



SPACE^o

a w a r e n e s s

CAREER EXERCISES

Contains a suite of activities related to space careers
for teachers to implement in a classroom.

NUCLIO

Topic:

Space-related careers

Keywords:

Space scientist, space engineer, space technician,

Education level:

All

Language:

English

Core Skills:

Asking questions
Developing and using models
Planning and carrying out investigations
Communicating information

Type of learning activity:

Full enquiry

INTRODUCTION

Role models can be a powerful influence to inspire young people and encourage them to consider a scientific or technical career. Researchers and engineers over the whole world can provide personal views on the latest space sciences and space technologies, share their personal experience as a scientists, tell about their education and what led them to a space career, or relate to students by what they may have in common.

Role models are particularly effective if they form part of a curriculum in which careers information and advice is integrated into subject teaching. This is why Space Awareness is providing a wide range of educational and career resources that can be used as a coherent suite of classroom activities.

The multiplicative effect of implementing activities related to space sciences and space careers, coupled with the influence of teachers on their students’ opinions and future career choices are important tools for enhancing the impact of role models.

The two following activities were designed taking into consideration that each one of them could be followed up by other Space Awareness activities. Connections to the Space Awareness [educational resources](#), [Space Scoops](#), and [career material](#) can easily be made.

A summary of suggestions selected amongst research articles provides good advices on how to use role models effectively with the classroom.

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ACTIVITY 1: ROLE MODEL VIDEOS DISCUSSION

Title of the activity	Role Model Videos Discussion
Summary	Through the observation of one or several Role Models' videos available on www.space-awareness.org/careers/ , students will reflect on the information about careers and career paths.
Topic	Careers in space sciences and career paths.
Educational level	All (primary and secondary)
Material	<ul style="list-style-type: none"> • Devices with internet access or big screen connected to internet. • Big piece of paper and material for drawing and decorating the poster or computers and software to make a poster.
Objectives	<ul style="list-style-type: none"> • Make students aware of the wide range of space-related careers and the diverse background of people working in the space sector. • Provide role models on space-related careers to make students aware of the range of careers and career paths possible to join the space sector.
Description	<ol style="list-style-type: none"> 1. Go to www.space-awareness.org/careers/ and have your students watch one or several interview videos. 2. Ask students to write down their comments about the videos: was there something that surprised them? What did they learn? What did they like or not? 3. Reflect on the information that the person(s) on the video(s) provides and engage a discussion with your class about space-related careers (e.g. what is a space-related career? How many different careers do students know related to space? Based on the video(s), what does the person do? How he/she became a professional of space? What can I do to be a professional of Space? Etc.). 4. Make a poster with your students about the conclusions obtained after the discussions about space-related careers. <p>Note: consider and discuss with students the description of the general 'Job Family' (see annex 1: e.g. engineer, technician, scientist, etc.), the necessary training and background studies, the necessary skills and abilities involved to become a space professional.</p>

<p>Links and annexes</p>	<ul style="list-style-type: none"> - Annex 1 – table - www.space-awareness.org/careers/ <p>To find more information about space careers, you can check the following:</p> <ul style="list-style-type: none"> - the European Space Agency careers page: http://www.esa.int/About_Us/Careers_at_ESA - a national or university career guidance service - a national space agency - your local Space Awareness contact (see www.space-awareness.org/about/)
<p>Possible links to other activities</p>	<ul style="list-style-type: none"> - Find a Space Scoop related to a space career or investigate about space careers involved in the discovery presented in a Space Scoop: www.space-awareness.org/scoops/ - Implement a space-related activity with your students: www.space-awareness.org/educate/

ACTIVITY 2: SPACE CAREERS NEAR MY SCHOOL

Title of the activity	Space Careers near my School
<p>Summary</p>	<p>After Identifying one or several individuals and/or institutions working on a space-related activity near the students' school location, students will elaborate their own interview and publish a video or a journalistic piece highlighting the careers and career paths they discovered about.</p> <p>This video/report could be posted on the Space Awareness Platform, on a social media platform, a school blog or school website, etc., to reach a larger community, including parents and other students.</p>
<p>Topic</p>	<p>Space research and industry near the school</p>
<p>Educational level</p>	<p>Middle and Upper Secondary school</p>
<p>Material</p>	<ul style="list-style-type: none"> • Devices with internet connection • Papers and pens • Camera or video camera (optional) and video maker software (optional)
<p>Objective</p>	<ul style="list-style-type: none"> • Make students aware of the wide range of space-related careers and the diverse background of people working in the space sector near their school. • Make students aware of their own country's institutions (educational institutions, research institutions, industry, commerce, etc.) related to space • Provide role models on space-related careers to make students aware of the range of careers and career paths possible to join the space sector • Inspire and engage students about space related careers
<p>Description</p>	<ol style="list-style-type: none"> 1. Identify, with your students, one or several individuals and/or institutions (universities, industry organizations, researcher institutes, researchers, etc.) that are somehow related to space (produce space components, participate/collaborate on some European mission, and investigate in a space related area). 2. Schedule a visit to that institute to meet people working there (alternatives: 1a. invite a particular person from your region/country to visit your school; 1b. schedule a skype meeting with a team/person from your region/country) 3. Decide with your students and list the questions they would like to ask 4. Prepare a team of pupils to make a report (like a journalistic video report or photo report)

	<ol style="list-style-type: none"> 5. Make the visit and the interview to the institution (or consider alternatives 1a. and 1b.) capture images (photos or videos, make sure with your contact that you are allowed). 6. Prepare the video/photo report with your students 7. Share the video/photos with the all school/students and promote an event (invite your community including parents) 8. Share the video and/or pictures of the event on the Space Awareness Platform, on a social media platform; in the school blog; school website; etc.
<p>Links and annex</p>	<p>To find out more information about careers, you can check the following:</p> <ul style="list-style-type: none"> - the resources available at www.space-awareness.org/careers/ - the European Space Agency careers page: http://www.esa.int/About_Us/Careers_at_ESA - a national or university career guidance service - a national space agency - your local Space Awareness contact (see www.space-awareness.org/about/)
<p>Possible links to other activities</p>	<ul style="list-style-type: none"> - Investigate about space careers involved in the discovery presented in a Space Scoop: www.space-awareness.org/scoops/ - Implement a space-related activity with your students: www.space-awareness.org/educate/



ADVICE ON USING ROLE MODELS

Already several social scientists got interested in the influence of role models on young people's views and choices. The following suggestions are summarising the results of some of the research articles on the subject and might help you use role models more efficiently with students.

1. It can be useful to have role models that are similar in background characteristics (e.g. gender, ethnicity, social class) to students but it can actually be more effective to have role models with other characteristics like how approachable they are.
2. It is important that role models show that they are 'real people' – who have (hobbies, interests, families outside of science). Such portrayals send a message that one does not have to be entirely devoted to science to the exclusion of all else, as well as providing a more rounded image that more students can relate to. For instance, discovering that a scientist likes a particular football team or television programme can serve as a point of contact or a way to relate to that individual.
3. For girls in particular, it is important that potential role models are not portrayed as 'too perfect'. That is, women scientists who are depicted as extremely bright AND very attractive and feminine are quite daunting and may serve to dissuade girls from pursuing a science path (because they send a message that one must be very attractive and highly intelligent to succeed in science).
4. While it is important not to provide students with misleading messages (e.g. 'most physicists are women'), highlighting what space scientists find attractive about the field can be a powerful tool. What aspects of their job are they most enthusiastic about? Finding out what attracted scientists to the field in the first place can also serve as a key point of connection as well ('oh, I'm also interested in helping other people!')
5. At the same time, it can be helpful for students to know that scientists may find a particular aspect of their work challenging. This sends a message to students that scientists aren't necessarily 'super geniuses' – that it is possible to have a career in science without everything about the subject matter coming easy to you.
6. Role models may be helpful addressing the lack of awareness about paths into space science. It would be helpful if they communicate about their educational path and choices and how it led to their current work.
7. Role model case studies are particularly effective if they form part of a curriculum in which careers information and advice is integrated into subject teaching.
8. 'Role models' we are referring to individuals who students might encounter in the course of particular activities. Students may or may not consider these individuals to be role models for them. Providing interviews with range of different people with different backgrounds, job type and interests will help to ensure broad appeal.

Additional resources

- Space Awareness webinar: Space Careers in the Classroom
<http://www.space-awareness.org/careers/webinar/webinar-3-space-careers-classroom/>
- Space Awareness webinar: Path to Space Careers
<http://www.space-awareness.org/careers/webinar/webinar-4-path-space-careers/>

ANNEX 1

List of some space careers

Engineers	Technologist - Technician	Space Scientists
Aerospace Engineers	Aviation Inspectors	Biochemists and Biophysicists
Architectural and Engineering Managers	Aerospace Engineering and Operations Technicians	Atmospheric and Space Scientists
Chemical Engineers	Aerospace Engineering and Operations Technicians	Biologist Career profile: http://www.space-awareness.org/careers/career/what-astrobiologist/ Interview: http://www.space-awareness.org/careers/interview/dr-zita-martins/
Computer Hardware Engineers	Aircraft Mechanics and Service Technicians	Chemists Career profile: http://www.space-awareness.org/careers/career/what-astrochemist/
Electrical Engineers	Aircraft Structure, Surfaces, Rigging, and Systems Assemblers	Computer and Information Research Scientists
Fire-Prevention and Protection Engineers	Avionics Technicians	Geoscientists Profile: http://www.space-awareness.org/fr/careers/career/who-astrogeologist/
Industrial Safety and Health Engineers	Electrical Engineering Technicians	Mathematicians
Materials Engineer Profile: http://www.space-awareness.org/careers/career/who-materials-engineer/	Electronic Drafters	Medical Scientists
Mechanical Engineers	Operations Analysis Technicians	Nuclear Equipment Operation Technicians
Nuclear Engineer	Robotics Technicians	Physicists Interview: http://www.space-awareness.org/careers/interview/dr-brian-shortt/
Robotics Engineer	Telecommunications Equipment Installers and Repairers	Soil and Plant Scientists
Telecommunications Engineering Specialists		Other: Astronaut - Pilot

Based on the following websites:

- <http://www.space-careers.com/>
- <http://nasajobs.nasa.gov/jobs/occupations.htm>
- <http://mgs-mager.gsfc.nasa.gov/Kids/careers.html>
- <https://www.onetonline.org/>



ANNEX 2

Research bibliography

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