CPI: TED-ED Flipped Lesson
Project Description Form

1. **Your Name: Ryan Sproles**
2. **Date: 1/12/2024**
3. **Authentic Topic: Solutions to cleaning up ocean pollution**
4. **Title of TED-ED Flipped Lesson: A robot that eats pollution | Jonathan Rossiter**
5. **Link to your TED-ED Flipped Lesson: A robot that eats pollution**
6. **Grade level it is appropriate for: 9-12 grade**
7. **Describe your full TED-Ed lesson:**

Scenario: (Introduction to the students; Hook for the lesson)

Today's about to get interesting. We're checking out a TED Ed video on robots taking on ocean pollution. It's not your typical class video; think tech meets real-world problem solving. Get ready for a cool perspective on robots and how they might just be the solution our oceans need.

Objectives:

Content objective: Tenth grade students will research and critically evaluate at least three technological solutions for ocean pollution, examining their effectiveness, limitations, and environmental impacts and then create a digital presentation, scoring Proficient or higher on the rubric.

Technology objective: Tenth grade students will design and develop a digital presentation in Canva using appropriate content that is visually appealing and 2-3 minutes in length, scoring Proficient or higher on the rubric.

Watch: (Who is the speaker? What is the video about?): This TED Ed is from Jonathan Rossiter. The video is about a robot he created that eats different types of pollution in the ocean and the pollution fuels the robot to keep eating and moving to eat more pollution.

Think:

1. True or False: The name of the Robot in this video is the RowBot.(5:29)
   a. **True**
   b. False
2. The RowBot has which of the following parts?(6:03)
   a. Brain
   b. Stomach
   c. Body
   d. **All of the above**
3. Analyze the connection between technology and ecological restoration. Discuss both the positive and negative impacts that robots could have. Think about what factors should be considered before using robots.
   Sample response: Robots can significantly aid ecological restoration by speeding up tasks like pollution cleanup in the ocean. However, potential negatives, like ecosystem disruption

and job displacement, must be considered. Before using robots, factors such as environmental sensitivity, and community involvement should be evaluated to ensure balanced and sustainable restoration.

4. Examine the ethical dilemmas that might surround the use of robots to clean up pollution. Evaluate potential environmental and human impacts if robots were used.
   Sample response: The use of robots in pollution cleanup raises ethical dilemmas. While they can enhance efficiency, concerns include potential environmental impacts, such as unintentional disturbance to ecosystems. Additionally, there's a need to assess the social aspect, considering the potential displacement of human workers. Striking a balance requires thorough evaluation of ethical considerations and the careful examination of both environmental and human impacts before widespread adoption of pollution-cleaning robots.

Dig Deeper:

Plastic Soup Foundation - This site provides a variety of solutions to dealing with pollution. It provides solutions for not only in the water, but on land as well. Some of the solutions require users while some are passive in how they operate.
National Ocean Service - This site provides infographics into how oil spills are cleaned up currently. The infographics focus on tools, oil spills on land, and oil spills at sea.
Back to Blue - This site provides a variety of solutions for cleaning up the ocean and preventing pollution from getting to the ocean initially. Information on the amount of plastic that ends up in the ocean yearly and other facts are listed. A case study on the bubble barrier is listed as a possible solution.
The Ocean Cleanup Project Video - This is an 8 minute video on the Ocean Cleanup Project.The video shows how they are using nets to capture plastic from the Great Pacific Garbage Patch. It discusses their success and future goals.

Discuss:

Consider the scalability of pollution-eating robots. Can these technologies be applied globally, or are there specific regions or contexts where they might be more effective?

Response 1:
I think pollution-eating robots are a game-changer globally. Pollution is a widespread issue, and these robots could be deployed in various regions to tackle different types of pollutants. In urban areas, where industrial activities contribute significantly to pollution, the robots could play a crucial role in improving air and water quality. Even in less industrialized regions, they might help address specific local pollution sources. The key is adapting the technology to suit different contexts, making it a versatile solution that can be applied on a global scale.
Response 2:
While the idea of pollution-eating robots is cool, I'm not sure they're a one-size-fits-all solution globally. Different regions face different environmental challenges, and what works in one place might not be as effective in another. In heavily industrialized areas, sure, these robots could be a big help. But in more rural or natural environments, they might struggle to make a significant impact. We should consider region-specific solutions, maybe focusing on other approaches in areas where these robots might not be the best fit.

…And Finally: (While this TED Ed section only allows 1000 characters, you need to *fully* describe the lesson and student project here. Write directions for the students.)

After you have finished the video and all the questions, you are going to research technological solutions for ocean pollution. You will pick 3 solutions and evaluate how effective they are, their limitations, and how they impact the environment. You will then organize your research into a 2-3 minute digital presentation on Canva that is visually appealing. Aim for Proficient or higher on the content and technology rubrics.

8. Create a separate assessment rubric for each of your objectives above.

Content objective: Tenth grade students will research and critically evaluate at least three technological solutions for ocean pollution, examining their effectiveness, limitations, and environmental impacts and then create a digital presentation, scoring Proficient or higher on the rubric.

Areas of Performance ↓	**1. Needs Much Improvement; Novice (0-44% of points)**	**2. Needs Improvement; Apprentice (45-74% of points)**	**3. Acceptable; Proficient (75-94% of points)**	**4. Excellent; Distinguished (95-100% of points)**
Evaluation	Minimal attempts at analysis, lacking depth and critical thinking.	Analysis lacks depth or clarity, with developing critical thinking.	Offers a solid analysis, showcasing proficient critical thinking.	Provides a nuanced analysis, demonstrating exceptional critical thinking.
Effectiveness	Minimal or no evaluation of effectiveness.	Limited evaluation of effectiveness.	Effectively evaluates the effectiveness of each solution.	Clearly and comprehensively evaluates the effectiveness of each solution.
Limitations	Minimal or no identification or analysis of limitations.	Limited identification or analysis of limitations.	Clearly identifies and analyzes limitations.	Identifies and analyzes limitations with exceptional insight.
Environmental Impacts	Minimal or no understanding of environmental impacts.	Limited understanding of environmental impacts.	Shows a clear understanding of environmental impacts.	Demonstrates an exceptional understanding of environmental impacts.

Technology objective: Tenth grade students will design and develop a digital presentation in Canva using appropriate content that is visually appealing and 2-3 minutes in length, scoring Proficient or higher on the rubric.

Areas of Performance ↓	**1. Needs Much Improvement; Novice (0-44% of points)**	**2. Needs Improvement; Apprentice (45-74% of points)**	**3. Acceptable; Proficient (75-94% of points)**	**4. Excellent; Distinguished (95-100% of points)**
Design and Layout	Shows minimal or no proficiency in using Canva for design and layout.	Utilizes Canva but with limited effectiveness in creating a visually appealing and organized presentation.	Effectively employs Canva to create a visually appealing and well-organized presentation that enhances the content.	Demonstrates an exceptional design, utilizing Canva to create a visually stunning and highly organized presentation that enhances the content.

Length	Fails to adhere to the time frame, resulting in a presentation significantly shorter or longer than required.	Struggles to manage time effectively, resulting in a presentation that may be too short or too long.	Effectively manages the time frame, delivering a coherent and engaging presentation.	Presents a well-structured and engaging presentation within the 2-3 minute time frame.

9. **Revised Bloom's level, Cognitive Process, and justification:**
   Bloom's Level 5 and cognitive process 5.2 Critiquing. The content objective requires students to evaluate the solution based upon their effectiveness, limitations, and environmental impacts.

10. **Describe the process you went through to complete this lesson:**
    I started by deciding on a standard to address. I then found the TED talk I wanted to use. I then created objectives. From the objective I made directions for the lesson. I watched the video and made questions that a student could answer by having watched the video and would require high level thinking at times. From there I searched for additional resources that might be useful.

11. **How long did this project take you?** This project took me 4 hours.

12. **What mistakes did you make and how did you correct them?**
    I didn't put a long enough description on the Dig Deeper section. I corrected it by going back and adding more information.

13. **What technical problems did you encounter?**
    At first I didn't know how I was going to post a response to the discussion question, but then realized once I published the lesson I would have the ability to post.

14. **Give APA references and annotations for ALL sources used in creating this project:**

References

The future of the ocean: The tech to tackle plastics. (2019). An initiative of Economist Impact and The Nippon Foundation. Retrieved January 12, 2024, from https://backtoblueinitiative.com/the-future-of-the-ocean-the-tech-to-tackle-plastics/#theGreatBubbleBarrier

This website was used for the "Dig Deeper" portion of my TED Ed. The website has information on potential solutions for cleaning up pollution and preventing pollution in the ocean.

How does NOAA help clean up oil and chemical spills? (n.d.). National Ocean Service. Retrieved January 12, 2024, from https://oceanservice.noaa.gov/facts/spills-cleanup.html

This website was used for the "Dig Deeper" portion of my TED Ed. This website provides multiple infographics on tools used and how oil spills are currently being cleaned up.

HS-ESS3-4 Earth and Human Activity. (n.d.). Next Generation Science Standards. Retrieved January 12, 2024, from https://www.nextgenscience.org/pe/hs-ess3-4-earth-and-human-activity

This provided the standard for which my content objective was based off of. This is the website for NGSS standards.

Rober, M. (2021, November 2). *The Ocean Cleanup begins cleaning the Great Pacific Garbage Patch*. YouTube. Retrieved January 12, 2024, from https://www.youtube.com/watch?v=tLcnJEMnlTs

This video was used for the "Dig Deeper" portion of my TED Ed. The video shows how the Ocean Cleanup organization is using nets and boats to collect trash currently in the Pacific Ocean.

Solutions to Plastic Pollution. (n.d.). Plastic Soup Foundation. Retrieved January 12, 2024, from https://www.plasticsoupfoundation.org/en/solutions/

This website was used for the "Dig Deeper" portion of my TED Ed. The website provides over 100 solutions that are being used to clean up pollution in different environments.

TED Ed. (n.d.). TED Ed. Retrieved January 12, 2024, from https://ed.ted.com/educator

This was used to create my TED Ed lesson. The TED Ed website has the video I used for making my lesson.

15. **Use the scoring rubric below for this project to score (and justify the score of) your project on each section as outlined in the rubric below. In the rubric, highlight (in yellow or any other color) your rating and type your justification in the far right column.**

	1. Indicator Not Met; Needs Much Improvement; Novice (0-44% of points)	2. Indicator Partially Met; Needs Improvement; Apprentice (45-74% of points)	3. Indicator Met; Acceptable; Proficient (75-94% of points)	4. Exceeds Indicator; Excellent; Distinguished (95-100% of points)	Comments/ Justifications
Watch (25 points)	• Poor choice of video for the flipped lesson that is not appropriate for topic and grade level • OR did not use a TED Talk; used a YouTube video	• Poor choice of video for the flipped lesson that is either not appropriate for topic and grade level • OR did not use a TED Talk; used a YouTube video	• Good choice of TED Talk video for the flipped lesson that is appropriate for topic and grade level	• Excellent choice of TED Talk video for the flipped lesson that is appropriate for topic and grade level	• My TED talk video uses language that would be age appropriate for high school students and address a standard that is expected of high school students.

Think (50 points)	• Questions are not clear and are not appropriate for topic/video or learning characteristics of pupils. • 1 multiple choice question with no feedback and no video hints	• Questions may not be appropriate to topic/video or learning characteristics of pupils. • 2 multiple choice questions with poor feedback and no video hints • 2 or more open ended, thought-provoking questions at a Bloom's level of Analyze or higher	• Questions are appropriate to topic/video and learning characteristics of pupils. • 2 multiple choice questions with appropriate feedback and video hints • 2 or more open ended, thought-provoking questions at a Bloom's level of Analyze or higher	• Questions are creative and clearly address the topic/video and learning characteristics of pupils. • 3 or more multiple choice questions with excellent feedback and video hints • 3 or more well-written, open ended, thought-provoking questions at a Bloom's level of Analyze or higher • Accomplishes the above on the first attempt	• My are creative and address the content in the video. I had 2 multiple choice and 2 open ended that were at the analyze or higher.
Dig Deeper (25 points)	• Only 1-2 print/media/ technology/websites are presented. • Few of the instructional documents, worksheets and assessments are listed and linked to the Appendix. • Very short description telling how resources are used in the student project or incomplete sentences.	• Not all specific print/media/ technology/websites are presented. Some obvious items are left out or discussed in very general terms. • Very short description telling how resources are used in the student project or incomplete sentences.	• All specific print/media/ technology/websites are presented. • 1 sentence description telling how resources can be used in the student project. .	• All specific print/media/ technology/websites are presented. • 2-3 sentence description for each resource telling how this resource can be used in the student project. • Accomplishes the above on the first attempt	• 4 website/videos were presented each with 2 more sentences describing what the resources contained.

Discuss (25 points)	• Discussion prompt that is not age appropriate and does not require higher level thinking • Inadequate sample student responses to the prompt	• Poorly written discussion prompt that may not be age appropriate or it does not require higher level thinking • Only one good or adequate sample student responses to the prompt or two samples are posted but they are too short or inadequate	• Good or adequate discussion prompt that is age appropriate and requires higher level thinking • Two good or adequate sample student responses to the prompt	• Excellent, well-written discussion prompt that is age appropriate and requires higher level thinking • Two excellent, well-written sample student responses to the prompt	• Prompt is well written and age appropriate. Two responses were written as student examples.

…And Finally (online) (25 points)	• Poorly written description (in the lesson file) of the student project; It does not describe what the student is supposed to do. The reader does not understand what students are supposed to do. • No evidence of higher level thinking in the student project (Analysis, Evaluation, or Create level of Bloom's) or incorrect use of verbs or context clues • Does not require that students create a technology product.	• Description of the student project (in the lesson file) does not give a good picture of what the student is supposed to do. The reader may have many questions about what students are supposed to do. • No evidence of higher level thinking in the student project (Analysis, Evaluation, or Create level of Bloom's) • Requires that students create a technology product but the project does not require higher level thinking with the content of the lesson.	• Description of the student project (in the lesson file) gives good picture of what the student is supposed to do. The reader may have 1-2 questions about what students are supposed to do. • Evidence of student interaction with the content at higher level thinking (Analyze, Evaluate, or Create level of Bloom's) • Requires that students create a technology product that demonstrates their higher level thinking with the content of the lesson.	• Excellent, well-written description (in the lesson file) of the student project. It gives enough detail that the reader can visualize the entire project. • Clear evidence of student interaction with the content at higher level thinking (Analyze, Evaluate, or Create level of Bloom's) • Requires that students create a technology product that demonstrates their higher level thinking with the content of the lesson. • Accomplishes the above on the first attempt	• Description explains what needs to be done, but could require clarification to some. Content is at the Evaluate level of Blooms. Students have to create a digital presentation that require higher level thinking.
Flipped Lesson File (50 points)	• The TED-Ed Flipped lesson does not demonstrate any higher-level thinking activities. • Incorrect identification and no justification of Bloom's Taxonomy level • Listed 1-2 references, used incorrect APA format; • No annotations. • No "borrowed" information (even the video) is cited. • Incomplete self-evaluation and no justification for each rating in last column.	• The TED-Ed Flipped lesson does not demonstrate how pupils are engaged in higher-level thinking activities with the content of the lesson as well as the pupil technology use. • Incorrect identification and justification of Bloom's Taxonomy level • Listed more than two references, used correct APA format; • No annotations for references or poorly written. • Not all "borrowed" information (even the video) is cited in the lesson in correct APA format or very poor APA style. • Incompletion self-evaluation or no justification for each rating in last column.	• The TED-Ed Flipped lesson demonstrates how pupils are engaged in higher-level thinking activities with the content of the lesson as well as the pupil technology use. • Correct identification and justification of Bloom's Taxonomy level • Listed more than four references, used correct APA format; • Annotations give two sentences—one gives the source's contents and the second tells how the source was used in creating lesson. • All "borrowed" information (even the video) is cited in the lesson in correct APA format with 2-3 APA errors. • Completion of self-evaluation with each area in the rubric rated and justification for each rating in last column.	• The TED-Ed Flipped lesson clearly demonstrates how pupils are engaged in higher-level thinking activities with the content of the lesson as well as the pupil technology use. • Correct identification and justification of Bloom's Taxonomy level • Listed more than six references, used correct APA format; • Annotations give two sentences—one gives the source's contents and the second tells how the source was used in creating lesson. • All "borrowed" information (even the video) is cited in the lesson in correct APA format. • Completion of self-evaluation with each area in the rubric rated and justification for each rating in last column. • Accomplishes the above on the first attempt	• All parts of lesson are completed as required. Lesson requires higher level thinking. • 6 sources listed with 2 or more sentences for annotation. • Self evaluation completed.