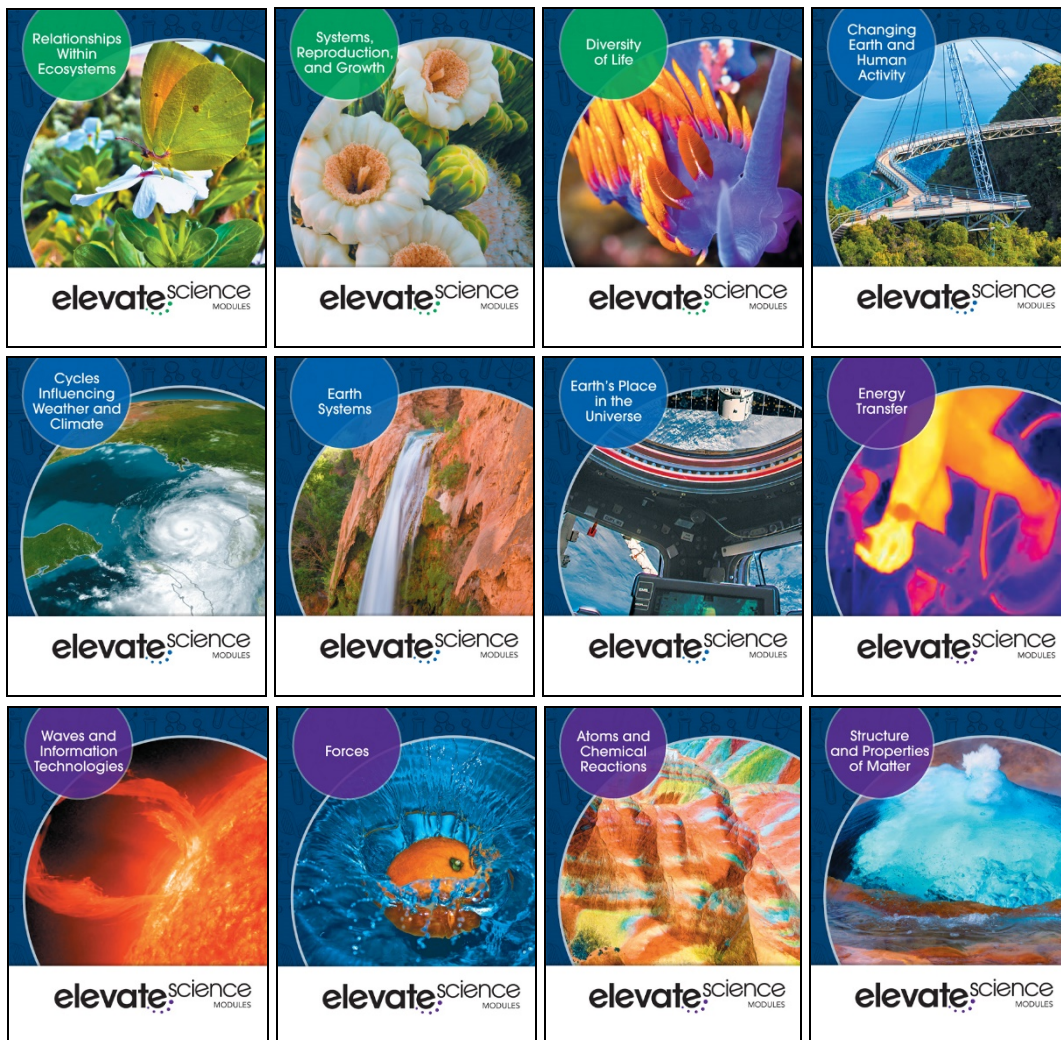


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To the  
**Arizona Science Standards (2018)**  
**Grade 8**

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| <b>Grade 8</b>   |  |
| <b>Eighth Grade: Focus on Cause and Effect; Energy and Matter; Stability and Change</b>  |  |
| <b>Physical Sciences: Students apply stability and change to explore chemical properties of matter and chemical reactions to further understand energy and matter.</b>                                   |  |
| <b>Physical Science Standards</b>  |  |
| 8.P1U1.1 Develop and use a model to demonstrate that atoms and molecules can be combined or rearranged in chemical reactions to form new compounds with the total number of each type of atom conserved. | <p><b>Atoms and Chemical Reactions</b><br/><b>SE/TE:</b><br/>Chemical Change, 80<br/>Building and Breaking Chemical Bonds, 81<br/>Evidence of Chemical Reactions, 82–83<br/>Law of Conservation of Mass, 94–95<br/>For related content, please see:<br/>Changes in Energy, 84<br/>Energy Graphs for Chemical Reactions, 85<br/>The Art of Chemical Change, 89<br/>Chemical Equations, 91–93<br/>Types of Chemical Reactions, 96</p> <p><b>Structure and Properties of Matter</b><br/><b>SE/TE:</b><br/>Chemical Changes in Matter, 27–29</p> |
| 8.P1U1.2 Obtain and evaluate information regarding how scientists identify substances based on unique physical and chemical properties.  | <p><b>Structure and Properties of Matter</b><br/><b>SE/TE:</b><br/>Matter, 5–7<br/>Video, 6<br/>Literacy Connection, 7<br/>Lesson 1 Check, 12</p>  |

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| 8.P4U1.3 Construct an explanation on how energy can be transferred from one energy store to another. | <p><b>Energy Transfer</b><br/> <b>SE/TE:</b><br/>           Energy in Motion and Force, 5<br/>           Thermal Energy, 25<br/>           Energy Transformation and Transfer, 35<br/>           uDemonstrate Lab: 3,2,1...Liftoff!, 46-49<br/>           Thermal Energy and Heat, 55<br/>           Types of Heat Transfer, 63-65<br/>           Question It!, 67<br/>           Temperature, Energy, and Friction, 76<br/>           For related content, please see:<br/>           Energy Changes and the Law of Conservation, 36-37<br/>           How Thermal Energy and Temperature Are Related, 57<br/>           Energy Conservation, 66</p>  |
| 8.P4U1.4 Develop and use mathematical models to explain wave characteristics and interactions.       | <p><b>Waves and Information Technologies</b><br/> <b>SE/TE:</b><br/>           Types of Waves, 5-7<br/>           Properties of Waves, 8-9<br/>           Wave Energy, 10<br/>           Reflection, Refraction, and Absorption, 15-17<br/>           Wave Interference, 18-21<br/>           The Behavior of Sound, 25-27<br/>           Factors Affecting the Speed of Sound, 28<br/>           Loudness and Pitch, 29-31<br/>           The Doppler Effect, 32<br/>           Characteristics of Electromagnetic Waves, 35<br/>           Models of Electromagnetic Wave Behavior, 36-37<br/>           Wavelength and Frequency, 38<br/>           The Electromagnetic Spectrum, 39-41<br/>           Light, Color, and Objects, 45-47<br/>           Reflecting Light, 48-50<br/>           Lenses, 51-52<br/>           For related content, please see:</p> <p><b>Energy Transfer</b><br/> <b>SE/TE:</b><br/>           Conservation of Energy in Waves, 38</p> |

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| 8.P4U2.5 Develop a solution to increase efficiency when transferring energy from one source to another.   | <p><b>Energy Transfer</b><br/> <b>SE/TE:</b><br/>           Quest Kickoff, 52–53<br/>           Quest Check-In, 68<br/>           Quest Check-Ins, 79<br/>           Quest Findings, 83</p>   |
| <b>Earth and Space Sciences: Students explore natural and human-induced cause-and-effect changes in Earth systems over time.</b>                  |   |
| <b>Earth and Space Standards</b>  |   |
| 8.E1U1.6 Analyze and interpret data about the Earth’s geological column to communicate relative ages of rock layers and fossils.                  | <p><b>Earth Systems</b><br/> <b>SE/TE:</b><br/>           Describing the Ages of Rocks, 155<br/>           Determining the Relative Ages of Rocks, 156–158<br/>           For related content, please see:<br/>           Determining Absolute Ages of Rocks, 159–160<br/>           The Geologic Time Scale, 165</p>   |
| 8.E1U3.7 Obtain, evaluate, and communicate information about data and historical patterns to predict natural hazards and other geological events. | <p><b>Earth Systems</b><br/> <b>SE/TE:</b><br/>           Case Study: The Case of the Shrinking Sea, 34–35<br/>           Connect It!, 108<br/>           Model It!, 105</p> <p><b>Cycles Influencing Weather and Climate</b><br/> <b>SE/TE:</b><br/>           How to Predict Weather, 31–33<br/>           Learning from Weather Maps, 34<br/>           Lesson 4 Check, 36<br/>           Lesson 1 Check, 70</p> |

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| <p>8.E1U3.8 Construct and support an argument about how human consumption of limited resources impacts the biosphere.</p> | <p><b>Changing Earth and Human Activity</b><br/><b>SE/TE:</b><br/>           Natural Resources, 57<br/>           Fossil Fuels, 58–62<br/>           Using Energy Resources, 64<br/>           Reducing Fossil Fuel Usage, 67<br/>           Humans and Minerals, 80<br/>           Case Study: Phosphorus Fiasco, 82–83<br/>           Human Impacts, 88–89<br/>           Using Natural Resources, 108–109<br/>           Balancing Needs, 110<br/>           Causes of Pollution, 113<br/>           Outdoor Air Pollution, 114–116<br/>           Sources of Freshwater Pollution, 138–139<br/>           Sources of Ocean Pollution, 140–141<br/>           For related content, please see:<br/>           Nuclear Energy, 63<br/>           Controlling Air Pollution, 118–119<br/>           Global to Local: Working Together to Reduce Air Pollution, 121<br/>           Land as a Resource, 123–124<br/>           Importance of Soil Management, 125–128<br/>           Sustainable Forest Management, 130–132<br/>           Water as a Resource, 137<br/>           Reducing Water Pollution, 142–143</p> <p><b>Cycles Influencing Weather and Climate</b><br/><b>SE/TE:</b><br/>           Recent Climate Change, 119–122</p> <p><b>Relationships Within Ecosystems</b><br/><b>SE/TE:</b><br/>           Human Impact, 103–104</p> |

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| <b>Life Sciences: Students develop an understanding of patterns and how genetic information is passed from generation to generation. They also develop the understanding of how traits within populations change over time.</b> |  |
| <b>Life Science Standards</b>   |  |
| 8.L3U1.9 Construct an explanation of how genetic variations occur in offspring through the inheritance of traits or through mutations.  | <b>Diversity of Life</b><br><b>SE/TE:</b><br>Diversity of Life, 37<br>Chromosomes and Variation, 38–39<br>Types of Mutations, 40–41<br>Environmental Factors, 42–43<br>Mutations in Reproduction, 44–46<br>How Natural Selection Works, 83<br>Genes and Natural Selection, 86–87<br>Mutations, 92–94 |
| 8.L3U3.10 Communicate how advancements in technology have furthered the field of genetic research and use evidence to support an argument about the positive and negative effects of genetic research on human lives.           | <b>Diversity of Life</b><br><b>SE/TE:</b><br>Artificial Selection, 49<br>Genetic Engineering, 50–53<br>Practical Uses for DNA, 54–56<br>Lesson 5 Check, 57<br>Topic 1 Review and Assess, 59<br>For related content, please see:<br>uEngineer It! Reinventing DNA as Data Storage, 35                 |
| 8.L4U1.11 Develop and use a model to explain how natural selection may lead to increases and decreases of specific traits in populations over time.   | <b>Diversity of Life</b><br><b>SE/TE:</b><br>How Natural Selection Works, 83<br>Model It!, 85<br>Genes and Natural Selection, 86–87<br>Evolution by Natural Selection, 81–87<br>Lesson 2 Check, 88   |
| 8.L4U1.12 Gather and communicate evidence on how the process of natural selection provides an explanation of how new species can evolve.  | <b>Diversity of Life</b><br><b>SE/TE:</b><br>Diversity of Life, 37<br>Mutations in Reproduction, 44–46<br>Evolution by Natural Selection, 81–87<br>Lesson 2 Check, 88  |