

Engineering For Non Engineers

There are many aspects of science and maths that need or use technology and engineering. This resource is aimed at STEM Ambassadors who are not trained engineers, but who work in an engineering related field.



Used in combination with the other support resources (*The Engineering Message, Diversity and Routes into Engineering*) the information and tasks explained here will help engage you and your audience with different aspects of engineering.

Remember this is a starting point for discussion and activity. Why not use in conjunction with one of our activity resources?
www.raeng.org.uk/eenpresources

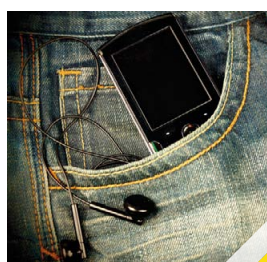
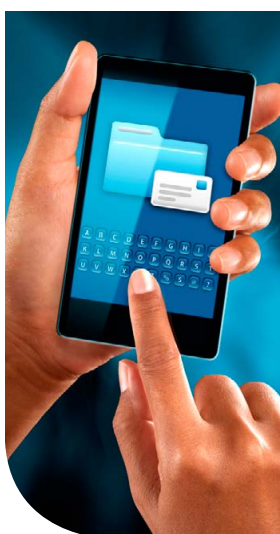
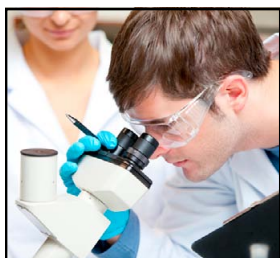
Engineering is Everywhere

A good way to test this theory is to split your audience into small teams and give them each a part of the room, and a pack of small post-it notes.

Using the post-it notes ask the group to put a note on anything they can see that they think involves engineering.

Ask each group to discuss one object they think has been engineered. What objects have they missed out? What are your audience's reasons? What do they think engineering is?

Allow time for the students to reflect on their answers, would they change them if asked again?



Engineering: Belief Circles

Another great way to discover and develop a groups' ideas and awareness about engineering is the use of belief circles.

Visit http://practicalaction.org/docs/education/engineering_belief_circles.pdf for a resource created by Practical Action.



What
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Look at the Mind Map produced by WISE (Women into Science, Engineering and Construction) which can be found at www.wisecampaign.org.uk/_db/_images/Engineering_Mind_Map_20100512040335.jpg to see just how varied engineering is.



More Information

Perhaps you could develop these ideas further by joining a school STEM Club?
www.stemclubs.net

Contact your local contract holder
www.stemnet.org.uk/regions

There are more useful ideas at
STEM Networking
networking.stemnet.org.uk

For more information on the Engineering Engagement Project visit The Royal Academy of Engineering website at
www.raeng.org.uk



Influences

It is a good idea to see how engineering influences your career.

The picture above depicts how Layla, a Physicist, is influenced by engineering and technology.

However this is true for our sports and hobbies too, Layla also likes playing the electric guitar:

- ✔ I need to plug my electric guitar into the mains power supply. Without engineers I wouldn't have any electricity.
- ✔ Engineers have helped to design and build the amp I need so that others can hear my music.
- ✔ My guitar is made from lots of different materials – engineers are needed for this too.

As a STEM Ambassador think about these diagrams and draw your own. You could ask your audience to draw an influences diagram for their favourite sport, hobby or subject too.

Skills

Don't worry if you have been asked to help with engineering or technology styled activities. As a STEM Ambassador you have many transferable skills which will be useful.

It is helpful to create a list of skills you think have been useful in your career, as this will show students the type of skills needed to work in STEM related areas.

We have started a list for you:

Skill	Use
Communication Skills	I am able to discuss ideas with colleagues and make presentations
Teamwork	I am able to work with others to deliver successful projects.
Problem Solving	I need to be able to analyse a situation and find creative ways to form solutions.



Role Models

**Science, Technology,
Engineering and
Mathematics careers**

are very varied and diverse therefore so are the people that follow these careers.

For further information see the Diversity, Engineering Message and Routes into Engineering resources from the Engineering Engagement Project.

For some great role Models visit:

STEMNET's Leading Lights at www.stemnet.org.uk/list/1 and the UKRC's Ingenious Women at www.theukrc.org/about-us/our-projects/ingenious-women

STEM Ambassadors in Action

Take a look at these STEM Ambassadors (right) who show how science and engineering interact.

There are lots more profiles for you to use throughout the Engineering Engagement Project Resources.



**STEM
AMBASSADORS
ILLUMINATING
FUTURES**

Anna Davis

Building Physicist

I was inspired to do an engineering degree after taking part in the Royal Academy of Engineers' Engineering Education Scheme ... I then went on to Bath University and studied Aerospace Engineering and specialised in fluid dynamics and computational fluid dynamics in my final year. Engineering skills are very transferable ...



The favourite part of my job is the interaction I get with other engineers, designers or architects. I help people solve their problems and also get to work on designs that no one has ever tried before.

Deborah Phelps

Physicist

I did A-levels in Physics, Maths and Chemistry. I loved the Physics and Maths but not so keen on the Chemistry which I found really hard going. So I did a BSc in Physics and Mathematics at Loughborough University. I chose Loughborough because they offered a year in industry as part of the degree.

The best bit about my job is probably seeing something that you've been working on actually being used by other people. I'm not strictly an engineer but there's certainly engineering involved in my job.



Science and Engineering: What is the Difference?



We have looked at how Engineering influences Science, but you may find it useful to think about the differences between science and engineering too.

Engineering applies scientific, mathematical, economic, social, and practical knowledge to design and build structures, machines, devices, systems, materials and processes that safely realise improvements to the lives of people.

Science is an enterprise that builds and organises knowledge in the form of testable explanations and predictions about the world.

Do you agree?

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