

CHAPTER 1

Basic Concepts in Environmental Science and Environmental Education from a Current Perspective

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NATIONAL ENVIRONMENT PREACH

Based on the fact that current and future generations have the right to live in a clean and healthy environment,

Emphasizing that I am in favor of environmentally friendly development,

Knowing that natural resources constitute both the source and limit of economic development,

Believing in the necessity and importance of individual contribution and participation in the protection and development of the environment;

I promise to protect environmental values and warn those who harm them, to be economical when using natural resources, to act in line with the principles of sustainable development, to act in cooperation and solidarity in this direction, and to be an example to everyone regarding the environment.

Süleyman Demirel

President of the time

Hüsamettin Cindoruk

Speaker of the Turkish Grand National Assembly of the time

Prof. Dr. Tansu Çiller

Prime Minister of the time

Rıza Akçalı

Minister of Environment of the time

Introduction

The Turkish Ministry of Environment and Urbanization said in a statement it issued about 30 years ago that humanity was at a historic turning point. Poverty, pandemics, lack of education and knowledge, and hunger are all on the rise. Nations have to coexist with many cultural differences at home but these differences also exist on an international scale. Humanity is accelerating the collapse of ecosystems in order to survive. Assessments made of the environment and sustainable development say it might be possible to achieve a more secure future by improving living standards for everyone and protecting ecosystems, but this is only possible through international collaboration. The framework of such collaboration must be based on a global partnership for sustainable development. This shows that environmental problems are a fundamental issue in the

21st century. We must first talk about ecology if we are to recognize environmental problems and find solutions to them. We then need to adopt a positive stance vis-à-vis the environment and develop environmentally friendly behaviors. This can only be achieved through environmental education. This chapter is going to discuss Basic Concepts in Environmental Science and Environmental Education from a Current Perspective to explain what needs to be considered when raising environmentally friendly individuals.

Basic Concepts in Environmental Science

The Environment

Many definitions of the environment have been made to date. The basic reason for this is that each culture perceives the word “environment” differently and attributes different meanings to it in a cultural sense. When considered as a concept, the environment can be defined as the biological, physical, social, economic, and cultural setting in which creatures maintain relationships and mutually interact throughout their lives (Republic of Turkey Environment Act, 1983). The related literature includes definitions that emphasize people’s relationships and interactions with other people, non-human creatures, and non-living objects (Keleş et al., 2009). One example of this is “The environment consists of humans and all other living organisms together with nature and all the elements in nature that affect human life” (Ertürk, 1998). Such definitions distinguish between humans and other living organisms, implying that humans are superior. Modern definitions appear to move away from this anthropocentric approach and instead adopt one that does not separate humans from other living organisms, one that describes man not as the master of the environment but as part of it. Most definitions of the environment describe it as living organisms and their communities and they include all the non-living external conditions that affect them throughout their lives; such definitions also describe all these factors as a whole. One of the first such definitions says, “The environment is all the factors that affect a living organism’s development and life.” We also see a definition of the environment that puts man at the center and that talks about the natural environment made up of stone, earth, water, and air, the environment made by man that includes houses and vehicles, and the social environment that includes all social relations. Another definition describes the environment as all the biotic and abiotic factors that affect a living being or a group of beings (Erten, 2020; Yıldız et al., 2000). This chapter uses a broader definition of the environment.

The environment is what we call the domain where living organisms and non-living objects interact with one another in equilibrium. The living organisms in this definition comprise producers, consumers, and decomposers. These living organisms are also called biotic factors. The non-living entities are all the physical and chemical conditions such as earth, air, wind, heat, light, and their associated inorganic (elements) and organic matter (nutrients). These are described as abiotic factors. All the living organisms and non-living objects here are what make up the environment. Primarily, the balance between the biotic and abiotic factors needs to be preserved for an ecosystem or environ-

ment to function healthily (Campbell, 1997; Erten, 2022; Kiziroğlu, 2004). It is the environment that gives living organisms the means to meet all their physiological needs such as shelter, nutrition, and maintaining their species. The environment has great meaning for all living organisms. Living beings must be at one with the environment if they are to survive (Karataş & Aslan, 2012).

Another concept that should be discussed while explaining the environment is the ecosystem. A review of the literature revealed that the concepts of environment and ecosystem are often used interchangeably. An ecosystem is a natural system that includes the interaction of living organisms with other living organisms and non-living factors, has all the necessary conditions for living organisms to live, has definite boundaries, and can renew itself. In other words, it is a self-contained living environment where living organisms can meet all their needs to live. An ecosystem can be a small pond or a large ocean. Although the concepts of ecosystem and environment are thought to be the same because they both include living and non-living factors, some elements distinguish these two concepts from each other. The boundaries of the ecosystem are defined, whereas the environment refers to a large area, including ecosystems. It includes small wetlands and vast oceans alike, in short, everywhere and everything that harbors living organisms (Yıldız et al., 2000).

Environmental Science

Environmental science, also known as ecology, is a sub-branch of biology. Environmental science examines the relationships of living organisms with themselves and their surroundings. In a broader definition, environmental science is the branch of science that examines the relationships and interactions of living organisms with living and non-living factors, the cycles of matter and energy that ensure the continuation of life, and the units of space that can renew themselves (Campbell, 1997; Erten, 2004; Kiziroğlu, 2004; Yıldız et al., 2000). The emphasis on living in this definition means all organisms in the realm of the living. Environmental science investigates both the positive and negative interactions of living organisms with living and non-living elements (Erten, 2004).

The history of environmental science tells us that Ernst Haeckel was the first scientist to use “ecology” as a concept. Haeckel provided a broad definition of ecology in 1869: “It is the science that investigates all the relationships of living organisms among themselves and with the organic and inorganic environment they are in.” According to this definition, ecology is a sub-branch of biology and has much in common with other sub-branches such as genetics, anatomy and physiology, evolution, and behavioral science. Although this definition was criticized by the scientists of the time for addressing such a broad scope, the subject area of ecology did not lend itself to a narrower definition. This is why ecology was treated as a separate branch of science in the 1970s when

environmental issues came to the fore on a global scale even though it had been regarded as a sub-branch of biology until the 1960s. At the root of this lie both the concern that environmental problems will now make the world uninhabitable and the effort to find a solution to these problems (Erten, 2004).

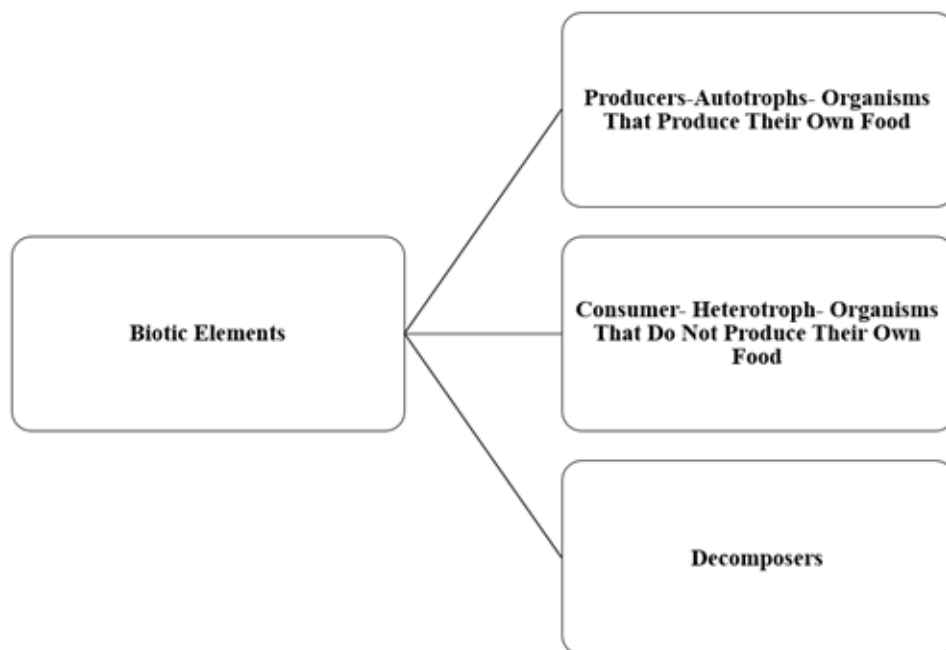
Although ecology seems to have been defined in the 1800s-1900s, it is a much older branch of science. Even before Haeckel's description, scientists knew that living beings interacted among themselves and with non-living factors. Aristotle's definition "The universe is a whole, the elements that make up the universe transform into each other with an endless cycle of matter, living organisms have adapted to the environment they live in, they interact with each other and their environment, and at the same time they are in a struggle to live" is proof that this knowledge existed about 400 years ago (Yıldız et al., 2000).

Biotic Elements

Biotic elements; It will be explained under three headings: procuders, consumers and decomposers.

Figure 1.

Biotic Elements



Producers-Autotrophs- Organisms That Produce Their Own Food

The basic building block of all life is cells, the smallest living unit of structure. Cells are a system in themselves and need energy to function. The source of this energy comes directly or indirectly from the sun. Organisms that synthesize organic compounds from inorganic compounds using solar energy through photosynthesis are producers-autotrophs. They produce their own food.

Consumer- Heterotroph- Organisms That Do Not Produce Their Own Food

Consumers get the food they need to meet their physiological needs from the producers. Animals, fungi, and bacteria are almost all consumers. Plant eaters/herbivores use plants as their only source of food, and meat eaters/carnivores use animals as their only source of food. Those that eat both plants and animals are called omnivores.

1.1.3.3. Decomposers

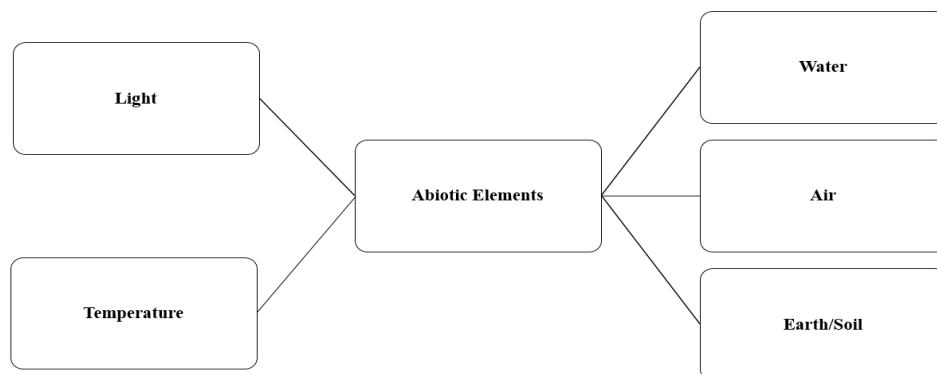
This group consists mainly of fungi and bacteria. The creatures in this group feed on all kinds of waste and also play a part in matter cycles. Decomposers destroy all animal and vegetable waste from fallen leaves to carcasses.

Abiotic Elements

Abiotic elements are all physical and chemical conditions such as soil, water, air, wind, temperature, light and, accordingly, inorganic (elements) and organic substances (nutrients). In this book chapter, air, water, soil, light and temperature will be explained in detail.

Figure 2.

Abiotic Elements



Air as an Abiotic Element

An abiotic element, air is vital as it carries the oxygen that living organisms need to breathe. Oxygen makes up 21 percent of air. Of the remainder, 78 percent is nitrogen, 0.03 percent is carbon dioxide and 0.97 percent is other gases. Carbon dioxide is another important gas for living organisms because it forms the basis of photosynthesis and is thus indispensable for the life of producers. The oxygen generated by the producers through photosynthesis is needed for all living organisms to breathe. The producers need the carbon dioxide generated by the consumers so they can perform photosynthesis. The producers need the inorganic abiotic elements used by decomposers and mixed into the soil to continue living. This example clearly shows the balance in the environment being discussed here. Meddling with any member of this order will upset the entire balance (Erten, 2019).

Water as an Abiotic Element

Waterless environments cannot harbor life. Water makes life possible. The Earth is a planet of water. However, only around 3.6 percent of this water can be drunk, and a substantial proportion of this is found at the poles. Currently, only 0.26 percent of all potable water is available (T.R. Ministry of Environment and Urbanization, 2018). Pollution and squandering of these resources result in droughts and a fall in water quality. Humanity faces a huge risk of drought in the near future. Furthermore, pollution reduces the number of living organisms in seas, rivers, and lakes and adversely impacts the diversity in this ecosystem. Another major problem is waters with increased heavy metal content because these substances accumulate in the adipose tissues of the creatures that live in these waters and reach humans via the food chain. Mankind must develop environmentally friendly behaviors that will be the solution to all environmental problems (Erten, 2019).

Earth-Soil as an Abiotic Element

Earth, or soil, is where many creatures live and feed. This is particularly the case for plants as this is where they cling on using their roots and intake water and minerals. Soil pollution, the destruction of forests, erosion, and excessive use of chemicals and fertilizers all affect the balance within the soil itself. This change in the structure of soil directly affects all life because even in a very small area of agricultural soil, we can talk about there being tons of organisms such as bacteria and fungi. One of the most damaging practices to soil and agriculture is undoubtedly the use of pesticides. Pesticides are chemicals used to destroy agricultural pests. These chemicals become part of the food chain, adversely impacting biodiversity and affecting not only agricultural pests but also many beneficial creatures. Another practice is to burn stubble. After stubble fields are burned, it mixes with the soil and acts as a fertilizer for the soil and at the same time enables the soil to absorb rainwater more easily. It also prevents erosion (Erten, 2019). We must avoid all these if we are to protect the soil.

Light as an Abiotic Element

Light prompts many behaviors such as migration, growth and development, reproduction, and photosynthesis in particular. Creatures need light to survive (Erten, 2019).

Temperature as an Abiotic Element

The Sun is the source of temperature on the Earth. Temperature plays an important role in many vital activities in living organisms, particularly for the functioning of enzymes. Temperature plays a major role in meeting the physiological needs of warm-blooded and cold-blooded animals (Erten, 2019). Temperature is one of the climatic and environmental conditions and also affects living organisms, which are biotic factors.

Relationship of Biotic Elements with Each Other and with Their Environment

Examples of the communication and interaction we see in nature include an animal eating a plant, trees growing deeper and larger roots to reach down into the nitrogen-rich soil, and mistletoe sinking its roots into the body of the tree that hosts it so

it can feed. In each case, the two organisms interact with each other differently. These can be listed as positive, negative, and neutral. Some types of interactions, their effects on organisms, and corresponding examples are summarized in the table below (Erten, 2019).

Table 1.

Relationship of Biotic Elements

	1st effect type	2nd effect type	Example
Competition	Negative (-)	Negative (-)	Regardless which one wins, two mammals fighting over prey lose energy and risk injury
Mutualism	Positive (+)	Positive (+)	A bee fertilizes flowers while feeding
Predation	Positive (+)	Negative (-)	Fungal growth on the branch of a tree. Although all the fungus's needs are met by the tree, the tree itself gets sick and damaged.
Commensalism	Positive (+)	Neutral (0)	Growing an orchid on a tree does not affect the tree either positively or negatively. The tree supports the growth and development of the orchid.
Amensalism	Negative (-)	Neutral (0)	The toxic substances secreted by the roots of <i>Hieracium pilosella</i> (mouse-ear hawkweed) inhibit the growth of the annual plants around it.
Neutralism	Neutral (0)	Neutral (0)	The presence of two insects that live on the same plant and have no effect on each other.

Negative Interaction

Negative interactions are based on energy consumption. The negative effect could also be that a snake eats a mouse or that another mouse has to relocate after consuming all the food in the immediate vicinity. Such interactions are divided into three: **competition**, **predation**, and **amensalism**.

Competition exists in all organisms and harms the entire organism in competition. There are winners and losers among the creatures in competition. The winner will spend more energy than the other to be the winner in this interaction (Allan & Johnson., 1997). This is the downside for the winner. The downside for the loser is losing the conflict. Creatures that live together use common resources in that environment to meet their own physiological needs. These resources are limited and not enough for all the living organisms. This is what lies at the heart of competition. These resources can be food, mate selection, or suitable habitat. It is seen not only in animals but also in plants. The use of sunlight and the effort to spread seeds to larger areas are examples of competition between plants. **Amensalism** is competition in plants. Plants can release toxic substances into their environment and remove other species from their surroundings to thrive. **Predation** is a type of negative interaction based on the relationship between prey and predator. It is based on the strong influencing the weak, thus ensuring the population

balance between the hunter and the prey. Although it seems to be harmful, it is actually useful in that it culls off the weak and sick individuals in populations. This means that future generations will have a stronger genetic makeup (Erten, 2020; Molles & Tibbets, 2002).

Positive Interaction

Collaborations between and within species are also quite common. Symbiosis is when one living organism's entire life cycle, or a significant part of it, takes place with the help of another living organism. Both organisms benefit the other in this kind of cooperative relationship. When both organisms benefit, this is called mutualism. If one party benefits while the other sees no positive or negative effects, this interaction is known as commensalism (Erten, 2020; Molles & Tibbets, 2002).

Neutrality

Relationships in which living organisms are not affected positively or negatively during their interactions. This is frequently seen in interspecies relations because organisms living in the same ecosystem often encounter each other (Erten, 2020; Molles & Tibbets, 2002).

Environmental Issues

The concept of environment is predicated on organisms living in balance with all the living and non-living factors around them. This balance explains interactions taking place in harmony with these factors. It is because of this that organisms can continue to exist and develop throughout their lives. This ecological balance in nature allows this state to continue as long as there is no external influence. This balance is only disrupted as a result of unthinking meddling from the outside (Görmez, 2003). The disruption of this balance results in many of the problems we face today. Many unexpected weather events in almost every part of the world are related to these problems. Examples include heavy rains, floods, landslides, severe wind events such as tornadoes, hurricanes, and typhoons as well as scorching summer heat, droughts, and forest fires due to the rise in temperatures. In short, these problems, which are defined as environmental problems, are all factors that adversely affect the interactions between living and non-living factors and their continuing mutual relationship in a state of balance (Erten, 2004).

We must first discover the reasons for these problems if we are to find solutions to them. Scientists agree that the most important cause of environmental problems is human behavior (Sciama, 2007). One such behavior is human beings using natural resources unthinkingly for their own wants and endless needs. This is because human beings see themselves as superior to nature. Yet, man is only one of the living organisms in the definition of the environment and is as important as other living organisms. In a system where other living and non-living organisms are harmed or destroyed, man too, cannot continue to live. Harm to all these factors will adversely affect all the conditions necessary to maintain life on this planet.

The consequences of the Industrial Revolution accelerated the destruction of

nature. As the population increased, so did consumption and the need for food and shelter. Consumption and the need for food and shelter continued to increase with the population. This led to increased exploitation of limited surface and subsurface resources to meet people's unlimited needs. With their needs easily met, people continued to increase the world's population as prosperity increased. Another factor in population growth is advancements in medical science. These advances have found solutions to many fatal diseases, prolonging human life as a result. The same is true of major outbreaks. Other variables that affect population numbers are advances in technology, increases in food, and fewer large-scale conflicts and wars. Although they may appear to be very positive developments, they negatively impact the carrying capacity of ecosystems and destroy nature. Some of the main environmental problems we face as a result of all this together with their causes and consequences are explained in the following table.

Table 2.

Causes and Results of Environmental Problems (Erten, 2004)

Environmental Problems	Causes	Results
<i>Air pollution</i>	Fossil fuels, burning garbage, radioactive rays	Acid rain, global warming, damage to the ozone layer, smog formation
<i>Water pollution</i>	Excessive fertilization, uncleaned domestic and industrial wastewater, tanker accidents, chemicals, all wastes dumped into the seas	Pollution of rivers, mass deaths of sea creatures, contamination of drinking water, increase in epidemic diseases
<i>Soil pollution</i>	Garbage and garbage heaps, acid rain, fertilization works, pesticides	Increasing heavy metal concentration in the soil, changing the pH value of the soil, becoming a source of pathogens, deteriorating aesthetics
<i>Extinction of animal and plant species</i>	Acid rain, plundering of rainforests, monoculture agriculture and forestry, direct destruction of plants and animals, pesticides	The disappearance of many plant and animal species, the destruction of forests, and the constant increase in natural disasters due to climate change
<i>Changing climates</i>	Destruction of tropical rainforests, unlimited consumption of fossil fuels, use of FKC gases	Formation of the greenhouse effect (Global warming), harmful rays reaching the earth, that is, living things, from the ozone layer
<i>Garbage Problems</i>	Being a consumer society, use and throw away, wastefulness, inadequate use of waste, lack of education	Resources have reached the point of depletion, underground and surface waters have become unusable due to pollution, and soils have become inefficient due to pollution by harmful substances resulting from garbage

Examples of environmental problems include air, water, and soil pollution, loss of biodiversity, plants, and animals becoming endangered or on the verge of extinction, global warming, ozone depletion, acid rain, and the climate crisis. The climate crisis

stands as one of the most pressing environmental problems. This is why the climate crisis was treated as a major problem at all meetings on environmental problems from the Rio Convention in 1992 to the Paris Agreement in 2015. The most important characteristic of these problems is that they are global problems that concern all of humanity regardless of gender, socioeconomic and sociocultural status, race, belief, language, or age and they adversely impact all life (Erten, 2004; Erten, 2019; Escobar, 1995; Nag & Vizayakumar, 2005; Rees, 1995). The first definition of environmental problems was made in the 1960s. Developments in the field of industry and technology in Europe, particularly in the 19th century, have made environmental problems an important problem in Europe and in other countries that will affect the whole world in the future (Görmez, 2015). Societies must first be made aware of environmental problems if solutions to them are to be found. Only by making societies aware will it be possible to conserve natural resources and create the desire to make the planet a more habitable place. Research shows that individuals are aware of the environment and its problems. The most important problem encountered in this context is the failure to develop a positive attitude toward this topic and adopt environmentally friendly behaviors. This shows that the knowledge societies have does not equate to the level of consciousness needed to find solutions to environmental problems. This is where environmental education comes into play.

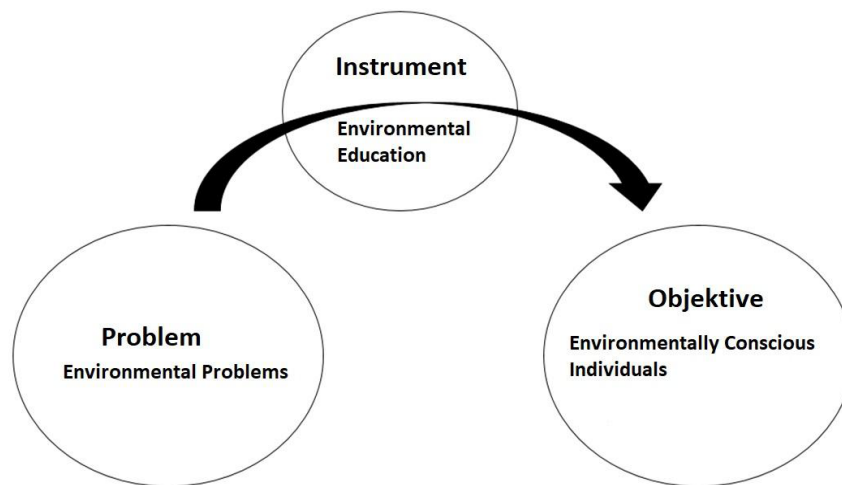
Environmental Education from a Current Perspective

Environmental Education and Environmental Awareness

Every person learns continually throughout their life. Desirable or undesirable behaviors continue to develop as learning continues. The concepts of humanity and learning are the basis of direct education. Education is a process that aims to furnish people with attitudes and behaviors that will contribute to society. Education can thus be examined from two perspectives, namely, society and the individual. In the context of the individual, education is based on changes in a person's behavior. In the context of society, it is the process of transferring accumulated knowledge and experience from one generation to the next (Sabancı, 2016). It also has a responsibility to society for how people behave. If education is the process of steering behavior in the desired direction, environmental education is also an important tool for developing environmentally friendly behavior. Environmentally friendly behaviors are the key to solving environmental problems. Environmental education is thus an important tool for solving environmental problems and raising environmentally conscious individuals by instilling environmentally friendly behaviors (Figure 3).

Figure 3.

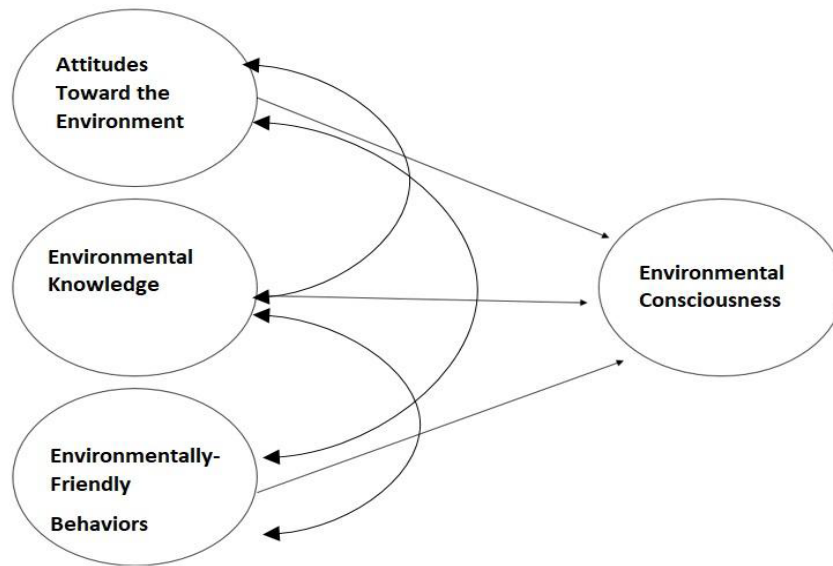
Environmental Problems, Environmental Education, Relationship Between Individuals with Environmental Consciousness (Erten, 2020)



Environmentally aware individuals are those who champion environmental problems and seek solutions, follow up-to-date information about the environment, and act to protect the environment (Smith, 2009). The main components of environmental awareness are environmental knowledge, a positive attitude toward the environment, and environmentally friendly behavior. Environmental education is a transdisciplinary process that teaches individuals these three basic components (Erten, 2019). Raising ecology-literate individuals is the goal of education today. In addition to possessing environmental knowledge, a positive attitude toward the environment, and adopting environmentally friendly behaviors, these individuals are also aware of sustainable development. They know that a habitable planet is the best legacy they can leave to future generations. They are aware of the rules and limits of the environment. They have the knowledge required not to disturb the balance of the environment. They see themselves not as superior to the environment, but as a part of it. They are aware of their dependency on the environment to meet all their needs to continue living (Harrison, 2010). Since instilling all these changes in students is not a simple and linear process, teachers need to have a thorough understanding of the theory underpinning environmental education. Students should first be taught about phenomena, events, concepts, and relationships regarding the environment. Students will develop positive feelings toward the environment as their knowledge of ecology increases. Students should be supported with instructional activities at this time to develop a positive attitude. After raising students who feel happy when they protect the environment and sad when they see the devastation caused by environmental problems, there is one last step to achieve environmental awareness. This is transforming the students' positive attitude into behavior. Students who act to protect the environment, who save, consume conscientiously, use public transport, and recycle

are said to have adopted environmentally friendly behaviors. This is the main purpose of environmental education (Ağyar, 2014). To summarize, it consists of four dimensions, namely, environmental awareness, environmental knowledge, attitude toward the environment, and environmentally friendly behavior. Environmental knowledge includes all existing information about living and non-living factors, the relationships between these factors, environmental problems, and nature. Attitude toward the environment covers all positive and negative attitudes and thoughts regarding environmental problems. Environmentally friendly behaviors are all behaviors that aim to protect the environment (Erten, 2004, 2019; Yüzüak & Erten, 2018).

Figure 4.
Environmental Awareness Dimensions (Erten, 2020)



As mentioned earlier, developments in industry and technology raise many problems. These problems affect all humanity. Unplanned urbanization, a problem introduced by increasing populations, affects children in particular. Today, children live their lives disconnected from nature. Also, with the development of technology, most children have to choose digital games over outdoor games. As a result, children do not know natural life. People who do not know nature will not make any effort to protect it. This is why the new generation appears to be a stranger to nature with little knowledge of environmental awareness and environmentally friendly behavior. The destruction of natural areas and over-urbanization are among the principal important reasons for this. Another reason is the lack of environmentally friendly curricula (Erten, 2004; Kahyaoğlu, 2016; Karataş & Aslan, 2012). This can be addressed by applying environmentally friendly teaching activities in environmental education. Environmental education appeals not only to the cognitive domain but also to the affective and psychomotor domains. This is why researchers and teachers need to design teaching activities with contemporary

educational approaches, including different learning environments such as out-of-school settings. This will increase students' physical and psychological communication alike.

Environmentally Friendly Activity Examples

Activity 1-Lighting

Purpose of the activity: The purpose of this activity is to ensure that students acquire energy saving behavior in order to raise environmentally conscious students. In order to achieve this goal, students must first gain awareness about the cost of the energy they spend at school.

Description: In order to save electricity, it is important to know how much each electrical appliance costs while operating. For example, every student has heard that they should turn off unnecessary lights that are left on. So, what does it cause when it remains open? What does this mean? It is a necessity to think about this issue and discuss it based on existing data.

Activity steps:

1. Students will be divided into groups of 3 or 5 people, considering the class size. Students will be given the following worksheet.
2. Each group will be given a classroom, teachers' room, tea house, principal/deputy principal's room to examine.
3. Student groups will be asked to collect data and fill out the worksheet in the classroom, teahouse, teachers' room, principal/deputy principal room they are responsible for.

Worksheet

Answer the questions below.

1. More than half of the energy used in most buildings is for heating. In addition, energy is consumed for lighting. Where are the places where lighting is provided in our school building?

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2. Are there places in our school building with too much or too little light? What do you think of overlighting?

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3. Is it possible to turn off unnecessary lights and leave the necessary ones on? What might be the effects of this behavior on the environment?

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4. How many bulbs or fluorescent lamps were there in our area? Write by counting.

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5. How many on-off switches were there in our area of responsibility? Write by counting.

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What we will do?

1. Observe the lights in the place you are responsible for for five days. If there is someone in the room, put a “+” sign in the **ROOM column** in the table. If there is no one in the room, put a “-” sign in the **ROOM column**. If the lights are on in the room, put a “+” sign in the **LIGHTS column**. If the lights are on in the room, put a “-” sign in the **LIGHTS column**. If you think the lights are left on unnecessarily, turn them off and warn your friends.

	DAY 1		DAY 2		DAY 3		DAY 4		DAY 5	
TIME	ROOM	LIGHTS	ROOM	LIGHTS	ROOM	LIGHTS	ROOM	LIGHTS	ROOM	LIGHTS
9:00										
10:00										
11:00										
12:00										
13:00										
14:00										
15:00										

2. What are your suggestions to reduce unnecessary light use in our school?

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Activity 2-Taps Repair

Purpose of the activity: The purpose of this activity is for students to realize the importance of water as a natural resource, to gain positive attitudes and behavior towards the environment by saving water with the skill of repairing taps, and to realize the importance of efficient use of resources.

Description: A dripping tap causes 30-200 liters of water to be wasted per day. Repairing a dripping faucet is one of the environmentally friendly actions. For this reason, it is important for students to check whether there is a dripping faucet in their schools and homes and to gain awareness about this issue. Even if there is no dripping tap in the building they live in, students should perform this activity on existing solid taps in order to be prepared for such a situation in the future.

Additional Information: Some taps are called on-off faucets. If an on-off tap is to be used, this structure inside must be completely replaced.

Activity steps:

1. Close the plumbing valve where you live and cut off the water flow completely.
2. To prevent parts of the tap from being lost, cover the drain holes with waste paper or a paper towel.
3. Remove the cover on the tap head with a flat screwdriver.
4. After removing the tap head cover, remove the resulting screw with a screwdriver and set it aside. Remove the tap head.
5. Remove the resulting tap core by turning it counterclockwise using pliers.
6. Remove the tap gasket, which is fixed with a pin under the tap core, by pushing it with a screwdriver or by grasping the edge of the gasket with pliers.
7. Replace the tap gasket you removed with a new one.
8. Now do the exact opposite of the steps you did for disassembly. Replace the tap hub onto the tap body by turning it clockwise with pliers.
9. Place the tap head on the tap hub and place it by applying downward force.
10. Secure the tap head by tightening the faucet hub screw with a screwdriver.

- 11. Replace the tap head cover.
- 12. Open the installation valve and check the operating status of the tap and whether the dripping has stopped.

Worksheet

Answer the questions below.

1. What does water mean to your life?

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2. How much water is in the world? How much of this water is suitable for consumption by living things? Do your research.

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3. Do you think the amount of water in the world can change or run out?

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4. Do you think you use water efficiently? What do you do to use water efficiently? What can you do to increase this efficiency?

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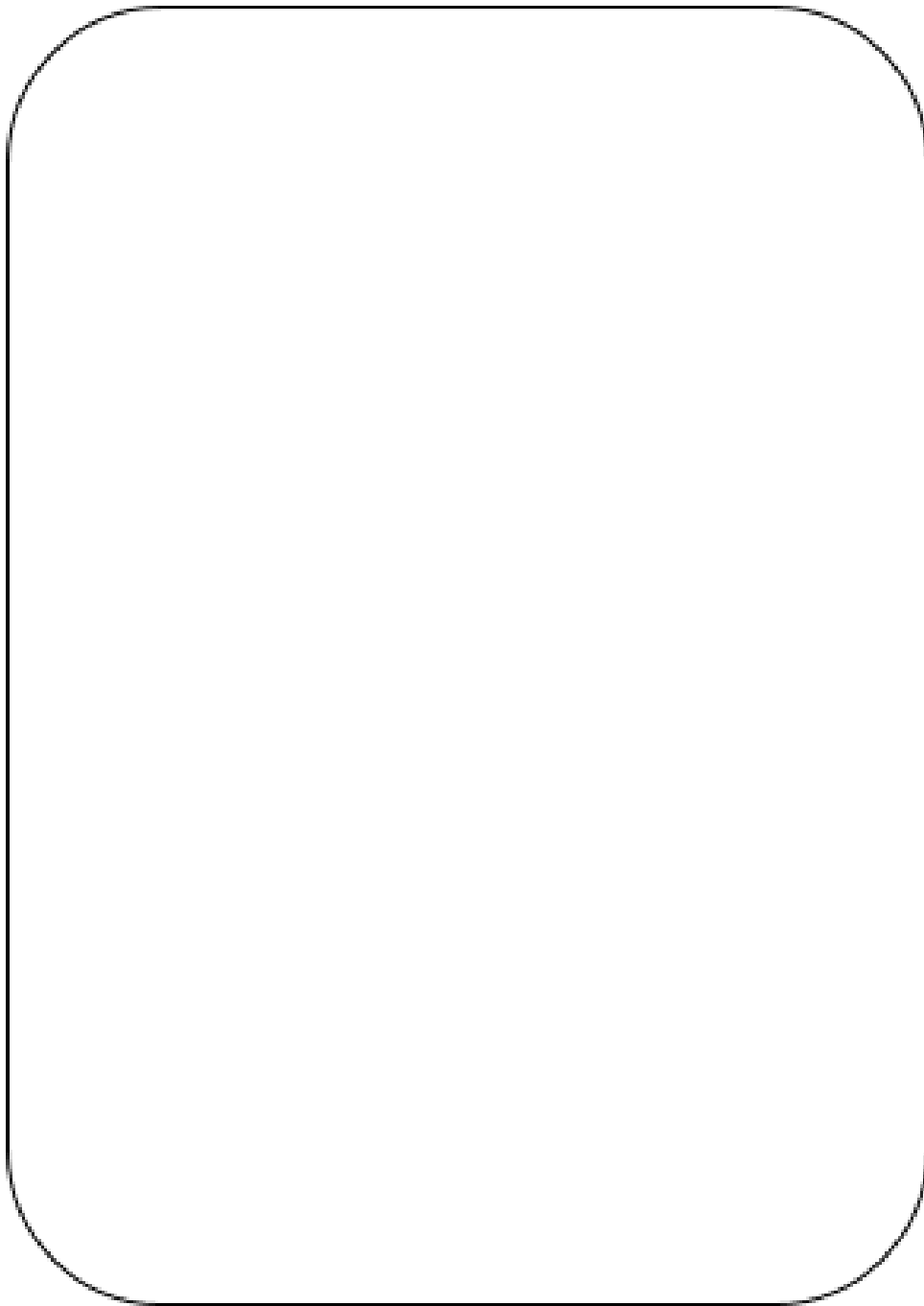
5. What did you change for the environment by fixing a dripping faucet? What benefits did you bring to the school or your family's economy by repairing this tap?

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6. Research World Water Day. Design a poster for this day.



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