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ED556K Climate Change for Teachers and Students
Assignment #13
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Lesson Reflection

This lesson is intended for the first day of my climate unit. The Climate Change Understanding table will be a tool for my students to track their growing understanding of some of the major topics associated with climate change. It will also allow me to quickly check students' prior knowledge and understanding. Students will start by completing the column on the left before watching the Al Gore TED talk, the middle column part way through the unit and the right column of the table at the end of the unit. We will use the table to track increasing understanding and evolving ideas as well as a starting point for class discussions.

Al Gore's TED talk and questions will be the first activity students will complete in the climate unit. Students will answer questions about the video as they watch and we will use the video as a springboard to more specific investigations into causes, mitigations and adaptations, and actions students can take.

When students finish the Gore TED talk they will get started on the conservation.org carbon calculator. Questions will prompt students to toggle between choices like "meat lover" and "vegetarian" to see how much of a difference those choices make. The calculator also allows students to see how much it would cost to buy carbon offsets and how those offsets are implemented. We will conclude with a class discussion where we will compare carbon footprints and let students talk about why there's may be higher than others.

The lesson went well and I was happy with the conversations that were generated at the end of class. At first, some students were confused about how to research answers that were not directly in the video but I changed the instructions to make it more clear that they had to find these answers on other sites. When I walked around the room and looked at student's answers to the questions in the table I learned that they have relatively little prior knowledge about climate change. Some students expressed genuine surprise to some of the facts and scenarios described in the videos.

In one conversation with a student, she was surprised by how much higher her carbon footprint was in comparison with her classmates. As we talked about it more she revealed her family does not recycle but the biggest influence was her family's occupation. Her father and brother operate a vehicle transport and towing business from home. They own several large trucks and drive them all for business and personal use. This started a good conversation about the conflict between earning a living and reducing carbon. We concluded that a good first step might be to start recycling and then she could work with her family to make their family business cleaner.

One change I may make for the lesson is to change some the questions on the table. I'd like to have about half of the questions match the two videos we watch so I can see if their understanding is evolving after this lesson. As they are now, it will be several more lessons before we explore most of the topics in the table.

Climate Change Understanding

I know that...	I'm learning that...	Now I know that...
What is climate change and is it affecting the Earth?	What is climate change and is it affecting the Earth?	What is climate change and is it affecting the Earth?
The Earth is warming because energy is being trapped. How is it being trapped?	The Earth is warming because energy is being trapped. How is it being trapped?	The Earth is warming because energy is being trapped. How is it being trapped?
How does ocean warming affect sea level?	How does ocean warming affect sea level?	How does ocean warming affect sea level?
How does a warming Earth affect the distribution of plants and animals?	How does a warming Earth affect the distribution of plants and animals?	How does a warming Earth affect the distribution of plants and animals?

What is the difference between climate change mitigation and adaptation?	What is the difference between climate change mitigation and adaptation?	What is the difference between climate change mitigation and adaptation?
How does climate change affect weather?	How does climate change affect weather?	How does climate change affect weather?
Who are the people who are affected right now by climate change?	Who are the people who are affected right now by climate change?	Who are the people who are affected right now by climate change?
What can you do to reduce your contribution to climate change?	What can you do to reduce your contribution to climate change?	What can you do to reduce your contribution to climate change?

Al Gore: The Case for Optimism on Climate Change (TED 2016)

<https://youtu.be/u7E1v24DlIk>

Questions

1. Before you start the TED Talk video, complete a quick online search for Al Gore, the video presenter. Write three sentences describing his life and career, and when he got involved in climate change advocacy.

Start TED-Talk Video Now

2. Al Gore talks about the “Earthrise” photo taken during an Apollo mission as a catalyst of the environmental movement. Complete a quick online search and describe which Apollo mission the photo was from and list the astronaut onboard who was also on Apollo 13.

3. Why does Al Gore describe our atmosphere as an open sewer?

4. Look at the slide of showing “The Biggest Sources of Greenhouse Gases”, pick the five you think are the largest and list them in order from most to least.

5. Between 1960 and 2013, how much have the Global Carbon Emissions from Fossil Fuels per year increased? (This information is on a slide from the video)

6. How much extra heat energy is trapped in the atmosphere by man made sources, per day?

7. Where is most of the heat trapped on the Earth stored?

8. What is the consequence of warmer oceans on hurricanes?

9. How do warmer oceans create flying rivers?

10. Al Gore mentions the increasing number of wildfires on the western united states, have you experienced the effects of these fires?

11. How is a warming Earth causing food shortages, climate refugees and other human migrations?

12. What happens when land ice melts?

13. Why does Mark Carney, the head of the United Kingdom Central Bank say that the majority of the remaining fossil fuels are unburnable? What is the risk?

14. Al Gore's answer to the first question "Do we need to change?" is an emphatic yes. Do you agree or disagree? Explain your answer.

15. What is the good news about the wind and solar energy production and battery storage?

16. Enough solar energy comes to the Earth in an _____ to supply the world's energy needs for a full year.

17. Al Gore's answer to the second question "Can we change?" is an emphatic yes. Do you agree or disagree? Explain your answer.

18. Al Gore shows a graphic depicting coal fired power plants that have been canceled, closed and had closing dates announced. One coal plant scheduled for closure is in Oregon. Complete a quick online search and describe a) who owns the plant and when it was approved b) when it is scheduled to be closed c) why it is being closed

19. Gore compared the challenge of stopping climate change to another seemingly impossible challenge. What was the challenge he was talking about?

20. Al Gore's answer to the third question "Will we change?" is an emphatic yes. Do you agree or disagree? Explain your answer.

Personal Carbon Footprint

What is a Carbon Footprint? If you don't know, conduct a quick online search and describe what you found out.

Watch Video: What YOU Can Do About Climate Change- <https://youtu.be/VTfgNFz1DBM>

Go to: Conservation International Carbon Calculator-
<https://www.conservation.org/act/carboncalculator/calculate-your-carbon-footprint.aspx#/>

1. Begin filling out the carbon calculator for yourself and enter your zip code then fill out the number of members in your household.
2. About how many tons of CO₂ would you save every year by living in an apartment building with 5+ units compared to a single family home? _____
3. About how many tons of CO₂ would you save every year if they changed your diet from "Meat lover" to "Vegetarian"? _____

Finish filling out the Carbon Calculator including the transportation usage and submit.

4. How many tons of CO₂ do you produce each year? _____
5. Do you produce more or less CO₂ than the average american? _____
6. Scroll down and describe how your carbon footprint compares to those of an average person in other countries.
7. The conservation.org website offers you the opportunity to offset your carbon footprint. How much would it cost if you wanted to purchase carbon offsets for one year? _____
8. Describe three things you could actually do to reduce your personal carbon footprint?
9. Scroll down near the bottom of the page and read about how conservation.org offsets your carbon footprint if you pay for their service. In three sentences describe how it works.