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|  | **Semester 1** |
| Unit | • S.ES:1 Horticulture |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:1-1 Illustrate and identify plants in the area studied. * S.ES:1-2 Demonstrate the proper use of field skills in mapping and data collection. * S.ES1-3 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6) * S.ES1-4 Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy. (HS-LS1-5) |
| Activities: | Calculate Biomass (HS-ESS2-6)  Photosynthesis Diagram (HS-LS1-5)  Leaf Pigment Chromatography  Plant/Tree ID (in field)  Height of Tree Field Test |

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| Unit | S.ES:2 Soil |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:2-1 Analyze different soils and compare the soil quality of different areas. |
| Activities: | * Texture Lab * Horizons * Particulate Size * Particulate Sieve (Separation by Grain Sizes) * Textural Triangle |

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| Unit | • S.ES:3 Water |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:3-1 Analyze different water samples and assess the water quality. * S.ES:3-2Compare biological, physical, and ecological factors that influence water quality. * S.ES:3-3 Diagram the water cycle. * S.ES:3-4 Identify characteristics of healthy streams. * S.ES:3-5 Identify threats to a healthy stream. * S.ES:3-6 Recommend actions to restore a stream to health. * S.ES:3-7 Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes. (HS-ESS2-5) * S.ES:3-8 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6) |
| Activities: | * Water Quality Field Testing * Macroinvertebrate Collection * Physical Observation of Stream * Vernier Labs BOD (HS-ESS2-5) * Modeling Hydrologic Cycle (Diagram, Comic Strip, Project, etc) (HS-ESS3-6) |

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| Unit | •S.ES:4 Biomes |
| “I Can” Learning Targets and Objectives (NGSS) | S.ES:4-1 Perform an animal diversity study and evaluate the diversity of the habitat studied.  S.ES:4-2 Describe the major characteristics of each biome, including weather, plant and animal life and resources.  S.ES:4-3 Identify the locations of the different biomes. |
| Activities: | * Biome Maps and Posters * Biome Project (brochure, commercial, power point, travel agent) * Latitude and Longitude Positioning vs Altitude |

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| Unit | * S.ES:5 Ecosystems |
| “I Can” Learning Targets and Objectives (NGSS) | S.ES:5-1 Identify and classify biotic and abiotic factors in an environment that affect organisms and placement of organisms in a food web.   * S.ES:5-2 Assess the abiotic factors that affect a habitat. * S.ES:5-3 Compare physical, ecological and behavioral factors that influence interactions and interdependence of organisms. * S.ES:5-4 Identify the characteristics of the ecosystems of the Earth. * S.ES:5-5 Characterize the different relationships among living organisms. * S.ES:5-6 Describe the impact of different organisms on the environment. * S.ES. 5-7 Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem. (HS-LS2-4)   S.ES.5-8 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. (HS-LS2-6)   * S.ES.5-9 Construct an argument based on evidence about the simultaneous coevolution of Earth’s systems and life on Earth. (HS-ESS2-7) |
| Activities: | ID Abiotic and Biotic Factors (Outside)  Food chains/webs (HS-LS2-4)  Energy Flow Calculations Worksheet (HS-LS2-4)  Food Web Project (HS-LS2-d), (HS-LS2-6) |

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| Unit | • S.ES:6 Populations |
| “I Can” Learning Targets and Objectives (NGSS) | S.ES:6-1 Illustrate and describe the relationship between predator and prey and its relationship on populations.  S.ES:6-2 Identify and compare different regional human population models and their impact on resources.  S.ES:6-3 Organize and model trends that occur in a population.  S.ES:6-4 Demonstrate how predator and prey relationships affect populations.  S.ES:6-5 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. (HS-LS2-1)  S.ES: 6-6 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (HS-LS2-7)  S.ES: 6-7 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem. (HS-LS2-6)  S.ES: 6-8 Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment. (HS-LS4-2)  S.ES: 6-9 Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity. (HS-LS4-6) |
| Activities: | Predator/Prey (HS-LS2-1)  Yeast Population (carrying capacity) (HS-LS2-1)  Turkey Trouble (HS-LS2-1), (HS-LS2-6)  Case Studies🡪 Cane Toads, Parachuting Cats, Island Royale (HS-LS2-7), (HS-LS2-6)  Darwinian Studies (Galapagos Finches) (HS-LS4-2)  Urban Squirrels Case Study and Inquiry Lab (HS- LS4-6) |

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| Unit | S.ES:7 Endangered Species |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:7-1 Analyze and explain biodiversity issues and its social and ecological impacts. * S.ES:7-2 Illustrate the interrelationship of an animal and their changing habitat. * S.ES:7-3 Identify factors that have led to an endangered species. * S.ES:7-4 Demonstrate an understanding of the issues that lead to a species becoming endangered. * S.ES: 7-5 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (HS-LS2-7) * S.ES: 7-6 Evaluate the evidence for the role of group behavior on individual and species’ chances to survive and reproduce. (HS-LS2-8) * S.ES: 7-7 Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence. (HS-LS4-1) |
| Activities: | Who Cares Lab? (HS-LS2-7)  Wanted Poster (HS-LS2-7)  Invasive Species (HS-LS2-8)  Fossil Studies (HS-LS4-1) |

**Semester 2**

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| Unit | • S.ES:8 Earth Science |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:8-1: Describe the theory of plate tectonics and list five discoveries that support it. * S.ES:8-2: Describe how the following movements affect plate boundaries: rifting, subduction, and translation. * S.ES:8-3: Identify the three major types of volcanic eruptions and give examples of each: shield, cinder, and stratovolcanoes. * S.ES: 8-4: Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history. (HS-ESS1-6) * S.ES: 8-5: Evaluate evidence of the past and current movements of continental and oceanic crust and the theory of plate tectonics to explain the ages of crustal rocks. (HS-ESS1-5) * S.ES: 8-6: Develop a model to illustrate how Earth’s internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features. (HS-ESS2-1) * S.ES: 8-7: Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection. (HS-ESS2-3) * S.ES: 8-8 Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate. (HS-ESS2-4) * S.ES: 8-9: Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6) * S.ES: 8-10: Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1) |
| Activities: | * Cracking Up (HS-ESS1-5) * Convection Lab (HS-ESS2-3) * Case Studies on Natural Disasters (HS-ESS3-1) * Natural History Events Project (HS-ESS3-1) * Rock Cycle ID Lab (HS-ESS2-6) * Scientific Journal Article Review (HS-ESS2-4) * Dinosaur Park in Denver Model * Half Life Lab (HS-ESS1-6) * Plate Tectonics Computer Simulation (HS-ESS2-1) |

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| Unit | • S.ES:9 Energy Sources |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:9-1 Compare renewable and nonrenewable resources. * S.ES:9-2 Describe the relationship of ecosystem changes and their impact on resources. * S.ES:9-3 Analyze the usage and conservation of various renewable and nonrenewable resources. * S.ES:9-4 Defend the use of different resources. * S.ES: 9-5 Apply scientific reasoning and evidence from ancient Earth materials, meteorites, and other planetary surfaces to construct an account of Earth’s formation and early history. (HS-ESS1-6) * S.ES: 9-6 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6) * S.ES:9-7 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1) * S.ES: 9-8 Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. (HS-ESS3-2) * S.ES: 9-9 Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. (HS-ESS3-3) |
| Activities: | * Half Life Lab (HS-ESS1-6) * Carbon Cycle Lab (HS-ESS2-6) |

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| Unit | • S.ES:10 Air Pollution and Climate Change |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES: 10-1 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. (HS-ESS3-5) * S.ES: 10-2 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity. (HS-ESS3-1) * S.ES: 10-3 Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate. (HS-ESS2-4) * S.ES: 10-4 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS-6) |
| Activities: |  |

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| Unit | • S.ES:11 Urbanization |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES:11-1 Illustrate the environmental changes of an area before and after urbanization. * S.ES 11-2 Illustrate ways to address the ecological changes in such areas. * S.ES:11-3 Defend the urbanization or preservation of an ecosystem. * S.ES 11-4 Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth’s systems. (HS-ESS2-2) * S.ES: 11-5 Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere. (HS-ESS2-6) * S.ES11-6 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems. (HS-ESS3-4.) * S.ES 11-7 Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth systems. (HS-ESS3-5) * S.ES:11-8 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. (HS-ESS3-6) * S.ES: 11-9 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. (HS-LS2-7) |
| Activities: |  |

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| Unit | • S.ES:12 Atmosphere and Weather |
| “I Can” Learning Targets and Objectives (NGSS) | * S.ES 12-1: Develop, revise, and use models of atmospheric circulation, to support explanations of how air masses redistribute energy from the sun. * S.ES 12-2: Design and conduct investigations to model the circulations at which clouds form and precipitation occurs, taking into account the factors of humidity, temperature, and pressure. * S.ES 12-3: Construct an argument based on evidence about the simultaneous coevolution of Earth’s systems and life on Earth. (HS-ESS2-7) * S.ES: 12-4: Use a model to describe how variations in the flow of energy into and out of Earth’s systems result in changes in climate. (HS-ESS2-4) |
| Activities: |  |