

## Didactic Scenario

### 1. Title

Sustainable Architecture

### 2. Keywords

Engineering, Technology, Maths and ICT

### 3. Basic Information

**STEAM Subject:** Engineering, Maths, Arts, ICT, Mosaics

**Typical interaction time with the instructional scenario in teaching hours for in-school work:**  
4 hours

**General description of the scenario:**

<u>Phases</u>	<u>Stage</u>	<u>Time</u>
Warm-up activity, introduction to the topic	preparation stage	20'
Explanation of work ahead and what is expected of them	preparation stage	50'
Presentation of the instructional-educational content	implementation stage	120'
Evaluation	conclusion-evaluation stage	50'

**Age group:** 10-11 years old

**Estimated difficulty level:**

Very Easy	Easy	Moderate	Challenging	Very Challenging
			X	

**Teaching resources**

**Material:** cardboard, glue, colored photocopy papers, straws, waste boxes

**School infrastructure:** Internet access, video projector or projection screen, tablets or smartphones

**Additional material from external sources/online tools:**

<https://youtu.be/awwYWhnLnao>

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

**Developed by:** Nurcan Büyükbayram

#### 4. Educational Problem

With the increase of the human population, it has become inevitable that environmental problems will increase and it has become necessary to make changes in the architectural structures. The importance of sustainable architecture, on the other hand, has increased its importance more clearly with the distorted urbanization that has occurred in increasing metropolitan populations.. This situation becomes an even bigger problem when the difference between the growth rate of the world population and the population Deceleration rate experienced in metropolitan cities is evaluated. The inability of the world to keep up with the pace of rapidly expanding metropolises in terms of population leads to distorted urbanization in these metropolises and, naturally, an increase in environmentally and environmentally unfriendly structures Considering the increasing environmental problems, infrastructure problems and many other adverse living conditions, the Decency between metropolitan cities and other cities is quite obvious. For this reason, sustainable architecture is of great importance, especially for metropolitan cities. The way to leave a more livable world to future generations is through sustainable architecture.

#### 5. Learning Objective (-s)

1. Explains the concept of innovation.
2. Evaluates the applications of sensor technology in daily life.
3. Converts draft drawings into three-dimensional visuals on computer.

## 6. Phases of the Scenario

### Phase 1

**Title:** Warm-up activity, introduction to the topic

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 20'

#### Detailed description of the scenario phase:

The students will do brainstorming by asking these questions: 'What should be done to converse and sustainably use the oceans, seas and marine resources for sustainable development? What can be the measures to be taken to protect, renew and promote the sustainable use of terrestrial ecosystems, to manage forests sustainably, to combat desertification, to stop and reverse the loss of soil fertility and to stop the loss of biodiversity

**Activity sheets:** N/A

### Phase 2

**Title:** Explanation of work ahead and what is expected from them

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 50'

#### Detailed description of the scenario phase:

Students will watch the presented material and participate interactively in the lesson; Let's find our solution suggestions by creating a mind map with our students. Creating word clouds of solution suggestions for our second theme using WordArt web 2 tool.

Students will watch the following videos on the relationship between Mathematics and sustainable environment, time and the diversity of environmental damages:

<https://youtu.be/s7MWyNezaww>

<https://youtu.be/ZJccLEGfHo>

<https://youtu.be/HAOCnDMGdKU>

<https://youtu.be/z2Fb0R2EYo4>

<https://youtu.be/Aa-o46CjlpE>

[Sürdürülebilir Mimari \(archi101.com\)](http://archi101.com)

Activity sheets: N/A

### Phase 3

**Title:** Presentation of the instructional-educational content

Indoor	Outdoor	Mixed
X		

**Phase duration in minutes:** 40'

#### Detailed description of the scenario phase:

In order to measure the carbon footprint, items such as cement, iron, aluminum, heating-cooling devices, etc. which have high environmental damage, especially during production and transportation of the constructions carbon emissions that will occur during the construction and of the buildings and later on should be calculated and an 'environmentally friendly' buildings are rationally designed buildings. Rational architecture is defined as 'designing the harmony of the building and nature and implementing it in a way that does not harm nature and humans. It must be documented that the materials do not harm the nature not only during use but also during production and construction phase.

Students will do research on sustainable architecture and develop ideas on how to build environmentally friendly buildings.

They can watch example of best practices to design their own houses at the engineering stage.

<https://youtu.be/leAWBCw5fiQ>

<https://youtu.be/iL1Lu-qA9t0>

[https://youtu.be/T\\_r-isEooX8](https://youtu.be/T_r-isEooX8)

[Dondurma Çubukları ile Ev Yapımı- Basit maket ev yapımı \(tr-cam.net\)](http://tr-cam.net)

Activity sheets: N/A

## 7. Evaluation Methodology

Students will search examples of sustainable architecture models and study on what to pay attention while designing buildings in cities of future. Mathematics has an important role in architecture and one cannot design a building without Mathematics.

## 8. Additional Resources for the teacher

Students will answer open questions, make artistic creations using digital applications.  
The teacher will use the answer garden web2 tool to give feedback and discuss their designs.  
<https://answergarden.ch/1718691>

Peer assessment can be done by using the following rubric.

	EXPERT	ADVANCED	APPRENTICE	NOVEL	WEIGHT
	4	3	2	1	
<b>Design / Creativity</b>	Excellent use of tools/technology. Strong creativity	Good use of tools/technology. Remarkable creativity	Fair use of tools/technology. Sufficient creativity	Poor use of tools/technology. Little creativity	30%
<b>Scientific report</b>	Excellent, complete, precise	Good, quite complete, clear	Sufficient even if not complete, quite clear	To be improved, incomplete	25%
<b>Engineering / NBS solutions</b>	Excellent understanding of how a constructed wetland works	Advanced understanding of how a constructed wetland works	Good understanding of how a constructed wetland works	Understanding of how a constructed wetland works to be improved	25% <input type="text"/>
<b>Presentation / pitch</b>	Presentation excellent, concise, effective	Very good, concrete, quite effective presentation	Simple, but clear presentation	Presentation to be improved, not completely convincing	20%