

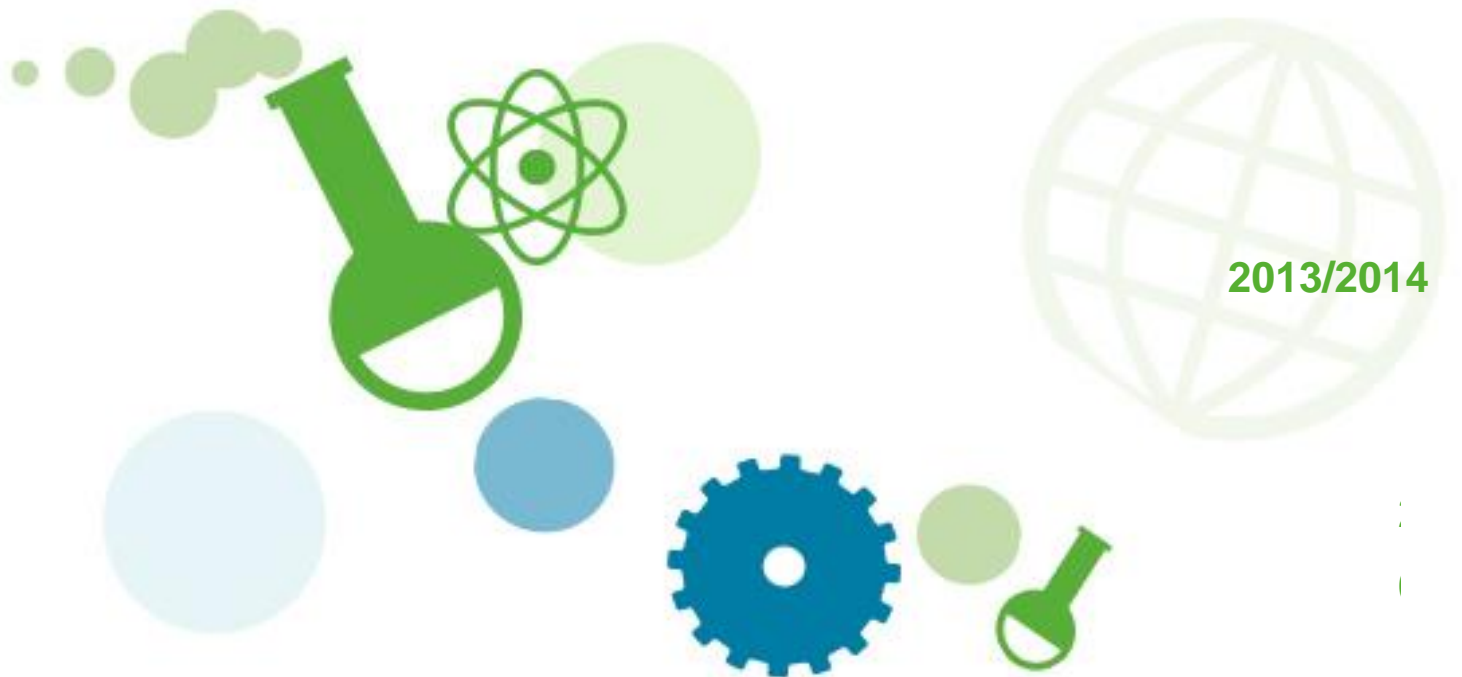


Shaping the future of maths  
and science education

# “Ignite Your future” Career Discussion

## Lesson Plan Two

### Some Key Concepts Related to STEM



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## OVERVIEW:

- **Lesson title:** Some Key Concepts
- **Age level:** 13-18
- **Time allotment:** 45 minutes
- **Resources:** video projector and the “Ignite Your Future” video developed for inGenious by European Schoolnet (<http://www.youtube.com/watch?v=xBYkxZzt8-M&feature=youtu.be>)
- **Document licensed**



## INGENIOUS:

inGenious is one of the largest and most strategic projects in science education undertaken in Europe. It brings teachers and industry partners together to ensure STEM education is both up-to-date and relevant to the job skills young people need.

By improving the image of science subjects and related career options, inGenious aims to stimulate pupils' interest in, and their understanding of, the wide range of opportunities that STEM can bring to their lives in the future.

Set up in 2011 by European Schoolnet and the European Roundtable of Industrialists, inGenious brings over 40 members from industry, ministries of education and associations together with European teachers.

**Join the inGenious Teacher Community:** <http://www.ingenious-science.eu>

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## INTRODUCTION:

The world of work today is complex and changing with new job functions and working methods emerging and evolving rapidly. Pupils' understanding of careers is often limited to the experience of people in their immediate environment (family and teachers) and their perceptions can be influenced by incomplete information and stereotypes. They can find it challenging to know where to begin when identifying their career pathway.

The “Ignite Your future” video was developed as part of inGenious, a European Commission funded initiative managed by European Schoonet. inGenious aims to foster collaboration between teachers and industry and improve pupils' understanding of careers in science, engineering, technology and maths (STEM). The video strives to show the link between STEM achievements, real careers and school pedagogy. It also aims to address stereotypical thinking, such as STEM is geeky or not for girls. It illustrates the important role that jobs employing STEM knowledge play in shaping our future world.

### Subject matter

This lesson suggests a way of managing discussion before and after a classroom screening of the “Ignite Your Future” video. The video encourages pupils to think about the wider world relevance of STEM teaching at school by covering three STEM innovations and some of the jobs roles related to them. The lesson takes this a step further by inviting pupils to think broadly about their current perception of careers in STEM.



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## LEARNING OBJECTIVES:

This lesson aims to stimulate thinking about the following areas:

- Our perception of STEM careers and what influences us
- Stereotypes and diversity
- Supply and demand

## ACTIVITY DESCRIPTION:

The activity can be introduced as follows:

It is never too early to think about your future because what you do in school impacts your choices in the future. Our thinking is shaped by the opinion of others. We often do not have a full picture of a career meaning our perceptions can be incomplete or dated. Today we are going to talk about some key concepts related to career choices. Our discussion will focus on careers that usually require an understanding of science, technology, engineering and maths (STEM).

### Part 2: Some Key Concepts

#### Step 1

Divide class into groups of 4-5 pupils and provide each group with the list of questions detailed in Annex A.

#### Step 2

Ask pupils (in their groups) whether the “Ignite Your Future” video changed their perception of STEM careers and if so, how? (Q1) Try to lead the discussion around the importance of questioning our thinking and keeping an open mind. Invite group representatives to summarize their discussion to the class.



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### Step 3

Ask pupils whether the video surprised them in any way. (Q2) Bring the discussion around to stereotypes and diversity.

**Stereotype:** a simplified, overgeneralized but widely accepted and used image of a person or thing. Examples: The English eat fried breakfast every day or the best machines come from Germany. Stereotypes can lead people to ignore the diversity of groups.

**Workplace diversity:** workplace diversity means accepting, welcoming and valuing the differences inherent in every individual and recognizing the contribution that a distinct skills, perspectives and experiences can make to organisational effectiveness and performance. Workplace diversity often results in, for example, better market understanding and marketing, improved product design, new problem solving techniques and management approaches.

The area of STEM is often perceived as boring, geeky, masculine, far removed from real 'action' and STEM jobs are considered to be isolated and lonely. A picture of a man in glasses working alone in a lab is a common STEM stereotype.

If pupils say they were surprised the film wasn't boring ask them why (Q3). Invite them to question their thinking about certain industries and roles.

You may want to say that women are under-represented in the working world of STEM and prompt a discussion about whether it is good that some innovation areas and industries are male dominated? (Q4) What is the value of diversity in general? (Q5) Invite group representatives to summarize their discussion to the class. The following talking point may be useful in explaining the value of gender diversity. Similar examples could be drawn for age and ethnicity.

#### Talking point: Car example

Ask pupils to raise their hand if they know women who own or drive cars.

Car ownership by women is taken for granted in developed markets and women are known to have a large say in the choice of the family car. It makes sense therefore to build cars that women like. Women know best what women like therefore it is good business sense to involve women in car design.

This example can be applied to most products and to diversity of all kinds – gender, race, socio-economic level, sexuality.



## Step 4

Return to full class discussion.

Another key labour market concept and career consideration is supply and demand.

**Supply and demand:** the relationship between the amount of goods or services that people want (demand) and the amount that is available (supply) in a given timeframe. According to the '**Law of Supply and Demand**', if demand for a product is high yet its supply is low, then the product's price will go up. If demand is low and the product is in wide supply then the product's price will go down.

Ask the class why some items are more expensive than others. Try to lead the discussion so that pupils realise rare things like great football players, diamonds, certain antiques and foods (caviar, top wines) are in scarce supply. Consequently, pupils could realise that the high cost of these items is because they are in short supply.

Ask pupils to reflect on the effect of supply and demand in the workplace.

If there is a shortage of a type of worker in a certain field, demand may increase and companies may compete to recruit that worker. Many companies may offer interesting remuneration packages for skills in short supply. Discuss supply and demand in relation to certain professions such as teaching, IT professionals, engineers, lawyers. Explain that pupils can look up job projections for certain occupations to determine the number of openings that are projected for the future.



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## ADDITIONAL ACTIVITIES:

### inGenious Educational activities

A range of STEM education activities developed by inGenious industry partners including Philips, Shell, Volvo, Intel and Microsoft can be found on the [inGenious website](#). You will need to register to the inGenious Teacher Community (takes a few minutes) to access them.

#### Useful resources:

On-line careers tests exist in various languages. They can be a useful resource in helping pupils to develop their self-awareness. Examples below:

- [www.bbc.co.uk/science/humanbody/mind/surveys/careers/](http://www.bbc.co.uk/science/humanbody/mind/surveys/careers/)
- [www.toutpoureussir.com/eng/orientest/index](http://www.toutpoureussir.com/eng/orientest/index) (English and French)

#### Role model databases and job seeker tips:

On-line resources exist in most countries. These offer insight into different types of careers and offer CV template and job seeker tips.

Examples below:

- <https://vle.thebrilliantclub.org/brightside/knowledge-bank>
- <http://www.myworldofwork.co.uk>

EU and UK examples below:

- <https://vle.thebrilliantclub.org/brightside/knowledge-bank>
- <http://www.myworldofwork.co.uk/>
- <http://www.futuremorph.org/>
- <https://nationalcareersservice.direct.gov.uk/Pages/Home.aspx>
- <http://www.prospects.ac.uk/>
- <http://www.careerswales.com/en/>
- <http://www.education.gov.uk/>
- <http://www.shu.ac.uk/research/cse/about-us/stem-unit>
- <http://www.wisecampaign.org.uk/>





## ANNEX:

### Annex A: Some Key Concepts

1. Did the “Ignite Your Future” video change your perception of STEM careers and if so, how?
2. Did the video surprise you in any way?
3. Do you think STEM careers are boring? If so why do you think this?
4. What do you think about the fact that women or often underrepresented in STEM industries? What might the consequences be?
5. What is the value of diversity?

#### References:

<http://www.fldoe.org/workforce/ced/pdf/supply-and-demand.pdf>

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The work presented in this document is supported by the European Union(s Framework Programme for Research and Development (FP7) - project ECB: European Coordinating Body in Maths, Science and Technology (Grant agreement N± 266622). The content of this document is the sole responsibility of the Consortium Members and it does not represent the opinion of the European Union and the European Union is not responsible or liable for any use that might be made of information contained herein.

