Engineers Without Borders - Canada

Learning About ENGINEERING: Modules for Teachers Resource

engineers without borders
ingénieurs sans frontières
Canada

ACGC
Alberta Council for Global Cooperation

Learning about *ENGINEERING:* Module for Teachers

Age Group: Grade 7-12 students

Note to teachers: This presentation is designed for students to gain a basic, general understanding of what engineering encompasses for students having little or no knowledge of the field. This is to be used in collaboration with the included digital presentation to allow students to think, make personal connections, and ask questions regarding their field of interest. Ideally, the audience for this presentation will be students looking into, interested in, or considering the engineering field (most probably high school students). The following questions and topics of discussion can be used at any point during the presentation, but is best if presentation is run through once by the teacher before presenting to students so that the following material can be used at the appropriate times.

Introduction

1. Ask students about how they define engineering. Allow them to share their perceptions, ideas, feelings about the field and what they think of it; including personal stories and connections. Allow for open discussion and debate.
2. Lead them through common myths and stereotypes of engineering; are some of these similar to what had been shared?

After presenting these myths and common misconceptions to the students, tell them a little more about the field:

In reality, engineering is a field that does indeed involve using skills such as science and mathematics, but requires artistic, open-minded, unique individuals to challenge daily problems from different angles. The dictionary defines engineering as a branch that applies not only the scientific and mathematical principles to help design structures, processes, materials, machines, and other devices to improve the lives of people, but also uses economic, social, business, and management skills. In actuality, the skills most appreciated in engineers are not the technical, scientific skills, but the innovative and creative thinking that

allows for humans to enhance their lifestyle by new designs engineers have a role in.

The number of women in engineering is steadily increasing to what it was 10 years ago- engineering just requires individuals who are able to think practically and logically while applying the above principle- so it is indeed NOT restricted to simply males! Individuals having all sorts of hobbies and interests have become successful engineers- not only restricted to simply those who play video games and repair computers. Due to the open nature of the field, engineers do not just work in offices or buildings, but can spend time in laboratories, outdoor areas, or even remote villages! Remember, because engineers solve global issues, they can work anywhere in the world…

Engineering is a profession that attempts to solve global issues through application of the above mentioned skills for the betterment of society as a whole. There are many areas that individuals can choose, depending on one's interest.

ENGINEERING DISCIPLINES

After showing students each respective clip of all sectors of the field, you can read them the following information and answer any questions they may have.

Civil Engineering- This area deals with the construction and design of structures that people use on a daily basis; this could include bridges roads, damns, buildings, skyscrapers, or even city parks and streets. Because these are common structures that affect people everyday, the work of a civil engineer ensures proper construction and maintenance of these designs.

Mechanical Engineering- Engineers in this field work with machines and tools, and mechanical systems as a whole. This area deals with learning about heating and cooling systems, mechanics, dynamics, kinematics, thermodynamics, and even areas from other disciplines such as electrical energy systems and fluid flow principles. The work of a mechanical engineer might include designing a robot, a medical device, a car engine system, or even a spaceship! Mechanical engineering is the broadest discipline because it includes so much information from different areas.

Electrical/Computer Engineering- These branches deal with the concepts of electricity and magnetism, electronics, computer science, and software/hardware design. There are thus many areas that fall under this branch, such as power systems, alternative energy sources, computer programming, circuit design, and communications technologies. Engineers in this field may work in areas such as automotive engineering, oil industry, telecommunications industry, or even research in alternative energy sources.

Chemical Engineering- Especially big in Alberta, chemical engineers use concepts from other areas of science like chemistry and biology to convert raw materials into other forms, like petroleum and oil and gas products. This may also encompass areas such as biomedical engineering, or environmental engineering. Chemical engineers may work in plants, offices, oil fields, and have to think both practically and economically as well. Other areas within chemical engineering include: electrochemistry, food engineering, biomolecular applications, oil refinery and oil exploration, processing engineering, and even water technology.

CLosing

Once students have looked at the different disciplines and asked and answered questions, offer them information from local post-secondary institutions, and let them know ways they can find out more about the field by contacting a local university.

Engineering is a great way to solve and tackle arising global matters, from environmental sustainability, to health, energy, and even social issues.

Once an engineering student, the options are endless as to what field you can choose to match your interest. Are you planning on going into an engineering program in the fall and are wondering what it is like to be an engineering student? The best to way to find out about any field is to ask someone. To find out more about a particular area or the faculty in general, contact your teacher or your local college or university.

Please see http://prezi.com/txulftgze2_p/the-realms-of-engineering/ for digital presentation.