

# Curriculum Overview

## 7<sup>th</sup> Grade Science

### 2018-2019

#### 1<sup>st</sup> Nine Weeks

#### Unit 1: Lab Safety, Measurement, and Scientific Investigation

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|----------------------------|--|
| <b>TEKS</b>                | 7.1AB, 7.2AB, 7.3A   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•Hypothesis</li> <li>•Independent variable</li> <li>•Dependent variable</li> <li>•Control</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>•Demonstrate safe practices during laboratory and field investigations as outlined in the Texas Safety Standards</li> <li>•Practice appropriate use and conservation of resources, including disposal, reuse, or recycling of materials</li> <li>•Plan and implement comparative and descriptive investigations by making observations, asking well-defined questions, and using appropriate equipment and technology</li> <li>•Design and implement experimental investigations by making observations, asking well-defined questions, formulating testable hypotheses, and using appropriate equipment and technology</li> <li>•Analyze, evaluate, and critique scientific explanations by using empirical evidence, logical reasoning, and experimental and observational testing, including examining all sides of scientific evidence of those scientific explanations, so as to encourage critical thinking by the student</li> <li>•Collect and record data using the International System of Units (SI) and qualitative means such as labeled drawings, writing, and graphic organizers</li> <li>•Construct tables and graphs, using repeated trials and means, to organize data and identify patterns</li> <li>• Analyze data to formulate reasonable explanations, communicate valid conclusions supported by the data, and predict trends</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. How do you make careful and meaningful observations of organisms?</li> <li>2. How can you apply safe practices in your home?</li> <li>3. What safety equipment do you need for your extra-curricular activities?</li> </ol>  |

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|  | 4. What are the consequences for not using safety equipment or following safe practices? |
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### Unit 2: Matter & Energy in Living Systems

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| <b>TEKS</b>                | 7.5AB, 7.6A, 7.7A   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•chemical energy •chlorophyll •chloroplast</li> <li>•photosynthesis • radiant energy</li> <li>•chemical changes •elements • matter • physical changes</li> </ul>   |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Recognize that radiant energy (sunlight) is transformed into chemical energy.</li> <li>• Recognize the equation for photosynthesis.</li> <li>• Recognize the components of the process of photosynthesis.</li> </ul>   |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. Why are most plants green?</li> <li>2. How do plants store sunlight to store energy?</li> <li>3. How is energy converted and stored in the process of photosynthesis?</li> <li>4. Why is photosynthesis important for life on Earth?</li> <li>5. Describe how radiant energy is transferred into usable energy by living systems?</li> <li>6. Describe the fundamental roles of chloroplasts and mitochondria in energy transformation.</li> <li>7. What type of energy is used in cells and what is the ultimate source of this energy?</li> <li>8. What is the role of pigments in photosynthesis?</li> <li>9. What kinds of organisms perform photosynthesis?</li> </ol> |

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**Unit 3: Dichotomous Keys**

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| <b>TEKS</b>                | 7.11A   |
| <b>Vocabulary</b>          | Organism • Structure • Insect • Dichotomous key • Classification • Identification • Domains   |
| <b>Key Concepts</b>        | Examine organisms or their structures such as insects or leaves and use dichotomous keys for identification   |
| <b>Essential Questions</b> | <ol style="list-style-type: none"><li>1. How can you use dichotomous keys to classify and identify organisms?</li><li>2. In what ways are organisms alike and different from one another?</li><li>3. How do we classify organisms into groups?</li><li>4. How do scientists organize the natural world?</li></ol> |

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#### Unit 4: Cells

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| <b>TEKS</b>                | 7.12CDEF   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•cell •cell membrane •cell wall •chloroplast</li> <li>•cytoplasm •mitochondrion •nucleus •organelle</li> <li>•vacuole</li> <li>•function • structure</li> <li>Cell → Tissue → Organ → Organ system → Organism</li> <li>•Organism •Waste removal •Excretion Metabolism</li> <li>•Cell theory</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Cell structure and function of organelles</li> <li>• Plant cells differ from animal cells in structure and function.</li> <li>•Recognize levels of organization in plants and animals, including cells, tissues, organs, organ systems, and organisms.</li> <li>•Compare the functions of a cell to the functions of organisms such as waste removal.</li> <li>•Recognize that according to cell theory all organisms are composed of cells and cells carry on similar functions, such as extracting energy from food to sustain life.</li> </ul>             |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. What are the differences of plant and animal cells?</li> <li>2. How is structure related to function at all biological levels of organization?</li> <li>3. What defines cell shape and size?</li> <li>4. How does the cell membrane help a cell maintain homeostasis?</li> <li>5. How do you explain the relationship between the structures and functions of cell organelles?</li> <li>6. Why must cells absorb energy and nutrients?</li> <li>7. How do cells, tissues, organs, and organ systems relate to the complexity of living organisms?</li> </ol> |

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**Unit 5: Human Organ Systems**

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| <b>TEKS</b>                | 7.12B  |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"><li>•Circulatory system • Respirator system y • Skeletal system • Muscular system • Digestive system • Excretory system • Reproductive system</li><li>•Integumentary system • Nervous system • Endocrine system</li></ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"><li>•Identify the main functions of the systems of the human organism, including the circulatory, respiratory, skeletal, muscular, digestive, excretory, reproductive, integumentary, nervous, and endocrine systems.</li></ul>  |
| <b>Essential Questions</b> | <ol style="list-style-type: none"><li>1. How do the structures of the digestive system work together to process the food you eat?</li><li>2. How do the structures and functions of living things allow them to meet their needs?</li><li>3. How does energy change from one form to another as it moves through a system?</li></ol> |

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**Unit 6: Reproduction, Heredity, & Natural Selection**

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|----------------------------|---|
| <b>TEKS</b>                | 7.11C, 7.14ABC  |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>• Sexual reproduction • Asexual reproduction</li> <br/> <li>• Traits • Natural selection • Selective breeding</li> <li>• Heredity • Genetics • Gene • Generation • Descendant</li> <li>• Ancestor • Dominant • Recessive • Punnett Square</li> <li>• Homozygous • Heterozygous • Purebred • Genotype</li> <li>• Phenotype • Variation • Mutation • Genes</li> <li>• Chromosomes • Nucleus • Traits</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Asexual vs. sexual reproduction</li> <li>• Uniform vs. diverse</li> <li>• Identify some changes in genetic traits that can have occurred over several generations through natural selection and selective breeding such as the Galapagos medium ground finch (<i>Geospiza fortis</i>) or domestic animals.</li> <li>• Define heredity as the passage of genetic instructions from one generation to the next generation.</li> <li>• Recognize that inherited traits of individuals are governed in the genetic material found in the genes within chromosomes in the nucleus.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. What makes organisms unique?</li> <li>2. What are the advantages and disadvantages to each type of reproduction?</li> </ol>   |

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#### Unit 7: Adaptations and Change of Organisms

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|----------------------------|--|
| <b>TEKS</b>                | 7.11B, 7.12A, 7.13AB   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•Internal structure</li> <li>• Organism</li> <li>•Adaptation</li> <li>•Structure</li> <li>•Function</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Gill filaments enable oxygen to diffuse into the blood.</li> <li>• Hollow bones are lighter, allowing flight.</li> <li>• Xylem in plants               <ul style="list-style-type: none"> <li>• System of tubes that both support the plant and transport cells that circulate water and dissolved minerals</li> </ul> </li> <li>• Phloem in plants               <ul style="list-style-type: none"> <li>• Cells laid out end-to-end throughout the plant, transporting sugars and other molecules created by the plant</li> </ul> </li> <li>•Describe and relate responses in organisms that may result from internal stimuli such as wilting in plants and fever or vomiting in animals that allow them to maintain balance.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. How are a plant's structures specially suited to their functions?</li> <li>2. How do plants respond to stimuli?</li> <li>3. How do behaviors enhance an animal's chance for survival?</li> </ol>   |

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#### **Unit 8: Weathering, Erosion, and Deposition; Watersheds**

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|----------------------------|---|
| <b>TEKS</b>                | 7.8BC   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•Weathering • Erosion • Deposition • Environment • Ecoregion • Sediment • •Mechanical weathering • Chemical weathering</li> <br/> <li>•Ground water • Surface water • Watershed</li> <br/> <li>•Biodiversity • Contribute • Sustainability • Ecosystem</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>•Analyze the effects of weathering, erosion, and deposition on the environment in ecoregions of Texas.</li> <li>•Model the effects of human activity on ground water and surface water in a watershed.</li> <li>•Describe how biodiversity contributes to the sustainability of an ecosystem.</li> <li>•Observe, record, and describe the role of ecological succession such as in a microhabitat of a garden with weeds</li> <li>•Investigate how organisms respond to external stimuli found in the environment, such as phototropism and fight or flight</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. How do human activities affect the surface water and groundwater in a watershed?</li> <li>2. How do objects and structures affect erosion?</li> </ol>   |

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**Unit 9: Ecosystems and Change**

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|----------------------------|--|
| <b>TEKS</b>                | 7.10ABC  |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•Habitat • Microhabitat • Biome Organism • Abiotic • Biotic</li> <br/> <li>•Variation • Population • Species • External feature • Behavior • Physiology • Migration • Hibernation • Bulb</li> <br/> <li>•Ecological • Succession • Pioneer species</li> <li>• Primary succession • Secondary succession</li> <li>•Microhabitat •Lichens</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Observe and describe different environments, including microhabitats in schoolyards and biomes</li> <li>• How they support different varieties of organisms through providing basic needs</li> <li>• Variety of life depends on environmental (biotic and abiotic) factors.</li> <li>• What external structures or behaviors increase the survivability of certain organisms</li> <li>• External features and physiology of plants and animals</li> <li>• Behaviors in plants and animals.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. How will similar populations react to changes in their environment?</li> </ol>   |

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#### Unit 10: Force and Motion

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|----------------------------|---|
| <b>TEKS</b>                | 7.7B  |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>• Force • Seedlings • Turgor pressure • Tropism</li> <li>• Geotropism • Phototropism</li> </ul>  |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Forces affect motion in plants as shown by their ability to overcome or respond to the force of gravity or turgor pressure.</li> <li>• Forces affect motion, as is demonstrated when seedlings push upward through soil, exerting an upward force on the soil greater than the downward force of gravity. Plants grow upward against the downward force of gravity in a process known as geotropism. Even when turned, plants will recognize the force of gravity and reorient their stems upward and their roots downward.</li> <li>• Water within a plant cell exerts a force, called turgor pressure, that pushes outward on its cell wall. The ability of a plant to maintain a strong upright position and to return to the upright position when blown by the wind is the result of the force exerted by water within each plant cell.</li> <li>• The flow of blood within the body is caused by the force of the heart pumping and moving blood within the veins and arteries as well as the contraction of the skeletal muscles. Gravity also plays a role in moving blood throughout the body.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. How do forces influence motion?</li> <li>2. How does the mass of an object influence motion?</li> </ol>   |

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#### Unit 11: Catastrophic Events

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|----------------------------|--|
| <b>TEKS</b>                | 7.8A   |
| <b>Vocabulary</b>          | Catastrophic • Ecosystem • Flood • Hurricane • Tornado   |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Catastrophic events can shape and restructure the environment through the force and motion evident in them.</li> <li>• Events include: weather events, geological events, and the impacts of events on ecosystems.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. Is there any time a catastrophic event could have a beneficial effect of the environment?</li> <li>2. How would the ability to predict a catastrophic event ahead of time be beneficial to people?</li> </ol>                |

#### Unit 12: Conditions for Life & Manned Space Exploration

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|----------------------------|---|
| <b>TEKS</b>                | 7.9AB   |
| <b>Vocabulary</b>          | <ul style="list-style-type: none"> <li>•Characteristic • Solar system • Proximity • Composition • Atmosphere • Exploration</li> <li>• Accommodation • Solar System • Manned space exploration</li> <li>• Terrestrial</li> </ul>   |
| <b>Key Concepts</b>        | <ul style="list-style-type: none"> <li>• Students will analyze the characteristics of objects in our solar system that allow life to exist such as: proximity to the Sun, presence of water, and the composition of the atmosphere.</li> <li>• Identify the accommodations, considering the characteristics of our solar system that enabled manned space exploration.</li> </ul> |
| <b>Essential Questions</b> | <ol style="list-style-type: none"> <li>1. What are the requirements for life to exist on Earth?</li> <li>2. If life exists elsewhere in the solar system, would it have to look like life forms on Earth?</li> </ol>  |