**Content Statements:**

- Earth's crust consists of major and minor tectonic plates that move relative to each other.
- Historical data and observations such as fossil distribution, paleomagnetism, continental drift and sea-floor spreading contributed to the theory of plate tectonics. The rigid tectonic plates move with the molten rock and magma beneath them in the upper mantle.
- Convection currents in the crust and upper mantle cause the movement of the plates. The energy that forms convection currents comes from deep within the Earth.
- There are three main types of plate boundaries: divergent, convergent and transform. Each type of boundary results in specific motion and causes events (such as earthquakes or volcanic activity) or features (such as mountains or trenches) that are indicative of the type of boundary

**Content Statements:**

- A combination of constructive and destructive geologic processes formed Earth's surface.
- Earth's surface is formed from a variety of different geologic processes, including but not limited to plate tectonics.

**Content Statements:**

- Evidence of the dynamic changes of Earth's surface through time is found in the geologic record.
- Earth is approximately 4.6 billion years old.
- Earth history is based on observations of the geologic record and the understanding that processes observed at present day are similar to those that occurred in the past (uniformitarianism).
- There are different methods to determine relative and absolute age of some rock layers in the geologic record. Within a sequence of undisturbed sedimentary rocks, the oldest rocks are at the bottom (superposition). The geologic record can help identify past environmental and climate conditions.

**PRINT RESOURCES**

*ScienceFusion*

- Ohio Test-Prep Grade 8 pages 1-15
- Unit 1, TE pages 1-116
- Unit 2, TE pages 117-192
- Unit 2, Lab Manual pages 84-150
- Unit 2, Assessment Guide pages 38-68
- Unit 3, TE pages 193-272
- Unit 3, Lab Manual pages 151-224
- Unit 3, Assessment Guide pages 69-99
- Unit 4, TE pages 273-346
- Unit 4, Lab Manual pages
- Unit 4, Assessment Guide pages

**DIGITAL RESOURCES**

*ScienceFusion*

- Unit 2, Lesson 1 Digital Lesson & Virtual Lab
- Unit 2, Lesson 2 Digital Lesson & Virtual Lab
- Unit 2, Lesson 3 Digital Lesson & Virtual Lab
- Unit 2, Lesson 4 Digital Lesson & Virtual Lab
- Unit 3, Lesson 1 Digital Lesson
- Unit 3, Lesson 2 Digital Lesson
- Unit 3, Lesson 3 Digital Lesson & Virtual Lab
- Unit 3, Lesson 4 Digital Lesson & Virtual Lab
- Unit 4, Lesson 1 Digital Lesson
- Unit 4, Lesson 2 Digital Lesson & Virtual Lab
- Unit 4, Lesson 3 Digital Lesson
- Unit 4, Lesson 4 Digital Lesson & Virtual Lab

SCIENCE AND ACADEMIC VOCABULARY					
<p><b>Unit 1:</b> Data, Dependent Variable, Empirical Evidence, Engineering, Experiment, Hypothesis, Independent Variable, Law, Life Cycle Analysis, Materials Science, Model, Observation, Prototype, Pugh Chart, Risk-Benefit Analysis, Simulation, Technology, Theory, Trade-Off</p> <p><b>Units 2-4:</b> Absolute Dating, Alluvial Fan, Asthenosphere, Barrier Island, Beach, Climate, Continental Drift, Contour Interval, Contour Line, Convection Current, Convergent Boundary, Core, Creep, Crust, Deformation, Delta, Deposition, Divergent Boundary, Dune, Earthquake, Elastic Rebound, Epicenter, Erosion, Fault, Floodplain, Focus, Fossil, Geographic Information System, Geologic Time Scale, Geological Column, Geology, Glacial Drift, Glacier, Global Positioning System, Groundwater, Half-Life, Ice Core, Index Contour, Landslide, Lithosphere, Loess, Magnetic Reversal, Mantle, Mesosphere, Mudflow, Plate Tectonics, Radioactive Decay, Radiometric Dating, Relative Dating, Relief, Remote Sensing, Rockfall, Sandbar, Scale, Sea-Floor Spreading, Seismic Wave, Shoreline, Slope, Subduction, Superposition, Tectonic Plat Boundary, Tectonic Plate, Theory, Topographic Map, Topography, Trace Fossil, Transform Boundary, Unconformity, Uniformitarianism</p>					
DIFFERENTIATION	FIELD EXPERIENCE CONNECTIONS				
<p>Leveled Inquiry</p> <ul style="list-style-type: none"> <li>Unit 2 TE pages 120, 130, 148, 162, 176</li> <li>Unit 3 TE pages 196, 206, 222, 240, 258</li> <li>Unit 4 TE pages 276, 286, 302, 318, 332</li> </ul> <p>Response to Intervention</p> <ul style="list-style-type: none"> <li>Unit 2 TE page 121</li> <li>Unit 3 TE page 197</li> <li>Unit 4 TE page 277</li> </ul> <p>Differentiated Instruction (Basic, ELL, and Advanced)</p> <ul style="list-style-type: none"> <li>Unit 2 TE pages 133, 144, 151, 165, 179</li> <li>Unit 3 TE pages 209, 225, 236, 243, 255, 261</li> <li>Unit 4 TE pages 289, 305, 314, 321, 335</li> </ul>					
INQUIRY SKILLS					
<table border="0"> <tr> <td> <ul style="list-style-type: none"> <li>Applying Computer Skills</li> <li>Applying Concepts</li> <li>Collecting Data</li> <li>Compare and Contrast</li> <li>Comparing Models</li> <li>Comparing Results</li> <li>Creating Models</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Creating/Constructing Graphs</li> <li>Developing Hypotheses</li> <li>Developing Procedures</li> <li>Drawing Conclusions</li> <li>Evaluating Evidence</li> <li>Evaluating Models</li> <li>Implementing Investigations</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Interpreting Diagrams/Images</li> <li>Interpreting Maps</li> <li>Making Inferences</li> <li>Making Observations</li> <li>Measuring Length in SI</li> <li>Observing Patterns</li> </ul> </td> <td> <ul style="list-style-type: none"> <li>Performing Calculations</li> <li>Planning Investigations</li> <li>Researching</li> <li>Revising Hypotheses</li> <li>Sequencing</li> <li>Using Technology</li> </ul> </td> </tr> </table>		<ul style="list-style-type: none"> <li>Applying Computer Skills</li> <li>Applying Concepts</li> <li>Collecting Data</li> <li>Compare and Contrast</li> <li>Comparing Models</li> <li>Comparing Results</li> <li>Creating Models</li> </ul>	<ul style="list-style-type: none"> <li>Creating/Constructing Graphs</li> <li>Developing Hypotheses</li> <li>Developing Procedures</li> <li>Drawing Conclusions</li> <li>Evaluating Evidence</li> <li>Evaluating Models</li> <li>Implementing Investigations</li> </ul>	<ul style="list-style-type: none"> <li>Interpreting Diagrams/Images</li> <li>Interpreting Maps</li> <li>Making Inferences</li> <li>Making Observations</li> <li>Measuring Length in SI</li> <li>Observing Patterns</li> </ul>	<ul style="list-style-type: none"> <li>Performing Calculations</li> <li>Planning Investigations</li> <li>Researching</li> <li>Revising Hypotheses</li> <li>Sequencing</li> <li>Using Technology</li> </ul>
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HANDS-ON INQUIRY AND APPLICATION					
<ul style="list-style-type: none"> <li>Unit 2, Lesson 1 Quick Lab 1: Wave Action on the Shoreline: LM pages 84-87</li> <li>Unit 2, Lesson 1 Quick Lab 2: Moving Sediment: LM pages 88-91</li> <li>Unit 2, Lesson 1 Quick Lab 3: Modeling Stalactites and Stalagmites: LM pages 92-95</li> <li>Unit 2, Lesson 1 Exploration Lab 1: Exploring Stream Erosion and Deposition: LM pages 96-104</li> <li>Unit 2, Lesson 2 Quick Lab 1: Modeling a Glacier: LM pages 105-107</li> <li>Unit 2, Lesson 2 Quick Lab 2: Modeling a Landslide: LM pages 108-111</li> <li>Unit 2, Lesson 3 Quick Lab 1: Interpreting a Local Topographic Map: LM pages 112-116</li> <li>Unit 2, Lesson 3 Quick Lab 2: Making a Topographic Map: LM pages 117-120</li> <li>Unit 2, Lesson 3 STEM Lab 1: Modeling a Landform from a Topographic Map: LM pages 121-129</li> <li>Unit 2, Lesson 4 Quick Lab 1: Analyzing Images of Earth: LM pages 130-134</li> <li>Unit 2, Lesson 4 Quick Lab 2: Identifying Locations in Satellite Images: LM pages 135-139</li> <li>Unit 2, Lesson 4 Field Lab 1: Finding Location by GPS: LM pages 140-150</li> <li>Unit 3, Lesson 1 Quick Lab 1: Using Seismic Waves to Study Earth's Interior: LM pages 151-154</li> <li>Unit 3, Lesson 1 Quick Lab 2: Modeling the Formation of Earth's Layers: LM pages 155-159</li> <li>Unit 3, Lesson 1 STEM Lab 1: Differentiation of Solid Materials: LM pages 160-171</li> <li>Unit 3, Lesson 2 Quick Lab 1: The History of Plate Tectonics: LM pages 172-175</li> <li>Unit 3, Lesson 2 Quick Lab 2: Magnetic Reversals and Plate Tectonics: LM pages 176-180</li> <li>Unit 3, Lesson 2 Exploration Lab 1: Modeling Geological Evidence: LM pages 181-192</li> <li>Unit 3, Lesson 3 Quick Lab 1: Causes of Landforms: LM pages 193-196</li> <li>Unit 3, Lesson 3 Quick Lab 2: Tectonic Plate Landforms: LM pages 197-200</li> <li>Unit 3, Lesson 3 Exploration Lab 1: Modeling Tectonic Plate Boundaries: LM pages 201-213</li> </ul>					

**HANDS-ON INQUIRY AND APPLICATION *cont.***

- Unit 3, Lesson 4 Quick Lab 1: Modeling Strike-Slip Faults: LM pages 214-216
- Unit 3, Lesson 4 Quick Lab 2: Earthquake Vibrations: LM pages 217-221
- Unit 3, Lesson 4 Quick Lab 3: Elastic Rebound: LM pages 222-224
- Unit 4, Lesson 1 Quick Lab 1: Modeling the Fossil Record: LM pages 225-228
- Unit 4, Lesson 1 Quick Lab 2: Fossil Flipbook: LM pages 229-231
- Unit 4, Lesson 1 STEM Lab 1: Exploring Landforms: LM pages 232-242
- Unit 4, Lesson 2 Quick Lab 1: Layers of Sedimentary Rock: LM pages: LM pages 243-246
- Unit 4, Lesson 2 Quick Lab 2: Ordering Rock Layers: LM pages 247-249
- Unit 4, Lesson 2 Exploration Lab 1: Earth's History: LM pages 250-258
- Unit 4, Lesson 3 Quick Lab 1: Index Fossils: LM pages 259-261
- Unit 4, Lesson 3 Quick Lab 2: Radioactive Decay: LM pages 262-265
- Unit 4, Lesson 4 Quick Lab 1: Timeline of Earth's History: LM pages 266-268
- Unit 4, Lesson 4 Quick Lab 2: Investigating Events in Earth's History: LM pages 269-271

**ASSESSMENTS/PROGRESS MONITORING**

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| <ul style="list-style-type: none"> <li>• Formative and Summative Assessment                             <ul style="list-style-type: none"> <li>○ Unit 2, Lesson 1 - TE page 135</li> <li>○ Unit 2, Lesson 2 - TE page 153</li> <li>○ Unit 2, Lesson 3 - TE page 167</li> <li>○ Unit 2, Lesson 4 - TE page 181</li> <li>○ Unit 3, Lesson 1 - TE page 211</li> <li>○ Unit 3, Lesson 2 - TE page 227</li> <li>○ Unit 3, Lesson 3 - TE page 245</li> <li>○ Unit 3, Lesson 4 - TE page 263</li> <li>○ Unit 4, Lesson 1 - TE page 291</li> <li>○ Unit 4, Lesson 2 - TE page 307</li> <li>○ Unit 4, Lesson 3 - TE page 323</li> <li>○ Unit 4, Lesson 4 - TE page 337</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Visual Summary and Lesson Review                             <ul style="list-style-type: none"> <li>○ Unit 2, Lesson 1 - TE page 142</li> <li>○ Unit 2, Lesson 2 - TE page 159</li> <li>○ Unit 2, Lesson 3 - TE page 173</li> <li>○ Unit 2, Lesson 4 - TE page 188</li> <li>○ Unit 3, Lesson 1 - TE page 218</li> <li>○ Unit 3, Lesson 2 - TE page 234</li> <li>○ Unit 3, Lesson 3 - TE page 251</li> <li>○ Unit 3, Lesson 4 - TE page 268</li> <li>○ Unit 4, Lesson 1 - TE page 298</li> <li>○ Unit 4, Lesson 2 - TE page 313</li> <li>○ Unit 4, Lesson 3 - TE page 329</li> <li>○ Unit 4, Lesson 4 - TE page 343</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Unit 2 Review - TE pages 190-192</li> <li>• Unit 3 Review - TE pages 270-272</li> <li>• Unit 4 Review - TE pages 344-346</li> </ul> |
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**ASSESSMENT GUIDE**

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| <p><b>Unit 2</b></p> <ul style="list-style-type: none"> <li>• Pretest: AG pages 38-39</li> <li>• Lesson 1 Quiz: Erosion and Deposition by Water: AG page 40</li> <li>• Lesson 1 Alt. Assessment: Erosion and Deposition by Water: AG page 41</li> <li>• Lesson 2 Quiz: Erosion and Deposition by Wind, Ice, &amp; Gravity: AG page 42</li> <li>• Lesson 2 Alt. Assessment: Erosion and Deposition by Wind, Ice, and Gravity: AG page 43</li> <li>• Lesson 3 Quiz: Topographic Maps: AG page 44</li> <li>• Lesson 3 Alt. Assessment: Topographic Maps: AG page 45</li> <li>• Lesson 4 Quiz: Images of Earth's Surface: AG page 46</li> <li>• Lesson 4 Alt. Assessment: Images of Earth's Surface: AG page 47</li> <li>• Performance-Based Assessment: TE: AG page 48</li> <li>• Performance-Based Assessment: SE: AG page 49-50</li> <li>• Review: AG pages 51-54</li> <li>• Test A: AG pages 55-61</li> <li>• Test B: AG pages 62-68</li> </ul> | <p><b>Unit 3</b></p> <ul style="list-style-type: none"> <li>• Pretest: AG pages 69-70</li> <li>• Lesson 1 Quiz: Earth's Interior: AG page 71</li> <li>• Lesson 1 Alt. Assessment: Earth's Interior: AG page 72</li> <li>• Lesson 2 Quiz: The Theory of Plate Tectonics: AG page 73</li> <li>• Lesson 2 Alt. Assessment: The Theory of Plate Tectonics: AG page 74</li> <li>• Lesson 3 Quiz: Plate Tectonics and Landforms: AG page 75</li> <li>• Lesson 3 Alt. Assessment: Plate Tectonics &amp; Landforms: AG page 76</li> <li>• Lesson 4 Quiz: Earthquakes: AG page 77</li> <li>• Lesson 4 Alt. Assessment: Earthquakes: AG page 78</li> <li>• Performance-Based Assessment: TE: AG page 79</li> <li>• Performance-Based Assessment: SE: AG pages 80-81</li> <li>• Review: AG pages 82-85</li> <li>• Test A: AG pages 86-92</li> <li>• Test B: AG pages 93-99</li> </ul> | <p><b>Unit 4</b></p> <ul style="list-style-type: none"> <li>• Pretest: AG pages 100-101</li> <li>• Lesson 1 Quiz: Geologic Change over Time: AG page 102</li> <li>• Lesson 1 Alt. Assessment: Geologic Change over Time: AG page 103</li> <li>• Lesson 2 Quiz: Relative Dating: AG page 104</li> <li>• Lesson 2 Alt. Assessment: Relative Dating- AG page 105</li> <li>• Lesson 3 Quiz: Absolute Dating: AG page 106</li> <li>• Lesson 3 Alt. Assessment: Absolute Dating: AG page 107</li> <li>• Lesson 4 Quiz: The Geologic Time Scale: AG page 108</li> <li>• Lesson 4 Alt. Assessment: The Geologic Time Scale: AG page 109</li> <li>• Performance-Based Assessment: TE: AG page 110</li> <li>• Performance-Based Assessment: SE: AG pages 111-112</li> <li>• Review: AG pages 113-116</li> <li>• Test A: AG pages 117-123</li> <li>• Test B: AG pages 124-130</li> </ul> |
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**ACADEMIC CONNECTIONS TO OTHER DISCIPLINES:**

- Astrobiology Connection - TE page 336
- Do the Math - TE page 137
- Do the Math - TE page 170
- Do the Math - TE page 172
- Do the Math - TE page 326
- Engineering Connection - TE page 134
- Fine Arts Connection - TE page 262
- Geography Connection - TE page 262
- Health Connection - TE page 180
- Language Arts Connection - TE 336
- Language Arts Connection - TE page 210
- Language Arts Connection - TE page 226
- Language Arts Connection - TE page 244
- Language Arts Connection - TE page 290
- Life Science Connection - TE page 226
- Life Science Connection - TE page 244
- Life Science Connection - TE page 322
- Math Connection - TE page 166
- Math Connection - TE page 322
- Natural Resources Connection - TE page 306
- Physical Education Connection - TE page 166
- Real World Connection - TE page 134
- Real World Connection - TE page 152
- Real World Connection - TE page 180
- Social Studies Connection - TE page 152
- Social Studies Connection - TE page 290
- Social Studies Connection - TE page 306
- Technology Connection - TE page 210