

Today I Learned About National Security

Description:

Changes to the climate have had and will have dramatic effects on natural disasters, mass movement, and government stability. The ability of governments, organizations, and leaders to plan for, adapt to, and prevent natural disasters will shape the future.

In this set of activities, high school students model changes in climate and their effects on international relations, investigate local climate impacts and solutions, and observe global climate patterns and adaptations. Lessons may be standalone or done in series.

Skills & Objectives

SWBAT

- Describe the connection between natural disasters, mass migration, and international relations.
- Describe the connection between human-caused carbon dioxide emissions and global climate change.
- Describe some methods of adaptation to climate-related risks around the world.

Skills

- Map analysis
- Critical thinking
- Communication

Students Should Already Know That

- Governments interact with one another through diplomacy, economic policy, environmental policy, and more.
- Natural disasters such as floods, storms, and droughts cause people to move from disrupted places to places of safety.

Standards Alignment:

HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ETS1-3 Evaluate a solution to a complex real-world problem based on prioritized criteria.

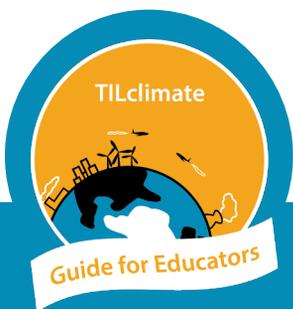
CCSS.ELA-LITERACY.RH: History/Social Studies - Integration of knowledge and ideas

Disciplinary Core Ideas:

ESS3.B: Natural Hazards

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 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.

The Mass Migration game and all three Dive Deeper activities take about the same amount of time. These could be done as stations or a jigsaw. The three Dive Deeper investigations are internet-based and could be done as homework or asynchronous remote work.

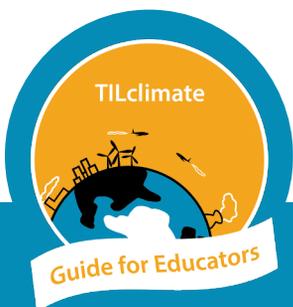
A Note About Printing

All student pages are designed to be printed grayscale, except for the map on page 2. A larger version of this map is included, which could be printed to share among students or projected in the classroom.

The worksheets on pages 8-13 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. Student-created podcasts are 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.

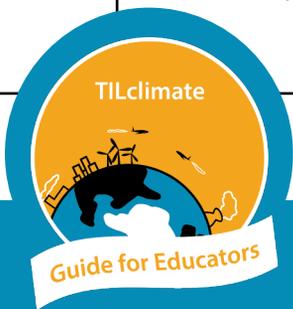
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Detailed Table of Contents

Page	Title	Description	Time (min)
	Podcast Episode	Students listen to TILclimate: TIL about national security, either as pre-class work at home or in the classroom. https://climate.mit.edu/podcasts/til-about-national-security	10-15
1-2	Background Reading	A brief reading including a definition of national security, causes and effects of climate change, weather vs climate, precipitation changes, and solutions.	5-10
3	Precipitation map	A larger version of the map on page 2, for sharing among students or projecting in the classroom if color printing is not available.	n/a
4-7	Mass Movement Game	Through simple roll-of-the-dice modeling, students imagine the changes in trade, immigration, and aid between four imaginary countries as the climate changes between 1950 and 2050.	15-20
8-9	Dive Deeper: Local Impacts (internet required)	Using a climate.gov interactive, students examine drought and precipitation data for a region of their choice and consider the impacts of changes.	15-20
10	Dive Deeper: Local Solutions (internet required)	Using the US Climate Resilience Toolkit, students choose, read, and report on a case study of a climate adaptation project.	15-20
11	Dive Deeper: Local Impacts, Local Solutions	In groups, students share the results of their Local Impacts and Local Solutions investigations. Then, they are challenged to consider how they would share their learning with friends and family.	15-20
12-13	Dive Deeper: Global Impacts, Global Solutions (internet required)	Using the NOAA Global Climate Report, students explore temperature and precipitation anomalies around the world. Then, using the Intergovernmental Panel on Climate Change (IPCC) 5 th Report, they briefly analyze best options for climate adaptation in a region of their choice.	15-20



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National Security

This Educator Guide includes a game, and three internet-based investigations. 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: Dramatic changes in precipitation and drought have effects on ecosystems and animals, driving migration, adaptation, and extinction.
- History/social science: International relations will be and have been deeply impacted by climatic events and climate change. Government policies and practices both react to and create the climate effects we see today.
- ELA/literature: Connections to fictional works that deal with migration, natural disasters, or international diplomacy.
- ELA/nonfiction: Interpretation and communication of complex concepts.

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/>
 - 02 The greenhouse effect and us
 - 04 The climate is always changing
 - 06 Predicting climate
 - 07 Understanding risk
 - 10 What can we do?
- MIT Climate Portal Explainers are one-page articles describing a variety of climate topics. <https://climate.mit.edu/explainers>
 - Cities and Climate Change
 - Climate Models
 - Food Systems and Agriculture
 - The Intergovernmental Panel on Climate Change
 - The Paris Agreement



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Wrap-Up Discussion Questions

- Have you heard about climate-related migration in the news? What other factors cause people to leave home and move somewhere else?
- Even if we stopped all carbon dioxide emissions tomorrow, the climate would continue to change for many years. What adaptation solutions were you most excited about?
- Thinking about effects on national security, immigration, and natural disasters can be very heavy and scary. If this is a topic you care about, how can you use your best skills to help? How have communicators, scientists, artists, engineers, activists, community leaders, and others made the changes they want to see?

Climate Solutions

Climate solutions can be thought of as falling into four co-equal categories. Across all categories, a focus on community-level solutions leads to more effective action. Community-level solutions change decision-making so that the default option for individuals is the one that has the best result for the climate. For example, policies that increase the solar and wind mix in the electric grid, instead of 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 we adapt buildings to keep people safe from heat and cold?

•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.

