

ENVIRONMENT &
SOCIETY SERIES



Environmental Issues Forums in the Classroom – Middle School Teacher Guide

*Climate Choices: How should we meet the
challenges of a warming planet?*

Environmental Issues Forums in the Classroom – Middle School Teacher Guide is part of NAAEE's Environmental Issues Forums series. EIF provides tools, training, and support for engaging adults and students in meaningful, productive discussions about sticky issues that affect the environment and communities. For more information about EIF and to download materials, please visit: <https://naaee.org/our-work/programs/environmental-issues-forums>

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NAAEE is the professional association for environmental educators in North America and beyond.

Education We Need for the World We Want

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Introduction

People throughout United States, and the rest of the world, are wrestling with the ramifications of climate change. We have important choices to make – from individual and community actions to corporate policies and government regulations. Each of these choices will impact our well-being. As a teacher, you have the opportunity to help your students understand climate change and the choices we need to make.

This teacher’s guide introduces you to the Environmental Issues Forums issue guide *Climate Choices: How should we meet the challenges of a warming planet?* Using *Climate Choices* offers an opportunity for you and your students to use a deliberative process to consider our climate change choices. This teacher’s guide provides background information on deliberation and how to use *Climate Choices* in your classroom, including material that will help you moderate a forum with your students. In addition, the guide points you, the teacher, to resources on climate change.

Environmental Issues Forums (EIF)

EIF, an initiative of the North American Association for Environmental Education (<http://naaee.org>), is designed to promote meaningful, productive deliberation, convened in your classroom, about difficult issues that affect the environment and communities. EIF is modeled on the National Issues Forums (NIF) – a nonpartisan, nationwide network of locally sponsored public issues forums. EIF, like NIF, is rooted in the simple notion that democracy requires an ongoing deliberative public dialogue. People need to come together to reason and talk – to deliberate about common problems. Understand together. Decide together. Act together. For more information on EIF, visit <https://naaee.org/our-work/programs/environmental-issues-forums>.

About *Climate Choices: How should we meet the challenges of a warming planet?*

Climate change is not only an environmental problem. It is also a public health issue, a threat to national security, and an economic challenge of considerable magnitude. Only recently has the public debate shifted away from weighing the evidence to asking what we should do about our changing climate and the effects that are beginning to be felt. The *Climate Choices* issue guide provides basic background information about climate change as well as three options that present different ways to approach the problem, along with their potential trade-offs:

- Option 1: Sharply reduce carbon emissions
- Option 2: Prepare and protect our communities
- Option 3: Accelerate innovation

Deliberative forums on this issue may not be easy. It may be helpful to remind your students that the objective of these forums is to begin to work through the tensions between the various things that we hold most valuable.

Why use EIF in the Classroom?¹

Through EIF in the Classroom your students will actively engage essential environmental issues through deliberation and participation in democratic practices. They will learn to listen to one another and consider alternative perspectives. They will deliberate about the choices they can make and the actions they can take in their own communities to address climate change. They will discuss climate change in a nonpartisan, non-confrontational manner.

In productive deliberation, people examine the advantages and disadvantages of different options for addressing a difficult public problem, weighing these against the things they hold deeply valuable. The framework in the *Climate Choices* issue guide describes three options and provides an alternative means for moving forward to avoid polarizing rhetoric. Each option is rooted in a shared concern, proposes a distinct strategy for addressing the problem, and includes roles for citizens to play. Equally important, each option presents the drawbacks inherent in each action. Highlighting these drawbacks allows the students to see the trade-offs that they need to consider in pursuing any action. It is these drawbacks, in large part, that make coming to shared judgement so difficult – but ultimately, so productive.

Watch Deliberation in the Classroom

Deliberation in the classroom has a long history of engaging students in discussions about a variety of issues. The following videos provide imagery of what forums look like in school classrooms.

- SUNY Broome and Windsor Middle School. In this video, teachers and students talk about the impact of classroom deliberation. Their deliberation focused on U.S. history: <https://www.youtube.com/watch?v=-lby4xJtCME>
- Birmingham, Alabama and Wausau, Wisconsin Students. This 20 minute video shows how forums were conducted in two different classrooms on two different topics.: https://www.youtube.com/watch?v=g_SdCnoLgao
- Strategies for Student-Centered Discussion. This video will provide tips on how to let students drive the discussion and how to use reflection: <https://www.teachingchannel.org/videos/strategies-for-student-centered-discussion>

Tips for Using Deliberation in Your Classroom

- Prepare your students for the forum. Students need background information and evidence to engage the topic fully. You may want to ask the students to read the

introduction to *Climate Choices* in advance of the forum and engage them in a discussion.

- Depending on your setting, consider spending a few lessons prior to the forum, introducing active listening skills and principles of argumentation.
- Localize the forum. Find background information that ties climate change impacts to their community. Suggestions include
 - If you are in a coastal location, studying coral reefs may be more interesting than tree rings.
 - Use local data to help bring the information to students. Research your state's use of renewables vs. non-renewables, emission standards or recent policies addressing climate change. This could be part of a prior or post forum activities conducted with the students as well!
- Emphasize the importance of students exploring the options, even if they don't agree with the approach personally. This is critical to making the exercise run smoothly.
- Encourage, as appropriate, students to develop ideas that take the learning from the forum to the next level. This could include the development of infographics, social media campaigns, or school events. Let your students take charge to showcase their learning and take climate action. Just make sure that these next projects have SMART (Specific, Measurable, Achievable, Realistic and Timely) objectives.

Your Role as a Moderator

- Provide an overview of the deliberation process.
- Ask probing questions about what's at stake in each issue and each option.
- Encourage participants to direct their questions and responses to one another.
- Remain neutral.
- Report: We want to know what you think and what your students think. Please ask your students to fill out the post-forum questionnaire. Please fill out the moderator response form. Both forms are downloadable and available online.

If this is your first experience as a moderator:

- You don't have to be an expert on the issue.
- Read the issue guide thoroughly.
- Consider questions that get to the heart of the issue and think through the essence of each option. This is a critical part of preparation.
- Stay focused on what the forum is about—deliberation. Ask questions that probe the underlying motivations of each option, the trade-offs it might require, and the willingness of the participants to recognize them. (See the sample questions listed below)
- Listen to others; remain neutral.

- Keep the discussion moving and focused on the issue. Sometimes it's difficult to move on to another option when there is so much more that could be said. But in order to make progress, participants need time to weigh all the major options fairly.
- Be mindful of the time. Reserve ample time for reflections on the forum. In many ways, this is the most important work the group will do. The moderator will provide reminders that time is passing, but it is up to all the participants to help preserve the time to reflect on what they have said and what they might want to do about it.

Sample Class Schedule – EIF in One Weekⁱⁱ

A community forum typically takes about 2-3 hours. Using EIF in the classroom requires a modified schedule to accommodate class periods, but also potentially allows for a deeper consideration of the issue over multiple days. The National Issues Forums Institute suggests that a forum can be completed in the course of one school week, provided that students are already familiar with the forum process and are proficient readers and speakers. Adjustments to the following schedule will need to be made to fit the needs of your students and school.

Class 1 – Introduce the Forum Process, Deliberation, and Climate Choices

Class 2 – Forum Discussion of Option #1 Sharply Reduce Carbon Emissions

Class 3 – Forum Discussion of Option #2 Prepare and Protect Our Communities

Class 4 – Forum Discussion of Option 3 Accelerate Innovation

Class 5 – Forum Discussion of Common Ground

Holding Your Forumⁱⁱⁱ

Materials

- ✓ Copies of *Climate Choices: How should we meet the challenges of a warming planet?* Purchase hard copies from NIFI or download the PDF for free at: <https://www.nifi.org/en/issue-guide/climate-choices>

OR

- ✓ Copies of *Climate Choices: How should we meet the challenges of a warming planet? Options Chart*. Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-options-chart>
- ✓ *Climate Choices Starter Video*. Purchase (\$6) at: <https://www.nifi.org/en/issue-guide/climate-choices>
- ✓ Copies of *Climate Choices Participant Questionnaire*. Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-how-should-we-meet->

[challenges-warming-planet-post-forum](#) or complete it online at <https://www.surveymonkey.com/r/ClimateChangePostForum>

- ✓ Moderator's Response Form (page 9) in *Climate Choices: How should we meet the challenges of a warming planet? A Guide to Moderating and Organizing Forums*. Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-how-should-we-meet-challenges-warming-planet-moderators-guide-forums> or complete it online at <https://www.nifi.org/en/post-forum-questionnaires>

Class 1 - Getting Started

1. Introduce or review the forum process
2. Introduce or review the characteristics of deliberation. When people deliberate they:
 - Assume that many people have the pieces of a workable solution to a problem
 - Listen and try to understand other people's ideas and perspectives
 - Search for strength in another person's views
 - Realize what is valuable to them
 - Weigh the costs and consequences of choices
 - Consider compromises
 - Identify actions that they would be willing to take or live with
 - Reach a shared understanding of a problem and its possible solutions
3. Establish or review ground rules for deliberation. They should agree that:
 - Everyone is encouraged to participate
 - No one or two individuals should dominate
 - The discussion should focus on the options
 - All the major options should be considered fairly
 - They will maintain an open and respectful atmosphere for the discussion
 - They will listen to each other
4. Ask the students to reflect on climate change by answering the following questions in their notebooks or journals:
 - Right now, these are my thoughts and opinions about climate change
 - During the forum, I want to learn the following about climate change
 - At this point, I think that the best approach to climate change is
 - I do/do not (circle one) expect my ideas about climate change to change because
 - At this time, I think that people who disagree with me should consider the following points or ideas
5. Introduce climate change as an issue
6. Assign the reading of the *Climate Choices* issue guide as homework
7. Ask the students to take a few minutes to talk about their personal experiences with climate change and give them an opportunity to their stories. A good question to

ask is, “Can anyone say how climate change has affected them or their family or community?”

Class 2 – Forum Discussion of Option #1 Sharply Reduce Carbon Emissions

We need to take aggressive action to reduce our energy consumption and other climate-changing behaviors. If we do not move swiftly to tackle the problem or climate change at its source, we risk catastrophic effects that we – and future generations – will not be able to handle. BUT this approach could limit our personal choices and freedom. And some people, communities, and businesses will be affected by the required changes more than others.

1. Begin the forum by setting goals.
2. Review the ground rules for deliberation.
3. Show the *Climate Choices* starter video as an introduction or refresher. Purchase (\$6) at: <https://www.nifi.org/en/issue-guide/climate-choices>.
4. Moderate a discussion of Option #1 Sharply Reduce Carbon Emissions (see suggested questions below).
5. Invite students to sum up the day’s discussion.
6. Assess students’ participation and understanding.

Questions to Surface Trade-Offs and Tensions

- How have you, your family, or other people you know tried to cut down on your personal CO2 emissions? Did anything make it difficult?
- What do you think is the best way to reduce emissions of CO2 or other greenhouse gases in the United States? Why?
- How much are you willing to invest in weatherizing your home, installing clean-power systems, or making other changes that help address climate change? Do you think changes like these should be required?
- How much more would you be willing to pay in energy costs to allow for “cleaner” energy?
- Would you be willing to deal with more regulations as an individual or as a business owner in order to collectively reduce emissions?
- Would you be willing to change your lifestyle—eat differently, ride a bike or take public transportation more often, lower your home thermostat—in order to reduce carbon emissions? Do you think changes like these should be required?
- How does this option address our concerns about climate change?
- What worries or makes us uncomfortable about this approach?
- If this approach worked perfectly, what would the trade-offs or consequences be?

Class 3 – Forum Discussion of Option #2: Prepare and Protect Our Communities

This option says we should protect and prepare communities and businesses for the most likely effects of climate change. We need to work together now to strengthen our resilience

in the face of climate-related impacts like flooding, drought, fire, health problems, and social unrest. BUT this approach does little to slow climate change, so we will have to accept greater environmental damage from climate change, including changes that we may not be able to manage. And some people and communities will need to make bigger changes and sacrifices than others.

1. Begin the forum by setting goals.
2. Review the ground rules for deliberation.
3. Moderate a discussion of Option #2: Prepare and Protect Our Communities (see suggested questions below).
4. Invite students to sum up the day's discussion.
5. Assess students' participation and understanding.

Questions to Surface Trade-Offs and Tensions

- If we help farmers adapt to climate change, are we obligated to help other industries?
- If climate change is almost certainly going to cause noticeable changes to the places we live in, how much change are we prepared to accept?
- This option is mostly about protecting human communities—but what about wildlife and/or special natural areas? Do we want to protect those as well?
- Climate change will likely result in health problems, especially among children and the elderly. What do we owe others in our communities to help them adapt?
- How should we balance individual rights and the good of the community, especially when it comes to property rights?
- Does focusing on adaptation rather than reducing CO2 emissions renege on our obligations to people in other countries?
- How does this option address our concerns about climate change?
- What worries or makes us uncomfortable about this approach?
- If this approach worked perfectly, what would the trade-offs or consequences be?

Class 4 – Forum Discussion of Option #3: Accelerate Innovation

We must invest in rapid innovation to develop new, cleaner fuel sources, new ways to influence Earth's climate, and even new societal arrangements. BUT we may not make progress quickly enough to avert the worst climate-change impacts, and some new ventures will fail or cause other environmental problems.

1. Begin the forum by setting goals.
2. Review the ground rules for deliberation.
3. Moderate a discussion of Option #3: Accelerate Innovation (see suggested questions below).
4. Invite students to sum up the day's discussion.
5. Assess students' participation and understanding.

Questions to Surface Trade-Offs and Tensions

- This option assumes we'll be able to keep our current way of life—including the amount of energy we use and waste we create—through innovation. Is consumption itself an issue to be considered?
- Are you concerned about unintended consequences of new experimental technologies?
- How important is cost-effectiveness when considering new technologies?
- Do you think that relying on technological change will address the problems of climate change quickly enough?
- What are the best ways to encourage widespread adoption of new technologies and ways of doing things? Should this be mandated?
- Does this option risk giving too much power and discretion to private companies?
- How does this option address our concerns about climate change?
- What worries or makes us uncomfortable about this approach?
- If this approach worked perfectly, what would the trade-offs or consequences be?

Class 5 - Ending the Forum

1. Discuss areas of common ground (see suggested questions below).
2. Invite students to sum up the day's discussion.
3. Assess students' participation and understanding.
4. Assign formal assessment, such as a project or essay, to be completed out of class.
5. Ask the students to reflect on climate change by answering the following questions in their notebooks or journals:
 - If someone were to ask me about climate change, this is what I would tell them
 - Right now, this is what I think about climate change
 - My ideas about the issue changed/did not change (circle one) because
 - I think that the most difficult part of making trade-offs and choices is
 - The most important thing that I learned from participating in the forum is
6. Ask students to complete the *Climate Choices Participant Questionnaire*. Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-how-should-we-meet-challenges-warming-planet-post-forum>] or complete the questionnaire online at: <https://www.surveymonkey.com/r/ClimateChangePostForum>.

Questions that Promote Individual Reflections

- How has your thinking about the issue changed?
- How has your thinking about other people's views changed?
- How has your perspective changed as a result of what you heard in this forum?

Questions that Promote Group Reflections

- What didn't we work through?
- Can we identify any shared sense of purpose or direction?
- Which trade-offs are we willing to make to move in a shared direction?
- Which are we unwilling to make? Next-Step Reflections
- What do we still need to talk about?
- How can we use what we learned about ourselves in this forum?
- Do we want to continue these discussions? What would we want to accomplish?

Moderator Questionnaire

Complete the *Moderator's Response Form* (page 9) in *Climate Choices: How should we meet the challenges of a warming planet? A Guide to Moderating and Organizing Forums*

Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-how-should-we-meet-challenges-warming-planet-moderators-guide-forums> or complete it online at <https://www.nifi.org/en/post-forum-questionnaires>

Please mail written questionnaires (both yours and your students') to National Issues Forums Institute, 100 Commons Road, Dayton, OH 45459, or you may scan and e-mail them to forumreports@nifi.org.

Background Resources

Resources Especially for Non-Science Teachers

- Get started with this quick reading from the National Oceanic and Atmospheric Administration (NOAA) "*Does global warming mean it's warming everywhere?*" <https://www.climate.gov/news-features/climate-qa/does-global-warming-mean-it%E2%80%99s-warming-everywhere>
- Discover the difference between weather and climate in these readings. An important distinction for guiding deliberation in your classroom. http://oceanservice.noaa.gov/facts/weather_climate.html and http://www.nasa.gov/mission_pages/noaa-n/climate/climate_weather.html
- In 3 minutes learn about our National Climate Assessments led by NOAA to understand how we observe, collect, measure, and analyze climate data and impacts. Watch video youtu.be/2dlheuvIKDg or read: <https://www.climate.gov/teaching/what-national-climate-assessment-nca>
- How do we measure global average temperature? These 5 simple steps will help you and students understand how we analyze global temperature data. <http://scied.ucar.edu/blog/how-measure-global-average-temperature-five-easy-steps>
- Read 12 key messages from the National Climate Assessment (2014) that will help you take climate change into your classroom.

<http://nca2014.globalchange.gov/report/our-changing-climate/introduction#introduction>

- Use this interactive lesson prior to the forum to help students read graphs and interpret data. <http://www.earthday.org/earthdaydotorg/wp-content/uploads/CEW-Lesson-3-6-8.pdf>
- Downey, L., Gentile, S. J., Hollweg, K.S., Hubbard-Sánchez, J., Johnson, C., Kumler, L., LaRocque, L., Poppleton, K., Shiflett-Fitton, D., Shuttleworth, J. (Eds.). (2013). *Advancing Climate Change Environmental Education: Resources and Suggestions*. Ithaca, NY: EECapacity, Cornell University Civic Ecology Lab, and North American Association for Environmental Education. Retrieved from: <http://www.eecapacity.net/climate-change-ee-project-based-online-learning-community-alliance.html>

Additional Resources for Teaching Climate Change Basics

In some cases, teachers may be able to build the deliberative process into a larger unit of study. In the sections below, selected resources (websites, videos, classroom activities) are suggested for each major part of the *Climate Choices* issue guide (Introduction, Option 1, Option 2, Option 3). These resources are not meant to be exhaustive, but to provide a starting place to learn more about climate change and to enhance student deliberation.

Introducing Climate Choices

Videos

- Climate Change Basics
<https://www.youtube.com/watch?v=ScX29WBJI3w>

Activities and Activity Guides

- CLEAN – Climate Literacy & Energy Awareness Network - select from over 600 activities:
<http://cleanet.org/clean/literacy/index.html>
- Tree Rings Living Records of Climate
<https://www3.epa.gov/climatechange/kids/documents/tree-rings.pdf>
- Students will investigate plants role in absorbing carbon dioxide in this experiment lesson from CLEAN.
http://www.carboeurope.org/education/CS_Materials/PlantsCO2Uptake.pdf
- Weather and Climate: What's the Difference?
<https://www3.epa.gov/climatechange/kids/documents/weather-climate.pdf>
- Understanding Climate vs. Weather
<http://www.cpalms.org/Public/PreviewResourceLesson/Preview/46129>
- Climate Generation: Climate Change and Energy Curriculum
<http://www.climategen.org/what-we-do/education/climate-change-and-energy-curricula/>

- Climate Literacy: The Essential Principles of Climate Science
<http://cpo.noaa.gov/OutreachandEducation/ClimateLiteracy.aspx>
- Investigating Parts Per Million, Drop by Drop
http://itsourair.org/sites/default/files/activities/IOA_1-3_Act_PPM_093014.pdf

Websites

- Center for Research on Environmental Decisions, The Psychology of Climate Change Communication
<http://guide.cred.columbia.edu/>
- Climate Kids NASA's Eyes on Earth
<http://climatekids.nasa.gov/>
- Environmental Protection Agency, A Student's Guide to Global Climate Change
<https://www3.epa.gov/climatechange/kids/>
- Facing the Climate Gap-How Environmental Justice Communities are Learning the Way to a More Sustainable and Equitable California
<https://dornsife.usc.edu/pere/facingtheclimategap/>
- Frequently Asked Questions about Global Warming and Climate Change: Back to Basics: https://www3.epa.gov/climatechange/Downloads/wycd/Climate_Basics.pdf
- Think Like a Scientist – Uncover the Cause of Today's Global Climate Change:
<https://www3.epa.gov/climatechange/kids/scientists/index.html#>
- Glossary of Climate Change Terms:
<https://www3.epa.gov/climatechange/glossary.html>
- National Atmospheric and Oceanic Administration (NOAA): National Climate Assessment (2014)
<http://nca2014.globalchange.gov/>
- National Climate Assessment (NCA) Teaching Resources
<https://www.climate.gov/teaching/national-climate-assessment-resources-educators/2014-national-climate-assessment-resources>
 - Carbon Cycle
http://www.education.noaa.gov/Climate/Carbon_Cycle.html
 - Changing Seasons
http://www.education.noaa.gov/Climate/Changing_Seasons.html
 - Climate change Impacts
http://www.education.noaa.gov/Climate/Climate_Change_Impacts.html
 - Climate Monitoring
http://www.education.noaa.gov/Climate/Climate_Monitoring.html
- NASA
 - Global Climate Change Vital Signs of the Planet
<http://climate.nasa.gov/>
 - Global Climate Education Resources
<http://climate.nasa.gov/resources/education/>
 - ESSEA Climate Education modules
<http://esseacourses.strategies.org/module.nasa.html>

- Climate Literacy: The Essential Principles of Climate Science:
https://downloads.globalchange.gov/Literacy/climate_literacy_lowres_english.pdf
- U.S. Climate Resilience Toolkit
<https://toolkit.climate.gov/>
- U.S. Global Change Research Program (USGCRP)
<http://www.globalchange.gov/climate-change>
- Yale Program on Climate Change Communication
<http://climatecommunication.yale.edu/>
 - Global warming’s six Americas in September 2012
<http://climatecommunication.yale.edu/publications/global-warmings-six-americas-in-september-2012/>

Option 1: Sharply Reduce Carbon Emissions

Selected Lesson Ideas to Get Started

- Students research and discuss which sector has the most carbon dioxide emissions in the US. Students should discover that it is the transportation sector with cars and light-duty trucks are responsible for 60 percent of transportation emissions. Research your state’s emission standard. Determine when the standard was set? How does it compare to the other 50 states?
- Students design an infographic on the impacts of climate change and emissions in your community. Students can explore particular sectors such as transportation or agriculture.
- Students define Carbon Footprint and begin to identify the connections between their daily energy use and the world. Daily actions like commuting or technology use can have a significant impact on the environment.
- Students use either of two online calculators to help them determine their carbon footprint.
<https://www.ase.org/resources/lesson-plan-how-big-your-carbon-footprint-6-12>
(Requires a login to use the tool)
<https://www3.epa.gov/climatechange/students/calc/index.html>
- Students estimate household greenhouse gas emissions using the Global Warming Wheel Card Classroom Activity Kit from the EPA. Students will think about their personal, family, school, and community contributions to climate change.
https://www3.epa.gov/climatechange/Downloads/ghgemissions/wheel_Welcome.pdf

Option 2: Prepare and Protect Our Communities

Selected Lesson Ideas to Get Started

- Students investigate local to global climate zones
http://oceanservice.noaa.gov/education/pd/oceans_weather_climate/media/climate_zones.swf
<https://www.arborday.org/media/mapchanges.cfm>
- Students use the Third U.S. National Climate Assessment to investigate What Climate Change Means for Regions Across America
<https://www.whitehouse.gov/blog/2014/05/06/what-climate-change-means-regions-across-america>
- Students use Climate Explorer, created by the National Oceanic and Atmospheric Administration (NOAA), to investigate their community's climate:
<https://toolkit.climate.gov/#climate-explorer>
- Students explore the Impacts of Climate change on Human Health in the U.S.
<https://health2016.globalchange.gov/>
- Students investigate the impacts of climate change on specific populations using EPA's Climate Change, Health, and Populations of Concern
https://www.epa.gov/climate-impacts/climate-change-health-and-populations-concern?utm_source=SED&utm_medium=toolkit&utm_campaign=ClimateHealth
- Download this free infographic poster for your classroom on "Going Green."
<https://www.epa.gov/recycle/think-green-you-shop-full-infographic-image-jpg>
- Students watch the National Park Video series to explore the impacts of climate change on a national park near your classroom
<https://www.nps.gov/subjects/climatechange/sciencevideos.htm>
- Students read case studies to see how climate change is impacting wildlife. After reading the case studies, they investigate what wildlife in their area might be impacted by climate change and discuss options for protecting environment. Suggestion, ask students to read *Cold Water Fish*
https://downloads.globalchange.gov/toolkit/ColdWaterFish_6_9_09.pdf
or *Birds*
https://downloads.globalchange.gov/toolkit/Birds_6_9_09.pdf
- Did you know that over 10,000,000 clothing items end up in landfills each year? Cheap clothing is not sustainable. Students explore how clothes impact climate change by watching this video from National Public Radio
<http://apps.npr.org/tshirt/#/title>
- Order trees from the Arbor Foundation and plant them at your school. Use the tree benefits calculator to determine the impact in your zip code and on your streets.
<http://www.treebenefits.com/calculator/>

Option 3: Accelerate Innovation

Selected Lesson Ideas to Get Started

- Introduce specific renewable technologies with these short 1-3 minute introductory videos from the U.S. Department of Energy video series: Energy 101. Topics include, wind, geothermal, solar, lumens, and biofuels. Ask students to think about the policies or incentives we could institute to accelerate our use of these renewable technologies.
<http://www.youtube.com/playlist?list=PLACD8E92715335CB2&feature=plcp>
- Ask students to learn more about innovations such as:
 - geoengineering – scientific methods for modifying Earth’s climate
 - smart electric meters
 - development of drought resistant crops
 - electric cars
 - biofuels
- Students explore policies and data using BITES, an online scenario tool for Carbon Emissions.
<https://bites.nrel.gov/>
- Students watch “How to Make a Wind Turbine in less than 20 minutes” and create their own.
<http://energy.gov/eere/articles/video-how-build-wind-turbine-less-20-minutes>
- Introduce the conversation on energy with a new TED-Ed video, *A Guide to Energy on Earth*. Have your students focus on the last question or flip the lesson!
<http://ed.ted.com/lessons/a-guide-to-the-energy-of-the-earth-joshua-m-sneideman>
- Take a deep dive into energy sources with your students. The idea being that you want them to think beyond oil, coal and electricity. Have students brainstorm what uses energy in the classroom or home. (There is a laundry list of technology!). Next, ask them to describe the different sources of energy that are used to generate electricity. Responses include fossil fuels (coal, oil, and petroleum), nuclear energy, hydroelectric energy, geothermal energy, solar energy, wind energy, and biomass energy. Use the following worksheet to have students determine how much renewable and nonrenewable sources we use in the USA. Page 26 is worksheet and page 46 are the answers:
<http://www.need.org/files/curriculum/guides/Intermediate%20Energy%20Infobook%20Activities.pdf>
- Have students investigate their school with this simple energy audit from the EPA.
https://www3.epa.gov/climatechange/Downloads/ghgemissions/wheel_studentact3.pdf

Linking to Social Media

- ✓ **#ActOnClimate** is the White House hashtag for showing positive movement on climate. Have your students capture images of solutions to climate change happening in their school or community. Create an Instagram or Pinterest Board for your classroom to showcase images. Have students use the hashtag **#ActOnClimate** to join the conversation.
- ✓ Teachers search on social media for the **#Teach4Climate** to find more resources, websites and activities for your classroom.
- ✓ Share your favorite resources on social media by using the **#Teach4Climate** hashtag in your social media posting.
- ✓ Teachers record your forum and share it with the NIF and EIF teams. We are always looking for samples to share with the community.

Additional Resources -Teaching Argument and Evidence

Hand, G.; Norton-Meier, L.; Staker, J.; Bintz, J. (2009). *Negotiating science: The critical role of argument in student inquiry*. Portsmouth, NH: Heinemann.

Norton-Meir, L.; Hand, B.; Hockenberry, L.; Wise, K. (2008). *Questions, claims, and evidence: The important place of argument in children's science writing*. Arlington, VA: NSTA Press.

Zemal-Saul, C.; McNeill, K. L.; Hershberger, K. (2013). *What's your evidence?: Engaging K-5 students in constructing explanations in science*. Boston, MA: Pearson.

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ⁱ EIF in the Classroom is modelled after materials developed by the National Issues Forums Institute. Additional resources can be found at <https://www.nifi.org/es/educators-center>

ⁱⁱ The sample class schedule and much of the information on holding classroom forums is adapted from Smith, E. (2001) *National Issues Forums in the Classroom*. Dayton, OH: National Issues Forums Institute

ⁱⁱⁱ Much of the information on holding a forum, including suggested questions to surface tradeoffs and tensions, is from *Climate Choices: How should we meet the challenges of a warming planet? A Guide to Moderating and Organizing Forums*. Download the PDF for free at: <https://www.nifi.org/en/catalog/product/climate-choices-how-should-we-meet-challenges-warming-planet-moderators-guide-forums>