

# SCIENCE FUSION



Houghton Mifflin Harcourt™

**ScienceFusion**

correlated to the

**Oklahoma Academic Standards for Science:  
Disciplinary Core Ideas**      **Grade 7**

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<p><b>Oklahoma Academic Standards: Disciplinary Core Ideas Grade 7</b></p>	<p><b>Citations</b></p> <p>In the <i>ScienceFusion</i> digital curriculum, students encounter the same science concepts, vocabulary, and inquiry as they see in the Student Edition, but written with new examples or scenarios to provide an alternative digital experience for every write-in textbook lesson.</p>	
<p><b>MS-PS1-1: Matter and Its Interactions</b></p>		
<p><b>Structure and Properties of Matter:</b></p> <ul style="list-style-type: none"> <li>• Substances are made from different types of atoms, which combine with one another in various ways.</li> <li>• Atoms form molecules that range in size from two to thousands of atoms.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod H U3 L3: Electrons and Chemical Bonding, pp. 180-189</p> <p>Mod H U3 L3: Electrons and Chemical Bonding, pp. 228-240</p>
<p><b>Structure and Properties of Matter:</b></p> <ul style="list-style-type: none"> <li>• Solids may be formed from molecules, or they may be extended structures with repeating subunits (e.g., crystals).</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>SE/Digital Curriculum</b></p>	<p>Mod H U3 L4: Ionic, Covalent, and Metallic Bonding, pp. 192-201</p> <p>Mod H U3 L4: Ionic, Covalent, and Metallic Bonding, pp. 244-256</p>

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<p><b>MS-PS1-2: Matter and Its Interactions</b></p>		
<p><b>Structure and Properties of Matter:</b></p> <ul style="list-style-type: none"> <li>Each pure substance has characteristic physical and chemical properties (for any bulk quantity under given conditions) that can be used to identify it.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod H U1 L4: Pure Substances and Mixtures, pp. 50-63; Mod H U3 L2: The Periodic Table, pp. 168-179</p> <p>Mod H U1 L4: Pure Substances and Mixtures, pp. 68-82; Mod H U3 L2: The Periodic Table, pp. 214-227</p>
<p><b>Chemical Reactions:</b></p> <ul style="list-style-type: none"> <li>Substances react chemically in characteristic ways.</li> <li>In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod H U4 L1: Chemical Reactions, pp. 212-223</p> <p>Mod H U4 L1: Chemical Reactions, pp. 272-285</p>
<p><b>MS-PS2-4: Motion and Stability: Forces and Interactions</b></p>		
<p><b>Types of Interactions:</b></p> <ul style="list-style-type: none"> <li>Gravitational forces are always attractive.</li> <li>There is a gravitational force between any two masses, but it is very small except when one or both of the objects have large mass—e.g., Earth and the sun.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod I U1 L4: Gravity and Motion, pp. 42-51</p> <p>Mod I U1 L4: Gravity and Motion, pp. 60-72</p>

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<p><b>MS-PS3-6: Energy</b></p>		
<p><b>Conservation of Energy and Energy Transfer:</b></p> <ul style="list-style-type: none"> <li>When the motion energy of an object changes, there is inevitably some other change in energy at the same time.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod H U2 L1: Introduction to Energy, pp. 100-111</p> <p>Mod H U2 L1: Introduction to Energy, pp. 130-143</p>
<p><b>MS-LS1-4: From Molecules to Organisms: Structure and Processes</b></p>		
<p><b>Growth and Development of Organisms:</b></p> <ul style="list-style-type: none"> <li>Animals engage in characteristic behaviors that increase the odds of reproduction.</li> <li>Plants reproduce in a variety of ways, sometimes depending on animal behavior and specialized features for reproduction.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod B U2 L6: Animal Behavior, pp. 150-161; Mod B U2 L4: Plant Processes, pp. 120-133</p> <p>Mod B U2 L6: Animal Behavior, pp. 190-203; Mod B U2 L4: Plant Processes, pp. 156-170</p>
<p><b>MS-LS1-5: From Molecules to Organisms: Structure and Processes</b></p>		
<p><b>Growth and Development of Organisms:</b></p> <ul style="list-style-type: none"> <li>Genetic factors as well as local conditions affect the growth of the adult plant.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod B U2 L4: Plant Processes, pp. 120-133</p> <p>Mod B U2 L4: Plant Processes, pp. 156-170</p>

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<p><b>MS-LS1-8: From Molecules to Organisms: Structure and Processes</b></p>		
<p><b>Information Processing:</b></p> <ul style="list-style-type: none"> <li>Each sense receptor responds to different inputs (electromagnetic, mechanical, chemical), transmitting them as signals that travel along nerve cells to the brain. The signals are then processed in the brain, resulting in immediate behaviors or memories.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod C U1 L2: The Nervous and Endocrine Systems, pp. 58-71; Mod A U2 L6: Animal Behavior, pp. 150-161</p> <p>Mod C U1 L2: The Nervous and Endocrine Systems, pp. 78-92; Mod A U2 L6: Animal Behavior, pp. 190-203</p>
<p><b>MS-LS3-1: Heredity: Inheritance and Variation of Traits</b></p>		
<p><b>Inheritance of Traits :</b></p> <ul style="list-style-type: none"> <li>Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual.</li> <li>Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod A U2 L4: Heredity, pp. 122-133</p> <p>Mod A U2 L4: Heredity. pp. 172-185</p>

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<p><b>Variation of Traits:</b></p> <ul style="list-style-type: none"> <li>• In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations.</li> <li>• Though rare, mutations may result in changes to the structure and function of proteins.</li> <li>• Some changes are beneficial, others harmful, and some neutral to the organism.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod A U2 L6: DNA Structure and Function, pp. 146-157</p> <p><b>TE/Digital Curriculum</b> Mod A U2 L6: DNA Structure and Function, pp. 202-215</p>
<p><b>MS-LS3-2: Heredity: Inheritance and Variation of Traits</b></p>	
<p><b>Growth and Development of Organisms:</b></p> <ul style="list-style-type: none"> <li>• Organisms reproduce, either sexually or asexually, and transfer their genetic information to their offspring.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 112-121</p> <p><b>TE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 158-170</p>
<p><b>Inheritance of Traits:</b></p> <ul style="list-style-type: none"> <li>• Variations of inherited traits between parent and offspring arise from genetic differences that result from the subset of chromosomes (and therefore genes) inherited.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 112-121</p> <p><b>TE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 158-170</p>

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<p><b>Variation of Traits :</b></p> <ul style="list-style-type: none"> <li>In sexually reproducing organisms, each parent contributes half of the genes acquired (at random) by the offspring. Individuals have two of each chromosome and hence two alleles of each gene, one acquired from each parent. These versions may be identical or may differ from each other.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 112-121</p> <p><b>TE/Digital Curriculum</b> Mod A U2 L3: Sexual and Asexual Reproduction, pp. 158-170</p>
<p><b>MS-LS4-3: Biological Unity and Diversity</b></p>	
<p><b>Evidence of Common Ancestry and Diversity:</b></p> <ul style="list-style-type: none"> <li>Comparison of the embryological development of different species also reveals similarities that show relationships not evident in the fully-formed anatomy.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod B U1 L3: Evidence of Evolution, pp. 28-37</p> <p><b>TE/Digital Curriculum</b> Mod B U1 L3: Evidence of Evolution, pp. 44-56</p>
<p><b>MS-LS4-4: Biological Unity and Diversity</b></p>	
<p><b>Natural Selection:</b></p> <ul style="list-style-type: none"> <li>Natural selection leads to the predominance of certain traits in a population, and the suppression of others.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 14-25</p> <p><b>TE/Digital Curriculum</b> Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 28-41</p>

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<p><b>MS-LS4-5: Biological Unity and Diversity</b></p>		
<p><b>Natural Selection:</b></p> <ul style="list-style-type: none"> <li>In artificial selection, humans have the capacity to influence certain characteristics of organisms by selective breeding. One can choose desired parental traits determined by genes, which are then passed on to offspring.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 14-25</p> <p>Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 28-41</p>
<p><i>*Connections to Engineering, Technology, and Application of Science</i></p> <p><b>Interdependence of Science, Engineering, and Technology:</b></p> <ul style="list-style-type: none"> <li>Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod K U3 L1: The Engineering Design Process, pp. 114-125; Mod K U3 L5: Engineering and Life Science, pp.168-179; Mod K U3 L6: Engineering and Life Science, pp.180-191</p> <p>Mod K U3 L1: The Engineering Design Process, pp. 150-163; Mod K U3 L5: Engineering and Life Science, pp.214-227; Mod K U3 L6: Engineering and Our World, pp.228-241</p>



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<p><b>MS-LS4-6: Biological Unity and Diversity</b></p>	
<p><b>Adaptation:</b></p> <ul style="list-style-type: none"> <li>• Adaptation by natural selection acting over generations is one important process by which species change over time in response to changes in environmental conditions.</li> <li>• Traits that support successful survival and reproduction in the new environment become more common; those that do not become less common. Thus, the distribution of traits in a population changes.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 14-25</p> <p><b>TE/Digital Curriculum</b> Mod B U1 L2: Theory of Evolution by Natural Selection, pp. 28-41</p>

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<p><b>MS-ESS1-1: Earth’s Place in the Universe</b></p>	
<p><b>The Universe and Its Stars:</b></p> <ul style="list-style-type: none"> <li>• Patterns of the apparent motion of the sun, the moon, and stars in the sky can be observed, described, predicted, and explained with models.</li> </ul> <p><b>Earth and the Solar System:</b></p> <ul style="list-style-type: none"> <li>• The model of the solar system can explain eclipses of the sun and the moon.</li> <li>• Earth’s spin axis is fixed in direction over the short-term but tilted relative to its orbit around the sun.</li> <li>• The seasons are a result of that tilt and are caused by the differential intensity of sunlight on different areas of Earth across the year.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod G U3 L1: Earth’s Days, Years, and Seasons, pp. 140-149; Mod G U3 L2: Moon Phases and Eclipses, pp. 152-161</p> <p><b>TE/Digital Curriculum</b> Mod G U3 L1: Earth’s Days, Years, and Seasons, pp. 184-196; Mod G U3 L2: Moon Phases and Eclipses, pp. 200-212</p>

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<p><b>MS-ESS1-2: Earth’s Place in the Universe</b></p>	
<p><b>The Universe and Its Stars:</b></p> <ul style="list-style-type: none"> <li>• Earth and its solar system are part of the Milky Way galaxy, which is one of many galaxies in the universe.</li> </ul> <p><b>Earth and the Solar System:</b></p> <ul style="list-style-type: none"> <li>• The solar system consists of the sun and a collection of objects, including planets, their moons, and asteroids that are held in orbit around the sun by its gravitational pull on them.</li> <li>• The solar system appears to have formed from a disk of dust and gas, drawn together by gravity.</li> </ul>	<p><b>SE/Digital Curriculum</b> Mod G U1 L1: Structure of the Universe, pp. 4-13; Mod G U2 L2: Gravity and the Solar System, pp. 60-73</p> <p><b>TE/Digital Curriculum</b> Mod G U1 L1: Structure of the Universe, pp. 12-24; Mod G U2 L2: Gravity and the Solar System, pp. 90-104</p>

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<p><b>MS-ESS1-3: Earth’s Place in the Universe</b></p>		
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<p><b>MS-ESS2-5: Earth’s Systems</b></p>		
<p><b>Weather and Climate:</b></p> <ul style="list-style-type: none"> <li>Because these patterns are so complex, weather can only be predicted probabilistically.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod F U4 L5: Weather Maps and Weather Prediction, pp. 208-221</p> <p>Mod F U4 L5: Weather Maps and Weather Prediction, pp. 266-280</p>

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<p><b>MS-ESS2-6 Earth’s Systems</b></p>		
<p><b>The Roles of Water in Earth’s Surface Processes:</b></p> <ul style="list-style-type: none"> <li>Variations in density due to variations in temperature and salinity drive a global pattern of interconnected ocean currents.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod F U2 L3: Ocean Currents, pp. 80-93</p> <p>Mod F U2 L3: Ocean Currents, pp. 104-118</p>
<p><b>Weather and Climate:</b></p> <ul style="list-style-type: none"> <li>Weather and climate are influenced by interactions involving sunlight, the ocean, the atmosphere, ice, landforms, and living things. These interactions vary with latitude, altitude, and local and regional geography, all of which can affect oceanic and atmospheric flow patterns.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod F U4 L3: What Influences Weather?, pp. 180-193; Mod F U4 L6: Climate, pp. 224-237</p> <p>Mod F U4 L3: What Influences Weather?, pp. 234-248; Mod F U4 L6: Climate, pp. 284-298</p>
<p><b>Weather and Climate:</b></p> <ul style="list-style-type: none"> <li>The ocean exerts a major influence on weather and climate by absorbing energy from the sun, releasing it over time, and globally redistributing it through ocean currents.</li> </ul>	<p><b>SE/Digital Curriculum</b></p> <p><b>TE/Digital Curriculum</b></p>	<p>Mod F U4 L3: What Influences Weather?, pp. 180-193; Mod F U4 L6: Climate, pp. 224-237; Mod F U2 L3: Ocean Currents, pp. 80-93</p> <p>Mod F U4 L3: What Influences Weather?, pp. 234-248; Mod F U4 L6: Climate, pp. 284-298; Mod F U2 L3: Ocean Currents, pp. 104-118</p>