

Engage with Space Toolkit

Space in the Classroom Activity

This toolkit was developed by Ars Electronica with the support of Science Gallery at Trinity College Dublin, Ciencia Viva and Leiden University.

spaceEU project has received funding from the European Union's Horizon 2020 Framework Programme for Research and Innovation under grant agreement No. 821832



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Introduction

About the spaceEU Engage with Space Toolkit

Space science is a rich and powerful tool in science education, as the excitement of space can open doors to reach new audiences and engage young people in STEAM. Humankind shared fascination with space can encourage young people to follow STEAM related careers while inspiring and broadening their minds. Engage with Space toolkit is a ready-to-use digital collection of space centred activities with a specific focus on girls and underserved communities. These activities encourage and help schools, youth centers, museums, universities, NGOs and informal learning spaces to bring together students, families, space professionals, their communities and more to engage them with the wonders of space.

The spaceEU Engage with Space Toolkit is comprised by:

Step into Space Exhibition

Step into Space exhibition consists of three flexible modules which allow to build a regional connection and engagement. The exhibition looks into how space exploration has been an intrinsic part of our lives, contributing to new technologies we use here on Earth, assists us in thinking about how to protect our planet, and inspiring us to think outside the box and to cooperate.

The architectural design allows you to adjust the exhibition to your needs; space and content wise. You can find graphic templates and detailed handbook about how to build the exhibition here and in the download section of spaceEU. We encourage you to invite and collaborate with local artists who can contribute to the exhibition.

Modules

- What We Made from Space
- Through the Lens of Space
- A Creative Space

Engagement & Education

The Engage with Space Toolkit presents detailed instructions for implementing spaceEU engagement formats. The formats presented here are trialed and tested, which doesn't mean they can't be modified to best suit local contexts. Engage with Space offers in detail one way to implement spaceEU engagement formats and we highly encourage you to adapt and adjust these formats to your needs. You know your audience and local partners the best!

The formats aim to reach two main target groups and can partly be combined and integrated in the exhibition.

Children and Youth

- Space in the Classroom
- space4youth
- space4youth Open Call
- Open Space Lab (integrated in the exhibition)

General Public

- Space Café
- Citizen Space Debate
- Space Unconference

With the exhibition and the engagement programmes the spaceEU project address the following objectives:

- We aim to inspire young people with space topics and encourage them to consider careers in the space sector.
- We want to celebrate the accomplishments of European space science and demonstrate how European society benefits from the space sector.
- We plan to highlight past and present contributions by women and minorities to the advancement of the space field and promote a diverse and inclusive space sector.

Find the complete spaceEU Engage with Space Toolkit at www.space-eu.org/toolkit.

About spaceEU

spaceEU (www.space-eu.org) encourages young people to choose careers in science and technology on the one hand and stimulates a sense of European and global citizenship on the other. An exhibition and a wide range of engagement programmes use the excitement of space and the beauty of the Earth in order to convey these stories. Our main target audience are youth and families with a specific focus on girls and youth from underprivileged communities as well as professional stakeholders.

Space in the Classroom Activity

Overview	
<p>Description</p>	<p>Space in the Classroom is a series of workshops or open talks in schools carried out by artists, researchers and industry specialists working in the space sector. The workshops and talks introduce space science and careers through direct contact with role models and disseminate European space field and daily-life applications of space technology.</p> <p>The experts individually have freedom to design and deliver more of a conversational question and answer, or an interactive workshop, within a set of guidelines ensuring a diversity of careers, backgrounds, and demographics are presented to participants. Depending on the format, Space in the Classroom can either be a one hour event or a longer workshop.</p>
<p>At a Glance</p>	<p>Suitable group size: 1-3 classes (max 40 people)</p> <p>Coordination ime: 3-5 months</p> <p>Duration of activity: 1-2h in-class</p> <p>Cost per Student: Low Cost</p> <p>Age: 6-19</p> <p>Education Level: Primary School Middle School Secondary School</p> <p>Types of Learning: Interactive Lecture Fun activity Informal Reflective practice (blogs, journals)</p> <p>Materials: Computer, video projector, seats, other workshop materials as required by expert</p> <p>Place: Classroom</p> <p>Catering: Catering is not needed.</p> <p>Promotion: No public promotion necessary</p>

<p>Goals and Objectives</p>	<p>Goals</p> <ul style="list-style-type: none"> • The goal of the activity is for participants to leave feeling like they might find a path in space sciences. The specific emphasis is on participants who may not have otherwise considered this path; underserved minorities, girls, or just those who see science as ‘not for them’ for whatever reason • See the connections between Space Science and the needs of society. • Gain awareness of the diversity of Space/STEAM professions. <p>Objectives:</p> <ul style="list-style-type: none"> • Motivate students to pursue space related careers through meeting professionals to whom they can relate. • Introduce space science and careers to youth at a young age in order to show them what kind of jobs exist in space science and these what professional lives look like. • Communicate and celebrate the accomplishments of European space science, technology and innovation and demonstrate how European society benefits from the space sector. • Highlight present contributions by women and minorities to the advancement of space field and promote a diverse and inclusive space sector.
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<p>Preparation</p>	
<p>Personnel</p>	<p>Organiser: coordinates and manages the activity. As it will take place in schools you don't need further organisational staff for the implementation.</p> <p>School / Teacher: Find a school and a particular class who would like to collaborate.</p> <p>Experts: Can be artists, space industry professionals, researchers, employees at planetarium or other space related organisations, etc. We suggest to pair an artist/creative project with a scientist/researcher in order to reach different layer, however you can also invite only space industry experts.</p>
<p>Step by Step</p>	<p>Finding and choosing your experts</p> <ol style="list-style-type: none"> 1. Finding suitable experts is important for holding an effective space in the classroom event. Speaker should be well-prepared, and ready to listen to the students' opinions and questions. They should feel comfortable

speaking with youth, and be able to avoid highly technical topics.

2. If you want to reach beyond your existing contacts and previous collaborators, you will need to establish connections with new experts. To do so you could:
 - a. Identify companies and organisations of interest.
 - b. Send a formal invitation letter to the CEO or director asking if the company, research centre or university would be interested in collaborating and have team members who would be open to do it.
3. Attempt to maintain a 1:1 gender balance in the speaker selection. Additionally, put a special effort into choosing experts who represents one or more of underserved communities that participants can relate to.
4. Attempt to solicit participation from a broad range of professionals working in space field; not only conventional researchers and engineers but also artists, designers, factory workers, project managers, etc.

Finding and choosing schools and/or teachers

1. It can be easier to work within your existing contacts and schools with whom you have previously collaborated.
2. If you are setting up new collaborations, start by approaching schools in underserved areas, or all girl schools.
3. Send a formal invitation letter to the Headmaster introducing the project and asking if the school would be interested in collaborating, and have teachers or classes that would be suitable for a visit. If you have a list of experts, include in the letter.

Preparing the Teachers and the Experts

1. Start by asking experts availability and find at least 5 options, coordinating their schedule with the school availability.
2. Share the desired learning outcomes with the experts and teachers as well as the diversity guidelines.
3. Discuss with teachers and experts what age groups and what classes make sense for these experts and the content.
4. Make sure the school can provide all needed materials. (Laptop and Projector, White board, etc) If necessary bring additional material from your organisation.
5. Meet with the expert and share the 'Presentation/Workshop Guidelines' below, and ensure

	<p>their questions are answered, and that they have the necessary materials for their presentation.</p> <ol style="list-style-type: none"> 6. In case you work on a new collaboration between artists and scientists, artists and industry or scientists and industry, make sure they communicate once before the event in order to prepare together and synchronise how the show will run (either in person or via skype). Make sure you introduced the teacher with the artist and the scientist at least through email so they have been in touch beforehand already. 7. Meet with the teacher and ensure their questions are answered. 8. The organiser should always be in charge to work as an intermediate between the experts and teachers. 9. Inform the parents about the event beforehand and assure consent for documenting the event. Needs to be done by teachers. 10. Send reminders several days before the event to both teachers and experts, confirming the day, time, and location, and ensuring that they will have all the materials they expect (some older classrooms may not necessarily have projectors unless requested, for example). 11. Teachers should speak about the event one class previously to prepare students for the event. <p>Agreements (if needed)</p> <ol style="list-style-type: none"> 1. Make sure you have an agreement with the experts that outlines who is responsible for what is the compensation for that if any. 2. If needed make sure you are allowed to document the event.
<p>Points to consider for running a more inclusive Space goes to the classroom</p>	<ul style="list-style-type: none"> • Consider the composition of your experts' pool: is it gender balanced (1:1)? Does it present individuals from different backgrounds? Does it reflect the composition of the school where the activity will take place? • Consider the composition of your experts' pool: does it represent a variety of space related careers and educational levels? Are you experts diverse in age? • Provide expert beforehand tips on how to prepare more inclusive slides/presentations: <ul style="list-style-type: none"> ○ Avoid slides with white backgrounds in favor of light grey, off-white, or dark colors with high-contrast text in a suitably large font - this will make it easier for light sensitive and migraine prone audience members. Avoid italics and use common sans-serif fonts as these are easier to read.

	<ul style="list-style-type: none"> ○ Make sure any colorful content, such as posters and slides, are clear and understandable to color-blind individuals. ● Consider rearranging a room in a circle for example, and the moderator/ facilitator won't be seated in front of the room. ● Be reminded of the importance of involving underserved minorities in discussions. More confident participants, often boys, will dominate discussions. Make a special effort to allow less outspoken participants to be part of the activity. Moderators/ facilitators and experts should be ask to: <ul style="list-style-type: none"> ○ Leave longer pauses when questions are asked to allow all participants time to think and respond. ○ Specifically make an effort to call on quieter participants, and try and maintain a balance of boys and girls that are called on. ○ Don't be afraid to tell a very outspoken participant you'd like to give others a chance to talk, especially if they are interrupting other participants. ● Ask experts to introduce participants to colleagues with diverse backgrounds, even if it is as simple as a group photograph of the team. If experts are presenting in a team, also ensure diversity within the presenting group - if there are two presenters both should not be white men for example. ● Set a high and equal level of expectations for all students. Avoid over including girls and underserved communities (this leads to dependency rather than independence). Encourage equally all students to take risks. ● Encourage expert to orally describe images and figures, even if they are on the slides, as this will aid those with visual impairments.
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Day of the Event	
Set Up	<p>Check beforehand that all tech and materials needed are on site.</p> <p>Make sure experts can find school and classroom easily.</p>
Kick off 10-15 min	<p>First thing: teacher introduces expert to class and explains the aims of the activity mentioning spaceEU project.</p>

	<p>A good way to kick off the meeting could be to ask students to share what comes to mind when they think of a scientist and/or what jobs they associate with science. It helps encourage students to speak freely and stereotypical representations of scientists are likely to emerge (glasses, man, white coat, laboratory, chemistry, mathematician, medicine, etc.).</p>
<p>Introduction 5 min</p>	<p>Participants are encouraged to speak freely and ask any questions they might have at any point in the discussion. The moderator/facilitator will introduce the expert, including the following:</p> <ul style="list-style-type: none"> • Who they are (name, age) • Their scientific discipline/background • Life outside of work: Some hobbies/family/etc.
<p>Career Path 15 min total (5 min presentation, 10 min for questions and discussion)</p>	<p>Expert will briefly present to participants about their studies, and what led them to a science career.</p> <ul style="list-style-type: none"> • What did I like to study as a youth? • How did I get to the job I have now? • Why did I choose this course of study? • What I like about it when I was studying? • What aspects of my studies do I use to today? • What was an occasion I failed and had to change path? • Who do I work for now? <p>One purpose of this section is to help participants find something they may identify with in the experts (the “What were they doing at my age?” question), and relate it to where they are at now. The other purpose is to show the participants different paths after secondary school, and the multitude of routes and outcomes in space science careers. It is also interesting to highlight ‘chaotic’ and nontraditional paths, showing challenges, and doubts.</p>
<p>Current Job 25 min total (10 min presentation, 15 min for questions and discussion)</p>	<p>Experts describe more about their current position. This can be conducted in a presentation format, a structured interview by the teacher/facilitator, or a more free-form question-and-answer with the participants. Some ideas for things experts can focus on:</p> <ul style="list-style-type: none"> • What do I do on a daily basis? <i>The goals of their organization/research, how it’s conducted, how they get funding, the tasks of their job.</i> • Who am I in contact with during the day? <i>Who works with them, who do they report to, the general organization of their workplace. A picture of the team members should be included, especially if it shows diversity in the team.</i>

	<ul style="list-style-type: none"> ● What's a typical day like at work? <i>Pictures or video of the workplace/lab are also helpful here.</i> ● What's my social life like/What are my hobbies? <i>This is to help combat the stereotype of the antisocial researcher.</i> ● Who is my boss? Who controls/checks what I do?<i>This is a good opportunity to describe some 'non-traditional' forms of accountability, such as the need to publish papers or submit a thesis.</i> ● What is my research subject and why do I find it interesting? ● Why is the work I do important to society? What impact does my work have on people? ● What I like most about being in this field? ● What are the boring/challenging parts of my job? ● How do I answer scientific questions? What experiments do I do? ● Describe a specific product, preferably with photos, videos, real data. How long did it take, how much did it cost, and who worked on it? ● Do I have any doubts about my role? ● Does my job match my expectations? ● What are the basic skills/qualifications necessary for my job? ● What is my future? <i>Specifics are good here - specific job prospects, specific openings, timeframes, etc.</i> <p>This section can be very flexible, and experts should adjust to the reactions and interests of both participants and teachers. Experts should be encouraged to present any material on their real and concrete life. The teacher/facilitator is to prepare this before the meeting, asking speakers to come with short videos, photos, pictures, if possible a little experiment...But remember: The intent here is not for the event to be a speech to a passive audience however, and experts should not bring the PowerPoint presentation from their last academic conference!</p>
<p>Conclusion 5 minutes</p>	<ul style="list-style-type: none"> ● At the end, it is important that participants have time to discuss with the presenters any remarks or comments they may have. ● Participants can also be asked if their perception of scientists has changed (as a good bookend if the introduction activity was done) having met the expert. ● They can also be asked if they have ideas of a job they might like to do later in the field of the experts, or if they are now curious about careers in science.

Wrap-up	
De-install of event	Make sure the venue will be left in a proper manner. Coordinate with the teacher.
Follow up	<ul style="list-style-type: none"> • Follow up with both teachers and experts after each event, encouraging them to continue collaborating. • Ask for feedback and follow up with thank-you-emails to all participants experts and teachers. • Following up with the parents needs to be done by the teacher. • Optional: share event documentation with everyone. • Process potential payments for experts. • Upload event documentation on your communication channels. • Let spaceEU know about it?

Questions and Recommendations	
Recommendation for teachers	Find some ideas about what teachers can build on after this session in the annex
Presentation/Workshop guidelines	Find a link to presentation / workshop guidelines in the annex
Recommendation	<p>Here are some ideas for inspiration:</p> <ul style="list-style-type: none"> • If the spaceEU exhibition is still going on and easy accessible for this class, encourage the teachers/school you are working with to visit it. • Refer to other spaceEU events or other space related events of your organisation if there's the chance. • Share with teachers interesting pre- and post-classroom activities. Check out the Space Awareness activities for teachers and/ or share with teachers Space Awareness Careers Booklet to help them prepare for the visit.

Intellectual Property: Ownership of Toolkit

All contents relating to the spaceEU exhibition 'Step into Space' and educational program 'spaceEU Activities' developed by the parties under the terms of the spaceEU agreement shall be jointly owned by the spaceEU consortium, unless otherwise stated. Utilization of any Joint Ideas/Deliverable beyond the scope of this toolkit shall be negotiated reasonably and in good faith by the parties hereto and shall be subject of a separate written agreement.

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