



## *Drexel-SDP GK-12 LESSON*

- *What is Engineering*
- *Engineering*
- Subject Area (Unit): *Engineering*
- Concept: Engineering

Objectives: This lesson will serve as the introductory lesson to a sequence of engineering related projects. The lesson deals with what engineers do, what do they have to consider, what are important qualities in a “good” engineer. The students will create company names and logos that they will use on in future projects.

Students will be able to....

- Understand the basic differences between scientists, mathematicians and engineers
  - Recognize the importance of creativity in engineering design
  - Understand the importance of constraints in a project such as time, budget, environmental impact and societal impact
  - Understand how basic understanding of science and math also allows them to make good decisions in life and the importance of science in politics
- PA Academic Standards: *3.1.7ABCE, 3.2.7ABC, 3.4.7AC, 3.6.7BC, 3.7.7E*
  - Grade Level: **6**
  - Setting/Group Size: Classroom split into small groups or working as individuals.
  - Duration/Time Required: *1 60 minute session*

**Materials List:** Science Notebook

**Context:** Most people think that engineering only requires skills in math and science. Many people fail to recognize the “art” in engineering and that creativity is as important if not more important in engineering as math or science skills. Engineering school teaches thinking skills, so that students learn to understand problems, recognize the tools available to them and then find a creative solution based on what is available. They have to deal with constraints, such as environmental and societal impacts of a project as well as issues related to budget and time available to complete a project.

**Methods and Procedure:** This main purpose of the lesson is to engage the students in a discussion on the role of engineers in their life and what makes a good engineer. The major point to stress is that engineers are artists, artists that paint with math and science. Engineers solve problems; they create solutions to important issues faced by people everyday, such as hunger, disease and pollution.

Begin with a discussion on what an engineer is, what is the difference between an engineer and a scientist, an engineer and a mathematician? Who in the room thinks they could be an engineer? Why or why not?

What are the important qualities of an engineer? How important is creativity, how is an engineer like a painter or a sculptor?

When an engineer identifies a problem, what ideas go into a solution?

- Existing Technology – what science and math can I apply to this problem?
- Possible Constraints such as cost, environmental impact, societal impact and availability of materials – everything can’t be made of diamonds and gold!
- What goals must be met, the device must be able to go this at this rate using this amount of power for instance

Have each group then create a team name and logo for themselves. These will be used on the future engineering projects.

**Assessment:** Ask the students to take 10 minutes to write briefly what they believe an engineer does and whether it is a career that might interest them, why or why not.

Science Journal Entry

- Keywords: Wireless Communication
- Author: Eric Gallo