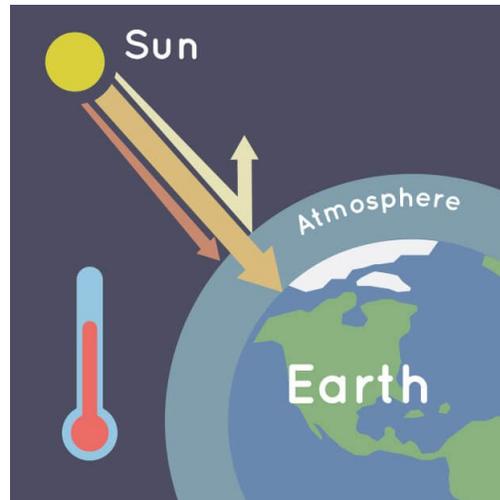
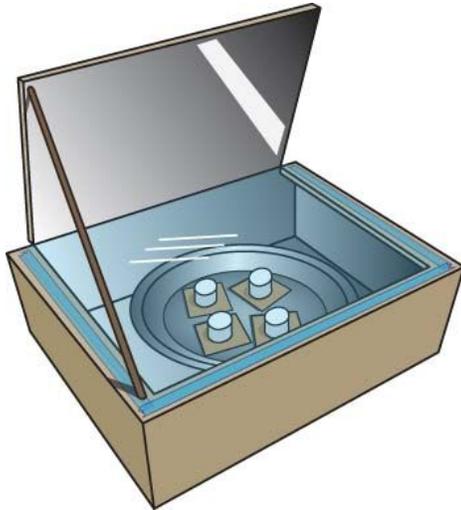


Make a Solar Oven

Objective: Study the impact of the greenhouse effect by building a solar oven.



Materials:

- Cardboard box
- Plastic wrap
- Aluminum foil
- Tape or glue
- Scissors
- Graham crackers, marshmallows, chocolate (optional)

Instructions:

1. You will want to start with a cardboard box like a shoe or pizza box. For the experiment to work, you will **not** want to use a very large box.
2. Cut the top of your box open to create a lid as shown in the image above.
3. Line the entire inside of the box with aluminum foil. Use tape or glue to cover the bottom, all four walls and the inside of the lid as smoothly as possible.
4. Cover the opening of the box with plastic wrap. Use two layers to better trap heat. Use tape to secure the plastic wrap so you can easily remove and replace it as needed.
5. Time to test your design! Place your solar oven in direct sunlight with the lid propped open. A stick from your yard will work fine as a prop. This will allow the sunlight to reflect off of the lid into the box.
6. You will want to leave it in the sunlight for about 30 minutes to properly preheat.



7. Once it has been preheated you can use your oven to cook! It works really well if you have ingredients to make s'mores.
8. Place a graham cracker on the bottom with a marshmallow on top of it and a piece of chocolate on top of that.
9. Replace the plastic wrap over the box and make sure that it is sealed tightly.
10. Check on your s'mores periodically to check the progress. The amount of time it takes will vary based on how much sun there is and how hot it is.
11. If you don't have s'mores ingredients you can try using other household items that will melt, like crayons!
12. Other ways you can experiment:
 - Place a piece of black paper in the bottom of your oven. The dark surface will absorb heat and should increase the temperature inside your oven.
 - Use a thermometer to take the temperature inside of your oven at different stages to see just how well your oven retains heat.

What did we learn?

Your solar oven is a great representation of a greenhouse. The transparent lid of your box allows you to see the greenhouse effect in action! The plastic wrap on your box represents the atmosphere and the inside of your box is the surface of the Earth. The transparent plastic allows the sunlight to pass through into the box where heat is absorbed. If your plastic wrap is sealed tightly, the heat that builds up inside of the box will not be able to escape. It will continue to build up and cause the box to get warmer and warmer.

Why does this matter?

Pollution in the atmosphere is causing Earth's natural greenhouse effect to intensify. Human activity increases the amount of greenhouse gases in our atmosphere which trap heat. The more greenhouse gases there are, the more heat that is being trapped by our atmosphere. This causes the Earth to become warmer gradually and directly impacts climate change.

Key Terms:

1. *Greenhouse effect*- a process that occurs when gases in Earth's atmosphere trap the Sun's heat. This process makes Earth much warmer than it would be without an atmosphere. The greenhouse effect is one of the things that makes Earth a comfortable place to live.
2. *Greenhouse gases*- gases in Earth's atmosphere that trap heat. They let sunlight pass through the atmosphere, but they prevent the heat that the sunlight brings from leaving the atmosphere. The main greenhouse gases are: Water vapor, Carbon dioxide, Methane, Ozone, Nitrous oxide, Chlorofluorocarbons



Additional Resources:

- <https://climatekids.nasa.gov/greenhouse-effect/>
- <https://climatekids.nasa.gov/greenhouse-cards/>