Environmental Research Paper

Content Area: **Science**
Course(s):
Time Period: **Marking Period 2**
Length: **2 weeks**
Status: **Published**

Course Pacing Guide

Unit	MP/Trimester	Weeks
Environmental Research Paper and Presentation	2	2

Unit Overview

Students choose an issue involving environmental risk that has put an increased pressure on a region or a population that needs an engineering solution. Some examples are sea level rise, increased storm intensity, ocean acidification, invasive species, the pacific garbage patch, amoung many others. Students will research the problem, the solutions that are currently being employed and propose a new creative solution. They must have at least three sources cited and the paper is between 3 and 5 pages. They will then create a presentation so they can educate their fellow students about the issue lhey learned about.

Enduring Understandings

Environmental issues can be mitigated with engineering solutions.

Essential Questions

What are some current and upcoming environmental issues we are facing?

How can engineering be used to address these issues?

New Jersey Student Learning Standards (No CCS)

9-12.HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
9-12.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.
9-12.HS-ETS1-1.1.1	Analyze complex real-world problems by specifying criteria and constraints for successful solutions.
9-12.HS-ETS1-3.6.1	Evaluate a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.
9-12.HS-ETS1-1.ETS1.A.2	Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering. These global challenges also may have manifestations in local communities.
9-12.HS-ETS1-3.ETS1.B	Developing Possible Solutions

Amistad Integration

The Amistad Bill (A1301), which became law in 2002, calls on New Jersey schools to incorporate African-American history into their social studies curriculum.

This course does not fall in this category.

Holocaust/Genocide Education

a. Every board of education shall include instruction on the Holocaust and genocides **in an appropriate place in the curriculum** of all elementary and secondary school pupils.

This lesson is not an approprate place.

Interdisciplinary Connections

HPE.2.1.12.C.2	Develop strategies that will impact local, state, national, and international public health efforts to prevent and control diseases and health conditions.
SCI.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.
SCI.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.
SCI.HS-ESS2-7	Construct an argument based on evidence about the simultaneous coevolution of Earth's systems and life on Earth.

Technology Standards

TECH.8.1.12.A.2	Produce and edit a multi-page digital document for a commercial or professional audience and present it to peers and/or professionals in that related area for review.
TECH.8.1.12.A.CS2	Select and use applications effectively and productively.

21st Century Themes/Careers

CAEP.9.2.12.C.3	Identify transferable career skills and design alternate career plans.

Financial Literacy Integration

1. The State Board of Education shall require that a school district incorporate in each of the grades [1][kindergarten] six[1] through eight financial literacy instruction to pupils enrolled in those grades. The purpose of the instruction shall be to provide [1][elementary and][1]middle school students with the basic financial literacy necessary for sound financial decision-making.

This course does not fall in this category.

Instructional Strategies & Learning Activities

Students choose an issue involving environmental risk that has put an increased pressure on a region or a population that needs an engineering solution. Some examples are sea level rise, increased storm intensity, ocean acidification, invasive species, the pacific garbage patch, amoung many others. Students will research the problem, the solutions that are currently being employed and propose a new creative solution. They must have at least three sources cited and the paper is between 3 and 5 pages. They will then create a presentation so they can educate their fellow students about the issue lhey learned about.

Differentiated Instruction

- Curriculum Map
- Inquiry/Problem-Based Learning
- Learning preferences integration (visual, auditory, kinesthetic)
- Tiered Learning Targets
- Learning through play
- Relationship-Building & Team-Building
- Self-Directed Learning
- Debate
- Student Data Inventories
- Mastery Learning (feedback toward goal)
- Goal-Setting & Learning Contracts
- Grouping
- Rubrics
- Flipped Classroom
- Mentoring
- Assessment Design & Backwards Planning

Formative Assessments

Students have the opportunity to conference with the teacher as most of this assignment will be done in class.

Summative Assessment

Students final report will be graded based on the depth of the students research into the issue chosen, the solutions the student has found and the solution the student proposes.

Benchmark Assessments

There are no benchmarks for this assignment.

Alternate Assessments

Students final report will be graded based on the depth of the students research into the issue chosen, the solutions the student has found and the solution the student proposes.

This is an alternative from the traditional sumative test given.

Resources & Technology

Students will be directed to the library resourse, EBSCO Host to search for scholarly articles based on their topic.

BOE Approved Texts

There is no Text Book for this class

Closure

Students turn in a paper and make a presentatino to the class as a closing to this assignment. The other students are instructed to take notes and may ask questions at the end of the presentation.

ELL

- Teacher Modeling
- Group work
- Simplified Written and Verbal Instructions
- Google Translate

Special Education

- Specify and list exactly what the student will need to learn to pass.
- Evaluate the classroom structure against the student's needs (flexible structure, firm limits, etc.).
- Keep workspaces clear of unrelated materials.
- Reduce visual distractions in the classroom (mobiles, etc.).
- Provide a computer for written work.
- Seat the student close to the teacher or a positive role model.
- Provide an unobstructed view of the chalkboard, teacher, movie screen, etc.
- Keep extra supplies of classroom materials (pencils, books) on hand.
- Maintain adequate space between desks.
- Give directions in small steps and in as few words as possible.

- Number and sequence the steps in a task.
- Have student repeat the directions for a task.
- Provide visual aids.
- Go over directions orally.
- Allow the student to complete an independent project as an alternative test.
- Grade spelling separately from content.
- Show a model of the end product of directions (e.g., a completed math problem or finished quiz).
- Stand near the student when giving directions or presenting a lesson.

504

- preferential seating
- extended time on tests and assignments
- modified textbooks or audio-video materials
- behavior management support
- excused lateness, absence, or missed classwork

At Risk

- Have student restate information
- Provision of notes or outlines
- Concrete examples
- Assistance in maintaining uncluttered space
- No penalty for spelling errors or sloppy handwriting
- Follow a routine/schedule
- Teach time management skills
- Verbal and visual cues regarding directions and staying on task
- Visual daily schedule
- Immediate feedback
- Work-in-progress check
- Pace long-term projects
- Cue/model expected behavior
- Use de-escalating strategies
- Use peer supports and mentoring
- Chart progress and maintain data

Gifted and Talented

Focus on effort and practice

Offer the Most Difficult First

Offer choice

Speak to Student Interests

Allow G/T students to work together

Encourage risk taking