7.6 Natural Resources and Human Impact

Content Area: **Science**
Course(s): **Science 7**
Time Period: **Marking Period 4**
Length: **40 days**
Status: **Published**

Established Goals/Standards

SCI.MS-ESS3	Earth and Human Activity
SCI.MS-ESS3-1	Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
SCI.MS.ESS3.A	Natural Resources
SCI.MS-ESS3-3	Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.
SCI.MS-ESS3-4	Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
SCI.MS.ESS3.C	Human Impacts on Earth Systems
SCI.MS-ESS3-5	Ask questions to clarify evidence of the factors that have caused climate change over the past century.
SCI.MS.ESS3.D	Global Climate Change

Technology Standards

TECH.8.1.8.A.CS2	Select and use applications effectively and productively.
TECH.8.1.8.B.1	Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).
TECH.8.1.8.C.CS1	Interact, collaborate, and publish with peers, experts, or others by employing a variety of digital environments and media.

NJ 21st Century Life and Careers /NJ Career Ready Practices

CAEP.9.2.8.B.7	Evaluate the impact of online activities and social media on employer decisions.

Interdisciplinary Connections

ELA/Literacy -

WHST.6-8.7	Conduct short research projects to answer a question (including a self-generated question), drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration. (MS-ESS3-3)
WHST.6-8.8	Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation. (MS-ESS3-3)

Mathematics -

6.RP.A.1	Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. *(MS-ESS3-3)*
7.RP.A.2	Recognize and represent proportional relationships between quantities. *(MS-ESS3-3)*
6.EE.B.6	Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. *(MS-ESS3-3)*
7.EE.B.4	Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. *(MS-ESS3-3)*

Essential Questions

- Have human actions impacted the global climate?
- How does Earth's climate compare to the climate in the past?
- How does the distribution of carbon in the Earth's systems affect global temperature?
- Why aren't minerals and groundwater distributed evenly across the world?

Enduring Understanding

- Human activities affect Earth's systems ~ sometimes positively, sometimes negatively.
- Natural resources are often limited.
- The amount of carbon on Earth is the same throughout time. The amount of carbon in each reservoir has changed significantly due to human actions.

Content

Humans depend on Earth's land, ocean, atmosphere, and biosphere for many different resources.

- All human activities draw on Earth's land, ocean, atmosphere, and biosphere resources and have both short and long-term consequences, positive as well as negative, for the health of people and the natural environment.
- Minerals, fresh water, and biosphere resources are distributed unevenly around the planet as a result of past geologic processes.
- Cause-and-effect relationships may be used to explain how uneven distributions of Earth's mineral, energy, and groundwater resources have resulted from past and current geosciences processes.
- Resources that are unevenly distributed as a result of past processes include but are not limited to petroleum, metal ores, and soil.
- Mineral, fresh water, ocean, biosphere, and atmosphere resources are limited, and many are not

renewable or replaceable over human lifetimes.

  - The distribution of some of Earth's land, ocean, atmosphere, and biosphere resources are changing significantly due to removal by humans.

  - All human activity draws on natural resources and has both short and long- term consequences, positive as well as negative, for the health of people and the natural environment.

- Human activities have significantly altered the biosphere, sometimes damaging or destroying natural habitats and causing the extinction of other species.

- Changes to Earth's environments can have different impacts (negative and positive) for different living things.

- Typically as human populations and per capita consumption of natural resources increase, so do the negative impacts on Earth, unless the activities and technologies involved are engineered otherwise.

- Relationships can be classified as causal or correlational, and correlation does not necessarily imply causation.

- The uses of technologies and any limitations on their use are driven by individual or societal needs, desires, and values; by the findings of scientific research; and by differences in such factors as climate, natural resources, and economic conditions. Thus technology use varies from region to region and over time.

  - Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.
  - Cause and effect relationships may be used to predict how increases in human population and per-capita consumption of natural resources impact Earth's systems.
  - The consequences of increases in human populations and consumption of natural resources are described by science.
  - Science does not make the decisions for the actions society takes.
  - Scientific knowledge can describe the consequences of human population and per-capita consumption of natural resources impact Earth's systems but does not necessarily prescribe the decisions that society takes.
  - Stability in Earth's surface temperature might be disturbed either by sudden events or gradual changes that accumulate over time.
  - Human activities and natural processes are examples of factors that have caused the rise in global temperatures over the past century.
  - Human activities play a major role in causing the rise in global temperatures.
  - Human activities, such as the release of greenhouse gases from burning fossil fuels, are major factors in the current rise in Earth's mean surface temperature (global warming).
  - Carbon reservoirs including how carbon is moved through each reservoir.
  - Real-time data project using solar radiation information
  - Reducing the level of climate change and reducing human vulnerability to whatever climate changes do occur depend on understanding of climate science, engineering capabilities, and other kinds of knowledge, such as understanding of human behavior, and on applying that knowledge wisely in decisions and activities.
  - Evidence that some factors have caused the rise in global temperature over the last century can include tables, graphs, and maps of global and regional temperatures, atmospheric levels of gases such as carbon dioxide and methane, and the rates of human activities.

Accommodations and Modifications

Accommodations and Modifications according to student IEP, 504, I&RS goals, and/or gifted status.

Assessment

Summative assessment

• Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.

Formative Assessments

- Participation/Observations
- Questioning
- Discussion Circles
- Science Notebook
- Exit Slips
- Peer/Self Assessment
- Rubrics
- Teacher-created project-based assessment
- Turn & Talk

Alternate Assessments

- Teacher-created project-based assessment
- Alternate running records
- Discussion Circles
- Turn and Talks

Benchmark Assessments

- Teacher-created assessment

Resources

https://oceanservice.noaa.gov/facts/eutrophication.html

Explanation of eutrophication

- Amplify
- BrainPOP
- Discovery Education