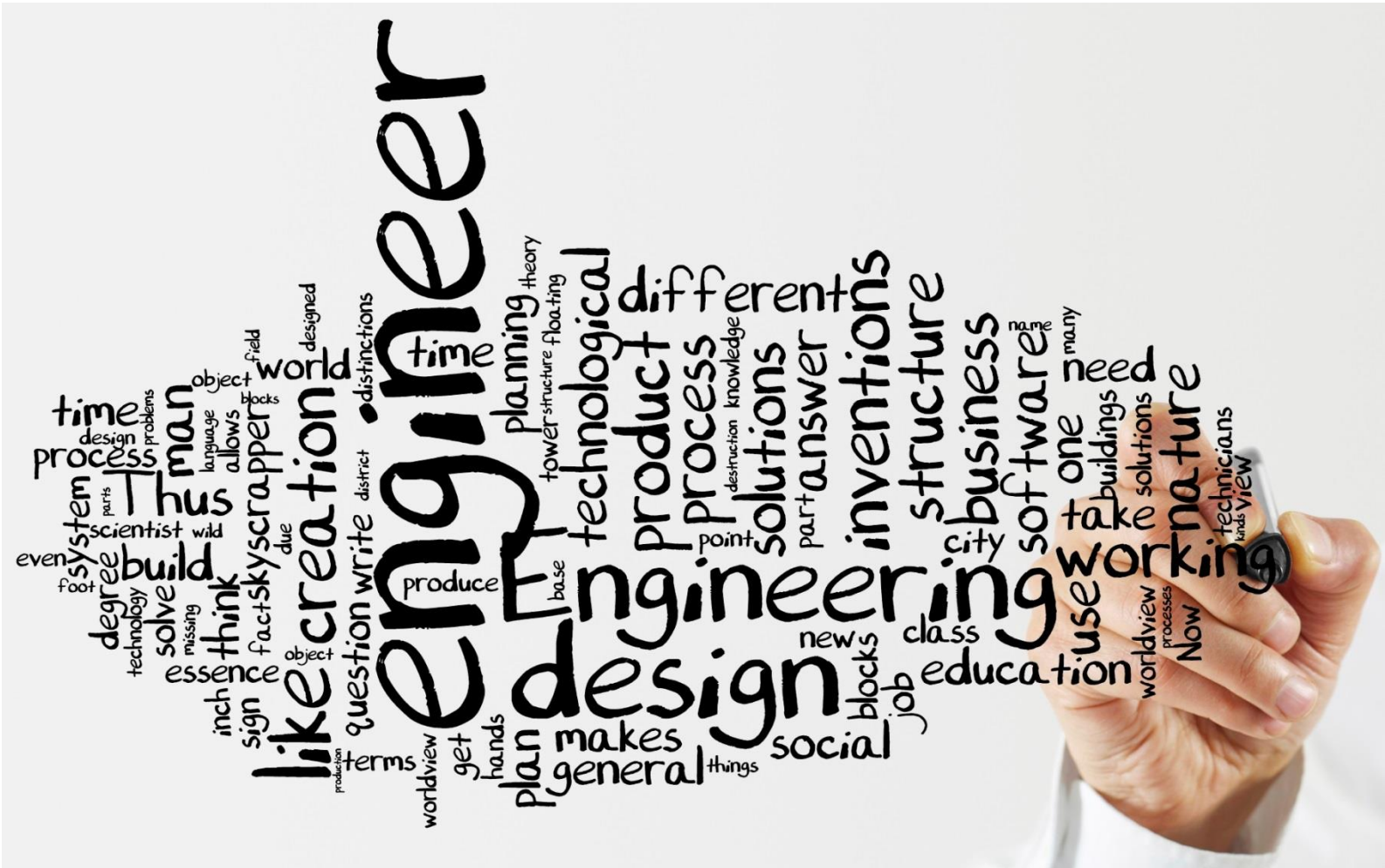


# Career Night Wednesdays – Engineering Careers

March 25<sup>th</sup>, 2015 6pm-8pm



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# What is an Engineer?

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The program is planned to be a total of 2 hours long and will contain 2 short activities and a discussion session with engineers

## Activity 1 – Draw an Engineer

**Time Allotted: 15minutes**

### Materials:

- Draw an engineer survey
- Pencils/Colored Pencils

### Method:

1. Before introducing what engineering is, students are asked to draw what their perception of an engineer is
2. Students are asked to give the top three words to describe an engineer
3. After the survey is complete, a brief overview of engineering is given
4. If computer is available, students can watch a [video](#) on engineering
5. At the end of the session, students will ask to draw another picture of an engineer based on what they have learned

### ENGINEERS CANADA DEFINITIONS

Engineering: “any act of planning, designing, composing, evaluating, advising, reporting, directing/supervising, or managing any of the foregoing, that requires the application of engineering principles and that concerns the safeguarding of life, health, property, economic interests, the public welfare or the environment.”

Engineering principles: “Engineering science subjects normally have roots in mathematics and basic sciences, but carry knowledge further to creative applications...”

## Activity 2 – Marshmallow Towers - Project Management and Engineering Design

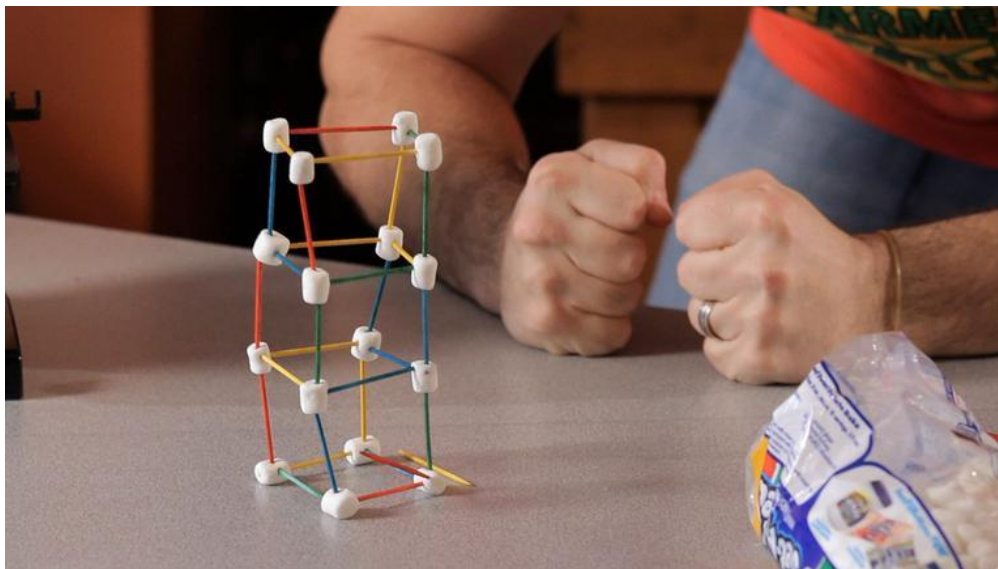
**Time Allotted: 30 minutes**

### Materials

- Mini marshmallows
- Toothpicks
- Project Management Handout
- Engineering Design Handout

### Method:

1. Pass out handout on Project management triangle and explain that when managing an engineering project you must balance scope, schedule and resources to create a quality product.
2. Split students into pairs. They will need to build marshmallow towers in different ways.
  - a. First they must build a tower that is **6-inches** tall in **5 minutes**, but will only have **20 toothpicks** and **20 marshmallows** and must use **1 hand** to build the tower
  - b. Second they will have **unlimited toothpicks and marshmallows** and can use **both hands**, but only have **1 minute** to build the 6-inch tower
3. Discuss how in the first iteration there was more time, but little resources. In the second iteration, there were more resources but little time. Which worked better?
4. Finally, pass out the handout of Engineering Design.
5. Discuss the stages of the process and how it could be used to design a better marshmallow tower
6. Students will then design a marshmallow structure as tall as possible that can hold the weight of a cellphone



## Fun Facts about Engineers

From NSPE website

- 1. The snowboard was invented by an engineer?**  
With some engineering twists and turns along the way, the snowboard has become a marvel of geometry, chemistry, and biomechanics. Since the snowboard allows deft turns, ski manufacturers have quickly adopted some of the snowboard innovations, enabling skiers to turn with less effort.
- 2. Engineers design running shoes for protection, performance, and comfort?**  
Engineers understand how much force travels from the ground through the shoe to the foot. Through the work of engineering, weight is distributed throughout the whole foot -- heel to toe.
- 3. A civil engineer created the slippery part of the water slide?**  
A civil engineer designed a pumping system to circulate just the right amount of water to the flume. Without the right flow of water, there is no ride. Additionally, civil engineers have designed the slide to withstand the weight of people, the water, and even the force of the wind blowing on it.
- 4. The launch and return of spacecraft, from the Apollo to the Shuttle, is a monumental engineering triumph?**  
The space program has greatly expanded the world's knowledge base. The technological advancement by engineers in energy, communications, materials, structures, and computers, have made space travel possible.
- 5. The Ferris Wheel is considered one of the greatest engineering wonders in the world?**  
The first Ferris Wheel was created by Pittsburgh, Pennsylvania engineer, George W. Ferris, in 1893. The wheel is supported by two 140-foot steel towers and connected by a 45-foot axle -- the largest single piece of forged steel ever made at that time.
- 6. Engineers make interactive television possible?**  
Engineers are involved in all aspects of interactive TV technology, from designing new cables, to creating new film emulsions, to engineering better sound quality. This technology allows viewers to select any program, film, or game from more than 500 channels.
- 7. Engineers play an instrumental role in the theme park industry? Theme park engineers are involved in designing, building, lighting, and even controlling the crowd flow in theme parks around the world.**
- 8. Companies and universities are using engineers to form the Virtual Reality and Simulation Initiative? This technology applies computer simulation and visualization to 3-D modeling projects, such as virtual offices.**
- 9. Bioengineers are creating a new and exciting medical technology? This technology will utilize virtual reality to help surgeons reconstruct facial birth defects.**
- 10. Computer engineers, in conjunction with animators, have created special effects in movies such as "Jurassic Park," "Forrest Gump," and "Interview with the Vampire"? Through "morphing" technology, images are digitally mastered to appear realistic**

## Engineering Careers

### Engineering Career Path

1. To become an engineer you will need a 4-5 year undergraduate degree
2. All students who graduate with an engineering degree in Canada receive the Iron Ring, a symbol of an engineer's commitment to society
3. After you complete your degree you begin work as an EIT (Engineer-in-Training)
4. After 4 years of working as an EIT, you can apply to become a Professional Engineer (P.Eng). This means you can have your own engineering practice and you get a personal official engineering stamp to legalize your engineering work!
5. You can also choose to do engineering research after you graduate, this will require a postgraduate degree, either a Master's or PhD



### Engineering Salaries

Via [talentegg.ca](http://talentegg.ca) 2014 statistics for Calgary

Engineering Discipline	Average Starting Salary
Electrical	\$62,632
Mechanical	\$58,927
Civil	\$57,824
Chemical	\$61,074
Mining	\$76,138
Materials	\$63,372
Environmental	\$57,490
Computer /Software	\$78,725