

GREENHOUSE GAS EFFECT



20+ mins.



16-25 players



Large Open
Space



4

LEARNING OBJECTIVES

- To understand how the greenhouse effect works, what human activities affect it, and how it affects the increase in Earth's temperature
- Learn about how to reduce greenhouse gas emissions, avoid greenhouse gases and mitigate climate change
- Critical thinking and combine information to find solutions

MATERIALS

- Name Tags (Laminated paper with sunlight and CO₂ molecules labels separately)
- Colored chinks

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FACILITATION GUIDELINES

1. Select a volunteer to represent the Earth.
2. Select 5-8 students to represent the CO₂ molecules (have them wear the CO₂ name tag).
3. Select 10-16 students to represent the Sun's rays (give them the corresponding name tag). Note: The number of students representing the sun's rays should be about twice as high as the number of CO₂ molecules.
4. Have the student, who represents the Earth, sit at the center of the space. From a certain distance from the Earth (about 3-4 steps), draw a circle and then draw another circle with a different chalk color at a greater distance (about 7-8 steps) from Earth.
5. Have the students representing the sun rays stand around in the outer circle and tell them that they can only move in a straight line.
6. Tell the first part of history (before the Industrial Revolution). Have 2 CO₂ students take their place in the inner circle.
7. Tell the students representing the sun's rays to move to Earth. Tell the CO₂ students that they must stand in their spot with their hands down.
8. Tell the sun ray students to return back to their original place in "space". Tell the CO₂ students that they can try to tag the sun rays (without moving their feet). During this, if the sun rays hit a CO₂, have them stop and remain close to Earth.
9. Count how many rays are trapped near Earth. Explain that this heat provides the Earth with a mild average temperature and allows life to still develop. Students place 1-2 jackets on the "Earth" to represent this increase in temperature.
10. Have all students representing sun rays return to the outer circle. Now, tell the second part of the story (industrial revolution). Ask students if CO₂ is increased in the atmosphere. 1-2 more CO₂ students should now take their place in the inner circle.
11. Repeat steps 7 & 8.
12. Measure how many rays are now trapped near the Earth and compare with the previous round. Ask the students what impact this has on Earth's temperature. Students place 1-2 more jackets on the "Earth."
13. Tell all students representing the sun rays to return to the outer circle. Tell the third part of the story (oil discovery). Ask students if CO₂ is increased in the atmosphere. Have 1-2 more CO₂ students take their place in the inner circle.
14. Repeat steps 7 & 8.
15. Count how many rays are now trapped near the Earth and compare with the previous round. Ask what impact this has on Earth's temperature. Students place 2-3 more jackets on the "Earth."

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FACILITATION GUIDELINES CONTINUED

16. Tell all students representing the sun rays to return to the outer circle. Now tell the fourth part of history (today's era). Ask students if CO₂ is increased in the atmosphere. Have 1-2 more CO₂ students take their place in the inner circle.
17. Repeat steps 7 & 8.
18. Count how many rays are now trapped near the Earth and compare with the previous round. Ask what impact this has on Earth's temperature. Students place 2-3 more jackets on the "Earth."
19. Tell all students, except the "Earth," to return to their positions. Ask them what conclusions they made. Ask the student representing the Earth how he/she feels under all of the jackets.
20. Have students propose solutions to reduce greenhouse gas emissions. When a student proposes a correct solution, ask him/her to remove a jacket from the "Earth."
21. The game ends when all jackets have been removed.

DEBRIEFING QUESTIONS

1. Did you have fun playing the game?
2. Did you learn anything from playing this game? What did you learn?
3. What are your final conclusions after playing this game?
4. What can we do to reduce the production of CO₂ and greenhouse gases?

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STORY

First Part:

Imagine 2-3 thousand years. In the atmosphere of the Earth, among other gases, there is also a small amount of CO₂. It comes mainly from volcanic eruptions and fires. The plants absorbed it to live, and what was left in the atmosphere kept the sun's rays on Earth. So the Earth maintained a satisfactory temperature and hosted life. Otherwise we will freeze

Second Part:

The years have passed ... we reached the industrial revolution for centuries, around 1750. The man discovered the machine and the use of coal to produce energy and movement. He built trains, boats, factories that all burned coal for their engines to work and produce or produce. And as the charcoal was burning, the CO₂ grew ... and slowly raised to the upper layers of the atmosphere ...

Third Part:

We are in 1900. We discovered something more precious than coal ... oil, black gold! We used oil to work the factories, to move ships and trains, to heat the buildings, build cars and planes. Movements were multiplied, the products produced by the factories as well. People spread and grew up, needed timber to build their homes and more land to cultivate, and they began to cut forests.

Fourth Part:

We arrive to today. The earth's population has surpassed 7 billion and is rising rapidly. We use more energy than ever! In homes for lighting, heating, work for appliances, in the city, in stores, in services, in factories to produce more and more products, to transport products from every corner of the earth to move ... Every family has one or more cars, we travel with airplanes more and more often since they are inexpensive! And of course, we use fossil fuels ... coal, oil, gas. And we consume too much, even if we do not get used to everything we buy. And we produce a lot of food, we throw a lot of food, we eat much more meat and we cut the forests to spread our crops. Scientists warn: CO₂ has grown a lot and will grow more and more if we do not take action! We move to self-destruction ...