



# HOW TO PRESENT STEM JOBS IN CLASSROOMS

A STE(A)M IT Guideline for teachers  
(Deliverable D4.2)





The STE(A)M IT project aims to (1) create and test of a conceptual framework of reference for integrated STE(A)M education; (2) develop a capacity building programme for primary schools teachers and secondary STEM teachers, based on this framework, with a particular focus on the contextualization of STEM teaching, especially through industry-education cooperation, and (3) further ensure the contextualization of the integrated STEM teaching by establishing a network of guidance counsellors/career advisors in schools promoting the attractiveness of STEM jobs to their classes. (<http://steamit.eun.org>).

**Publisher:** European Schoolnet (EUN Partnership AISBL), Rue de Trèves, 61, 1040 Brussels, Belgium

**Please cite this publication as:** Katsikerou et al. (2021). Guidelines on how to present STEM jobs in classrooms, January 2021, European Schoolnet, Brussels

**Keywords:** Science, Technology, Engineering and Mathematics (STEM); Integrated STEM education; Primary Education; Secondary Education; Careers.

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Published in January 2021. The views expressed in this publication are those of the authors and not necessarily those of, EUN Partnership AISBL, the European Commission or the projects and organisations that supported the publication.

This publication corresponds to Deliverable D4.2 Guidelines on how to present STEM jobs in classrooms of the STE(A)M IT project. The work presented in this document is supported by the European Commission's Erasmus + programme – project STE(A)M IT (Grant agreement 612845-EPP-1-2019-1- BE-EPPKA3-PI-FORWARD), 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.

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## INTRODUCTION

The STE(A)M IT project is developed around the principle that to get students to see the interest of STEM studies and careers, and even more importantly, show students and society at large the key role that STEM plays in improving our lives, STEM needs to be taught in an integrated way instead of teaching all components of S-T-E-M separately.

Apart from creating and testing a conceptual framework of reference for integrated STE(A)M<sup>1</sup> education, the STE(A)M IT project aims to develop a capacity building programme for teachers with a particular focus on the contextualization of STEM teaching, through industry-education cooperation. This demands to also ensure the contextualization of integrated STEM teaching by establishing a network of guidance counsellors and career advisors in schools promoting the attractiveness of STEM jobs.

Within this framework, the STE(A)M IT project created a “Repository of STEM Job Profiles”, which aims to raise awareness on the skills needed in the STEM careers and jobs in general, by collecting career sheets, video interviews and podcasts depicting STEM job profiles.

### The importance of supporting teachers to provide career counselling.

The continued substantial shortage of STEM skilled workers may jeopardize the success of the European economy. This affects all industrial sectors and slows down the pace of innovation, which in turn has adverse effects on employment and productivity in the related industries. Consequently, the shortage of STEM professionals at all levels weakens Europe's ability to compete globally.

Additionally, the job market has been so complex that even in the case of schools with dedicated staff, students do not always get the help that they need. The handbook for policymakers that was issued by the OECD & European Commission (2004) highlights the fact that usually the career guidance staff of a school cannot respond to the pupils' needs due to lack of staff and resources. The same paper, also indicates that career guidance practitioners get trained rarely or -in some cases- there is no provision for their training. This puts additional weight to the value of career advisors' initial training. Unfortunately though, the content and process of the initial training are rarely defined at a governmental level. The current national trends in the training and development strategy for career advisors, reproduces the absence of relation between their professional practices and the goals for public education, training and employment policies.

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<sup>1</sup> Recently, the term STEM has been expanded to include A, representing Arts, as a way of highlighting the importance of creativity in STEM education, or even with A as a reference to All, i.e. highlighting the importance of connecting STEM to all other disciplines.



This is the case even though, according to the literature, effective career counselling at a national level can have an economic, educational, and social effect. In a review of 27 studies, it was revealed that participation in school-based career activities, were related to better economic outcomes than expected by the individuals. (Hughes et al., 2016 as cited in OECD, 2004).

Previous research on the field indicates that teachers pose as the primary source of information on STEM careers for students since most of the participant students of the research had not received advice and career guidance from stakeholders other than their teachers. These results underline the importance of building a support system for teachers to provide career counseling and contextualize STEM classes (Boiko et. al., 2019).

## About these guidelines

In these guidelines we provide suggestions on how to integrate the topic of STEM careers, especially with the use of career sheets, video interviews and podcasts in classes, as well as activities and follow-up suggestions.

This document aims at supporting teachers integrate career guidance in the teaching. To accomplish that, we first present some examples of projects and initiatives that have taken place in Europe and are manifestations of integrating career counselling in traditional teaching. Later, we present suggestions for teachers on how to utilize the material of the career sheets, video interviews and podcasts that were developed during this project. The suggestions aim to be adaptable in various educational contexts so that teachers can use them without disrupting their agenda.

The suggestions are divided in activities that aim in contextualization of STEM courses and can offer ideas about introducing the career sheets in various STEM classes, and in activities that aim at tackling career guidance-oriented learning objectives of the curriculum and can be used in the corresponding career orientation courses. Finally, there are some indicative activities proposed that aim on pushing the school community further from the STEM jobs repository so that teachers and students can explore also other points of information on the STEM job market.



# EXAMPLES OF PROJECTS AND INITIATIVES CARRYING OUT ACTIONS THAT SHARE STEM CAREERS

## International Initiatives

### STEM Alliance

The STEM Alliance – inGenious Education and industry, brings together industries, Ministries of Education and education stakeholders to promote STEM education and careers to young Europeans and address anticipated future skills gaps within the European Union. The STEM Alliance, coordinated by European Schoolnet builds on the success of the inGenious initiative (2011-2014) to increase the links between STEM education and careers, by involving schools throughout Europe.

With the support of major industries and private partners, the STEM Alliance for inGenious Education and Industry activities promotes STEM jobs in all industrial sectors and contribute to build a STEM-skilled workforce. The STEM Alliance improves and promotes existing industry-education STEM initiatives (at national, European and global levels) and contributes to innovation in STEM teaching at all levels of education.

Read more: <http://www.stemalliance.eu/>

### Space EU

Space EU engages teachers and teacher training institutes to promote the uptake of space content in primary and secondary science education. The project's teacher trainings demonstrate the potential interdisciplinary nature of space-related activities and how to integrate those activities successfully into the classroom and curriculum, in both formal and informal settings.

Read more: <https://www.space-eu.org/>

### STEAMonEdu

STEAMonEdu is structured around three aspects: developing a community, mapping the roles and competences that are involved in exemplar STEAM educational practices, and advancing professional development efforts for teachers and educators.

This project involves various stakeholders in order to enhance integrated STEM education. Therefore, it targets teachers and trainers interested in practicing STEAM education, education and training organizations, researchers in education, educational authorities and policy makers and other stakeholders.



The online community that was designed for the needs of the project connects stakeholders so that they develop high-quality educational material and learning scenarios. It is an action plan that gathers STEAM education best practices and policies.

Furthermore, the development of a STE(A)M competence framework for implementing relevant policies and practices, alongside with the launch of STE(A)M educator profile, and a readiness self-assessment tool, offer a concise framework that allows CTI (Computer Technology Institute and Press) to explore opportunities for enhancing educational capacities in STE(A)M education.

Read more: <https://steamonedu.eu>

## CHOICE

This project aims at reinforcing young people's engagement in STEM subjects and careers. Additionally, it is expected to facilitate the reduction of the skill gap in the job market. Some of the project's outcomes will be a MOOC on STE(A)M education and field visits to successful companies and University Faculties to meet with role models in the area of STEM. The last practice aims at showing a variety of career paths to the students just like the career sheets of STE(A)M IT aim to do in class.

The MOOC that is developed in this project targets primarily students. However, it demands the engagement of teachers since it uses a blended-learning approach (the activities that are implemented in class, run by the teacher, while the distance learning is done in the online platform). That is how teacher engagement is assured. Therefore, it not only provides an interesting STE(A)M learning experience for the student. It also fosters teachers' professional development by providing them the guidelines for an exemplar learning experience. Additionally, the community section functions as a mechanism for interaction between students, teachers and businesses. This is an innovative way of linking education to business without political intervention at a national level.

Read more: <https://www.euchoice.eu/>

## National Initiatives

In Denmark a teacher's professional development program was carried out by the Government. It allowed teachers to gain specialization in science and mathematics -among other fields. Of the 800 teachers that gained a science specialization, 430 also completed courses that qualified them for guidance counsellors (Caprile M. et al. 2015). Moving further in effective career guidance practices, Denmark, as well as other countries such as Austria and Germany, have integrated portfolios as a tool to reinforce their career guidance system in schools. This system has proved to contextualize students' STEM learning to their career planning, and is considered by OECD an effective response system to tackle the challenges of in-school career guidance (OECD, 2004).





# Repository of STEM Jobs Profiles

Welcome to the STE(A)M IT Repository of STEM Jobs profiles! On this page, you will find information and multimedia resources (career sheets, videos, podcasts) about exciting STEM-related careers. Whether you are a student, a parent, a teacher or a career counsellor, you are welcome to use and share these resources as well as providing testimonials and feedback on the challenges you are facing and how these materials can help to overcome these challenges.

## MEET AN EXPERT IN WEB DEVELOPMENT

### Web Development Expert

A web development expert is what one would call an architect of the web. Web developers build the foundations of websites, blogs and other platforms making the information and content users are searching for. Not only are they meticulous and creative, but they are also multi-tasking experts able to understand. [Read more...](#)

By Vanessa James, 3 weeks ago

## MEET A SCIENTIST IN THE FIELD OF BIOMIMETIC MEDICINE

### Scientist in Biomimetic Medicine

Are you students fascinated by nature? Can they spend hours observing natural phenomena, such as flying birds, and try to build their flying machine based on their observations? They might be on the right path to becoming scientists in the field of biomimetic. A scientist in the field of biomimetic. [Read more...](#)

By Vanessa James, 2 months ago

## MEET A SEISMOLOGIST

### Seismologist

Are your students interested in what is happening below our surface? Are they fascinated by earthquakes or tsunamis? Then the career of Seismologist might be the right one for them. They are first of all scientists! Their journey combines physics, mathematics, geology, and computing processing. Seismologist studies earthquakes, their causes. [Read more...](#)

By Vanessa James, 2 months ago

## MEET A RESEARCHER IN PARTICLE PHYSICS

### Researcher in Particle Physics

Have your students ever asked about what dark matter is? Are they curious about unraveling the nature of the universe and understanding the roles and connections between protons, neutrons, electrons and other particles? Then they might be interested in following a career in particle physics! Researchers in Particle Physics spend their [Read more...](#)

By Vanessa James, 3 months ago

## MEET A METEOROLOGIST RESEARCHER

### Meteorologist Researcher

## STE(A)M IT CAREER SHEETS

The career sheet is a flexible teaching material for teachers to use as they see it fit. Its main purpose is to inform students about the economic opportunities that arise from STEAM studies. Apart from studies on Science, Technology, Engineering and Mathematics, all fields of knowledge are integrated into today's economy. Therefore, it is essential to present career paths to students that encourage them to discover their own talents while they advise them on growing their skills towards realistically set expectations.

All career sheets that are being published by the STE(A)M IT project include:

- Overview of the job
- Typical working day
- How to become a professional of this career path
- What skills are needed in this career
- What organizations and in which industries are those professions needed

Career sheets from other projects also included in the repository of STEM Careers might not have some of the additional materials like podcasts, but still provide valuable information for the students on the specific careers.

On some occasions, you can also find information regarding the key subjects that could help students develop the skills they need for a specific path. Moreover, on the Website that the material is presented, you can always find links with additional information, videos and podcasts with the interviews that were conducted in order to develop the career sheets. Explore all the resources [here](#).



## PROPOSED ACTIVITIES

The options below introduce some learning activities that can be integrated in various learning contexts after adapted to the classroom's characteristics. The main principle that all the proposals have in common is that they treat the career sheets as useful material to open new horizons to students and initiate a constructive self-exploration process. Under no circumstances, should those career paths be presented in a totalitarian way or perceived as the universal answer to professional success.

We propose activities for various educational objectives. You can integrate the career sheets in your teaching either by multiple five-minute discussions in various STEM subjects or by including them in bigger project-based activities within the scope of STEM classes. Moreover, in case you teach classes that tackle career orientation learning goals of the curriculum, you can find a small syllabus that you can integrate in your teaching for addressing the field of STEM careers in class. Finally, you can find place-based and Professionals Go back to school activities that will take your classroom to other sources of information on STEM jobs, providing to your class a holistic perspective on the job market.

### **Integrate the STEM job repository in any course of the curriculum.**

To integrate the material in your STEM classes you can use different pedagogical tools. In the discussion section you will find indicative career sheets categorized by fields of knowledge that they are compatible with. Therefore, you will be able to integrate them in your everyday teaching thought discussions. You are prompted to go through the repository and discover more career sheets to integrate in your class based on the learning goals you are currently tackling in your class.

In the project-based activities section you will find ideas for projects you can develop in your STEM class. These discussions and projects aim at contextualization of STEM classes and at fostering ownership of learning in students.

### **Discussions**

One way for integrating career sheets into your teaching is to connect the learning goals of various courses with activities that are linked to the subject.

In order to connect the career sheets to the courses we present below a proposal for some of the career sheets.



- [Space Mission specialist](#) could be used in a **Physics** class during courses on Newton's laws. It could also be utilised in a Natural Sciences class when you are discussing the atmospheric structure.
- [Cybersecurity specialist](#) would be ideal to be introduced in an **ICT class** when you discuss safe surfing behaviour.
- [Meteorologist career sheet](#) can be introduced in **Physics** when you present thermodynamics laws.
- [Lighting Engineer](#) can be combined with the **Physics** teaching of Coulomb's law or other electromagnetism fields of knowledge.
- The career sheet of a [Plasma Physicist](#) can be challenging to introduce in class mainly because plasma is a state of matter that exists predominantly in space. Therefore, it is difficult for students to relate to. For this career path to be tangible for students, you could use teaching material from electromagnetism in a **Physics class**. Plasma is the form that matter takes when it becomes sufficiently hot and energetic. The matter breaks down into particles that include negatively charged electrons and positively charged ions. Therefore, this career sheet can also be addressed in **Chemistry class**.
- [Urban Informatics Analyst](#) career sheet can be introduced in a **Statistics class** but also in a **Social Sciences class**. Using it can help you link the importance of statistics to the decision-making processes.

## Project-based activities

### 1. Let's turn our skill into potential

The career sheets would also be very constructive material for project-based activities. Using the skills that are presented as essential for each career path, students can explore their possibilities and plan a course of action towards their development. For the needs of the project, the students can work individually or in groups. The groups are formed according to the career preference of the students.

This project-based activity aims at supporting students in their professional orientation while it links the subject to the real world. That way, you contextualize STEM according to students' interests and lives.

### Learning Outcome

Each student -or group of students- could present in the classroom their action plan regarding their future education and set goals for their school year for the related subjects. It is recommended that these presentations are scheduled so that the student's job preference is relevant to the subject that is being taught.



## Tips for the implementation

If you teach STEM, it would be advisable to ask the students to present their chosen career to help you deliver new knowledge relevant to their chosen field that you are about to introduce to the class. They could present a relevant experiment in class that would make them feel closer to their career choice.

## 2. Become an Urban Analyst! Understand your community

Using the Urban Analyst career sheet can make statistics fun!

Explore the [Eurostat education corner](#). You can find databases connected not only to statistics learning objectives but also address social issues in your class. Depending on the background of your class and your location you can create a sequence of activities that help students understand statistical tools always under the prism that an urban analyst would have. This means that the students will not only find the dispersion or the mean of a certain phenomenon, but they will try to analyse the social implications of it and provide data that can lead to a constructive discussion for decision makers.

For example, consider examining the available square meters of green spaces per citizen in your city. Moreover, if you combine data of CO2 emissions, you can point out the air quality of various areas in the city. Using a city map, you can point out the areas that lack oxygen the most. Following, you can use a map of your area to help your students ideate where could additional green spaces be developed? The question could be framed as follows “If you were an urban analyst that consults our mayor, what would you propose?” This indicative activity can lead with your students stepping out from the role of the urban analyst and step into the shoes of an urban architect. How would your students choose to restructure the available spaces? Which plants are compatible with your area’s climate? How much care would these plants demand? (link to environmental studies).

## Enhance your teaching to tackle career guidance related learning goals.

In case the curriculum you are to follow includes specifically career guidance learning objectives, you can use this brief indicative syllabus of activities to utilize the STEM job repository for the needs of your course.

## Introducing the professions and processing the information

Before getting deep into designing a professional development strategy, you need to introduce the career sheets in class in a constructive way that sets the groundwork and develops useful skills for the later stages of the career guidance process. You can do that by implementing gamified activities in class that aim at introducing students in simple terminology that is used in the job market. You can use the same activity to introduce all the career sheets or utilize a combination of the proposed activities.



You can even alter and adjust the proposed activities to your classroom's needs or you can create your own activities.

### **Guess who.**

Students are told the name of the profession and they are given a blank career sheet. In groups they have to write what they think the person doing the profession needs to know, what skills he/she needs to practice the profession and what his/her working day would look like, etc. To develop further their career sheet, they are advised to research on job search engines (e.g Indeed, LinkedIn, CareerBuilder, Glassdoor, Monster) profiles that much this job title. This process introduces students to the idea and functionality of job descriptions, a key-concept in the job searching process and they can also getting to know professional networking platforms, such as the ones mentioned previously.

After that, one representative of the group reads their description of the profession, and another receives a completed career sheet from the teacher and reads it to the class.

This is followed by a discussion about the occupation in the form of differences in the career sheet filled out by the students and the person engaged in this job. An oral survey among the students as to whether they are likely to pursue this profession can lead to communicating about how they imagine themselves as professionals.

After that, the teacher can show the students videos about the professions they have discussed using the Interviews for the STE (A) M IT Repository of STEM Jobs profiles which you can find [here](#).

### **SWOT my profession**

Before the lesson, the teacher prepares a story about a certain profession, using a career sheet in the first person, which he will read to the students. The main character of the story is the person who deals with this profession, mentioning specific information about the profession through the story, for example:

- Who am I, what are my skills?
- What are my advantages and disadvantages?
- Where was I educated, what have I learned / done during schooling?
- Where am I employed, what the preparation for my workday looks like?
- What my workday looks like?
- What my work environment looks like?

After hearing the story, students are instructed to try to imagine themselves in the role of a character from the story that was read. They are then given a worksheet on which students use the SWOT analysis method to write impressions of the profession from the story from their perspective, for example:



- Strengths - what are my characteristics that would make me good in this profession?
- Weaknesses - are there any shortcomings to deal with this occupation that I could work on?
- Opportunities - what are my goals, what would I get if I pursued this occupation?
- Threats - what challenges would I face if I pursued this profession?

Students who wish to do so can share their analysis in front of other students.

This activity can be performed in a different way: Students can create their own protocol of the interview and conduct it with a professional and analyze the data using SWOT analysis.

This activity will later help students with developing their CV. Being able to understand what the employer needs from you and what skills and experience fit this job description is key for a successful job search. Of course, students are nowhere near this process, but this activity sets the groundwork for a thoroughly developed professional identity.

### **Introduction to job searching**

Students are divided to work in groups. By random selection (for example by pulling out a piece of paper), each group of students gets the name of one profession from the database of career sheets, which in the next week should be researched online according to predetermined guidelines, for example:

- Overview of the job
- Typical working day
- How to become a professional of this career path?
- What skills are needed in this career?
- What organizations and in which industries are those professions needed?

After that, each group of students presents the profession to the other students. The method of presentation can be determined in advance by the teacher or in agreement with the students, for example, display of occupation through acting, display of occupation through PowerPoint presentation, display of occupation through posters and similar.

After that, during the discussion, the career sheets filled in by the professional and the data obtained by the students through their research are compared.

This activity fosters research and presentation skills that are always essential for the professional development of students. It introduces students to the process of outlining the characteristics of a job and inevitably takes them through a comparison process.



## STE(A)M IT Repository of STEM Jobs profiles

Video interviews created within the STE (A) M IT Repository of STEM Jobs profiles can be used alone or in addition to career sheets. In order for teachers to be able to bring students closer to different professions and encourage them to think about their own future careers, they can also use the interviews created within the STE(A)M IT project. With each video created within the STE(A)M IT Repository of STEM Jobs profiles, the teacher can encourage students to find and present examples of people working in that profession in their country.

In occupations for which they cannot find examples, you can discuss what it would be like for a person to pursue that profession in your country. You can do that with guiding questions like the following:

- What kind of education in your country “Career Title” needs to have?
- What skills “Career Title” needs to develop during schooling?
- Would there be anything different in the description of the occupation in your country compared to the profile of “Career Title” you watched in the video?
- Do you find it interesting to be “Career Title”? What are the reasons for that?

## Designing a professional development strategy

After having introduced some of the professions individually in class, you can use the ensemble of the repository to engage students in activities that demand higher-order thinking processes. This will develop further their critical thinking and strategic skills.

### Step 1: Let’s debate: Best profession competition

The goal of this activity is to help students realize what factors make a profession alluring to them. Therefore, it helps them familiarize with real-life opportunities and challenges that professionals face every day.

Defining what you expect from your job is the first step towards discovering your future steps of professional development.

All students are divided into four or five groups, except for three students who are separated from the groups (voluntarily or randomly) and pose as the “judges”. Each group of students receives a different career sheet. Each group of students has some time to read the material, research and prepare to present that profession to the students who have been separated from the group. The task of each group is to present the profession to the students in such a way that is the most alluring so that the “judges” choose it over the other professions presented. The teacher agrees with the students on the criteria on the basis of which the judges will make the final decision on which team is more successful. These criteria can be: creativity, dynamic presentation, selection of different forms of presentation (for example, visual, written or oral presentation, acting), persuasiveness, etc.



Students should be reinforced to include wage statistics they found online, and highlight any detail of the job that can be an asset (e.g. ability to work remotely, status, importance of the job for the society etc.). Judges should assess which group of students is better acquainted with their occupation and which occupation they would choose. At this point it should be emphasised that judges have a saying only on which presentation was more effective. This does not mean that the professions that were not picked are not alluring enough, it rather reflects upon the persuasion strategy of the teams.

By the end of this activity, all students should be prompted to take notes of what working conditions they consider important for their profession to have. They also should take notes in case any particular field of knowledge presented is of interest to them.

## Step 2: Research

In the previous activity, students got a first introduction to the idea of job descriptions, skills and job search engines as a research tool for the job market. Moreover, the previous activity aimed at putting students in the process of introspection. They discovered what they consider 'good' working conditions and 'interesting' knowledge field to work on. Now it is the time to use those pre-acquired knowledge and self-realization to develop their professional development strategy through conducting research based on their own priorities.

Also, in case teachers who engaged students with the STEM jobs repository are looking for opportunities to engage students in small research activities that are close to students' interests and experiences, a great way to do that is by asking them to use reliable sources and professionals networks to discover professional opportunities that interest themselves.

You can utilize the template that is offered in the Annex to help students with their research. As you will see in the template, this process is structured in three parts:

- A) Using the career sheets offered in the STEM jobs repository students can define even more the key-words of their desk research and then search in broader databases that are rich in information on the background needed for the profession of their interest.
- B) Following, they can search for institutions and experiences that will provide them the needful background. It is essential that they are prompted to gather information about the different possible studying and working paths they can take (academic, vocational education and training and initial work prior to further studies can be three different pathways to be considered), and develop a list of pros and cons.
- C) Finally, they can develop their own action plan starting from the profession-end goal and breaking it down to decisions they need to take in the near future.

This activity aims at introducing a provision mentality and guide students through the process of professional development in a job market that some times can feel chaotic and hard to follow.



## Moving further from the STEM repository

### Place-based activity

Depending on your access to industrial infrastructure, you could arrange excursions to locations inside your city and meet with professionals in their work environment. This can prove intriguing for students since they will have the opportunity to see the action of the job. The teacher can consider even asking students about the professions of their parents and discuss with the class whether any of those professions is intriguing to them.

It would be advisable to choose for this activity careers that take place in unconventional spaces (for example a visit to a research laboratory, an observatory of stars, a production area, or other spaces where students can specifically see devices, tools, and procedures performed as part of a job) and avoid offices with no visible stimuli to illustrate (for example, an office in which there are only basic accessories for work - computer, printer, documents, etc.).

To make this work, first, think about the infrastructure that your area has available. If you are close to a University, go through the faculties and discover exciting projects or labs that could pose as potential locations. Consider also industrial spaces or business rich in visual stimuli.

After you have some locations in your mind, find the relevant career sheets and present them in class. Focus on your student's reactions. For this activity, the career sheets will facilitate you in the elimination procedure while they introduce the conversation of career possibilities. According to your class's interest, prioritize your possible locations and try contact professionals that match the characteristics of the career sheets you focus on. Make sure you explain your role and the purpose of your activity. That way, the professional can enrich your excursion with information and small place-based activities you might not be aware of.

After you arrange the excursion, make sure that you know exactly the schedule with the activities and what you will talk about.

The last part of the activity is the most important. Make sure that when you come back to school you process with your students all the new information you got. You can do that with guiding questions like the following:

- What is important to know when you are a(n) "Career Title"?
- What skills do you believe are needed to fulfill task X?
- What implications does that job have on the individual's personal life? (e.g. long working hours, travelling, potential dangers of the job)
- Do you find it an interesting career? Why/ Why not?
- What intrigued you the most in this excursion.



- Would you like to work on machinery systems like the ones we visited?
- What do you need to do to be able to use such machinery one day?

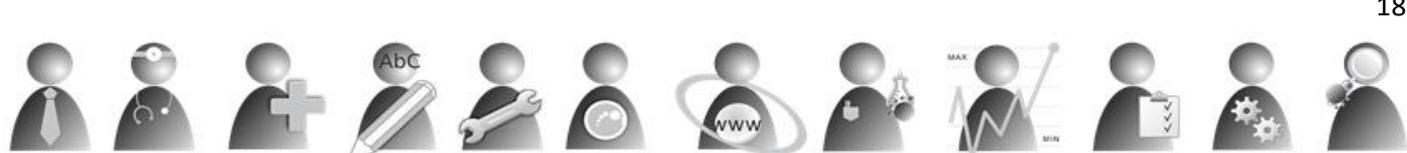
## Professionals Go back to school (invite guests)

The "STEM Professionals Go Back To School" is a STEM Alliance scheme that encourages volunteers from STEM industry (technicians, scientist, engineers, researchers or employment and recruiting managers) and teachers to organise career talks and collaborative activities in schools.

You can develop your own Professionals go back to school initiative. The career sheets could pose as additional material during an initiative such as this. Students could attempt to develop the career sheet of the professional that you invited in your class. This can help students realize the implications that a career has to your development. During this activity, students can also understand the importance of a mentality towards lifelong learning. Students can prepare questions in advance for a visiting expert.

To better present the profession of a visiting expert, and for students to conceive the everyday tasks of the profession, it is advised to:

- Ask the visiting professional to bring a product / object that he / she makes or uses during work. That is to show the students how he / she works. If the visitor is comfortable with that, it would be constructive to give students the product / object so they can see it, touch it or try it (if applicable). After that, they can talk about everything the professional uses in their work
- The person coming to visit can prepare in advance simple tasks from the scope of their work for students to do individually or in groups. They can then discuss their experience in performing these tasks



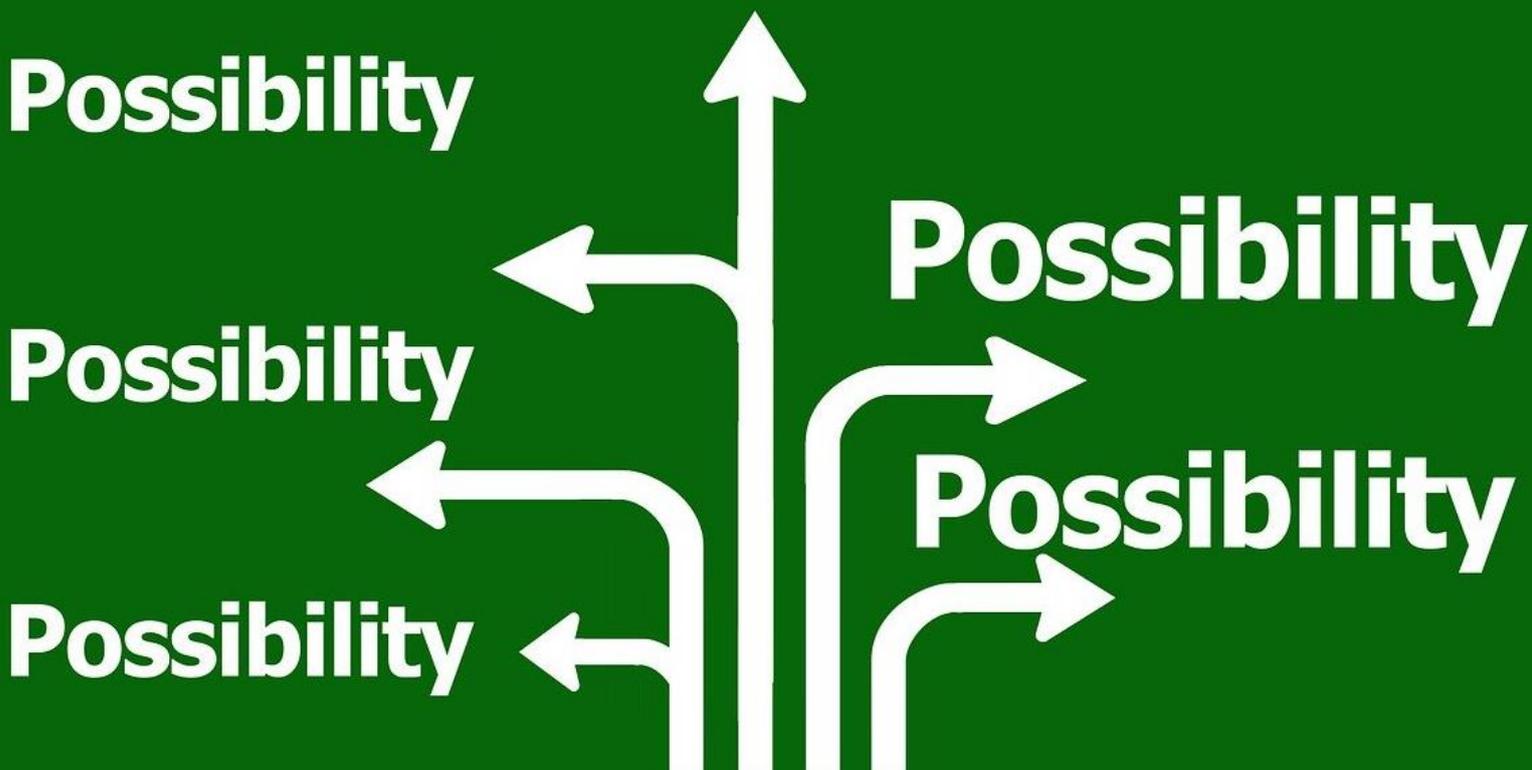
## CONCLUSIONS

Teachers play a fundamental role in students' professional orientation (Boiko et. al., 2019). This underlines the necessity for offering a support system for teachers to succeed in this role. The STEM jobs repository is a database that introduces teachers and students to the terminology and opportunities that are met in the STEM job market. However, the school community should not treat this database as the sole point of information on professional trends. As explained previously, this database aims at helping the students acquire some initial terminology so they can guide themselves in active job search engines and open to the world of the job market.

With teacher's guidance, students can use the career sheets to initiate an introspection process, link STEM acquired knowledge to the job market, and familiarize themselves with opportunities they had never considered.

The proposed activities are susceptible to adaptation and teachers can even decide to follow a completely different way to integrate the material in class. Utilizing the STE(A)M IT STEM jobs repository in the best possible way falls under the teacher's responsibility and no other party claims to have jurisdiction on that. However, it is essential to point out that this is a collaborative tool to use in class and can be reinforced by innovative pedagogies such as project and problem-based learning, collaborative, and active learning. It can also foster the mentality of lifelong learning since the key message of all the career sheets highlights the importance of continuous professional and personal development.

# Possibilities



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# ANNEX - PROFESSIONAL DEVELOPMENT ACTION PLAN TEMPLATE

## Part A: Define your professional requirements

### Key-words that will define your research

<Students are to define the key skills, work conditions and job titles they are considering for their research. This is a dynamic process. They might have some key-words in mind initially and while going through new career sheets, they can enrich their preferred key-words>

## Part B: Make your research

### Professional objective

<The student is to fill in the title of the position he/she targets at. >

### Main background-knowledge needed

<The student is to fill in the background knowledge they need to obtain so that they can follow their intended profession>

### Institutions and experiences that can foster the needed knowledge background

<The student is to present different options for studies or initial work experience that can later on lead to the intended profession. It is essential to detailly outline the differences of those options and the various possibilities each option offers. A list of pros and cons for each option can make the next steps of the activity easier.





**Option A**

**Institution:**

**Type of Education:**

**Prons:**

**Cons:**

**Option B**

**Institution:**

**Type of Education:**

**Prons:**

**Cons:**

**Option C**

**Institution:**



**Type of Education:**

**Prons:**

**Cons:**

**Main skills needed:**

<Students are to fill in the skills that are needed for their chosen profession and to note which of the skills they already master and which they need to improve.>

**Ways to improve your skills**

<The student is to propose ways and contexts that can help him/her improve the needed skills. How school can facilitate this process? Maybe he/she can ask for the support and monitoring of the teacher since exterior observants tend to provide valuable feedback on the progress of our skills.>

**PART C: Develop your action plan**

<After evaluating all the data obtained and prioritizing the areas of needed development. It is important that the student writes down an action plan. Start from school goals and move to future bigger goals.

Including alternative plans is also advisable since professional development is never a linear process. If there are different specialties that allure the student he/she can start developing a plan that for now does not exclude any of them. Another matter to consider is how the teacher can support the student in this process. Maybe during the course, the teacher keeps in mind the specific goal of the student and make sure to assign relevant tasks when possible and give feedback regularly.>





# STEAM IT

AN INTERDISCIPLINARY STEM APPROACH

In these guidelines teachers can find suggestions on how to integrate the topic of STEM careers and jobs in their classes, especially with the use of career sheets, video interviews and podcasts, as well as activities and follow-up suggestions. The aim is to support teachers to integrate career guidance in the teaching. The activities suggested are adaptable in various educational contexts so that teachers can use them within their existing curricula and programmes. These guidelines correspond to Deliverable D4.2 Guidelines on how to present STEM jobs in classrooms of the STE(A)M IT project.

STE(A)M IT is developing a conceptual framework of reference for integrated STEM education including a capacity building programme for primary and secondary STEM teachers, based on this framework, with a particular focus on the contextualization of STEM teaching, especially through industry-education cooperation. STE(A)M IT will ensure the contextualization of the integrated STEM teaching by establishing a network of guidance counsellors/career advisors in schools promoting the attractiveness of STEM jobs to their classes.

The work presented in this document has received funding from the European Union's ERASMUS+ programme project STE(A)M IT (Grant agreement 612845-EPP-1-2019-1- BE-EPPKA3-PI-FORWARD), 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 Union or the Education, Audiovisual and Culture Executive Agency, which are not responsible for any use that might be made of the information contained.

