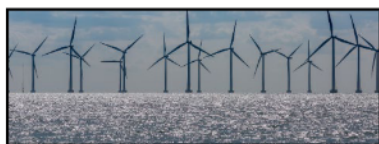


Climate Change, It's Natural and It's Also Human



Executive Summary

This Climate Change video is 22 minutes long and includes five pause breaks for discussion. It covers the causes of climate change, both natural and human. It provides background on greenhouse gases: how they work, specific gases, and their effects on the planet, both positive and negative. Then it traces the history of global warming, starting with the use of fossil fuels during the industrial revolution up until the present. There is also information on climate forecasting, with an explanation of how scientists use ice core sampling to learn about the history of the earth's temperature for the past 800,000 years. There's a discussion of people's perceptions of climate change. The concern is that until people are convinced that climate change is happening and that humans are causing it to rapidly accelerate, there's no reason for them to make the kinds of changes that need to be made. The video concludes with the urgent need to reduce greenhouse gases through reduction of fossil fuels and an increase in renewable energy.



Instruction Guide

This video is 22 minutes long and includes five pause breaks for discussion. Allow approximately 45 minutes for the entire lesson. For homework the day before, assign the following questions:

- What do you know about climate change?
- Why is climate change happening?
- What are the potential impacts of climate change?

These questions appear on the first discussion slide, so students should be prepared for a meaningful discussion, whether live or remote. Discussions can be in small groups (or breakout sessions if remote) to facilitate participation.



Further Study/Homework Options

1. Read this article about rising sea levels off Cape Cod.
What scientific analysis is reported here? What is the human toll, the environmental toll?
<https://apps.bostonglobe.com/metro/2019/09/26/cape-cod-climate-change/story/>
2. What is a "carbon footprint" and what are some ways to reduce it? Take one or both of the following quizzes with your family to determine your carbon footprint and write about one change you can commit to making. <https://howdoyoufuel.com/quiz>; <https://www.conservation.org/carbon-footprint-calculator#/>

Climate Change, It's Natural and It's Also Human

Further Study/Homework (continued):

3. CFCs are human-made gases that are extremely effective at creating the greenhouse gas effect. What is the history of chlorofluorocarbon use in consumer products? Create a timeline of the EPA's decision to allow, change, then recommend against the use of CFCs.
4. Who is Greta Thunberg? How has she created a youth movement about climate change? There are other youth leaders emerging throughout the world - can you learn more about who they are?
5. Create a mini lesson for younger students on one of these topics: greenhouse gases, ice core sampling, renewable energy.



Resources

List of global warming potential for various gases

https://en.wikipedia.org/wiki/Global_warming_potential

Excellent overview of climate change in Massachusetts

<https://www.massaudubon.org/our-conservation-work/climate-change/effects-of-climate-change>

The impact of climate change on Cape Cod is of global significance.

Article and short documentary:

<https://www.bostonglobe.com/metro/2019/09/26/climate-change-cape-cod/G9fVJLDVELLJHaffTZ9qTJ/story.html>

Teacher resources

<https://pulitzercenter.org/changingcape>

EPA Climate Change resource page 1

<https://www.epa.gov/climate-research>

Ice Core Sampling

<https://www.ncdc.noaa.gov/news/picture-climate-what-can-we-learn-ice>

<https://climate.nasa.gov/news/2616/core-questions-an-introduction-to-ice-cores/>

Climate Forecasting

<https://eos.org/science-updates/advancing-climate-forecasting>