

## CHAPTER 10

# *Innovative Thematic Activities in Sustainable Development Education*

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### Sustainable Development

A human being has been in direct interaction with the environment and uses it in line with their needs to maintain his life since the first day of his existence on Earth. Natural conditions on Earth sometimes comfort people's lives and sometimes create complicated situations. The human being, faced with some problems and needs throughout his life, tries to adapt to the environment and nature to survive and change his background (Özbuğutu, Karahan, & Tan, 2014). This situation has been the case since the beginning of human existence. However, since the beginning of the 20<sup>th</sup> century, human environmental changes have reached unprecedented magnitudes. Humans think they have the right to consume nature unlimitedly to live well. Unfortunately, nature no longer finds the opportunity to renew itself due to rapid population growth, increasing needs, and the need for excessive consumption (Karakoç, 2004; Önder & Güven Yıldırım, 2021). Unless the world can renew itself, natural resources essential for life, such as air, water, and soil, will be polluted at an alarming rate. Population continues to increase rapidly; meanwhile, agricultural lands required for food supply, forests that provide ecological balance, and, more importantly, biological systems are rapidly disappearing. Toxic gases and wastes that threaten future generations are increasing worldwide. The increase in

greenhouse gases, global climate changes, the depletion of the ozone layer, and the rate of depletion of natural resources cause many social and societal problems. The Living Planet Report states that the vertebrate population will decrease by approximately 52% quickly (WWF, 2014). Today's environmental problems appear as the new cost of industrial society. Obviously, destroying the environment and making it uninhabitable in the name of economic growth is incompatible with any goal (Karaca, 2007).

Scientists have concluded that human beings are the most fundamental cause of environmental problems, which started with the Industrial Revolution and extended to the present (Legget, 2007). The balance of the world is deteriorating day by day due to the excessive ambition of people (Özey, 2004). Instead of living in harmony with nature and benefiting from nature in line with their needs, people pollute, exploit, and destroy nature. This situation causes severe global problems and threatens the world (Karaca, 2007). The best solution to eliminate this threat is not to consume natural resources if not necessary or to consume less, transforming resources by reusing them. In short, it is necessary to ensure the transfer of natural resources to future generations (Tıraş, 2012). At this point, the concept of sustainable development emerges. The conceptual foundations of sustainable development date back to the 1970s (Walshe, 2013). In the early 1970s, a group of economists and scientists published a report titled "Limits to Growth." In this report, they stated that the Earth has a limited supply of physical resources and warned that consuming these resources could result in disaster (Du Pisani, 2006). The United Nations Environment Conference was held in Stockholm in 1972 and catalyzed the adoption of international agreements on ocean pollution, pollution from ships, and trade in endangered species (Paul, 2008). The concept of sustainability was included in most of the principles adopted by the conference, and it was stated that development should be sustainable. It focused on issues related to the use of natural resources and economic and social issues (Du Pisani, 2006).

The word sustainability means to continuousness and to continue. Sustainable development is meeting the needs of the present so that future generations can meet their own needs (United Nations General Assembly, 1987). In other words, sustainable development is meeting the needs of both present and future generations by considering individuals' basic needs and the natural environment's self-renewal capacity (Conca & Geoffrey, 2004).

### **Sustainable Development Education**

The concept of sustainable development education first came to the fore at the United Nations Earth Summit in Rio Janeiro in 1992 (Fischer et al., 2015; Jickling & Wals, 2008). The teaching and learning approach adapted to sustainable development issues is called sustainable development education (Olsson & Gericke, 2016). Sustainable development education also means uninterrupted education that enables individuals to take sustainable

actions and provides them with the necessary knowledge, attitudes, skills, and values (UNECE, 2005). Sustainable development education has several principles, including intergenerational equality, gender equality, social tolerance, poverty, protection of the environment, protection of natural resources, and the right to live in peaceful societies (Brunold, 2006). In educating people for sustainable development, Orr (1994) identified six pillars of education:

- Education in the fields of science should include environmental education.
- Environmental issues are complex and cannot be explained by a single discipline. Institutions should provide interdisciplinary transformation.
- For individuals residing in the same places, education should be given through dialogues on the characteristics of reasonable consumption. Thanks to these conversations, it will be ensured that people accept the existence of other people living around them so that they do not act selfishly and respect the lives of others around them.
- How education is done is as important as the content of education. Environmental education must, therefore, be oriented to real-life conditions and needs because real learning is experiential and participatory.
- Experiences on Earth are both a practical part of understanding the environment and an aid to good thinking. To understand nature, one must have good observation and field intelligence.
- Education is about building a sustainable society.

Sustainable development education has been introduced in schools as a new and comprehensive education program in recent years (Öhman & Ostman, 2008). Sustainable development education focuses on making the younger generation future responsible citizens (Walshe, 2013).

Sustainable development education provides students of all ages with the knowledge, skills, values, and mediation to address interconnected global issues such as climate change, biodiversity loss, unsustainable use of resources, and inequality. It empowers students of all ages to make informed decisions and take individual and collective action to change society and care for the planet. Sustainable development education is a lifelong learning process and is an integral part of quality education. It develops the cognitive, socio-affective, and behavioral dimensions of learning and covers learning content and results, education, and the learning environment itself (Özer, 2023). An effective education for sustainability can be achieved by changing students' knowledge, attitudes, values, and behaviors (Fien, 1997).

In 2014, the document "Education 2030" was prepared by UNESCO. For the

years 2015-2019, targets, objectives, priority areas, and a roadmap have been determined. The report includes five priority areas (UNESCO, 2022):

- Integrating sustainable development into international and national policies,
- Transforming learning environments into sustainable learning environments (EKO-School green campus),
- Ensuring that in-service and pre-service professional development programs are compatible with sustainable development education in order to develop the capacities of educators,
- Conducting workshops that will strengthen young people's sustainable development visions,
- Increasing the quality of local platforms to strengthen the local dimension of sustainable development.

It is stated that sustainable development should be included in the curriculum at all class levels in schools. On the other hand, these programs need to be developed to equip individuals with knowledge and skills (UNECE, 2005). For this, UNESCO (2013) recommends using activities such as simulations, class discussions, storytelling, drama, peer counseling, games, music, design, and drawings in lessons. A practical, sustainable development education should be prepared following the level of the student and should include various teaching methods and student-led projects (UNECE, 2005). Fien and Trainer (1993) underlined that sustainable individuals can be prepared during the education process and that transforming values and attitudes into behaviors is possible by deeply addressing and expanding sustainable development issues. In addition, for individuals to understand sustainable development, the three-dimensional structure of sustainable development should be handled with a holistic approach (Wolbring & Burke, 2013). Researchers state that sustainable development does not belong to any discipline alone, but various disciplines can contribute to sustainable development at specific rates (McKeown, 2002). At this point, innovative thematic activities for sustainable development education in all disciplines can be practical.

### Innovative Learning

Innovation is defined as the degree to which an individual accepts innovations relatively earlier than other members of his environment (Midgley & Dowling, 1978). Individual innovation refers to the individual's desire to adopt the new, apply, use, and benefit from the innovation. Institutional innovation, on the other hand, refers to the institutional implementation of new ideas suitable for the characteristics and structure of the institution (Kılıçer, 2011; Rogers, 2003).

Innovative learning means that students regularly learn new things, question the information they have learned, and think about new ideas independently (Upadhyay, 2020). By changing the teaching style and method, the teacher incorporates creativity and innovation into the teaching process (Kalyani & Rajasekaran, 2018). In short, any dynamic, system-wide change that aims to add value to educational processes and outcomes is defined as innovative learning (OECD, 2009). Kalyani and Rajasekaran (2018) state that innovative teaching is necessary to help students reach their full potential. However, it is emphasized that teachers' competence in innovative teaching is the most important factor affecting the quality of teaching. At this point, Kalyani and Rajasekaran (2018) presented some suggestions to teachers. These suggestions were given as love the work done, using audio and video tools in the lessons, using the brainstorming technique, including out-of-school activities in the lessons, role-playing, puzzles and games, supporting creativity, and introducing the lessons like a story. Innovative learning is possible with the existence of innovative schools. Turan and Cansoy (2021) stated the main characteristics of innovative schools as follows:

- Using different evaluation methods
- Active use of informatics and web-based learning in blended learning in and out of school learning
- Establishing professional cooperation with the teacher
- Providing out-of-school learning opportunities
- Community participation in the education process
- Providing 21st-century skills-focused learning
- Providing individualized education that pays attention to the individual differences between students
- Courses are generally project-oriented or project-based in a way to develop inquiry
- Designing a flexible learning environment
- Accepting families as the focal point and their participation in learning at school
- Preparing a flexible training program
- Use of strong teaching and learning approaches
- Encourage cooperative learning
- Openness to innovation and arousing the desire to try new applications.

As mentioned above, it is essential to use various learning methods and techniques in the lessons in order to ensure innovative learning. Innovation aims to raise individuals who can think creatively, keep up to date, and create a more qualified and effective teaching-learning process (Taş, 2017). One of the methods and techniques that can achieve this goal can be considered thematic learning.

### Thematic Learning

In the literature, there are many definitions of thematic learning. Jacobs (1989) states, “It is an approach that uses more than one discipline, method and knowledge to teach a theme, concept, problem.” Yıldırım (1996) states, “It is the presentation of traditional subject areas by bringing them together in a meaningful way around certain concepts.” According to Miller (2005), “Thematic learning means helping individuals to live more consciously in their own society and natural environment.”

In thematic learning, themes are centered, and teaching is based on these themes. The main thing here is to gather the information forming the theme under one roof and to reveal its relations with the central theme (Öztürk & Dilek, 2003). The thematic approach states that learning activities should be developed around “Generative Themes,” which are a part of the cultural environment of the students. Generative themes increase students’ motivation, contribute to their being critical individuals, and expand their knowledge about the subject. (Canas, Novak, & Gonzalez, 2004). Meanwhile, thematic learning allows teachers to adapt their knowledge and skills to real-life situations by removing the boundaries created around the lessons taught separately. Students with different intelligences and learning styles benefit from the natural experience of many types of intelligence in different disciplines when learning a skill or concept. During the learning process, students make transitions from concrete concepts to abstract concepts through applied and active learning experiences. Through play and exploration, children discover their world. In integration models, students combine their perceptions of sight, hearing, and touch, allowing them to use these powers (Cone et al., 1998).

With the curriculum updated in 2005, it has been suggested to use thematic learning in educational environments, and the reasons are listed as follows (MEB, 2005).

- To increase study potential and thus their self-confidence by motivating students with individual differences and to ensure that this situation is reflected in different courses,
- To increase students’ awareness of their environment, their ties with the environment, and their awareness of how they can make a difference,
- To ensure students’ respect for different points of view by capturing them.
- To develop team spirit in students,

- To enable students to gain knowledge and skills through the activities they will participate in,
- To improve the study habits of students,
- To improve students' attitudes towards school.

In light of the information mentioned above, it is of great importance to provide an education under a common sustainable development theme in all courses taught in schools since the topics of sustainable development, which is one of the environmental issues, are complex and cannot be explained by a single discipline (Orr, 1994). In this context, innovative thematic learning activities are included as an example of teaching sustainable development in secondary schools.

### **Innovative Thematic Activity Examples**

In this section, sample activities that can be used in “Sustainable Development” education are given in the following courses taught in secondary schools affiliated to the Ministry of National Education in Turkey;

**Activity 1.** Science Course; making alcohol-free cologne

**Activity 2.** Turkish Course; preparing a panel

**Activity 3.** Mathematics Course; creating and interpreting a chart

**Activity 4.** Social Studies Course; preparing an upcycling project exhibition

**Activity 5.** Foreign Language Course; designing a taboo game

**Activity 6.** Information Technologies and Software Course; creating a digital content

**Activity 7.** Religious Culture and Moral Knowledge Course; making creative drama

**Activity 8.** Visual Arts Course; drawing a picture

**Activity 9.** Music Course; designing Wheel of Fortune for composing

**Activity 10.** Physical Education and Sports Course; making compost with competition

**Activity 11.** Technology and Design Course; designing a project

### **Preparation Class**

In order to teach the subject of sustainable development with activities, first of all, students should be informed about these activities. For this reason, in the first place, students are informed about innovative thematic activities, the aims of the activities and the classroom applications of these activities. Again, sustainable development, the importance of sustainable development for our country and the world, and the goals of sustainable development are briefly explained to the students. It is explained to the students that due to the integrated and interdisciplinary nature of sustainable development, a joint learning process will be carried out in all courses. Students are made ready and willing to do the activities.

### Activity 1. Sample Activity for Science Course

In order to teach the subject of sustainable development in the Science Course, students are asked to design projects for the efficient use of resources. First of all, what the project is, its aims and application steps are explained to the students. Afterwards, students are asked to research products that can be used in making alcohol-free cologne and to bring the products they choose to produce alcohol-free cologne to class when they come to the Science class the next week. Students are also instructed to bring empty cologne bottles to class along with these products. The next week, students bring distilled water, vinegar, lemon and orange/lemon peels, fragrant flowers, rose petals and various essences of their choice when they come to class. Then the students start cologne production. Under the guidance of their teachers, students produce their own colognes from these products and put them in bottles. Alcohol-free cologne that can be used easily and safely in daily life is obtained. Sample images of colognes prepared by students are given in Figure 1.

**Figure 1.**

*Sample images of colognes prepared by students*



With this activity, waste materials are evaluated, resources are used sparingly, and cologne is produced at a very low cost. In addition, as a result of this activity, an in-class application is carried out for the purpose of “to realize the mutual interaction between the individual, the environment and the society; to develop awareness of sustainable development regarding society, economy and natural resources”, which is among the objectives of the Science Course Curriculum (MEB, 2018a).

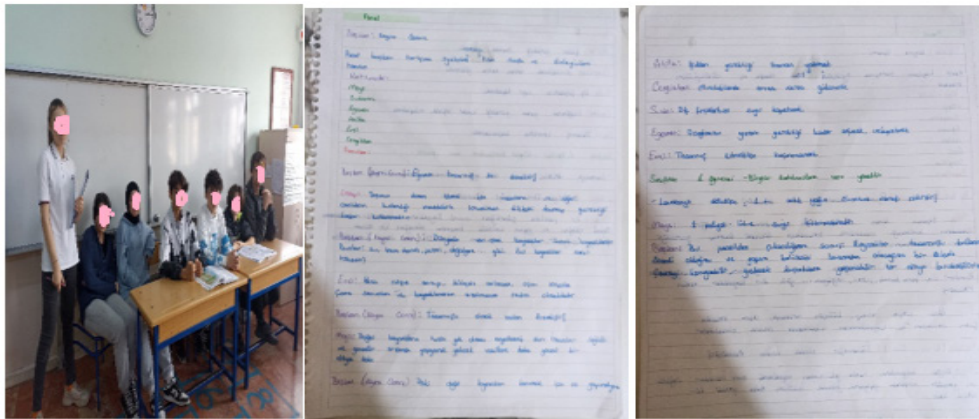
### Activity 2. Sample Activity for Turkish Course

Students are informed about the panel, which is a form of oral expression, within the scope of Turkish Lesson. What the panel is, the parts of the panel, the features of a good panel, the rules to be followed in the panel are explained, and examples of panels made before are examined in class. Then, it is explained to the students that in the next lesson, a panel will be held in the classroom with the participation of the students. Until the next lesson, students are asked to do research on the subject of “Efficient Use of Resources for Sustainable Development” and to scan the relevant resources. In the next lesson,

panelists are selected from the students on a voluntary basis, and a panel chairman is also selected. Then the panel started. In accordance with the panel rules, each student presents the information and data obtained as a result of their own research to their friends. Afterwards, a discussion environment is created within the class on the subject. At the end of the panel, the chairman of the panel concludes the discussion by making inferences about the subject. And the panel ends. Sample images of the panel and the panel chairman's presentation papers are given in Figure 2.

**Figure 2.**

*Sample images of the panel and the panel chairman's presentation papers*

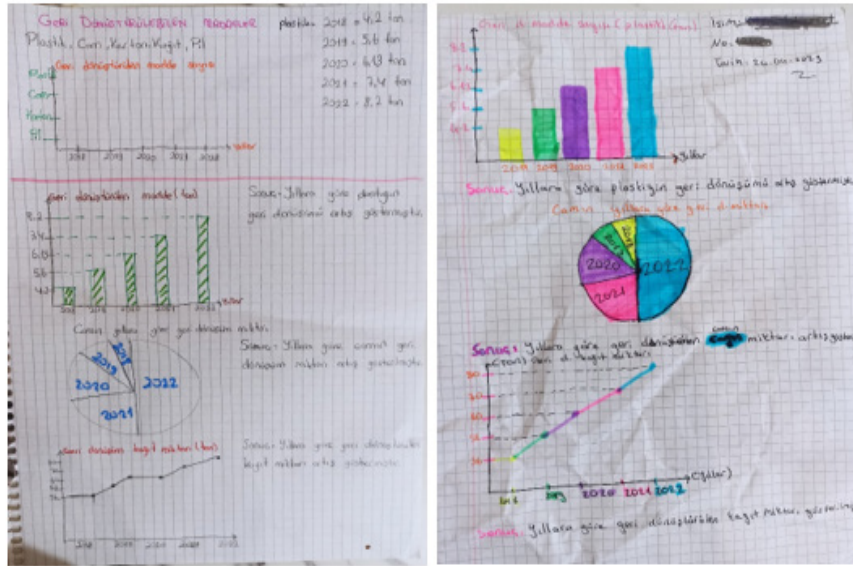


With this activity, first of all, one of the general objectives stated in the Turkish Course Curriculum; “ensuring that students express their feelings and thoughts, their opinions or thesis on a subject in an effective and understandable way, verbally and in writing” and “developing students’ ability to access, organize, question, use and produce information from printed materials and multimedia resources” objectives are provided (MEB, 2018b). In addition, thanks to this activity, sustainable development education is given to the students by discussing the economical use and importance of resources for sustainable development.

### Activity 3. Sample Activity for Mathematics Course

Students are given one week to find the amount of materials such as plastic, glass, metal, paper, cardboard and wood produced since 2018. They are also told to research how much of these products that are put on the market are recyclable. Students bring their research results to the next Mathematics course. Students report the statistical information they obtained from the research results. Then this information is transferred to paper as tables and graphics. Finally, students interpret the results obtained from tables and graphs and make data-based predictions about the scarcity of resources and the status of resources for future generations. Sample images of the graphics prepared by the students are given in Figure 3.

**Figure 3.**  
*Sample images of graphics*



With this activity, students gain skills such as researching, collecting data, reporting data, putting data results into tables and graphs, reading tables and graphs, and making forward-looking predictions. In addition, they gain awareness of the current situation of resources, their sustainability and the resource problems that future generations will experience. With this activity, students also acquire the skills of “researching, producing and using information” and “making sense of the relations between people and objects and the relations of objects with each other by using the meaning and language of mathematics”, which are among the special objectives of the Mathematics Course Curriculum (MEB, 2018c).

#### Activity 4. Sample Activity for Social Studies Course

Before coming to the Social Studies course, students are asked to make preliminary preparations and collect the waste materials (paper, cardboard, plastic bottles, jars, etc.) that they consider recyclable in their homes for a while. During the week of the activity, students bring the waste they collect to school. In addition, before the activity starts, dried branches and leaves in the school garden are collected together with the students. Students are divided into small study groups and each group is asked to collaboratively transform their waste materials into a new product using their imaginations. At this point, the students are told about the concept of waste, recycling, upcycling, and zero waste. The place and importance of these issues in the protection of natural resources is explained, and the contribution of waste evaluation to the national economy is emphasized. All materials brought to the classroom by the students are placed on the cardboards laid in the classroom in such a way that they do not scatter and pollute the environment. Materials such as scissors, utility knives, rulers, crayons, etc. that the

students may need during the activity are also provided by the teacher and brought to the classroom. Then the activity started. First of all, students prepare a draft drawing as a group for their upcycling project and determine the materials they will need. Then, the materials needed are taken from the common area in the classroom and the project work is started. Students make designs such as houses, bridges, water guns, pinball games using their imaginations. Then each group presents their design to their classmates. The activity ends after all groups have completed their presentations. Afterwards, a small school exhibition is organized where students can exhibit the products they made in the Social Studies course. In this exhibition, students explain the necessity of using resources sparingly, the concepts of recycling, upcycling and zero waste, and how they evaluate waste in their own work to other students visiting the exhibition. Thus, other students studying at the school are also made aware of this issue. Other students are also conscious of sustainable development. In addition, the prepared products are also exhibited on the school website and it is ensured that their families can see how the materials considered as household waste can be recycled. In this way, the widespread effect of the projects is increased. Sample images of the exhibition consisting of upcycling projects made by students are given in Figure 4.

**Figure 4.**

*Sample images of the project exhibition and projects*



With this activity, students learn about the concept of waste, recycling and upcycling, zero waste and the importance of these concepts. Students develop the ability

to design a product. At the same time, the course is taught in accordance with the purpose of “students become aware of the limitations of the natural environment and resources, try to protect natural resources with environmental awareness, and have a sustainable environmental understanding” which is among the general objectives of the Social Studies Course Curriculum (MEB, 2018d).

### Activity 5. Sample Activity for Foreign Language Course

English course is chosen for the activity to be done in the Foreign Language course. Before the activity starts, it is explained to the students that the game will be played in the lesson. Then, the key concepts of sustainable development are written on the board in the form of a table in both English and Turkish. The teacher makes students work on these concepts for a while. Meanwhile, the students try to learn the English of the keywords. Then, the English cards that will form the Taboo game are prepared with students. After the English Taboo cards containing the keywords of the relevant subject are prepared, the class is divided into groups. Each group competes in turn and all groups are given an equal amount of time. Each group chooses a narrator for the first round. And the game has started. The narrator tries to explain the word on the Taboo card to his/her friends by paying attention to the forbidden words. Groupmates try to say the English equivalent of the key concept. The group that finds the English translation of the key concept gets points. After all groups have played the game, the group with the most points wins the game. Sample images of the Taboo game are given in Figure 5.

**Figure 5.**

*Sample images of the taboo game*



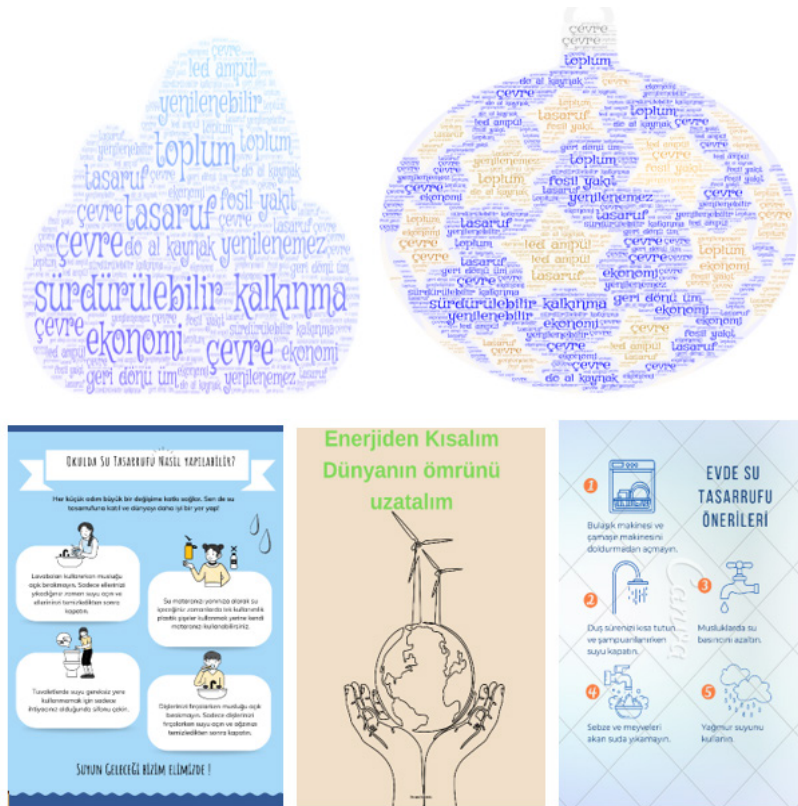
With this activity, students not only have a pleasant learning experience by playing games, but also learn the English of key concepts related to sustainable development. Thus, “to increase students’ interest in learning the target language and to enable them to use this language in real life” and “Students learn the language with pleasure through games, activities related to real life, drawing-painting, role-playing, listening-speaking, and narration” targets, which are the main objectives of the English Course Curriculum, are achieved (MEB, 2018e).

### Activity 6. Sample Activity for Information Technologies and Software Course

Web.02 tools are taught to the students in line with the outcomes in the Information Technologies and Software course. Then, students are asked to prepare original banners, slogans or posters on the subject of sustainable development by using Web.02 tools. Students freely create banners, slogans, posters and even word clouds. Afterwards, the prepared digital contents are published on the school web page and all students are provided with access to these contents. In this way, it is ensured that other students also gain awareness of sustainable development. Sample images of digital content prepared by students are given in Figure 6.

**Figure 6.**

*Sample images of digital content*



With this activity, students create creative digital content for sustainable development and efficient use of resources. In addition, the purpose of “to enable students to use information technologies effectively and in accordance with their purpose” specified in the Information Technologies and Software Course Curriculum is realized (MEB, 2018f).

### Activity 7. Sample Activity for Religious Culture and Moral Knowledge Course

In the Religious Culture and Moral Knowledge course, first of all, students talk about the understanding of the environment in sacred religions, respect for nature, sustainable development goals and the efficient use of resources, under the guidance of their teachers. Students are asked to give examples from religious sources, religious information, and

the lives of prophets on the subject. The place and importance of the environment and natural resources in religion is discussed. Then, the creative drama activity started. The creative drama technique and the application of this technique are explained to the students with examples. In the course, a few preparatory and trial studies are carried out in which the students will take part. Then, ten students are selected from the class on a voluntary basis. Five of these students assume positive behaviors towards the efficient use of resources for sustainable development, and five students assume roles that will exhibit negative behaviors. Students are given some time to prepare and edit for their roles. Afterwards, a creative drama activity is carried out in the classroom. After the creative drama activity is completed, discussions about the creative drama activity are held in the classroom environment. Sample images of students' creative drama work are given in Figure 7.

**Figure 7.**

*Sample images of creative drama*



With this activity, students realize the importance of protecting the natural environment and using resources sparingly, which are included in their religious beliefs. They learn how bad it is to waste resources and what consequences it can have. At the same time, a course is taught in accordance with the purpose of “students’ understanding of the effects of religion on social life, culture and civilization elements”, which is among the objectives of the Religious Culture and Moral Education Course Curriculum (MEB, 2018g).

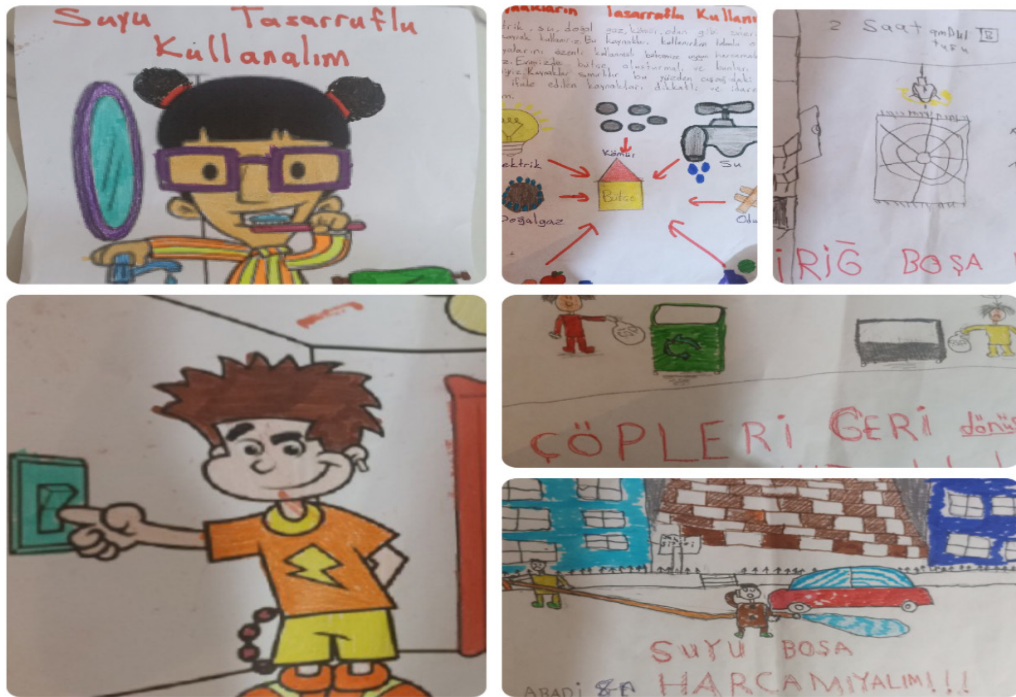
### **Activity 8. Sample Activity for Visual Arts Course**

In the Visual Arts course, the following objectives of sustainable development are explained to the students; “to end poverty, eliminate hunger, to provide health services for a healthy and balanced life, to provide equal opportunity in education, eliminating gender inequality, improve water and hygiene infrastructure, increase energy efficiency and consumption of renewable energy sources, provide decent work and economic growth, to make investments in innovation, industry and infrastructure, provide justice,

build sustainable cities and communities, to create a sustainable consumption and production system, climate action, protect aquatic life, protect terrestrial life, to create peaceful, just and strong institutions, provide cooperation and support”. Students are asked to do research on these 16 objectives and bring their research results to the Visual Arts class. In the Visual Arts course, students are asked to draw pictures for the goals of sustainable development, taking into account their research. Sample images of the drawings made by the students are given in Figure 8.

**Figure 8.**

*Sample images of drawings*



With this activity, students realize a learning experience for the goals of sustainable development. In addition, the goal of raising students who associate Visual Arts with other disciplines, which is among the main objectives of the Visual Arts Course Curriculum, is realized (MEB,2018h).

### Activity 9. Sample Activity for Music Course

For the activity to be done in the music course, a game of Wheel of Fortune material is prepared with the students. Sustainable development goals are written on the wheels of the Wheel of Fortune. After the Wheel of Fortune material prepared with the participation of the whole class, the students in the class are divided into 4 groups. Each group gives themselves a nickname and the competition begins. One student from each group comes to the board in turn and spins the Wheel of Fortune, and the sustainable development goal that appears on the Wheel of Fortune belongs to that group. Sustainable development goal that has come out to one group is removed from the Wheel of Fortune and the other group comes to the board to spin the wheel. After all groups have turned the wheel

and chosen a goal, all groups are asked to write a song about their goal and compose a composition with these words. All groups are given some time for this. At the end of this period, a willing person from the group comes to the board and sings the song for the sustainable development goal of their group to the whole class. Other groups rate this song. And this process is repeated until all the group 'songs' are finished. If desired, the game can be continued until the 16 goals of sustainable development are completed. At the end of the activity, the group with the most points wins the game. Sample images of the Wheel of Fortune are given in Figure 9.

**Figure 9.**

*Sample images of the Wheel of Fortune*



With this activity, students work on the goals of sustainable development by playing games and having fun. In addition, due to the memorability of the lyrics, learning about sustainable development goals becomes more permanent. In addition, an activity for the purpose of “to enable students to express their feelings, thoughts and experiences through music” in the Music Course Curriculum is carried out (MEB, 2018i).

#### **Activity 10. Sample Activity for Physical Education and Sports Course**

Students are asked to make a preliminary preparation before coming to the Physical Education and Sports class. Students are assigned to collect organic waste from home and school for a while. During this time, students collect waste such as egg shells, vegetable and fruit wastes, and newspapers in their homes. In addition, dried branches, leaves, tea and coffee wastes in the school garden are also collected by the students. Students bring all the waste they collect to the Physical Education and Sports class. It is explained to the students that they will make compost with the materials brought. In addition, what compost is, what it is used for and its benefits are explained. Emphasizing sustainability, the importance of using organic wastes as compost is mentioned. Then, all students are taken to the school garden/gymnasium, and identical racetracks with various obstacles are set up in the school garden/gym with the students. In some of these racetracks, students are required to run straight, in some of them dribbling, in some of them they have to complete the racetrack by jumping over obstacles. Then the starting

point of the racetracks is determined. The other end of the racetracks is determined as the waste point where the wastes will be collected. Cardboard boxes are placed at the waste point and all the waste brought by the students is placed at this point in a way that does not pollute the environment. Then the class is divided into as many groups as the number of racetracks. The groups should be equal to each other in all respects and the number of students in the groups should be equal. Each group is given compost columns made from waste carboys. Also, each group member wears gloves. Then the students are told that there will be a competition and the rules of this competition are explained. The aim of this competition is to cross the racetrack starting from the starting point and to return to the starting point by taking as much waste material as possible from the waste point. At the end of the game, the winner of the game is determined by the excess amount of waste brought. At this point, it should be carefully explained to the students that speed and game completion are important, but that the winner will be the group that brings the most waste to the starting point. Then the competition begins. Each group passes to the starting point of the equal racetracks. The students choose a group name for themselves by talking among themselves, and also determine the order in which the players enter the game. Group members start the game with the starting whistle and compete individually, respectively. Until one group member completes the racetrack and returns to the starting point with the waste, the other group member cannot start the racetrack. The competition continues until all group members have completed the racetrack. The competition is over when all group members of any group have finished the racetrack and returned to the starting point. When the game is over, students who cannot play the racetrack may remain in groups that are not fast enough. The rule is that all group members complete the racetrack as soon as possible and bring as much waste as possible to the starting point. After the time is stopped, each group fills their waste into their own compost column. Equal amount of water is given to all groups and they are asked to add this water to their compost. Finally, the compost column of each group is weighed. The group that makes the compost with the most waste wins the game. The prepared composts are poured to the bottom of the trees in the school garden after waiting for the required time. Sample images of the compost competition are given in Figure 10.

**Figure 10.***Sample images of the compost competition*

With this competition, students not only have a fun lesson in a competitive environment, but also make compost that can be used to improve the structure of the soil by evaluating organic wastes. With this activity, one of the main objectives of the Physical Education and Sports Course Curriculum is “to develop communication skills, cooperation, fair play, social responsibility, leadership, sensitivity to nature and respect for differences through physical education and sports” target is achieved (MEB, 2018j).

### **Activity 11. Sample Activity for Technology and Design Course**

In the Technology and Design Course, it is explained to the students that they will design a project. Students are informed about what the project is, its features and how to prepare it. Then the students are divided into groups. Students in the groups are asked to design heat-insulated house models for the efficient use of resources. All the necessary materials are given to all groups and students work to design a project during the lesson. At this point, students can create the main skeleton of their houses from cardboard, prepare the roof of the house using styrofoam, add doors and windows to their houses, and paint the exteriors of their houses in the colors they want in their heat-saving house projects. Again, some groups may stick aluminum foil to the windows in order to save heat, and some groups may cover the exterior of the house with thermal insulation materials (cotton, foam, styrofoam). Sample images of the projects made by the students are given in Figure 11.

**Figure 11.***Sample images of students' projects*

With this activity, students designed project houses that can save energy with thermal insulation materials in line with the sustainable development theme. In addition, an activity was carried out in the Technology and Design Course Curriculum with the aim of “to enable students to take responsibility for the solution of the problems they encounter in daily life and to use technology development processes and design skills in the solution of these problems” (MEB, 2018k).

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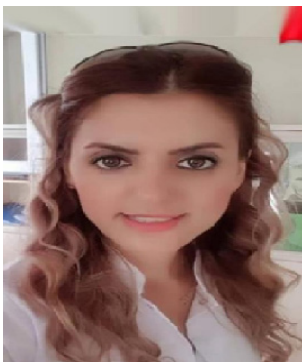
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