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| **WCSD High School Environmental Science Unit Overview**  This course model arranges the Performance Expectations for High School Environmental Science into different units with guiding questions. Throughout this semester you will be incorporating global issues including sustainability, population, energy, ethics, and policies. | | | |
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| **1st Semester Ecology** | | | |
| **Unit title: Characteristics of Ecosystems**  **Guiding Question:**  How does human activity affect the relationships between abiotic and biotic factors in an ecosystem? | **Unit title: Matter and Energy Cycles**  **Guiding Questions:**  How do the nonliving parts of the Earth’s systems provide the basic materials to support life?  How does the flow of energy into and out of Earth’s systems result in changes in climate? | **Unit title: Biomes**  **Guiding Questions:**  How does the environment affect where and how an organism lives?  How do interactions within the biosphere balance dynamic feedback mechanisms that determine the number and types of biomes, ecosystems, and species? | **Unit title: Population Dynamics**  **Guiding Questions:**  How do changes in population size relate to environmental conditions?  How does the human population affect the environment and biodiversity? |
| **HS-LS2-7.** Design evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity. | **HS-ESS2-4.** \*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-ESS2-6.** 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 coevolution 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-ESS3-2. \***Evaluate competing design solutions, for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios. |

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| **2nd Semester Resource Use** | | | |
| **Unit title: Renewable/Non Renewable Resources**  **Guiding Questions:**  How can we ethically manage nonrenewable and renewable resources?  What are the potential uses and limitations of nonrenewable and renewable resources? | **Unit title:**  **Environmental Degradation**  **Guiding Question:**  How do our choices as consumers and waste producers impact Earth’s systems? | **Unit title:**  **Environmental Policies**  **Guiding Question:**  How do environmental policies and trade-offs affect the health of the environment as well as societal needs? | **Unit title:**  **Sustainability & Ethics**  **Guiding Questions:**  How do we manage Earth’s resources sustainably and ethically?  How can we use and develop technologies to increase sustainability? |
| **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.  **HS-ESS3-3.** \*Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity. | **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.  **HS-ESS2-4.** \*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-ESS3-2.** \*Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.  **HS-ESS3-4.** \*Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.  **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. | **HS-ETS1-1.** \*Analyze a major challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.  **HS-ETS1-2.** Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.  **HS-ETS1-3.** Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.  **HS-ETS1-4.** Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem. | **HS-ETS1-1.** \*Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs to wants.  **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.  **HS-ESS3-3.** \*Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.  **HS-ESS3-4.** \*Evaluate or refine a technological solutions that reduces impacts of human activities on natural systems.  **HS-ESS3-6.**  \*Use a computational representation to illustrate the relationships among Earth systems and how those are being modified due to human activity. |