



“IT IS TOO HOT”

STUDENT ACTIVITIES

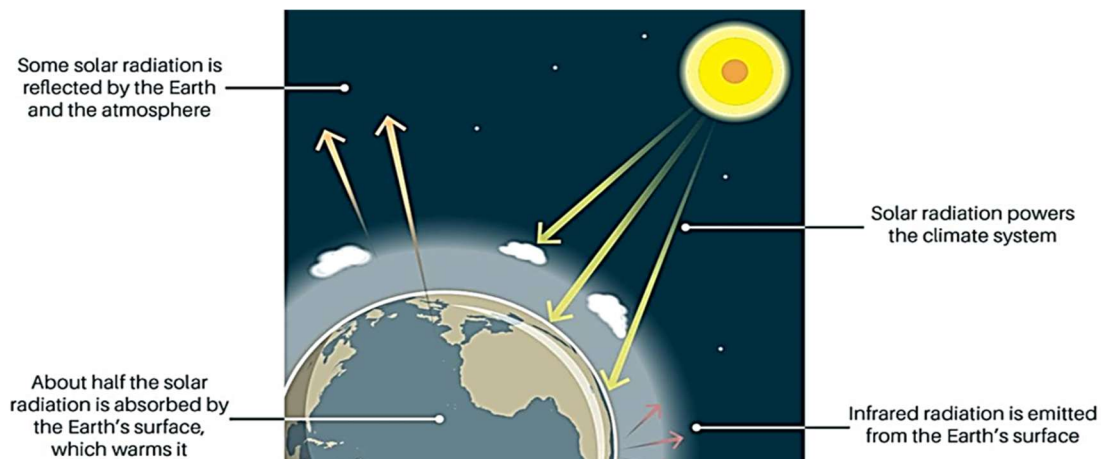
During the day, the Sun shines through the atmosphere. Earth's surface warms up in the sunlight. At night, Earth's surface cools, releasing heat back into the air. But some of the heat is trapped by the greenhouse gases in the atmosphere. That is what keeps our Earth a warm and cozy 58 degrees Fahrenheit (14 degrees Celsius), on average.

The recent years, mainly due to air pollution with certain gases, the amount of trapped heat increases, leading to global temperature increase. One can imagine these gases as a cozy blanket enveloping our planet, helping to maintain a warmer temperature than it would have otherwise.

Expected outcome:

A laboratorial experiment that proves that sunrays in an enclosed environment, increase the area's temperature.

In this activity, we will have the chance to explore and understand the Greenhouse Effect. In the beginning, we will conduct experiments aimed at answering specific questions. These experiments are designed to provide the necessary background knowledge required to effectively use a Greenhouse



The scientist who first “proved” the greenhouse effect.



In 1856, decades before the term "Greenhouse Effect" was created, Eunice Newton Foote demonstrated the greenhouse effect in her home laboratory. She placed a glass cylinder filled with carbon dioxide in sunlight and found that it was heated much more than a cylinder of ordinary air. Her conclusion: more carbon dioxide in the atmosphere could result in a warmer planet.



The ability to heat carbon dioxide is fundamental to climate science and explains why our planet's temperature is rising as we burn fossil fuels like oil and gas at a rapid rate, sending more carbon dioxide into the atmosphere. Foote herself even hypothesized that global warming was possible: "An atmosphere of this gas [carbon dioxide] would give our earth a high temperature," she wrote, "and if, as some suppose, at a time in its history air had mixed with it in greater proportion than it does today, an elevated temperature . . . It would necessarily happen."

<https://www.bbvaopenmind.com/en/science/environment/eunice-newton-foote-pioneer-greenhouse-effect>

Investigations:

1. What is light?

Activity 1.

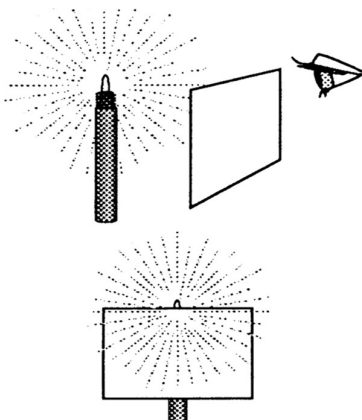
Imagine yourself on the beach, on a sunny day. Undoubtedly, the Sun makes you feel hot. What does this mean for the nature of light? (What does the Sun “carry” in order to make you feel hot?)

Discuss your opinion with the class.

Activity 2.

The light that originated from the Sun, has the same nature as the light from a candle, or a lamp.

Place a piece of paper in a way that covers half of a lamp.



Do you still see the whole lamp (or the candle)? _____

“This ability of the light to “bend” over objects is called _____”
(Ask your teacher for the name given to this ability of light.)

2. How is light transmitted through vacuum space?

“Light has the ability to travel in space”. Do you agree with this opinion and why?

3. Watch a short clip from

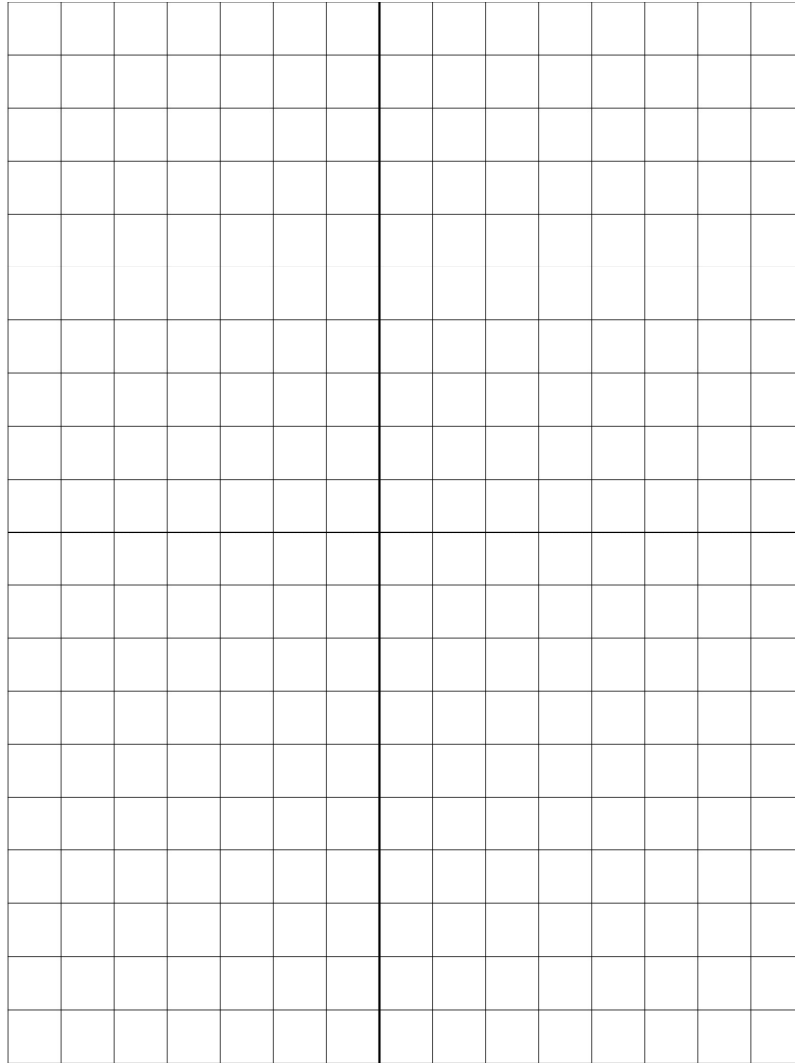
<https://youtu.be/J1yIApZtLos?si=4aYaBSmidihDNze0>

Discuss in the class, what is light and complete the following conclusion.

Conclusion:

Wave is a form of _____ that has the ability to carry a form of _____ called _____.

Place the data on the following axis and construct the graph of both beakers on the same axis.



Do you notice a significant temperature difference between the two beakers?
Why do you think this occurs?

Conclusion

Through this simulation, you have investigated the Greenhouse Effect and constructed a model that simulates it. In the process, you learned about the dual nature of light and its electromagnetic abilities. At the end, you were able to construct the Greenhouse effect model and study its variables.