

Didactic Scenario

1. Title

Learning about ecosystem

2. Keywords

biodiversity, producers, consumers, non-living factors

3. Basic Information

STEAM Subject: Science, Technology, Arts

Typical interaction time with the instructional scenario in teaching hours for in-school work:
40'+40'+40'

General description of the scenario:

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Learning about the Ecosystem	preparation stage	40'
I learn about the diversity in the Ecosystem	preparation stage	40'
I am researching ecosystem degradation and its causes	implementation stage	40'

Age group: 9-11 years

Estimated difficulty level:

Very Easy	Easy	Moderate	Challenging	Very Challenging
		X		

Teaching resources

Material: paper, pencils, pens, background cardboard, crayons, glue, materials of their choice for terrarium, empty fish bowl, empty fish bone template

School infrastructure: smartboard and computer

Additional material from external sources/online tools:

<https://bilimgenc.tubitak.gov.tr/makale/konveksiyon-yontemiyle-isi-akisini-gozlemleyelim>
https://ders.eba.gov.tr/ders/proxy/VCollabPlayer_v0.0.992/index.html#/main/curriculumResource?resourceID=8d8daa7242f8d6d53c54778e5c341aa3&resourceTypeID=3&loc=0&locID=31830af6996f96dacbf4b628e5d88b9c&showCurriculumPath=false
https://ders.eba.gov.tr/ders/proxy/VCollabPlayer_v0.0.993/index.html
<https://www.morpakampus.com/anasayfa>

Differentiated Instruction for students of differing abilities and learning styles in the same class: N/A

Developed by: Sıdıka Kök

4. Educational Problem

Since the student has just been introduced to the concept of 'ecosystem', it is first necessary to concretise this concept in the student's mind. Just like he/she groups the books in his/her bookshelf they also realise that they should group the living things on Earth according to where they live and include them in the appropriate ecosystem. Thus, they also realise the types of ecosystems.

They see that life groups are formed on Earth. It is given that the idea that the world is not only an ecosystem but also a combination of many ecosystems is correct. In addition, it is ensured that the living things in an ecosystem and comparisons with other ecosystems are made to realise the diversity of living things and to realise that there are more varieties than they think. It is ensured that they see the deterioration in the ecosystem by creating careful perspectives that they cannot look around.

5. Learning Objective (-s)

1. It will be effective in the perception, concretisation and solution of problems and will help students to structure information and provide permanent learning. it is thought to be appropriate.

2. Students can focus on the lesson by gamification without losing their interest, lesson enjoy playing an active role in the process, recognise the strengths and weaknesses of the ideas that emerge and express them correctly are among our goals.
3. It is aimed to understand the concept of ecosystem and ecosystem types.
4. It is one of our goals to question the importance of biological diversity in the ecosystem and its importance for natural life.
5. It is aimed to offer solutions for prevention by questioning the causes of deterioration in the ecosystem.

6. Phases of the Scenario

Phase 1

Title: Learning about the Ecosystem

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 40'+40'

Detailed description of the scenario phase:

Students are asked to think of an area in the world in which there are living and non-living beings within certain boundaries, where living things have to communicate with other living things and living things have to communicate with non-living factors. They are given clues with the expressions of an area with a wide variety of living things. They form groups from the answers given. Forest land, sea water aquatic environment...The groups formed are diversified and ecosystem types are made to be realised.

Land Ecosystem	Aquatic Ecosystem
1.Forest	1.Ocean
2.Desert	2.Sea
3.Meadow	3.Lake
4.Caves	4.River

Activity sheets:

Activity 1

Each student is asked to choose an ecosystem for themselves. Brainstorming is done about the living beings in the ecosystem they have chosen. They are asked to fill in the meaning analysis

table by making additions in order to realise the biodiversity of the ecosystem they have chosen.

Types of Ecosystems Living Creatures	Forest	Meadow	Mountain	Desert	River	Lake	Sea
Camel							
Snake							
Goat							
Gelengi							
Cactus							
Bird of Prey							
Grasshopper							
Microscopic Organisms							
Lizard							
Centipede							
Mushroom							
Lotus							
Mouse							
Whale							
Frog							
Fern Herb							
Insect							
Fish							
Pine							
Lion							
Bear							



After completing the meaning analysis table, different types of ecosystems are written on the papers. One less than the number of students in the group is glued on the stool. The students

walk around the stool singing the song 'Ali babanın bir çiftliği var'. Before stopping the music, the teacher calls out the name of a living creature and stops the music. A student who goes to the right ecosystem and stands without being able to sit down is out of the game. The music continues for the other students. In this way, the number of students gradually decreases and finally the only student left wins the game.



<https://www.youtube.com/watch?v=PH90fAuY3YA>

Activity 2:

In the second stage of the activity, students are given paper, pencil, background cardboard, crayons and glue. Then the teacher gives a short introduction about lapbook (a design that includes short summary information, pictures, student drawings, games, etc. on any subject) and asks the students to make their own lapbooks in three dimensions about the ecosystem they have chosen. Students present their designs.





<https://cutt.ly/3wDxO97b>

Phase 2

Title: I learn about the diversity in the Ecosystem

Indoor	Outdoor	Mixed
X		X

Phase duration in minutes: 40'+40'

Detailed description of the scenario phase:

Meaning analysis table

Features Creatures	Living Beings	Non- Living Beings
Rock/Stone		
Flower		
Bird		
Soil		
Lake		
Tree		
Air		
Ant		
Sea		
Leaf		
Battery		
Fish		
Board		

Students are given a meaning analysis table. They are asked to mark the given words in the living and non-living columns.



Forest ecosystem picture is shown and students are asked what they see. According to the answers given, it is ensured that the students recognise living and non-living beings. Student answers are written on the board and a diagram is created.

Producer, consumer and decomposer living things are reminded and their interactions with each other and with inanimate beings are mentioned.

Activity sheets:

Activity 1

Let's make your own tiny ecosystem.

How to make a terrarium?

Terrariums are usually waterless environments prepared for the life of plants, reptiles and insects. These environments are not a decorative element, but an ecosystem in themselves.

Find and bring the materials you think are necessary for the ecosystem for the terrarium from the school garden. Discuss with your group mates which living or non-living material you put and why you put it and create your own ecosystem in the given fan.



<https://www.youtube.com/watch?v=NIZOmFml85M>

Activity 2

Structured Grid (Place the following concepts in the dotted sections opposite the given questions. Each correct answer is worth 5 points.

1 Light	2 Sea	3 Land	4 Seperators
5 Moisture	6 Consumer	7 Pollen	8 Land
9 Meat-eaters	10 Skin	11 Microskopic Organism	12 Liver
13 Desert	14 Planet	15 Producer	16 Electric Circuit

17 Sky stones	18 Aquarius	19 Forest	20 Water
------------------	----------------	--------------	-------------

Place the appropriate numbers from the table opposite the questions below.

1. Which Factors affect the ecosystem?
2. Which of these are among the biotic (living) factors affecting the ecosystem?
3. Which of these are abiotic (non-living) factors affecting the ecosystem?
4. Which of these can be given as examples of ecosystem concepts?

The answers are evaluated together with the students and the correct results are determined. Students are asked to exchange their own papers with their friends. They are asked to calculate their friend's work by following the score calculation instructions below.

Score Calculation:

$$\frac{C_1}{C_2} - \frac{C_3}{C_4}$$

C1: Number of correctly selected boxes C2: Total number of boxes
C3: Number of incorrectly selected boxes C4: Total number of unchecked boxes

In order to recover the score from negative and evaluate it out of 100, the number found is summed with 1 and multiplied by 50.

Phase 3

Title: I am researching ecosystem degradation and its causes

Indoor	Outdoor	Mixed
X		

Phase duration in minutes: 40'+40'

Detailed description of the scenario phase:

Sample mind map

The picture is shown. They are asked to interpret the ecosystem concepts and the factors affecting the ecosystem. With this activity, which is thought to be effective in the perception, concretisation and solution of problems, they are prepared to express their ideas without hesitation.

Activity sheets:

Activity 1

They are asked to create their own mind maps.



<https://drive.google.com/file/d/1t8t58R3buzmns2jIQfeq-HlfxoJ3pEUU/view>

1. Why might the Convention on Biological Diversity be needed?
2. What do you think is the purpose of the convention?

The social networks (facebook, instagram, etc.) used by the students are mentioned. It is asked to imagine that these developments disappear. The effects of this situation on the world are discussed.

They are asked about the disappearance of one of the living organisms or organisms that communicate with each other in the ecosystem. They are asked to think of a picture in which the leaves that have dried and fallen since the world was founded are not broken down by decomposers and mixed into nature. Then a picture is shown. They are expected to interpret it.



Brainstorming is done with questions such as if there is no water, if there is no light, if there are no plants.

Activity 2:

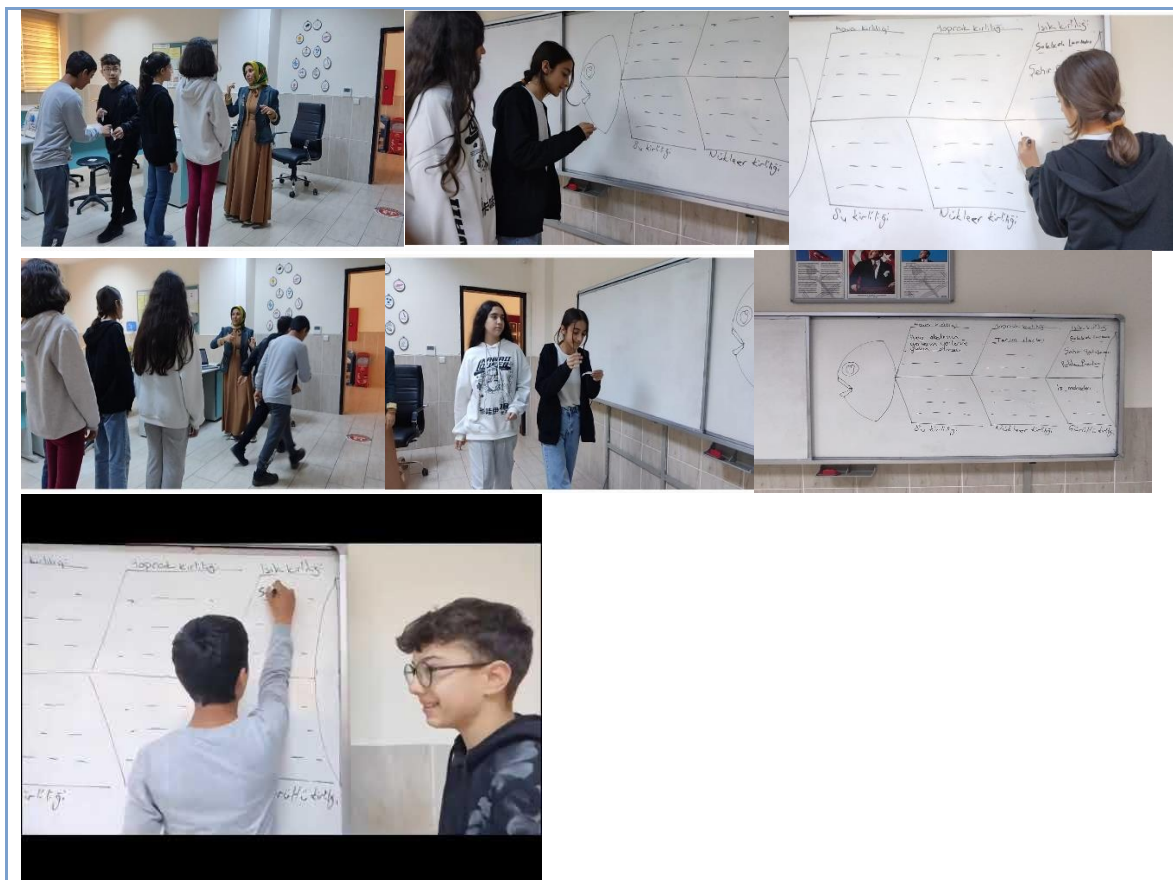
It is said that fishbone technique will be used in the study and information is given about this technique. (<https://selinyetimoglu.com/>)

Beforehand, the teacher hides the passwords to be written on the fishbone inside the school building. Student groups are asked questions about the ecosystem. In return for the correct answer, the location of the password is told. Students are asked to bring the password inside the building and write it on the fishbone we draw on the classroom board. Thus, the areas on the fishbone are completed. At the end of the activity, the fishbone is checked and discussed. Fishbone technique has been prepared to comprehend the causes of deterioration in the ecosystem. It consists of six parts: water pollution, soil pollution, air pollution, light pollution, noise pollution and nuclear pollution. When students complete the fishbone, they reach a whole that reveals the causes of deterioration in the ecosystem.

After the fishbone is completed, a discussion is made about the ecosystem and the balance in the ecosystem.

The causes of deterioration in the ecosystem are discussed through fishbone.

It is discussed what can be done to minimise the deterioration of the ecosystem.



<https://www.youtube.com/watch?v=eHFDR6esKBE>



https://drive.google.com/file/d/1tBK9XJqsOkV_VU18LxHK8VFwIVJJETuk/view

The video of environmental problems caused by human activities taken from Morpa Kampüs Education portal is watched. Discussions are held on the subject and suggestions are discussed.

Annex 1:

1. To find out where the first clue is, you need to give an example of a living thing in an ecosystem.

Your answer is correct, then you can find the first password at

2. To find out where the second clue is, you need to name an example of an inanimate thing in the ecosystem.

Your answer is correct, then you can find the second password at

3. To find out where the third clue is, you need to name an action of people that causes air pollution.

Your answer is correct, then you can find the third password at

4. To find out where the fourth clue is, you need to name an action of people that causes water pollution.

Your answer is correct, then you can find the fourth password at

5. To find out where the fifth clue is, you need to name a human action that causes soil pollution.

Your answer is correct, then you can find the fifth password at

6. To find out where the sixth clue is, you'll have to find out you need to tell me your action.

Your answer is correct, then you can find the sixth code at

7. To find out where the seventh clue is, you need to know the environmental damage caused by fossil fuels. you need to explain.

Your answer is correct, then you can find the seventh password at

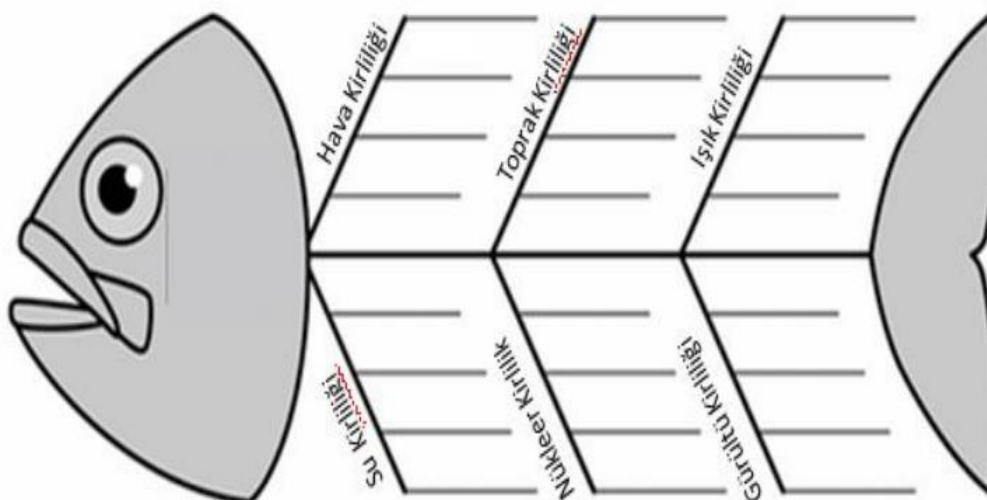
8. To find out where the eighth clue is, you need to find out and explain how exhaust gases damage the environment.

Your answer is correct, then you can find the eighth code at

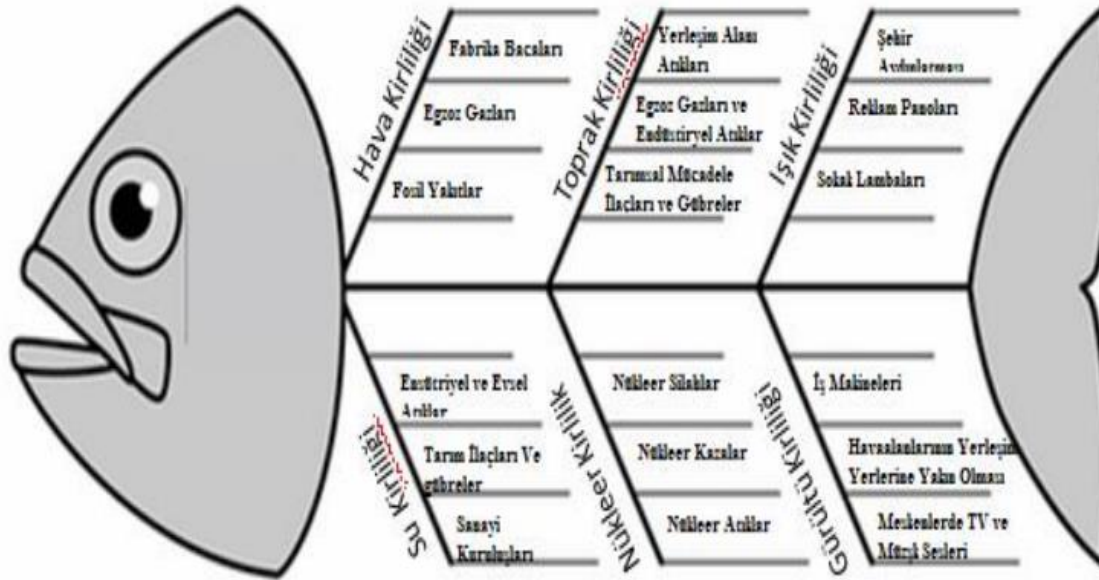
9. To find out where the ninth clue is, you need to explain the environmental damage caused by pesticides.

Your answer is correct, then you can find the ninth code at

Annex 2: Fishbone Cahrt



Annex 3: A filled fishbone on which the passwords are placed



7. Evaluation Methodology

Instruction:

This assessment tool was prepared to evaluate the performance of the students in preparing a design in the activity "I am learning the ecosystem and its types". Please indicate your opinions (observations) according to the following criteria (by putting an X in the relevant section)

Criteria	0 (Not observed) or (Very poor)	1 (Weak) or (Inadequate)	2 Middle	3 (Good) or (Adequate)	4 (Very Good) or (Very Satisfactory)
It is sufficient to determine the subject concepts related to design					
The design to be realized is visually striking					
The design is different/unique from other students' designs.					

Lapbook accurately represented on the model					
---	--	--	--	--	--

8. Additional Resources for the teacher

KARAPINARLI, R., & GÖRGEN, İ. (2014). YARATICI DRAMA TEMELLİ MATEMATİK ÖĞRETİMİNİN İLKÖĞRETİM ÖĞRENCİLERİN BAŞARI VE HATIRLAMA DÜZEYİNE ETKİSİ. Electronic Turkish Studies, 9(5).

Güner, S., Atalay, Y. ve Dolma, A. (2010). 4-siyanobenzaldehit izonikotinoil-hidrazon monohidratın deneysel ve teorik çalışması. Moleküler Yapı Dergisi , 984 (1-3), 389-395.

https://www.google.com/search?q=lapbook+&sca_esv

https://ybsansiklopedi.com/wp-content/uploads/2014/11/ybs_ansiklopedi_v1_is4_December_2014_1.pdf

<https://selinyetimoglu.com/2015/03/23/etkili-karar-verme-surecinde-balik-kilcigi-diyagrami-nasil-kullanilir/>

<https://dergipark.org.tr/en/download/article-file/787038>

<https://dergipark.org.tr/en/pub/turkjcs/issue/34171/377830>

<https://dergipark.org.tr/en/pub/dubited/issue/35735/358033?publisher=duzce>

<https://tr.wikipedia.org/wiki/Ekosistem>

<https://www.morpakampus.com/anasayfa>