



e-SMARTkids



EXPERIMENT

Make a mini greenhouse

Background

The greenhouse effect is the rise in temperature that the Earth experiences because certain gases in the atmosphere absorb heat from the sun and radiate it back down to the Earth's surface. Without these gases, heat would escape into space and the Earth would be a lot colder. Because of how they warm the Earth, these gases are referred to as "greenhouse gases."

Burning fossil fuels to produce energy for electricity, heat and transportation causes more greenhouse gases to build up at a faster rate. When there are more greenhouse gases, more heat is radiated toward the Earth's surface and our planet gets warmer. This is known as global warming.

Why is global warming bad? It can cause glaciers to melt and add water to the oceans, causing sea levels to rise. It can change ocean temperatures and weather patterns, causing droughts and floods. It can alter plant and animal habitats, forcing animals to move or die out. Hotter and colder temperatures, and then the need for more energy use, also affect humans.

To understand how the greenhouse effect works, try this experiment in which you build a mini greenhouse.

Materials

- Two large glass bottles or jars of the same size
- One piece of plastic wrap (or a recycled plastic bag)
- One rubber band
- Four ice cubes, all the same size
- Optional: two thermometers that will fit inside the bottles
- A printout of this experiment
- A pencil

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EXPERIMENT

Make a mini greenhouse (continued)

Directions and observations

Place two ice cubes and the optional thermometer in each bottle. If you are using thermometers, record the temperature in each bottle:

Cover the mouth of one bottle with the plastic and fasten it in place with the rubber band. Leave the other bottle open.

Predict which ice cubes will melt faster in a sunny spot, and why:

Predict whether the temperature in each bottle will be different:

Place the two bottles side-by-side in a warm, sunny place. Time how long it takes for the ice to melt in each bottle. If you are using thermometers, check the temperatures in each bottle when the ice begins to melt. Record the times and the temperatures here:

Were your predictions correct? Why/why not?

Conclusions

1. Did one bottle of ice melt faster than the other? Why?

2. How are your observations related to the transfer of radiant energy?

3. How are your observations related to the greenhouse effect?
