

Today I Learned About Carbon Offsets

Description:

Countries, companies and even individuals can pay for carbon offsets to reach “carbon neutral” or “net zero” targets. Students investigate carbon dioxide distribution, what carbon offsets are, the history of the Kyoto Protocol, and how forest health interacts with carbon offset claims.

Skills & Objectives

SWBAT

- Explain that carbon dioxide is emitted in some places more than others but distributes throughout the atmosphere.
- Describe the idea of a carbon offset.
- Understand the basics of the Kyoto Protocol.
- Analyze carbon offset claims of companies and organizations.

Skills

- Media literacy
- Discussion
- Map reading

Students Should Already Know

- A basic understanding of the relationship between carbon dioxide and climate change.

Standards Alignment:

HS-ESS3-6 Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-3 Evaluate a solution to a complex real-world problem

RST.9-10.8 Assess the extent to which the reasoning and evidence in a text support the author’s claim.

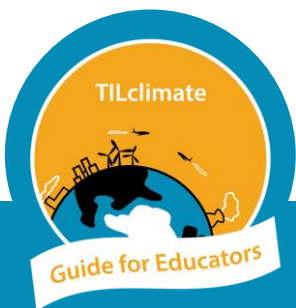
Disciplinary Core Ideas:

ESS2.D Weather and Climate

ESS3.A Natural Resources

ESS3.C Human Impacts on Earth Systems

ESS3.D Global Climate Change



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How To Use These Activities:



Pages with the circular “TILclimate Guide for Educators” logo and dark band across the top are intended for educators. Simpler pages without the dark band across the top are meant for students.

Each of the included activities is designed to be used as a standalone, in sequence, or integrated within other curriculum needs. A detailed table of contents, on the next page, explains what students will do in each activity.

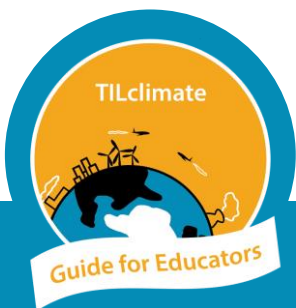
A Note About Printing/Materials

All student pages are designed to be printable in grayscale, except for the map on page 3. A few copies of this page could be printed color for students to share, or the image projected in the classroom.

The worksheets do not leave space for students to answer questions. Students may answer these questions in whatever form is the norm for your classroom – a notebook, online form, or something else. This allows you, the teacher, to define what you consider a complete answer.

Podcasts in the Classroom: Throughout these Guides for Educators, we invite students to think about how they would share their learning with family and friends. One way to do this is to encourage your students to create their own podcasts - they're shareable, creative, and have multiple options for embedded assessment. We would love to hear any podcasts or see any other projects you or your students create! Email us at tilclimate@mit.edu, Tweet us @tilclimate, or tag us on Facebook @climateMIT.

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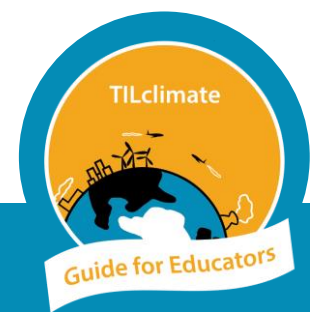
Detailed Table of Contents

Page	Title	Description	Time (min)
	Podcast Episode	Students listen to TILclimate: TIL about carbon offsets, either as pre-class work at home or in the classroom. https://climate.mit.edu/podcasts/e6-til-about-carbon-offsets	10-15
1	Carbon Dioxide Distribution (internet required, see note)	Students watch a model of a year's worth of carbon dioxide build-up in Earth's atmosphere and explore the factors that affect it.	15-20
2-3	Kyoto Protocol (internet required, see note)	Students read about the 1997/2005 Kyoto Protocol in small groups. Then, in a jigsaw, they explore the three main market-based mechanisms of the Protocol.	30-45
4-5	Carbon Offsets (internet required, see note)	Students explore real-life carbon offset and climate statements from companies and analyze how effective they might be.	20-45
6-7	Forests and Carbon (internet required)	Using data from Global Forest Watch, students investigate the claims of carbon offsets that focus on deforestation and reforestation.	15-20

Internet Use

With limited or no internet access in class, the following adaptations can be made:

- Carbon Dioxide Video: Project on the wall for the whole class.
- Kyoto Protocol: Print a copy of the overall web page, as well as the three mechanism descriptions from the site.
- Carbon Offsets: See pages a-e for sample climate change statements from major retailers.



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Carbon Offsets and the Kyoto Protocol

This Educator Guide includes data investigations, discussions, and history analysis. Educators may pick and choose among the pieces of the Guide, as suits their class needs.

Parts of this Guide may align with the following topics:

- Life/environmental science: Carbon cycle, forests.
- History/social science: Kyoto Protocol, geopolitics.
- ELA/literature: Climatepunk, hopepunk, and speculative fiction.
- ELA/nonfiction: Reading and understanding treaties.

MIT Resources

We recommend the following as resources for your own better understanding of climate change or as depth for student investigations. Specific sections are listed below:

- Climate Science, Risk & Solutions, an interactive introduction to the basics of climate change. <https://climateprimer.mit.edu/>

Chapter 02

Chapter 10

- MIT Climate Portal Explainers are one-page articles describing a variety of climate topics. New Explainers are posted monthly. <https://climate.mit.edu/explainers>

Carbon Offsets

Climate Targets

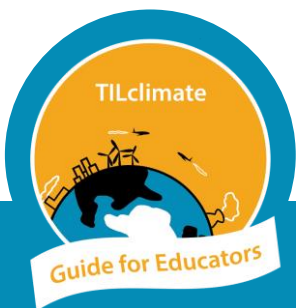
Forests and Climate Change

Soil-Based Carbon Sequestration

Coastal Ecosystems and Climate Change

Loss and Damage

Climate Justice



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Wrap-Up Discussion Questions

- Do you agree that “a CO₂ molecule warms the planet the same in Germany as in India, the planet [doesn't] notice the difference”? Why or why not?
- Describe the Kyoto Protocol in your own words.
- What questions do you still have about the Protocol?
- Which of the market-based mechanisms in the Kyoto Protocol interest you the most?
- Based on the podcast episode, how effective do you think carbon offset programs are?
- Why do you think this? Do you think they should or could be improved?
- How would you explain carbon offsets to a friend or family member?
- Would you buy carbon offsets? Why or why not?

Climate Solutions

Climate solutions can be thought of as falling into four categories outlined below. Across all categories, solutions at the community, state or federal level are generally more impactful than individual actions. For example, policies that increase the nuclear, solar and wind mix in the electric grid are generally more effective at reducing climate pollution than asking homeowners to install solar panels. For more on talking about climate change in the classroom, see “How to Use This Guide”.

•Energy Shift

How do decision-makers make the switch from carbon-producing energy to carbon-neutral and carbon-negative energy?

•Energy Efficiency

What products and technologies exist to increase energy efficiency, especially in heating and cooling buildings?

•Adaptation

How can cities and towns adapt to the impacts of climate change?

•Talk About It

Talking about climate change with friends and family can feel overwhelming. What is one thing you have learned that you could share to start a conversation?

What solutions are the most exciting in your classes? We would love to hear from you or your students! Images, video, or audio of student projects or questions are always welcome. Email us at tilclimate@mit.edu, Tweet us @tilclimate, or tag us on Facebook @climateMIT.

