

**EARTH SCIENCE DAYBOOK © 2003**  
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**Grades 6-8**

correlated to

**Arkansas**  
**Science Curriculum**  
**Framework**

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**Earth Science Daybook © 2003**  
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 correlated to  
**Arkansas Science Curriculum Framework**  
**Grade 6**

**Strand 1: Nature of Science**

**Standard 1: Characteristics and Processes of Science**

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 6	Science Daybooks
<b>Processes of Science</b> NS.1.6.1 Verify accuracy of observations	<b>Earth Science Teacher’s Guide:</b> 20-23, 45, 49, 71, 82, 84-85, 95, 100, 103, 120-121, 124, 125, 126, 129, 143, 160, 173, 174, 187, 192, 193  <b>Life Science Teacher’s Guide:</b> 10, 12, 13, 24, 26-27, 48-49, 54, 55, 64, 91, 114, 117, 118, 120, 122-123, 132-133, 140-141, 146, 148-149, 150, 154-155, 162, 164, 214, 216  <b>Physical Science Teacher’s Guide:</b> 28-29, 31, 34-35, 52, 55, 64, 70, 78, 81, 104, 107, 116, 136, 188, 190, 206-207
NS.1.6.2 Apply components of experimental design used to produce empirical evidence: <ul style="list-style-type: none"> <li>• hypothesis</li> <li>• replication</li> <li>• sample size</li> <li>• appropriate use of control</li> <li>• use of standardized variables</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 27, 40-43, 45, 46, 48-49, 63, 67, 72-75, 76-79, 88-91, 99, 113, 123, 128-129, 163, 171, 172-175, 192-195, 198-201, 202, 220  <b>Life Science Teacher’s Guide:</b> 24, 26-27, 35, 82-85, 86-89, 94-97, 129, 132-133, 136-139, 158-161, 166-169, 188-191, 190, 205, 214-217, 221, 224  <b>Physical Science Teacher’s Guide:</b> 18-19, 66-67, 76, 77, 103, 119, 124, 129, 138-141, 150-151, 174, 181, 190, 191, 213
NS.1.6.3 Compare scientific data using mean, median, mode, and range using SI units	<b>Life Science Teacher’s Edition:</b> 100  <b>Physical Science Teacher’s Edition:</b> 10B, 77, 172

Student Learning Expectations, Grade 6	Science Daybooks
<p>NS.1.6.4 Construct and interpret scientific data using</p> <ul style="list-style-type: none"> <li>• data tables/charts</li> <li>• bar and double bar graphs</li> <li>• line graphs</li> <li>• stem and leaf plots</li> <li>• line graphs</li> </ul>	<p><b>Earth Science Teacher’s Edition:</b> 13, 22, 29, 32, 39, 41, 47, 60-61, 87, 116-117, 119, 130, 139, 140, 149, 152, 162-163, 174, 196-197, 200</p> <p><b>Life Science Teacher’s Edition:</b> 12-13, 26-27, 33, 34, 36, 49, 56, 63, 70, 79, 82-85, 87, 110, 120, 126, 127, 128, 132-133, 138, 144-145, 152, 160, 164-165, 190, 193-195, 200-201, 204-205, 210, 213</p> <p><b>Physical Science Teacher’s Edition:</b> 10, 14, 18-19, 25-26, 55, 90, 91, 103, 110, 133, 144-145, 148-149, 151, 154, 157, 160, 161, 167, 184-185, 190, 194, 203, 206-207, 210, 215, 217</p>
<p>NS.1.6.5 Communicate results and conclusions from scientific inquiry</p>	<p><b>Earth Science Teacher’s Guide:</b> 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217</p> <p><b>Life Science Teacher’s Guide:</b> 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217</p>
<p>NS.1.6.6 Develop and implement strategies for long-term, accurate data collection</p>	<p><b>Earth Science Teacher’s Guide:</b> 10B, 17, 30B, 31, 40B, 41, 49, 52B, 53, 94B, 97, 101, 114B, 115, 124B, 125, 136B, 143, 145, 146B, 147, 149, 156B, 157, 166B, 173, 168, 188B, 189</p> <p><b>Life Science Teacher’s Guide:</b> 10B, 11, 20B, 24, 25, 26, 32, 36, 40B, 41, 62-63, 69, 78-79, 81, 82B, 83, 94B, 95, 132-133, 136B, 137, 139, 140, 141, 144, 148, 156B, 159, 188B, 193, 198B, 199, 203, 216-217</p> <p><b>Physical Science Teacher’s Guide:</b> 10B, 15, 18, 30B, 31, 37, 40B, 43, 47, 104B, 109, 114B, 117, 124B, 125, 133, 136B, 139, 147, 148, 150-151, 156-157, 166B, 169, 173, 183, 184, 205, 206-207, 217</p>
<p><b>Characteristics of Science</b> NS.1.6.7 Distinguish between scientific fact and opinion</p>	<p><b>Earth Science Teacher’s Guide:</b> 72B, 72-75, 80-81, 217</p> <p><b>Physical Science Teacher’s Guide:</b> 20B, 136B, 138-141</p>

<b>Student Learning Expectations, Grade 6</b>	<b>Science Daybooks</b>
NS.1.6.8 Explain the role of prediction in the development of a theory	<b>Earth Science Teacher's Guide:</b> 80-81, 88-91, 113, 125, 128-129, 138-139, 163, 170-171  <b>Life Science Teacher's Guide:</b> 62B, 72B, 98, 127, 167, 188  <b>Physical Science Teacher's Guide:</b> 18, 20B, 36-37, 119, 150-151
NS.1.6.9 Define and give examples of laws and theories	<b>Earth Science Teacher's Guide:</b> 72-75, 76, 78-79, 80-81, 223  <b>Life Science Teacher's Guide:</b> 224  <b>Physical Science Teacher's Guide:</b> 20A, 20-29, 40, 224

## Strand 2: Life Science

### Standard 2: Living Systems: Characteristics, Structure, and Function

**Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 6</b>	<b>Science Daybooks</b>
<b>Structure and Function</b> LS.2.6.1 Observe, describe, and illustrate plant and animal tissues: <ul style="list-style-type: none"> <li>• muscle</li> <li>• blood</li> <li>• skin</li> <li>• xylem</li> <li>• phloem</li> </ul>	<b>Life Science Teacher's Guide:</b> 40, 44-47, 48, 55, 142-145, 146A, 146B, 150-151, 154-155, 218, 224
LS.2.6.2 Illustrate the hierarchical relationships of cells, tissues, and organs	<b>Life Science Teacher's Guide:</b> 10, 22, 40B, 40, 44, 46, 47, 48, 142, 154, 223, 224
LS.2.6.3 Investigate the functions of tissues	<b>Life Science Teacher's Guide:</b> 40, 44-47, 48, 55, 142-145, 146A, 146B, 147, 150-151, 154-155, 218, 224

Student Learning Expectations, Grade 6	Science Daybooks
LS.2.6.4 Model and explain the functions of animal organs: <ul style="list-style-type: none"> <li>• heart</li> <li>• lung</li> <li>• kidneys</li> <li>• eyes</li> <li>• ears</li> <li>• skin</li> <li>• teeth</li> </ul>	<b>Life Science Teacher's Guide:</b> 10B, 47, 134, 135, 136B, 140-143, 144-145, 146B, 146, 149, 150-153, 154, 162-165, 221, 222, 224
LS.2.6.5 Model and explain the function of plant organs: <ul style="list-style-type: none"> <li>• leaves</li> <li>• roots</li> <li>• stems</li> <li>• flowers</li> </ul>	<b>Life Science Teacher's Guide:</b> 20A, 24-27, 54-57, 58, 124B, 124, 126, 128-131,
LS.2.6.6 Dissect organs, including but not limited to <ul style="list-style-type: none"> <li>• heart</li> <li>• eye</li> <li>• lung</li> <li>• stem</li> <li>• root</li> </ul>	<b>Life Science Teacher's Guide:</b> 24, 49, 55, 146B, 147, 151, 156A, 156, 157
LS.2.6.7 Describe the relationship between organ function and the following needs of cells: <ul style="list-style-type: none"> <li>• oxygen</li> <li>• food</li> <li>• water</li> <li>• waste removal</li> </ul>	<b>Life Science Teacher's Guide:</b> 8, 14-17, 20B, 20-23, 24-27, 28-29
LS.2.6.8 Investigate careers, scientists, and historical breakthroughs related to tissues and organs	<b>Life Science Teacher's Guide:</b> 20B, 39, 40A, 40B, 44-47, 136A, 137-139, 156B, 159, 161

**S t a n d a r d 3 : L i f e C y c l e s , R e p r o d u c t i o n ,  
a n d H e r e d i t y**

**Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<b>Heredity and Reproduction</b> LS.3.6.1 Describe characteristics of plants and animals manipulated through selective breeding	<b>Life Science Teacher's Guide:</b> 18-19, 52A, 58-61, 72B

Student Learning Expectations, Grade 6	Science Daybooks
LS.3.6.2 Predict the outcome of selective breeding practices over several generations	<b>Life Science Teacher's Guide:</b> 59, 61
LS.3.6.3 Relate the development of Earth's present-day complex species from earlier, distinctly different simpler species	<b>Life Science Teacher's Guide:</b> 80-81, 221
LS.3.6.4 Investigate careers, scientists, and historical breakthroughs related to adaptations and selective breeding	<b>Life Science Teacher's Guide:</b> 18, 58-61, 72B, 111, 114, 122
<b>Regulation and Behavior</b> LS.3.6.5 Describe behavioral adaptations of organisms to the environment: <ul style="list-style-type: none"> <li>• hibernation</li> <li>• estivation</li> <li>• tropism</li> <li>• territorial behavior</li> <li>• migration</li> </ul>	<b>Life Science Teacher's Guide:</b> 104B, 108-109, 110-113, 114B, 114, 117, 121, 128-131, 200 <b>Physical Science Teacher's Guide:</b> 72B, 75, 193
LS.3.6.6 Differentiate between innate behaviors: <ul style="list-style-type: none"> <li>• migration</li> <li>• web spinning</li> <li>• defensive posture</li> <li>• communication</li> <li>• imprinting and learned behaviors</li> <li>• speaking a language</li> <li>• using tools</li> <li>• hunting skills</li> </ul>	<b>Life Science Teacher's Guide:</b> 104B, 110-113, 114B, 114-117, 118-121, 122-123, 128-131, 182-185, 199-201, 202-205, 218 <b>Physical Science Teacher's Guide:</b> 72B, 75-77, 146, 192
LS.3.6.7 Describe the following structural adaptations for survival in the environment: <ul style="list-style-type: none"> <li>• coloration</li> <li>• mimicry</li> <li>• odor glands</li> <li>• beaks</li> <li>• feet</li> <li>• wings</li> <li>• fur</li> <li>• ears</li> <li>• spines</li> <li>• teeth</li> <li>• thorns</li> <li>• characteristics of seeds</li> </ul>	<b>Life Science Teacher's Guide:</b> 24, 54, 58, 59, 80-81, 104-107, 108-109, 118-121, 122-123, 128-131, 198-201, 202-205 <b>Physical Science Teacher's Guide:</b> 146, 193

<b>Student Learning Expectations, Grade 6</b>	<b>Science Daybooks</b>
LS.3.6.8 Investigate careers, scientists, and historical breakthroughs related to learned and innate behaviors	<b>Life Science Teacher's Guide:</b> 111, 114B, 122, 124B, 126-127, 188B, 181, 188-191, 192-195, 198B, 202-205  <b>Physical Science Teacher's Guide:</b> 72B, 75, 77

## **S t a n d a r d 4 : P o p u l a t i o n s a n d E c o s y s t e m s**

**Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 6</b>	<b>Science Daybooks</b>
<b>Populations and Ecosystems</b> LS.4.6.1 Recognize environmental adaptations of plants and animals	<b>Life Science Teacher's Guide:</b> 24, 80-81, 104B, 104-107, 108-109, 110-113, 114B, 114-117, 118-121, 122-123, 128-131, 134, 182-185, 198-201, 202-205, 218  <b>Physical Science Teacher's Guide:</b> 193
LS.4.6.2 Conduct simulations demonstrating competition for resources within an ecosystem	<b>Life Science Teacher's Guide:</b> 176, 188B, 188-191, 192-195
LS.4.6.3 Conduct simulations demonstrating natural selection	<b>Life Science Teacher's Guide:</b> 76-79, 80-81
LS.4.6.4 Analyze natural selection	<b>Life Science Teacher's Guide:</b> 72B, 76-79, 80-81, 222

## **S t r a n d 3 : P h y s i c a l S c i e n c e**

### **S t a n d a r d 5 : M a t t e r a n d C h a n g e s**

**Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 6</b>	<b>Science Daybooks</b>
<b>Properties of Matter</b> PS.5.6.1 Identify common examples of chemical properties: <ul style="list-style-type: none"> <li>• ability to burn</li> <li>• ability to produce light</li> <li>• ability to react with other substances</li> </ul>	<b>Physical Science Teacher's Guide:</b> 166-167, 168-171, 172-175, 176, 182-185, 186-187, 188A, 188-191
PS.5.6.2 Compare and contrast characteristics of physical and chemical properties	<b>Physical Science Teacher's Guide:</b> 56-59, 104-107, 112-113, 136-137, 138-141, 142-145, 146-149, 150-151, 152-155, 156-157, 158-161, 162-165, 166-167, 168-171, 172-175, 178-181, 182-185, 186-187, 188-191, 192-195, 196-197, 198-199, 200-203, 204-207, 208-211, 212-215, 216-217, 222

Student Learning Expectations, Grade 6	Science Daybooks
PS.5.6.3 Conduct investigations using acid/base indicators	<b>Physical Science Teacher's Guide:</b> 169-171, 179, 188-191, 218
PS.5.6.4 Apply skills of scientific investigation to determine density using SI units	<b>Earth Science Teacher's Guide:</b> 87  <b>Physical Science Teacher's Guide:</b> 124A, 124, 125, 126
PS.5.6.7 Identify characteristics of chemical changes: <ul style="list-style-type: none"> <li>• burning</li> <li>• production of a new substance</li> <li>• production of light</li> <li>• color change</li> <li>• endothermic and exothermic reactions</li> <li>• reactivity</li> </ul>	<b>Life Science Teacher's Guide:</b> 24, 25  <b>Physical Science Teacher's Guide:</b> 101, 170-171, 178-181, 188-191, 196-197, 198-199, 200-203, 204-207, 208B, 208-211, 218, 223
PS.5.6.8 Conduct investigations comparing and contrasting physical and chemical changes	<b>Physical Science Teacher's Guide:</b> 56-59, 104-107, 112-113, 136-137, 138-141, 142-145, 146-149, 150-151, 152-155, 156-157, 158-161, 162-165, 166-167, 168-171, 172-175, 178-181, 182-185, 186-187, 188-191, 192-195, 196-197, 198-199, 200-203, 204-207, 208-211, 212-215, 216-217
PS.5.6.10 Investigate scientists, careers, and historical breakthroughs related to chemical properties and chemical changes	<b>Life Science Teacher's Guide:</b> 24  <b>Physical Science Teacher's Guide:</b> 59, 104B, 113, 136B, 138-141, 146B, 125, 127, 155, 156B, 159, 160, 165, 169, 171, 195, 196-197, 198-199, 208B, 208-211, 212-215, 216-217

## Standard 6: Motion and Forces

**Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<p><b>Motions and Forces</b>                      PS.6.6.1                      Compare and contrast simple machines and compound machines</p>	<p><b>Physical Science Teacher's Guide:</b> 30-33, 34-35, 36-39, 40B, 40-41, 42-45, 46-49, 219, 223</p>
<p>PS.6.6.2                      Identify and analyze the simple machines that make up a compound machine</p>	<p><b>Physical Science Teacher's Guide:</b> 30-33, 34-35</p>
<p>PS.6.6.3                      Conduct investigations of various forces using SI units (newton)</p>	<p><b>Physical Science Teacher's Guide:</b> 25-26</p>
<p>PS.6.6.4                      Recognize and give examples of different types of forces:</p> <ul style="list-style-type: none"> <li>• gravitational forces</li> <li>• magnetic forces</li> <li>• friction</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 78-79, 185, 204, 212, 220</p> <p><b>Life Science Teacher's Guide:</b> 46</p> <p><b>Physical Science Teacher's Guide:</b> 10-13, 14-17, 20-23, 24-27, 29, 53, 72-73, 74-77, 220, 221</p>
<p>PS.6.6.5                      Understand why objects have weight</p>	<p><b>Physical Science Teacher's Guide:</b> 224</p>
<p>PS.6.6.6                      Compare and contrast weight and mass</p>	<p><b>Life Science Teacher's Guide:</b> 222</p> <p><b>Physical Science Teacher's Guide:</b> 221, 224</p>
<p>PS.6.6.7                      Describe the effects of force:</p> <ul style="list-style-type: none"> <li>• move a stationary object</li> <li>• speed up, slow down or change the direction of motion</li> <li>• change the shape of objects</li> </ul>	<p><b>Life Science Teacher's Guide:</b> 47</p> <p><b>Physical Science Teacher's Guide:</b> 10-13, 14-17, 20-23, 24-27, 28-29, 30-33, 34-35, 36-39, 40-41, 42-45, 46-49, 72-73, 74-77, 78-81, 216-217, 218, 220, 224</p>
<p>PS.6.6.8                      Conduct investigations to demonstrate change in direction caused by force</p>	<p><b>Physical Science Teacher's Guide:</b> 11, 12, 16-17, 22-23, 25-26, 30B, 31, 37</p>
<p>PS.6.6.9                      Conduct investigations to calculate the change in speed caused by applying forces to an object</p>	<p><b>Physical Science Teacher's Guide:</b> 79</p>

Student Learning Expectations, Grade 6	Science Daybooks
PS.6.6.10 Investigate careers, scientists, and historical breakthroughs related to compound machines and forces	<b>Physical Science Teacher's Guide:</b> 10, 12, 20-23, 24-27, 28-29, 30B, 30-33, 34-35, 36-39, 40B, 40-41, 42-45, 46-49, 72-73, 74-77

## Standard 7: Energy and Transfer of Energy

**Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<b>Energy</b> PS.7.6.1 Classify examples of energy forms: <ul style="list-style-type: none"> <li>• chemical</li> <li>• electromagnetic</li> <li>• mechanical</li> <li>• thermal</li> <li>• nuclear</li> </ul>	<b>Earth Science Teacher's Guide:</b> 30B, 30, 33, 34-37, 39, 130-131, 198B, 206-207  <b>Physical Science Teacher's Guide:</b> 52-55, 56-59, 70-71, 94B, 94-97, 98-101, 102-103, 104B, 104-106, 107-111, 112-113, 128-129, 198B, 198-199, 200-203, 204-207
PS.7.6.2 Summarize the application of the law of conservation of energy in real world situations: <ul style="list-style-type: none"> <li>• electrical energy into mechanical energy</li> <li>• electrical energy into heat</li> <li>• chemical energy into mechanical energy</li> <li>• chemical energy into light</li> </ul>	<b>Earth Science Teacher's Guide:</b> 30, 33, 34-37, 130-131, 206-207  <b>Physical Science Teacher's Guide:</b> 59, 64, 65, 70, 82, 198-199, 200-203, 204-207
PS.7.6.3 Conduct investigations demonstrating how energy can be converted from one form to another	<b>Earth Science Teacher's Guide:</b> 130-131, 206-207  <b>Physical Science Teacher's Guide:</b> 64, 81, 95, 105, 107, 201, 202, 206-207
PS.7.6.4 Investigate the transfer of energy in real world situations: <ul style="list-style-type: none"> <li>• conduction</li> <li>• convection</li> <li>• radiation</li> </ul>	<b>Earth Science Teacher's Guide:</b> 30, 33, 34-37, 39, 130-132, 206-207  <b>Physical Science Teacher's Guide:</b> 56-59, 62B, 62-65, 82B, 82-85, 86-87, 88-91, 94-97, 98-101, 102-103, 112-113, 124-127, 128-129
PS.7.6.5 Investigate careers, scientists, and historical breakthroughs related to energy forms and conversions	<b>Earth Science Teacher's Guide:</b> 30B, 132, 198B  <b>Physical Science Teacher's Guide:</b> 62B, 62-65, 82B, 82-85, 86, 88-91, 96, 98-101, 102-103, 112-113, 124-127, 129

## Strand 4: Earth and Space Systems

### Standard 8: Earth Systems

**Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<p><b>Structure and Properties</b>                      ESS.8.6.1                      Identify and diagram the layers of the Earth:</p> <ul style="list-style-type: none"> <li>• crust</li> <li>• mantle</li> <li>• inner and outer core</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 20, 21, 35, 80, 219, 221</p>
<p>ESS.8.6.2                      Model the layers of the Earth</p>	<p><b>Earth Science Teacher's Guide:</b> 20, 21, 35, 80, 219, 221</p>
<p>ESS.8.6.3                      Model how convection currents in the mantle affect lithosphere movement</p>	<p><b>Earth Science Teacher's Guide:</b> 89, 219</p>
<p>ESS.8.6.4                      Conduct investigations to identify the variables within volcanoes that cause different types of eruptions</p>	<p><b>Earth Science Teacher's Guide:</b> 82B, 82-85, 86-87, 88-90, 224</p>
<p>ESS.8.6.5                      Diagram and explain how volcanoes work</p>	<p><b>Earth Science Teacher's Guide:</b> 82B, 82-85, 88-90, 224</p>
<p>ESS.8.6.6                      Explain how volcanic activity relates to mountain formation</p>	<p><b>Earth Science Teacher's Guide:</b> 81</p>
<p>ESS.8.6.7                      Connect short-term changes in climate with volcanic activity</p>	<p><b>Earth Science Teacher's Guide:</b> 24, 51, 88, 169</p>
<p>ESS.8.6.8                      Compare and contrast the different land forms caused by Earth's internal forces:</p> <ul style="list-style-type: none"> <li>• mountains</li> <li>• plateaus</li> <li>• trenches</li> <li>• islands</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 72B, 78, 81, 83</p>

Student Learning Expectations, Grade 6	Science Daybooks
ESS.8.6.10 Identify the effects of earthquakes on Earth’s surface: <ul style="list-style-type: none"> <li>• tsunamis</li> <li>• floods</li> <li>• changes in natural and man-made structures</li> </ul>	<b>Earth Science Teacher’s Guide: 89</b>
ESS.8.6.11 Investigate and map patterns of earthquake and volcanic activity	<b>Earth Science Teacher’s Guide: 36, 90</b>
ESS.8.6.12 Locate earthquake belts on Earth: <ul style="list-style-type: none"> <li>• Mediterranean-Trans-Asiatic</li> <li>• Circum-Pacific (Ring of Fire)</li> </ul>	<b>Earth Science Teacher’s Guide: 90</b>
ESS.8.6.13 Analyze how earthquake occurrences are recorded (seismograph) and measured (Richter scale)	<b>Earth Science Teacher’s Guide: 89, 90</b>
ESS.8.6.14 Model the effect of major geological events on land and ocean features: <ul style="list-style-type: none"> <li>• mountain building</li> <li>• ocean trenches</li> <li>• island formation</li> <li>• mid-ocean ridges</li> </ul>	<b>Earth Science Teacher’s Guide: 23, 72B, 78, 79, 81, 83</b>
ESS.8.6.15 Investigate careers, scientists, and historical breakthroughs related to internal forces that change the Earth	<b>Earth Science Teacher’s Guide: 23, 72B, 72-75, 76-79, 80-81, 82B, 88-91</b>

## Standard 9: Earth's History: Changes in Earth and Sky

**Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<b>Earth's History</b> ESS.9.6.1 Research methods of determining geologic time: <ul style="list-style-type: none"> <li>• fossil records</li> <li>• mountain building</li> <li>• rock sequencing</li> </ul>	<b>Earth Science Teacher's Guide:</b> 20-23, 24-27, 40-43, 44-47, 48-49, 72B, 72-75, 78, 79, 81, 83
ESS.9.6.2 Model rock layer sequencing based on characteristics of fossils	<b>Earth Science Teacher's Guide:</b> 20-23, 24-27
ESS.9.6.3 Analyze evidence that supports the theory of plate tectonics: <ul style="list-style-type: none"> <li>• matching coastlines</li> <li>• similar rock types</li> <li>• fossil record</li> </ul>	<b>Earth Science Teacher's Guide:</b> 20-23, 47, 72B, 72-75, 76-79, 80-81

## Standard 10: Objects in the Universe

**Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 6	Science Daybooks
<b>Solar system: Sun, Earth, Moons, Planets, Galaxies</b> ESNS.10.6.2 Compare the distance of the following: <ul style="list-style-type: none"> <li>• from the sun to Earth (light minutes)</li> <li>• from the next nearest star to Earth (light years)</li> </ul>	<b>Earth Science Teacher's Guide:</b> 199
ESNS.10.6.3 Describe how astronomers measure distance to stars	<b>Earth Science Teacher's Guide:</b> 199
ESNS.10.6.4 Calculate the rate at which we would have to travel to other stars and planets in our solar system using current technology	<b>Earth Science Teacher's Guide:</b> 199
ESNS.10.6.5 Explain the effect of the sun on comets	<b>Earth Science Teacher's Guide:</b> 178B, 182-183, 184-187, 190

Student Learning Expectations, Grade 6	Science Daybooks
<p>ESNS.10.6.6 Compare and contrast comets, meteors, and asteroids by</p> <ul style="list-style-type: none"> <li>• size</li> <li>• orbits</li> <li>• nucleus</li> <li>• mass</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 178B, 178-181, 182-183, 184-187</p>
<p>ESNS.10.6.9 Investigate careers, scientists, and historical breakthroughs related to the sun and space travel</p>	<p><b>Earth Science Teacher’s Guide:</b> 188B, 208B, 208-211, 212-213, 214-217</p>

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 correlated to  
**Arkansas Science Curriculum Framework**  
**Grade 7**

**Strand 1: Nature of Science**

**Standard 1: Characteristics and Processes of Science**

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 7	Science Daybooks
<b>Processes of Science</b> NS.1.7.1 Interpret evidence based on observations	<b>Earth Science Teacher’s Guide:</b> 20-23, 45, 49, 71, 82, 84-85, 95, 100, 103, 120-121, 124, 125, 126, 129, 143, 160, 173, 174, 187, 192, 193  <b>Life Science Teacher’s Guide:</b> 10, 12, 13, 24, 26-27, 48-49, 54, 55, 64, 91, 114, 117, 118, 120, 122-123, 132-133, 140-141, 146, 148-149, 150, 154-155, 162, 164, 214, 216  <b>Physical Science Teacher’s Guide:</b> 28-29, 31, 34-35, 52, 55, 64, 70, 78, 81, 104, 107, 116, 136, 188, 190, 206-207
NS.1.7.2 Analyze components of experimental design used to produce empirical evidence: <ul style="list-style-type: none"> <li>• hypothesis</li> <li>• replication</li> <li>• sample size</li> <li>• appropriate use of control</li> <li>• use of standardized variables</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 27, 40-43, 45, 46, 48-49, 63, 67, 72-75, 76-79, 88-91, 99, 113, 123, 128-129, 163, 171, 172-175, 192-195, 198-201, 202, 220  <b>Life Science Teacher’s Guide:</b> 24, 26-27, 35, 82-85, 86-89, 94-97, 129, 132-133, 136-139, 158-161, 166-169, 188-191, 190, 205, 214-217, 221, 224  <b>Physical Science Teacher’s Guide:</b> 18-19, 66-67, 76, 77, 103, 119, 124, 129, 138-141, 150-151, 174, 181, 190, 191, 213
NS.1.7.3 Interpret scientific data using mean, median, mode, and range using SI units	<b>Life Science Teacher’s Edition:</b> 100  <b>Physical Science Teacher’s Edition:</b> 10B, 77, 172

Student Learning Expectations, Grade 7	Science Daybooks
<p>NS.1.7.4 Construct and interpret scientific data using</p> <ul style="list-style-type: none"> <li>• histograms</li> <li>• circle graphs</li> <li>• scatter plots</li> <li>• double line graphs</li> <li>• line graphs by approximating line of best fit</li> </ul>	<p><b>Earth Science Teacher’s Edition:</b> 116-117, 140, 152, 162-163, 196, 200</p> <p><b>Life Science Teacher’s Edition:</b> 34, 127, 138, 152, 160, 190, 204-205, 213</p> <p><b>Physical Science Teacher’s Edition:</b> 103, 151, 160</p>
<p>NS.1.7.5 Communicate results and conclusions from scientific inquiry</p>	<p><b>Earth Science Teacher’s Guide:</b> 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217</p> <p><b>Life Science Teacher’s Guide:</b> 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217</p>
<p>NS.1.7.6 Develop and implement strategies for long-term, accurate data collection</p>	<p><b>Earth Science Teacher’s Guide:</b> 10B, 17, 30B, 31, 40B, 41, 49, 52B, 53, 94B, 97, 101, 114B, 115, 124B, 125, 136B, 143, 145, 146B, 147, 149, 156B, 157, 166B, 173, 168, 188B, 189</p> <p><b>Life Science Teacher’s Guide:</b> 10B, 11, 20B, 24, 25, 26, 32, 36, 40B, 41, 62-63, 69, 78-79, 81, 82B, 83, 94B, 95, 132-133, 136B, 137, 139, 140, 141, 144, 148, 156B, 159, 188B, 193, 198B, 199, 203, 216-217</p> <p><b>Physical Science Teacher’s Guide:</b> 10B, 15, 18, 30B, 31, 37, 40B, 43, 47, 104B, 109, 114B, 117, 124B, 125, 133, 136B, 139, 147, 148, 150-151, 156-157, 166B, 169, 173, 183, 184, 205, 206-207, 217</p>

Student Learning Expectations, Grade 7	Science Daybooks
<p>NS.1.7.7 Distinguish between questions that can and cannot be answered by science</p>	<p><b>Earth Science Teacher’s Edition:</b> 10, 11, 14-15, 16, 18-19, 22-23, 26-27, 31-33, 36-37, 42-43, 44, 46-47, 49, 52, 54-55, 56, 58-59, 64-65, 69, 71, 72, 74-75, 77-79, 81, 82, 84-85, 87, 88, 90-91, 96, 98-99, 100, 102-103, 105, 106, 108-109, 110, 112-113, 114, 116-117, 120-121, 123, 126-127, 128-129, 132-133, 137, 139, 140-141, 142, 145, 148-149, 152-153, 155, 156, 158, 160, 162-163, 165, 168-169, 171, 172, 174-175, 180-181, 183, 186-187, 191, 192, 194-185, 197, 200-201, 204-205, 206-207, 210-211, 213</p> <p><b>Life Science Teacher’s Edition:</b> 12-13, 14, 19, 20, 22-23, 24, 25, 26-27, 29, 33, 36-37, 39, 40, 42-43, 46-47, 53, 54, 56-57, 58, 60-61, 62, 64, 66-67, 70-71, 74-75, 78-79, 81, 84-85, 88-89, 94, 96-97, 98, 100-101, 103, 105-107, 108, 109, 110, 112-113, 114, 116-117, 118, 120-121, 123, 126-127, 130-131, 132-133, 138-139, 141, 144-145, 146, 148-149, 152-153, 155, 157, 158, 160-161, 162, 164-165, 166, 168-169, 171, 172, 174-175, 180-181, 184-185, 187, 190-191, 194-195, 197, 198, 200-201, 202, 204-205, 206, 207, 208, 210-211, 213, 214, 216-217</p> <p><b>Physical Science Teacher’s Edition:</b> 12-13, 16-17, 18-19, 22-23, 25-27, 29, 30, 31-32, 34-35, 38-39, 41, 44-45, 48-49, 54-55, 58-59, 61, 64-65, 67, 68, 70-71, 73, 76-77, 78, 80-81, 84-85, 87, 90-91, 96-97, 100-101, 103, 106-107, 110-111, 113, 115, 116, 118-119, 120, 122-123, 124, 126-127, 129, 132-133, 136-137, 138, 140-141, 144-145, 146, 148-149, 150-151, 154-155, 156-157, 158, 160-161, 162, 164-165, 167, 168, 170-171, 174-175, 180-181, 184-185, 187, 190-191, 194-195, 197, 199, 202-203, 206-207, 210-211, 214-215, 217</p>
<p>NS.1.7.8 Explain the role of testability and modification in the development of a theory</p>	<p><b>Earth Science Teacher’s Edition:</b> 72B, 72-75, 76-79, 80-81</p> <p><b>Life Science Teacher’s Edition:</b> 224</p> <p><b>Physical Science Teacher’s Edition:</b> 10B, 40, 224</p>
<p>NS.1.7.9 Compare and contrast hypotheses, laws, and theories</p>	<p><b>Earth Science Teacher’s Guide:</b> 72-75, 76, 78-79, 80-81, 220, 223</p> <p><b>Life Science Teacher’s Guide:</b> 129, 136, 139, 158, 161, 224</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20A, 20-29, 40, 76, 119, 124, 150, 151, 181, 224</p>

## Strand 2: Life Science

### Standard 2: Living Systems: Characteristics, Structure, and Function

**Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 7	Science Daybooks
<p><b>Structure and Function</b>                      LS.2.7.1                      Illustrate the hierarchical relationships of cells, tissues, organs, and organ systems</p>	<p><b>Life Science Teacher’s Guide:</b> 10, 22, 40B, 40, 44, 46, 47, 48-49, 134, 142, 146B, 146-149, 150-153, 154, 156-157, 162-165, 222, 223, 224</p>
<p>LS.2.7.2                      Analyze how two or more organs work together to perform a function (e.g., mouth and stomach to digest food)</p>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 134, 146B, 142-145, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.3                      Identify organ systems in vertebrates and plants</p>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 55, 134, 142-145, 146B, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.4                      Analyze the structure and function of tissues, organs, and organ systems of a vertebrate and an angiosperm using various models or methods of dissection</p>	<p><b>Life Science Teacher’s Guide:</b> 40, 44-47, 48-49, 55, 134, 142-145, 146B, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.5                      Compare and contrast vertebrate systems and plant organ systems</p>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 55, 134, 142-145, 146B, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.6                      Identify human body systems:</p> <ul style="list-style-type: none"> <li>• nervous</li> <li>• digestive</li> <li>• circulatory</li> <li>• respiratory</li> <li>• excretory</li> <li>• integumentary</li> <li>• skeletal/muscular</li> <li>• endocrine</li> <li>• reproductive</li> </ul>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 134, 146B, 142-145, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.7                      Relate the structure of vertebrate and plant body systems to their functions</p>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 55, 134, 142-145, 146B, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>
<p>LS.2.7.8                      Investigate functions of human body systems</p>	<p><b>Life Science Teacher’s Guide:</b> 48-49, 134, 146B, 142-145, 146-149, 150-153, 154-155, 156-157, 162-165, 222</p>

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
LS.2.7.9 Describe interactions between major organ systems	<b>Life Science Teacher's Guide:</b> 48-49, 55, 134, 142-145, 146B, 146-149, 150-153, 154-155, 156-157, 162-165, 222
LS.2.7.10 Investigate careers, scientists, and historical breakthroughs related to life systems	<b>Life Science Teacher's Guide:</b> 20B, 39, 40A, 40B, 44-47, 136A, 137-139, 156B, 159, 161, 183

### **S t a n d a r d 3 : L i f e C y c l e s , R e p r o d u c t i o n , a n d H e r e d i t y**

**Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Heredity and Reproduction</b> LS.3.7.1 Explain that the fertilized egg cell carries genetic information from each parent and multiplies to form a complete organism	<b>Life Science Teacher's Guide:</b> 18-19, 68, 221
LS.3.7.2 Distinguish between sperm cells and egg cells	<b>Life Science Teacher's Guide:</b> 18, 220, 224
LS.3.7.3 Compare and contrast the structure and function of the sperm cell and the egg cell in vertebrates and plants and their role in sexual reproduction	<b>Life Science Teacher's Guide:</b> 18, 220, 224
LS.3.7.4 Investigate and analyze the development of embryos	<b>Life Science Teacher's Guide:</b> 35, 40B, 58
LS.3.7.5 Dissect a poultry egg to analyze its structure (e.g., paper, plastic, or clay models, virtual dissection, or specimen dissection)	<b>Life Science Teacher's Guide:</b> 12-13
LS.3.7.6 Dissect a flower to analyze the reproductive system of angiosperms (e.g., paper, plastic, or clay models; virtual dissection; or specimen dissection)	<b>Life Science Teacher's Guide:</b> 55, 56, 126, 132
LS.3.7.7 Differentiate between sexual and asexual reproduction in <ul style="list-style-type: none"> <li>• vertebrates</li> <li>• plants</li> </ul>	<b>Life Science Teacher's Guide:</b> 18, 35, 55, 58, 126, 132

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
LS.3.7.8 Identify the number and source of chromosomes in human body cells	<b>Life Science Teacher's Guide:</b> 33, 219
LS.3.7.9 Identify the number and source of chromosomes in human sex cells	<b>Life Science Teacher's Guide:</b> 52, 219
LS.3.7.10 Explain the role of cell division	<b>Life Science Teacher's Guide:</b> 18-19, 30B, 30-33, 34-37, 39, 218
LS.3.7.11 Investigate careers, scientists, and historical breakthroughs related to reproduction	<b>Life Science Teacher's Guide:</b> 18-19, 54-57
<b>Regulation and Behavior</b> LS.3.7.12 Summarize the interactions between organ systems in the maintenance of homeostasis	<b>Life Science Teacher's Guide:</b> 20B, 39, 40A, 40B, 44-47, 136A, 137-139, 156B, 159, 161

### **Standard 4: Populations and Ecosystems**

**Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Populations and Ecosystems</b> LS.4.7.1 Explain the role of reproduction in the continuation of a species	<b>Life Science Teacher's Guide:</b> 127, 181

### **Strand 3: Physical Science**

#### **Standard 5: Matter and Changes**

**Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Properties of Matter</b> PS.5.7.1 Explain how a small number of naturally-occurring elements can result in the large variety of substances found in the world	<b>Physical Science Teacher's Guide:</b> 136-137, 142-145, 166B, 166-167, 168-171, 172-175, 220

Student Learning Expectations, Grade 7	Science Daybooks
<p>PS.5.7.2 Create models of common compounds:</p> <ul style="list-style-type: none"> <li>• water</li> <li>• carbon dioxide</li> <li>• salt</li> <li>• iron oxide</li> <li>• ammonia</li> </ul>	<p><b>Life Science Teacher’s Guide:</b> 22, 25, 29</p> <p><b>Physical Science Teacher’s Guide:</b> 168-171, 175</p>
<p>PS.5.7.3 Identify compounds as substances consisting of two or more elements chemically combined</p>	<p><b>Physical Science Teacher’s Guide:</b> 136, 168, 201, 219</p>
<p>PS.5.7.4 Compare and contrast properties of compounds to those of the elements that compose them:</p> <ul style="list-style-type: none"> <li>• salt: sodium, chlorine</li> <li>• water: hydrogen, oxygen</li> <li>• carbon dioxide: carbon, oxygen</li> </ul>	<p><b>Life Science Teacher’s Guide:</b> 22, 25, 29</p> <p><b>Physical Science Teacher’s Guide:</b> 168-171, 175, 219</p>
<p>PS.5.7.5 Demonstrate techniques for forming and separating mixtures:</p> <ul style="list-style-type: none"> <li>• mixing</li> <li>• magnetic attraction</li> <li>• evaporation</li> <li>• filtration</li> <li>• chromatography</li> <li>• settling</li> </ul>	<p><b>Physical Science Teacher’s Guide:</b> 148-149, 155, 156B, 156-157, 158-161, 182-185, 188-190, 221</p>
<p>PS.5.7.6 Classify substances as</p> <ul style="list-style-type: none"> <li>• elements</li> <li>• compounds</li> <li>• mixtures</li> </ul>	<p><b>Physical Science Teacher’s Guide:</b> 136-137, 138, 148-149, 155, 156B, 156-157, 158-161, 166-167, 168, 172-175, 182-185, 188-190, 201, 219, 220, 221</p>
<p>PS.5.7.7 Distinguish among solvent, solute, and solution</p>	<p><b>Physical Science Teacher’s Guide:</b> 158-161, 162-165, 196, 201, 223</p>
<p>PS.5.7.8 Investigate the effect of variables on solubility rates</p>	<p><b>Physical Science Teacher’s Guide:</b> 159, 162-165</p>
<p>PS.5.7.10 Investigate scientists, careers, and historical breakthroughs related to elements, mixtures, and compounds</p>	<p><b>Physical Science Teacher’s Guide:</b> 136B, 138-141, 155, 156B, 158-160, 166B, 166-167, 168-171, 201</p>

## Standard 6: Motion and Forces

**Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 7	Science Daybooks
<b>Motions and Forces</b> PS.6.7.1 Compare and contrast Newton’s three laws of motion	<b>Earth Science Teacher’s Guide:</b> 209  <b>Physical Science Teacher’s Guide:</b> 8, 10-13, 20-23, 24-27, 28-29, 222
PS.6.7.2 Conduct investigations demonstrating Newton’s first law of motion	<b>Physical Science Teacher’s Guide:</b> 12-13, 20, 22-23
PS.6.7.3 Demonstrate Newton’s second law of motion	<b>Physical Science Teacher’s Guide:</b> 24-27
PS.6.7.4 Conduct investigations of Newton’s third law of motion	<b>Physical Science Teacher’s Guide:</b> 29
PS.6.7.5 Explain how Newton’s three laws of motion apply to real world situations (e.g., sports, transportation)	<b>Earth Science Teacher’s Guide:</b> 209  <b>Physical Science Teacher’s Guide:</b> 8, 10-13, 20B, 20-23, 24-27, 28-29
PS.6.7.6 Investigate careers, scientists, and historical breakthroughs related to laws of motion	<b>Physical Science Teacher’s Guide:</b> 8, 9, 10, 12, 15, 16, 20, 24-27, 28, 222

## Standard 7: Energy and Transfer of Energy

**Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 7	Science Daybooks
<b>Energy</b> PS.7.7.1 Identify natural resources used to supply energy needs	<b>Earth Science Teacher’s Guide:</b> 30B, 30-33, 34, 37, 38-39, 220, 222  <b>Physical Science Teacher’s Guide:</b> 71
PS.7.7.2 Describe alternatives to the use of fossil fuels: <ul style="list-style-type: none"> <li>• solar energy</li> <li>• geothermal energy</li> <li>• wind</li> <li>• hydroelectric power</li> <li>• nuclear energy</li> <li>• biomass</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 30B, 33, 34-37, 38, 39, 103, 130, 211, 220, 223  <b>Physical Science Teacher’s Guide:</b> 71

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
PS.7.7.3 Conduct investigations to identify types of potential energy and kinetic energy	<b>Physical Science Teacher’s Guide:</b> 10B, 14-17, 18-19, 186, 221, 222
PS.7.7.4 Investigate alternative energy sources	<b>Earth Science Teacher’s Guide:</b> 33, 35, 130-131
PS.7.7.5 Investigate careers, scientists, and historical breakthroughs related to natural resources, alternative resources, electricity, and magnetism	<b>Earth Science Teacher’s Guide:</b> 30B, 130-133 <b>Physical Science Teacher’s Guide:</b> 62B, 62-65, 66-67, 68-71, 72B, 72-73, 74-77, 78-81

## S t r a n d 4 : E a r t h a n d S p a c e S y s t e m s

### S t a n d a r d 8 : E a r t h S y s t e m s

**Students shall demonstrate and apply knowledge of Earth’s structure and properties using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Structure and Properties</b> ESS.8.7.1 Describe the composition and physical characteristics of the atmosphere	<b>Earth Science Teacher’s Guide:</b> 95, 136B, 136-137, 138-141, 142-145, 218
ESS.8.7.2 Investigate the influence of global patterns on local weather: <ul style="list-style-type: none"> <li>• movement of air masses</li> <li>• Coriolis effect</li> <li>• jet stream</li> <li>• global wind belts</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 142-145, 218
ESS.8.7.5 Identify elements of weather: <ul style="list-style-type: none"> <li>• temperature</li> <li>• air pressure</li> <li>• wind speed</li> <li>• wind direction</li> <li>• humidity</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 124B, 134, 146-149, 150-153, 154-155, 156B, 156-159, 160-163, 164-165
ESS.8.7.6 Conduct investigations using weather measurement devices: <ul style="list-style-type: none"> <li>• anemometers</li> <li>• barometers</li> <li>• sling psychrometers</li> <li>• thermometers</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 94A, 101, 136B, 136-137, 146A, 149

Student Learning Expectations, Grade 7	Science Daybooks
<p>ESS.8.7.7 Predict weather conditions using data on the following:</p> <ul style="list-style-type: none"> <li>• temperature</li> <li>• air pressure: highs, lows, fronts</li> <li>• clouds</li> <li>• wind speed</li> <li>• wind direction</li> <li>• humidity</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 94, 134, 142, 146B, 146-149, 150-153, 154-155, 156B, 156-159, 160-163, 164-165</p>
<p>ESS.8.7.8 Identify the causes and effects of weather-related phenomena:</p> <ul style="list-style-type: none"> <li>• thunderstorms</li> <li>• tornadoes/hurricanes/cyclones/typhoons</li> <li>• drought</li> <li>• acid precipitation</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 75, 134, 146B, 146-149, 150-153, 154-155, 156B, 156-159, 160-163</p>
<p>ESS.8.7.9 Explain tornado belt weather patterns using a map of the United States</p>	<p><b>Earth Science Teacher’s Guide:</b> 156-159</p>
<p>ESS.8.7.10 Describe ways human beings protect themselves, others, and their property from adverse weather conditions</p>	<p><b>Earth Science Teacher’s Guide:</b> 71, 156, 159, 165</p>
<p>ESS.8.7.11 Describe and map climates of major Earth regions</p>	<p><b>Earth Science Teacher’s Guide:</b> 115, 166, 170, 218</p>
<p>ESS.8.7.13 Identify and explain the effects that human activities have on weather and atmosphere</p>	<p><b>Earth Science Teacher’s Guide:</b> 166B</p>
<p>ESS.8.7.15 Investigate careers, scientists, and historical breakthroughs related to atmosphere and weather</p>	<p><b>Earth Science Teacher’s Guide:</b> 124B, 134, 136-137, 146B, 146-149, 150-153, 154-155, 162</p>
<p><b>Cycles</b> ESS.8.7.16 Conduct investigations demonstrating the water cycle</p>	<p><b>Earth Science Teacher’s Guide:</b> 92, 94B, 94-95, 103</p>
<p>ESS.8.7.17 Explain the relationship between the water cycle and ground water</p>	<p><b>Earth Science Teacher’s Guide:</b> 94B, 94-95</p>
<p>ESS.8.7.18 Investigate cloud formation</p>	<p><b>Earth Science Teacher’s Guide:</b> 94, 95, 142, 157, 158, 160, 218</p>

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
ESS.8.7.19 Conduct investigations demonstrating the greenhouse effect	<b>Earth Science Teacher’s Guide:</b> 166B
ESS.8.7.20 Research how human activities may contribute to global warming	<b>Earth Science Teacher’s Guide:</b> 166B
ESS.8.7.21 Explain examples of actual events that cause temporary climate changes: <ul style="list-style-type: none"> <li>• volcanic dust</li> <li>• drought</li> <li>• meteor impact</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 24, 53-55, 88, 116, 161, 169

## **S t a n d a r d 9 : E a r t h ’ s H i s t o r y : C h a n g e s i n E a r t h a n d S k y**

**Students shall demonstrate and apply knowledge of Earth’s history using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Earth’s History</b> ESS.9.7.1 Analyze charts to infer past atmospheric conditions based on the organisms found in the fossil record	<b>Earth Science Teacher’s Guide:</b> 24
ESS.9.7.2 Demonstrate that Earth has a magnetic field that is detectible at the surface with a compass	<b>Earth Science Teacher’s Guide:</b> 78 <b>Physical Science Teacher’s Guide:</b> 74, 75, 76
ESS.9.7.3 Compare and contrast Earth’s magnetic field to those of natural or human-made magnets with <ul style="list-style-type: none"> <li>• North and South poles</li> <li>• lines of force</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 78 <b>Physical Science Teacher’s Guide:</b> 74, 75, 76
ESS.9.7.4 Analyze evidence of sea floor spreading: <ul style="list-style-type: none"> <li>• magnetic reversal</li> <li>• molten material</li> <li>• drilling samples</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 76, 78-79
ESS.9.7.5 Research ways in which people have used compasses	<b>Physical Science Teacher’s Guide:</b> 74, 75

## **Standard 10: Objects in the Universe**

**Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 7</b>	<b>Science Daybooks</b>
<b>Solar system: Sun, Earth, Moons, Planets, Galaxies</b> ESNS.10.7.6 Investigate careers, scientists, and historical breakthroughs related to rotations and revolutions of bodies in space	<b>Earth Science Teacher's Guide:</b> 178, 180, 181, 182

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 correlated to  
**Arkansas Science Curriculum Framework**  
**Grade 8**

**Strand 1: Nature of Science**

**Standard 1: Characteristics and Processes of Science**

Students shall demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	Science Daybooks
<p><b>Processes of Science</b>                      NS.1.8.1                      Justify conclusions based on appropriate and unbiased observations</p>	<p><b>Earth Science Teacher’s Guide:</b> 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217</p> <p><b>Life Science Teacher’s Guide:</b> 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217</p>
<p>NS.1.8.2                      Evaluate the merits of empirical evidence based on experimental design:</p> <ul style="list-style-type: none"> <li>• hypothesis</li> <li>• replication</li> <li>• sample size</li> <li>• appropriate use of control</li> <li>• use of standardized independent and dependent variables</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 27, 40-43, 45, 46, 48-49, 63, 67, 72-75, 76-79, 88-91, 99, 113, 123, 128-129, 163, 171, 172-175, 192-195, 198-201, 202, 220</p> <p><b>Life Science Teacher’s Guide:</b> 24, 26-27, 35, 82-85, 86-89, 94-97, 129, 132-133, 136-139, 158-161, 166-169, 188-191, 190, 205, 214-217, 221, 224</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 66-67, 76, 77, 103, 119, 124, 129, 138-141, 150-151, 174, 181, 190, 191, 213</p>

Student Learning Expectations, Grade 8	Science Daybooks
<p>NS.1.8.3 Formulate a testable problem using experimental design</p>	<p><b>Earth Science Teacher’s Edition:</b> 27, 63, 67, 77, 78, 99, 113, 123, 129, 172, 173, 174</p> <p><b>Life Science Teacher’s Edition:</b> 126, 136, 139, 158, 161</p> <p><b>Physical Science Teacher’s Edition:</b> 18-19, 103, 150-151, 181, 213</p>
<p>NS.1.8.4 Analyze a set of scientific data using mean, median, mode, and range using SI units</p>	<p><b>Life Science Teacher’s Edition:</b> 100</p> <p><b>Physical Science Teacher’s Edition:</b> 10B, 77, 172</p>
<p>NS.1.8.5 Suggest solutions to real world problems by analyzing scientific data in</p> <ul style="list-style-type: none"> <li>• data tables/charts</li> <li>• histograms</li> <li>• circle graphs</li> <li>• scatter plots</li> <li>• stem and leaf plots</li> <li>• line and double line graphs by approximating line of best fit</li> </ul>	<p><b>Earth Science Teacher’s Edition:</b> 13, 22, 29, 32, 39, 41, 47, 60-61, 87, 116-117, 119, 130, 139, 140, 149, 152, 162-163, 174, 196-197, 200</p> <p><b>Life Science Teacher’s Edition:</b> 12-13, 26-27, 33, 34, 36, 49, 56, 63, 70, 79, 82-85, 87, 110, 120, 126, 127, 128, 132-133, 138, 144-145, 152, 160, 164-165, 190, 193-195, 200-201, 204-205, 210, 213</p> <p><b>Physical Science Teacher’s Edition:</b> 10, 14, 18-19, 25-26, 55, 90, 91, 103, 110, 133, 144-145, 148-149, 151, 154, 157, 160, 161, 167, 184-185, 190, 194, 203, 206-207, 210, 215, 217</p>
<p>NS.1.8.6 Formulate inferences based on scientific data</p>	<p><b>Earth Science Teacher’s Guide:</b> 16, 18, 29, 30, 34, 40, 41, 42, 43, 44, 45, 47, 48, 49, 52, 55, 56, 58, 61, 62, 66, 67, 70, 71, 72, 73, 80, 82, 86, 88, 95, 96, 97, 104, 106, 110, 118, 124, 125, 126, 128, 129, 130, 138, 141, 142, 143, 154, 155, 160, 164, 165, 166, 168, 169, 170, 182, 184, 188, 192, 193, 195, 197, 199, 202, 203, 205, 207, 208, 212, 220</p> <p><b>Life Science Teacher’s Guide:</b> 10, 14, 18, 20, 40, 43, 44, 47, 67, 68, 72, 75, 82, 85, 87, 94, 97, 98, 101, 104, 105, 108-109, 110, 112, 114, 116-117, 118, 119, 121, 122, 123, 128, 130, 137, 139, 141, 142, 143, 145, 146, 150, 154-155, 156-157, 162, 165, 178, 180, 182, 186, 187, 192, 196, 197, 198, 200, 202, 205, 206, 208, 217</p> <p><b>Physical Science Teacher’s Guide:</b> 10, 14, 16, 19, 20, 23, 30, 31, 35, 36, 40, 41, 42, 43, 46, 48, 52, 54, 56, 59, 61, 62, 65, 67, 68, 71, 72, 73, 74, 77, 78, 79, 82, 85, 94, 97, 99, 102, 103, 104, 106, 108, 109, 110, 112, 113, 114, 115, 120, 124, 127, 128, 129, 146, 149, 152, 157, 162, 165, 169, 172, 174, 178, 181, 182, 183, 186, 187, 188, 191, 192, 197, 198, 199</p>

Student Learning Expectations, Grade 8	Science Daybooks
<p>NS.1.8.7 Communicate results and conclusions from scientific inquiry following peer review</p>	<p><b>Earth Science Teacher’s Guide:</b> 17, 20, 24, 25, 27, 28, 29, 30, 33, 39, 40-41, 49, 52, 56, 59, 60, 61, 64, 66, 71, 81, 82, 85, 88, 91, 96, 97, 99, 100, 103, 107, 109, 111, 113, 117, 118, 119, 121, 124, 128, 130, 142, 145, 150, 153, 155, 171, 174-175, 187, 189, 195, 196, 197, 213, 217</p> <p><b>Life Science Teacher’s Guide:</b> 13, 14, 17, 18, 19, 20, 22, 24-25, 26-27, 30, 31, 33, 44, 46, 48, 49, 52, 53, 55, 59, 64, 66-67, 76, 79, 86, 88, 94, 97, 103, 107, 110, 111, 113, 115, 118, 121, 122-123, 139, 141, 142, 144-145, 146, 147, 149, 155, 158, 166-169, 173, 178, 179, 181, 182, 185, 188, 191, 192, 193-194, 195, 202, 205, 209, 213, 214</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20, 23, 25, 28, 40, 42, 45, 46, 49, 55, 74, 77, 89, 94, 95, 101, 102, 103, 111, 112, 113, 124, 125, 139, 149, 155, 171, 193, 209, 211, 216-217</p>
<p>NS.1.8.8 Develop and implement strategies for long-term, accurate data collection</p>	<p><b>Earth Science Teacher’s Guide:</b> 10B, 17, 30B, 31, 40B, 41, 49, 52B, 53, 94B, 97, 101, 114B, 115, 124B, 125, 136B, 143, 145, 146B, 147, 149, 156B, 157, 166B, 173, 168, 188B, 189</p> <p><b>Life Science Teacher’s Guide:</b> 10B, 11, 20B, 24, 25, 26, 32, 36, 40B, 41, 62-63, 69, 78-79, 81, 82B, 83, 94B, 95, 132-133, 136B, 137, 139, 140, 141, 144, 148, 156B, 159, 188B, 193, 198B, 199, 203, 216-217</p> <p><b>Physical Science Teacher’s Guide:</b> 10B, 15, 18, 30B, 31, 37, 40B, 43, 47, 104B, 109, 114B, 117, 124B, 125, 133, 136B, 139, 147, 148, 150-151, 156-157, 166B, 169, 173, 183, 184, 205, 206-207, 217</p>

Student Learning Expectations, Grade 8	Science Daybooks
<p><b>Characteristics of Science</b>  NS.1.8.9  Generate questions that can and cannot be answered by science</p>	<p><b>Earth Science Teacher’s Edition:</b> 10, 11, 14-15, 16, 18-19, 22-23, 26-27, 31-33, 36-37, 42-43, 44, 46-47, 49, 52, 54-55, 56, 58-59, 64-65, 69, 71, 72, 74-75, 77-79, 81, 82, 84-85, 87, 88, 90-91, 96, 98-99, 100, 102-103, 105, 106, 108-109, 110, 112-113, 114, 116-117, 120-121, 123, 126-127, 128-129, 132-133, 137, 139, 140-141, 142, 145, 148-149, 152-153, 155, 156, 158, 160, 162-163, 165, 168-169, 171, 172, 174-175, 180-181, 183, 186-187, 191, 192, 194-185, 197, 200-201, 204-205, 206-207, 210-211, 213</p> <p><b>Life Science Teacher’s Edition:</b> 12-13, 14, 19, 20, 22-23, 24, 25, 26-27, 29, 33, 36-37, 39, 40, 42-43, 46-47, 53, 54, 56-57, 58, 60-61, 62, 64, 66-67, 70-71, 74-75, 78-79, 81, 84-85, 88-89, 94, 96-97, 98, 100-101, 103, 105-107, 108, 109, 110, 112-113, 114, 116-117, 118, 120-121, 123, 126-127, 130-131, 132-133, 138-139, 141, 144-145, 146, 148-149, 152-153, 155, 157, 158, 160-161, 162, 164-165, 166, 168-169, 171, 172, 174-175, 180-181, 184-185, 187, 190-191, 194-195, 197, 198, 200-201, 202, 204-205, 206, 207, 208, 210-211, 213, 214, 216-217</p> <p><b>Physical Science Teacher’s Edition:</b> 12-13, 16-17, 18-19, 22-23, 25-27, 29, 30, 31-32, 34-35, 38-39, 41, 44-45, 48-49, 54-55, 58-59, 61, 64-65, 67, 68, 70-71, 73, 76-77, 78, 80-81, 84-85, 87, 90-91, 96-97, 100-101, 103, 106-107, 110-111, 113, 115, 116, 118-119, 120, 122-123, 124, 126-127, 129, 132-133, 136-137, 138, 140-141, 144-145, 146, 148-149, 150-151, 154-155, 156-157, 158, 160-161, 162, 164-165, 167, 168, 170-171, 174-175, 180-181, 184-185, 187, 190-191, 194-195, 197, 199, 202-203, 206-207, 210-211, 214-215, 217</p>
<p>NS.1.8.10  Explain the role of peer review, evidence, and modification in the development of a theory</p>	<p><b>Earth Science Teacher’s Edition:</b> 72B, 72-75, 76-79, 80-81</p> <p><b>Life Science Teacher’s Edition:</b> 224</p> <p><b>Physical Science Teacher’s Edition:</b> 10B, 40, 224</p>
<p>NS.1.8.11  Evaluate the merit of hypotheses, laws, and theories</p>	<p><b>Earth Science Teacher’s Guide:</b> 72-75, 76, 78-79, 80-81, 220, 223</p> <p><b>Life Science Teacher’s Guide:</b> 129, 136, 139, 158, 161, 224</p> <p><b>Physical Science Teacher’s Guide:</b> 18-19, 20A, 20-29, 40, 76, 119, 124, 150, 151, 181, 224</p>

## Strand 2: Life Science

### Standard 2: Living Systems: Characteristics, Structure, and Function

**Students shall demonstrate and apply knowledge of living systems using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<p><b>Structure and Function</b>                      LS.2.8.1                      Illustrate the hierarchical relationships of cells, tissues, organs, organ systems, and organisms</p>	<p><b>Life Science Teacher’s Guide:</b> 10, 22, 40B, 40, 44, 46, 47, 48-49, 134, 142, 146B, 146-149, 150-153, 154, 156-157, 162-165, 222, 223, 224</p>
<p>LS.2.8.2                      Identify different types of single-celled organisms:</p> <ul style="list-style-type: none"> <li>• protists</li> <li>• bacteria</li> </ul>	<p><b>Life Science Teacher’s Guide:</b> 10, 20, 94B, 94-97, 98-101, 102-103, 170, 172-175, 218, 223</p>
<p>LS.2.8.3                      Relate the effect of bacteria on oral health</p>	<p><b>Life Science Teacher’s Guide:</b> 102</p>
<p>LS.2.8.6                      Compare and contrast characteristics of unicellular organisms and multi-cellular organisms</p>	<p><b>Life Science Teacher’s Guide:</b> 10, 20, 34, 94B, 94-97, 98-101, 102-103, 170, 172-175, 218, 222, 223</p>
<p>LS.2.8.7                      Classify cells as eukaryotic or prokaryotic</p>	<p><b>Life Science Teacher’s Guide:</b> 14, 20</p>
<p>LS.2.8.8                      Identify and describe similarities and differences among organisms of different, but closely related taxa (e.g., pine trees, big cats, rodents, ungulates)</p>	<p><b>Life Science Teacher’s Guide:</b> 82B, 82-85, 86-89, 90-91</p>
<p>LS.2.8.9                      Investigate careers, scientists, and historical breakthroughs related to organisms</p>	<p><b>Life Science Teacher’s Guide:</b> 52B, 54-57, 58-61, 62B, 65, 72B, 73, 82B, 82-85, 87, 88-89, 90-91, 94, 95, 98, 104B, 114B, 114-117, 119, 121, 122, 124B, 126-127</p>

## Standard 3: Life Cycles, Reproduction, and Heredity

Students shall demonstrate and apply knowledge of life cycles, reproduction, and heredity using appropriate safety procedures, equipment, and technology.

Student Learning Expectations, Grade 8	Science Daybooks
<p><b>Heredity and Reproduction</b>                      LS.3.8.1                      Identify and explain why inherited characteristics of living things depend on genes</p>	<p><b>Life Science Teacher's Guide:</b> 18-19, 50, 52B, 52-53, 54-57, 58-61, 62B, 62-63, 64-67, 68-71, 221</p>
<p>LS.3.8.2                      Differentiate between dominant and recessive traits</p>	<p><b>Life Science Teacher's Guide:</b> 57, 59, 62-63, 64-67, 77-79, 219, 223</p>
<p>LS.3.8.3                      Observe and classify traits as dominant or recessive:</p> <ul style="list-style-type: none"> <li>• tongue rolling</li> <li>• detached earlobes</li> <li>• widow's peak</li> <li>• hitchhiker's thumb</li> <li>• dimples</li> <li>• unibrow</li> </ul>	<p><b>Life Science Teacher's Guide:</b> 62-63</p>
<p>LS.3.8.4                      Differentiate among observed inherited traits and acquired traits of plants and animals</p>	<p><b>Life Science Teacher's Guide:</b> 50, 51, 52-53, 54, 57, 58-61, 62B, 62-63, 64-67, 68-71, 76-79, 220, 223, 224</p>
<p>LS.3.8.6                      Predict patterns that emerge from simple genetic crosses</p>	<p><b>Life Science Teacher's Guide:</b> 62-63, 66</p>
<p>LS.3.8.8                      Explain how genetic variation within a species is a result of dominant traits and recessive traits</p>	<p><b>Life Science Teacher's Guide:</b> 50, 55, 57, 59, 62-63, 64-67, 77-79</p>
<p>LS.3.8.9                      Compare and contrast patterns of embryological development for all vertebrates, including humans</p>	<p><b>Life Science Teacher's Guide:</b> 35, 40B, 58</p>
<p>LS.3.8.10                      Distinguish between characteristics of plants and animals through selective breeding</p>	<p><b>Life Science Teacher's Guide:</b> 18-19, 52A, 58-61, 72B</p>
<p>LS.3.8.11                      Investigate careers, scientists, and historical breakthroughs related to genetics</p>	<p><b>Life Science Teacher's Guide:</b> 52B, 54-57, 58-61, 62B, 65</p>

<b>Student Learning Expectations, Grade 8</b>	<b>Science Daybooks</b>
<b>Regulation and Behavior</b> LS.3.8.12 Compare the theory of evolution to the characteristics of a scientific theory	<b>Life Science Teacher’s Guide:</b> 72-75, 76-79, 80-81, 186-187, 220
LS.3.8.13 Identify basic ideas related to biological evolution: <ul style="list-style-type: none"> <li>• diversity of species</li> <li>• variations within species</li> <li>• adaptations</li> <li>• natural selection</li> <li>• extinction of a species</li> </ul>	<b>Life Science Teacher’s Guide:</b> 50, 54-57, 58-61, 62-63, 64-67, 72B, 72-75, 76-79, 80-81, 82B, 82-85, 86-89, 90-91, 94-97, 98-101, 102-103, 104-107, 108-109, 110-113, 124-127, 128-131, 132-133, 178-181, 182-185, 192-195, 198-201, 202-205, 214-217
LS.3.8.14 Explain that the fossil record provides evidence of life forms’ appearance, diversification, and extinction	<b>Earth Science Teacher’s Guide:</b> 40B, 41, 42, 44-47  <b>Life Science Teacher’s Guide:</b> 82-83
LS.3.8.15 Explain the process of natural selection	<b>Life Science Teacher’s Guide:</b> 76-79, 80-81, 222
LS.3.8.16 Identify genetic traits that make organisms more likely to survive and reproduce in a particular environment	<b>Life Science Teacher’s Guide:</b> 72B, 72-75, 76-79, 80-81
LS.3.8.17 Investigate careers, scientists, and historical breakthroughs related to natural selection and the fossil record	<b>Earth Science Teacher’s Guide:</b> 40B, 41-43, 44-47  <b>Life Science Teacher’s Guide:</b> 76-79, 80-81, 82-83

**Standard 4: Populations and Ecosystems**  
 Students shall demonstrate and apply knowledge of populations and ecosystems using appropriate safety procedures, equipment, and technology.

<b>Student Learning Expectations, Grade 8</b>	<b>Science Daybooks</b>
<b>Populations and Ecosystems</b> LS.4.8.1 Analyze the effect of changes in environmental conditions on the survival of individual organisms and entire species	<b>Life Science Teacher’s Guide:</b> 72-75, 76-79, 80-81

## Strand 3: Physical Science

### Standard 5: Matter and Changes

**Students shall demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<b>Properties of Matter</b> PS.5.8.1 Compare the atomic theory to the characteristics of a scientific theory	<b>Physical Science Teacher's Guide:</b> 136-137, 138-141, 173-175, 218
PS.5.8.2 Explain the structure of atoms	<b>Physical Science Teacher's Guide:</b> 136-137, 138-141
PS.5.8.3 Determine the number of protons, neutrons, and electrons in an atom	<b>Physical Science Teacher's Guide:</b> 167, 169, 174, 175
PS.5.8.4 Create atomic models of common elements	<b>Life Science Teacher's Guide:</b> 22, 25, 29  <b>Physical Science Teacher's Guide:</b> 145, 170, 173, 174, 175
PS.5.8.5 Investigate scientists, careers, and historical breakthroughs related to the atomic theory	<b>Physical Science Teacher's Guide:</b> 136B, 138-141

### Standard 6: Motion and Forces

**Students shall demonstrate and apply knowledge motion and forces using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<b>Motions and Forces</b> PS.6.8.1 Model how motion and forces change Earth's surface: <ul style="list-style-type: none"> <li>• compression</li> <li>• tension</li> <li>• weathering</li> <li>• erosion</li> </ul>	<b>Earth Science Teacher's Guide:</b> 20, 21, 29, 52B, 52-55, 56-59, 60-61, 62B, 62-65, 66-69, 70-71, 72B, 78, 81, 83, 89, 219, 224
PS.6.8.2 Conduct investigations demonstrating the field force (lines of force) in magnetic fields	<b>Physical Science Teacher's Guide:</b> 70-71, 74, 75, 76

<b>Student Learning Expectations, Grade 8</b>	<b>Science Daybooks</b>
PS.6.8.3 Design and conduct investigations applying variables affecting the strength of an electromagnet	<b>Physical Science Teacher’s Guide:</b> 79-81
PS.6.8.4 Analyze and compare the relationship between electricity and magnetism	<b>Physical Science Teacher’s Guide:</b> 70, 71, 78-81
PS.6.8.5 Investigate careers, scientists, and historical breakthroughs related to motion and forces that change Earth’s surface	<b>Earth Science Teacher’s Guide:</b> 52B, 52-55, 56-59, 60-61, 62B, 65, 66-69, 70-71, 72B, 78, 81, 89

**Standard 7: Energy and Transfer of Energy**  
**Students shall demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.**

<b>Student Learning Expectations, Grade 8</b>	<b>Science Daybooks</b>
<b>Energy</b> PS.7.8.1 Construct open and closed electrical circuits: <ul style="list-style-type: none"> <li>• series circuits</li> <li>• parallel circuits</li> </ul>	<b>Physical Science Teacher’s Guide:</b> 69-71, 219
PS.7.8.2 Describe and diagram open and closed series and parallel circuits	<b>Physical Science Teacher’s Guide:</b> 69-71, 219
PS.7.8.3 Compare and contrast open and closed series circuits and parallel circuits	<b>Physical Science Teacher’s Guide:</b> 219
PS.7.8.4 Conduct investigations demonstrating the characteristics of a wave: <ul style="list-style-type: none"> <li>• wavelength</li> <li>• frequency</li> <li>• speed</li> <li>• amplitude</li> </ul>	<b>Physical Science Teacher’s Guide:</b> 94B, 97, 100, 103, 105, 109, 110-111, 112-113, 218, 220, 223, 224
PS.7.8.6 Explain how energy is transferred through waves: <ul style="list-style-type: none"> <li>• seismic waves</li> <li>• sound waves</li> <li>• water waves</li> <li>• electromagnetic waves</li> </ul>	<b>Earth Science Teacher’s Guide:</b> 89, 90  <b>Physical Science Teacher’s Guide:</b> 94B, 94-97, 98-101, 104-107, 108-111, 112-113, 221

Student Learning Expectations, Grade 8	Science Daybooks
PS.7.8.7 Describe how waves travel through different kinds of media	<b>Physical Science Teacher's Guide:</b> 93, 94B, 94, 97, 98, 104B, 104, 105
PS.7.8.8 Differentiate among reflection, refraction, and absorption of various types of waves	<b>Physical Science Teacher's Guide:</b> 97, 101, 114B, 117, 120-123
PS.7.8.9 Describe and diagram the electromagnetic spectrum	<b>Physical Science Teacher's Guide:</b> 94B, 98-101
PS.7.8.10 Analyze the electromagnetic spectrum	<b>Physical Science Teacher's Guide:</b> 94B, 98-101
PS.7.8.11 Investigate examples of real world uses of the electromagnetic spectrum	<b>Physical Science Teacher's Guide:</b> 94B, 98-101
PS.7.8.12 Conduct investigations demonstrating the separation of white light into its spectrum using refraction	<b>Physical Science Teacher's Guide:</b> 98-101, 117
PS.7.8.13 Compare ways to transfer information: <ul style="list-style-type: none"> <li>• sound</li> <li>• light</li> <li>• radio</li> <li>• microwave energy</li> </ul>	<b>Physical Science Teacher's Guide:</b> 92, 97, 98-101, 102-103, 104-107, 108-111, 112-113, 114-115, 116-119, 120, 199, 200-203
PS.7.8.14 Investigate careers, scientists, and historical breakthroughs related to waves and the electromagnetic spectrum	<b>Physical Science Teacher's Guide:</b> 92, 93, 94B, 98-101, 102-103, 104-107, 111, 112-113, 114-115

## Strand 4: Earth and Space Systems

### Standard 8: Earth Systems

**Students shall demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<p><b>Structure and Properties</b>                      ESS.8.8.1                      Analyze the causes and predict the consequences of global warming on the following:</p> <ul style="list-style-type: none"> <li>• weather</li> <li>• temperature</li> <li>• ocean water levels</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 134, 166B, 172-175, 220</p>
<p>ESS.8.8.2                      Investigate how global patterns of water currents influence local weather:</p> <ul style="list-style-type: none"> <li>• Gulf Stream</li> <li>• Atlantic Currents</li> <li>• California Current</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 123, 127, 129</p>
<p>ESS.8.8.3                      Conduct investigations to compare and contrast different landforms found on Earth:</p> <ul style="list-style-type: none"> <li>• mountains</li> <li>• plateaus</li> <li>• plains</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 10-11, 16, 81</p>
<p>ESS.8.8.4                      Synthesize and model the result of both constructive and destructive forces on land forms:</p> <ul style="list-style-type: none"> <li>• deposition</li> <li>• erosion</li> <li>• weathering</li> <li>• crustal deformation</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 20, 21, 29, 52B, 52-55, 56-59, 60-61, 62B, 62-65, 66-69, 70-71, 72B, 72-75, 76-79, 80-81, 82B, 82-85, 219, 224</p>
<p>ESS.8.8.5                      Compare and contrast the different landforms caused by Earth's external forces:</p> <ul style="list-style-type: none"> <li>• plains</li> <li>• canyons</li> <li>• deltas</li> <li>• valleys</li> <li>• swamps</li> </ul>	<p><b>Earth Science Teacher's Guide:</b> 52</p>
<p>ESS.8.8.7                      Use topographic maps to identify surface features of Earth</p>	<p><b>Earth Science Teacher's Guide:</b> 10-11, 12, 16, 223</p>

Student Learning Expectations, Grade 8	Science Daybooks
<p>ESS.8.8.8 Demonstrate an understanding of the agents of erosion:</p> <ul style="list-style-type: none"> <li>• gravity</li> <li>• water</li> <li>• ice</li> <li>• wind</li> <li>• animals, including humans</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 20, 21, 29, 52-55, 56-59, 60-61, 62-65, 66-69, 70-71, 219</p>
<p>ESS.8.8.9 Using models of rivers, predict changes when variables, such as load, slope, amount of water, or the composition of a stream bed, are changed through erosion or deposition</p>	<p><b>Earth Science Teacher’s Guide:</b> 104B, 106-109, 110-113</p>
<p>ESS.8.8.11 Investigate careers, scientists, and historical breakthroughs related to external forces that change the Earth</p>	<p><b>Earth Science Teacher’s Guide:</b> 59, 60-61, 62B, 62-65, 66-69, 70-71</p>
<p><b>Cycles</b> ESS.8.8.12 Investigate the types of weathering involved in the breakdown of organic and inorganic components of Earth’s surface</p>	<p><b>Earth Science Teacher’s Guide:</b> 20, 21, 29, 52B, 52-55, 56-59, 60-61, 62B, 62-65, 66-69, 70-71, 219, 224</p>
<p>ESS.8.8.13 Illustrate soil profiles</p>	<p><b>Earth Science Teacher’s Guide:</b> 52, 53, 54, 60, 223</p>
<p>ESS.8.8.14 Apply knowledge of soil profiles to local soil samples</p>	<p><b>Earth Science Teacher’s Guide:</b> 53</p>
<p>ESS.8.8.15 Investigate the formation of soil types</p>	<p><b>Earth Science Teacher’s Guide:</b> 53</p>
<p>ESS.8.8.16 Identify components of soil as inorganic or organic through investigations</p>	<p><b>Earth Science Teacher’s Guide:</b> 53</p>
<p>ESS.8.8.17 Identify the basic nutrients needed by plants that are present in soils:</p> <ul style="list-style-type: none"> <li>• nitrogen</li> <li>• phosphorous</li> <li>• potassium</li> </ul>	<p><b>Earth Science Teacher’s Guide:</b> 24, 129</p>

Student Learning Expectations, Grade 8	Science Daybooks
ESS.8.8.18 Identify ways plants use organic and inorganic components in the soil	<b>Earth Science Teacher's Guide:</b> 24, 129
ESS.8.8.19 Investigate and analyze the composition of a variety of soils	<b>Earth Science Teacher's Guide:</b> 52, 53, 54, 60

## Standard 9: Earth's History: Changes in Earth and Sky

**Students shall demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<b>Earth's History</b> ESS.9.8.1 Explain processes that have changed Earth's surface that have resulted from sudden events (e.g., earthquakes and volcanoes) and gradual changes (e.g., uplift, erosion, and weathering)	<b>Earth Science Teacher's Guide:</b> 20, 21, 29, 52B, 52-55, 56-59, 60-61, 62B, 62-65, 66-69, 70-71, 72B, 72-75, 76-79, 80-81, 82B, 82-85, 219, 224
ESS.9.8.2 Analyze how rock sequences may be disturbed by the following: <ul style="list-style-type: none"> <li>• erosion</li> <li>• deposition</li> <li>• igneous intrusion</li> <li>• folding</li> <li>• faulting</li> <li>• uplifting</li> </ul>	<b>Earth Science Teacher's Guide:</b> 20, 21, 29, 62B, 62-65, 66-69, 70-71, 72B, 72-75, 76-79, 80-81, 82B, 82-85, 219, 224

## Standard 10: Objects in the Universe

**Students shall demonstrate and apply knowledge of objects in the universe using appropriate safety procedures, equipment, and technology.**

Student Learning Expectations, Grade 8	Science Daybooks
<b>Solar system: Sun, Earth, Moons, Planets, Galaxies</b> ESS.10.8.1 Summarize the effects of gravity on bodies in space	<b>Earth Science Teacher's Guide:</b> 204, 212, 220
ESNS.10.8.2 Identify variables that affect the amount of gravitational force between two objects: <ul style="list-style-type: none"> <li>• mass of the objects</li> <li>• distance between the objects</li> </ul>	<b>Physical Science Teacher's Guide:</b> 16

Student Learning Expectations, Grade 8	Science Daybooks
ESNS.10.8.5 Define the terms galaxy and universe	<b>Earth Science Teacher's Guide:</b> 198B, 198-201, 202-205, 206-207, 220
ESNS.10.8.6 Illustrate the appearance of galaxies as seen through a telescope: <ul style="list-style-type: none"> <li>• clarity</li> <li>• shape</li> </ul>	<b>Earth Science Teacher's Guide:</b> 207
ESNS.10.8.9 Investigate careers, scientists, and historical breakthroughs related to gravity, galaxies, and the universe	<b>Earth Science Teacher's Guide:</b> 198B, 200-201, 202-205, 206-207  <b>Physical Science Teacher's Guide:</b> 15-16, 20-23



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