I Design My Dream Environment Lesson Plan

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Integration

21st Century Theme: Global Awareness

Disciplinary Concepts	**Mathematics** Views of objects from different perspectives 2D shapes 3D objects	**Science Education** Recycling
	Technology Creating animation Creating a poster	**Art** Architectural design

Prerequisite Knowledge

Learning Outcomes for Mathematics:

- Students are able to calculate the area of the rectangle, using square centimeters and square meters.
- Students are able to create the area formula of the triangle, solve the related problems.
- Students are able to create area formula of parallelogram, solve related problems.
- Students are able to recognize rectangle, parallelogram, trapezoid, and rhombus; determine angle properties (Square is treated as a special type of rectangle and rhombus. Besides, rectangle and rhombus are treated as special types of parallelogram. Also rectangle, rhombus, and parallelogram are treated as special types of trapezoid.)

Learning Outcomes for Science Education:

- Students are able to realize the importance of resources and recycling necessary for life.
- Students are able to make inferences about environmental problems that may occur in the future as a result of human activities.
- Students are able to discuss the benefits and harmful situations in human-environment interaction on examples.

Learning Outcomes for Information Technologies

- Students are able to perform research at a basic level using search engines.
- Students are able to explain image file formats.
- In addition to file formats, file types such as vector and bitmap are emphasized.
- Students are able to carry out the editing processes related to the visuals.
- By using open-source or free-access visual processing programs, activities such as cutting, changing the color, and drawing a new image are performed on images.

Learning Outcomes for Social Studies:

- Together with their friends, students are able to develop ideas for the solution of global problems.

Learning Outcomes

Grade Level: 7th-grade
Duration: 10 lesson hours

Learning Outcomes for Mathematics

- Students are able to draw two-dimensional views of three-dimensional objects from different directions.
  Structures made of equal cubes and known geometric objects are used. Suitable squared papers are used for drawing. It is requested to associate the views of the structures from different directions (such as symmetrical front-back and right-left views). b) Interactive studies can be included with appropriate information and communication technologies.

	• Students are able to create the structures whose drawings are given regarding their views from different directions. Structures made of equal cubes and known geometric objects are used. Isomeric paper can be used to draw structures made up of equal cubes. • Interactive studies can be included with appropriate information and communication technologies. **Learning Outcomes for Science Education** • Household Waste and Recycling • Students are able to distinguish between recyclable and non-recyclable materials in household waste. • Students are able to design a project for the recycling of household solid and liquid wastes. • Students are able to question recycling in terms of effective use of resources. • Students are able to pay attention to waste control in its immediate surroundings. • Students are able to develop a project to deliver reusable items to those in need. **Learning Outcomes for Information Technologies** • Students are able to design a poster using a poster creation program. • Students are able to explain the basic concepts of animation. The logic of working with squares is explained. • Students are able to create the scenario of the animation with the help of storyboard. • Students are able to recognize the interface and features of the animation program used. • Students are able to create animation for a specific purpose. **Visual Arts** • Students are able to use art elements and design principles while creating visual artworks.
Real World Context	**Problem Situation** In order to find solutions to natural environmental problems, students are expected to make an environmental design.
	Materials Appendix 1, Appendix 2, Appendix 3, Appendix 4, unit cube, internet, computer, printer
	Preparation for the lesson Teachers will prepare for the lesson by researching the following questions to learn about and integrate recycling into the lesson: ● What is recycling? ● What are recyclable and non-recyclable materials & products? ● How do recycled materials re-enter production? ● How is waste control ensured? ● What are the products made with recycled materials? In which areas have they been utilized? ● What are shape and object? What are the differences? ● What are the 2D views of 3D objects like? ● How to use the Storyboardthat animation creation site?
	Resources https://evduzenleme.com/plastik-sise-kapaklarindan-neler-yapilabilir/ https://www.homejelly.com/green-art-bottles-recycled-into-beautiful-form-and-function/ https://twistedsifter.com/2012/03/animals-sculptures-made-from-shattered-cds/ https://i.pinimg.com/originals/7d/75/08/7d7508995d10cacef3b0d03dd33bcb0b.jpg https://i.pinimg.com/originals/24/44/33/24443311c03d246f3ec0b8949675ca6f.jpg https://www.viking.com.tr/gelecege-donusum.html#:~:text=1%20ton%20kullan%C4%B1lm%C4%B1%C5%9F%20ka%C4%9F%C4%B1t%20%C3%A7%C3%B6pe,karbon%20dioksitin%20bertaraf%20edilmesini%20sa%C4%9Flar https://www.freepik.com/ https://www.towardszerowaste.gov.sg/recycle/what-to-recycle/ https://www.omo.com/tr/iyilikicinkirlenmekguzeldir.html https://www.storyboardthat.com/storyboard-creator https://www.youtube.com/
STEAM Activity	**Ask** The lesson begins by brainstorming. Students are asked the following questions: ● What is recycling? ● Why is recycling important?

Receiving the answers from the students, the teacher starts the video (provided with the link address) about the importance of recycling (Recycling | Why is Recycling important ? | Learn about Recycling | Recycle Process | Video for Kids).

After the video, the following questions are asked to the students, and a discussion environment is created in the classroom:

- What would happen if we couldn't recycle used products?
- Which products can we recycle?
- What do you do to contribute to recycling?
- Have you used a recycled product?
- Why is it important to recycle products?

Appendix 1. What Happens If It is Recycled? named material is projected onto the screen with the help of the smart board or printed out and pasted on the board so that all students can see it. After sharing the material with the students, the contribution of the paper to the environment and economy when recycled is discussed. The class discusses whether all products are recyclable. After the discussion, the video with the link address is watched (Recycling for Kids | Recycling Plastic, Glass and and Paper | Recycle Symbol | Kids Academy) and the same question is discussed again. After the video, which products are recyclable or not are discussed along with their reasons.

Research

The teacher shares the link provided with the students so that they can research recyclable and non-recyclable products (https://www.towardszerowaste.gov.sg/recycle/what-to-recycle/). The site contains a list of recycled products and non-recyclable products, and information on how recycled products are recycled. The teacher asks students to examine this site before coming to class. They are asked to choose five of the products they examined, and write a report on the recycling process of these products. When students come to class, they present the information they have researched.

Students are asked if they have any information about the OMO's "We contribute to the transformation of plastic waste into playgrounds" project. Briefly, the project is introduced, and the purpose of the project is discussed in the class. To raise awareness among students about what can be done with recycling, the material named " **Appendix 2. Products Made with Recycling** " is examined. For this purpose, the material is projected onto the screen with the help of the smart board or printed out and pasted on the board so that all students can see it. Students are asked the following questions and the answers are discussed:

- What kind of a place would you like to design with recyclable products?
- Which recycling material would you use? Why?
- Why did you choose this area? (E.g. garden, house, school, park, etc.)

Imagine

Students are divided into groups of four or five. Students who want to make similar designs can be gathered in a group. Each student shares his/her idea by providing reasons with the group. As a group, students decide on the environment they will design, and the objects that should be in this environment. They determine which recycling materials they want to use to create these objects. The questions that students should ask themselves while building their imagined environment are as follows.

- What kind of environment do I want? (E.g. safe, eco-friendly, pet-friendly, etc.)
- What do I aim for in this environment?
- What might be the needs of the people living in this environment? To what extent do I meet these needs?
- What are your favorite things in your city and neighborhood?
- What buildings, services, recreation areas or venues should the community have?
- What is the geographical structure of the city?
- Is there fresh water in or near the city?
- Why do people want to live in the city?

Plan

The students are given **Appendix 3. squared paper** and a sufficient amount of unit cubes for the areas to be designed. The groups brainstorm about what kind of environment they will design.

Create

The groups are asked to create the environment they will design with unit cubes in 3D. Groups are asked about different side views of the designed environment. The worksheet named **Appendix 4. Different Side Views of the Design** is given to each group so that they can make the drawings of these views. Then, they draw views of this environment from different sides on the paper given. At this stage, students are guided by the teacher to correctly draw the views of the 3D drawings from the left, right, front, back, top and bottom. After completing their environment, students go to https://www.storyboardthat.com/storyboard-creator and create a poster that will encourage people to live here by expressing the characteristics of the environment they designed. One or two

	students from each group are assigned as spokespersons to present this design and poster. The designs are printed on colored paper by the teacher and given to the groups.
	Test Students complete the design they prepared with unit cubes and the 2D views they drew on paper and submit them to the teacher. The teacher distributes the papers to the groups randomly (making sure that each group receives a different group's paper). The groups are asked to find the environment designed with unit cubes of the views on the paper. At this stage, students are expected to find objects and appearances by comparing them. The teacher should guide the students, if needed. After each group matches the drawings and objects, the student or students selected as a spokesperson in each group come nearby their own designs and tell the group about their designs, share their posters, and try to ensure that those people live in this designed environment. Students are given 2-3 minutes. Then they are asked to listen to different groups. When all groups and spokespersons are completed, the reasons why a student wants to live in which environment are shared in the class.
	Improve Groups are asked to compare their drawings and objects, and to correct any mistakes. They are expected to complete the arrangements if they want to add or subtract from the feedback received while describing their environment. Students are asked to develop their designs by thinking about the following questions: ● What do you think will make your community even better? ● How do you help people feel comfortable and safe? ● Is there a difference between your 2D design and your 3D design? (You can test the structures by comparing their appearance.) ● Which part of your city excites you or makes you proud most? ● Can you create different communities within the city? ● Can you make the community look like a community you've visited in the past? ● How is your community different from a community in another country? ● How do moving buildings change the feel or purpose of the community? ● Can you arrange your city to have electricity powered by renewable energy? ● Can you make a major tourist attraction in your city to promote tourism and strengthen the economy?
Materials	The material named **What Happens If It is Recycled?** has been prepared for students to gain awareness about recycling. The material named **Products Made with Recycling Materials** has been prepared for students to gain awareness of what can be done with recyclable materials. The worksheet named **Area to be Designed** has been prepared for students to use in the planning phase of the environment they will design. The worksheet named **Different Side Views of the Design** has been prepared for students to draw the views of the 3D design they created.
Test	*This part will be completed by the teacher after the lesson plan is implemented in the classroom.*
Improve	*This part will be completed by the teacher after the lesson plan is implemented in the classroom.*

Appendix 1. What Happens If It is Recycled?

In a year, when 1 ton of used paper is not thrown away, but recovered and reused in paper production;

	It ensures the disposal of 12,400 m3 of carbon dioxide, a greenhouse gas in the air.
It ensures the continuation 12,400 m3 of oxygen production .	
	It provides the protection of 17 mature trees, which provide the oxygen needs of 34 people.
It saves 32 m3 of water consumed by 3 families in 1 month .	
	It saves 2.4 m3 from landfills.
It saves 1,750 liters of fuel-oil that 2 families will consume for heating in winter.	
	It saves 4,100 KW/h of electricity that 20 families will consume in 1 month.

Appendix 2. Products Made with Recycled Materials

Table and Chair

Wall Decorations

Lighting Made with Plastic Bottles

Animal Figures Designed with CD

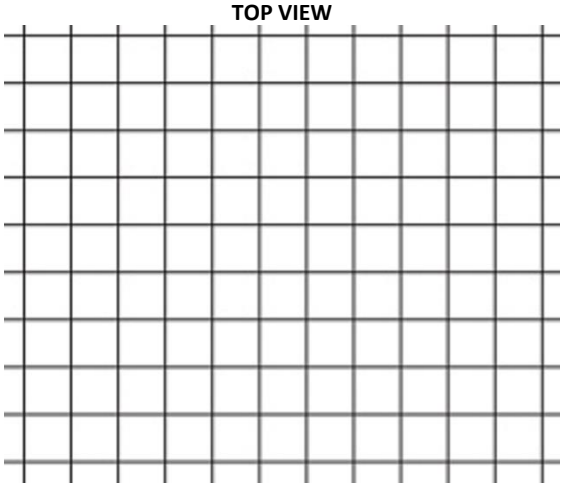
Chicken Figure Made with Eggshells

Rabbit Figure Made with Unused Materials

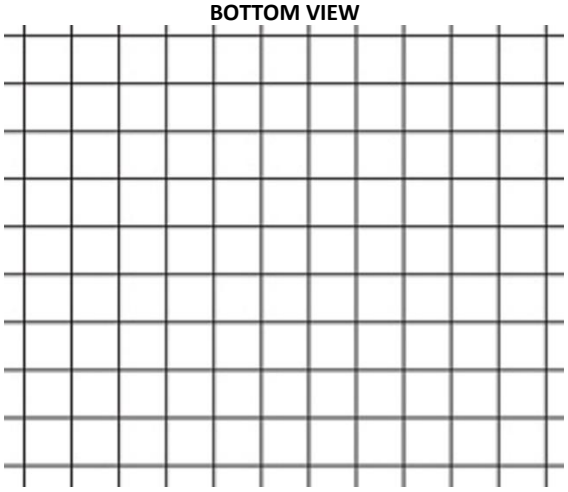
Appendix3. Design Area

Appendix 4. Different Side Views of the Design

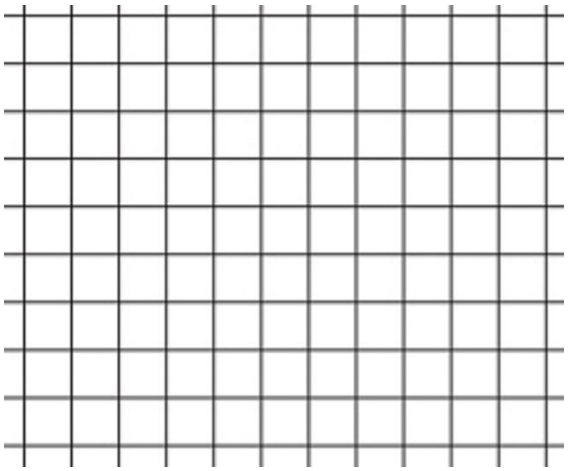
TOP VIEW



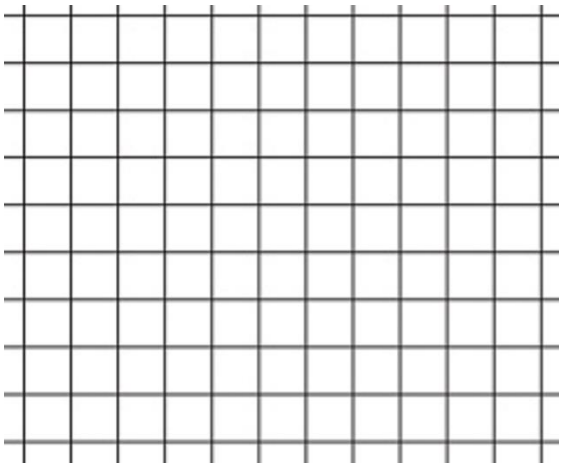
BOTTOM VIEW



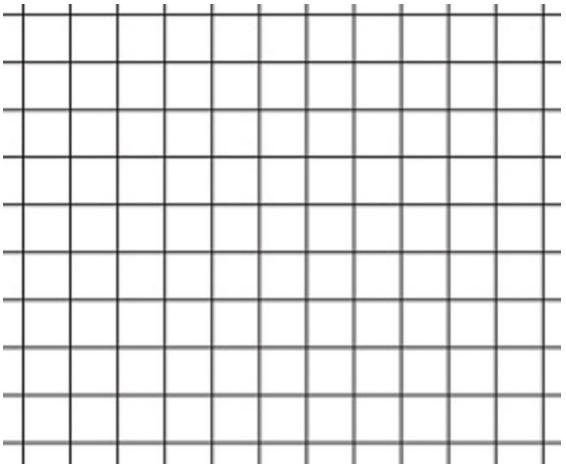
FRONT VIEW



BACK VIEW



RIGHT VIEW



LEFT VIEW