**Guiding Questions for the SRC Engineering Design Process E-Portfolio**

*Directions: Each student should copy and answer the following questions in their engineering journal. The guiding questions below reflect various concepts that should be explored and investigated in each step of the design process.*

**Identify the Problem**

* What is the problem to be solved? Is my focus on Sustainability or Building a Robot?

**Research the Problem**

* Have I reviewed at least three sources (articles, websites, etc.) that discuss why this a problem worth solving?
* What is sustainability and how is it related to this design challenge?
* How does the problem relate to sustainability triangle?

**Develop Possible Solutions**

* What are some methods that have been used in the past in an attempt to address this problem?
* What are the constraints (time, materials, safety, etc.)?
* Has each member of my group brainstormed possible solutions to the problem?
* Has each member of my group provided sketches of what their solution would look like?
* Has every member participated in the brainstorming session?
* Were all the ideas recorded and reported?

**Select Best Possible Solution**

* What are some positive aspects of each solution?
* What are the negative aspects of each solution?
* Based on our knowledge of past attempts to solve this problem, what are some of the key design elements that are needed to effectively develop a real solution to this problem?
* How do we develop the design requirements?

**Construct a Prototype**

* How can we develop a prototype that when tested adheres to all of the design requirements needed to solve the problem?
* What materials and techniques are to be utilized to construct this prototype?

**Test and Evaluate the Prototype**

* How can I test the prototype in a manner which would provide me with data and information relevant to how each phase in the testing meets the design requirements?
* How will a successful solution be evaluated?
* How can we test a prototype to identify the amount of pollution gathered in a specific time frame?
* In what ways can the prototype be improved?

**Present Results and Plan for Production**

* How can I construct a graph(s) which provides me with a visual representation of how our prototype performed on each phase(s) of testing?
* How can the design be described effectively to communicate why it is the best solution to the problem?

**Review & Redesign**

* In what way can we improve our prototype so that it adheres to the design requirements?
* How does our mentor provide input to our design according to the criteria?
* How did the design perform under test conditions?
* How did material choice and assembly techniques affect the outcome?
* What was identified as needing change as a result of this step?
* Reflect on how this process has increased you knowledge and understanding of sustainability as VBCPS 21st Century skill?