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2011

# Working with the Engineering Design Process

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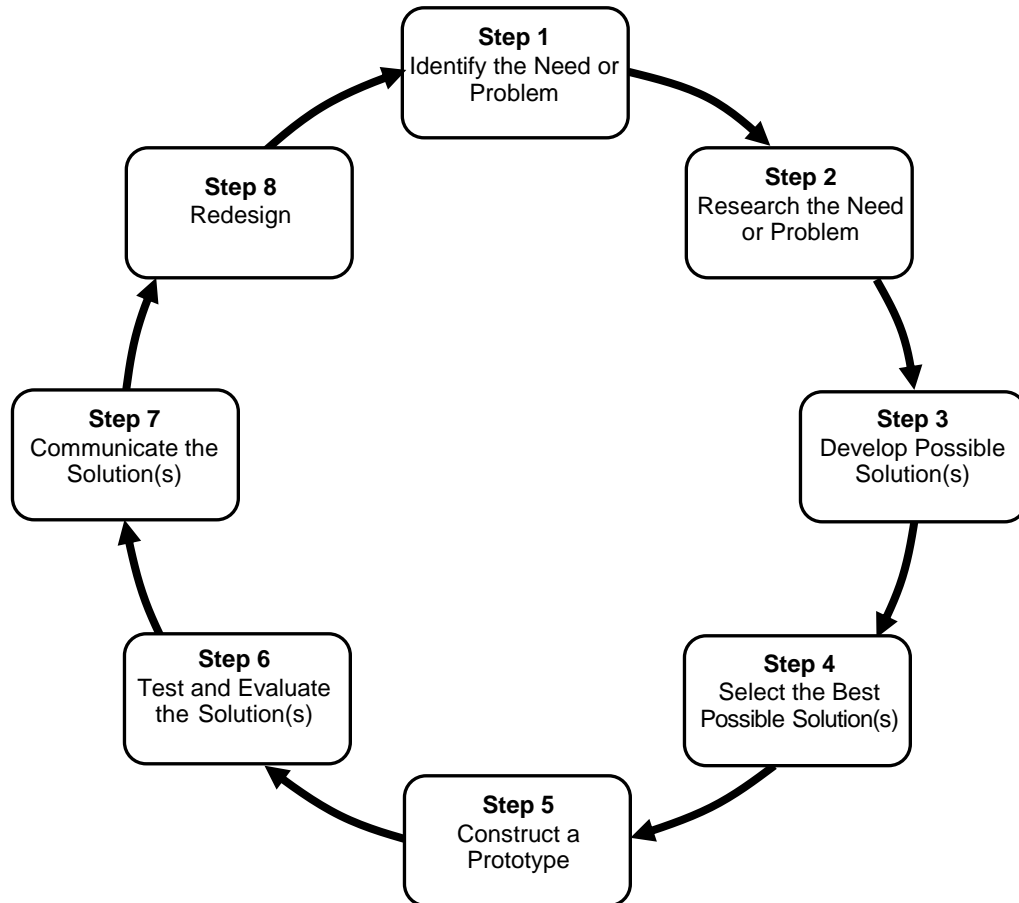
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Gralinski, Thomas, "Working with the Engineering Design Process" (2011). *Science and Engineering Saturday Seminars*. 17.  
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# Engineering Design Sequence



**From: State of Massachusetts Science and  
Technology/Engineering Frameworks**

1. Identify the need or problem
2. Research the need or problem
  - Examine the current state of the issue and current solutions
  - Explore other options via the Internet, library, interviews, etc.
3. Develop possible solution(s)
  - Brainstorm possible solution(s)
  - Draw on mathematics and science
  - Articulate the possible solution(s) in two and three dimensions
  - Refine the possible solution(s)
4. Select the best possible solution(s)
  - Determine which solution(s) best meet(s) the original need or solve(s) the original problem
5. Construct a prototype
  - Model the selected solution(s) in two and three dimensions
6. Test and evaluate the solution(s)
  - Does it work?
  - Does it meet the original design constraints?
7. Communicate the solution(s)
  - Make an engineering presentation that includes a discussion of how the solution(s) best meet(s) the initial need or the problem
  - Discuss societal impact and tradeoffs of the solution(s)
8. Redesign
  - Overhaul the solution(s) based on information gathered during the tests and presentation

### **Helpful Hints:**

Let students know that they already do most of this as part of every-day activities and that they do it multiple times every day. We are just giving it a formal name.

I suggest introducing the concept of the Engineering Design Sequence with one of those more mundane examples.

Reinforce that this concept is flexible and that there are many versions of the process. I have seen from 5 to 12 steps depending on how things are bunched together.

In reality there are often sub-loops within the process. An example of that might be that during the prototype building you come across a problem and go back to step 3 to work out the problem before going further.

