**OVERVIEW**

In these activities you’ll learn about Industrial engineering, more specifically variability, quality, overwork, and planning. Variability is to what degree anything is subject to change. Variability can be influenced by many factors such as randomness, and amount. As Industrial engineers it is important to take variability into consideration when analysing data and processes. Quality is the standard to which products are made and classified. Industrial engineers have to make sure quality products are being produced and that quality is maintained for all products. Overwork can be defined by people having to work past their capacity. Human factors is something Industrial engineers have to take into account when establishing working standards. It is important for employees to be comfortable when working. Industrial engineers take everything from what chairs a company will use to how to reduce the amount of movements it takes to complete a task. Lastly, planning is used in all aspects of engineering. It is important for engineers to plan for short and long term. Setting objectives and course of action allows for unforeseen circumstances to arise and be prepared for them.

**MATERIALS**

- Paper
- Pencil or Pen

**INSTRUCTIONS**

1. **Activity One**
   - Grab a friend, parent or sibling
   - Set a timer for 1 minute or follow along with us!
   - Each of you will write your first name as many times as you can for one minute
   - Use the provided excel sheet to collect your data
   - Compare results. Did the person with the longest name have the lowest amount? Did the person with the shortest name have the highest amount? If not, what could have contributed to the differences?

2. **Activity Two**
   - Grab a friend, parent or sibling
   - Set a timer for one minute or follow along with us!
   - Determine a square size everyone will follow
   - Draw as many squares as you can within one minute (think about quality or quantity)
• Use the provided excel sheet to collect your data
• Compare results. Did the person with the most squares have the lowest quality? Did the person with the least squares have the highest quantity? Why is quality important? If you purchase something that does not meet your quality expectations how would you react?

3. Activity Three
• Grab a friend, parent or sibling
• Set a timer for one minute or follow along with us!
• Snap as many times as you can while keeping track. As soon as the timer shows 30 seconds left write down how many times you snapped and start over from one for the remaining 30 seconds. When the timer says 0 stop snapping and write down how many times you snapped the second 30 seconds
• Use the provided excel sheet to collect your data.
• How does your first number compare to the second? How tired was your hand during the second round?

4. Activity Four
• Grab a friend, parent or sibling
• Set a timer for one minute or follow along with us!
• When the person keeping time says go run and get as many red (or any other color) items as you can within one minute.
• How many items did you get? If you had 30 seconds before the activity began how would you have strategized?
• Use the provided excel sheet to collect your data
• Chose another color and give yourself 30 seconds to prepare and think about what items you have of this color and where they are in your house. Did you perform better the second time? Think about a time you have planned or strategized in your every day life.