**Engineering Design Process Notes – COMPLETED**

* What is it?
  + A problem solving method.
  + Engineers and technologist use design processes to find solutions to technological problems.
  + Most products were probably developed using process like this one.
* Solution could be an…
  + Innovation: Improving upon an existing process or product
  + Invention: Creation of a product or process for the first time
* 6 STEPS arranged in a loop
  + It is likely that you will move through the loop several times before solving a problem in the BEST way.
* **Step 1: Define the Problem**
  + Design Brief: a written plan that identifies a problem to be solved, its criteria (desired specifications), and its constraints (limitations).
  + Gather information
  + Research how we can solve the problem.
  + May want to consult an expert in the field or resources: library, books, magazines, articles, web sites, encyclopedias, research reports, etc.
  + Make a written record of all the information gathered and cite the sources!
* **Step 2: Generate Concepts**
  + ALL ideas should be written down, even the ones that seem unrealistic
  + Ideas need to be down on paper in some way so they are not forgotten
    - written words
    - sketches
    - drawings
* **Step 3: Develop a Solution**
  + Narrow down your list of ideas
  + Choose the best option to pursue
  + Use a decision matrix to choose a final solution
    - Decision Matrix: A tool used to compare ideas against one another using specific criteria
  + A good way to design the solution is to create a series of sketches that increase in detail.
    - Thumbnail Sketches
    - Rough Sketches
    - Comprehensive Drawings
    - Technical Drawings
  + Bill of Materials: list of materials needed to construct the solution (material, quantity, unit)
* **Step 4: Construct and Test Prototype**
  + Prototype
    - Full-scale
    - Fully-functioning
    - Example of the final product
    - It is built to undergo testing before the product goes into full production.
  + Model
    - Looks like the final product
    - NOT full-scale
    - NOT functional
  + Test the solution!
  + Record results
* **Step 5: Evaluate Solution**
  + Evaluate the results
  + What changes need to be made?
  + Pursue an entirely different solution?
  + Make minor change?
  + Focus on making your solution better!
* **Step 6: Present Solution**
  + Formal Report
  + Slideshow Presentation
  + Video
  + Can vary based on audience