Project funded by
EUROPEAN UNION

BioLearn

Black Sea
CROSS BORDER
COOPERATION

BIODIVERSITY

Participant's Booklet

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Black Sea CROSS BORDER COOPERATION

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

BIODIVERSITY

Participant's Booklet

Target Audience: 8-14 years old

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Joint Operational Programme Black Sea Basin 2014-2020 is co-financed by the European Union through the European Neighbourhood Instrument and by the participating countries: Armenia, Bulgaria, Georgia, Greece, Republic of Moldova, Romania, Turkey and Ukraine.

This publication was produced with the financial support of the European Union. Its contents are the sole responsibility of Enez District Governorship and do not necessarily reflect the views of the European Union.

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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 the26-monthsproject 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:

1. "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

Biodiversity

What Is Biodiversity?

Our world is home to living beings in numerous ecosystems from the deepest points of the oceans to the highest peaks of the mountains. The diversity created by all these living beings is called **biological diversity (biodiversity)**. While the biodiversity in the equator regions with more moderate climate conditions is richer, the cold climate around the poles causes poorer biodiversity. For example, there are more species in the Amazon rainforests compared to the harsh conditions in Antarctica.

Biodiversity varies under different climate conditions and geographies.

Our world is home to living beings in numerous ecosystems from the deepest points of the oceans to the highest peaks of the mountains.

Scientists and conservationists use the concept of biodiversity to understand whether nature is working healthily and whether the living beings in nature are under any threats. Thus, they try to prevent the extinction of species. While doing that, they consider biodiversity in 3 different ways.

First, they investigate **the diversity of the species**. For example, living beings in the Black Sea are considered one by one as fish such as Horse Mackerel, Anchovy, Bonito; mammals such as Common Dolphin, Bottlenose Dolphin and Eurasian Otter; birds such as Shag, Yellow-legged Gull and Yelkouan Shearwater. They also try to identify the microorganisms, mushroom and plant species in this region. In this way, they reveal the diversity of the species in the Black Sea.

Second, they investigate **genetic diversity**. Let's take a look at ourselves to understand genetic diversity. For example, what colour are your eyes? Is your hair wavy or straight? Which shape do your nose and lips have? Is your look exactly the same as people around you? Although all humans around the world belong to the same species called Homo sapiens, everyone has different body structure and no one is exactly the same as others, right? This is because we all have different genetics... Scientists investigate this diversity in other living creatures in the ecosystem just like the diversity we have as humans.

Scientists and conservationists use the concept of biodiversity to understand whether nature is working healthily and whether the living beings in nature are under any threats.

Lastly, they consider **the diversity of the ecosystems**. In general terms, we can define an ecosystem as a relationship between the living being and non-living things such as air, water, soil and temperature. The living beings living in a healthy ecosystem can meet their necessary needs to grow and reproduce. Different ecosystems enable different species to meet their needs. For example, the wetland ecosystem, forest ecosystems or shore ecosystem in the Black Sea enrich the ecosystem diversity in the Black Sea. Because different groups of living beings can live in each ecosystem. The birds in the wetlands, the mammals in the forests or the fish in the sea can live in different ecosystems but exist around the same sea.

As a result, the diversity in species, genetics and ecosystems create biodiversity as a whole.

Why Is Biodiversity Important?

Numerous ecosystems from wetlands to rain forests are at one with the living creatures that live in these ecosystems. The existence and healthy life of these living beings show how healthy an ecosystem functions. Therefore, protecting biodiversity has significant importance.

The living beings in the ecosystem have never-ending communication and interaction with each other. Humans are a part of biodiversity like all other living beings. Bacteria that we cannot see with our own eyes protecting us from diseases or accessing clean drinking water thanks to plants in the wetlands are linked with healthy bi-

odiversity and correct functioning of the ecosystem. The extinction of biodiversity will cause disturbing these relationships and therefore, leading humans and various other living beings to experience serious problems.

Biodiversity is extremely important for the continuation of life. The air that we breathe, the water that we drink, the food that we eat all depend on biodiversity. The clean air exists with the existence of trees. Various fruits, vegetables and plants exist with the

Did you know?

Our body is full of microorganisms. More than 10 thousand bacteria species live in the human body. Their total number might exceed 100 trillion! They form approximately 1.5 kg of our body weight. This diversity and the number of beneficial bacteria are crucial for our health.

existence of bees and bugs. Biodiversity ensures the safety of our food. Our richness of food with various plant-based and animal-based food types forms the basis for us to eat well and stay healthy. Our immune system functions healthily thanks to thousands of different microorganisms living in our body. On the other hand, scientists benefit from biodiversity in medication production. We use various plants, mushrooms and microorganisms in medication production to treat our diseases. Other than food, biodiversity helps us to meet our basic needs such as sheltering and clothing. Additionally, it provides spaces with natural beauties that are good for our soul. Moreover, all of these valuable services from biodiversity are freely offered by nature...

The high-speed train designed in Japan was inspired by the beak of a bird called kingfisher. In this way, it is possible to move forward with less friction and energy loss.

Apart from all these, we owe to the rich biodiversity for our artistic and technological development. Various artists are inspired by this biodiversity in their paintings, composed songs or written texts. In addition to artists, engineers, designers and scientists are influenced by this biodiversity. Various technological developments have marks from biological elements. Moreover, this has a special name. Finding solutions and developing new methods by being inspired by nature is called **biomimicry.**

Biodiversity is extremely important for the continuation of life. The air that we breathe, the water that we drink, the food that we eat all depend on biodiversity.

How Can We Determine Biodiversity Richness?

Scientists use different methods to define and measure biodiversity richness. The most common method is to determine the number of species and individuals in a certain area. For example, while 312 different bird species live in the Danube Delta, approximately 100 bird species live in the Sakarya River Delta. In a global sense, this difference could be larger. For example, the number of plant and animal species living in the rain forests is 20 times more than the species living in the North Pole region. A similar situation is valid for the number of individuals or the abundance of living things. For example, the number of Brown bears in Turkey and Georgia is significantly higher than Brown bears in Bulgaria.

Geography and climate conditions play an important role as the reason for these differences. Living beings can develop differ-

ent adaptations over the long years for the conditions of that region to be able to live in that region. For example, mammals living in cold climate conditions have thicker fur, higher body fat and more suitable colours to snow than the animals living in hot climates. These adaptation differences cause a change in the number of living beings in different regions.

Although this method of measurement is functional, it is not sufficient to fully identify the biodiversity of our planet. The studies show that we are still unable to determine the exact number of creatures on our planet. Currently, 1.5 million different species except bacteria have been discovered and scientifically named. But scientists think that this number is more than 8.7 million!

1.5 million different species except bacteria have been discovered and scientifically named.

Arctic foxes wear white fur to have camouflage in their surroundings during winter. Red foxes have colours suitable for milder geographic conditions.

When the estimated number of species is this high, scientists are in relentless research to discover new species. New living beings can only be discovered by visiting new places. The depths of oceans and seas are among the most ideal places for this job! As a result of the studies, scientists recently discovered more than 200 new species on our planet. These species are so unique in genetic terms that most of them do not have close relatives.

Biodiversity Loss

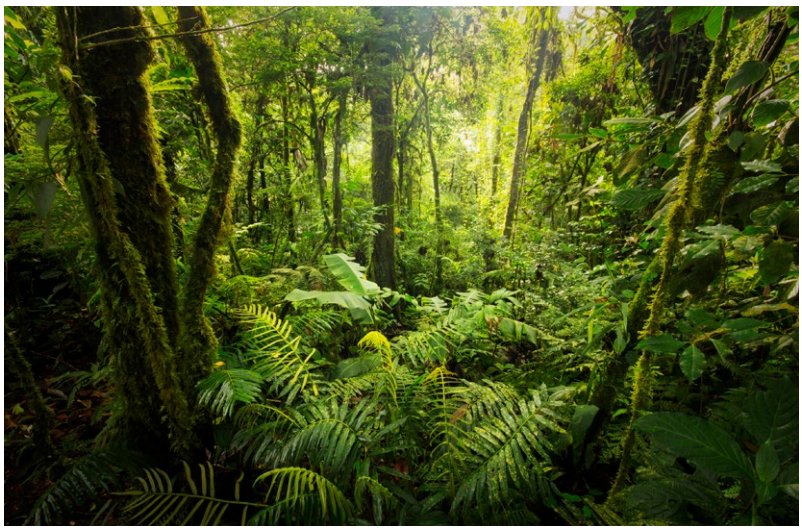
Our world can be more durable against the problems it has been facing thanks to this rich biodiversity. Because the greater the biodiversity, the more likely it is to withstand harsh conditions such as drought, disease, and climate change. However, some species are going extinct and disappear forever. This extinction might occur as a result of a natural process in some cases. For example, while dinosaurs that lived in the prehistoric period were extinct due to natural events, the most important responsible part of the extinction of today is humans.

In the last 100 years, human expansion to every corner of the world and human damage to nature has caused and is still causing hundreds of living beings to go extinct.

It is known that Mediterranean Monk Seal which is under threat at a global scale used to live in the Black Sea. Today, it is estimated that there are only 700 individuals left mostly in the Aegean Sea.

Did you know?

Thousands of living species on Earth are facing the threat of extinction. According to studies, more than 450 species went extinct in the last 10 years.



The studies show that in the last 100 years, human expansion to every corner of the world and human damage to nature has caused and is still causing hundreds of living beings to go extinct. One of the main reasons for this extinction is damaged or destroyed natural habitats. For example, destroying a forest to form an agricultural field or fragmentation of the habitats dividing into pieces for roads threaten the future of these living beings in this forest. Additionally, pollution, excessive hunting, climate change and dozens of other problems threaten the existence of living beings.

Still, it is possible to eliminate all these threats and to make our planet a safer place for all living things. By adjusting our individual lives in a nature-friendly way and changing our habits that damage nature, we can start shaping a beautiful future where all living beings live in harmony.

What did we learn?

The entire living beings and the ecosystem in our world are called biological diversity or biodiversity.

The healthy existence of biodiversity is vital for all living beings, especially for humans.

Various threats including human activities cause biodiversity to be damaged and destroyed.

Worksheets

PLANT OBSERVATION

Date _____ **Start and End Time:** _____ **Location** _____

Observer _____

How many different leaf types did you see? Try to draw them.			
Leaf 1	**Leaf 2**	**Leaf 3**	**Leaf 4**

How many different tree stem types did you see? Put this page on the tree stem and colour it with a pencil. Apply the tree stem pattern here.			
Tree Stem 1	**Tree Stem 2**	**Tree Stem 3**	**Tree Stem 4**

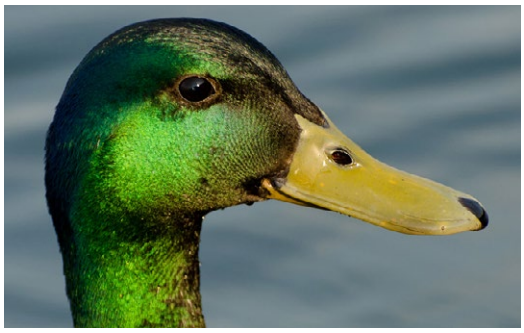
How many different seeds did you see? Learn their names or try to draw them.			
Seed 1	Seed 2	Seed 3	Seed 4

How many different fruits did you see? How is the size, shape, colour? Write them here.			
Fruit 1	Fruit 2	Fruit 3	Fruit 4

How many different flowers did you see? How is the colour? Try to draw them and write the colours.			
Flower 1	Flower 2	Flower 3	Flower 4

BIRD BEAK AND FEET

The birds' beaks can give an idea about what they eat; their feet can give an idea about where they live or for what they use their feet. Look at the birds below closely and guess!

By looking at the beak type, guess what the bird eats and write here.	
	
	
	
	

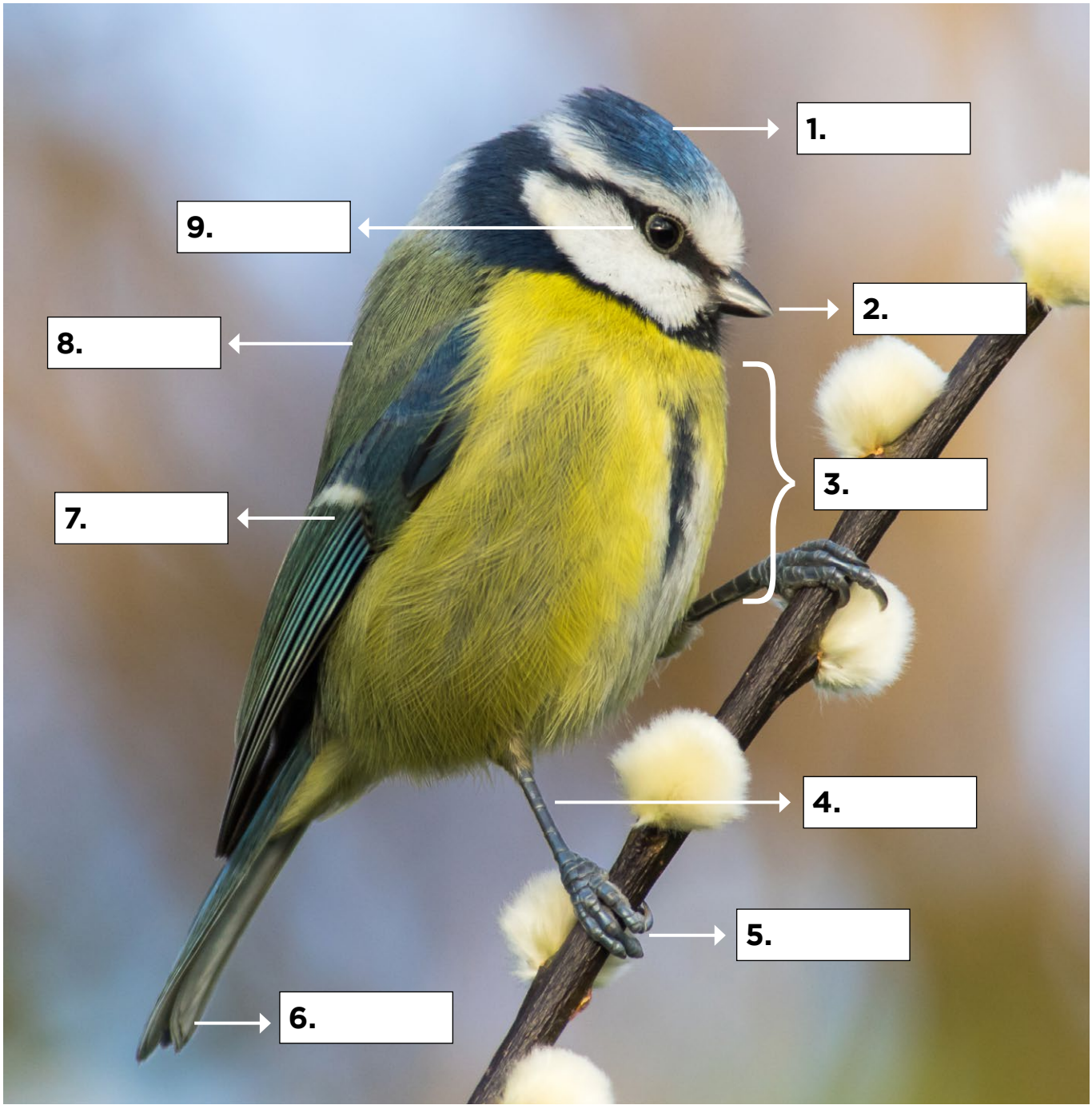
Guess the function of the feet types and write it here.

BIRD DIAGRAM

Place the words given below correctly to the boxes in the image and complete the bird diagram.

Tail - Eye - Leg - Back - Breast - Foot - Beak - Wing - Head



Bird Diagram Answer Key:

1. Head **2.** Beak **3.** Breast **4.** Leg **5.** Foot **6.** Tail **7.** Wing **8.** Back **9.** Eye

Notes

References

Anand, F. S. (2020, November 4). CBSE Class 3 Science Birds and their features. Takshila Learning. https://www.takshilalearning.com/cbse-class-3-evs-birds-and-their-features/

Biodiversity. (n.d.). Britannica Kids. https://kids.britannica.com/students/article/biodiversity/317516#

Biodiversity for Kids. (n.d.). Kiddle Encyclopedia. https://kids.kiddle.co/Biodiversity#:%7E:text=Biodiversity%20refers%20to%20the%20variety,too%20many%20species%20become%20extinct.

Birds' Legs and Feet. (n.d.). The RSPB. https://www.rspb.org.uk/birds-and-wildlife/natures-home-magazine/birds-and-wildlife-articles/how-do-birds-survive/birds-legs-and-feet/

How many species haven't we found yet? (2019, December 26). National Geographic. https://www.nationalgeographic.com/newsletters/animals/2019/12/how-many-species-have-not-found-december-26/

IUCN. (2015, June). Overview of European Red Lists results. https://www.iucn.org/downloads/red_list_overview_new_1.pdf

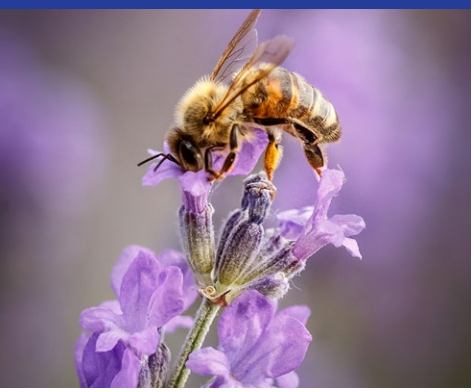
NIH Human Microbiome Project defines normal bacterial makeup of the body. (2012, June 13). National Institutes of Health (NIH). https://www.nih.gov/news-events/news-releases/nih-human-microbiome-project-defines-normal-bacterial-makeup-body#:%7E:text=Where%20doctors%20had%20previously%20isolated,microorganismal%20genera%20in%20healthy%20adults.

On and in you. (n.d.). Phaser App. https://www.micropia.nl/en/discover/stories/on-and-in-you/

Sweetlove, L. (n.d.). Number of species on Earth tagged at 8.7 million : Nature News. Nature. https://www.nature.com/news/2011/110823/full/news.2011.498.html#:%7E:text=News-,Number%20of%20species%20on%20Earth%20tagged%20at%208.7%20million,80%25%20of%20species%20still%20undiscovered.

Watson, S. (2017, February 9). Good vs. Bad Germs. Healthline. https://www.healthline.com/health/cold-flu/good-bad-germs

What is Biodiversity? | AMNH. (n.d.). American Museum of Natural History. https://www.amnh.org/explore/ology/biodiversity/what-is-biodiversity



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The Title of the Programme
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