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| **WCSD High School Earth Science Unit Overview**  This course model arranges the Performance Expectations for High School Earth Science into different units with guiding questions. The **HS-ETS1-1, HS-ETS1-2, HS-ETS1-3, HS-ETS1-4** engineering design standards will be integrated throughout the units at the teacher’s discretion. | | |
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| **1st Semester Earth Science** | | |
| **Unit Title & Guiding Question(s)** | **Key Topics** | **Performance Expectations** |
| **Unit Title: Maps**  **Guiding Question(s):**  How are maps used as a tool in Earth Science? | * Map Types * Longitude * Latitude * Location | **HS-ESS2-2** Analyze geoscience data to make the claim that one change to Earth’s surface can create feedbacks that cause changes to other Earth systems. |
| **Unit Title: Composition of the Earth**  **Guiding Question(s):**  How do rocks provide evidence of the cycling of matter within the Earth’s interior? | * Rocks | **HS-ESS2-3\*** Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection. |
| **Unit Title: Plate Tectonics**  **Guiding Question(s):**  How can evidence-based models demonstrate Earth’s internal and external processes?  How do these internal and external processes impact humanity? | * Mining * Earthquakes * Volcanoes | **HS-ESS2-1** 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-ESS2-3\*** Develop a model based on evidence of Earth’s interior to describe the cycling of matter by thermal convection.  **HS-ESS3-1\*** 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-ESS3-2** Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios |
| **Unit Title: Atmosphere**  **Guiding Question(s):**  How do variations in earth’s energy flow affect atmospheric processes and humanity? | * Weather * Carbon Cycle * Climate * Biogeochemical Cycles | **HS-ESS2-4** Use a model to describe how variations in the flow of energy into and out of Earth’s system result in changes in climate.  **HS-ESS2-6** Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere  **HS-ESS2-7** Construct an argument based on evidence about the simultaneous co-evolution of Earth’s systems and life on Earth.  **HS-ESS3-1\*** 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-ESS3-3** Create a computational simulation to illustrate the relationship among the management of natural resources, the sustainability of human populations, and biodiversity.  **HS-ESS3-5** 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’s systems.  **HS-ESS3-6** Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity. |
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| **2nd Semester Earth Science** | | |
| **Unit Title & Guiding Question(s)** | **Key Topics** | **Performance Expectations** |
| **Unit Title: Surface Processes**  **Guiding Question(s):**  How does water affect Earth materials and surface processes? | * Surface Water * Mass Movement * Weathering * Erosion * Deposition * Soil * Groundwater * Oceans | **HS-ESS2-5** Plan and conduct an investigation of the properties of water and its effects on Earth materials and surface processes.  **HS-ESS3-1\*** 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-ESS3-4** Evaluate or refine a technological solution that reduces impacts of human activities on natural systems |
| **Unit Title: History of the earth**  **Guiding Question(s):**  How can evidence of plate movement be used to explain Earth’s history?  How can evidence be used to explain the earth’s formation? | * Impact Theory * Fossils * Earth’s Formation * Radioactive Decay * Half-life | **HS-ESS1-5** 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-ESS1-6** 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 |
| **Unit Title: Space**  **Guiding Question(s):**  How do stars keep and release their energy?  How are the origins of objects and their motions in the universe described? | * Solar Systems * Nuclear Fusion * Galaxies * Stars * Universe * Big Bang Theory | **HS-ESS1-1** Develop a model based on evidence to illustrate the life span of the sun and the role of nuclear fusion in the sun’s core to release energy that eventually reaches Earth in the form of radiation  **HS-ESS1-2** Construct an explanation of the Big Bang theory based on astronomical evidence of light spectra, motion of distant galaxies, and composition of matter in the universe  **HS-ESS1-3** Communicate scientific ideas about the way stars, over their life cycle, produce elements.  **HS-ESS1-4** Use mathematical or computational representations to predict the motion of orbiting objects in the solar system. |