

AEROSPACE IN CLASS  
LEARNING SCENARIO

Future of the Skies:  
A Step in the Future!



Funded by the **Airbus Foundation** and coordinated by **European Schoolnet** (EUN – the network of 34 European Ministries of Education), the **Aerospace in Class Project** is about piloting STEM resources from the **Airbus Foundation Discovery Space**, a digital portal for aerospace exploration, connecting students, parents and educators across the globe with professionals in the field, bringing today's research and technology to life. The creation of this Learning Scenario is supported the **STEM Alliance** (an initiative that brings together industries, Ministries of Education, and education stakeholders to promote STEM education and careers to young Europeans) and by **Scientix**, funded from the European Union's H2020 research and innovation programme – project Scientix 4 (Grant agreement N. 101000063). The content of the document is the sole responsibility of the organizer and does not represent the opinion of the European Commission (EC), nor is the EC responsible for any use that might be made of the information contained.

# Future of the Skies: A Step in the Future!

By Ilze Šmate

## Abstract

In this Learning Scenario, students will learn about renewable and non-renewable resources. They have to think about future life, how to save resources and how to manage everyday life to save and protect nature.

Students will start with a brainstorm activity on what kind of resources do we use in our daily lives. In the next step, they will work in pairs about renewable and non-renewable resources. After some introductory videos, among which “the Future of Cities” from the Airbus Foundation Discovery Space, students will work individually using Tinkercad. They have to create and design a future city integrating at least two renewable energy resources and present this to the class.

## Keywords

Energy, Nature Resources, Renewable Resources, Non-Renewable Resources

| Table of summary                |  |
|---------------------------------|--|
| <i>Subject</i>                  | <i>Science, natural science</i>  |
| <i>Topic</i>                    | <i>Renewable and non-renewable resources<br/>Future of Cities</i>  |
| <i>Age of students</i>          | <i>11-12 years old</i>   |
| <i>Preparation time</i>         | <i>Ca. 20 min<br/>Note: Preparation for Tinkercad: ca. 10 mins (or 60 mins)<br/>It takes only about 10 mins to create Tinkercad accounts for your students. Ideally, they would all have had at least one 60-minute lesson in Tinkercad prior to this lesson, whereby they logged into the classroom environment and completed a basic tutorial.<br/>Otherwise, your time for your lesson will be eaten up and the learning will not be maximised.</i>   |
| <i>Teaching time</i>            | <i>90 minutes<sup>1</sup></i>  |
| <i>Online teaching material</i> | <i>Where Do We Get Oil From?<br/><a href="https://www.youtube.com/watch?v=xZ1HIBIJU0">https://www.youtube.com/watch?v=xZ1HIBIJU0</a><br/>How is Coal Formed?<br/><a href="https://www.youtube.com/watch?v=BQ_Ethb6_Wk">https://www.youtube.com/watch?v=BQ_Ethb6_Wk</a><br/>How aerospace will shape the future - Future of Cities:<br/><a href="https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/future-of-the-skies.html#Cit">https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/future-of-the-skies.html#Cit</a><br/><a href="https://www.tinkercad.com/">https://www.tinkercad.com/</a></i> |

<sup>1</sup> Extra time will be needed if students are not familiar with Tinkercad. See preparation time above.

|   |  |
|---|--|
| <i>Offline teaching material</i>                        | <i>Sticky notes with resources (labelled with: Water, Wind, Sun, Biomass fuels, Geothermal energy, Coal, Oil, Natural Gas, Wave, Wood)</i>   |
| <i>Airbus Foundation Discovery Space resources used</i> | <i>How aerospace will shape the future - Future of Cities:<br/><a href="https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/future-of-the-skies.html#Cit">https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/future-of-the-skies.html#Cit</a></i> |

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## Integration into the curriculum

The Learning Scenario easily fits into the science curriculum in Latvia. This lesson is aimed at 5<sup>th</sup> to 6<sup>th</sup> grade (11-12 years old). At the end of 6<sup>th</sup> grade, according to the Latvian State Basic Education Standard, pupils need to:

- know the various natural resources, their products and how to use them.
- know kinds of natural resources: renewable and non-renewable resources.
- distinguish between renewable and non-renewable sources of energy.
- know how to explain that energy (electricity, heat, light, energy for living organisms) can be obtained from different natural resources.
- use the most efficient energy saving methods and choose the most appropriate ones and explain their choice.
- to group natural resources (renewable and non-renewable) and describe their conservation, reuse and recycling options, using information sources and observations.
- observe changes in nature, formulates causal relationships, including experimental data, do conclusions about the research question.
- explain the impact of rational use of natural resources (wind energy, water resources, wood) on the environment, human living conditions, gathering information from various sources.

## Aim of the lesson

1. Raise awareness about renewable and non-renewable sources as well as the need to preserve them.
2. To think of how natural resources can be preserved for future generations.
3. To improve skills to collaborate working in pairs/groups.
4. To develop design thinking and working with Tinkercad.
5. To improve presentation and digital skills.

## Outcome of the lesson

Students will know what renewable and non-renewable resources are. They will have practiced creative thinking skills, thinking about future as well as how to save energy and use resources which are environmentally friendly.

## Trends

- **Project-Based Learning** - learning by comparing and designing
- **Collaboration** - learning and working in pairs/small groups

## 21<sup>st</sup> century skills

1. **Collaboration and cooperation** – Working in pairs and in small groups, students will learn to communicate and collaborate among themselves, take responsibility and enhance their communication skills.
2. **Creativity** - Using idea-creation techniques (brainstorming), creating new and worthwhile ideas using Tinkercad, students will develop their design and creative thinking skills.
3. **Digital skills** - Using different online tools (Padlet, Kahoot, Tinkercad, YouTube) and publishing pictures, students will learn how to use different apps and digital tools in the learning process.
4. **Critical thinking** – Drawing conclusions as well as making judgments and decisions, students will improve their critical thinking skills.

## Activities

| Activity                | Procedure  | Time   |
|-------------------------|--|--------|
| <b>1. Introduction</b>  | Students brainstorm answers to the question “What kind of resources do we use?” The brainstorm can be done orally and in written on the whiteboard or on a digital platform like padlet.com.   | 5 min  |
| <b>2. Work in pairs</b> | Working in pairs, students try to understand which resources are renewable and non-renewable. Students use sticky notes with names of different resources and sort them into the two groups.<br><br>Possible resources could be: <i>Water, Wind, Sun, Biomass fuels, Geothermal energy, Coal, Oil, Natural Gas, Waves, Wood.</i>   | 5 min  |
| <b>3. Videos</b>        | The students watch the videos on “ <a href="#">Where Do We Get Oil from?</a> ” and “ <a href="#">How is Coal Formed?</a> ”   | 10 min |
| <b>4. Discussion</b>    | The teacher initiates a discussion, asking e.g. “Do you have some comments about renewable and non-renewable resources?” or “Do you want to change some sticky notes maybe?”   | 5 min  |
| <b>5. Video</b>         | Students watch the video from the Airbus Foundation Discovery Space on the <a href="#">Future of Cities</a> .<br><br>If time permits, students can also watch other videos related to ‘Future of cities’ like:<br><br>Future cities: The Smart Cities of Tomorrow Are Already Here <a href="https://youtu.be/THiQtn9hVB8">https://youtu.be/THiQtn9hVB8</a><br><br>City of the Future: Singapore – Vignette (3 min) <a href="https://youtu.be/u_Xp9XELXsw">https://youtu.be/u_Xp9XELXsw</a> | 5 min  |

| Activity                       | Procedure   | Time   |
|--------------------------------|---|--------|
|                                | Renewable: Short cartoon (8-11 years old kids)<br><a href="https://youtu.be/1sl_ot8qoXE">https://youtu.be/1sl_ot8qoXE</a><br>Non-renewable: Short cartoon (8-11 years old kids)<br><a href="https://youtu.be/thdKsEA-llo">https://youtu.be/thdKsEA-llo</a>  |        |
| <b>6. Creating a city</b>      | Individual work: Using <a href="#">Tinkercad</a> or any other programme, students get creative and design a future city integrating at least two renewable energy resources.<br><br>Depending on the students' abilities, they can also draw their cities on paper or build them in another way.            | 40 min |
| <b>7. Presentation</b>         | Students present their Tinkercad works in small groups. Students who are listening and watching other students' presentations give feedback according to "Praise! Ask! Offer!" <sup>2</sup> (after a presentation they have to say one good thing, ask one question and offer something more to this work). | 10 min |
| <b>8. Feedback<sup>3</sup></b> | Students fill out a quiz (sample quiz included in <a href="#">Annex</a> )   | 10 min |

## Assessment

The quiz in [Annex](#) about "Energy Resources" can be played at the end of the lesson (Feedback part). This can also be used for formative assessment of students.

## About the Aerospace in Class Project

The "Aerospace in Class" Project is about integrating STEM resources from the Airbus Foundation Discovery Space in classes for 8- to 12-year-old students. The project is funded by the **Airbus Foundation** which is committed to bringing together the products and people of the global aerospace company Airbus to help address the challenges of today's society. Youth development is one of the pillars upon which the Airbus Foundation is built, empowering young people for the challenges of tomorrow. The **Airbus Foundation Discovery Space** is a [digital portal](#) for aerospace exploration, connecting students, parents and educators across the globe with professionals in the field, bringing today's research and technology to life. [European Schoolnet](#) is coordinating this project. EUN is the network of 34 European Ministries of Education, based in Brussels, which aims to bring innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers, researchers, and industry partners.



The "Aerospace in Class" Project has also been supported by the STE(A)M Partnerships programme of Scientix, funded from the European Union's H2020 research and innovation programme – project Scientix 4 (Grant Agreement N. 101000063), coordinated by European Schoolnet (EUN). The content of the document is the sole responsibility of the organizer and it does not represent the opinion of the European Commission (EC), and the EC is not responsible for any use that might be made of information contained.

<sup>2</sup> In Latvian: "3P – Paslavē, Pajautā Piedāvā!".

<sup>3</sup> A further, extra non-obligatory activity for those that want to give students the opportunity to put their inventiveness and creativity into practice, can have students create videos and posters about future cities (Video editing applications: Biteable, Stop Motion, WeVideo; Kinemaster for phone recording; Canva for posters, flyers).



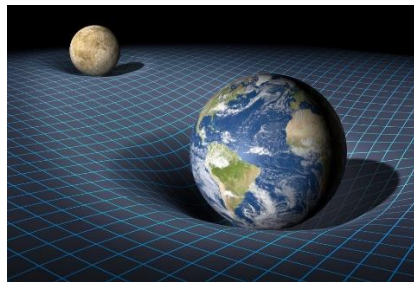
Quiz on Energy Resources



<https://www.energysavers2.com/page9.php>

1. Which energy resource is nonrenewable?

- Biomass
- Geothermal
- Solar
- ✓ Fossil Fuels



Earth and Moon on a gravity grid, Dieter Spannkebel/Stockbyte/Getty Images

2. Which energy source would be affected most by weather?

- Geothermal
- Fossil fuels
- Biomass
- ✓ Wind



Latvia, photo by Ilze Šmate (CC BY)

3. Why is important to recycle?

- Increase the amount of garbage thrown in the landfill
- Conserve the aluminum used to cook dinners
- Reduce the amount of plastic in her home
- ✓ Save energy that would be needed to replace these products



Photo by Ilze Šmate (CC BY)

#### 4. What are advantages of using geothermal energy?

- It is widely available
- ✓ It is renewable
- It produces no pollution
- All of these



Strokkur (Iceland), photo by Ilze Šmate (CC BY)

#### 5. What is a disadvantage of wind energy?

- Wind is free
- Wind energy generates no greenhouse gases
- Few safety risks
- ✓ Need a lot of turbines to produce a lot of electricity



Cyprus, photo by Ilze Šmate (CC BY)

#### 6. What are some advantages of hydro-electric energy?

- Water is "free"
- Does not produce greenhouse gases
- Is renewable
- ✓ All of the above



Heuer And World Surf League Pe'ahi Challenge, Darryl Oumi/Getty Images Entertainment/Getty Images

## 7. What is a limitation of solar energy?

- Will always be there during our lifetime
- ✓ Expensive technology
- Does not produce greenhouse gases
- It is free



*Photovoltaik Dachanlage Hannover - Schwarze Heide - 1 MW.jpg*

## 8. What are nonrenewable resources?

- ✓ Resources that are used up faster than they can be replaced
- Resources that are used all up
- Resources that are replaced almost as fast as they are used
- Resources that are infinite



*<https://www.eqmagpro.com/wp-content/uploads/2019/01/Energy-Park-That-Will-Promote-Renewable-Resources-To-Come-Up-In-Thane.jpg>*