Honors Science 8 Unit 9: Environmental Resources and Stability on Earth 2019

Content Area: **Science**
Course(s): **Honors Life Science 8**
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Enduring Understandings:

- Conservation of non-renewable resources is vital to the world' health.
- Human activity impacts ecosystems
- People benefit from biodiversity in many ways.People can use knowledge of biodiversity to make decisions about the environment.
- The relationship between human population and the impact on natural resources

Essential Questions:

- How can basic chemistry be used to explain the mechanisms that control the global temperature in the atmosphere?
- How can we use our resources in a more responsible way?
- How do humans impact the environment?
- How does human activity affect the global climate?
- How has the uneven distribution of fossil fuels affected the U.S. economy?
- Why is biodiversity important?

Lesson Titles:

- Design and Build a Water filter
- Environmental Issue notes infused with video clips
- Environmental Stewardship Trip
- Exploring for Petroleum lab
- Exploring the Gloucester County Water shed - Watershed presentation
- Human Impact Webquest
- Human Population Graphing
- Renewable and Non-renewable energy
- Water Quality lab

21st Century Skills and Career Ready Practices:

CRP.K-12.CRP1	Act as a responsible and contributing citizen and employee.

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
CRP.K-12.CRP3	Attend to personal health and financial well-being.
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP5	Consider the environmental, social and economic impacts of decisions.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP7	Employ valid and reliable research strategies.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP9	Model integrity, ethical leadership and effective management.
CRP.K-12.CRP10	Plan education and career paths aligned to personal goals.
CRP.K-12.CRP11	Use technology to enhance productivity.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.

Inter-Disciplinary Connections:

LA.RST.6-8	Reading Science and Technical Subjects
LA.RST.6-8.1	Cite specific textual evidence to support analysis of science and technical texts.
LA.RST.6-8.2	Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.
LA.RST.6-8.3	Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
LA.RST.6-8.4	Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 6-8 texts and topics.
LA.RST.6-8.5	Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.
LA.RST.6-8.7	Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).
LA.RST.6-8.8	Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.
LA.RST.6-8.9	Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
LA.RST.6-8.10	By the end of grade 8, read and comprehend science/technical texts in the grades 6-8 text complexity band independently and proficiently.
LA.WHST.6-8	Writing History, Science and Technical Subjects
LA.WHST.6-8.1	Write arguments focused on discipline-specific content.
LA.WHST.6-8.2	Write informative/explanatory texts, including the narration of historical events, scientific procedures/experiments, or technical processes.

Instructional Strategies, Learning Activities, and Levels of Blooms/DOK:

- Emphasis is on how these resources, including land, ocean, atmosphere, biosphere, mineral, and fresh water, are limited and typically are nonrenewable, and how their distributions are significantly changing

as a result of removal by humans. Students will use variables to represent quantities and construct simple equations and inequalities to solve problems by reasoning about the quantities.

- Know your energy cost lab (stem)
- Students can also look at past occurrences of catastrophic events to determine how those events have influenced the development of technologies scientists use to predict future events.
- Students can analyze maps, charts, and images of natural hazards to look for patterns in past occurrences of catastrophic events. Data on natural hazards can include the locations, magnitudes, and frequencies of the natural hazards. Students can use these data to make reliable predictions of future catastrophic events.
- Students can be provided with data from tests performed on these existing design solutions. They will analyze and interpret these data to determine similarities and differences in findings. This is where they are deciding where different parts of the pre-existing solutions can be combined. For example, the building materials of a particular dam may be superior while the shape of another design may be more suitable. Students should consider the ratio relationship between the impacts that humans have on the environment and the impact that the design solution has on minimizing these impacts. Students will need to consider both qualitative and quantitative data when drawing conclusions about the various design solutions.
- Students can then write an informative text to explain the causes of uneven distributions of Earth's minerals, energy, and groundwater resources. These causes can include past and current geosciences processes as well as human removal of resources. The written text needs to include specific evidence to support the student's explanation.
- Throughout this unit of study, students will be engaged in the engineering design process. Students can start by identifying a human impact on the environment that has resulted from human consumption of natural resources. Using what they have identified, students will begin to define the criteria and constraints of the design problem whose solution will help to monitor and minimize the human impact on the environment. Using informational texts to support this process is important. Students will draw evidence from these texts in order to support their analysis, reflection, and research.
- Tutoring during Academic Enrichment
- When students consider criteria, they should conduct short research projects to examine factors such as societal and individual needs, cost effectiveness, available materials and natural resources, current scientific knowledge, and current advancements in science and technology. They should also consider limitations due to natural factors such as regional climate and geology. While conducting their research, students will need to gather their information from multiple print and digital sources and assess the credibility of each source.

Modifications

Formative Assessment:

- Anticipatory Set
- Closure
- Warm-Up

Alternative Assessments

Performance tasks

Project-based assignments

Problem-based assignments

Presentations

Reflective pieces

Concept maps

Case-based scenarios

Summative Assessment:

- Alternate Assessment
- Benchmark
- Marking Period Assessment

Benchmark Assessments

Skills-based assessment

Reading response

Writing prompt

Lab practical

Resources & Materials:

- Engineers Without Borders- Water pumping project
- Real Data- Population Density and Carbon Emissions
- US and World Population Clocks- updates quickly (every minute)