# Correlation of the Smithsonian's STCMS™ to the Oklahoma Academic Standards for Science 2020, Grades 6–8


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# Smithsonian's STCMS™ Learning Framework for the Oklahoma Academic Standards for Science 2020, Grades 6–8

| | Physical Science | Earth Science | Life Science |
|---|---|---|---|
| Grades 6-8 | Electricity, Waves, and Information Transfer | Earth's Dynamic Systems | Structure and Function |
| | Matter and Its Interactions | Weather and Climate Systems | Ecosystems and Their Interactions |
| | Energy, Forces, and Motion | Space Systems Exploration | Genes and Molecular Machines |

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| Grade 6 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™** |
| **Matter and Its Interactions (PS1)** | |
| **6.PS1.4** Develop a model that predicts and describes changes in particle motion, temperature, and state of a pure substance when thermal energy is added or removed. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 5 pgs. 96–105; Lesson 6 pgs. 115c–135a; Lesson 7 pgs. 135c–157a; Lesson 10 pgs. 201c–219a<br><br>***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 4 pgs. 61c–83b; Lesson 11 pgs. 219a–226a |
| **Energy (PS3)** | |
| **6.PS3.3** Apply scientific principles to design, construct, and test a device that either minimizes or maximizes thermal energy transfer. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c–219a<br><br>***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a |
| **6.PS3.4** Plan an investigation to determine the relationships among the energy transferred, the type of matter, the mass, and the change in the average kinetic energy of the particles as measured by the temperature of the sample. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c–219a<br><br>***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 4 pgs. 61c–83b; Lesson 8 pgs. 163a–181b; Lesson 9 pgs. 181c–193; Lesson 11 pgs. 219a–226a<br><br>***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 2 pgs. 9a–23; Lesson 12 pgs. 199a–205 |

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| Grade 6 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™** |
| **Waves and Their Applications in Technologies for Information Transfer (PS4)** | |
| **6.PS4.2 D**evelop and use a model to describe that waves are reflected, absorbed, or transmitted through various materials. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 6 pgs. 115c–135b; Lesson 7 pgs. 135c–157b; Lesson 8 pgs. 157c-177; Lesson 10 pgs. 201c–219a |
| **From Molecules to Organisms: Structure and Processes (LS1)** | |
| **6.LS1.1** Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 2 pgs. 15a–43a; Lesson 8 pgs. 165a–171a<br><br>***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 2 pgs. 17a–33b; Lesson 11 pgs. 181a–186 |
| **6.LS1.2** Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 2 pgs. 15a–43a; Lesson 3 pgs. 43b–65; Lesson 8 pgs. 165a–171a |
| **6.LS1.3** Use an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 6 pgs. 111a–141; Lesson 7 pgs. 141a–165; Lesson 8 pgs. 165a–171a |
| **6.LS1.8** Gather and synthesize information that sensory receptors respond to stimuli by sending messages to the brain for immediate behavior or storage as memories. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 7 pgs. 141a–165; Lesson 8 pgs. 165a–171a<br><br>***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 9 pgs. 177a–201b; Lesson 10 pgs. 201c–219a |
| **Earth's Place in the Universe (ESS1)** | |
| **6.ESS1.4** Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's geologic history. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 1a–13a; Lesson 9 pgs. 241c–275b; Lesson 11 pgs. 295c–319a; Lesson 12 pgs. 319c–329 |

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| Grade 6 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™** |
| **Earth's Systems (ESS2)** | |
| **6.ESS2.1** Develop a model to describe the cycling of Earth's materials and the flow of energy that drives these processes within and among Earth's systems. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 1a–13b; Lesson 5 pgs. 117c–147b; Lesson 12 pgs. 319c–329 |
| **6.ESS2.2** Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 2–13; Lesson 2 pgs. 13c–39b; Lesson 3 pgs. 39c–73b; Lesson 4 pgs. 73c–117b; Lesson 5 pgs. 117c–147b; Lesson 6 pgs. 147a–181; Lesson 7 pgs. 181a–209b; Lesson 8 pgs. 209c–241b; Lesson 9 pgs. 241c–275b; Lesson 10 pgs. 275c–295b; Lesson 11 pgs. 295c–319b; Lesson 12 pgs. 319c–329 |
| **6.ESS2.3** Analyze and interpret data on the patterns of distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 2–13; Lesson 4 pgs. 74–117; Lesson 8 pgs. 209c–241b; Lesson 9 pgs. 241c–275b; Lesson 10 pgs. 275c–295b; Lesson 11 pgs. 295c–319b; Lesson 12 pgs. 319c–32 |
| **6.ESS2.4** Develop a model to describe the cycling of water through Earth's systems driven by energy from the sun and the force of gravity. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 5 pg. 122b; Lesson 10 pg. 281<br><br>***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 3 pgs. 23a–41; Lesson 12 pgs. 199a–205 |
| **6.ESS2.5** Collect data to provide evidence for how the motions and complex interactions of air masses result in changes in weather conditions. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 5 pgs. 119–120<br><br>***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 3 pgs. 23a–41; Lesson 4 pgs. 41a–63b; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 8 pgs. 117c–139; Lesson 12 pgs. 199a–205 |

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| Grade 6 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™** |
| **6.ESS2.6** Develop and use a model to describe how unequal heating and rotation of the Earth causes patterns of atmospheric and oceanic circulation that determine regional climates. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 5 pgs. 119–120<br><br>***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 2 pgs. 9a–23; Lesson 3 pgs. 23a–41; Lesson 4 pgs. 41a–63b; Lesson 5 pgs. 63c–81; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 9 pgs. 139a–153; Lesson 12 pgs. 199a–205 |
| **Earth and Human Activity (ESS3)** | |
| **6.ESS3.2** Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 1a–13a; Lesson 2 pgs. 13c–39b; Lesson 3 pgs. 39c–73a; Lesson 4 pgs. 73c–117a; Lesson 6 pgs. 147a–181; Lesson 7 pgs. 181a–209a; Lesson 12 pgs. 319c–329<br><br>***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 6 pgs. 81a–101; Lesson 7 pgs. 101a–117b; Lesson 8 pgs. 117c–139; Lesson 12 pgs. 199a–205 |

# A Correlation of Smithsonian's STCMS™ to the Oklahoma Academic Standards for Science 2020, Grades 6–8

| Grade 7 | |
|---|---|
| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Matter and Its Interactions (PS1)** | |
| **7.PS1.1** Develop models to describe the atomic composition of simple molecules and extended structures. | ***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 2 pgs. 17c–37b; Lesson 4 pgs. 61c–83b; Lesson 5 pgs. 83c–107b; Lesson 6 pgs. 107c–141; Lesson 10 pgs. 193a–218; Lesson 11 pgs. 219a–226a |
| **7.PS1.2** Analyze and interpret patterns of data related to the properties of substances before and after the substances interact to determine if a chemical reaction has occurred. | ***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 2 pgs. 17c–37b; Lesson 3 pgs. 37c–61b; Lesson 6 pgs. 107c–141; Lesson 7 pgs. 141a–163; Lesson 9 pgs. 181c–192; Lesson 10 pgs. 193a–218; Lesson 11 pgs. 219a–226a |
| **7.PS1.3** Gather and make sense of information to describe that synthetic materials come from natural resources and impact society. | ***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 10 pgs. 193a–219; Lesson 11 pgs. 219a–226a |
| **7.PS1.5** Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved. | ***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 9 pgs. 181c–193; Lesson 11 pgs. 219a–226a |
| **7.PS1.6** Construct, test, and modify a device that releases or absorbs thermal energy by chemical processes to solve a problem. | ***Matter and Its Interactions*** **Teacher Edition**<br>Lesson 1 pgs. vi–17b; Lesson 8 pgs. 163a–181b; Lesson 11 pgs. 219a–226a |
| **Energy (PS3)** | |
| **7.PS3.1** Construct and interpret graphical displays of data to describe the proportional relationships of kinetic energy to the mass of an object and to the speed of an object. | ***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 6 pgs. 82, 90–101<br><br>***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 2 pgs. 13a–31; Lesson 5 pgs. 63a–81; Lesson 9 pgs. 141a–153 |

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| Grade 7 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **7.PS3.2** Develop a model to describe that when objects interacting at a distance change their arrangement, different amounts of potential energy are stored in the system. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 5 pgs. 112–116<br><br>***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 5 pgs. 63a–81; Lesson 6 pgs. 81a–10; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 |
| **7.PS3.5** Construct, use, and present arguments to support the claim that when the kinetic energy of an object changes, energy is transferred to or from the object. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 5 pgs. 112–116<br><br>***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 2 pgs. 13a–31; Lesson 5 pgs. 63a–81; Lesson 7 pgs. 103a–123; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153<br><br>***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 4 pgs. 65a–91; Lesson 5 pgs. 91a–115a; Lesson 10 pgs. 201c–219a |
| **From Molecules to Organisms: Structure and Function (LS1)** | |
| **7.LS1.6** Construct a scientific explanation based on evidence for the role of photosynthesis in the cycling of matter and flow of energy into and out of organisms. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 4 pgs. 79a–97; Lesson 5 pgs. 97a–125; Lesson 11 pgs. 243a–249<br><br>***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 4 pgs. 65a–91; Lesson 8 pgs. 165a–171a |

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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **7.LS1.7** Develop a model to describe how food molecules in plants and animals are broken down and rearranged through chemical reactions to form new molecules that support growth and/or release energy as matter moves through an organism. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 4 pgs. 77–84<br><br>***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 4 pgs. 65a–91; Lesson 5 pgs. 91a–111; Lesson 8 pgs. 165a–171a |
| **Ecosystems: Interactions, Energy, and Dynamics (LS2)** | |
| **7.LS2.1** Analyze and interpret data to provide evidence for the effects of resource availability on organisms and populations of organisms in an ecosystem. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 2 pgs. 27a–49; Lesson 3 pgs. 49a–71; Lesson 6 pgs. 125a–147; Lesson 11 pgs. 243a–249 |
| **7.LS2.2** Construct an explanation that predicts patterns of interactions among organisms across multiple ecosystems. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 6 pgs. 125a–147; Lesson 11 pgs. 243a–249 |
| **7.LS2.3** Develop a model to describe the cycling of matter and flow of energy among living and nonliving parts of an ecosystem. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 4 pgs. 79a–97; Lesson 5 pgs. 97a–125; Lesson 11 pgs. 243a–249 |
| **7.LS2.4** Construct an argument supported by empirical evidence that changes to physical or biological components of an ecosystem affect populations. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 7 pgs. 147a–179; Lesson 8 pgs. 179a–199; Lesson 11 pgs. 243a–249 |
| **7.LS2.5** Evaluate competing design solutions for maintaining biodiversity and ecosystem services. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 9 pgs. 199a–221; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249 |

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| Grade 7 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Earth and Human Activity (ESS3)** | |
| **7.ESS3.1** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes. | ***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 10 pgs. 166–175<br><br>***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 1a–13a; Lesson 10 pgs. 275c–295b; Lesson 12 pgs. 319c–329 |
| **7.ESS3.3** Apply scientific principles to design a method for monitoring and minimizing human impact on the environment. | ***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249 |
| **7.ESS3.4** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems. | ***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 11 pgs. 175c–199; Lesson 12 pgs. 199a–205<br><br>***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 10 pgs. 275c–295b |
| **7.ESS3.5** Obtain, evaluate, and communicate evidence of the factors that have caused changes in global temperatures over the past century. | ***Weather and Climate Systems*** **Teacher Edition**<br>Lesson 1 pgs. vi–9; Lesson 9 pgs. 139a–153; Lesson 10 pgs. 153a–175b; Lesson 11 pgs. 175c–199; Lesson 12 pgs. 199a–205 |

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| Grade 8 | |
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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Motion and Stability: Forces and Interactions (PS2)** | |
| **8.PS2.1** Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects in a system. | ***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 6 pgs. 81a–103; Lesson 7 pgs. 103a–123; Lesson 8 pgs. 123a–141; Lesson 9 pgs. 141a–153 |
| **8.PS2.2** Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object. | ***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 2 pgs. 13a–31; Lesson 4 pgs. 49a–63; Lesson 6 pgs. 81a–103; Lesson 7 pgs. 103a–123; Lesson 9 pgs. 141a–153 |
| **8.PS2.3** Ask questions about data to determine the factors that affect the strength of electric and magnetic forces. | ***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 3 pgs. 31a–49<br><br>***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 2 pgs. 19a–41; Lesson 3 pgs. 41a–65; Lesson 4 pgs. 65a–91; Lesson 10 pgs. 201c–219a |
| **8.PS2.4** Construct and present arguments using evidence to support the claim that gravitational interactions are attractive and depend on the masses of interacting objects. | ***Space Systems Exploration*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 4 pgs. 57a–77; Lesson 7 pgs. 127a–147; Lesson 8 pgs. 147a–167; Lesson 10 pgs. 187a–193<br><br>***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 5 pgs. 63a–81 |
| **8.PS2.5** Conduct an investigation and evaluate the experimental design to provide evidence that fields exist between objects exerting forces on each other even though the objects are not in contact. | ***Energy, Forces, and Motion*** **Teacher Edition**<br>Lesson 1 pgs. iv–13; Lesson 3 pgs. 31a–49; Lesson 5 pgs. 63a–81<br><br>***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 2 pgs. 19a–41; Lesson 3 pgs. 41a–65; Lesson 4 pgs. 65a–91; Lesson 10 pgs. 201c–219a |

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|---|---|
| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Waves and Their Applications in Technologies for Information Transfer (PS4)** | |
| **8.PS4.1** Use mathematical representations to describe patterns in a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 1 pgs. vi–19; Lesson 6 pgs. 115c–135b; Lesson 7 pgs. 135c-157a; Lesson 10 pgs. 201c–219a |
| **8.PS4.3** Integrate qualitative scientific and technical information to support the claim that digitized signals (sent as wave pulses) are a more reliable way to encode and transmit information. | ***Electricity, Waves, and Information Transfer*** **Teacher Edition**<br>Lesson 8 pgs. 157c–177; Lesson 10 pgs. 201c-219a |
| **From Molecules to Organisms: Structure and Processes (LS1)** | |
| **8.LS1.4** Use arguments based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 7 pgs. 111a–129; Lesson 11 pgs. 181a–186 |
| **8.LS1.5** Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 8 pgs. 129a–141; Lesson 9 pgs. 141a–165<br><br>***Ecosystems and Their Interactions***<br>Lesson 1 pgs. 1a–27; Lesson 10 pgs. 221a–243; Lesson 11 pgs. 243a–249 |
| **Heredity: Inheritance and Variation of Traits (LS3)** | |
| **8.LS3.1** Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 6 pgs. 87c–111; Lesson 11 pgs. 181a–186 |
| **8.LS3.2** Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 3 pgs. 33c–49; Lesson 4 pgs. 49a–67; Lesson 5 pgs. 67a–87b; Lesson 8 pgs. 129a–141; Lesson 11 pgs. 181a–186 |

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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Biological Unity and Diversity (LS4)** | |
| **8.LS4.1** Analyze and interpret data to identify patterns within the fossil record that document the existence, diversity, extinction, and change of life forms throughout the history of life on Earth. | ***Earth's Dynamic Systems*** **Teacher Edition**<br>Lesson 1 pgs. 1a–13a; Lesson 9 pgs. 241c–275b; Lesson 12 pgs. 319c–329 |
| **8.LS4.2** Apply scientific ideas to construct an explanation for the patterns of anatomical similarities and differences among modern organisms and between modern and fossil organisms to infer ancestral relationships. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 6 pgs. 111a–141; Lesson 8 pgs. 165a–171a |
| **8.LS4.3** Analyze displays of pictorial data to compare patterns of similarities in the embryological development across multiple species to identify relationships not evident in the fully formed anatomy. | ***Structure and Function*** **Teacher Edition**<br>Lesson 1 pgs. 1a–15; Lesson 2 pgs. 15a–43a; Lesson 8 pgs. 165a–171a |
| **8.LS4.4** Construct an explanation based on evidence that describes how genetic variations of traits in a population increase some individuals' probability of surviving and reproducing in a specific environment. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 8 pgs. 129a–141; Lesson 9 pgs. 141a–165; Lesson 11 pgs. 181a–186<br><br>***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 8 pgs. 179a–199; Lesson 11 pgs. 243a–249 |
| **8.LS4.5** Gather and synthesize information about the practices that have changed the way humans influence the inheritance of desired traits in organisms. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 9 pgs. 141a–165; Lesson 10 pgs. 165a–181; Lesson 11 pgs. 181a–186 |
| **8.LS4.6** Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. | ***Genes and Molecular Machines*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 9 pgs. 141a–165; Lesson 11 pgs. 181a–187<br><br>***Ecosystems and Their Interactions*** **Teacher Edition**<br>Lesson 1 pgs. 1a–27; Lesson 8 pgs. 179a–199; Lesson 11 pgs. 243a–249 |

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| **Oklahoma Academic Standards for Science** | **Smithsonian's STCMS™ Teacher Edition Citations** |
| **Earth's Place in the Universe (ESS1)** | |
| **8.ESS1.1** Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons. | ***Space Systems Exploration*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 2 pgs. 17a–35; Lesson 3 pgs. 35a–57; Lesson 4 pgs. 57a–77; Lesson 5 pgs. 77a–95; Lesson 10 pgs. 187a–193 |
| **8.ESS1.2** Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system. | ***Space Systems Exploration*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 7 pgs. 127a–147; Lesson 8 pgs. 147a–167; Lesson 10 pgs. 187a–193 |
| **8.ESS1.3** Analyze and interpret data to determine scale properties of objects in the solar system. | ***Space Systems Exploration*** **Teacher Edition**<br>Lesson 1 pgs. 1a–17; Lesson 6 pgs. 95a–127; Lesson 10 pgs. 187a–193 |