

## 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: Cycles and Patterns of Earth and the Moon**

This topic focuses on Earth's hydrologic cycle, patterns that exist in atmospheric and oceanic currents, the relationship between thermal energy and the currents, and the relative position and movement of the Earth, sun and moon.

**Content Statements:**

- The hydrologic cycle illustrates the changing states of water as it moves through the lithosphere, biosphere, hydrosphere and atmosphere.
- Thermal energy is transferred as water changes state throughout the cycle. The cycling of water in the atmosphere is an important part of weather patterns on Earth. The rate at which water flows through soil and rock is dependent upon the porosity and permeability of the soil or rock.

**Content Statements:**

- Thermal-energy transfers in the ocean and the atmosphere contribute to the formation of currents, which influence global climate patterns.
- The sun is the major source of energy for wind, air and ocean currents and the hydrologic cycle. As thermal energy transfers occur in the atmosphere and ocean, currents form. Large bodies of water can influence weather and climate. The jet stream is an example of an atmospheric current and the Gulf Stream is an example of an oceanic current.
- Ocean currents are influenced by factors other than thermal energy, such as water density, mineral content (such as salinity), ocean floor topography and Earth's rotation. All of these factors delineate global climate patterns on Earth.

**Content Statements:**

- The atmosphere has different properties at different elevations and contains a mixture of gases that cycle through the lithosphere, biosphere, hydrosphere and atmosphere.
- The atmosphere is held to the Earth by the force of gravity.
- There are defined layers of the atmosphere that have specific properties, such as temperature, chemical composition and physical characteristics.
- Gases in the atmosphere include nitrogen, oxygen, water vapor, carbon dioxide and other trace gases.
- Biogeochemical cycles illustrate the movement of specific elements or molecules (such as carbon or nitrogen) through the lithosphere, biosphere, hydrosphere and atmosphere.

**Content Statements:**

- The relative patterns of motion and positions of the Earth, moon and sun cause solar and lunar eclipses, tides and phases of the moon.
- The moon's orbit and its change of position relative to the Earth and sun result in different parts of the moon being visible from Earth (phases of the moon).
- A solar eclipse is when Earth moves into the shadow of the moon (during a new moon).
- A lunar eclipse is when the moon moves into the shadow of Earth (during a full moon).
- Gravitational force between the Earth and the moon causes daily oceanic tides.
- When the gravitational forces from the sun and moon align (at new and full moons) spring tides occur.
- When the gravitational forces of the sun and moon are perpendicular (at first and last quarter moons), neap tides occur.

PRINT RESOURCES	DIGITAL RESOURCES		
<p><i>ScienceFusion</i></p> <ul style="list-style-type: none"> <li>Unit 1, TE pages 1-94</li> <li>Unit 2, TE pages 95-188</li> <li>Unit 2, Lab Manual pages 98-170</li> <li>Unit 2, Assessment Guide pages 34-66</li> <li>Unit 3, TE pages 189-264</li> <li>Unit 3, Lab Manual pages 171-235</li> <li>Unit 3, Assessment Guide pages 67-97</li> <li>Unit 4, TE pages 265-342</li> <li>Unit 4, Lab Manual pages 236-314</li> <li>Unit 4, Assessment Guide pages 98-128</li> <li>Unit 5, TE pages 343-404</li> <li>Unit 5, Lab Manual pages 315-357</li> <li>Unit 5, Assessment Guide pages 129-157</li> </ul>	<p><i>ScienceFusion</i></p> <ul style="list-style-type: none"> <li>Unit 1, Digital Lessons</li> <li>Unit 2, Lesson 1 Digital Lesson</li> <li>Unit 2, Lesson 2 Digital Lesson &amp; Virtual Lab</li> <li>Unit 2, Lesson 3 Digital Lesson</li> <li>Unit 2, Lesson 4 Digital Lesson &amp; Virtual Lab</li> <li>Unit 2, Lesson 5 Digital Lesson</li> <li>Unit 3, Lesson 1 Digital Lesson &amp; Virtual Lab</li> <li>Unit 3, Lesson 2 Digital Lesson</li> <li>Unit 3, Lesson 3 Digital Lesson</li> <li>Unit 3, Lesson 4 Digital Lesson &amp; Virtual Lab</li> <li>Unit 4, Lesson 1 Digital Lesson</li> <li>Unit 4, Lesson 2 Digital Lesson &amp; Virtual Lab</li> <li>Unit 4, Lesson 3 Digital Lesson</li> <li>Unit 4, Lesson 4 Digital Lesson</li> <li>Unit 5, Lesson 1 Digital Lesson &amp; Virtual Lab</li> <li>Unit 5, Lesson 2 Digital Lesson &amp; Virtual Lab</li> <li>Unit 5, Lesson 3 Digital Lesson</li> </ul>		
SCIENCE AND ACADEMIC VOCABULARY			
<p><b>Unit 1:</b> Accuracy, Constant, Data, Dependent Variable, Empirical Evidence, Engineering, Experiment, Hypothesis, Independent Variable, Mean, Measurement, Model, Observation, Precision, Prototype, Scientific Notation, Simulation, Technology</p> <p><b>Units 2-5:</b> Acid Precipitation, Adhesion, Air Mass, Air Pollution, Air Pressure, Air Quality, Aquifer, Atmosphere, Channel, Climate, Cohesion, Condensation, Conduction, Convection, Coriolis Effect, Day, Deep Current, Dew Point, Divide, Eclipse, Elevation, Equinox, Eutrophication, Evaporation, Front, Global Warming, Global Wind, Gravity, Greenhouse Effect, Groundwater, Heat, Humidity, Ice Age, Jet Stream, Latitude, Local Wind, Lunar Phases, Mesosphere, Neap Tide, Non-Point-Source Pollution, Ocean Current, Ozone Layer, Particulate, Penumbra, Point-Source Pollution, Polarity, Potable, Precipitation, Radiation Relative Humidity, Reservoir, Revolution, Rotation, Satellite, Season, Smog, Solstice, Solvent, Specific Heat, Spring Tide, Stratosphere, Sublimation, Surface Current, Surface Water, Temperature, Thermal Energy, Thermal Expansion, Thermal Pollution, Thermosphere, Tidal Range, Tide, Topography, Transpiration, Tributary, Troposphere, Umbra, Upwelling, Visibility, Water Cycle, Water Pollution, Water Table, Watershed, Weather, Wind, Year</p>			
DIFFERENTIATION	FIELD EXPERIENCE CONNECTIONS		
<p>Leveled Inquiry</p> <ul style="list-style-type: none"> <li>Unit 2 TE pages 98, 110, 124, 138, 152, 172</li> <li>Unit 3 TE pages 192, 202, 216, 232, 250</li> <li>Unit 4 TE pages 268, 278, 292, 310, 326</li> <li>Unit 5 TE pages 346, 356, 372, 390</li> </ul> <p>Response to Intervention</p> <ul style="list-style-type: none"> <li>Unit 2 TE page 99</li> <li>Unit 3 TE page 193</li> <li>Unit 4 TE page 269</li> <li>Unit 5 TE page 347</li> </ul> <p>Differentiated Instruction (Basic, ELL, and Advanced)</p> <ul style="list-style-type: none"> <li>Unit 2 TE pages 113, 127, 141, 155, 169, 175</li> <li>Unit 3 TE pages 205, 219, 235, 247, 253</li> <li>Unit 4 TE pages 281, 295, 306, 313, 329</li> <li>Unit 5 TE pages 359, 368, 375, 387, 393</li> </ul>	<p>Great Lakes Science Center's Cleveland Creates! Program.</p> <p><b>Program Details:</b> A standards-based program that uses the Engineering and Design Process. Students learn about energy transformation and electricity through an electrifying demonstration and a hands-on workshop. To prepare in advance, plan to attend the professional development session.</p> <p>For more information contact: Karyn Saunders 216-696-2760 or email <a href="mailto:saundersk@glsc.org">saundersk@glsc.org</a></p>		
INQUIRY SKILLS			
<ul style="list-style-type: none"> <li>Applying Concepts</li> <li>Classifying Data</li> <li>Collecting Data</li> <li>Collecting Samples</li> <li>Communicating Results</li> <li>Comparing Data</li> <li>Conducting Research</li> <li>Creating Models</li> <li>Creating Sketches</li> <li>Creating/Constructing Graphs</li> <li>Developing Hypotheses</li> <li>Developing Procedures</li> <li>Drawing Conclusions</li> <li>Evaluating Models</li> <li>Evaluating Procedures / Methods</li> <li>Explaining Observations</li> <li>Explaining Results</li> <li>Identifying Patterns</li> <li>Making Inferences</li> <li>Making Observations</li> <li>Making Predictions</li> <li>Performing Calculations</li> <li>Practicing Lab Techniques</li> <li>Recording Observations</li> <li>Revising Hypotheses</li> <li>Testing Hypotheses</li> </ul>			

## HANDS-ON INQUIRY AND APPLICATION

- Unit 2, Lesson 1 Quick Lab 1: Reaching the Dew Point: LM pages 98-100
- Unit 2, Lesson 1 Quick Lab 2: Compare Densities: LM pages 101-104
- Unit 2, Lesson 2 Quick Lab 1: Modeling the Water Cycle: LM pages 105-107
- Unit 2, Lesson 2 Quick Lab 2: Can You Make It Rain in a Jar?: LM pages 108-111
- Unit 2, Lesson 2 Exploration Lab 1: Changes in Water: LM pages 112-123
- Unit 2, Lesson 3 Quick Lab 1: Modeling Groundwater: LM pages 124-125
- Unit 2, Lesson 3 Quick Lab 2: Model a Stream: LM pages 126-129
- Unit 2, Lesson 3 STEM Lab 1: Aquifers and Development: LM pages 130-141
- Unit 2, Lesson 4 Quick Lab 1: Modeling the Coriolis Effect: LM pages 142-145
- Unit 2, Lesson 4 Quick Lab 2: The Formation of Deep Currents: LM pages 146-149
- Unit 2, Lesson 4 Quick Lab 3: Can Messages Travel on Ocean Water?: LM pages 150-153
- Unit 2, Lesson 5 Quick Lab 1: Ocean Pollution From Land: LM pages 154-156
- Unit 2, Lesson 5 Quick Lab 2: Turbidity and Water Temperature: LM pages 157-160
- Unit 2, Lesson 5 Field Lab 1: Investigating Water Quality: LM pages 161-170
  
- Unit 3, Lesson 1 Quick Lab 1: Modeling Air Pressure: LM pages 171-172
- Unit 3, Lesson 1 Quick Lab 2: Modeling Air Pressure Changes with Altitude: LM pages 173-176
- Unit 3, Lesson 1 Field Lab 1: Measuring Oxygen in the Air: LM pages 177-193
- Unit 3, Lesson 2 Quick Lab 1: The Sun's Angle and Temperature: LM pages 194-197
- Unit 3, Lesson 2 Quick Lab 2: How Does Color Affect Temperature?: LM pages 198-201
- Unit 3, Lesson 2 Quick Lab 3: Modeling Convection: LM pages 202-205
- Unit 3, Lesson 2 STEM Lab 1: Heat from the Sun: LM pages 206-216
- Unit 3, Lesson 3 Quick Lab 1: Flying with the Jet Stream: LM pages 217-219
- Unit 3, Lesson 3 Quick Lab 2: Rising Heat: LM pages 220-222
- Unit 3, Lesson 3 Quick Lab 3: Modeling Air Movement by Convection: LM pages 223-227
- Unit 3, Lesson 4 Quick Lab 1: Collecting Air-Pollution Particles: LM pages 228-231
- Unit 3, Lesson 4 Quick Lab 2: Identifying Sources of Indoor Air Pollution: LM pages 232-235
  
- Unit 4, Lesson 1 Quick Lab 1: Classifying Features of Different Types of Clouds: LM pages 236-239
- Unit 4, Lesson 1 Quick Lab 2: Investigate the Measurement of Rainfall: LM pages 240-243
- Unit 4, Lesson 1 Field Lab 1: Exploring Landforms: LM pages 244-262
- Unit 4, Lesson 2 Quick Lab 1: Analyze Weather Patterns: LM pages 263-265
- Unit 4, Lesson 2 Quick Lab 2: Coastal Climate Model: LM pages 266-269
- Unit 4, Lesson 2 Exploration Lab 1: Modeling El Niño: LM pages 270-280
- Unit 4, Lesson 3 Quick Lab 1: Determining Climate: LM pages 281-284
- Unit 4, Lesson 3 Quick Lab 2: Factors that Affect Climate: LM pages 285-288
- Unit 4, Lesson 3 Quick Lab 3: The Angles of the Sun's Rays: LM pages 289-293
- Unit 4, Lesson 3 Field Lab 1: How Land Features Affect Climate: LM pages 294-305
- Unit 4, Lesson 4 Quick Lab 1: Greenhouse Effect: LM pages 306-309
- Unit 4, Lesson 4 Quick Lab 2: Graphing Sunspots: LM pages 310-314
  
- Unit 5, Lesson 1 Quick Lab 1: Earth's Rotation and Revolution: LM pages 315-318
- Unit 5, Lesson 1 Quick Lab 2: Seasons Model: LM pages 319-321
- Unit 5, Lesson 1 Field Lab 1: Sunlight and Temperature: LM pages 322-331
- Unit 5, Lesson 2 Quick Lab 1: Moon Phases: LM pages 332-334
- Unit 5, Lesson 2 Quick Lab 2: Lunar Eclipse: LM pages 335-337
- Unit 5, Lesson 2 STEM Lab 1: What the Moon Orbits: LM pages 338-350
- Unit 5, Lesson 3 Quick Lab 1: Tides and Beaches: LM pages 351-353
- Unit 5, Lesson 3 Quick Lab 2: Tidal Math: LM pages 354-357
  
- STEM Unit 2: TE pages 166-169
- STEM Unit 3: TE pages 244-247
- STEM Unit 5: TE pages 384-387

**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 115</li> <li>○ Unit 2, Lesson 2 - TE page 129</li> <li>○ Unit 2, Lesson 3 - TE page 143</li> <li>○ Unit 2, Lesson 4 - TE page 157</li> <li>○ Unit 2, Lesson 5 - TE page 177</li> <li>○ Unit 3, Lesson 1 - TE page 207</li> <li>○ Unit 3, Lesson 2 - TE page 221</li> <li>○ Unit 3, Lesson 3 - TE page 237</li> <li>○ Unit 3, Lesson 4 - TE page 255</li> <li>○ Unit 4, Lesson 1 - TE page 283</li> <li>○ Unit 4, Lesson 2 - TE page 297</li> <li>○ Unit 4, Lesson 3 - TE page 315</li> <li>○ Unit 4, Lesson 4 - TE page 331</li> <li>○ Unit 5, Lesson 1 - TE page 361</li> <li>○ Unit 5, Lesson 2 - TE page 377</li> <li>○ Unit 5, Lesson 3 - TE page 395</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 120</li> <li>○ Unit 2, Lesson 2 - TE page 135</li> <li>○ Unit 2, Lesson 3 - TE page 149</li> <li>○ Unit 2, Lesson 4 - TE page 164</li> <li>○ Unit 2, Lesson 5 - TE page 184</li> <li>○ Unit 3, Lesson 1 - TE page 213</li> <li>○ Unit 3, Lesson 2 - TE page 228</li> <li>○ Unit 3, Lesson 3 - TE page 243</li> <li>○ Unit 3, Lesson 4 - TE page 261</li> <li>○ Unit 4, Lesson 1 - TE page 288</li> <li>○ Unit 4, Lesson 2 - TE page 304</li> <li>○ Unit 4, Lesson 3 - TE page 322</li> <li>○ Unit 4, Lesson 4 - TE page 339</li> <li>○ Unit 5, Lesson 1 - TE page 366</li> <li>○ Unit 5, Lesson 2 - TE page 382</li> <li>○ Unit 5, Lesson 3 - TE page 400</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Unit 2 Review - TE pages 186-188</li> <li>• Unit 3 Review - TE pages 262-264</li> <li>• Unit 4 Review - TE pages 340-342</li> <li>• Unit 5 Review - TE pages 402-404</li> </ul> |
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**ASSESSMENT GUIDE**

**Unit 2**

- Pretest: AG pages 34-35
- Lesson 1 Quiz: Water and Its Properties: AG page 36
- Lesson 1 Alt. Assessment: Water and Its Properties: A G page 37
- Lesson 2 Quiz: The Water Cycle: AG page 38
- Lesson 2 Alt. Assessment: The Water Cycle: AG page 39
- Lesson 3 Quiz: Surface Water and Groundwater: AG page 40
- Lesson 3 Alt. Assessment: Surface Water & Groundwater: AG page 41
- Lesson 4 Quiz: Ocean Currents: AG page 42
- Lesson 4 Alt. Assessment: Ocean Currents: AG page 43
- Lesson 5 Quiz: Human Impact on Water: AG page 44
- Lesson 5 Alt. Assessment: Human Impact on Water: AG page 45
- Performance-Based Assessment: TE: AG page 46
- Performance-Based Assessment: SE: AG pages 47-48
- Unit Review: AG pages 49-52
- Unit Test A: AG pages 53-59
- Unit Test B: AG pages 60-66

**Unit 3**

- Pretest: AG pages 67-68
- Lesson 1 Quiz: The Atmosphere: AG page 69
- Lesson 1 Alt. Assessment: The Atmosphere: AG page 70
- Lesson 2 Quiz: Energy Transfer: AG page 71
- Lesson 2 Alt. Assessment: Energy Transfer: AG page 72
- Lesson 3 Quiz: Wind in the Atmosphere: AG page 73
- Lesson 3 Alt. Assessment: Wind in the Atmosphere: AG page 74
- Lesson 4 Quiz: Human Impact on the Atmosphere: AG page 75
- Lesson 4 Alt. Assessment: Human Impact on the Atmosphere: AG page 76
- Performance-Based Assessment: TE: AG page 77
- Performance-Based Assessment: SE: AG pages 78-79
- Unit Review: AG pages 80-83
- Unit Test A: AG pages 84-90
- Unit Test B: AG pages 91-97

**Unit 4**

- Pretest: AG pages 98-99
- Lesson 1 Quiz: Elements of Weather: AG page 100
- Lesson 1 Alt. Assessment: Elements of Weather: AG page 101
- Lesson 2 Quiz: What Influences Weather?: AG page 102
- Lesson 2 Alt. Assessment: What Influences Weather?: AG page 103
- Lesson 3 Quiz: Climate: AG page 104
- Lesson 3 Alt. Assessment: Climate: AG page 105
- Lesson 4 Quiz: Climate Change: AG page 106
- Lesson 4 Alt. Assessment: Climate Change: AG page 107
- Performance-Based Assessment: TE: AG page 108
- Performance-Based Assessment: SE: AG pages 109-110
- Unit Review: AG pages 111-114
- Unit Test A: AG pages 115-121
- Unit Test B: AG pages 122-128

**Unit 5**

- Pretest: AG pages 129-130
- Lesson 1 Quiz: Earth's Days, Years, & Seasons: AG page 131
- Lesson 1 Alt. Assessment: Earth's Days, Years, and Seasons: AG page 132
- Lesson 2 Quiz: Moon Phases and Eclipses: AG page 133
- Lesson 2 Alt. Assessment: Moon Phases & Eclipses: AG page 134
- Lesson 3 Quiz: Earth's Tides: AG page 135
- Lesson 3 Alt. Assessment: Earth's Tides: AG page 136
- Performance-Based Assessment: TE: AG page 137
- Performance-Based Assessment: SE: AG pages 138-139
- Unit Review: AG pages 140-143
- Unit Test A: AG pages 144-150
- Unit Test B: AG pages 151-157

**ACADEMIC CONNECTIONS TO OTHER DISCIPLINES:**

- Astronomy Connection - TE page 236
- Botany Connection - TE page 128
- Do the Math - TE page 117
- Do the Math - TE page 132
- Do the Math - TE page 337
- Earth Science Connection - TE page 330
- Ecology Connection - TE page 156
- Engineering Connection - TE page 220
- Engineering Connection - TE page 282
- Engineering Connection - TE page 394
- Environmental Science Connection - TE page 236
- Health Connection - TE page 156
- Health Connection - TE page 176
- Language Art Connection - TE page 114
- Language Arts Connection - TE page 128
- Language Arts Connection - TE page 206
- Language Arts Connection - TE page 296
- Language Arts Connection - TE page 330
- Life Science Connection - TE page 314
- Math Connection - TE page 142
- Physical Science Connection - TE page 114
- Physiology Connection - TE page 376
- Real World Connection - TE page 142
- Real World Connection - TE page 176
- Real World Connection - TE page 206
- Real World Connection - TE page 220
- Real World Connection - TE page 254
- Real World Connection - TE page 254
- Real World Connection - TE page 394
- Social Studies Connection - TE page 296
- Social Studies Connection - TE page 314
- Social Studies Connection - TE page 360
- Technology Connection - TE page 282
- Technology Connection - TE page 360

**SUGGESTED PACING**

**STRAND: LIFE SCIENCE (LS)**

**Topic: Cycles of Matter and Flow of Energy**

This topic focuses on the impact of matter and energy transfer within the biotic component of ecosystems.

**Content Statements:**

- Matter is transferred continuously between one organism to another and between organisms and their physical environments.
- Plants use the energy in light to make sugars out of carbon dioxide and water (photosynthesis). These materials can be used and immediately stored for later use. Organisms that eat plants break down plant structures to produce the materials and energy they need to survive. Then they are consumed by other organisms.
- Energy can transform from one form to another in living things. Animals get energy from oxidizing food, releasing some of its energy as heat.
- The total amount of matter and energy remains constant, even though its form and location change.

**Content Statements:**

- In any particular biome, the number, growth and survival of organisms and populations depend on biotic and abiotic factors.
- Biomes are regional ecosystems characterized by distinct types of organisms that have developed under specific soil and climatic conditions.
- The variety of physical (abiotic) conditions that exists on Earth gives rise to diverse environments (biomes) and allows for the existence of a wide variety of organisms (biodiversity).
- Ecosystems are dynamic in nature; the number and types of species fluctuate over time. Disruptions, deliberate or inadvertent, to the physical (abiotic) or biological (biotic) components of an ecosystem impact the composition of an ecosystem.

**PRINT RESOURCES**

*ScienceFusion*

- Unit 6, TE pages 405-534
- Unit 6, Lab Manual pages 358-479
- Unit 6, Assessment Guide pages 158-196

**DIGITAL RESOURCES**

*ScienceFusion*

- Unit 6, Lesson 1 Digital Lesson
- Unit 6, Lesson 1 Virtual Lab
- Unit 6, Lesson 2 Digital Lesson
- Unit 6, Lesson 3 Digital Lesson
- Unit 6, Lesson 3 Virtual Lab
- Unit 6, Lesson 4 Digital Lesson
- Unit 6, Lesson 5 Digital Lesson
- Unit 6, Lesson 6 Digital Lesson
- Unit 6, Lesson 7 Digital Lesson
- Unit 6, Lesson 7 Virtual Lab

**SCIENCE AND ACADEMIC VOCABULARY**

Biodiversity, Biome, Carbon Cycle, Carnivore, Carrying Capacity, Cellular Respiration, Chlorophyll, Competition, Coniferous Tree, Consumer, Cooperation, Deciduous Tree, Decomposer, Desert, Ecosystem, Emigration, Energy, Energy Pyramid, Estuary, Eutrophication, Food Chain, Food Web, Grassland, Habitat, Herbivore, Immigration, Law Of Conservation Of Energy, Law Of Conservation Of Mass, Limiting Factor, Matter, Nitrogen Cycle, Omnivore, Photosynthesis, Pioneer Species, Producer, Succession, Taiga, Tundra, Water Cycle, Wetland

**DIFFERENTIATION**

Leveled Inquiry

- Unit 6 TE pages 410, 424, 438, 456, 474, 488, 504, 518

Response to Intervention

- Unit 6 TE page 411

Differentiated Instruction (Basic, ELL, and Advanced)

- Unit 6 TE pages 427, 441, 452, 459, 471, 477, 491, 500, 507, 521

**FIELD EXPERIENCE CONNECTIONS**

Great Lakes Science Center's Cleveland Creates! Program.

**Program Details:** A standards-based program that uses the Engineering and Design Process. Students learn about energy transformation and electricity through an electrifying demonstration and a hands-on workshop. To prepare in advance, plan to attend the professional development session.

For more information contact: Karyn Saunders  
216-696-2760 or email [saundersk@glsc.org](mailto:saundersk@glsc.org)

**INQUIRY SKILLS**

- |                          |                            |                       |                             |
|--------------------------|----------------------------|-----------------------|-----------------------------|
| • Analyzing Results/Data | • Comparing Results        | • Drawing Conclusions | • Making Inferences         |
| • Applying Concepts      | • Creating Models          | • Evaluating Models   | • Making Observations       |
| • Classifying Organisms  | • Describing Relationships | • Explaining Results  | • Making Predictions        |
| • Classifying Samples    | • Designing Experiments    | • Graphing Data       | • Organizing Results/Data   |
| • Comparing Events       | • Developing Procedures    | • Making Diagrams     | • Practicing Lab Techniques |

**HANDS-ON INQUIRY AND APPLICATION**

- Unit 6, Lesson 1 Quick Lab 1: Plant Cell Structures: LM pages 358-361
- Unit 6, Lesson 1 Quick Lab 2: Investigate Carbon Dioxide: LM pages 362-365
- Unit 6, Lesson 1 S.T.E.M. Lab 1: Investigate Rate of Photosynthesis: LM pages 366-376
- Unit 6, Lesson 2 Quick Lab 1: Making Compost: LM pages 377-380
- Unit 6, Lesson 2 Quick Lab 2: Energy Role Game: LM pages 381-384
- Unit 6, Lesson 2 Quick Lab 3: Where Does All the Energy Flow?: LM pages 385-390
- Unit 6, Lesson 2 Field Lab 1: Food Webs: LM pages 391-400
- Unit 6, Lesson 3 Quick Lab 1: Pyramid of Energy: LM pages 401-404
- Unit 6, Lesson 3 Quick Lab 2: Model the Carbon Cycle: LM pages 405-408
- Unit 6, Lesson 3 Quick Lab 3: Condensation and Evaporation: LM pages 409-412
- Unit 6, Lesson 4 Quick Lab 1: Climate Determines Plant Life: LM pages 413-416
- Unit 6, Lesson 4 Quick Lab 2: Identify Your Land Biome: LM pages 417-420
- Unit 6, Lesson 4 Field Lab 1: Survey of a Biome's Biotic and Abiotic Factors : LM pages 421-431
- Unit 6, Lesson 5 Quick Lab 1: Life in Moving Water: LM pages 432-435
- Unit 6, Lesson 5 Quick Lab 2: Light Penetration and Water Clarity: LM pages 436-439
- Unit 6, Lesson 6 Quick Lab 1: What Factors Influence a Population Change?: LM pages 440-443
- Unit 6, Lesson 6 Quick Lab 2: Investigate an Abiotic Limiting Factor: LM pages 444-447
- Unit 6, Lesson 6 Exploration Lab 1: How Do Wetland Populations Interact?: LM pages 448-458
- Unit 6, Lesson 7 Quick Lab 1: Measuring Species Diversity: LM pages 459-462
- Unit 6, Lesson 7 Quick Lab 2: Investigate Evidence of Succession: LM pages 463-466
- Unit 6, Lesson 7 Field Lab 1: Predicting How Succession Follows a Human Disturbance: LM pages 467-479
- STEM- TE pages 468-471

**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 6, Lesson 1 - TE page 429</li> <li>○ Unit 6, Lesson 2 - TE page 443</li> <li>○ Unit 6, Lesson 3 - TE page 461</li> <li>○ Unit 6, Lesson 4 - TE page 479</li> <li>○ Unit 6, Lesson 5 - TE page 493</li> <li>○ Unit 6, Lesson 6 - TE page 509</li> <li>○ Unit 6, Lesson 7 - TE page 523</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Visual Summary and Lesson Review           <ul style="list-style-type: none"> <li>○ Unit 6, Lesson 1 - TE page 435</li> <li>○ Unit 6, Lesson 2 - TE page 450</li> <li>○ Unit 6, Lesson 3 - TE page 467</li> <li>○ Unit 6, Lesson 4 - TE page 485</li> <li>○ Unit 6, Lesson 5 - TE page 499</li> <li>○ Unit 6, Lesson 6 - TE page 515</li> <li>○ Unit 6, Lesson 7 - TE page 528</li> </ul> </li> </ul> | <ul style="list-style-type: none"> <li>• Unit 6 Review - TE page 530-533</li> </ul> |
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**ASSESSMENT GUIDE**

## Unit 6

- Unit 6 Pretest: AG pages 158
- Lesson 1 Quiz: Photosynthesis and Cellular Respiration: AG page 160
- Lesson 1 Alternative Assessment: Photosynthesis and Cellular Respiration: AG page 161
- Lesson 2 Quiz: Ecology and Energy Transfer: AG page 162
- Lesson 2 Alternative Assessment: Ecology and Energy Transfer: AG page 163
- Lesson 3 Quiz: Energy and Matter in Ecosystems: AG page 164
- Lesson 3 Alternative Assessment: Energy and Matter in Ecosystems: AG page 165
- Lesson 4 Quiz: Land Biomes: AG page 166
- Lesson 4 Alternative Assessment: Land Biomes: AG page 167
- Lesson 5 Quiz: Aquatic Ecosystems: AG page 168
- Lesson 5 Alternative Assessment: Aquatic Ecosystems: AG page 169
- Lesson 6 Quiz: Population Dynamics: AG page 170
- Lesson 6 Alternative Assessment: Population Dynamics: AG page 171
- Lesson 7 Quiz: Changes in Ecosystems: AG page 172
- Lesson 7 Alternative Assessment: Changes in Ecosystems: AG page 173
- Performance-Based Assessment: Teacher Edition: AG page 174
- Performance-Based Assessment: Student Edition: AG pages 175-176
- Unit 6 Unit Review: AG pages 177-182
- Unit 6 Unit Test A: AG pages 183-189
- Unit 6 Unit Test B: AG pages 190-196

**ACADEMIC CONNECTIONS TO OTHER DISCIPLINES:**

- Real World Connection: TE page 428
- Marine biology Connection: TE page 428
- Earth Science Connection: TE page 442
- Math Connection: TE page 442
- Environmental Science Connection: TE page 460
- Engineering Connection: TE page 460
- Life Science Connection: TE page 478
- Social Studies Connection: TE page 478
- Chemistry Connection: TE page 492
- Social Studies Connection: TE page 492
- Do the Math: TE pages 500-501
- Real World Connection: TE page 508
- Fine Arts Connection: TE page 508
- Health Connection: TE page 522
- Language Arts Connection: TE page 522



**SUGGESTED PACING**

**STRAND: PHYSICAL SCIENCE (PS)**

**Topic: Conservation of Mass and Energy**

This topic focuses on the empirical evidence for the arrangements of atoms on the Periodic Table of Elements, conservation of mass and energy, transformation and transfer of energy.

**Content Statements:**

- The properties of matter are determined by the arrangement of atoms.
- Elements can be organized into families with similar properties, such as highly reactive metals, less-reactive metals, highly reactive nonmetals and some gases that are almost completely nonreactive.
- Substances are classified according to their properties, such as metals and acids.
- When substances interact to form new substances, the properties of the new substances may be very different from those of the old, but the amount of mass does not change.

**Content Statements:**

- Energy can be transformed or transferred but is never lost.
- When energy is transferred from one system to another, the quantity of energy before transfer equals the quantity of energy after transfer. When energy is transformed from one form to another, the total amount of energy remains the same.

**Content Statements:**

- Energy can be transferred through a variety of ways. Mechanical energy can be transferred when objects push or pull on each other over a distance.
- Electromagnetic waves transfer energy when they interact with matter.
- Thermal energy can be transferred through radiation, convection and conduction.
- Electrical energy transfers when an electrical source is connected in a complete electrical circuit to an electrical device.

**PRINT RESOURCES**

*ScienceFusion*

- Unit 7, TE pages 535-658
- Unit 7, Lab Manual pages 480-574
- Unit 7, Assessment Guide pages 197-235
- Unit 8, TE pages 659-767
- Unit 8, Lab Manual pages 575-669
- Unit 8, Assessment Guide pages 236-273

**DIGITAL RESOURCES**

*ScienceFusion*

- Unit 7, Lesson 1 Digital Lesson
- Unit 7, Lesson 2 Digital Lesson
- Unit 7, Lesson 3 Digital Lesson
- Unit 7, Lesson 3 Virtual Lab
- Unit 7, Lesson 4 Digital Lesson
- Unit 7, Lesson 4 Virtual Lab
- Unit 7, Lesson 5 Digital Lesson
- Unit 7, Lesson 6 Digital Lesson
- Unit 7, Lesson 7 Digital Lesson
- Unit 7, Lesson 7 Virtual Lab
- Unit 8, Lesson 1 Digital Lesson
- Unit 8, Lesson 1 Virtual Lab
- Unit 8, Lesson 2 Digital Lesson
- Unit 8, Lesson 3 Digital Lesson
- Unit 8, Lesson 3 Virtual Lab
- Unit 8, Lesson 4 Digital Lesson
- Unit 8, Lesson 4 Virtual Lab
- Unit 8, Lesson 5 Digital Lesson
- Unit 8, Lesson 6 Digital Lesson
- Unit 8, Lesson 6 Virtual Lab

**SCIENCE AND ACADEMIC VOCABULARY**

Acid, Amplitude, Atom, Atomic Number, Average Atomic Mass, Base, Calorie, Chemical Change, Chemical Equation, Chemical Formula, Chemical Reaction, Chemical Symbol, Concentration, Conduction, Conductor, Convection, Electric Circuit, Electric Current, Electromagnetic Wave, Electron, Electron Cloud, Endothermic Reaction, Energy, Energy Transmission, Exothermic Reaction, Force, Frequency, Group, Heat, Insulator, Kinetic Energy, Law Of Conservation Of Energy, Law Of Conservation Of Mass, Longitudinal Wave, Mass Number, Mechanical Energy, Mechanical Wave, Medium, Metal, Metalloid, Mixture, Neutralization Reaction, Neutron, Nonmetal, Nucleus, Parallel Circuit, Period, Periodic Table, pH, Physical Change, Potential Energy, Product, Proton, Radiation, Reactant, Resistance, Salt, Series Circuit, Solubility, Solute, Solution, Solvent, Thermal Energy, Transverse Wave, Voltage, Wave Period, Wave Speed, Wavelength, Work

**DIFFERENTIATION**

Leveled Inquiry

- Unit 7 TE pages 540, 554, 568, 582, 596, 612, 626, 642
- Unit 8 TE pages 664, 676, 690, 702, 720, 738, 752

Response to Intervention

- Unit 7 TE page 541
- Unit 8 TE page 665

Differentiated Instruction (Basic, ELL, and Advanced)

- Unit 7 TE pages 557, 571, 585, 599, 608, 615, 629, 645
- Unit 8 TE pages 679, 693, 705, 717, 723, 734, 741, 748, 755

**FIELD EXPERIENCE CONNECTIONS**

Great Lakes Science Center's Cleveland Creates! Program.

**Program Details:** A standards-based program that uses the Engineering and Design Process. Students learn about energy transformation and electricity through an electrifying demonstration and a hands-on workshop. To prepare in advance, plan to attend the professional development session.

For more information contact: Karyn Saunders  
216-696-2760 or email [saundersk@glsc.org](mailto:saundersk@glsc.org)

INQUIRY SKILLS			
<ul style="list-style-type: none"> <li>Analyzing Results</li> <li>Answering Questions</li> <li>Applying Concepts</li> <li>Calculating Results</li> <li>Collecting Data</li> <li>Comparing Models</li> <li>Comparing Observations</li> </ul>	<ul style="list-style-type: none"> <li>Creating Models</li> <li>Creating/Constructing Graphs</li> <li>Developing Hypotheses</li> <li>Developing Procedures</li> <li>Drawing Conclusions</li> <li>Evaluating Procedures</li> </ul>	<ul style="list-style-type: none"> <li>Explaining Events</li> <li>Explaining Observations</li> <li>Identifying Patterns</li> <li>Interpreting Data</li> <li>Interpreting Observations</li> <li>Making Inferences</li> </ul>	<ul style="list-style-type: none"> <li>Making Observations</li> <li>Making Predictions</li> <li>Organizing Results</li> <li>Planning Investigations</li> <li>Practicing Lab Techniques</li> <li>Writing Chemical Equations</li> </ul>
HANDS-ON INQUIRY AND APPLICATION			
<p>Unit 7</p> <ul style="list-style-type: none"> <li>Lesson 1 Quick Lab 1: Physical or Chemical Change?: LM pages 480-482</li> <li>Lesson 1 Quick Lab 2: Properties of Combined Substances: LM pages 483-486</li> <li>Lesson 2 Quick Lab 1: Investigate the Size of Atomic Particles: LM pages 487-490</li> <li>Lesson 2 Quick Lab 2: Investigate Masses of Atomic Particles: LM pages 491-494</li> <li>Lesson 3 Quick Lab 1: A Model Atom: LM pages 495-497</li> <li>Lesson 3 Quick Lab 2: Predicting Properties: LM pages 498-501</li> <li>Lesson 3 Quick Lab 3: Recognizing Patterns: LM pages 502-504</li> <li>Lesson 4 Quick Lab 1: Breaking Bonds in a Chemical Reaction: LM pages 505-507</li> <li>Lesson 4 Quick Lab 2: Catalysts and Chemical Reactions: LM pages 508-511</li> <li>Lesson 4 Exploration Lab 1: Change of Pace: LM pages 512-525</li> <li>Lesson 5 Quick Lab 1: Investigate Solutions: LM pages 526-529</li> <li>Lesson 5 Quick Lab 2: Solution Concentration: LM pages 530-533</li> <li>Lesson 5 Exploration Lab 1: Investigate Solubility: LM pages 534-544</li> <li>Lesson 6 Quick Lab 1: Household Acids and Bases: LM pages 545-547</li> <li>Lesson 6 Quick Lab 2: Making Salt: LM pages 548-551</li> <li>Lesson 6 Exploration Lab 1: Acids, Bases, and Fruit Oxidation: LM pages 552-562</li> <li>Lesson 7 Quick Lab 1: Determining pH Levels: LM pages 563-566</li> <li>Lesson 7 Quick Lab 2: Investigating Respiration with Chemical Indicators: LM pages 567-570</li> <li>Lesson 7 Quick Lab 3: Investigating the Effects of Acid Precipitation: LM pages 571-574</li> </ul>	<p>Unit 8</p> <ul style="list-style-type: none"> <li>Lesson 1 Quick Lab 1: Electrical, Light, and Heat Energy: LM pages 575-578</li> <li>Lesson 1 Quick Lab 2: Conservation of Energy: LM pages 579-582</li> <li>Lesson 2 Quick Lab 1: Transferring Potential Energy: LM pages 583-586</li> <li>Lesson 2 Quick Lab 2: The Energy of a Pendulum: LM pages 587-590</li> <li>Lesson 2 S.T.E.M. Lab 1: Energy in a Roller Coaster: LM pages 591-599</li> <li>Lesson 3 Quick Lab 1: Simple Heat Engine: LM pages 600-603</li> <li>Lesson 3 Quick Lab 2: Observing the Transfer of Energy: LM pages 604-607</li> <li>Lesson 3 Quick Lab 3: Exploring Thermal Conductivity: LM pages 608-610</li> <li>Lesson 3 Field Lab 1: Building a Solar Cooker: LM pages 611-623</li> <li>Lesson 4 Quick Lab 1: Resonance in a Bottle: LM pages 624-626</li> <li>Lesson 4 Quick Lab 2: Waves: LM pages 627-630</li> <li>Lesson 4 Quick Lab 3: Waves on a Spring: LM pages 631-633</li> <li>Lesson 5 Quick Lab 1: Investigate Electric Current: LM pages 634-638</li> <li>Lesson 5 Quick Lab 2: Lemon Battery: LM pages 639-642</li> <li>Lesson 5 S.T.E.M. Lab 1: Voltage, Current, and Resistance: LM pages 643-653</li> <li>Lesson 6 Quick Lab 1: Compare Parallel and Series Circuits: LM pages 654-657</li> <li>Lesson 6 Quick Lab 2: Compare Materials for Use in Fuses: LM pages 658-661</li> <li>Lesson 6 Exploration Lab 1: Model the Electric Circuits in a Room: LM pages 662-669</li> </ul>		
ASSESSMENTS/PROGRESS MONITORING			
<ul style="list-style-type: none"> <li>Formative and Summative Assessment <ul style="list-style-type: none"> <li>Unit 7, Lesson 1 - TE page 559</li> <li>Unit 7, Lesson 2 - TE page 573</li> <li>Unit 7, Lesson 3 - TE page 587</li> <li>Unit 7, Lesson 4 - TE page 601</li> <li>Unit 7, Lesson 5 - TE page 617</li> <li>Unit 7, Lesson 6 - TE page 631</li> <li>Unit 7, Lesson 7 - TE page 647</li> <li>Unit 8, Lesson 1 - TE page 681</li> <li>Unit 8, Lesson 2 - TE page 695</li> <li>Unit 8, Lesson 3 - TE page 707</li> <li>Unit 8, Lesson 4 - TE page 725</li> <li>Unit 8, Lesson 5 - TE page 743</li> <li>Unit 8, Lesson 6 - TE page 757</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Visual Summary and Lesson Review <ul style="list-style-type: none"> <li>Unit 7, Lesson 1 - TE page 565</li> <li>Unit 7, Lesson 2 - TE page 579</li> <li>Unit 7, Lesson 3 - TE page 593</li> <li>Unit 7, Lesson 4 - TE page 607</li> <li>Unit 7, Lesson 5 - TE page 622</li> <li>Unit 7, Lesson 6 - TE page 638</li> <li>Unit 7, Lesson 7 - TE page 653</li> <li>Unit 8, Lesson 1 - TE page 687</li> <li>Unit 8, Lesson 2 - TE page 699</li> <li>Unit 8, Lesson 3 - TE page 713</li> <li>Unit 8, Lesson 4 - TE page 732</li> <li>Unit 8, Lesson 5 - TE page 747</li> <li>Unit 8, Lesson 6 - TE page 763</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Unit 7 Review - TE page 654-657</li> <li>Unit 8 Review - TE page 764-767</li> </ul>	

ASSESSMENT GUIDE	
<p>Unit 7</p> <ul style="list-style-type: none"> <li>• Unit 7 Pretest: AG pages 197-198</li> <li>• Lesson 1 Quiz: Physical and Chemical Changes: AG page 199</li> <li>• Lesson 1 Alternative Assessment: Physical and Chemical Changes: AG page 200</li> <li>• Lesson 2 Quiz: The Atom: AG page 201</li> <li>• Lesson 2 Alternative Assessment: The Atom: AG page 202</li> <li>• Lesson 3 Quiz: The Periodic Table: AG page 203</li> <li>• Lesson 3 Alternative Assessment: The Periodic Table: AG page 204</li> <li>• Lesson 4 Quiz: Chemical Reactions: AG page 205</li> <li>• Lesson 4 Alternative Assessment: Chemical Reactions: AG page 206</li> <li>• Lesson 5 Quiz: Solutions: AG page 207</li> <li>• Lesson 5 Alternative Assessment: Solutions: AG page 208</li> <li>• Lesson 6 Quiz: Acids, Bases, and Salts: AG page 209</li> <li>• Lesson 6 Alternative Assessment: Acids, Bases, and Salts: AG page 210</li> <li>• Lesson 7 Quiz: Measuring pH: AG page 211</li> <li>• Lesson 7 Alternative Assessment: Measuring pH: AG page 212</li> <li>• Performance-Based Assessment: Teacher Edition: AG page 213</li> <li>• Performance-Based Assessment: Student Edition: AG pages 214-215</li> <li>• Unit 7 Unit Review: AG pages 216-221</li> <li>• Unit 7 Unit Test A: AG pages 222-228</li> <li>• Unit 7 Unit Test B: AG pages 229-235</li> </ul>	<p>Unit 8</p> <ul style="list-style-type: none"> <li>• Unit 8 Pretest: AG pages 236-237</li> <li>• Lesson 1 Quiz: Energy Transformation and Transfer: AG page 238</li> <li>• Lesson 1 Alternative Assessment: Energy Transformation and Transfer: AG page 239</li> <li>• Lesson 2 Quiz: Mechanical Energy: AG page 240</li> <li>• Lesson 2 Alternative Assessment: Mechanical Energy: AG page 241</li> <li>• Lesson 3 Quiz: Thermal Energy and Heat: AG page 242</li> <li>• Lesson 3 Alternative Assessment: Thermal Energy and Heat: AG page 243</li> <li>• Lesson 4 Quiz: Waves and Energy: AG page 244</li> <li>• Lesson 4 Alternative Assessment: Waves and Energy: AG page 245</li> <li>• Lesson 5 Quiz: Electric Currents: AG page 246</li> <li>• Lesson 5 Alternative Assessment: Electric Currents: AG page 247</li> <li>• Lesson 6 Quiz: Electric Circuits: AG page 248</li> <li>• Lesson 6 Alternative Assessment: Electric Circuits: AG page 249</li> <li>• Performance-Based Assessment: Teacher Edition: AG page 250</li> <li>• Performance-Based Assessment: Student Edition: AG pages 251-252</li> <li>• Unit 8 Unit Review: AG pages 253-258</li> <li>• Unit 8 Unit Test A: AG pages 259-265</li> <li>• Unit 8 Unit Test B: AG pages 266-273</li> </ul>
ACADEMIC CONNECTIONS TO OTHER DISCIPLINES:	
<ul style="list-style-type: none"> <li>• Life Science Connection: TE page 558</li> <li>• Technology Connection: TE page 558</li> <li>• Earth Science Connection: TE page 572</li> <li>• Technology Connection: TE page 572</li> <li>• Astronomy Connection: TE page 586</li> <li>• Biology Connection: TE page 596</li> <li>• Art Connection: TE page 600</li> <li>• Life Science Connection: TE page 600</li> <li>• Do the Math: TE page 604</li> <li>• Math Connection: TE page 616</li> <li>• Social Studies Connection: TE page 616</li> <li>• Language Arts Connection: TE page 616</li> <li>• Do the Math: TE page 621</li> <li>• Fine Arts Connection: TE page 630</li> <li>• Real World Connection: TE page 630</li> <li>• Fine Arts Connection: TE page 646</li> </ul>	<ul style="list-style-type: none"> <li>• Real World Connection: TE page 646</li> <li>• Do the Math: TE page 649</li> <li>• Real World Connection: TE page 680</li> <li>• Fine Arts Connection: TE page 680</li> <li>• Physical Education Connection: TE page 694</li> <li>• Fine Arts Connection: TE page 694</li> <li>• Do the Math: TE page 698</li> <li>• Real World Connection: TE page 706</li> <li>• Social Studies Connection: TE page 706</li> <li>• Real World Connection: TE page 724</li> <li>• Earth Science Connection: TE page 724</li> <li>• Do the Math: TE page 731</li> <li>• Social Studies Connection: TE page 742</li> <li>• Environmental Science Connection: TE page 742</li> <li>• History Connection: TE page 756</li> <li>• Health Connection: TE page 756</li> </ul>