

Global and Local Solutions to Climate Change

Overview

Students focus on global and local climate change solutions, using evidence gleaned from previous activities to support their predictions of the effectiveness of their proposed solutions. They come to understand that scientists and engineers are working to slow or stop climate change and to lessen the effects of climate change; people, businesses, communities, and governments can make choices that reduce their carbon footprints; and that possible solutions to climate change can involve chains of possible causes and effects.

Learning Outcomes

Students will be able to:

- Create climate change solution flowcharts, engage in discussions, and provide evidence that proposed solutions may have an impact on causes and effects of climate change.
- Describe how a solution will decrease the amount of heat-trapping gases in the atmosphere (mitigation) or prepare for inevitable increase in global temperature (adaptation).
- Reason logically about addressing the causes and lessening the effects of climate change.

NGSS Connections

- **Disciplinary Core Ideas:** MS.ETS1.B: Developing Possible Solutions; MS.ESS3.D: Global Climate Change; HS.ESS3.C: Human Impacts on Earth Systems; HS.ESS3.D: Global Climate Change; HS.ETS1.B: Developing Possible Solutions
- **Science and Engineering Practice:** Constructing Explanations and Designing Solutions
- **Crosscutting Concepts:** Cause and Effect, Systems and System Models

Ocean Literacy Principles

- 6.G Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

17

Use Wind Power and Solar Power

Electricity is used to power a huge number of things, from televisions to computers to the lights in a football stadium. Energy to power electrical devices can be made in several different ways. Most energy is made through the burning of fossil fuels, especially coal. When fossil fuels are burned, they release heat-trapping gases, such as CO₂ into the atmosphere. Wind power and solar power are two other ways to produce energy. They are both renewable sources of energy, meaning that we will never run out of them. Wind and solar power also do not release heat-trapping gases into the atmosphere.

Wind power: As wind turbines turn, they convert wind energy to electricity. Some states have built offshore wind farms to capture wind energy along the coastline, while others have built inland wind farms. In 2012, wind power was responsible for just over 4 percent of the electricity generated in the United States.

Solar power: Solar power comes from the sun. Solar panels take light energy from the sun and convert it to electricity, so they work best in places that receive a lot of sunlight. Many states have built large solar power stations.

California is one state that already has laws that require 33 percent of all electricity in the state to come from renewable resources such as wind and solar power by 2020. You can write letters to your local power company or state government asking them to increase the amount of wind or solar power they use. You could even try changing your school's energy source to wind or solar!



Wind turbines generate electricity without burning fossil fuel.



Solar panels capture energy from sunlight.

Color Sheet—Ocean Sciences Sequence 3.11, 3.12

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