

AEROSPACE IN CLASS LEARNING SCENARIO

Future of the Skies: Future of Factories



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: Future of Factories

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Abstract

This learning scenario will focus on the creativity of the students in designing their own robot machines that will be used in the future to help build/assemble wings of an aircraft. They will learn the process of how airplanes are made at present and identify the need in making aircraft with the help of technology through robot machines.

Keywords

Create, Robot, Design, Machine and Technology

Table of summary	
Subject	Technology, Science, English and Art
Topic	Technology: Learn how to create and design a robot machine. Science: How aircrafts are made and the important parts of an aircraft. English: Be familiar with new vocabularies, understanding a video and group oral discussion Art: Students will use their creativity in making their robot machine model
Age of students	11-12 years old
Preparation time	30 minutes
Teaching time	120 minutes (2 lessons of 60 minutes each) ¹
Online teaching material	Presentation on “Future Robot Machine in Assembling Aircraft’s Wing” Worksheet found in Annex 1 on “Robot Machines in Assembling Aircraft’s Wings”
Offline teaching material	Papers, cardboard, glue, scissors, tape, glue gun and other recyclable materials from home
Airbus Foundation Discovery Space resources used	Future of the Skies: Future of Factories https://www.airbus.com/company/sustainability/airbus-foundation/discovery-space/kids/future-of-the-skies.html#Fac

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¹ This learning scenario can be re-organized so that it is taught in three lessons instead of two if the teacher believes that this would help their students. An alternative schedule can be found on [Annex 2](#).

Integration into the curriculum

Technology: The Students will learn how to design a robot machine.

Science: How aircrafts are made and its different important parts.

English: Be familiar with new vocabularies with the context of aircraft; Students will participate, coordinate individual design through oral discussion within their group members; Demonstrating students' skills in answering questions on paper.

Art: Building robot machine model base on own design.

Aim of the lesson

The students will understand and learn how aircrafts are made as well as their different important parts. They will learn to be creative in designing a robot machine that might be used in the future to assemble aircrafts wing. Students will be able to learn new vocabularies in relation to aircraft.

Outcome of the lesson

The outcome of this lesson is for the students to identify important different parts of aircraft and relate it to their robot machine design that will help in assembling the aircraft wings to complete the construction of the aircraft as a whole.

Trends

Project-Based Learning: Through fact-based tasks, students will be creative and design a solution to a problem.

Collaborative Learning: Students will be working in a group where they will discuss and collaborate their individual ideas to reach one common goal in solving a problem.

Peer Learning: Students will gain knowledge through discussion and supporting each other.

Edutainment: Through hands on activity in building their robot machine model, students will learn while having fun.

21st century skills

Critical Thinking: Students will learn and discover information themselves.

Communication: By discussion and sharing individual ideas.

Collaboration and Creativity: Students will learn how to be creative in making a design to address a problem and solving it.

Activities

Activity	Procedure	Time
	Lesson 1	60 min
Introduction	<p>The teacher will give a presentation about how an aircraft is made as well as its important different parts (see presentation).</p> <p>The video “Future of Factories” from the Airbus Foundation Discovery Space, will be played.</p> <p>Teachers can look for some information about how the airplane works, process in manufacturing it from design to the assembly stage, and the important parts of the airplane focusing more on attaching the wing of an airplane to its fuselage. These are some websites that might be useful for teachers who are new to the topic:</p> <ul style="list-style-type: none"> • https://www.airbus.com/aircraft/how-is-an-aircraft-built.html • https://www.aircraftcompare.com/blog/how-airplanes-are-made/ • http://adventureflight.ph/important-parts-of-an-aircraft/ • https://www.flightliteracy.com/major-components-of-an-aircraft/ • https://www.oxfordsaudia.com/en/blog/aircraft-construction-how-are-airplanes-made/ 	15 min
Individual Task	<p>Students will individually create their own designs of a robotic machine that might help assembling the wings of an aircraft to connect them to the aircraft’s body in the future.</p> <p>The teacher should make clear to the students what will be the goal for the activity, that is to design and build a model robot that will help in the future in assembling the wings into the fuselage of the airplane. The students will have their own initiative with their design and how their robot will work. When the students start making their robot design, the teacher will only need to supervise the students on their design, so the target timeline will be achieved.</p>	15 min
Group Task	<p>In groups, students will present their individual designs and decide within their respective group which design they will choose to build a model for the next lesson.</p>	15 min
Packet Questionnaire	<p>Students will be answering a questionnaire regarding their work</p> <p>(section “A. Design Proposal” of the activity packet in the Annex 1).</p>	15 min

Activity	Procedure	Time
	Lesson 2	60 min
Building a Model	As a group, students will build a model of their chosen robotic machine design using papers, cardboard, glue, scissors, tape, glue gun and other recyclable materials from home.	40 min
Presentation of Models	Each group will present their chosen design in class and explain why they choose it as well as its advantage in assembling the wing of the aircraft.	10 min
Packet Questionnaire	Students will be answering a questionnaire regarding their work (answering the second section " B. Evaluation " of the activity packet in Annex 1)	10 min

Assessment

Students will be answering a packet questionnaire about building their own robot machines. There will be no correct or wrong answer in this packet questionnaire, as the answers are subjective and depend on how the students evaluate their individual work.

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.

Build me ROBOT!

Name:

Class:

Robot Machines in Assembling Aircraft's Wing

In this project, you will apply your creativity in designing and building your own robot machine that will help the aircraft workers in assembling the wings of an aircraft to its fuselage.

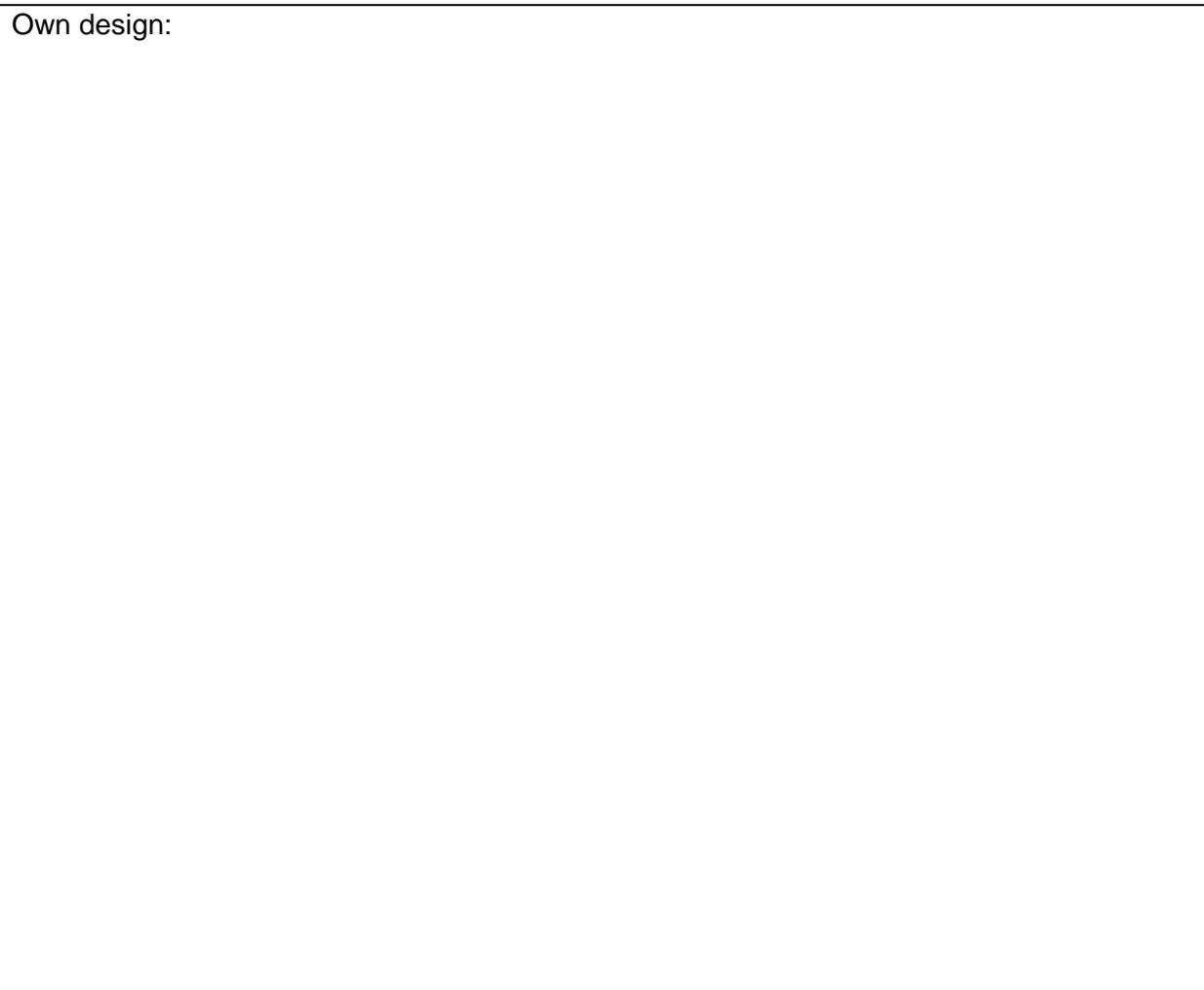
You will work in groups of 4-5 to design, create and build a model of your robot machines. Only some materials are provided in class (glue, popsicle sticks, elastic bands). You should bring materials from home in order to build your robot machine. You will run into some technical issues which will require your group to collaborate and problem solve, good luck!

A. Design Proposal

Each group member will make its own design to be presented within your group:

A neat drawing of your original "planned design"

Own design:



As a group, choose which you think is the best design among your members to build a model of your robot machine.

Group Design:

Brief description on how your robot machine will work:

B. Evaluation

What are the challenges you encountered in building your model robot machine? Be specific to mention what went well and what did not go well.

a) What went well?

b) What did not go well?

Annex: 2 Alternative Schedule

Activity	Procedure	Time
Lesson 1 (45 to 60 minutes)		
Introduction Lesson	<p>The teacher will give a presentation about how an aircraft is made as well as its important different parts (see presentation slides 1-4).</p> <p>Presentation slides 5-6 (discussing the students' task)</p> <p>Note: The activity packet should be given to individual students and be discussed. Students need to know and be guided before they will start their task.</p>	<p>30 minutes</p> <p>15-30 minutes</p> <p>NOTE: Time can be adjusted depends on the teachers need.</p>
Lesson 2 (45 to 60 minutes)		
The Design	<p><u>Individual Task</u></p> <p>Students will individually create their own designs of a robotic machine that might help assembling the wings of an aircraft to connect them to the aircraft's body in the future. The teacher should make clear to the students what will be the goal for the activity, that is to design and build a model robot that will help in the future in assembling the wings into the fuselage of the airplane. The students will have their own initiative with their design and how their robot will work. When the students start making their robot design, the teacher will only need to supervise the students on their design, so the target timeline will be achieved.</p> <p><u>Group Task</u></p> <p>In groups, students will present their individual designs and decide within their respective group which design they will choose to build a model for the next lesson.</p> <p><u>Packet Questionnaire</u></p> <p>Students will be answering a questionnaire regarding their work (section "A. Design Proposal" of the activity packet in Annex 1).</p> <p><u>Note:</u> Students can start their construction in this lesson if they have time left during the lesson.</p>	<p>20 minutes</p> <p>25 minutes</p> <p>15 minutes</p> <p>NOTE: Time can be adjusted depends on the teachers need.</p>

Activity	Procedure	Time
Lesson 3 (45 to 60 minutes)		
Construction, Presentation and Packet Questionnaire	<p>-As a group, students will build a model of their chosen robotic machine design using papers, cardboard, glue, scissors, tape, glue gun and other recyclable materials from home.</p> <p>- Each group will present their chosen design in class and explain why they choose it as well as its advantage in assembling the wing of the aircraft.</p> <p>- Students will be answering a questionnaire regarding their work (answering the second section “B. Evaluation” of the activity packet in Annex 1)</p>	<p>45 to 60 minutes</p> <p>Note: Time can be adjusted depends on the teachers need. Time from the previous lessons can be cut down to give way for this lesson if needed.</p>