























BIOLEARN-BSB142 ECO-CONSCIOUS MINDS TO STOP POLLUTION IN THE VALUABLE WETLANDS OF BLACK SEA BASIN

CLIMATE AND CLIMATE CHANGE

Participant's Booklet

Target Audience: 14+ years old











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About The Project

BIOLEARN (Eco-Conscious Minds to Stop Pollution in the Valuable Wetlands of Black Sea Basin - BSB142), which was initiated on 01.01.2020 within the scope of the first call for proposals of "Joint Operational Programme Black Sea Basin 2014-2020" where the Directorate for EU Affairs is the national authority, is led by District Government of Enez.

Representatives of the following partners are as follows:

- 1. District Government of Enez-Turkey
- 2. Division Directorate of Edirne under First Regional Directorate under General Directorate of Nature Protection and Nature Parks of Ministry of Agriculture and Forestry Turkey
- 3. Foundation Caucasus Environment Georgia
- 4. Agricola NGO Ukraine
- 5. Green Balkans / Stara Zagora NGO Bulgaria
- 6. Management Body of Evros Delta and Samothraki Protected Areas Greece

The overall objective of the project is to provide information, experience transfer and capacity building training between partners and develop a common environmental protection and education approach, methodology and organizing campaigns that will raise awareness in the society to reduce pollution in important wetlands in the Black Sea Basin.

The main activities to be carried out within the scope of the 26-months project are as follows:

- 1. Establishment of a total of 4 environmental protection and training centres, one of which is on the shores of Gala Lake, and providing environmental protection training to visitors and especially to students. By providing equipment for the other 6 existing centres, there will be a network of 10 activity and training centres.
- 2. Workshops to be held in Bulgaria and Greece, focusing on discussions about examples of



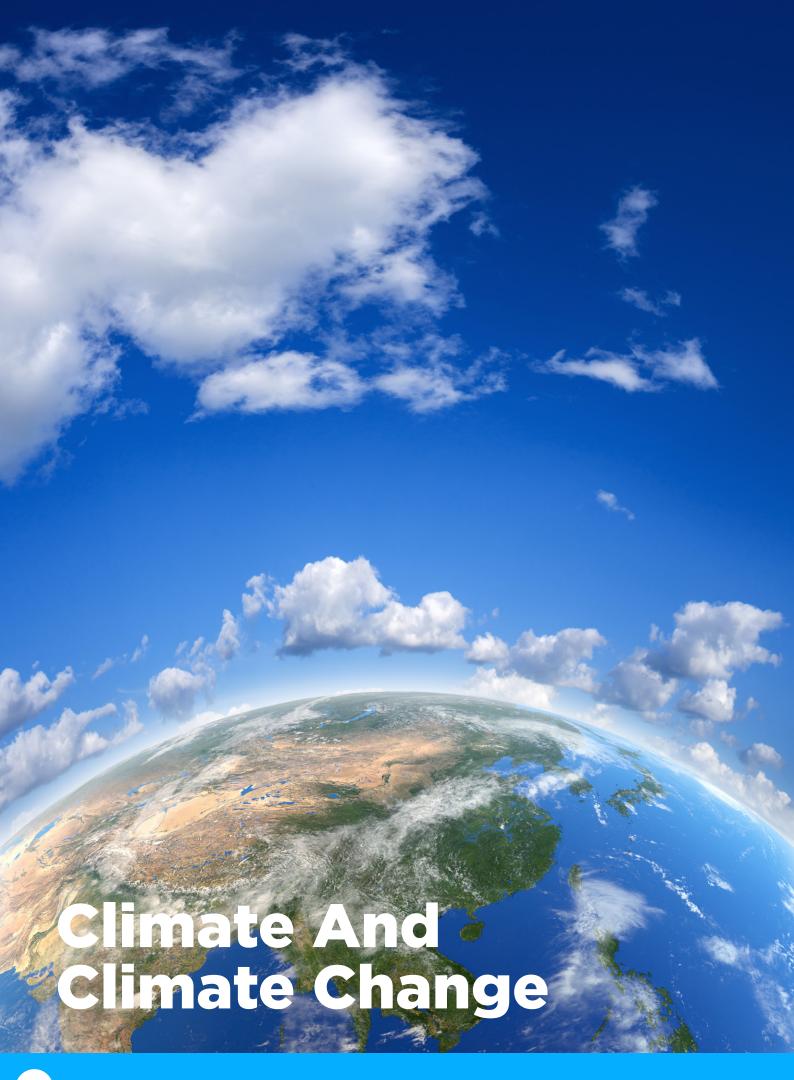
successful training and awareness-raising campaigns for the protection of wetlands, sharing experiences and preparing the materials to be used in training which will be applied in all centres. Capacity building training for trainers.

- 3. Organizing massive and synchronized cleaning campaigns to reduce pollution in wetlands.
- 4. Award-winning photo contest and exhibition focused on wetland protection.
- 5. Organizing a wetland pollution-based painting contest and exhibition in primary and secondary schools.

Outputs of the Project:

- "Stop Pollution" and "Save Nature" environmental education and activity centres, one of which is mobile, will be established in 5 countries and will sustainably carry out training and awareness-raising activities.
- 2. A report will be prepared on the nature and rate of pollutants in 5 wetlands in the Black Sea Basin.
- 3. A guide with examples of good practices consisting of training and campaigns focused on protecting wetlands will be prepared.
- 4. A wetland protection training set consisting of 12 sections will be prepared especially for students. Training sets will also be shared on the internet.
- 5. After 10 people from 2 each partner country received trainer's training, they will train 25 people in each region (totally 125 people) and the sustainability of training activities will be ensured in the established centres.
- 6. A painting competition on environmental protection will be held in at least 15 primary and secondary schools and paintings selected by the jury will be exhibited.
- 7. Pictures taken in 5 regions with the participation of professional photographers will be exhibited. With the mobile 'Stop Pollution' vehicle, the exhibition will travel to 5 countries.
- 8. An environmental cleaning campaign will be held simultaneously with the participation of 1500 people in 5 regions.
- 9. With the international conference to be held in Georgia, the outputs of the project and future action plans will be shared with the public.

For more information, you can visit the project website: www.bio-learn.org



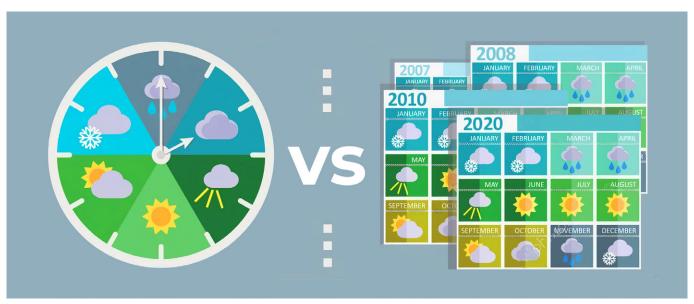


While the weather might change every hour, day, month or year, the climate is the model of weather conditions over a wide geographic area for a longer period like at least 30 years.

Weather or Climate?

Let's look at the sky today. What do you see? Is it a hot sunny day with no clouds in the sky or a cloudy sky with raindrops falling softly? Maybe the streets are covered with snow or the roofs are scorched by the sun...

The thing you see in the sky when you open the window is actually a scene from that day's weather. Maybe the sun will shine between the clouds a few hours later or the rainwater will flow along the streets on the next day. You are observing the short-term atmospheric events at a certain point like your neighbourhood or city. Factors such as temperature, precipitation, humidity, wind are effective in the formation of this weather condition.



☑ While weather defines short-term events, climate represents the changes over the years.

The climate is a more comprehensive concept than the weather. It is not limited to just a few days or a single city. While the weather might change every hour, day, month or year, the climate is the model of weather conditions over a wide geographic area for a longer period like at least 30 years. For example, rain on November 10 in your city explains the weather for that day while the rainy and stormy period in October-November every year in the Black Sea is the climate of this region.

Five main climate groups are classified on Earth as tropical, dry, temperate, continental and polar.

The climate around the world is classified in various ways. The climate classification by German scientist Wladimir Köppen is the







most widely accepted. Accordingly, five main climate groups are classified on Earth as tropical, dry, temperate, continental and polar. There are also 13 different climate types under these main climate groups. For example, the climate of the landlocked Black Sea can be mainly classified as continental although it is under the influence of the shorelines. That means that there are seasonal temperature variations. The north-western part has a semi-arid (steppe) climate with cold winters and hot, dry summers. The south-eastern part, protected by high mountains, has a humid subtropical climate with abundant precipitation, warm winters and humid summers. Sometimes the winds coming from the Atlantic via Eastern Europe bring rain and storms.

Did You Know?

The climate of the regions is changing due to climate change. The tropical climate around the equatorial region is spreading to the north and south parts of the planet. Or the regions with a Mediterranean climate are beginning to show features of a semi-arid climate.



What is Climate Change?

Although it is not as fast as daily or weekly changes of weather, climates experience changes as well. These changes emerge over many years. For example, the semi-arid climate might be experienced in the Mediterranean climate region over time. In other words, there may be a decrease in the amount of precipitation in the region over the years.

The studies show that our planet has experienced numerous climate changes in the millions of years. Sometimes there was an ice age due to the cold climate and sometimes global drought was experienced due to the hot climate. But all of the changes occurred over a long period that will not be experienced in human life and the factors causing the change emerged naturally.

Our planet has experienced numerous climate changes in the millions of years.





Our planet is experiencing a similar climate change in our time. The global average temperatures are increasing, glaciers are melting, sea levels are rising and heavy precipitation results in devastating floods. The difference is that climate change this time is occurring rapidly as a result of human activities rather than natural factors. The unexpected one-degree increase in global temperature averages over the last 150 years is the most important evidence of this.

Becoming a Paleoclimatologist

The scientists researching the climate of our planet by collecting samples from trees, depths of oceans or glaciers are called "Paleo-climatologists". The studies by different researchers are compared and considered as correct if these studies match each other. If there is no match, further research is needed to be carried out.



By analysing the air bubbles and water molecules trapped in the ice cores taken from the depths of the glaciers, the climatic conditions of past years can be determined.

Scientists use different methods to learn about past climate changes on our planet. They investigate the tree trunks to learn the climate conditions of a relatively closer past which is a few centuries ago. There are two fundamental methods if they want to go back further to thousands of years ago. First, they can go deeper into the oceans and analyse the sediment samples. Second, they can collect ice cores from kilometers deep in glaciers such as Antarctica which have been frozen for millions of years.

Why Does Climate Change?

The world's climate is determined by various factors such as meteorological phenomena in the atmosphere, temperature and salinity in the seas and oceans, the number of glaciers, vegetation and landforms. The climate changes as these fac-

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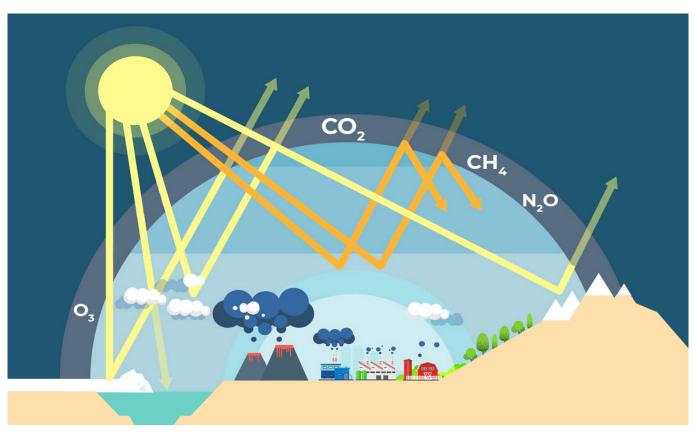






tors change. Today, scientists state that there is a striking fact that our planet is getting warmer day by day... The main reason for that is the activities of humans, especially in the last 150 years. This is called **anthropogenic climate change** which is human-induced climate change.

The atmosphere is an air layer consisting of a mixture of various gases in a different ratio. This structure consisting of **green-house gases** such as carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), ozone (O_3), water vapour (N_2O) wraps our planet like a cover. They trap some of the sun's energy reflected by Earth and keeps these solar radiations between the atmosphere and Earth's surface. They prevent all of the solar radiation from being reflected and escaping to space. This situation called, the



The greenhouse gases capture solar radiation and heat our planet.

greenhouse effect, keeps our planet warm enough to sustain life. If there are no greenhouse gases, the average temperature of the planet would be -18°C instead of 15°C.

The greenhouse gases and the greenhouse effects that made our planet habitable at a balanced way especially until the pre-industrial period have changed over time. Over the last century, humanity has industrialised at a tremendous speed, developed vehicles and our consumption habits have changed. All of these changes have led to more energy needs. An airplane without fuel cannot fly or a factory without electricity cannot operate! As a result, a higher amount of fossil fuels is being used uncontrollably than ever before. The greenhouse





Our planet is getting warmer day by day.
The main reason for that is the activities of humans, especially in the last 150 years.

gases released into the atmosphere due to fossil fuel use increased the density of these gases. The balanced structure of the atmosphere has changed. It began to keep more greenhouse gases and more solar radiation as well as heat the surface more.

Substances such as coal, oil and natural gas are called **fossil fuels**. Because these substances are formed when organic materials such as plants and animals decay underground over millions of years. In other words, fossil fuels are the residues of prehistoric forests and dinosaurs! Most of these fossil fuels contain carbon and hydrogen elements. When fossil fuels burn, carbon and hydrogen form compounds with oxygen and are released into the atmosphere as carbon dioxide gas and water vapour.





Other than using fossil fuels, other human activities also cause carbon dioxide and other greenhouse gases. The burning of coal, natural gas and solid waste, cement production and deforestation increase the amount of carbon dioxide. Methane gas is released during the production and transportation of fossil fuels. Additionally, a high amount of methane gas is released due to animal husbandry, agricultural practices and organic waste decomposition in the urban solid waste landfills. Nitrous oxide production is caused by the burning of fossil fuels and solid waste and fertiliser application to agricultural products. Fluorinated gases are formed due to various industrial processes.

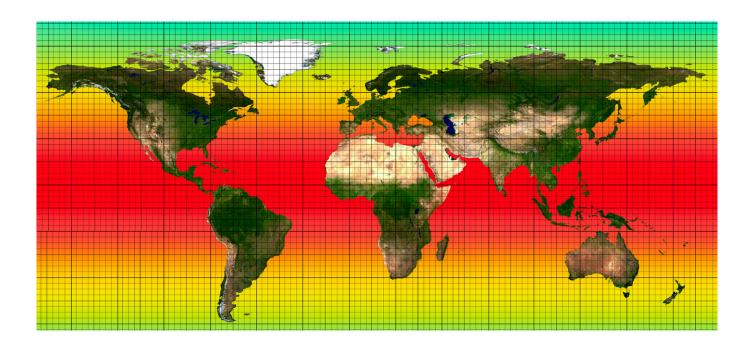
Other than using fossil fuels, other human activities also cause carbon dioxide and other greenhouse gases.

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Each gas has a different effect on climate change and these are investigated under three main titles to compare their effects on global warming. The density of the gases, how long they stay in the atmosphere and how much heat they absorb give us some ideas about their effects. To express this situation, the Global Warming Potential (GWP) term is used. Each greenhouse gas has a global warming potential and some gases are more effective at making the planet warmer. If the global warming potential of gas is high, it means that gas is absorbing more heat and contributing to the warming of the planet more. For example, while carbon dioxide remains in the atmosphere for thousands of years, methane gas stays in the atmosphere much shorter than carbon dioxide (approximately 10 years) but its warming capacity is 25 times more than carbon dioxide. Nitrous





oxide has approximately 300 times more global warming potential than carbon dioxide and it can stay in the atmosphere for 114 years. Hydrofluorocarbon found in devices adjusting temperature levels such as air-conditioners, refrigerators and freezers can stay in the atmosphere for 270 years and has 14,800 times more global warming potential.

Although greenhouse gases are mostly generated due to the direct use of fossil fuels, they are also released due to our everyday activities. Although we are not aware of it, greenhouse gases are released during almost every activity, from the food we eat, the clothes we wear, taking a shower, to our

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travels. **Carbon footprint** measurement is used for measuring the carbon emissions of an individual from all these activities. These measurements are divided into the primary footprint and secondary footprint. For example, using a motor vehicle or heating the house is the primary footprint. Our secondary footprint includes the carbon emissions by the products we eat, drink or use.

Calculate your carbon footprint!

Scan the QR code on your phone and calculate your carbon footprint.



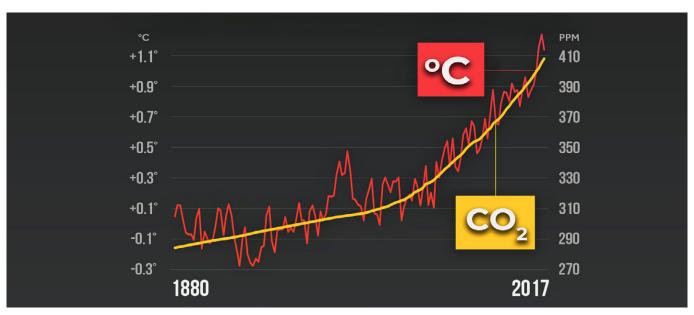
Effects of Climate Change and Measures

Due to human activities, the temperature of the planet has increased by 1 degree compared to the pre-industrial period. The last 5 years have been recorded as the hottest 5 years ever. As we cannot solve this problem and still cannot take permanent steps, climate activists call this situation a **climate crisis**.

In order to combat climate change on a global scale, climate negotiations that started with the Earth Summit regularly are held. Under the umbrella of the United Nations, these summits held with the participation of all member states are aimed to reduce and eliminate the factors that cause climate change, especially carbon emissions. In the process of continuing with The effects of climate change are visible in different ways.
Although the global temperatures are increasing, some regions of the planet are warming very much while others are becoming colder than ever before.







Both carbon dioxide emissions and global temperature averages have been constantly increasing since the industrial revolution. (Source: Climate Central)

Did You Know?

The precipitation pattern changes due to climate change. The precipitation amount for one time can be too much or too little. For example, in recent years, the precipitation on the Black Sea coast in Turkey has happened in a short duration with more than average and caused floods and landslides. As a result, lots of people have experienced serious loss of life and property.

the Kyoto Protocol in 1997 and lastly the signing of the Paris Climate Agreement in 2015, countries must make a joint effort to keep the global temperature increase below 2°C compared to the pre-industrial levels and to limit this increase to 1.5°C.

The effects of climate change are visible in different ways. Although the global temperatures are increasing, some regions of the planet are warming very much while others are becoming colder than ever before. The precipitation frequency and intensity are changing. Glaciers are melting, oceans are warming and the sea level is rising. While there are floods in some regions, others struggle with excessive weather events such as drought and heatwaves. The number of hurricanes, storms and forest fires is increasing. Agricultural production is being damaged.



This change in the global temperature seriously threatens habitats and living beings in these habitats. Various habitats on the planet such as oceans, seas, forests, wetlands and glaciers and numerous plant and animal species dependent on these habitats are directly impacted by climate-related problems. Even small temperature changes can lead to serious impacts on ecosystems. Numerous living beings and habitats are disappearing or experiencing the threat of extinction as a direct result of climate change. For example, due to shifting seasons, some trees leaf out earlier than they should and the caterpillars that feed on them hatch earlier from their eggs. The number of caterpillars is increasing earlier than before but the birds that eat these caterpillars are late for them and they starve. Since birds lay eggs and hatch with an annual rhythm that has been established over many years, the time mismatch can result in popula-





The coral reefs
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tion declines. Another example is happening in oceans and seas which are the largest oxygen source and carbon dioxide sink. The coral reefs found there have the highest biodiversity compared to other ecosystems and they are highly sensitive to climate change. The coral reefs host more than one-quarter of all marine fish species. A spike of 1-2°C in the ocean temperature can trigger stress in the coral reefs. This causes coral reefs to expel the algae that live in their tissues and that give their colour. As the algae leaves, the corals fade. This is called **coral bleaching**. If the ocean temperatures stay high for long enough, this will result in the death of the corals.



The rich ecosystem of coral reefs is devastatingly affected by climate change.

Did You Know?

Climatic conditions serve as a clock for many creatures, from birds to butterflies, bears to trees. Timing of hibernation, reproduction, migration, blossoming or becoming a butterfly from a caterpillar are all determined by this clock. Studies show that birds might miss their migration times, the plants might bloom early or the caterpillars might turn into butterflies early due to climate change. This wrong timing disturbs the healthy functions of the ecosystem and ends up with the death of numerous living beings.

We have some duties to prevent climate change in addition to governments and large industrial companies. These duties are in fact simple and effective. We need to change our lifestyles to avoid activities that damage our planet and to minimise our carbon footprint. We can choose walking, cycling or using public transport to reduce our carbon footprints in transportation. We can strive to use energy efficiently and we can be careful about saving electricity and water. We can take shorter showers and unplug the electronic devices not in use. We can reduce our wastes. Instead of plastic bags, we can use cloth bags for shopping and instead of single-use products, we can choose durable or recycled products.

We need to change our lifestyles to avoid activities that damage our planet and to minimise our carbon footprint. In this way, we can prevent the acceleration of climate change and minimise the negative effects of climate change on our planet.

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We can think about whether we need a product before buying it. We can consume less meat and try to consume local foods and seasonal fruits and vegetables. We can re-use our goods or share them with someone who needs them instead of throwing them away. In this way, we can prevent the acceleration of climate change and minimise the negative effects of climate change on our planet.















CARBON FOOTPRINT TEST

FOOD	TRANSPORTATION
 Which best defines your diet? a. I eat meat in every meal (20) b. I eat meat in some meals (10) c. I rarely eat meat (5) d. I don't eat meat (0) How often do you eat outside (restaurant/cafe/online food order)? a. Every day (20) b. Few times a week (10) c. Once a month (5) d. None (0) How much of your food do you waste? a. More than half (20) b. A quarter (10) c. One tenth (5) d. None (0) How much of the food that you eat is locally grown? a. I don't know (20) b. Some (10) c. Most (5) d. All (0) 	 How do you travel most? a. By car (20) b. By motorcycle (10) c. With public transport (5) d. None - I walk or ride a bicycle (0) How many hours do you spend in your car or motorcycle? a. More than 1 hour (20) b. Half - 1 hour (10) c. Less than half an hour (5) d. Never (0) How many hours do you spend on public transport? a. More than 1 hour (20) b. Half - 1 hour (10) c. Less than half an hour (5) d. Never (0) How many times do you fly each year? a. 4 or more times (20) b. 2-3 times (10) c. 1-2 times (5) d. None (0)
Total Points:	Total Points:
HOUSE	STUFF
 What kind of house do you live in? a. 2-3 storey detached house (20) 	 How many electronic devices do you have in your house?
 b. 1 storey detached house (10) c. Apartment / Flat (5) 2. How many rooms per person do you have? a. 4 or more (30) b. 3 (20) c. 2 (10) d. 1 (5) 3. Which temperature range do you keep in your house in winter? a. Above 21°C (hot) (20) b. 18-21°C (warm) (10) c. 14-17°C (cool) (5) d. Below 14°C (cold) (0) 4. Do you turn off the lights and electronic devices when not in use? a. No (10) b. Yes (0) 	 a. 10 or more (20) b. 5-10 (10) c. 1-5 (5) d. 0 (0) 2. How many clothes do you buy in a year? a. More than 8 pieces (30) b. 5-7 pieces (20) c. 2-4 pieces (10) d. 1 piece (5) 3. How much trash do you generate in a day? a. More than 1L jar (20) b. 1L jar (10) c. 0.5L jar (5) d. None (0) 4. Do you throw products such as glass, metal, and paper into recycling bins? a. No (20) b. Yes (5)
 c. Apartment / Flat (5) 2. How many rooms per person do you have? a. 4 or more (30) b. 3 (20) c. 2 (10) d. 1 (5) 3. Which temperature range do you keep in your house in winter? a. Above 21°C (hot) (20) b. 18-21°C (warm) (10) c. 14-17°C (cool) (5) d. Below 14°C (cold) (0) 4. Do you turn off the lights and electronic devices when not in use? 	 a. 10 or more (20) b. 5-10 (10) c. 1-5 (5) d. 0 (0) 2. How many clothes do you buy in a year? a. More than 8 pieces (30) b. 5-7 pieces (20) c. 2-4 pieces (10) d. 1 piece (5) 3. How much trash do you generate in a day? a. More than 1L jar (20) b. 1L jar (10) c. 0.5L jar (5) d. None (0) 4. Do you throw products such as glass, metal, and paper into recycling bins?

Sum the scores from all categories. Learn your carbon footprint according to the result.

Less than 70 points Great! Your carbon footprint is low. Share your environmentally friendly choices in your daily life and inspire people.

70-160 Points You are trying to be careful about your lifestyle. But your lifestyle still has an impact on the planet. You can search for what you can do to lessen your impacts on nature.

More than 160 points Watch out! Your carbon footprint is high! Let's take a step before it is too late for our planet and start reducing your carbon footprint.



Notes

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