02 UNIT 2 -Earth Systems, Resources, Land and Water Use

Content Area: **Science**
Course(s): **Environmental Science**
Time Period: **Semester 1**
Length: **3 weeks**
Status: **Published**

Standards

	Patterns
	Stability and Change
	Constructing Explanations and Designing Solutions
HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
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.
HS-ESS2	Earth's Systems
ESS2.B	Plate Tectonics and Large-Scale System Interactions
HS-ESS3	Earth and Human Activity
HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and climate change have influenced human activity.

Enduring Understandings

1. Many of the earth's systems interact through plate tectonics.
2. The locations of minerals and ores is determined by earth processes and will determine the process needed to extract the resource.
3. Soils have specific characteristics due to factors such as parent material, climate, topography and biological activity.
4. Soil characteristics determine its ability to hold water and grow crops.
5. Humans' use of natural resources will alter the environment.
6. Water is a scarce resource with many stakeholders including sectors such as energy, agriculture, communities as well as natural populations.
7. Sustainable use can help reduce our impact on land and water resources.

Essential Questions

1. How does the structure and processes of our planet affect the distribution of resources like minerals, soil and water?

2. Where do our valuable resources like minerals and soil come from?

3. How do we share in common resources equitably and sustainably?

4. What ways has the government tried to regulate the use of land for different purposes?

5. What are the impacts of humans on the land and water resources we use for both everyday and commercial/industrial purposes?

6. What are sustainable strategies for using land and water for both agriculture and residential living?

Knowledge and Skills

Knowledge

1. Students will know the difference between convergent, divergent and transform plate boundaries. Each boundary has a signature phenomena and results in the formation of specific landforms such as island arcs, trenches, volcanoes and mountains.

2. Students will know how sea floor spreading and subduction play a role in the creation and destruction of the planet's crust.

3. Students will know the process of soil formation from the crust and how to use its properties to categorize soil types.

4. Students will know how the characteristics of soil relate to its water holding capacity and fertility.

5. Students will know how the distribution of resources determines how we can extract them and each procedure has pros and cons.

6. Students will know how although water is necessary for life, it is a scarce resource.

7. Students will know the various methods we use to alter water availability such as irrigation, aqueducts and dams as well as the costs and benefits to each method.

8. Students will know how human land use effects the environment and the idea behind the "Tragedy of the Commons"

9. Students will know how different categories of public land are defined and be able to describe the different land management policies in the US including national parks, refuges and wilderness areas.

10. Students will know how residential land use and how both suburban and urban sprawl cause environmental problems.

11. Students will know how industrial agriculture requires many technological advances but also, the cost to these advances such as reduced biodiversity, pesticide residues in watersheds, and reduced soil fertility.

12. Students will know alternatives to industrial farming methods, as well as to fishing and aquaculture.

Skills

1. Use maps to identify plate boundary interactions
2. Investigate the properties of soil using chemical analysis and soil triangles.
3. Construct an argument using evidence about human activities in using resources and their impact on the environment.
4. Investigate the pros and cons of sustainable practices in food production

Modifications

https://docs.google.com/document/d/1ODqaPP69YkcFiyG72fIT8XsUIe3K1VSG7nxuc4CpCec/edit?usp=sharing

Assessments

https://docs.google.com/document/d/1wR7bQF-8AQoRrt0g4C3hKja0yjwDjC9_BiAmONWbTcI/edit?usp=sharing