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„Save the Earth”

‘’Our Actions are Our Future!”

2023-1-PL01-KA210-SCH-000157500



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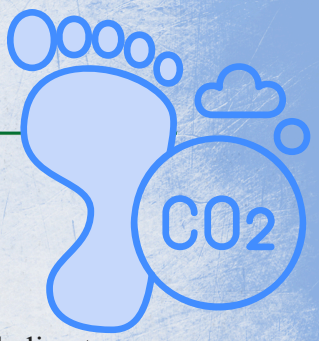
1. Carbon Footprint

Concept

A ***carbon footprint*** is the total amount of greenhouse gases—mainly carbon dioxide (CO_2), methane (CH_4), and nitrous oxide (N_2O)—that are released into the atmosphere as a result of human activities. These emissions come from transportation, electricity use, food production, and manufacturing. By understanding their carbon footprint, students and schools become more aware of how everyday choices—such as the way we travel, what we eat, or how much energy we use— contribute to global warming. This awareness helps foster responsibility and environmental stewardship at both personal and institutional levels.



Goals

Knowledge

Define what a carbon footprint is and explain how it contributes to global climate change.
Identify daily activities and school operations (e.g., energy use, waste, food, and transport) that produce greenhouse gas emissions.
Recognize the difference between direct emissions (e.g., driving, heating) and indirect emissions (e.g., manufacturing school materials, food supply chains).
Understand the relationship between carbon footprint reduction and the achievement of global sustainability goals (SDGs 12 and 13).

Skills

Use age-appropriate online tools (e.g., ***Carbon Footprint Calculator for Kids***) to measure personal and class-level carbon footprints.
Analyze results, interpret data, and discuss the implications of high or low emission scores.
Create a practical “To-Do List” identifying realistic actions to lower emissions at home and school (e.g., turning off lights, using reusable bottles, reducing paper use).
Design visually appealing posters and infographics to raise awareness within the school community.
Develop and play card games and puzzles that reinforce the concepts of carbon reduction and energy efficiency.

Attitudes & Behaviors

Develop environmental empathy and a sense of global citizenship.
Take ownership of personal and school-level sustainability actions.
Value teamwork, cooperation, and shared responsibility for creating a greener school environment.
Commit to making long-term behavioral changes such as reducing waste, conserving energy, and promoting eco-friendly habits.

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Activities

1. Carbon Footprint Calculator

Students work individually or in pairs to complete an ***age-based carbon footprint quiz***. Results are compared on a classroom chart to visualize collective impact.

> ***Tools:*** Online calculator or printed worksheet.
> ***Discussion:*** "Which habits produce the most carbon?" and "What small changes can make a big difference?"
> ***Learning Outcome:*** Students become aware of their personal environmental impact through measurable data.

TOOLS

Carbon Footprint Survey: How Big Is Your Family's Carbon Footprint?

Some of our lifestyle choices and day-to-day activities emit excess carbon dioxide and other greenhouse gases into the atmosphere. The amount of greenhouse gases we produce is referred to as our "carbon footprint." Too much carbon dioxide and other greenhouse gases in our atmosphere can lead to unnatural climate change, which can have a harmful effect on our planet. Take this survey to get a sense of the size of your family's carbon footprint.

Housing and Home Energy

1. If you live in a single-family home, color 4 rings ***RED***; if you live in an apartment or other type of home, color 2 rings ***RED***.
2. If you don't use energy-efficient ENERGY STAR certified light bulbs such as CFLs (compact fluorescents), color 1 more ring ***RED***.
3. If your home doesn't have a programmable thermostat, color 1 more ring ***RED***.
4. If you are not familiar with the ENERGY STAR label for energy-efficient products, color 1 more ring ***RED***.

Transportation

5. For every small car in your family, color 1 ring ***BLUE***.
6. For every medium or large car in your family, color 2 rings ***BLUE***.
7. If you don't regularly change the air filter on your car and check the tire pressure, color 1 more ring ***BLUE***.
8. For every airplane trip you've taken in the past year, color 1 more ring ***BLUE***.

Personal Habits

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9. If you are a vegetarian, color 1 ring ***GREEN***; if you are not a vegetarian, color 2 rings ***GREEN***.
10. If you never eat organic food, color 1 more ring ***GREEN***.
11. If you take baths, run the faucet while brushing your teeth or washing dishes, or water your lawn several times a week, color 1 more ring ***GREEN***.

Recycling and Waste

12. If you usually recycle your household trash, color 1 ring ***BROWN***; if you never recycle, color 2 rings ***BROWN***.
13. If you never compost your yard and kitchen waste, color 1 more ring ***BROWN***.

Now read on to learn what you can do to reduce the size of your carbon footprint.

What can you do to reduce the size of your carbon footprint?

Single-family homes generally consume more energy per resident than multifamily housing such as apartment buildings. But no matter where you live, there are things you can do to reduce the amount of energy your home uses, thus reducing your carbon footprint.

Energy-efficient, ENERGY STAR certified light bulbs such as CFLs and LEDs consume less electricity than conventional incandescent light bulbs. Change your household lights to ENERGY STAR and you'll save money on your household energy bills, too.

A programmable thermostat turns your home's heating or air conditioning up and down automatically, depending on the time of day. When your home's energy system is working efficiently, it wastes less energy, thus reducing your carbon footprint.

ENERGY STAR certified products such as lighting, appliances, and electronics, use less energy. When purchasing new products look for the ENERGY STAR label to save energy, save money, and reduce your carbon footprint.

All gasoline-powered automobiles emit carbon dioxide. The larger the car, the more carbon dioxide is emitted. Cars that are properly maintained are more energy efficient. Be sure to regularly change the air filter and make sure the tires are always properly inflated. Virtually all modes of transportation consume energy, thus they impact your carbon footprint.

The growing, processing, packaging, delivery, and distribution of food requires energy from farms, factories, trucks, grocery stores, and more. Because a vegetarian diet does not include meat, a vegetarian tends to have a smaller carbon footprint than does a nonvegetarian.

The production of organic food puts less stress on the environment, so your carbon footprint is smaller if you tend to eat organic food.

Water that goes down our drains and sewers must be processed through water treatment plants, even if the water is clean. Using only the amount of water you really need helps reduce your carbon footprint.

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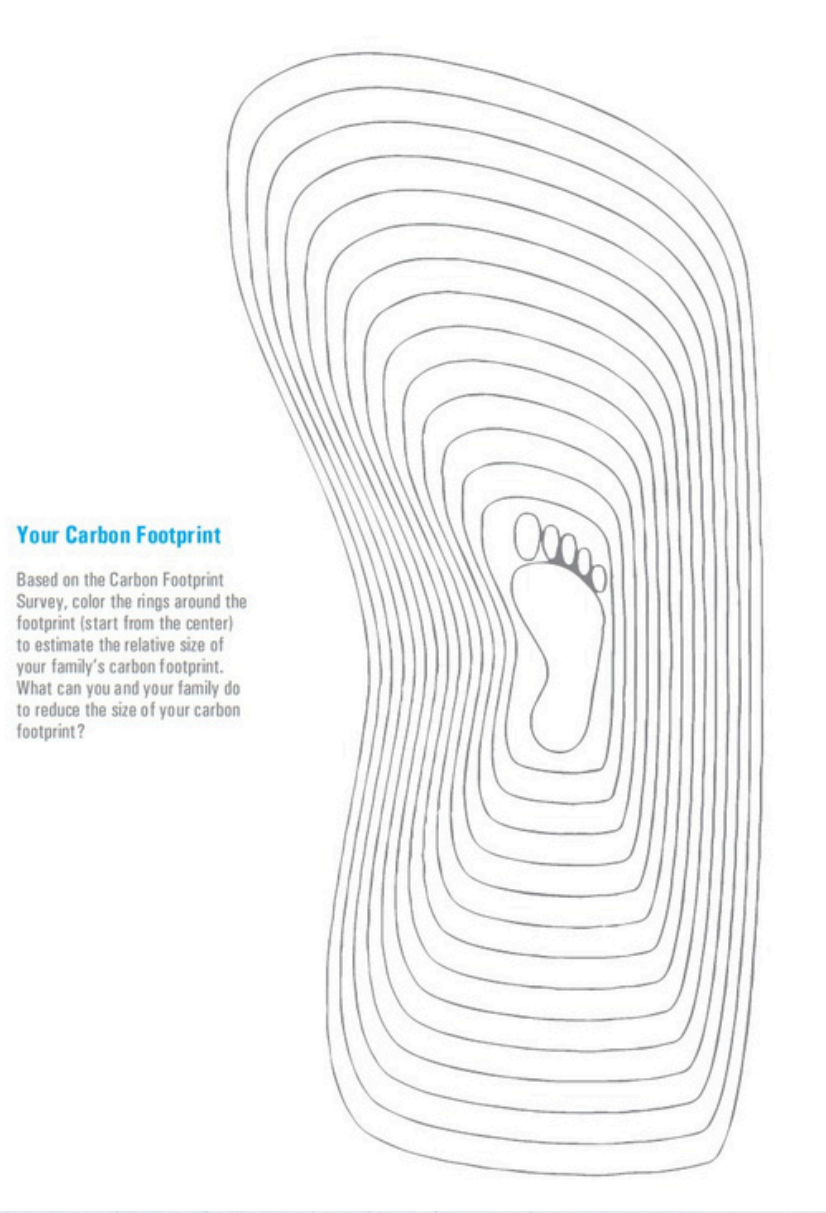
Recycling is good for the environment because it keeps excess waste out of landfills and trash incinerators. If you recycle on a regular basis, your carbon footprint is smaller.

Composting is good for the environment because it keeps kitchen and garden waste out of the trash and it encourages natural gardening practices. If you compost at your house, your carbon footprint is smaller.



2.To-DoListWorkshop

Insmallgroups,students brainstorm and compile realistic daily or weekly actions to lower their footprint.

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Output: A "Green Commitment Wall" where each student adds one personal action (e.g., walk to school once a week, eat less packaged food).
Cross-Curricular Integration: English (writing commitment statements), Math (calculating reductions), Science (understanding energy use).
Teacher Role: Facilitate reflection and encourage creative, feasible solutions.

3. Poster Creation

Students design informative and persuasive posters that communicate key facts about carbon footprinting and solutions.

Materials: Recycled paper, natural pigments, or digital tools (e.g., Canva, Google Slides).
Showcase: Posters displayed in school corridors or during Eco Week.
Extension Activity: Students prepare short presentations to explain their posters to younger peers.

Poster Creation Activity: "My Carbon Footprint, My Responsibility"

Objective:
To help students visualize and communicate ways to reduce their carbon footprint through creative expression. The activity encourages both artistic and scientific thinking while promoting environmental awareness across the school community.

Materials:

Recycled paper, cardboard, and old magazines for collage work
Natural pigments or eco-friendly paints (tea, beetroot, turmeric, spinach, etc.)
Scissors, glue, colored pencils, and markers
Digital tools for online design (e.g., ***Canva***, ***Google Slides***, ***Adobe Express***)
Research materials: fact sheets, charts, and infographics about carbon emissions

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Process:

1. ***Introduction (15 minutes):***
   The teacher introduces examples of effective environmental posters, discussing what makes them visually powerful (use of color, short slogans, emotional impact).
   Students brainstorm key messages they want to communicate, such as:
   - "Small Steps, Big Impact"
   - "Save Energy, Save Our Planet"
   - "Think Before You Throw"
2. ***Design Phase (40 minutes):***
   Students begin designing their posters individually or in small groups.

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- Encourage them to mix ***facts*** with ***creativity***— forexample,usingreal carbon statistics beside artwork.
- Those using digital tools can include QR codes linking to educational websites or videos about sustainability.
- Emphasize the use of recycled and eco-friendly materials to reduce waste even during the activity itself.

3. ***Collaboration & Peer Feedback (20 minutes):***
   Groups exchange posters and give each other constructive feedback based on clarity, creativity, and environmental message.
   Teachers and students together vote for posters that are most ***informative***, ***creative***, and ***action-inspiring***.
4. ***Showcase & Exhibition:***
   - Final posters are displayed in ***school corridors***, ***the eco-corner***, or ***during Eco Week***.
   - Students can also upload digital versions to the school's website or social media channels to reach the wider community.
5. ***Extension Activity – "Teach the Younger Ones":***
   Each group prepares a short 3–5 minute presentation explaining their poster to younger students (ages 10–13).
   - Focus: What is a carbon footprint? Why should we care? What can students do to reduce it?
   - This promotes ***peer learning*** and develops ***public speaking and leadership skills***.



Kids express their creativity and learn about clean air by drawing scenes of air pollution and eco-friendly solutions.

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Kids learning and having fun with simple environmental activities—tree planting, recycling, drawing, and exploring nature.

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Kids taking part in a fun recycling challenge—sorting waste and learning how to reduce, reuse, and recycle at school.

Reflection and Discussion:

After the exhibition, students reflect on their learning through a guided discussion:

What did I learn about my own carbon footprint?

Which part of my daily life produces the most emissions?

How can I communicate sustainability more effectively in the future?

Expected Learning Outcomes:

Students understand how visual media can influence environmental behavior.

They develop skills in teamwork, design thinking, and persuasive communication.

Younger students are inspired to adopt eco-friendly practices through peer modeling.

The school community becomes more visually engaged with sustainability themes.

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What is Climate Change?

Climate change is the increase in the average temperature of the planet.

Climate change affects the planet in many ways: for example, there will be more heatwaves, wildfires, floods, droughts, and landslides.



The Atmosphere

The atmosphere is a jacket of gases that surround our planet. It is made of:

Nitrogen (N_2) - 78.1 %

Oxygen (O_2) - 20.9 %

Argon (Ar) - 0.9 %

Carbon dioxide (CO_2) - 0.04 %

And very small amounts of other gases

Why is the earth warming?

Greenhouse gases

Climate change is caused by the increase in the atmospheric concentration of greenhouse gases. Greenhouse gases are gases in the Earth's atmosphere that trap heat reflected from the earth's surface (like how heat is trapped in a greenhouse). We need some greenhouse gases to survive, without them the earth would be -19°C, which is about the same temperature as your freezer!

However, in recent years, the amount of greenhouse gases in the atmosphere has increased so much that more heat is being trapped, causing the increase in the average temperature of the Earth (the planet is becoming warmer), and the global climate to change. The increase in the amount of greenhouse gases is caused by people and their actions.

There are a number of gases that contribute to global warming – some of these are:



The Global Carbon Cycle

Carbon

Carbon is a chemical element and is found in many forms, as an energy source for building things:

- Our bodies (18% of a person) – in our DNA, muscles, bones and more
- The atmosphere, as CO_2
- Rocks, soils and the earth's crust
- Fuel (e.g. petrol and diesel)
- Oceans
- Animals
- Plants
- Buildings

Carbon moves around the earth between these different forms through the 'carbon cycle'. The carbon cycle is the movement of carbon, in the form of CO_2, into and out of the atmosphere.



Carbon Dioxide

Carbon dioxide, also called CO_2 (pronounced see-oh-two), is the most important of the greenhouse gases as it is emitted in large quantities and has a long-lasting influence. CO_2 stays in the atmosphere for thousands of years (also known as 'atmospheric lifetime'), this is one of the reasons why it builds up in the atmosphere and why we need to reduce emissions.

Other greenhouse gases have shorter lifetimes or much smaller concentrations in the atmosphere. For example, 0.04% of the atmosphere is CO_2, while methane accounts for 0.00018%, and nitrous oxide 0.00003%. Even such small quantities are enough to trap lots of heat. Carbon dioxide in the atmosphere is part of the 'carbon cycle'.

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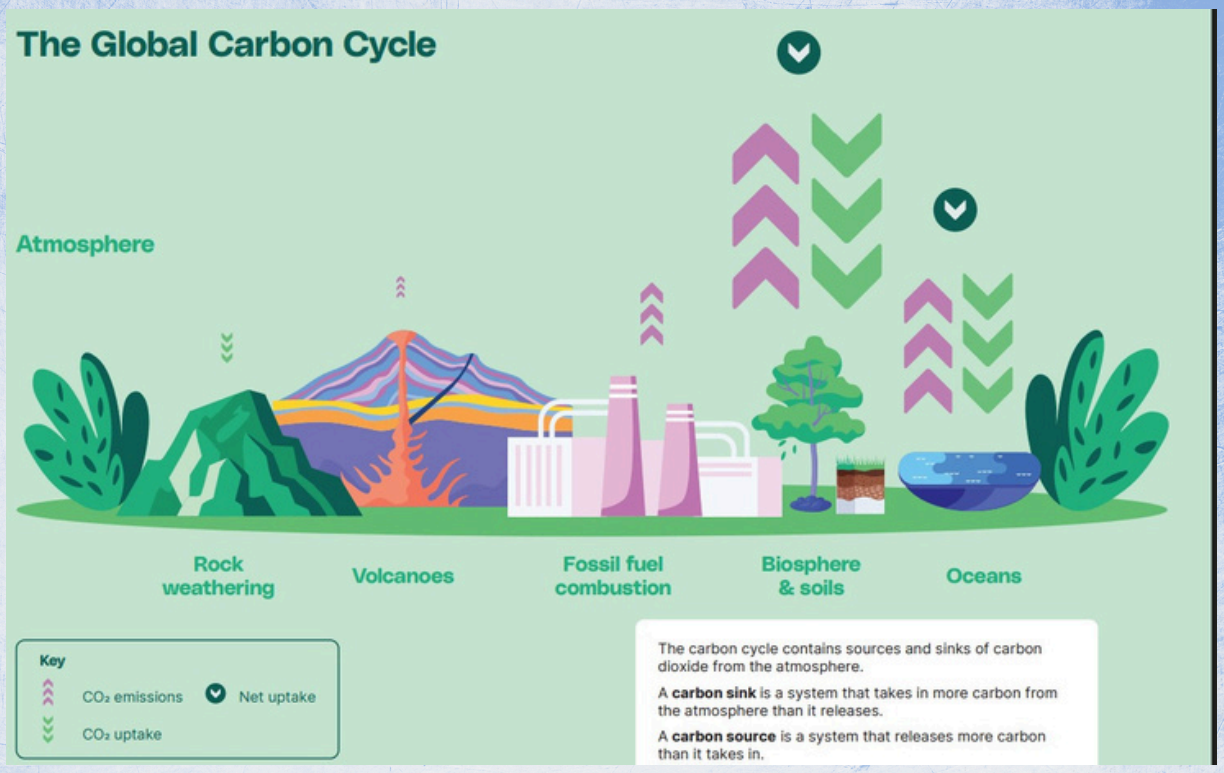



4. Teacher Resource Workshop

Teachers collaborate to design ***8 educational card games*** and ***4 puzzles*** themed around:

Energy-efficient behaviors

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Sustainabletransportation
Food choices and carbon impact
Waste reduction in schools
These games can be used in science, geography, and English classes to make environmental learning interactive and enjoyable.

Card Games

1. Carbon Footprint Action Cards

Deck of ~30 cards: each card has an everyday action (e.g., "Take a 10-minute shower", "Use public transport instead of car", "Eat a meat-free meal").
Players draw a card, estimate their CO_2 reduction, then discuss how to make it happen.
Goal: build a personal ***to-do*** list based on drawn cards.

2. Greenhouse Gas Matching Game

Set of cards: half show greenhouse gases (CO_2, CH_4, N_2O, H_2O vapour), half show sources (vehicles, livestock, deforestation, power plants).
Players match gas ↔ source.
Includes "Effect" cards showing consequences (sea-level rise, heatwaves).
Goal: understand cause-effect links.

3. Climate Change Terminology Snap

Deck with pairs: climate term + definition (e.g., "Mitigation" + "Actions that reduce greenhouse gases").
Play like Snap/Memory: flip cards, match term & definition.
Reinforces vocabulary.

4. Recycling Sort & Score Game

Cards show various items (plastic bottle, aluminium can, banana peel, glass jar, etc.).
Each card has score value if sorted correctly (and negative if wrong).
Players take turns, sort items into bins, earn or lose points.
Goal: accurate sorting + discussion of why.

5. Sustainable Habit Challenge Cards

Cards describe habit challenges (30 cards): e.g., "Use a reusable bottle for one week", "Walk or cycle to school two days", "Pack waste-free lunch three times".
Players draw a challenge, commit to doing it, later share experience.
Builds long-term behavior change.

6. Climate Solutions Auction Game

Cards represent solutions (solar panels, reforestation, bike lanes, insulation).
Players 'bid' points (or resource tokens) to acquire solutions.

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After acquiring, theycalculate estimated CO_2reduction.
Goal: prioritize high-impact solutions and decide as a team.

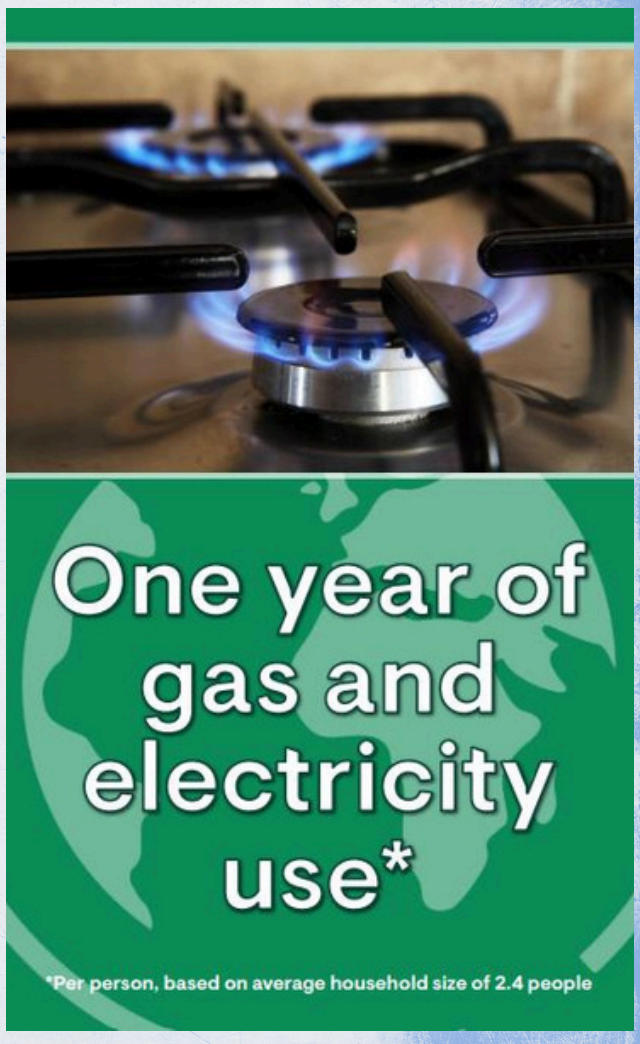
7. Carbon Footprint Puzzle Cards

Cards with partial charts/infographics showing footprint components (transport, food, home energy, waste).
Players collect pieces to assemble full infographic.
Then discuss which area is largest in their context and how to reduce it.

8. Role-Play Debate Cards

Cards assign roles (student, parent, local business owner, policy-maker) plus scenario cards (e.g., “School plans to replace all lights with LED”, “Local council proposes new bike lanes”).
Players discuss and argue from their role’s perspective.
Encourages understanding of multiple viewpoints in sustainability decisions.





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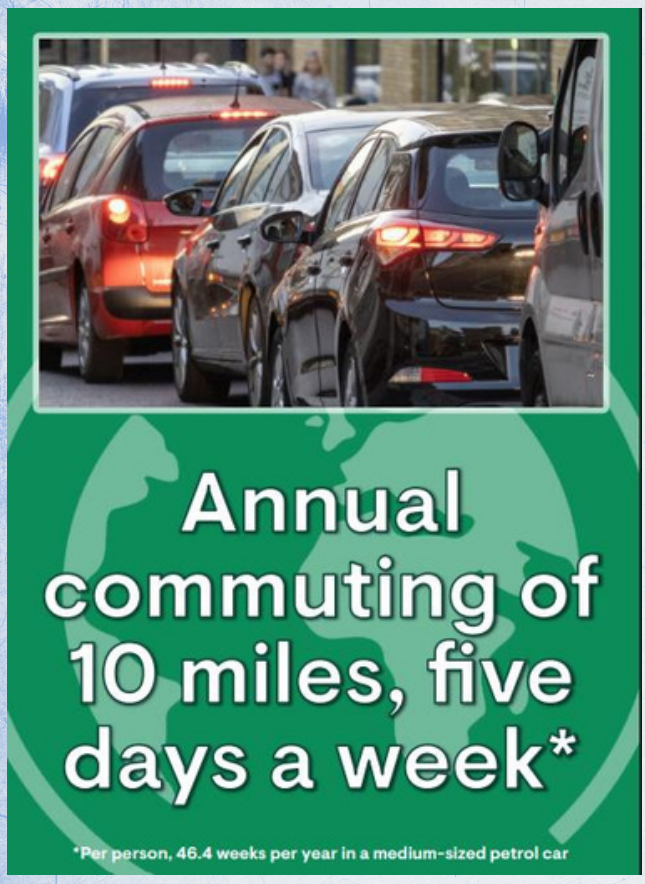







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Educational Card Games

1. Carbon Footprint Trumps

Game Mechanic: Top Trumps / War.
Concept: Each card features a school-related item or action (e.g., "School Bus," "Beef Burger Lunch," "LED Lightbulb," "Classroom Projector," "Reusable Water Bottle").
Stats: Cards have 3-4 stats like ***"Carbon Cost," "Energy Use,"*** and ***"Waste Generated."***
How to Play: Players compare stats. For "Carbon Cost," the lowest number wins. For "Energy Use," lowest wins. This teaches students to quantify and compare the relative impacts of everyday choices.

2. Problem & Solution Snap

Game Mechanic: Snap or Memory/Concentration.
Concept: The deck is composed of pairs. One card shows a "Problem" (e.g., "Vampire Power" - electronics on standby), and the other shows its matching "Solution" (e.g., "Unplugging Devices").
Pairs: Other pairs could include: "Food Waste" -> "Compost Bin," "Single-Use Bottle" -> "Water Fountain," "Driving to School" -> "Walking or Biking."

How toPlay: In"Snap,"playersshout"Snap!"when a problem is playedfollowedby its solution (or vice-versa). In "Memory," students flip cards to find the matching pairs.

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3. "Go Green!" (Go Fish)

Game Mechanic: Go Fish.
Concept: The goal is to collect "books" of 4 cards from a single sustainable category.
Categories (Suits):

- o ***Energy Savers*** (Turn off lights, Smart thermostat, etc.)
- o ***Waste Warriors*** (Recycle, Compost, Reuse, etc.)
- o ***Green Transport*** (Bike, Walk, Bus, Carpool)
- o ***Local Lunch*** (School garden, Local farm, etc.)

- ***How to Play:*** Standard Go Fish rules. "Do you have any 'Waste Warriors'?" This reinforces the different categories of climate action.

4. The Old Landfill

Game Mechanic: Old Maid.
Concept: A standard deck of pairs (e.g., 2 "Solar Panel" cards, 2 "Recycling Bin" cards). There is one single, unpaired card: ***"The Old Landfill."***
How to Play: Players make pairs and discard them. The goal is to not be the player left holding the "Old Landfill" card at the end. This creates a simple, negative association with the "landfill" as the undesirable outcome.

5. Carbon Counters

Game Mechanic: Point-Based Strategy (like a simple TCG).
Concept: Each player starts with 10 "Carbon Points." The goal is to be the first player to get to zero.
Cards:

- o ***Green Cards:*** These reduce your points (e.g., "Packed a Zero-Waste Lunch" - ***Lose 2 points***).
- o ***Red Cards:*** These are "played" on other players to give them points (e.g., "Left the tap running" - ***Give another player 1 point***).

- ***How to Play:*** Players draw and play cards, strategically reducing their own footprint while holding others accountable.

6. School Scenario Shuffle

Game Mechanic: Scenario / Choice (like ***Apples to Apples*** or ***Cards Against Humanity***, but for school).
Concept: One player is the "Eco-Judge" and draws a ***Scenario Card*** (e.g., "It's a cold day and someone left the classroom window open while the heat is on.").
How to Play: The other players play a ***Choice Card*** from their hand (e.g., "Close the window," "Tell the teacher," "Do nothing," "Turn the heat up higher"). The Eco-Judge picks the best (most eco-friendly) choice, and that player wins the point. This sparks discussion and critical thinking.

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7. "Cleaner School" Rummy

Game Mechanic: Rummy / Set Collection. ***Concept:*** Players must collect "melds" (sets) of 3 or more cards that form a logical green category. ***Example Sets:***

- ***The 3 R's:*** "Reduce," "Reuse," "Recycle"
- ***Waste Streams:*** "Compost," "Paper Recycling," "Plastic Recycling"
- ***Energy Actions:*** "Turn off lights," "Unplug," "Solar Panel"

- ***How to Play:*** Standard Rummy rules, but the sets are predefined. This teaches students to group related concepts.

8. Footprint Freeze Dance

Game Mechanic: Action / Freeze. ***Concept:*** A deck of "Action Cards." A teacher or "DJ" plays music. ***How to Play:*** When the music stops, the DJ pulls a card and everyone must freeze in the pose of that action. ***Cards:*** "Pretending to turn off a light," "Riding a bicycle," "Planting a tree," "Sorting recycling." This is a great game for younger students to connect physical actions with key concepts.

Activity 1 – Design your own Eco-School

This week's topic focuses on the environment, looking at the key issues facing our planet and ways in which we can help to secure a sustainable future for the next generations. Some of the most significant environmental issues that we face today include pollution, climate change and natural resources running low. We need YOU to help educate people on the steps they can take to help save the environment, design practical solutions and become experts in your local environments.



Students – This activity is to design your own Eco-School. As the experts who attend schools on a daily basis, we want you to help design the eco-friendly (environmentally friendly) schools of the future.

Are there any existing products/facilities that you would include? Will you create technology of your own? You need to think about which designs will be most effective, and offer the biggest benefit to the environment.

You should consider the following factors when designing your school:

- Which energy source will your school use?
- Is your school sustainable (can it rely on itself to function)?
- Which existing or new technologies will you implement?
- How will you dispose of used materials and waste?
- Where will you source your supplies and food?
- How will students and teachers help to ensure that the school is sustainable?

You can create your school using any method you wish. This could be a drawing, model, video or PowerPoint.

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Activity 2 – Online Activity: Create an Environmental Magazine

Students – In this project, you will learn how to use HTML and CSS to create a multi-page magazine website with a two-page layout. Your task is to create a two-page magazine that gives the general public tips and advice on how they can help to save the environment. Aim for at least 5 top tips and include images/graphics where possible.

Access the activity.

What you will need:

- A PC/tablet capable of accessing trinket.io

What you will learn

- How to use basic programming to create a multi-page magazine website
- How to utilize intermediate HTML and CSS skills





Activity 3 – Active Activity: Nature Scavenger Hunt

Students – This activity involves incorporating a nature hunt into your daily exercise routine, searching for items such as trees and birds as you keep active while exploring your local environment. View this video to get started.

This activity can be completed in your yard or on a short walk. Remember that you should be accompanied by a parent/guardian at all times and look both ways when crossing roads.

Remember to adhere to social distancing practices and follow government recommendations. In the CDC's COVID-19 "Caring for Children" section, the organization lists going with kids on a walk or bike ride as a way to keep them active. Check out the site for other great recommendations as well. Please check the section before your walk in the instance their recommendation changes as the situation develops.

Access the activities below:

- Nature Scavenger Hunt for students 4 to 10 years old
- Nature Scavenger Hunt for students 11 and up



Bonus activities

Reminder that third party software should not be downloaded on CGI devices.

Water Use Chart

Compare the amount of water used in various activities.

Listen UP!

Activities from the Environmental Protection Agency (EPA) about preventing noise pollution and protecting your ears.

Polar Ice Cap Activity

Learn how melting polar ice caps impact the oceans.

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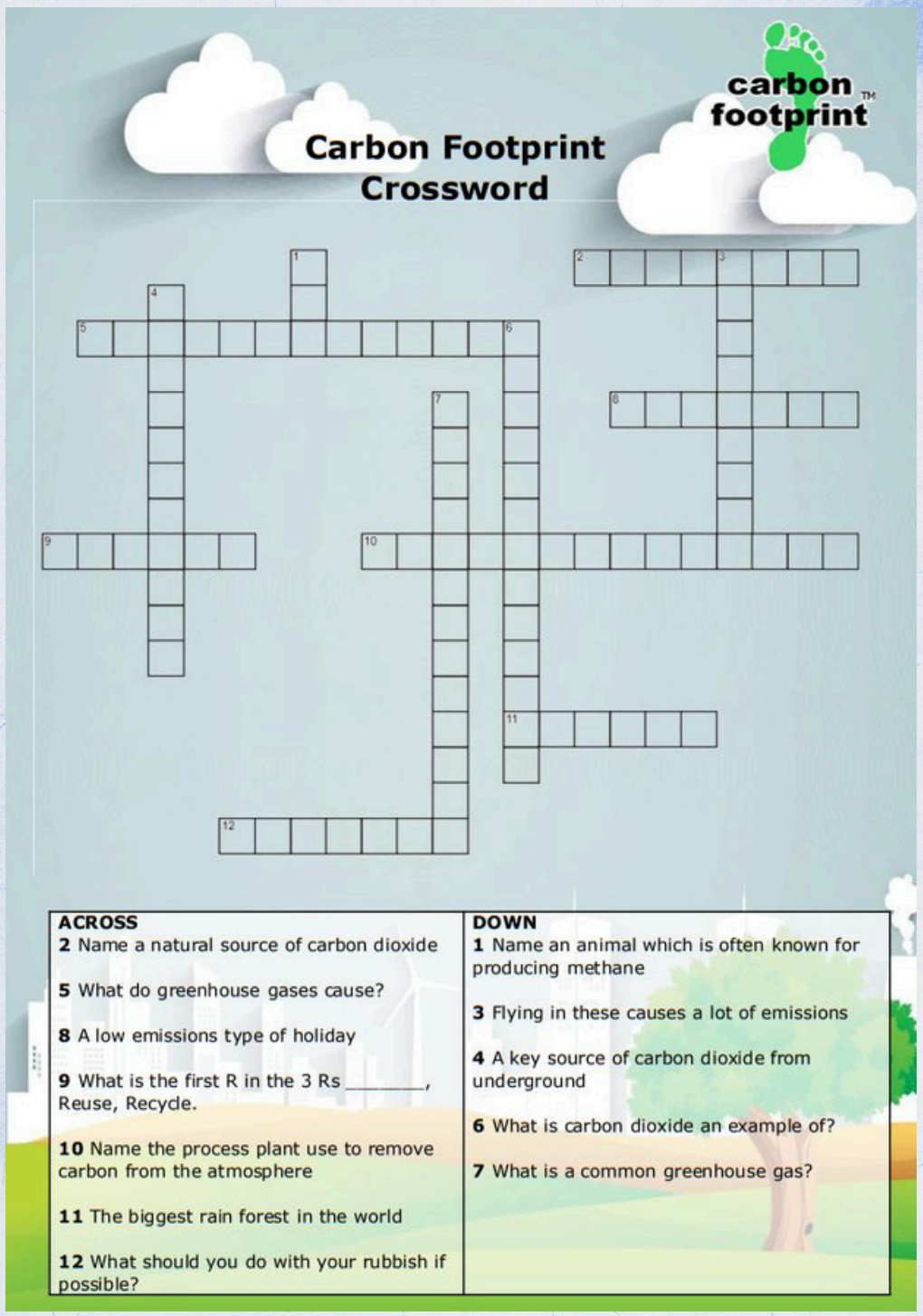

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LESSON PLANS

Grade Level: 4th grade Age Level: 8-10	Date: 13-10-2025 Duration: 60 (30+30) minutes
Instructional Focus/Project Title: “Earth’s SOS”	Method technical principle: Begin with a dramatic scene: The teacher pretends to be Planet Earth, wearing a blue scarf and a sad face. Says: "I’m getting too hot! My ice is melting, my animals are struggling, and my weather is going wild!" Students ask “Earth” questions like:

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<table>
<tr><td>Music Lesson: Learning songs related to the theme.</td><td>• Why are you getting hot?
• What can we do to help?</td></tr>
<tr><td>Association with other courses

Visual Arts Lesson: Draw, painting....</td><td>Association with music lesson
https://youtu.be/eWZQWFWENQA?si=K8zVlXR3O-sPAeTC

Association with visual art :Make a visual description of what was observed during the activity.</td></tr>
<tr><td>Gains :

● Knows the definition of global warming;
● Knows why it matters;
● Knows that human actions affects the planet;
● Knows ways to reduce the carbon footprint.</td><td>Goals/ Objectives:

• Understand the basics of global warming.
• Explore how human actions affect the planet.
• Discover simple ways to help protect Earth.</td></tr>
<tr><td>Vocabulary:

● Global warming
● Human actions
● Greenhouse gases</td><td>Resources:

Dictionary, live resource, natural environment.</td></tr>
<tr><td>Activity/Procedures:

• One container is covered with plastic wrap (greenhouse), the other is open.
• Place both under a lamp or in sunlight.
• Measure temperature after 10 minutes.
Discuss:
• Why did the covered container get warmer?
• How does this relate to Earth’s atmosphere?</td><td>Materials/Supplies: Suggested materials to bring together for this unit:
• Two clear containers
• Thermometers
• Plastic wrap
• Lamp or sunlight
Camera</td></tr>
<tr><td>Evaluation:

● Why did the covered container get warmer?
● How does this relate to Earth’s atmosphere?</td><td>Technology:

You can record the activity on video.</td></tr>
</table>

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Grade Level: 4th grade Age Level: 8 - 10 Instructional Focus/Project	Date: 14.10.2025 Duration: 60 (30+30) minutes
Title: “Mission Earth: Save the Planet!”	Method technical principle: Tell students: "You are part of a secret team of Earth Explorers. Your mission: investigate why Earth is heating up and find ways to cool it down before it’s too late!" Hand out “Explorer Badges” and a mission folder with today’s tasks.
Association with other courses: ICT Lesson: Watch video; create a” rescue plan to help the Earth” using technology. Music Lesson: Learning songs related to the theme.	Association with music lesson https://youtu.be/lJToF8D9bdU?feature=shared Association with ICT lesson: use computers to research and create a “rescue plan to help Earth”.
Gains : ● Knows the definition of global warming; ● Knows why it matters; ● Knows that human actions affects the planet; ● Knows ways to reduce the carbon footprint.	Goals/ Objectives: ● Understand the concept of global warming and its causes. ● Explore the impact on nature and people. ● Collaborate on solutions to protect the planet.
Vocabulary: Global warming, greenhouse gases, wildfires, floods, saving energy.	Resources: Dictionary, video, live resource

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<td>Activity/Procedures:

1- Use a simple slideshow or video to explain:
• What is global warming
• Greenhouse gases
• Human activities causing it
Include fun facts like:
• Cows produce methane!
• Ice reflects sunlight, but water absorbs it!
2- Give each team a “clue kit” with:
• Photos of wildfires, floods, melting ice
• Cards with facts and myths
Challenge: Sort the facts from myths and explain how each photo shows global warming effects.
3- Each team creates a “Rescue Plan” with 3 actions they can take to help Earth.
Examples:
• Use reusable bottles
• Plant a tree
• Talk to family about saving energy
Let them present their plans to the class.</td>
<td>Materials/Supplies: Suggestedmaterials to bring together for thisunit

● Short video aboutglobal warming
● “Explorer Badges”
● Photos of wildfires,floods, melting ice
● Cards with facts andmyths
● Reusable bottles
● Camera
● Pen
● Paper
● Computers</td>
</tr>
<tr>
<td>Evaluation

● Why is Earth heating up?
● Are there ways to cool it down?
● How does human activities contribute for the global warming of the planet?
● Write an easy about the “Rescue Plan” created by your team.</td>
<td>Technology:

You can record the activity on video.</td>
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Grade Level: 4th grade Age Level: 8-10	Date: 15.10.2024 Duration: 60 (30+30) minutes
Instructional Focus/Project Title: "Time Travelers to Planet Earth"	method technical principle: Team work Tell students: "You are time travelersvisitingEarthinthe year 1900. The planetiscooler,forestsare vast, and animals roamfreely.
Association with other courses Visual arts Lesson: Drawing, painting, decorate a classroom poster. Music Lesson: learning songs related to the theme.	Association with musiclesson https://youtu.be/57MpZ-1VmRs?feature=shared Associationwithvisualartlesson:Drawor writeaboutwhattheplanetcanlooklikein the year 2100, under two scenarios: • "Green Future" (we take action now) • "Hot Future" (we ignore the problem) Decorate a classroom poster with their "toolkit for saving Earth" ideas.
Gains : • Knows the consequences of global warming; • Knows that Earth´s climate has changed over time; • Knows that human actions affects the climate ; Knows ways to reduce the carbon footprint.	Goals/ Objectives: • UnderstandhowEarth'sclimate has changedovertime. • Explore thefutureconsequencesof global warming. • Learn howpresent-daychoicescan shape a bettertomorrow.
Vocabulary: Climate change, global warming, extreme weather events, green future / hot future,	Resources: Dictionary, live resource, internet.

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Activity/Procedures:	Materials/Supplies: Suggested materials to bring together for this unit:
1- Journey to the Past Show images or short clips of: • Pristine nature • Early cities with fewer cars • Wildlife in abundance Ask: • What do you notice about the air, land, and water? • How do people live differently? 2- Visit the Present Use a "time portal" sound effect or animation to jump to 2025. Show visuals of: • Traffic and factories • Melting ice caps • Extreme weather events 3- Mission to the Future Split students into small groups. Each group imagines Earth in the year 2100 under two scenarios: • "Green Future" (we take action now) • "Hot Future" (we ignore the problem) Let them draw or write: • What the planet looks like • How people live • What animals and nature are like Each group presents their vision to the class. 4- Time Traveler's Toolkit Create a "Toolkit for Saving Earth" together: • Turn off unused lights • Use less plastic • Plant trees • Talk to others about climate change	• Interactive board • Images or short clips of pristine nature, early cities with fewer cars, wildlife in abundance, traffic and factories, melting ice caps and extreme weather events. • Pencils, color pencils, paper, pen. • Camera

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Let students decorate a classroom poster with their toolkit ideas.	
Evaluation • What changed? • What caused these changes? • How does this affect people and animals?	Technology: You can record the activity on video.

Grade Level: 4th grade Age Level: 8-10	Date: 16.10.2025 Duration: 120 minutes
Instructional Focus/Project Title: "Nature Mini-Explorers"	method technical principle: *out-of-class teaching techniques:travel, observation.
Association with other courses Visual arts: Build a small terrarium. Music: learning songs	Association with music lesson https://youtu.be/WTZY7-hrVvY?feature=shared Association with visual art : build a small terrarium using collected materials.
Gains : • Learn about local flora and fauna. • Understand basic ecological concepts like ecosystems, biodiversity, and life cycles. • Develop awareness of environmental protection and sustainability. • Foster respect for living beings and natural habitats.	Goals/Objectives: • Spark curiosity and respect for nature through games and environmental observation. • Promote Active Learning. • Engage children in hands-on activities that reinforce ecological concepts.

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- Engage in healthy movement through walking and hands-on tasks.
- Express ideas and discoveries through drawing, building, and storytelling.
- Connect imagination with real-world learning.

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- Allow children to expresstheir discoveries through art,building, and storytelling.
- Provide a safe and enjoyable outdoor experience that nurtures both body and mind.

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Vocabulary:

Endemic species, biodiversity, ecosystem, life cycles, human actions.

</td>
<td>

Resources:

Live resource (Funchal Ecological Park).

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Activity/Procedures:

10:00 - Brief explanation of the park and safety rules.

• Distribution of name tags and small field notebooks.

10:15 – Guided Walk: “Discovering the Forest”:

• Light trail walk with stops to observe plants, insects, and birds - Fun facts about Madeira’s endemic species.

• Collection of leaves and seeds for the next activity.

11:00 – Workshop: “Create Your Mini-Ecosystem”

• Each student builds a small terrarium using collected materials.

• Discussion about life cycles and biodiversity.

11:45 – Final Game: “Eco-Quiz”.

• Simple questions based on what they learned.

• Small eco-friendly prizes (e.g., wooden pencils, seed packets).

12:00 – Wrap-Up

• Presentation of “Mini-Explorer” certificates.

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Materials/Supplies: Suggested materials to bring together for this unit

- Tags
- Field notebooks and pencils
- Glass or plastic jars for terrariums
- Soil, pebbles, moss (prepared in advance)
- “Eco-Quiz”
- Certificates and souvenirs
- Camera

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Evaluation ● Did children demonstrate strong engagement with nature-based learning? ● Did they show curiosity and retained key and concepts about biodiversity environmental protection? ● Did participants express joy and excitement? ● Did the outdoor setting contribute to a relaxed and positive atmosphere? ● Did students identify local flora and fauna, asked thoughtful questions, and retained key environmental concepts? ● Was observation and documentation, verbal and artistic expression, problem-solving and teamwork included in developed skills?	Technology: You can record the travel observation activity on video.

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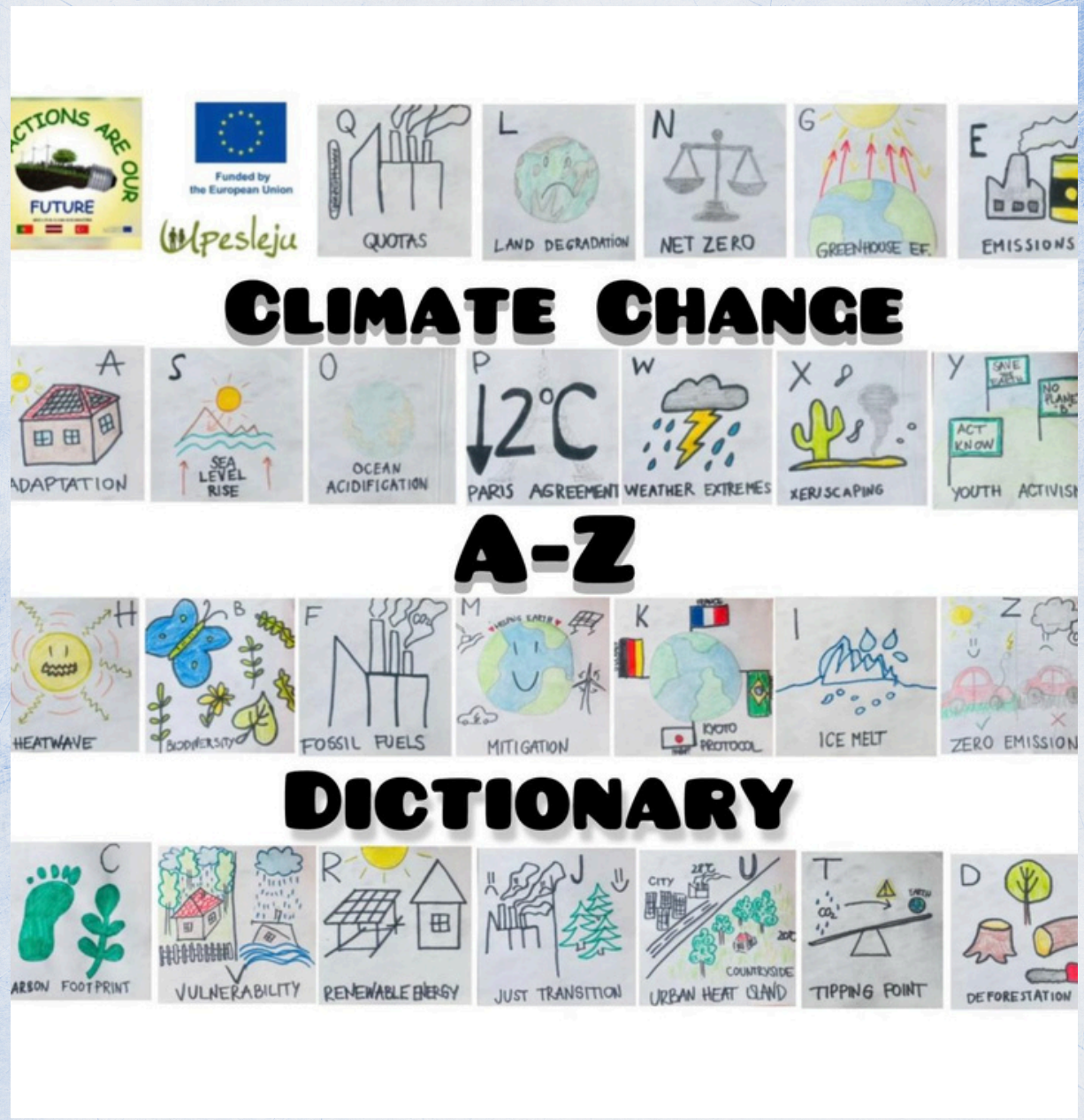

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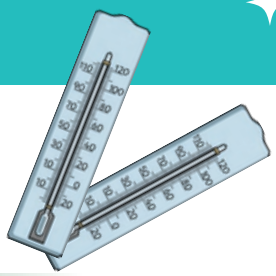
Greenhouse Effect
Experiment 1









You need :

- Two clear plastic bottles
- Two Thermometers
- Plastic wrap
- Rubber bands
- Timer or stopwatch
- Sunny place outside or a lamp



Steps:

- Label the two bottles "A" and "B"
- Place a thermometer inside each bottle
- Cover the opening of Bottle B with plastic wrap and secure it with a rubber band
- Leave Bottle A uncovered
- Place both bottles outside in the sun (or under a lamp)

Write down your predictions:

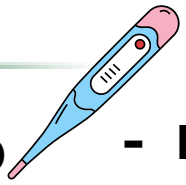
- Which bottle do you think will get warmer?
- Why do you think this will happen?

Greenhouse Effect Experiment 2



You need :

- 2 plastic bottles (1-1.5 l)
- 2 balloons
- vinegar (100 ml)





- baking soda (2-3 tsp)
- funnel
- thermometers (2 pcs.)
- lamp (e.g., halogen)

Steps:

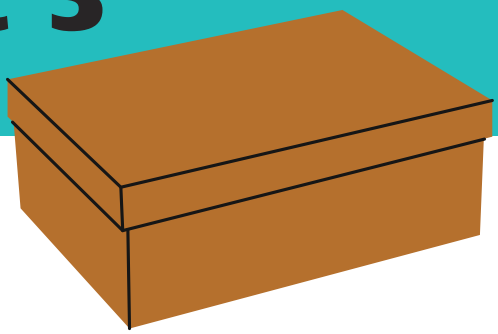
1. Put baking soda into an empty balloon (use a funnel).
2. Pour vinegar into one bottle. Leave the second bottle empty (control).
3. Place the balloon with baking soda on the neck of the bottle with vinegar.
4. Tilt the balloon so the baking soda falls inside - CO_2 will form.
5. Gently remove the balloon and move it to the other bottle to also fill it with gas.
6. Insert thermometers into both bottles.
7. Place the bottles side by side and shine the lamp on them.
8. Check and record the temperatures every 2-5 minutes.

Reflection Questions

👉 Which bottle warmed up faster? Why?
👉 What does this show about the role of CO_2 in Earth's atmosphere?
👉 What human activities increase the amount of CO_2?

Greenhouse Effect Experiment 3





You need :

1 shoe box (open at the top)
Transparent plastic sheet or cling film
Toy figures (trees, houses, animals, people)
Flashlight or lamp (to act as the Sun)
Thermometer (optional)



Steps:

Put toy figures inside the shoe box. They represent Earth (nature, animals, and people).
Cover the open top of the shoe box with transparent plastic. This is the atmosphere.
Shine the flashlight onto the plastic so that the light passes inside.
Put your hand inside or use a thermometer to feel/measure the warmth inside the box.
Try the same experiment without the plastic cover. Compare the difference.

Reflection Questions

👉 What did you feel inside the shoe box compared to outside?
👉 Was the box warmer with or without the plastic cover?

Greenhouse Effect Experiment 4



You need :

2 trays (same size)
Equal number of ice cubes
Cling wrap (plastic wrap)
Sunlight (or a heat lamp if indoors)

Steps:

Place the same number of ice cubes in each tray.
Cover one tray with cling wrap tightly.
Leave the other tray open.
Put both trays in direct sunlight at the same time.
Observe carefully over time which tray's ice melts faster.

Reflection Questions

What happened to the ice under the cover?

Greenhouse Effect Experiment 5



You need :

Pictures (cutouts, drawings, or printed images) of:

Cars 🚗 **Trees** 🌳 **Cows** 🐄 **Bicycles** 🚲
Factories 🏭 **Wind Turbines** 🌬️

Two large boxes, baskets, or sheets of paper labeled:

Produces Greenhouse Gases **Helps the Earth**

Steps and reflection

Spread the picture cards out on a table or floor.

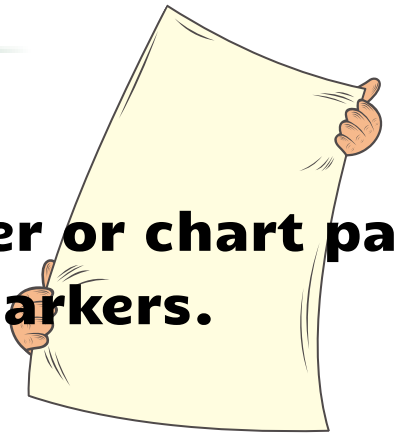
Ask students to think about each item:
Does it create pollution and greenhouse gases?
Or does it help the Earth by cleaning the air, using renewable energy, or not polluting?
Have them place each picture in the correct box.

Discuss the answers as a group.

Greenhouse Effect Experiment 6



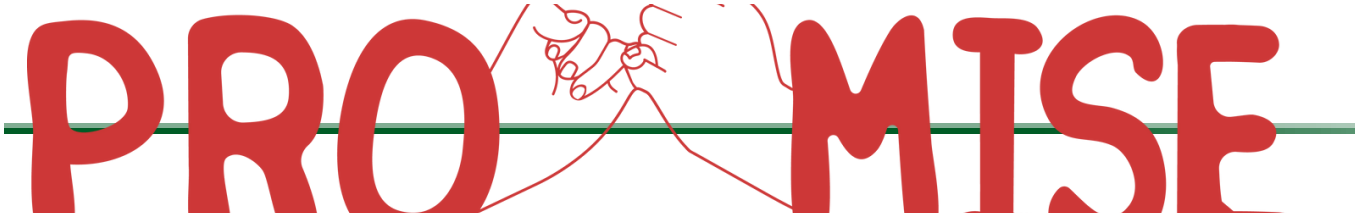
You need :



A large sheet of paper or chart paper
Crayons, markers.

Steps and reflections:

Take a sheet of paper and divide it into two halves using a line.
On the left side, draw things that pollute the Earth or increase carbon footprint.
On the right side, draw things that help the Earth and reduce carbon footprint.
At the bottom of the poster, write one promise about what you personally will do to help reduce pollution and protect the planet.



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The Greenhouse Effect



Learning points

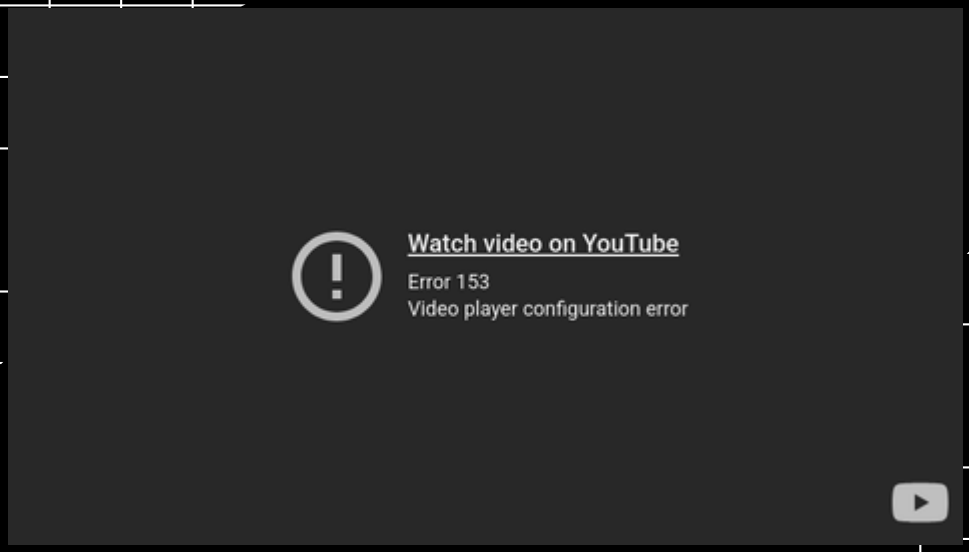
Describe the stages of the greenhouse effect.

State the 3 greenhouse gases.

Explain the impact of human activities.

What is the greenhouse effect?

When heat remains trapped in the atmosphere, caused by the build-up of greenhouse gases.


Watch video on YouTube
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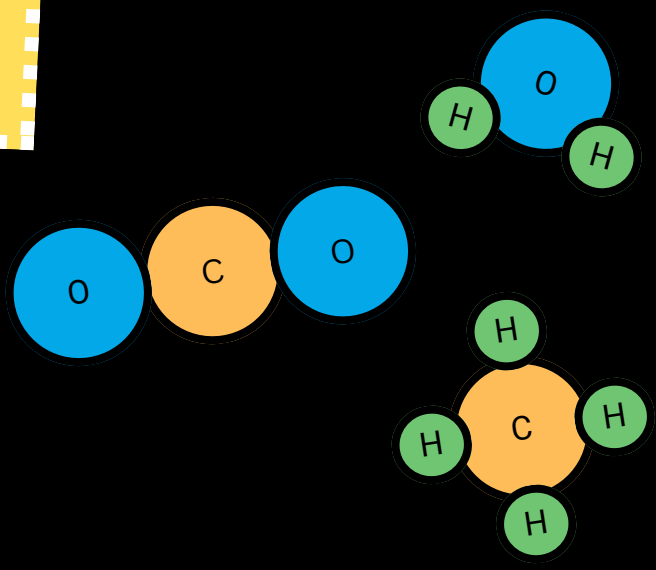
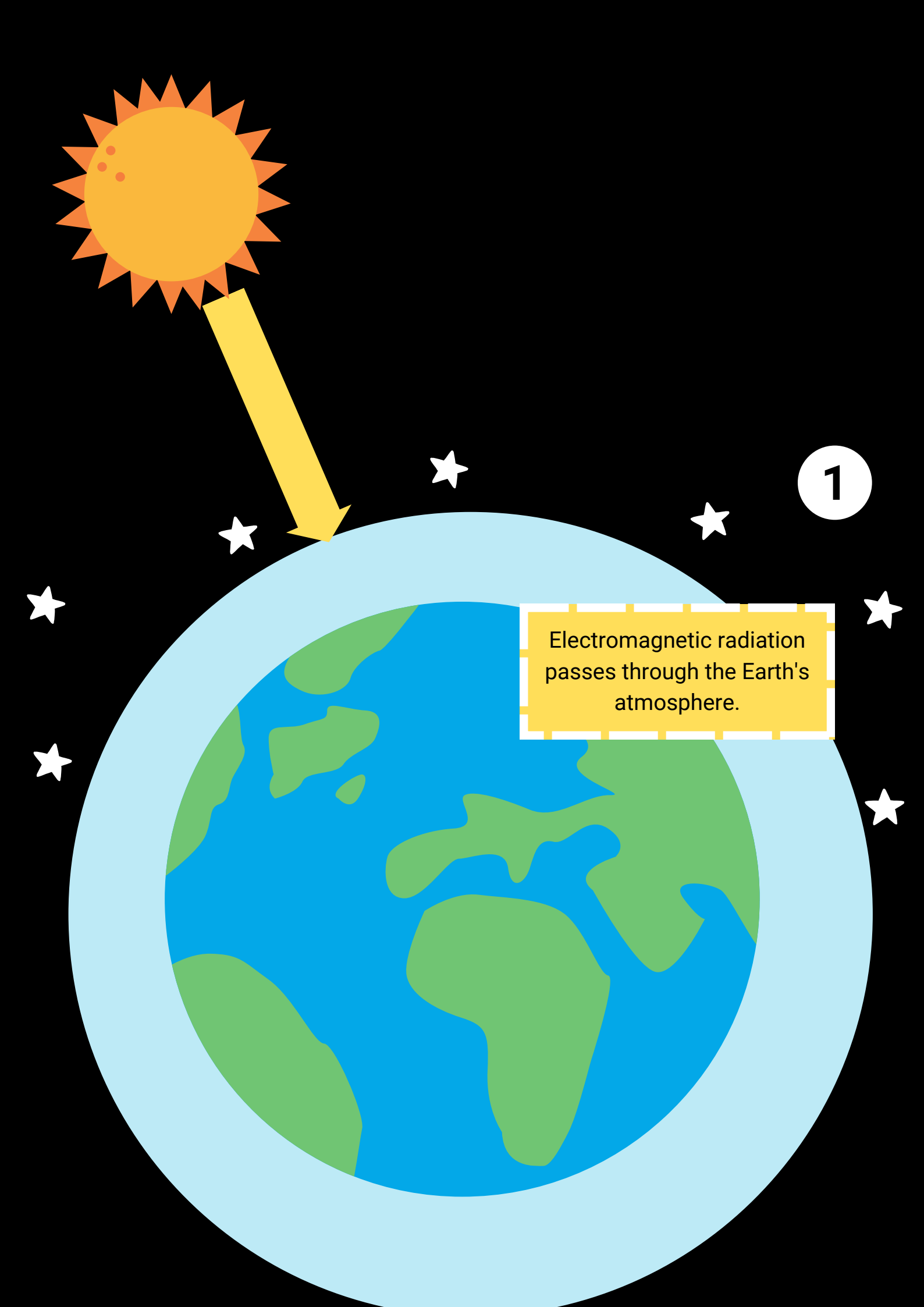
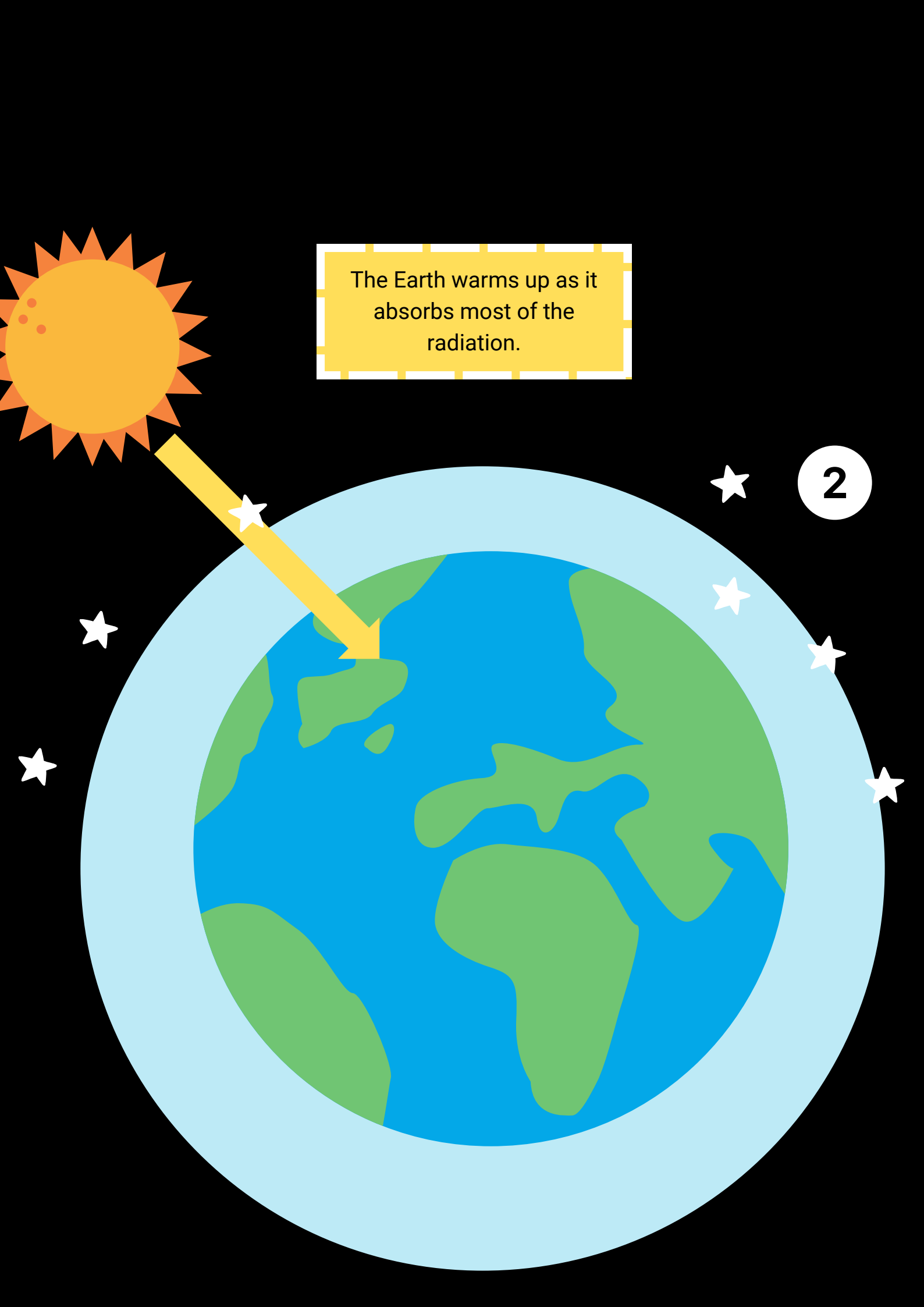
Greenhouse gases

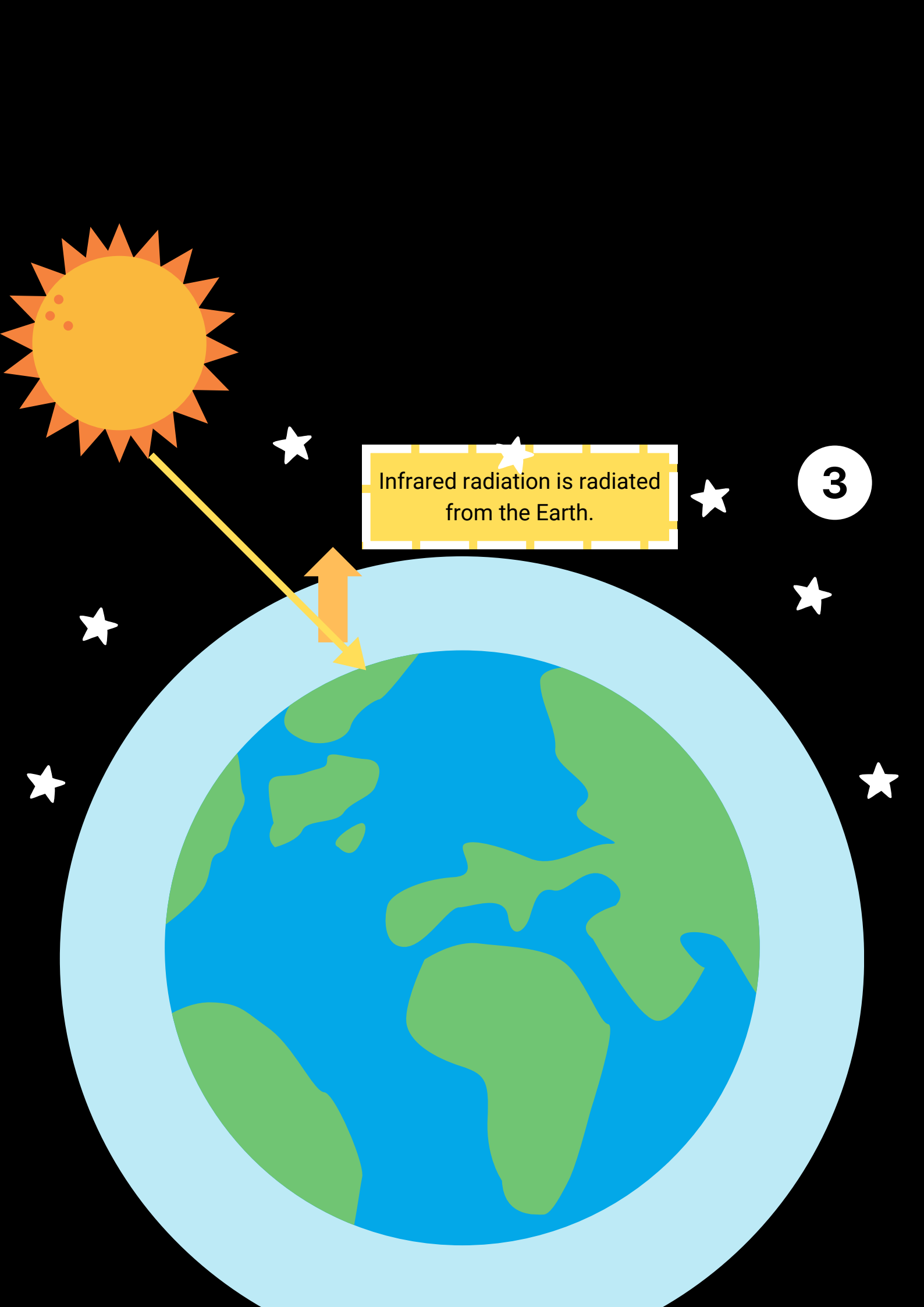
1. Water vapor
2. Carbon dioxide
3. Methane

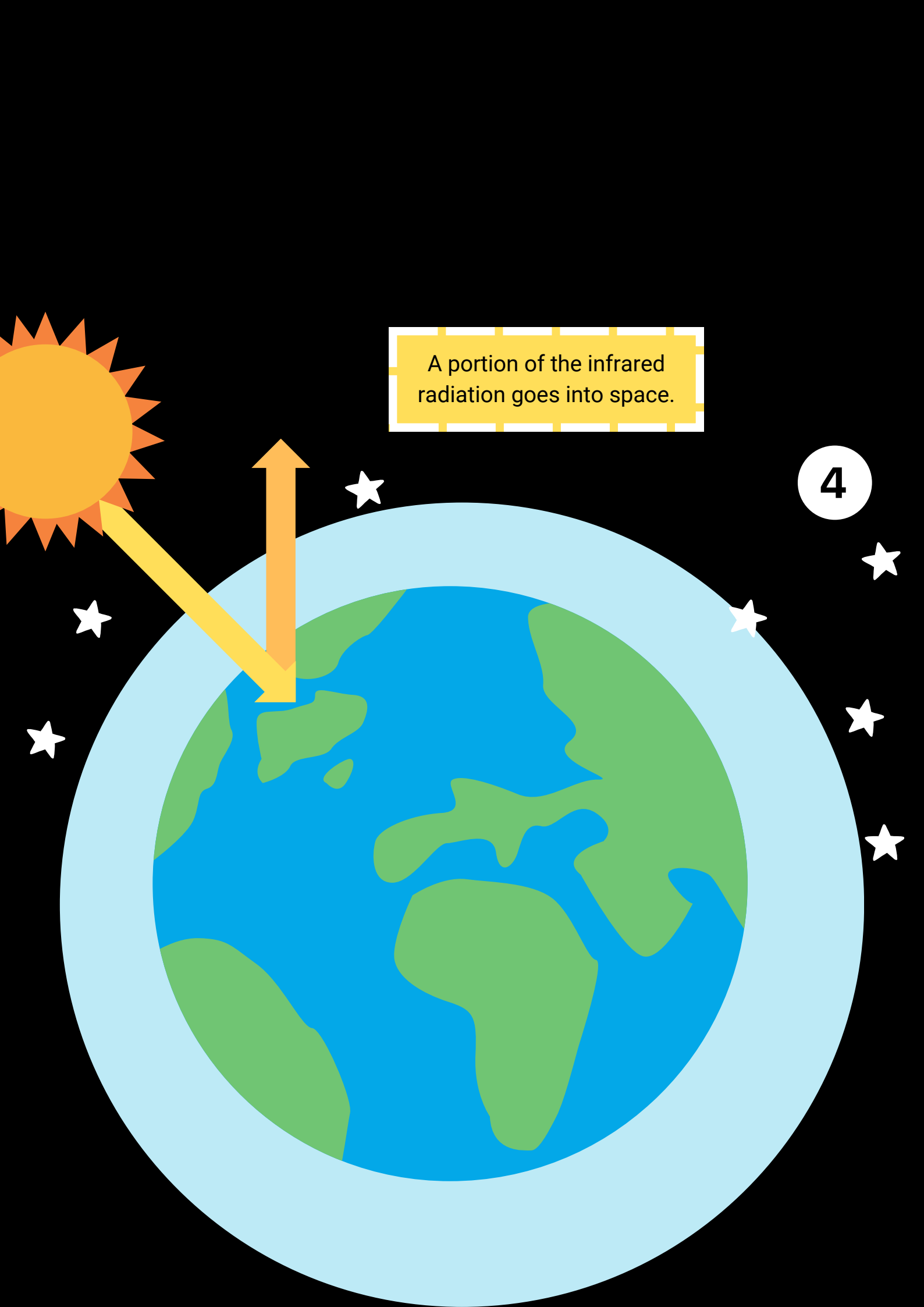


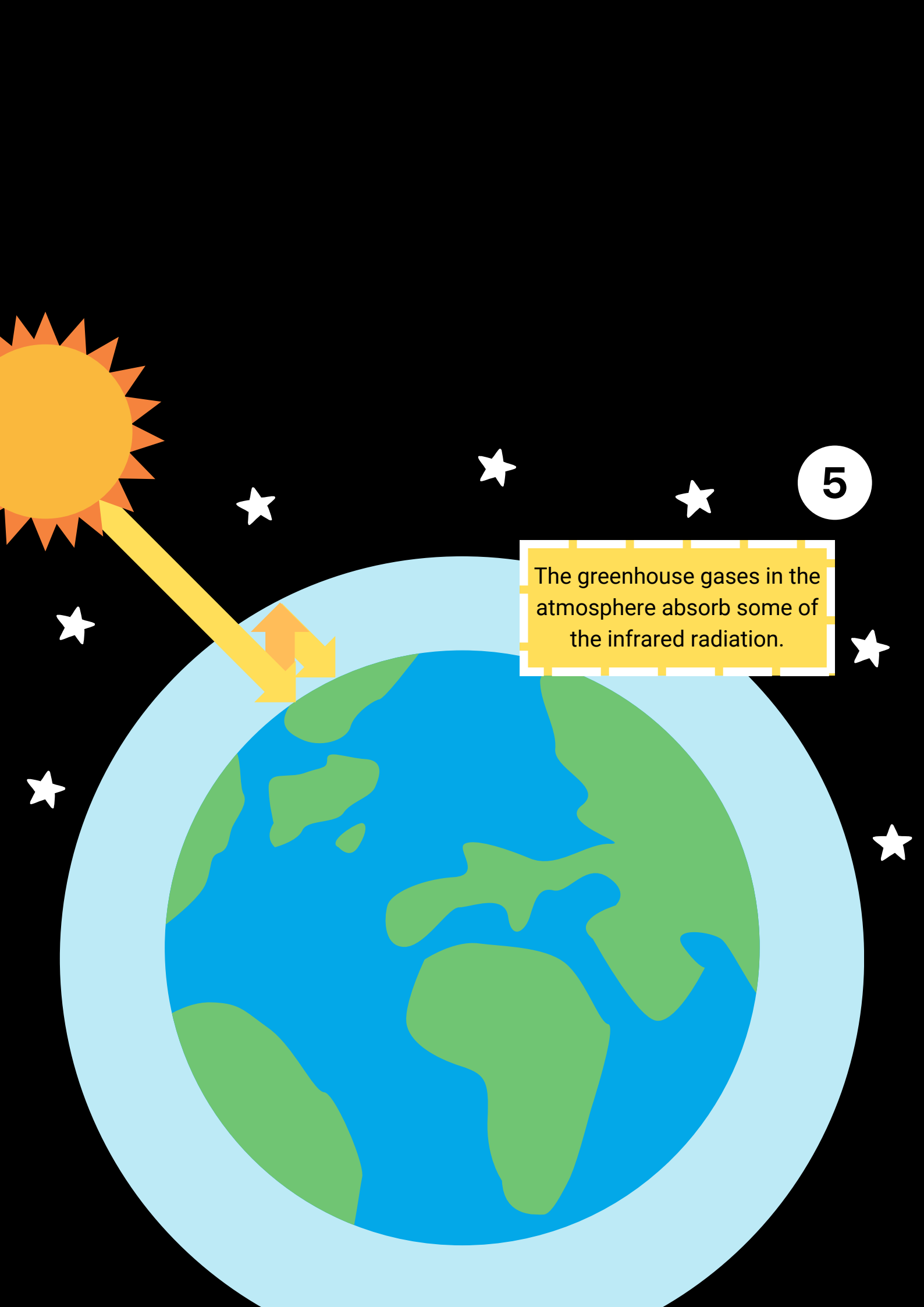
The greenhouse gases absorb heat which is radiated from the Earth. They then release this energy, which in turn keeps the Earth warm.

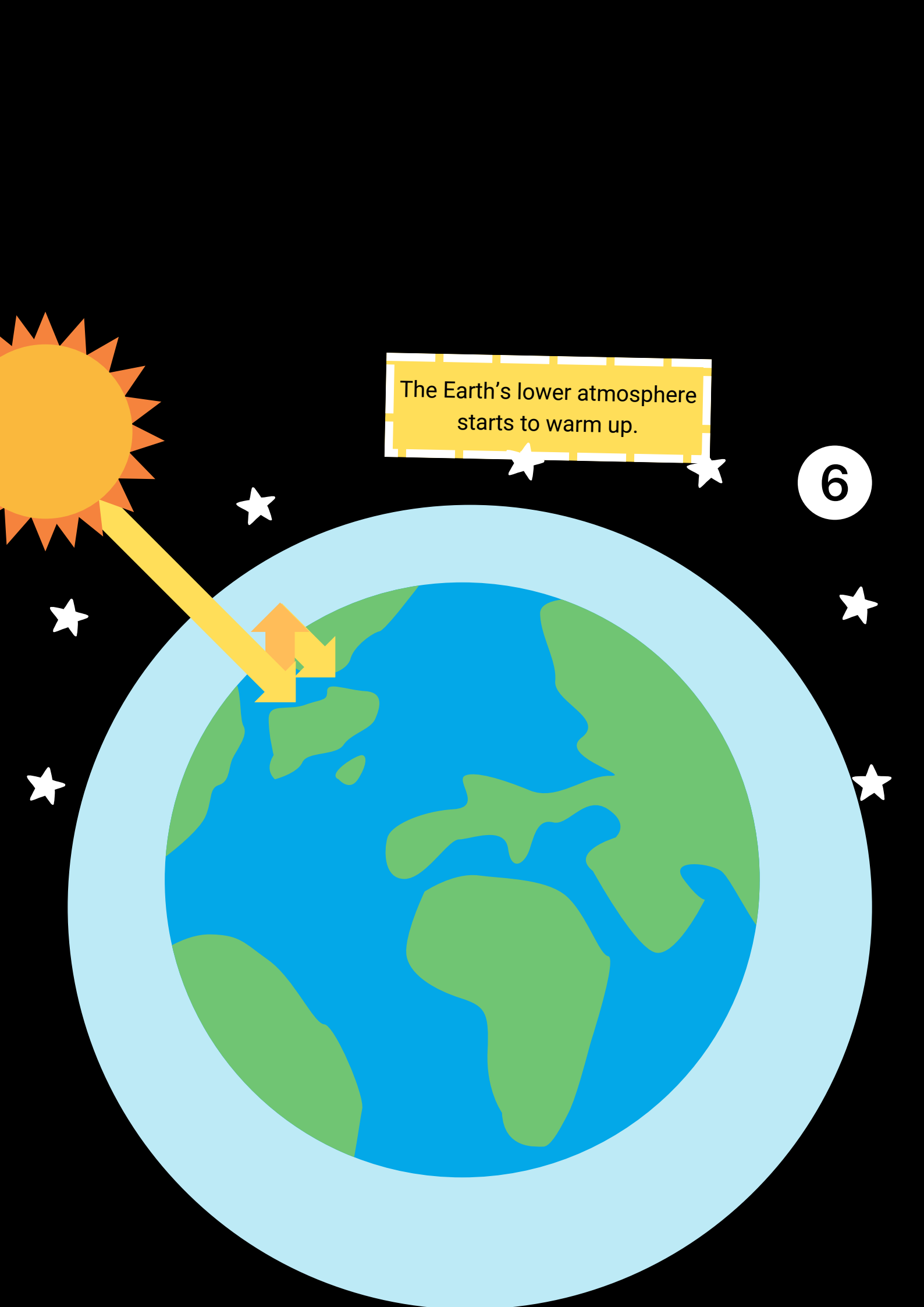

1
Electromagnetic radiation passes through the Earth's atmosphere.


The Earth warms up as it absorbs most of the radiation.
2


Infrared radiation is radiated from the Earth.
3


A portion of the infrared radiation goes into space.
4


5
The greenhouse gases in the atmosphere absorb some of the infrared radiation.


The Earth’s lower atmosphere starts to warm up.
6

A greenhouse is made of glass. The sun shines in through the glass and heats up the greenhouse. It is used for growing plants, flowers and vegetables. Plants growing in a greenhouse grow faster than outside it. Because a greenhouse is made of glass it stays warm on the inside all year round. The air in the greenhouse gets warmer and warmer and cannot escape.

The Sun heats up the Earth's atmosphere. The atmosphere is not made of glass but has greenhouse gases that trap the heat. Examples of greenhouse gases are carbon dioxide, water, methane and nitrate oxide. Too many greenhouse gases can cause the Earth's temperature to increase. This increase in greenhouse gases is causing a change in the living environment of our planet.



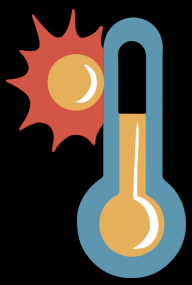
Greenhouse Effect Experiment 1

Mini Greenhouse Experiment



You will need:





- Two clear plastic bottles
- Two Thermometers
- Plastic wrap



- Rubber bands
- Timer or stopwatch
- Sunny place outside or a lamp

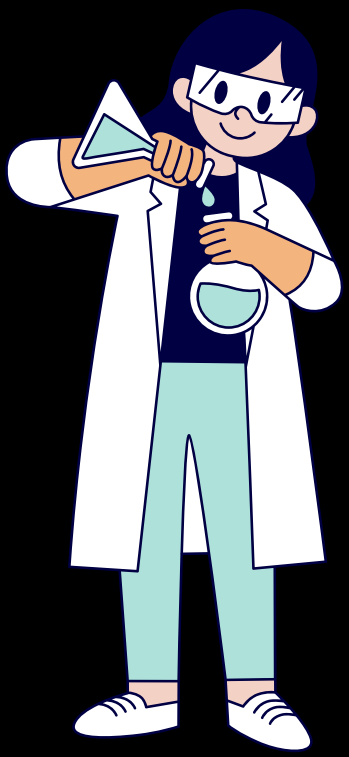




Greenhouse Effect Experiment 1

Steps:

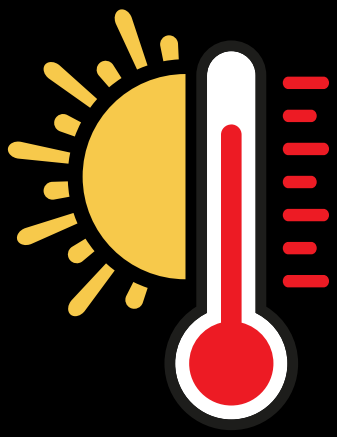
Label the two bottles "A" and "B".
Place a thermometer inside each bottle.
Cover the opening of Bottle B with plastic wrap and secure it with a rubber band.
Leave Bottle A uncovered.
Place both bottles outside in the sun (or under a lamp).



Greenhouse Effect Experiment 1



Conducting the Experiment:



a. Record the temperatures in each bottle before placing them under the lamp or in the sun.
b. Turn on the lamp or place the bottles in the sun and start the timer.
c. Record the temperature in each bottle every 5 minutes for 30 minutes.
d. Write down your observations in the table



👉 Which jar got hotter? Why?

Greenhouse Effect Experiment 2



Melting Ice – Glaciers



You will need:

2 trays, ice cubes, cling wrap, sunlight.



Greenhouse Effect Experiment 2



Steps:

1. Place equal ice cubes in both trays.
2. Cover one tray with cling wrap.
3. Put both trays in the sun.
4. Watch which ice melts faster.

👉 What happened to the ice under the cover?



Greenhouse Effect Experiment 3

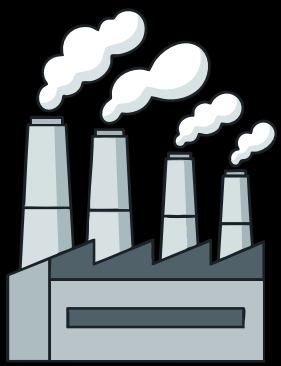
Sorting Game – Greenhouse Gases



Cut out or draw pictures of these: cars, trees, cows, factories, wind turbines, bicycles.

Put them in the right box:

Produces Greenhouse Gases



Helps the Earth



Greenhouse Effect Experiment 4



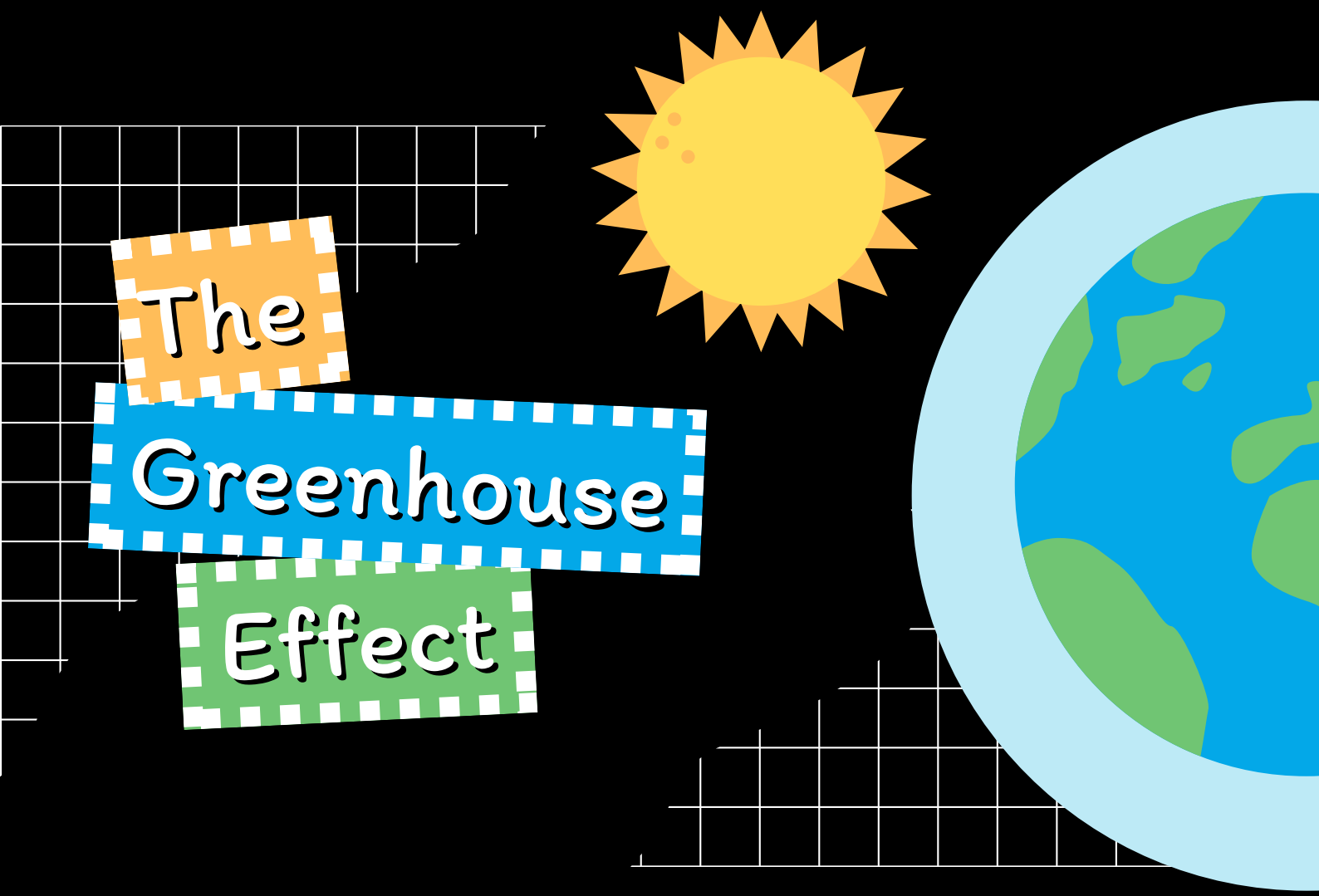
Carbon Footprint Poster

Make a poster!
On one side, draw things that pollute (cars, smoke, rubbish).
On the other side, draw things that help the Earth (trees, bikes, recycling).

👉 Write one promise: What will YOU do to help?



The Greenhouse Effect



Climate Change A-Z Dictionary



A – Adaptation

Adjusting systems (natural or human) to reduce harm from climate change — e.g. planting drought-resistant crops, building flood defences.

B – Biodiversity

The variety of living species (plants, animals, fungi, microbes) in a given ecosystem or on Earth. Healthy biodiversity helps ecosystems resist and recover from climate stress.

C – Carbon Dioxide (CO_2)

A greenhouse gas emitted from burning fossil fuels, deforestation, and respiration. Its accumulation drives global warming.

D – Deforestation

The removal of trees and forests, often for agriculture or development, resulting in loss of carbon sinks and greater CO_2 in the atmosphere.

E – Emissions

Release of greenhouse gases (CO_2, methane, etc.) into the atmosphere from human or natural sources — e.g. power plants, vehicles.

F – Fossil Fuels

Coal, oil, and natural gas formed over millions of years from ancient organisms, used for energy, but emit CO_2 when burned.

G – Greenhouse Gases

Gases in Earth's atmosphere (like CO_2, CH_4, N_2O) that trap heat, causing the greenhouse effect.

H – Heatwave

A prolonged period of excessive heat, often worsened by climate change, causing health risks and environmental stress.

I – Inertia (Climate Inertia)

Delay between emitting greenhouse gases and temperature increase; the climate system takes time to respond.

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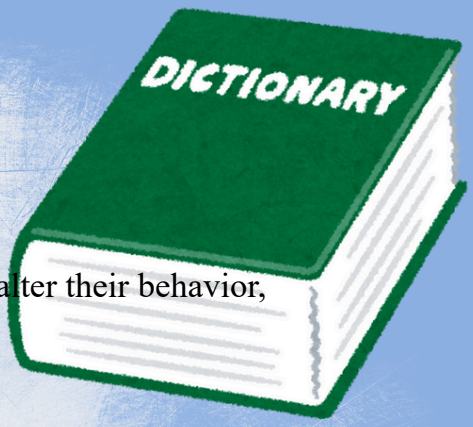

J – Jet Streams

Fast flowing, narrow air currents in the atmosphere. Climate change can alter their behavior, affecting weather patterns.

K – Kyoto Protocol

An international treaty (adopted in 1997) setting binding emission reduction targets for developed countries.

L – Low-Carbon

Practices or technologies that produce minimal greenhouse gas emissions — e.g. renewable energy, efficient buildings.

M–Mitigation

Efforts to reduce or prevent emission of greenhouse gases — e.g. switching to clean energy, reforestation.

N – Net Zero

Balancing emissions produced with emissions removed (via carbon sinks or technologies) to achieve no net addition to atmosphere.

O – Ocean Acidification

Lowering of ocean pH due to increased CO_2 absorption, harming marine life like corals and shellfish.

P – Permafrost

Permanently frozen ground in polar regions; thawing due to warming releases stored methane and CO_2.

Q – Quota (Carbon Quota)

A regulatory limit on emissions for individuals, companies, or countries, used in cap-and-trade systems.

R – Resilience

The ability of ecosystems or societies to adapt to and recover from climate impacts, such as storms or droughts.

S – Sea Level Rise

The increase in the average level of the sea, caused by melting ice and thermal expansion of seawater.

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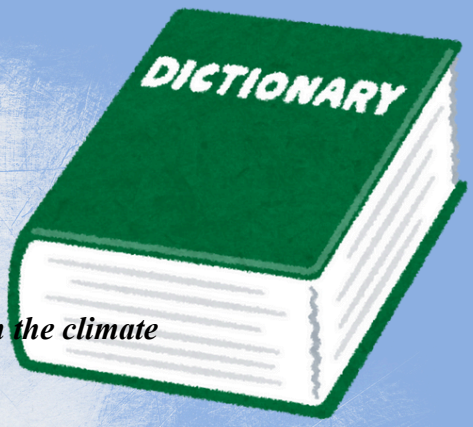

T – Tipping Point

A threshold beyond which a small change can lead to irreversible changes in the climate system, like collapse of ice sheets.

U – Urban Heat Island

Cities that are significantly warmer than surrounding areas due to human infrastructure, less green space, and heat-absorbing surfaces.

V – Vulnerability

The degree to which a system (community, ecosystem) is susceptible to, and unable to cope with, adverse effects of climate change.

W – Weather vs. Climate

Weather refers to short-term atmospheric conditions; Climate is long-term patterns of weather in a region over decades.

X – Xeriscaping

A landscaping method designed for dry climates, using water-efficient plants to reduce water use and stress on ecosystems.

Y–Yield (Agricultural Yield)

Amount of crop produced per unit area. Climate change can reduce yields via heat stress, pests, and droughts.

Z – Zero Emissions

When no greenhouse gases are released into the atmosphere, often a target for future sustainable energy systems.

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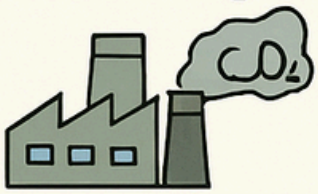

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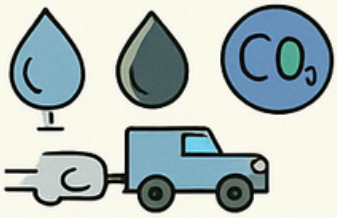

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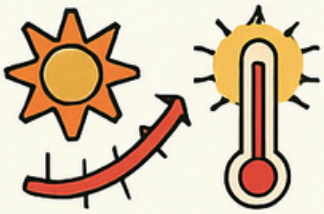

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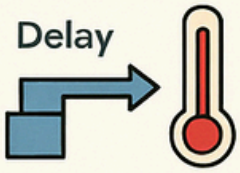

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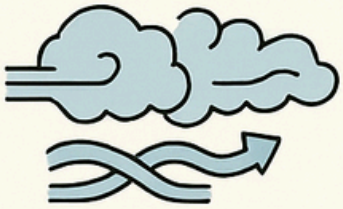

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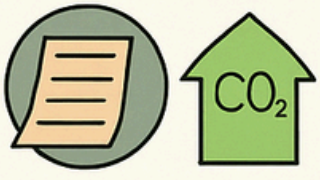

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Climate Change A-Z Dictionary



Mitigation

Efforts to reducer or prevent emission of greenhouse gases



Net Zero

Balancing emissions produced with emissions removed



Ocean Acidification

Lowering of ocean pH due to increased CO_3 absorption



Quota

A regulatory limit on emissions



Resilience

The ability to adapt and recover



Sea Level Rise

The increase in the average level of the sea



Urban Heat Island

Significantly warmer cities due to tur human activities



Tipping Point

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Climate Change

Biodegradable	Something capable of decaying into its basic components.
Biodiesel	A renewable fuel for diesel engines derived from natural oils such as soybean oil.
Biomass	Plant or animal materials used to create energy
Bi product	Excess material produced.
Carbon emissions	Pollution released into the atmosphere from carbon dioxide and carbon monoxide; often produced by motor vehicles.
Carbon footprint	The amount of carbon dioxide produced by your lifestyle.
Carbon offsets	Monetary purchase to counter the amount of carbon emitted into the atmosphere rather than reducing carbon use.
Circular economy	A system dedicated to eliminating waste by reusing, sharing, repairing, and recycling resources.
Climate positive	Exceeding achieving carbon neutrality by removing additional carbon dioxide from the atmosphere; also referred to as carbon negative.
Eco-conscious	The mentality to focus on reducing harm to the environment wherever possible.
Greenwashing	Misrepresenting something as being “green” when it’s not environmentally sound.
Localvore	Someone who consumes only food that has been cultivated locally.
Net-zero	Achieving a balance between emissions produced and emissions removed from the atmosphere; also known as carbon neutrality.

STORIES



Story 1 – "The Four Bins of Friendship"

Characters: Elif (Türkiye), Tomasz (Poland), Sofia (Portugal), and Liene (Latvia)

In an Erasmus+ school garden, four students were puzzled by overflowing waste bins. Each country had its own color system — blue for paper, green for glass, yellow for plastic, and brown for organic waste — but no one seemed to agree.

Elif suggested, "Why don't we make ***one*** recycling guide that combines all our systems?"

They createda "Four Bins of Friendship" poster usingthe colorsfromeachcountry.Tomasz illustrated Polish recycling symbols, Sofia wrote Portuguese slogans ("Reduzir, Reutilizar, Reciclar"), and Liene added drawings of Latvian forests.

At the end of the day, they taught younger students how to sort correctly — and their mixed recycling station became the most popular spot in the school garden.

Moral: Recycling brings people — and countries — together when we speak the same ***green*** language.

Story 2 – "The Bread That Came Back"

Characters: João (Portugal), Duygu (Türkiye), Marek (Poland), and Emīls (Latvia)

One morning, João noticed piles of leftover bread in the school cafeteria. "In Portugal, we turn old bread into ***açorda***, a traditional soup," he said.

Duygu added, "In Türkiye, we never throw bread away — we feed birds or make ***galeta unu*** (bread crumbs)."

Marek suggested collecting food scraps for composting, while Emīls designed a small "Food Waste to Soil" corner in the garden.

By the end of the week, every school meal's leftovers were sorted: bread to crumbs, vegetables to compost, and packaging to recycling bins. They even used the compost for their new lettuce bed.

Moral: Food waste can be turned into nourishment again — for the soil, for animals, and for new friendships.

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Story 3 – "The Puzzle of Plastic"

Characters:
Marta (Poland), İpek (Türkiye), Rodrigo (Portugal), and Lauma (Latvia)

During a beach clean-up project, the group discovered hundreds of plastic bottle caps scattered along the sand. They collected them all, cleaned them, and wondered what to do next.

"I know!" said Lauma. "Let's make a world map from bottle caps — each color a different continent."
For three days, they sorted, arranged, and glued caps on recycled cardboard. When it was finished, their map sparkled with colors — a symbol of global unity against pollution.

Story 4 – "Recycling Symphony"

Characters:
Ali (Türkiye), Anete (Latvia), Katarzyna (Poland), and Miguel (Portugal)

Each country's students brought recyclable materials to music class: plastic bottles, tin cans, paper rolls, and glass jars.
Ali built a drum from a paint can. Miguel filled glass jars with different water levels to make a bottle xylophone. Katarzyna used paper rolls for flutes, and Anete made shakers with rice and seeds.

Together they composed a ***Recycling Symphony*** — a song about nature, teamwork, and renewal. They performed it at the school assembly, wearing green T-shirts that read ***"Listen to the Earth."***

Moral: Even waste can make music when hearts and hands from different cultures work in harmony.

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Expected Outcomes

For Students

Demonstrate a clear understanding of what a carbon footprint is and how it affects global warming.

Accurately calculate and interpret personal and collective emission results.

Develop action-oriented thinking through To-Do Lists and creative communication materials.

Build environmental vocabulary and digital literacy while preparing posters or digital infographics.

Show increased motivation to implement eco-friendly habits both at home and at school.

For Teachers

Gain a set of reusable, curriculum-aligned materials (games, puzzles, activities) to teach sustainability topics in engaging ways.

Strengthen capacity to integrate environmental education into different subjects STEM, language learning, social studies).

Fostera school-wide sustainability culture by encouraging collaboration between teachers, students, and parents.

For the School Community

Foster a school-wide between reduced waste and energy consumption through conscious collective actions.

Visible culture of sustainability through eco-displays and awareness campaigns.

Enhanced sense of belonging and responsibility among students as active “eco-ambassadors.”

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FAQs about environmental activities for students

Q1: Why are environmental activities important for students?

✅ They teach children about ecosystems, pollution, and climate change. Hands-on tasks improve problem-solving, responsibility, and teamwork. By practicing activities like tree planting or recycling, students develop real-world environmental skills. ***(Source: UNICEF Climate Action for Kids, 2024)***

Q2: What simple environmental activities can students try?

✅ Fun ideas include drawing about pollution, planting trees, nature walks, recycling, energy-saving habits, and eco-friendly contests. Teachers can adapt activities by age group, classroom size, and local environment to maximize engagement.

Q3: How do environmental activities help students learn science practically?

✅ Students apply concepts like renewable energy, biodiversity, and pollution control through hands-on projects. This improves retention, critical thinking, and curiosity. Example: building a solar oven or tracking classroom energy use. ***(Source: NASA Climate Kids, 2024)***

Q4: How can teachers make environmental learning exciting?

✅ Use games, contests, outdoor activities, and start "Green Clubs." Integrate worksheets, journals, or classroom tracking charts for measurable outcomes. Linking activities to local environmental events (e.g., World Environment Day) increases relevance.

Q5: How can parents support environmental learning at home?

✅ Encourage kids to turn off lights, reuse items, recycle, read eco-books, or watch nature videos together. Use simple charts to track progress and reward participation.

Q6: How do environmental activities align with SDG 13 (Climate Action)?

✅ Many activities help students understand climate change and take action, supporting SDG 13 targets like reducing carbon footprints, promoting renewable energy, and building climate awareness from a young age. Example: tree planting and energy-saving challenges contribute to carbon reduction efforts.

Q7: What government or NGO programs support school sustainability projects?

✅ Programs such as ***MOEFCC's Green Schools Challenge***, ***UNICEF Climate Action for Kids***, ***Swachh Vidyalaya Abhiyan***, and local NGO initiatives provide resources, training, and grants for schools to implement sustainability activities.

Q8: Where can I find more resources?

✅ Check out UNICEF Climate Action for Kids, EPA Environmental Education Resources, NASA Climate Kids, and UNESCO environmental programs for global classroom activities.

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