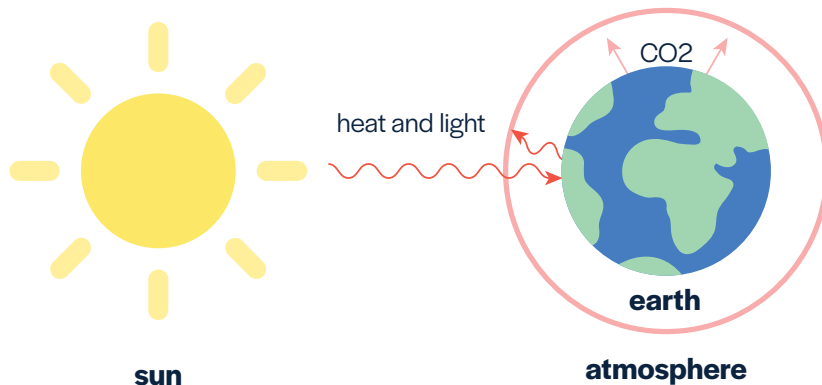


Greenhouse Effect Experiment

the greenhouse effect

The atmosphere (the air that surrounds planet Earth) holds heat and light from the Sun. The atmosphere is made of different types of gas. Gases that hold in the Sun's heat are called greenhouse gases. One of these greenhouse gases is carbon dioxide (CO₂). Humans make lots of CO₂ by burning fossil fuels like coal and oil.

Fun fact: A greenhouse is a building with glass walls and a glass roof. Greenhouses are used to grow plants because they stay warm inside. That's because the glass walls of the greenhouse trap the Sun's heat.



How do humans impact the greenhouse effect by making more CO₂?

Write down how you think humans impact the greenhouse effect by making more CO₂.

Hypothesis:

A guessed answer to a scientific question is called a **hypothesis**. Try phrasing your answer with the words "if" and "then."

If I pet my dog, then he will wag his tail.

To figure out if your hypothesis is right, **let's do an experiment!**

materials needed:

- two clean 2 liter bottles (recycled soda bottles work)
- two corks with holes drilled through the middle (big enough for the thermometers, and make sure you get an adult's help with this part!)
- two thermometers
- a funnel
- 2 tablespoons of baking soda
- ¼ cup of vinegar
- two heat lamps
- tape and a marker

steps for the greenhouse effect experiment:

We are going to create two different atmospheres inside 2 liter bottles. Remember, the atmosphere is the air that surrounds our planet. We will create carbon dioxide in one bottle to represent the carbon dioxide humans add to the atmosphere. Then, we will heat the bottles equally and measure the temperatures of each bottle. Which bottle do you think will be warmer?

1. Read through all the steps before doing the experiment.
2. Make sure the thermometers are accurate by testing the room temperature. Write down the temperature of the room so that you have a starting point.
3. Put a strip of tape on each bottle. Label one “**control**” and the second one “Earth.”
4. In the control bottle, place a cork in the opening. Then, place one of the thermometers in the hole in the cork. Set the control bottle aside.
5. Have your cork and thermometer ready for the Earth bottle - because there is going to be a chemical reaction!
6. With the funnel, put the baking soda in the Earth bottle. Then, pour in the vinegar.
7. Quickly place the cork and thermometer in the Earth bottle opening to prevent the reaction from escaping!
8. What do you see happening? Write it down! When baking soda and vinegar are mixed, they react and create carbon dioxide (CO₂). The bubbles you see are bubbles of carbon dioxide!

Control is the word scientists use to describe the part of the experiment we use to compare results.



9. Place a heat lamp next to each bottle and wait five minutes. The heat from the lamp represents the heat from the Sun reaching Earth.
10. After five minutes, check the temperature in each bottle. Is one bottle hotter than the other?

results:

1. Write down the temperature you measured in the Control bottle.

2. Write down the temperature you measured in the Earth bottle.

3. To find the difference, subtract the Control temperature from the Earth temperature. $\text{Control} - \text{Earth} = \text{temperature difference}$.

4. How does adding carbon dioxide change the temperature of the bottle?

How do humans impact the greenhouse effect by making more CO₂?

Things to think about:

How does increasing the temperature of planet Earth affect plants, animals, and humans? How can we produce less carbon dioxide?

Find more resources and learn more at climate-heroes.org!

