

AEROSPACE IN CLASS  
LEARNING SCENARIO

# Future of the Skies: Cultivating in Space



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: Cultivating in Space

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## Abstract

You know that Earth will probably not be a friendly place for cultivation in the coming decades. Air and water pollution as well as rising temperatures could create sustainability issues. What if you could travel to space and start cultivating your plants there? Is it possible? Anything is possible if you travel with the rocket that will be created by primary school students using reusable materials. Students will learn about the sustainability of our Earth's environment and give alternatives for cultivation on other planets.

## Keywords

Cultivation, Space, Sustainability, Reuse, Future

### Table of summary

|                                 |   |
|---------------------------------|---|
| <i>Subject</i>                  | <i>Greek language, English language, Art, Environmental Education, ICT (Information and Communication Technologies), Astronomy, Mathematics</i>   |
| <i>Topic</i>                    | <i>Future of the Skies</i>  |
| <i>Age of students</i>          | <i>8-12 years old</i>   |
| <i>Preparation time</i>         | <i>Ca. 2 hours</i><br><i>Note: remember to ask students to bring some seeds of local vegetables.</i>  |
| <i>Teaching time</i>            | <i>135 minutes (3 lessons of 45 minutes each) + 30 mins for quiz</i>  |
| <i>Online teaching material</i> | <i>Video on "What is sustainability?":</i><br><a href="https://www.youtube.com/watch?v=gTamnlXbqgc">https://www.youtube.com/watch?v=gTamnlXbqgc</a><br><br><i>Video on "The Solar System Planets   Educational Video for Kids":</i><br><a href="https://youtu.be/ASQkz4XaphU">https://youtu.be/ASQkz4XaphU</a><br><br><i>(also available in Greek: Ηλιακό σύστημα / Διάστημα - Εκπαιδευτικό βίντεο: <a href="https://www.youtube.com/watch?v=zrT4jLRsHUI">https://www.youtube.com/watch?v=zrT4jLRsHUI</a>)</i><br><br><i>Instruction on how to "Make a Rocket using Toilet Paper Roll":</i> <ul style="list-style-type: none"><li>• <a href="https://www.myteachingstation.com/make-a-rocket-using-toilet-paper-roll">https://www.myteachingstation.com/make-a-rocket-using-toilet-paper-roll</a></li><li>• <a href="https://kidsactivitiesblog.com/64258/toilet-roll-craft-rocket/">https://kidsactivitiesblog.com/64258/toilet-roll-craft-rocket/</a></li><li>• <a href="https://youtu.be/yM9uMf84ueE">https://youtu.be/yM9uMf84ueE</a></li></ul> <i>Or any other (just search for "rocket toilet paper")</i><br><br><i>Optional:</i> <ul style="list-style-type: none"><li>• <i>Article on "Mars Express gets festive: A winter wonderland on Mars": <a href="https://bit.ly/3bu0pDU">https://bit.ly/3bu0pDU</a></i></li></ul> |

|   |  |
|---|--|
|   | <ul style="list-style-type: none"> <li>• <i>Sustainable Development Goal Game “Go Goals”</i>: <a href="https://go-goals.org/downloadable-material/">https://go-goals.org/downloadable-material/</a></li> </ul>   |
| <i>Offline teaching material</i>                        | <p><i>For building a rocket: 3 sheets of paper (orange, white and yellow), paper glue (or stapler) scissors, kitchen paper cylinder (or toilet paper roll), yellow tissue paper, a ruler, a compass, a 1-euro coin (or 50-cents), different colored post-its, colorful pens, whiteboard, local vegetable seed in small bags</i></p> <p><i>Instead of a rocket, students can also create a farmhouse or space station in which local seeds can be cultivated (please note that in this case, different materials will be needed than for the rocket).</i></p> |
| <i>Airbus Foundation Discovery Space resources used</i> | <p><a href="#"><i>Future of the Skies: Future of Space</i></a></p> <p><a href="#"><i>Mission to the Moon: Space Food on the Moon</i></a></p>   |

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## Integration into the curriculum

This Learning Scenario can be integrated into the curriculum of the minority school in 4th grade Greek language book, Module 3 “Travelling on land, sea and air”. It can be easily integrated in Greece’s public schools’ curriculum as well.

## Aim of the lesson

The aim of the lesson is for students to understand the danger the Earth faces due to pollution and climate change as well as to give alternatives for cultivation on other planets.

## Outcome of the lesson

Students will learn about the sustainability of the Earth’s environment. They will create a rocket using reusable materials and put inside local seeds to be cultivated on other planets.

## Trends

- **Project-Based Learning**
- **Lifelong learning**

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

**Communication:** students will discuss sustainability, reducing waste and reusing materials as well as the possibility of living on other planets and cultivating vegetables there.

**Creativity:** using of the whiteboard, students can be very creative and use post-it notes for a brainstorming activity. Building a rocket out of reusable materials will also boost their creativity.

**Life and career skills:** The Airbus Foundation Discovery Space videos will give the students a chance to fantasize about their future and even think of studying subjects related to space. The “Go Goals” game will give them the opportunity to learn more about sustainability.

**Technology skills:** the last activity will engage students with technology and encourage them to express their opinions or thoughts by using a web 2.0 tool.

| Activities          |  |                            |
|---------------------|--|----------------------------|
| Activity            | Procedure  | Time                       |
| <b>Part 1</b>       |  | <b>45 min.<sup>1</sup></b> |
| <b>Introduction</b> | Students will watch the video on " <a href="#">What is sustainability?</a> " After this, they discuss other ways of reducing waste and reusing materials.  | 30 min.                    |
| <b>Creation</b>     | Students will create a brainstorming presentation using the whiteboard. They will use colorful pens to write reusable materials on post-it notes and stick them to the whiteboard.   | 10 min.                    |
| <b>Gathering</b>    | Students are asked to bring some seeds of local vegetables in order to preserve them properly in small bags. Seeds should be kept in small paper bags (not plastic in order to avoid moisture) away from light and moisture in general.  | 5 min.                     |
| <b>Part 2</b>       |  | <b>90 min.</b>             |
| <b>Introduction</b> | Students will watch these two videos from the Airbus Foundation Discovery Space: <a href="#">Future of Space</a> and <a href="#">Space Food on the Moon</a> .  | 10 min.                    |
| <b>Discussion</b>   | The teacher shows a video about the <a href="#">Planets of our Solar System</a> . The students discuss the possibility of living in the near or far future on other planets (for example Mars). The teacher can show some photos of Mars (e.g. <a href="https://bit.ly/3bu0pDU">https://bit.ly/3bu0pDU</a> ). The discussion can address questions like: "What about our vegetables?", "We need them to have a healthy life. How can we transfer and grow our seeds into Mars?", "What things should we bring to Mars for our first day there?", "What different factors can affect the growth of vegetables? (Ph of soil/light etc.)" | 20 min.                    |
| <b>Creation</b>     | Students will use the <a href="#">instructions to create a rocket</a> or <a href="#">these</a> . They can also watch <a href="#">this video</a> for instructions. This activity can be done by each student individually or in groups of two.<br><br>Instead of a rocket, students can also create a farmhouse or space station in which local seeds can be cultivated (please note that different materials will be needed than for the rocket). Many sources of instructions and background information can be found online, for example:  | 30 min.                    |

<sup>1</sup> Part 1 can be shortened as the teacher sees fit.

| Activity                                   | Procedure  | Time    |
|--|--|---------|
|  | <ul style="list-style-type: none"> <li>- <a href="#">Growing Plants and Vegetables in a Space Garden</a>, NASA 2011</li> <li>- <a href="#">Greenhouses for Mars</a>, NASA 2007</li> <li>- <a href="#">A greenhouse in space</a>, ESA 2011</li> <li>- <a href="#">Creating a mini-greenhouse in preschool</a>, TeachPreschool.org 2013</li> </ul> |         |
| <b>Presentation of rockets<sup>2</sup></b> | Each student (or group) will present their rocket, farmhouse or space station with local seeds to the class.   | 15 min. |
| <b>Feedback</b>                            | Feedback on the project is discussed (orally or with a programme like Mentimeter.com). Possible questions are “What impressed you?” or “What will you keep from this project?”.  | 15 min. |
|  | <b>Optional Quiz Game</b>  | 30 min. |
| <b>Quiz Game</b>                           | Students can play the Sustainable Development Goal Game “ <a href="#">Go Goals</a> ”. The game aims to help teach children around the world about the Sustainable Development Goals in a simple and child-friendly way.  | 30 min. |

### Teacher’s feedback

The author of the Learning Scenario provides some suggestions to adapt to online teaching in the [Annex](#).

To make the exercise of rocket crafting more challenging for older students, an additional task can be to also create a base that the rocket will use to take off using reusable materials.

### 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> If wanted and able to, teachers may procure a Green Screen and record short videos with the students. This, however, will add extra time to the learning scenario, so teachers should plan accordingly.

## Annex: Adaption to Online Implementation

E-book instructions of creating a rocket (in Greek): <https://issuu.com/vivi49/docs/>

- Mentimeter: [www.menti.com](http://www.menti.com)
- Sustainable Development Goal Game “Go Goals”: <https://go-goals.org/downloadable-material/>