

EED 480

Student Project-Based Learning Outlines

I. Title: Humans and Earth

Grade Level: 5th grade

II. BIG IDEA:

Let's investigate how humans are making Earth sick and how we are affecting the Earth and all living things on Earth.

III. TASKS: We will

A. Investigate and explore how humans are making Earth sick.

B. Research how human activity is affecting the Earth and all living things on Earth.

C. Finally, create a website that provides information on three things:
1. How humans are making Earth sick. 2. How human activity is affecting the Earth and all living things on Earth. 3. What can humans do to prevent further damage and repair the Earth?

1. Launch Project: Entry Event & Driving Question (DQ)	2. Build Knowledge Understanding & Skill to answer DQ
3 Present Products that Answer DQ	4. Develop and Revise Products and Answers to DQ

IV. JUSTIFICATION : This lesson series will allow students to become stronger global citizens. This lesson series will allow students to explore exactly how humans interact with our Earth and how human activities affect the Earth and all living systems. This will allow students to become better aware of the idea and all living systems coexist in a world and we need to take care of our world. In addition to becoming stronger global citizens, the students get to take part in web designing. Students will develop and practice their web design skills by creating an informational website on a topic such as glacier melting. Students will also get to present their website to their peers as well as a fourth-grade classroom. This will allow students to practice and develop certain social skills.

Commented [BSF1]: This is a great way to promote, extend and disseminate knowledge developed during the PBL

V. STANDARDS: Grade Level and Subject Area: Kindergarten to 5th Science, Social Studies, Language Arts, Mathematics and the Arts

ELA/Literacy:

- RI. 5.2 Determine two or more main ideas of a text and explain how they are supported by key details; summarize the text.
- RI. 5.4 Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a *grade 5 topic or subject area*.
- RI. 5.7 Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently.
- RI. 5.9 Integrate information from several texts on the same topic in order to write or speak about the subject knowledgeably.

Arts: Visual Arts 5.2.3 Demonstrate beginning skill in the manipulation of digital imagery (e.g., computer-generated art, digital photography, or videography).

NGSS (Next Generation Science Standards)

- A. Disciplinary Core Ideas
 - a. ESS2: Earth's Systems
 - b. ESS3: Earth and Human Activity
 - c. ETS1: Engineering Design
 - d. ETS2: Links Among Engineering, Technology, Science, and Society
- B. Science and Engineering Practices
 - a. Asking questions (for science) and defining problems (for engineering)
 - b. Developing and using models
 - c. Planning and carrying out investigations
 - d. Analyzing and interpreting data
 - e. Engaging in argument from evidence
 - f. Obtaining, Evaluating, and Communicating Information
- C. Crosscutting Concepts
 - a. Cause and Effect: Mechanisms and Explanation
 - b. Structure and Function
 - c. Patterns
 - d. Systems and System **Models**

Commented [BSF2]: Wow! Comprehensive and correct inclusion!

VI . ENGAGING CONTEXT: Hook- Launch activity: Children will be shown a picture of Earth with a thermometer in it's mouth. Students will be asked

what the picture means. The picture means that the Earth is sick. The students will be asked: "What if I told you that humans were making the Earth sick?" Students will then discuss with a partner, how they think humans make the Earth sick. Students will also be shown some pictures of examples of how Earth has been affected by human activity:

Commented [BSF3]: This works really well!

- Trash pile the size of Texas in the ocean / Sea animals with plastic around them
- Coral bleaching
- Deforestation
- Birds covered in oil
- Melting glaciers
- Landfills
- Ozone layer

VII. MEASURABLE OBJECTIVES

A. As student thinking drives this lesson, students can pursue their own inquiry about the topic above that their group signed up for. They will research how humans are making Earth sick, how it affects living systems, and what humans can do to do less damage.

B. As the culminating activity of this PBL students will create an informational website that meets the objective of the Big idea to teach 4th graders.

VIII TOTAL TIME:

Launch event-One: Class Periods of 45 minutes;

Building Knowledge- Two: 5 Class Periods; 45 minutes

Showing Knowledge (Claims and Evidence) 60 minutes
(Students develop and revise products and or performances)

IX. Social Skills and or Habits of Mind to Engage/Assess

<input checked="" type="checkbox"/> Persistence	<input checked="" type="checkbox"/> Problem posing
<input type="checkbox"/> Decreasing impulsivity	<input checked="" type="checkbox"/> Drawing on past knowledge
<input checked="" type="checkbox"/> Empathic listening	<input type="checkbox"/> Application to new situations
<input checked="" type="checkbox"/> Flexibility in thinking	

<input checked="" type="checkbox"/> Metacognitive awareness	<input type="checkbox"/> Precision of language and thought
<input type="checkbox"/> Checking for accuracy	<input type="checkbox"/> Using all the senses
<input checked="" type="checkbox"/> Questioning	<input checked="" type="checkbox"/> Ingenuity, originality, insightfulness and creativity
	<input checked="" type="checkbox"/> Inquisitiveness, curiosity
	<input checked="" type="checkbox"/> Enjoyment of problem solving

IX. Level of Voice Appropriate for Activity:

Noise Levels

	SILENT MISSION: Silent - No talking at all
	TOP SECRET PLAN: Quiet - Only you and a partner
	SUPER TEAM TASK: Normal - Just your table team
	POWER VOICE: Strong - Hear it across the room
	BIONIC NOISE: Loud - Only used outside

X. BSCS 5-E Framework

Engage: forming groups

- A. DIRECT INSTRUCTION: forming groups, assigning roles, describing roles and tasks

Forming Groups: To form groups, students will be asked to stand in line based on how much they know about how humans interact with the Earth. If the student is standing on the left side of the line, they are confident that they know a lot about how humans interact with the Earth and if they are standing

on the right side of the line, they are not very confident that they know a lot about how humans interact with the Earth. Then, the left half of the line with line up in front of somebody on right side of the line. The groups will be formed by making groups of 5.

Choosing Topic: The topics will be listed on the board. Each group will be given two minutes to discuss what their first, second, and third choices are. Then, a number 1 through 5 will be pulled from a hat. If number one is picked, then group 1 will get to choose first and so forth.

Assigning Roles: To assign roles, the student who has a birthday closest to Earth day (April 22) will be the Materials Manager/Spy. Then, the roles will continue to be assigned rotating clockwise.

Materials Manager/ Spy Tasks: Make sure your team receives and uses the materials. If the team has a question following Three Before ME-- go to another team to answer your question [or see what they have learned].

Checker's Tasks - Make sure the time limits are observed. Help others complete their tasks. Let instructor know when your team has completed the task.

Researcher's Tasks – Researches information to answer the question and provide more information on the topic. The researcher receives the information to give to the typer.

Typer's Tasks: Carefully observes and counts the number of drops that a penny will hold so that each team member has access to the data. Carefully completes the Team analysis page to represent the results of the trials.

Encourager/Observer's Task - Coach the team to persevere and stay together while sharing and turn-taking. Notice, identify and record occurrence of team members' social skills and habits of mind.

(Observer records individual performance)

Checklists and Rubrics provided for student goal setting and self-assessment; Peer Assessment (Team Performance Rubric) [Rate Your Mates] Content Assessment (poster)

Explore:

- **Day one:** Each group will be given a book that pertains to their topic. Each group will nominate a "Storytime Teller" to read the book to their book. Students will write questions or comments that they have in their science journal. After the students are done reading the book, they will have a group discussion in which they will discuss the

Commented [BSF4]: Good plan for forming heterogeneous groups.

Commented [BSF5]: Great inclusion!

questions/comments they wrote in their science journal and also how the book made them feel.

- **Day two:** Each group will conduct an experiment that pertains to their topic.
 - o **Glaciers:** Students will conduct an experiment that tests the effects of melting glaciers on the coasts and marine animals.
<https://www.youtube.com/watch?v=IDZWWcAfn-c>
 - o **Oil Spills:** Students will conduct an experiment that tests the effects of oil spills on marine life (animals and plants).
<https://www.youtube.com/watch?v=cfWV3YYI4oM>
 - o **Deforestation:** Students will create a deforestation model in which they will create a forest with animals and humans and explain the important trees have for those living systems. Then, students will come up with questions on what would happen if their whole forest was cut down.
<https://www.youtube.com/watch?v=jvm3ZL4uDh0>
 - o **Plastic Pollution in the Ocean:** Students will conduct an experiment where they will test the effects of plastic pollution in the ocean.
<http://jdaniel4smom.com/2017/01/water-pollution-experiments-kids.html>
 - o **Ozone layer:** Students will conduct an experiment where they will test the importance of the ozone layer and how holes in the ozone layer can be harmful to living systems.
<https://www.youtube.com/watch?v=HeYtNXNHAp0>
- **Day Four:** Students will discuss alternatives harmful habits that they have seen or that they currently do. Students will then research other alternatives and discuss as a whole class on ways to be more sustainable.

Explain:

- **Day One:** Students will gather information and discuss ways in which humans make the Earth sick based on their topic. Students will be able to use the story book they read in their group, as well as information and research from the internet. Students are encouraged to use different types of sources such as articles, speeches (TED Talks), research data (statistics, pie charts, bar graphs, etc.), and documentaries. Once students have gathered information, they will work on the first part of their website titled, "How Humans Make the Earth Sick".
- **Day Two:** Students will explain their experiment to their class and explain how human activity affects living systems on Earth in terms of their topic. For example, the group whose topic is glaciers will explain their experiment outcome to the class and explain how melting glaciers affect other living systems such as marine animals and humans.
- **Day Three:** Students will gather information and discuss ways in which human activity in terms of their topic affects other living systems on Earth. Students are encouraged to use different types of sources such as articles, speeches (TED Talks), research data

Commented [BSF6]: Wonderful selection of key, important topics.

(statistics, pie charts, bar graphs, etc.), and documentaries. Students will work on Part Two of their website: "How Human Activity Affects Other Living Systems on Earth".

- **Day Four:** Students will add their finishing touches to their website, as well as add a final page to their website in which students will write a contract to the Earth and sign it.

Extend/Elaborate:

- **Day One:** Students will fine-tune their website for part one. Students will put their information into paragraphs, as well as add in photos, videos, and data.
- **Day Three:** Students will fine-tune their website for part two. Students will put their information into paragraphs, as well as add in photos, videos, and data. Students are also encouraged to use data and pictures from their experiment from Day two.
- **Day Four:** Students will fine-tune their website for part three. Students will put their information into paragraphs, as well as add in photos, videos, and data.

XI. Materials List

Day One:

- laptop
- projector
- photos (trash pile in ocean, birds with oil, deforestation, coral bleaching, melting glaciers, sea animals with plastic)
- books (listed at the end)
- Chrome books for the students

Day Two: *materials for each experiment listed in the hyperlink under "Explore".

- Materials for glacier experiment
- Materials for oil spill experiment
- Materials for deforestation experiment
- Materials for plastic pollution experiment
- Materials for ozone layer experiment

Day Three:

- Chrome books for students

Day Four:

- Chrome books for students

Evaluate: (Assess): criteria on website and criteria on presentation

Day Five: Students will present their website to the class.

Day Six – Ten: Each group will present to a fourth grad class.

Assessment: Students will be assessed on their website as well as their presentation. **As a class**, we will make the criteria for both the website and presentation.

Informal Assessments: Students will be informally assessed based on their daily reading logs for each day of the learning segment:

- “What is one thing you learned about how humans interact with Earth that shocked you?”
- “What is one thing you will do differently to help our Earth?”
- “How do humans make Earth sick in terms of your topic?”
- “How does human activity affect animals and plants?”
- “What was the easiest and hardest part about making a website?”

Individual information detailing student learning takeaways from the **Launch** activity

Criteria:

1. Does it include a driving question in any of the identified disciplines?
2. Does it include at least three new science vocabulary words?
3. Does it propose the development of a project--students/unit plan-teachers?
4. Does it show evidence that all team members were involved?

Commented [BSF7]: You really do not need to include this section which was for your construction of the lesson.

Formative Assessment of Non-Cognitive Factors: Self Assessment Using the Habits of Mind Check Sheet and Write-up Form (Google Docs).

Each group will complete a group self-assessment:

Group Self Evaluation Checklist

Name _____ Class Period _____ Date _____
Topic of Study _____ Group Members' Names _____

As a team, decide which answer best suits the way your team worked together. Then, complete the remaining sentences.

We finished our task on time, and we did a good job!	<input type="checkbox"/> YES <input type="checkbox"/> NO
We encouraged each other and we cooperated with each other.	<input type="checkbox"/> YES <input type="checkbox"/> NO
We used quiet voices in our communications.	<input type="checkbox"/> YES <input type="checkbox"/> NO
We each shared our ideas, then listened and valued each other's ideas.	<input type="checkbox"/> YES <input type="checkbox"/> NO
We did best at	
Next time we could improve at	

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Students will also fill in this chart so see which social skills they used throughout the learning segment.

<input type="checkbox"/> Persistence	<input type="checkbox"/> Problem posing
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	<input type="checkbox"/> Enjoyment of problem solving

Children's Literature that Supports the PBL:

- *The Great Kapok Tree: A Tale of the Amazon Rainforest* by Lynne Cherry
- *On the Reef* by Judith and Shandley McMurray
- *Oil Spill!* by Paul Mirocha
- *The Glaciers are Melting* by Donna Love

