

SOLVE THE MYSTERY OF WHAT HAPPENED TO PLANET EARTH



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INSTRUCTIONS FOR THE GAME

What is included in the toolbox?

- Instructions sheet
- Directions sheet
- Materials checklist
- Scenario sheet
- 6 puzzles
- 6 answer keys
- 6 explanation sheets (hints)
- Game visuals
- Reward certificate
- Debriefing material
- Tips to include youngsters with SLDs

Learning objectives

- Discover the impact of human activity on the climate crisis
- Learn about the alarming scenarios for the future and what kind of damage could happen to the environment

Trained skills

- Teamwork
- Time management
- Problem-solving
- Scientific method



INSTRUCTIONS FOR THE GAME

Puzzle types



Manipulation-type
puzzles



Observation-type
puzzles



Decoding-type
puzzles



Logic-type
puzzles

Level of difficulty

Intermediate



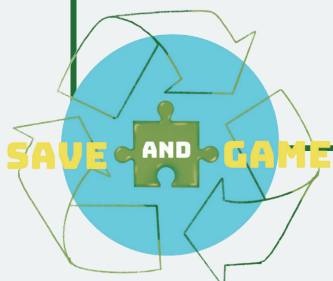
Duration of the game

1 hour



Number of players

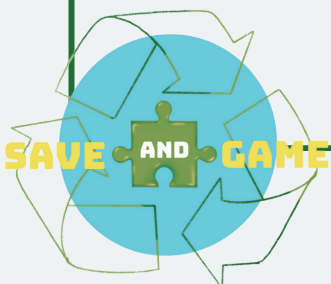
3 to 4



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DIRECTIONS FOR THE GAME MASTER

1. Print the content of the toolbox.
2. Prepare the material with the help of the checklist.
Check that everything is functional.
3. Welcome the players, explain the general rules, and let them read the introduction of the game.
4. Follow the progression of the players throughout the game flow and provide them with hints when they are stuck on a puzzle.
5. After the game, organise a debriefing session with the players. Ask them what their feelings are about the game and the learning objectives. Check what they wrote in their report and discuss it.
6. Do not forget to hand out the reward certificates to the players before they are leaving.



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MATERIALS CHECKLIST

Computer (laptop/desktop) Functional

Mouse Functional

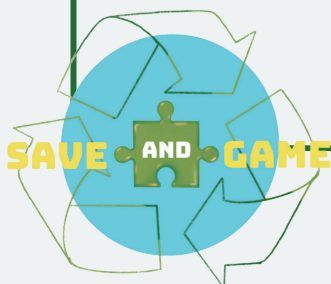
Keyboard Functional

Blank report template 2100

Report 2023

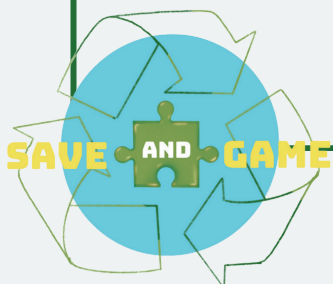
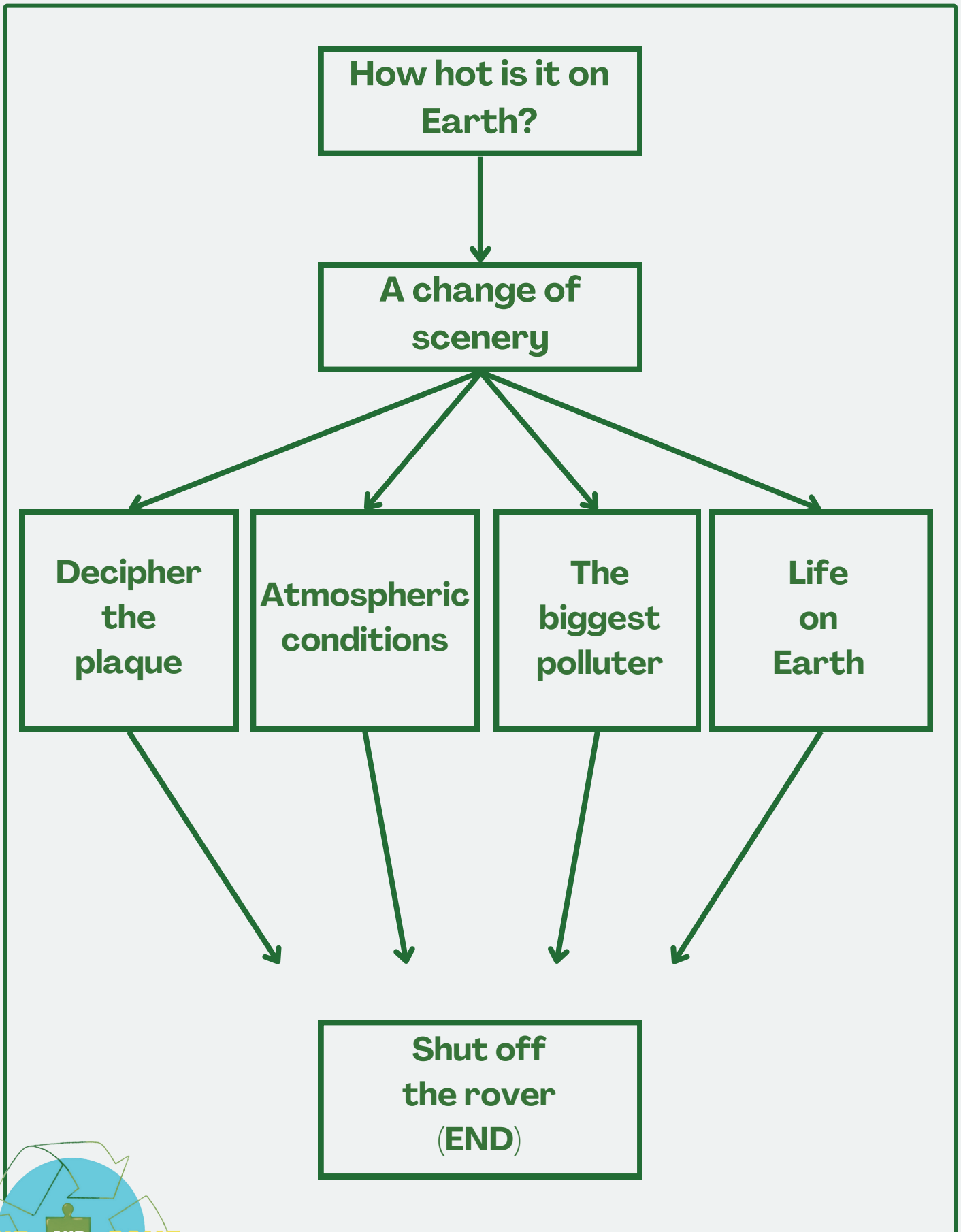
Print as many copies as you need, either one
for the group or one for each player.

Pens Functional



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GAME PROGRESSION



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SOLVE THE MYSTERY OF WHAT HAPPENED TO PLANET EARTH

Background story

The year is 2100. You are a group of intergalactic explorers who have been charged with the mission to explore every planet in the Solar System and make a report about each one. Exploring Mercury and Venus took longer than expected. It's now the Earth's turn but you are on a tight schedule...

You have access to a previous report on planet Earth from 2023. You heard rumours that the Earth is now very different from what it used to be...

In order to collect data, you are sending a rover which, thanks to its advanced technology, is able to communicate with you and livestream its journey in real-time.

Unfortunately, your rover has malfunctioned upon landing and is at risk of shutting down soon...

The Mission

Make sure to gather as much data as possible before your rover stops functioning so that you can compile your report on planet Earth. Determine if any significant changes have occurred since 2023.

Your supervisors are waiting for your report as soon as possible... Do not make them wait...



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PUZZLE N°1

How hot is it on Earth?



It seems that the rover is recording an abnormally high temperature.

According to the previous report from 2023, the highest temperature recorded in this specific region during summer was 40°C. However, your rover is recording a temperature of 45°C.

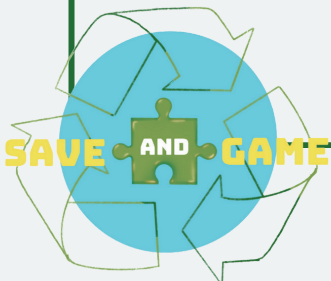
Could the rover's thermal sensors be broken due to the impact? Or has the surface temperature on Earth significantly increased?

After a quick check, the thermal sensors are doing fine, so it seems that this second hypothesis is confirmed...

Match the increase in average surface temperature with the correct places.

Puzzle type: Logic-type puzzle 

Estimated resolution time: 10 minutes

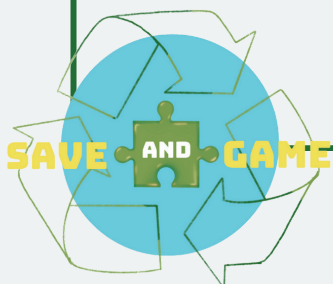
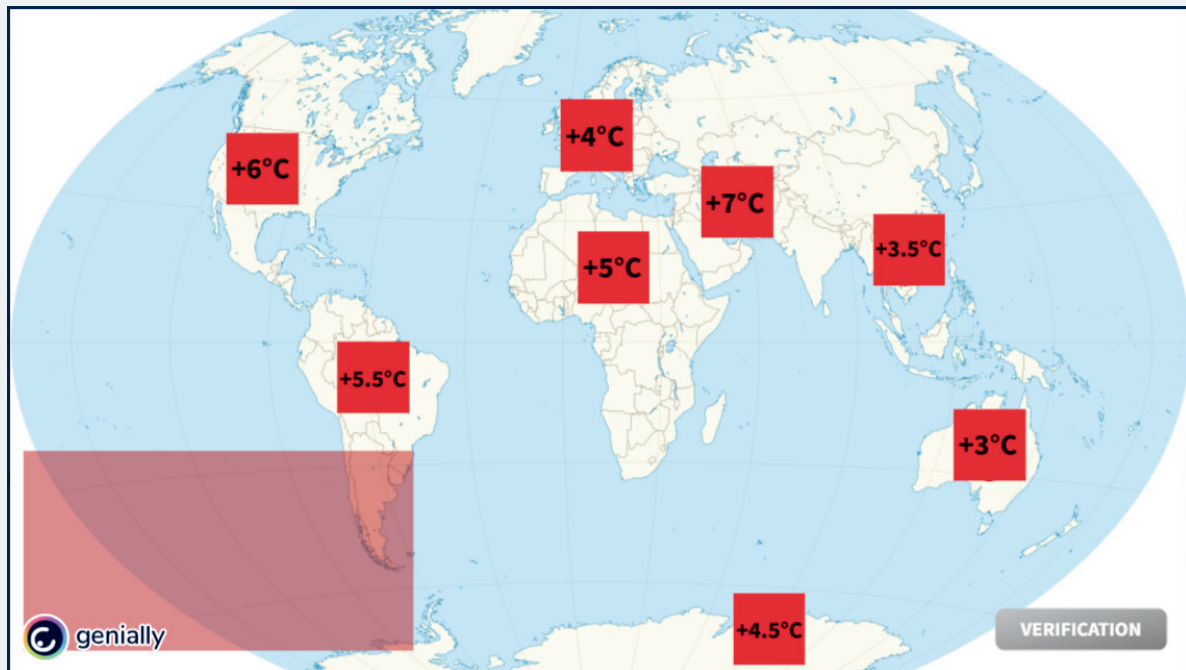


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PUZZLE N°1

How hot is it on Earth? - Solution

- North America = $+6^{\circ}\text{C}$
- Europe = $+4^{\circ}\text{C}$
- North Africa = $+5^{\circ}\text{C}$
- Antarctica = $+4.5^{\circ}\text{C}$
- Oceania = $+3^{\circ}\text{C}$
- Middle East = $+7^{\circ}\text{C}$
- South East Asia = $+3.5^{\circ}\text{C}$
- South America = $+5.5^{\circ}\text{C}$



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PUZZLE N°1

How hot is it on Earth? - Hints

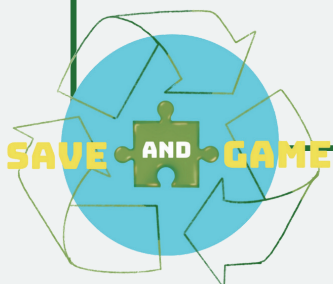
Hint:

Large areas of land tend to warm more and faster than areas that are closer to the water.

Given to the players

YES

NO



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PUZZLE N°2

A change of scenery



You managed to stabilise the rover's camera, and now you are able to take a full look at the surroundings.

This place looks strangely familiar... By comparing the geographical coordinates, you quickly notice that the same exact place was explored during the previous exploration, as you find a picture of it in the previous report from 2023.

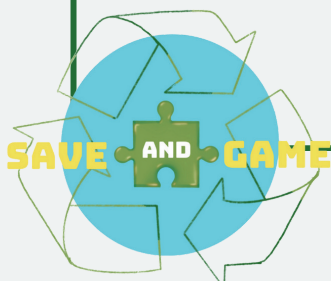
However, it seems that many changes have happened in the last 77 years...

Take note of what you see in your report.

Go to the next page and find the seven differences between the two pictures

Puzzle type: Observation-type puzzle 🔍

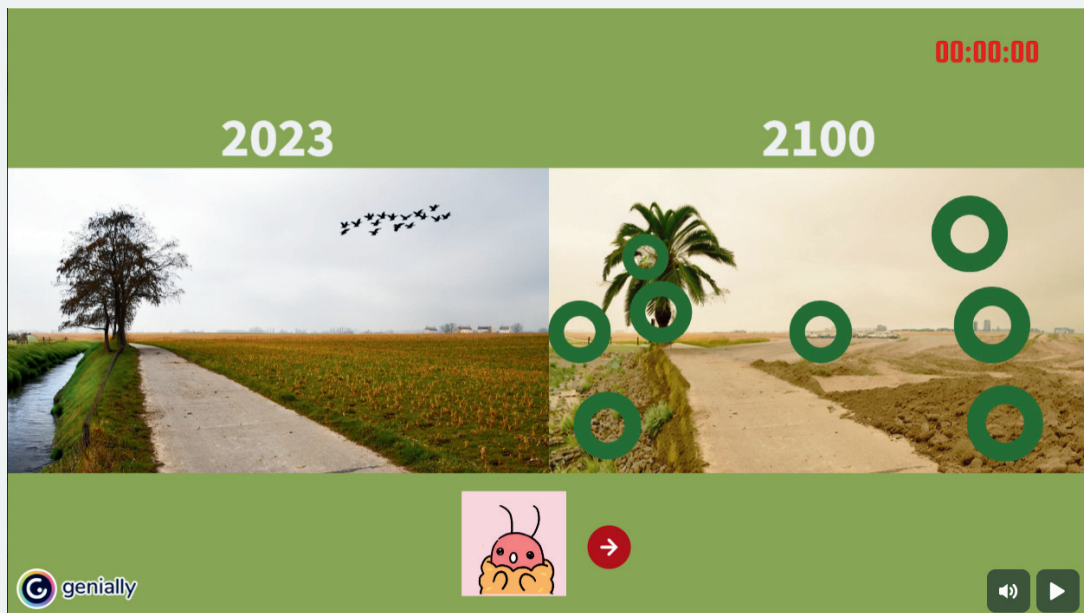
Estimated resolution time: 5 minutes



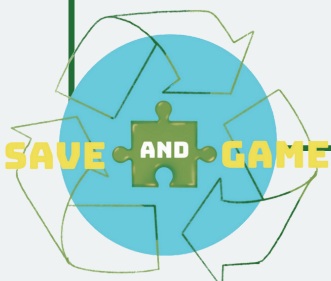
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PUZZLE N°2

A change of scenery - Solution



- The river has dried out.
- A palm tree has replaced the old tree.
- The birds have disappeared.
- A parrot is sitting in the palm tree.
- The cows have disappeared.
- The houses have disappeared and now we see some tall buildings in the distance.
- The field is not cultivated any more.
- Some part of the field has become a parking lot.



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PUZZLE N°2

A change of scenery - Hints

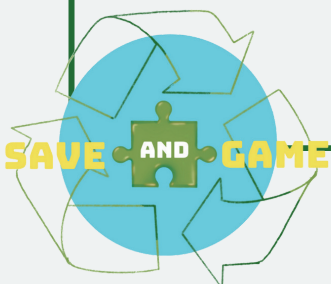
Hint:

Notice what elements have disappeared, but also which ones have appeared.

Given to the players

YES

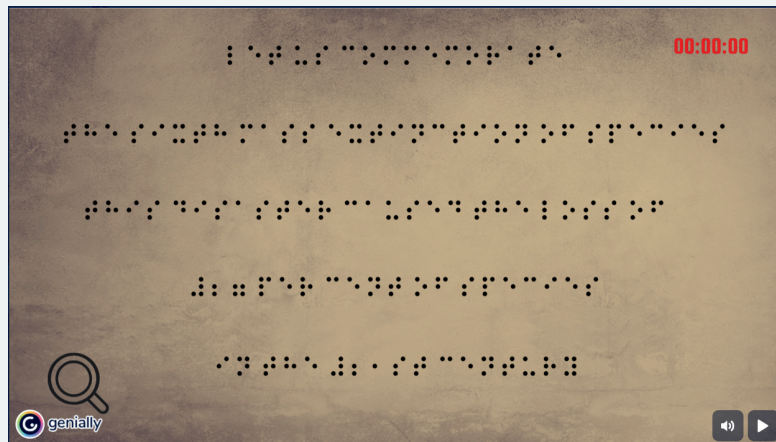
NO



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PUZZLE N°3

Decipher the plaque



You decided to send your rover to investigate what that shiny thing in the distance was.

It's a plaque. The top half is covered with dirt, so you cannot read what it says, but it also features some weird code with dots on it on the bottom half.

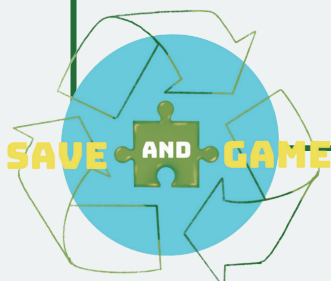
What kind of alphabet is this, and what is the meaning of this inscription? It might reveal something useful for your report...

Decipher the message.

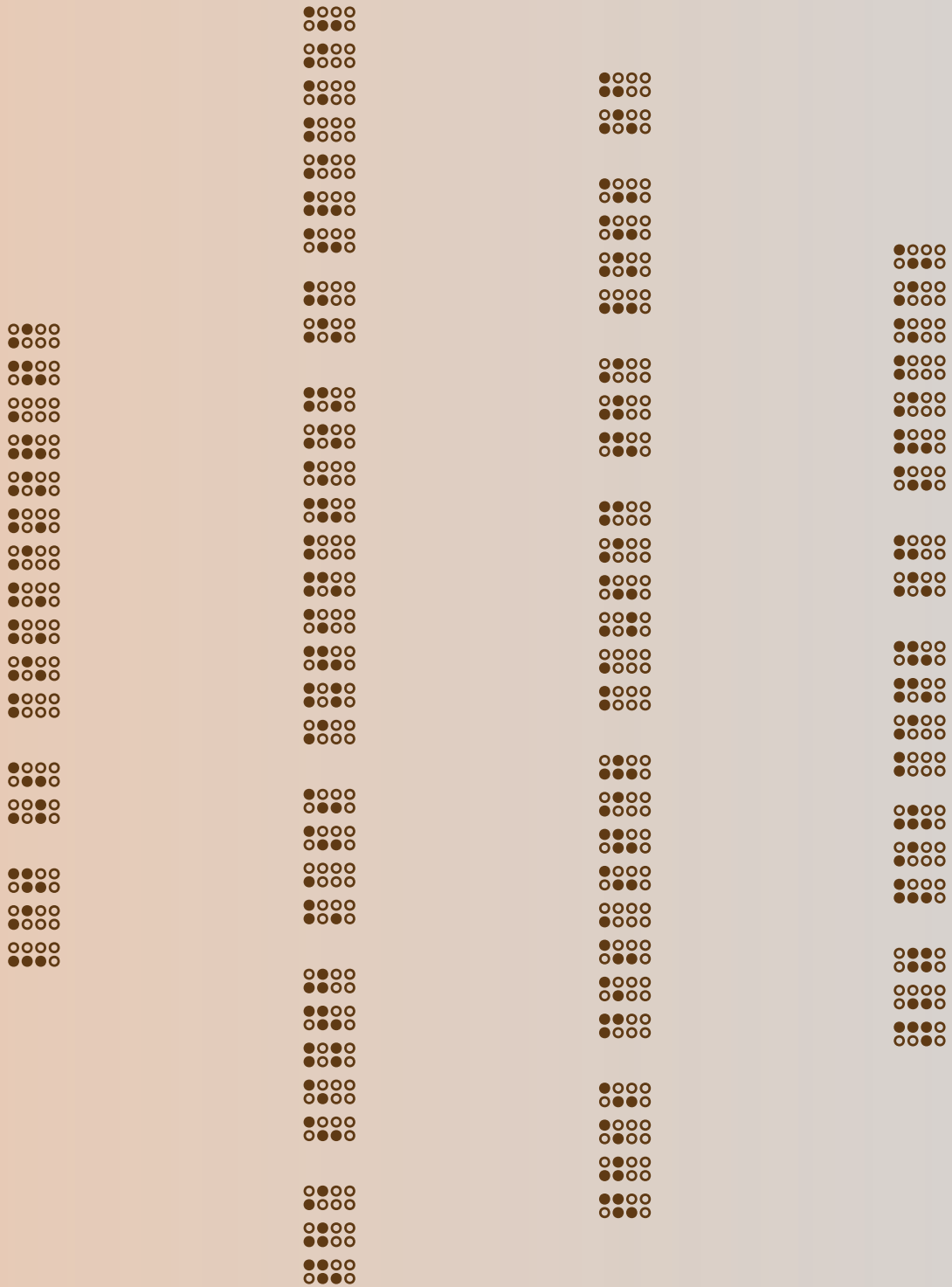
Puzzle type: Decoding-type puzzle



Estimated resolution time: 10 minutes



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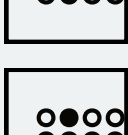
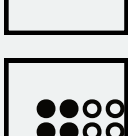
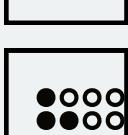
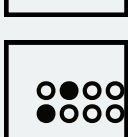
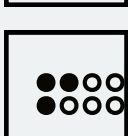
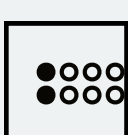
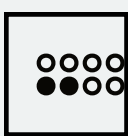
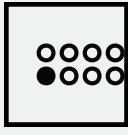
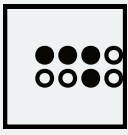
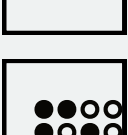
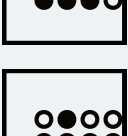
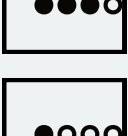
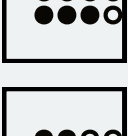
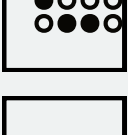
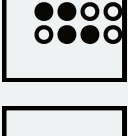
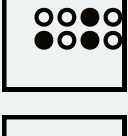
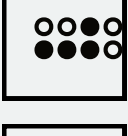
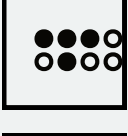
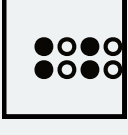
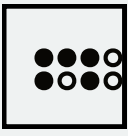
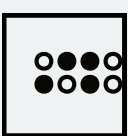
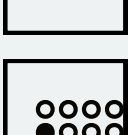
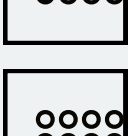
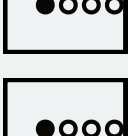
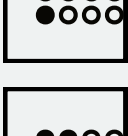
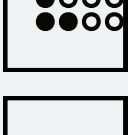
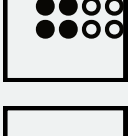
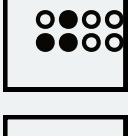
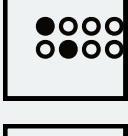
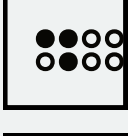
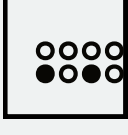
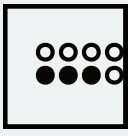
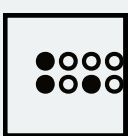


A B C D E F G H I J K L M

N O P Q R S T U V W X Y Z

Number indicator

1 2 3 4 5 6 7 8 9



PUZZLE N°3

Decipher the plaque - Solution

The plaque says:

"Let us commemorate the sixth mass extinction of species. This disaster caused the loss of 27 per cent of species in the 21st century."

The last part of the sentence "in the 21st century" is already given because it can be read on the picture of the plaque.

Do not hesitate to encourage the players to divide the work.

Type the deciphered sentences here 00:00:00

let us commemorate

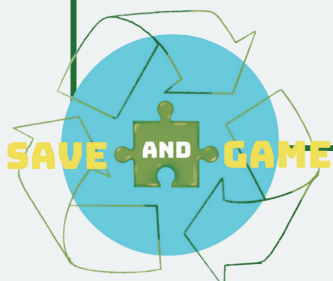
the sixth mass extinction of species

this disaster caused the loss of

27 per cent of species

in the 21st century

genially 🔊 ▶



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PUZZLE N°3

Decipher the plaque - Hints

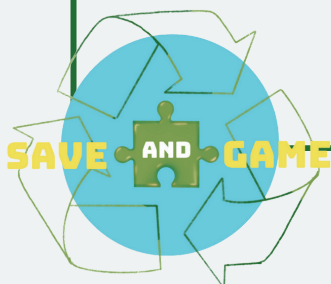
Hint:

Try matching all the letters to the corresponding Braille letters first, then find the meaning.

Given to the players

YES

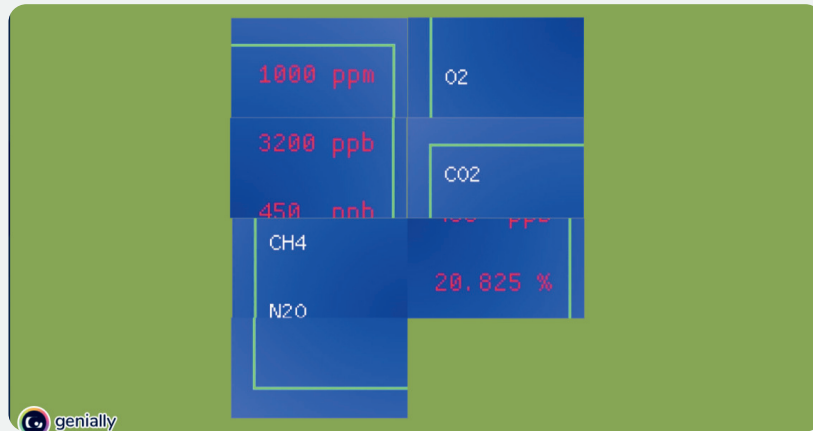
NO



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PUZZLE N°4

Atmospheric conditions



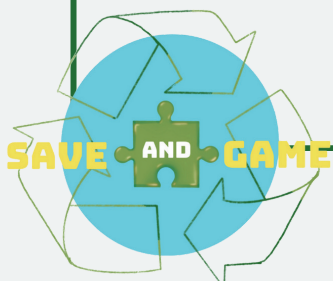
There is a heavy layer of smog in the air. You cannot see very far as it is very dense. You decide to use the air quality detector of the rover to determine what the exact atmospheric conditions are. The detector is not working very well, and you have to fix it.

The screen is all scrambled. Solve the puzzle.

Then take note in your report.

Puzzle type: Manipulation-type puzzle 

Estimated resolution time: 10 minutes

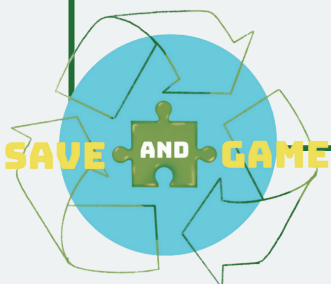


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PUZZLE N°4

Atmospheric conditions - Solution

CO ₂	1000 ppm
CH ₄	3200 ppb
N ₂ O	450 ppb
O ₂	20.825 %



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PUZZLE N°4

Atmospheric conditions - Hints

Hint n°1:

The secret to solve this puzzle is to proceed from the top to the bottom.

Given to the players

YES

NO

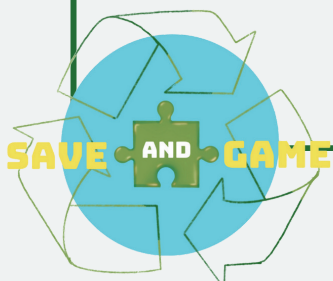
Hint n°2:

Move the pieces clockwise.

Given to the players

YES

NO



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PUZZLE N°5

The biggest polluter



Read the clues and match the correct industries with the correct data **00:00:00**

INDUSTRY	FASHION	AIRLINE	FOOD	ELECTRONICS	10%	25%
PERCENTAGE OF GLOBAL CARBON EMISSIONS					4%	3%
AMOUNT OF WASTE GENERATED EACH YEAR					6.7 million tons	50 million tons
MAIN DANGER TO THE ENVIRONMENT					1.6 billion tons	92 million tons
					Deforestation	Toxic waste
					Water and soil pollution	Air pollution

genially VERIFICATION

Now rank the four industries from least to most polluting **00:00:00**

FASHION FOOD AIRLINE ELECTRONICS

genially VERIFICATION

Your rover came across what is known on Earth as a "landfill". It is a place where humans dispose of their waste.

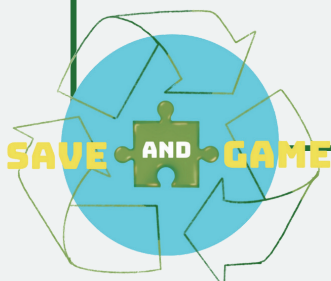
You read in the 2023 report that waste management was already a topic of concern, and it seems that the situation hasn't changed.

You start wondering how bad human activity impacted the planet and decide to do some research...

Find out more about some of the most polluting industries.

Puzzle type: Logic-type puzzle 

Estimated resolution time: 10 minutes



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PUZZLE N°5

The biggest polluter - Solution

Read the clues and match the correct industries with the correct data



HH:MM:SS

INDUSTRY	FASHION	AIRLINE	FOOD	ELECTRONICS
PERCENTAGE OF GLOBAL CARBON EMISSIONS	10 %	3%	26 %	4 %
AMOUNT OF WASTE GENERATED EACH YEAR	92 million tons	6.7 million tons	1.6 billion tons	50 million tons
MAIN DANGER TO THE ENVIRONMENT	Water and soil pollution	Air pollution	Deforestation	Toxic waste



VERIFICATION

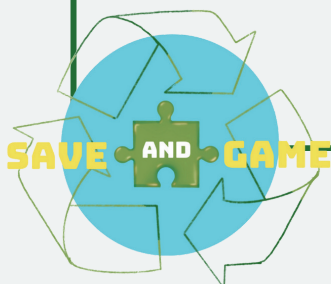


Now rank the four industries from least to most polluting

HH:MM:SS



VERIFICATION



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PUZZLE N°5

The biggest polluter - Hints

Hint n°1:

Proceed line by line. Place the industries first.

Given to the players

YES

NO

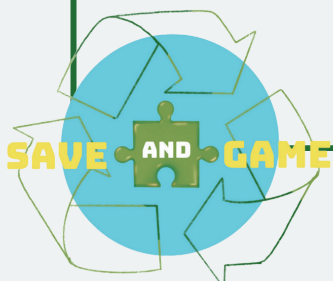
Hint n°2:

Compare the percentage of carbon emissions and the amount of waste produced to determine who are the biggest and smallest polluters.

Given to the players

YES

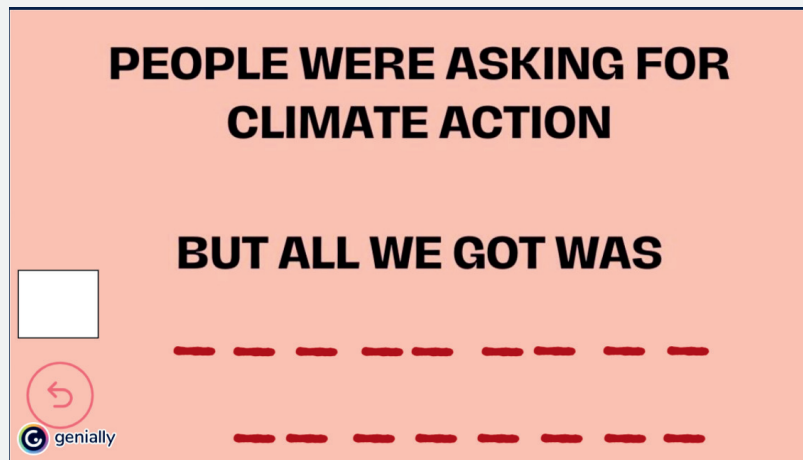
NO



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PUZZLE N°6

Life on Earth



As you can see, humans have been facing many problems in the last 77 years... They do not seem too happy about their living conditions at the moment.

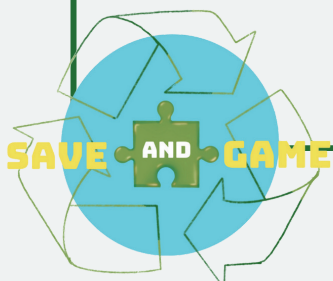
This poster here is blaming the main source of all the Earth's past and current problems. It is your chance to finally understand what caused this planet to change so drastically in the span of a few decades.

However, you will have to guess the correct words before the clue is revealed to you...

Good luck!

Puzzle type: Logic-type puzzle 

Estimated resolution time: 5 minutes



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PUZZLE N°6

Life on Earth - Solution

00:00:00

**PEOPLE WERE ASKING FOR
CLIMATE ACTION**



BUT ALL WE GOT WAS

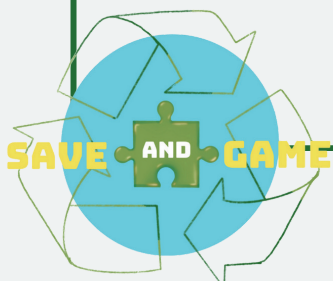
N

P O L I T I C A L

I N A C T I O N



genially



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PUZZLE N°6

Life on Earth - Hints

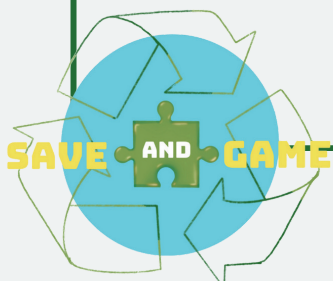
Hint:

Start by guessing the vowels.

Given to the players

YES

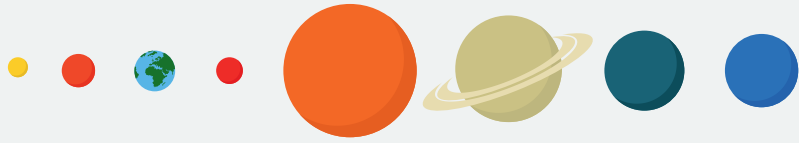
NO



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REPORT 2100

Planet explored:



Observations:

Surface temperature:

Atmospheric conditions:

Land and water:

Life:

REPORT 2100

Hypotheses about life conditions:

Conclusions:

REPORT 2023

Planet explored:



Observations:

Surface temperature:

The Earth is in its hottest period in 100.000 years.

Surface temperatures are increasing everywhere on the planet, and some regions like Europe, North America and Asia experience major heatwaves.

Atmospheric conditions:

CO2 concentration: 418 parts per million (ppm)

CH4 concentration: 1900 parts per billion (ppb)

N2O concentration: 335 parts per billion (ppb)

O2 percentage: 20,95 %

Land and water:

Severe droughts have been affecting several parts of the Earth, while other parts experience extreme floods. This is putting pressure on soil (crops) and water streams.

Life:

Of the estimated 8.7 million animal and plant species on Earth, around 1 million is threatened with extinction. Humans are facing various crises and tensions. Many of them are worried about the global state of their planet.

REPORT 2023

Hypotheses about life conditions:

The Earth's climate appears to be changing, with temperatures getting increasingly warmer. This phenomenon seems to cause certain extreme weather events, such as droughts and floods, which are impacting the environment. These new climate patterns might also explain why so many animal and plant species are now at risk of extinction and why human life seems to have become rather unstable.

Conclusions:

Life conditions on Earth are getting more and more uncertain. The global warming of the atmosphere and all its consequences might alter life on Earth as we know it.

However, humans are an intelligent life form and will surely find a solution to preserve their planet and its biodiversity, to guarantee the survival of their species.

REPORT 2023

Annex



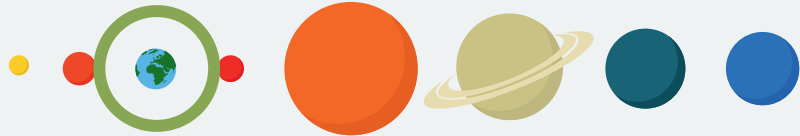
Picture taken at 50°12'50"N 4°52'32"E

07/08/2023

REPORT 2100

expected answers

Planet explored:



Observations:

Surface temperature:

Temperatures have significantly increased everywhere on Earth.

The biggest increased happened in the Middle East (+7°C) and the smallest increased happened in Oceania (+3°C). Europe is facing a +4°C increase.

Atmospheric conditions:

CO2 concentration: 1000

parts per million (ppm)

CH4 concentration: 3200

parts per billion (ppb)

N2O concentration: 450 parts

per billion (ppb)

O2 percentage: 20,825 %

Land and water:

In the explored area, the small river has completely dried out.

The soil has also become dry and is not cultivated any more. Some parts of what used to be a crop are now covered in concrete.

Life:

27% of animal and plant species have gone extinct during the sixth mass extinction of species.

Humans are facing many crises at the same time: food crisis, housing crisis, environmental crisis. There is some civil unrest.

REPORT 2100

expected answers

Hypotheses about life conditions:

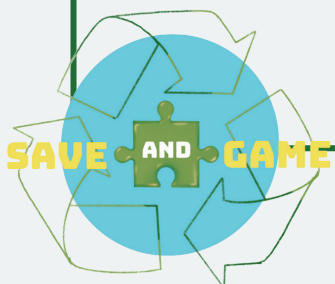
Temperatures have continued increasing since the last report, which might have intensified the drought periods, leading to the disappearance of certain smaller water streams. The atmosphere also contains more greenhouse gases than precedently. These seem to mainly come from human activities (big industries). All those elements visibly led to a massive biodiversity loss and harsher living conditions for humans.

Conclusions:

Life conditions on Earth have become more than uncertain since our last report in 2023. Humans did not find a solution to the global warming of their planet's atmosphere and now the Earth is almost unrecognisable. Human activity, through industries, contributed to this alteration of the environment. But it seems that another major cause is political inaction. Humans, through their representants, deliberately chose not to find a solution.

TIPS for debriefing the game

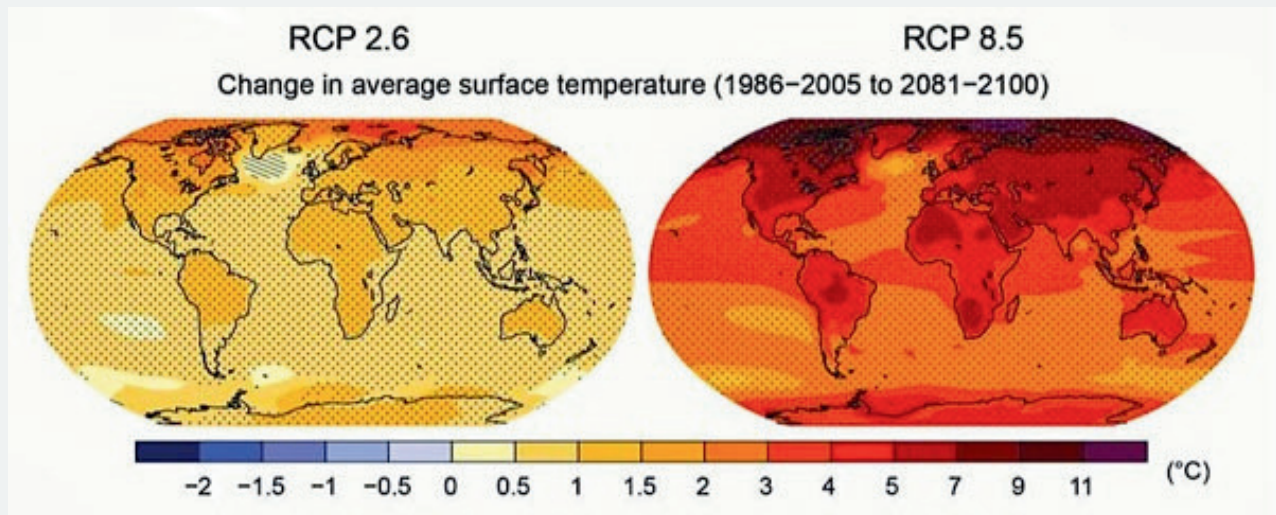
- Ask the group how they are feeling after completing the game. Take a few minutes to discuss the outcome of the game and evaluate together the level of cooperation and teamwork effort.
- Individually ask each player what they believe went well for them, and what did not.
- Discuss the learning outcome of each enigma and assess what knowledge the players have gained from them.
 - This Escape Game is inspired by the Intergovernmental Panel on Climate Change's (IPCC) scenario RCP 8.5, which presents the worst-case scenario of what could happen if we do not regulate our greenhouse gases emissions. Remind the players that it is considered an unlikely scenario.
- Summarise what has been said before letting the players go.



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PUZZLE N°1 - Debriefing

This puzzle displays the projected local increases in surface temperatures by the year 2100, based on the IPCC's RCP 8.5 scenario. According to this scenario, the average temperature of the world could increase by up to 4.8°C.



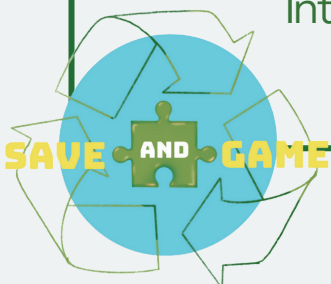
Source: <https://climat.be/changements-climatiques/changements-observees/rechauffement-planetaire>

The projection on the left, however, is based on the RCP 2.6 scenario and presents a global increase of less than 2°C, which is what we can achieve if we manage to stop carbon emissions by 2100.

The IPCC's latest estimate is a global rise of 3.2°C if the current policies stay implemented and carbon neutrality is not achieved by 2100.

Ask the players if they were surprised by some of the numbers. Did they expect higher or lower increases?

Interesting tool to use: the [IPCC WGI Interactive Atlas](#)



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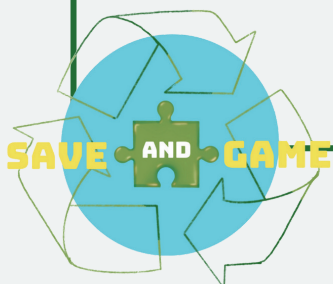
PUZZLE N°2 - Debriefing

This puzzle provides a representation of some of the changes that might occur in the environment by 2100 if greenhouse gas emissions are not reduced and carbon neutrality is not achieved.

Experts predict that numerous regions will face aridity and water scarcity, here evidenced by the dried river and uncultivated land. Uncultivated land is also a sign of decline in soil quality. Additionally, the continued emission of high levels of carbon dioxide suggests that human activity will continue to expand, as seen in the increased use of concrete in the picture. Finally, a warmer climate means that species characteristic of warmer regions might acclimate in our regions. In the picture, we can observe this change through the apparition of a palm tree and the presence of a parrot, although the geographical coordinates place this landscape in Belgium.

Discuss with the players if they think this is an accurate depiction of what Western Europe might look like in 2100.

You can also ask them if they have already noticed some changes in their local environment.



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PUZZLE N°3 - Debriefing

The goal of this puzzle is to discuss the topic of mass extinction of species.

We talk about "mass extinction" when a significant percentage of living species go extinct across a wide geographic area within a short period of geologic time (thousands of years). Many factors can cause a mass extinction.

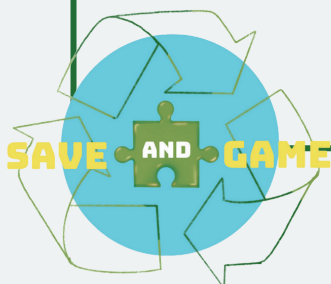
A large number of scientists believe that the sixth mass extinction of species has begun. It is a consequence of human activity, through our unsustainable use of land, our unsustainable use of water, and our unsustainable ways of living that are resulting in climate change.

The current species extinction rate is between 1,000 and 10,000 higher than the natural extinction rate. ([WWF](#))

Estimations announce that we could lose 27% of all species by 2100 if we do not fix the climate crisis.

Discuss with the players if they know some species that are currently threatened with extinction.

Invite them to have a look at the [IUCN Red List of Threatened Species](#).



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PUZZLE N^o4 - Debriefing

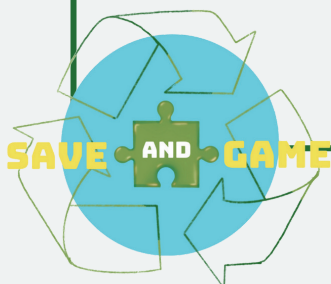
The data presented in this puzzle is also a projection based on a scenario in which carbon neutrality is not achieved.

This scenario, called A1FI, assumes that humanity pursues personal wealth rather than environmental quality, which results in an increase of CO₂, CH₄ and NO₂ concentrations in the atmosphere. This would obviously accentuate the global warming of the atmosphere.

In the long run, the percentage of oxygen in the atmosphere would also be affected by the increase in greenhouse gas concentration.

Discuss with the players if they know what are the main sources of CO₂, CH₄ and N₂O emissions.

It is also interesting to develop the concept of carbon neutrality and how we can achieve it as a society.

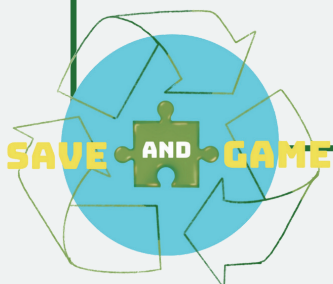


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PUZZLE N°5 - Debriefing

This puzzle is focused on human activity, which is the main cause of greenhouse gas emissions and, consequently, the main responsible of the climate crisis.

It is interesting to discuss with the players how they would have ranked those industries without the available data. Would they have found the right order straight away?



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PUZZLE N°6 - Debriefing

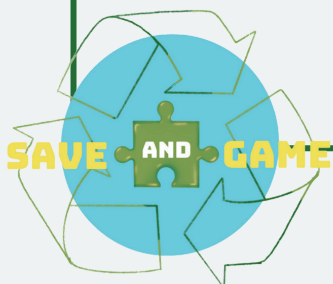
The goal of this puzzle is to remind the players that not only are humans responsible for the climate crisis, but they are also the ones able to find a solution.

Many citizens are convinced that politicians and policymakers do not understand the urgency of the situation and that stronger measures should be taken in order to reduce our carbon emissions.

That's why the IPCC's scenarios exist: to show policymakers the possible consequences of their actions (or lack thereof).

Discuss with the players if they know about the measures taken by their local authorities and by the European Union in order to reduce the future impacts of climate change.

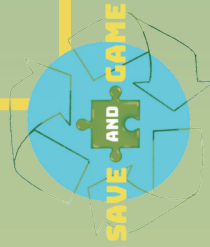
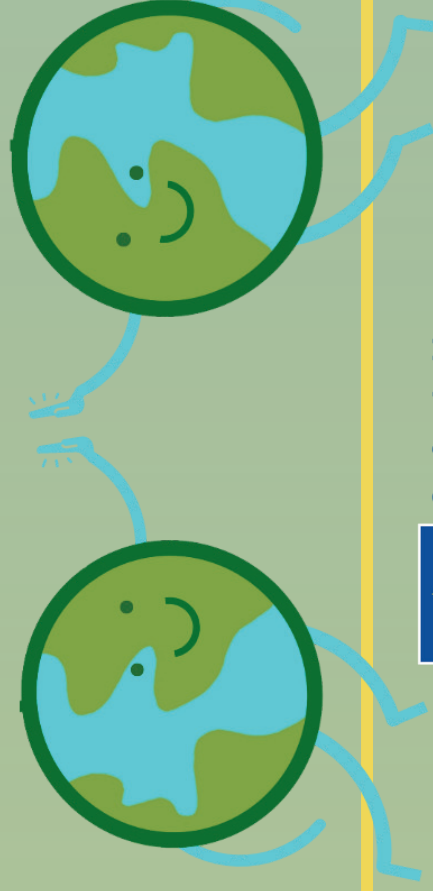
Mention the European Green Deal and ask the players' opinion.



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REWARD CERTIFICATE

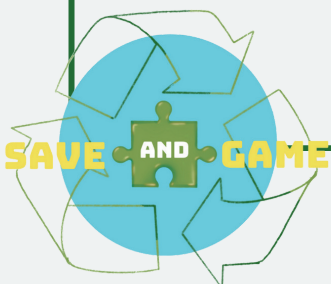
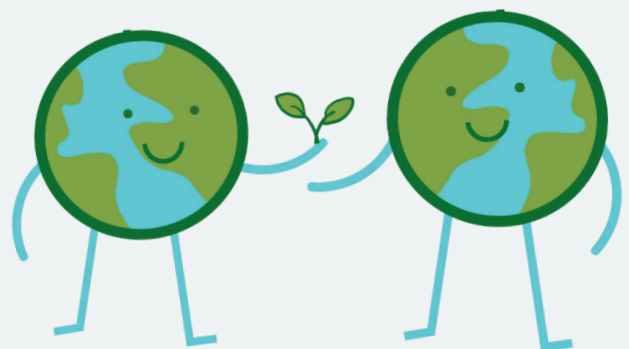
**YOU HAVE SUCCESSFULLY
COMPLETED THE MISSION
YOUR SUPERVISORS ARE VERY
HAPPY WITH YOUR WORK
YOU DID A GREAT JOB**



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TIPS ON SLDs INCLUSION

- Make sure that everyone understood the instructions. Repeat them if necessary.
- Make sure that there is enough space on the desk to be able to write on the reports.
- Use clear language
- Print the reports on one side only to avoid having to turn the pages.
- If possible, print the reports on off-white paper.
- Encourage cooperation between the players.



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