

Lesson 5: Solutions to Climate Change

Supplemental Material

Introduction: This document will help you adapt **Lesson 5: Solutions to Climate Change** for different age groups, different time spans, and different educational settings. It will also point to additional resources and strategies for helping students find their footing with this challenging lesson.

Different Age Groups

Younger Age Groups

The easiest way to adapt this lesson for younger age groups is to make physical wedges for students to manipulate. A template for making game pieces, and step-by-step instructions for the game can be found at the Princeton Carbon Mitigation Initiative (the template is at the end of the document):

http://www.ctenergyeducation.com/images/Wedges_Concept_Game_Materials_July05.pdf



Carbon Mitigation Initiative, Princeton University

More Advanced Groups

An alternative activity for advanced groups would be to use the C-ROADS World Climate simulation from *ClimateInteractive.org*:

<https://croadsworldclimate.climateinteractive.org>.

This game focuses more on the impacts of different parameters on climate goals. Players specify the year that emissions peak, the year emissions begin to decline after they peak, the rate at which emissions are reduced (%/year), the level of effort to prevent deforestation and to promote afforestation. The tab key is used to move across the input table. After an input is entered, the graphs change to show the new result.

You can run this simulation for 3-6 regions or globally. You can also see impacts on additional outcomes such as glacial melting and methane release from melting permafrost, as well as the impact on developed and developing countries.

Different Time Spans

The basic lesson presented in the webinar is intended to take **50 minutes** to complete. The lesson does include a couple of extension ideas that would take an additional class period or two. Another way to extend the lesson is to spend more time with the FLICC activity. You could assign the following roles to students or groups of students and have them serve as representatives at the summit. Students/groups should write a position paper from the perspective of their assigned country, industry, or organization. In the summit, they should represent the position of these entities, not themselves. Recall from lesson two what the students predicted would happen in the future under different scenarios and use the summit to determine goals and strategies that would benefit all countries most successfully.

A list of possible roles (you may choose a few or use all, depending on class size and time):

- U.N. Secretary General
- U.S. Delegate
- Chinese Delegate
- India Delegate
- European Union Delegate
- Russia Delegate
- Brazil Delegate
- Nigeria Delegate
- OPEC Representative

- Industry Representative – Automotive Industry
- Industry Representative – Oil and Gas Industry
- Industry Representative – Chemical Industry

- Industry Representative – Biofuels Industry
- Industry Representative – Wind Energy Industry
- Industry Representative – Nuclear Energy Industry
- Industry Representative – Solar Energy Industry
- Industry Representative – Hydrogen Fuels Industry
- Venture Capitalist (large projects)
- Venture Capitalist (small projects)

- IPCC Representative
- World Bank Representative
- Greenpeace Representative
- UNICEF Representative
- Red Cross Representative

Each version of the lesson developed by NCSE Ambassador Teachers is available in a shared folder. We encourage you to explore each version of the lesson for the one that suits your needs the best.

Here is the link to the shared folder:

<https://drive.google.com/drive/folders/1lxVikAXkO7p07U8ijeE-dEc7P7nGJMIN>

Different Educational Settings

This lesson is intended for classroom applications, but it could also be done in informal science settings. The lesson could be used as an after school or summer camp activity, for instance, without modification.

The lesson could also be flipped by starting with the FLICC component and then using the data analysis to support the debunking of the misconception.

If you are interested in discussing additional ways to use this lesson in informal settings, contact Brad Hoge at hoge@ncse.com

Additional Resources

Lessons in the shared folder also include additional resources such as links and worksheets that can be used with both the data analysis and FLICC portions of this lesson.