Developing Engineering Problems

Develop one or more textbook-like problems related to a real-world challenge

The 5 Ps of problem development

The 5 Ps can be considered in any order, and should be considered iteratively until appropriate problem statements have been developed for the real-world challenge. As you work, keep a list of assumptions and approximations that you may apply. Also, identify the parameters (both known and unknown) that apply to the problem.

Principles

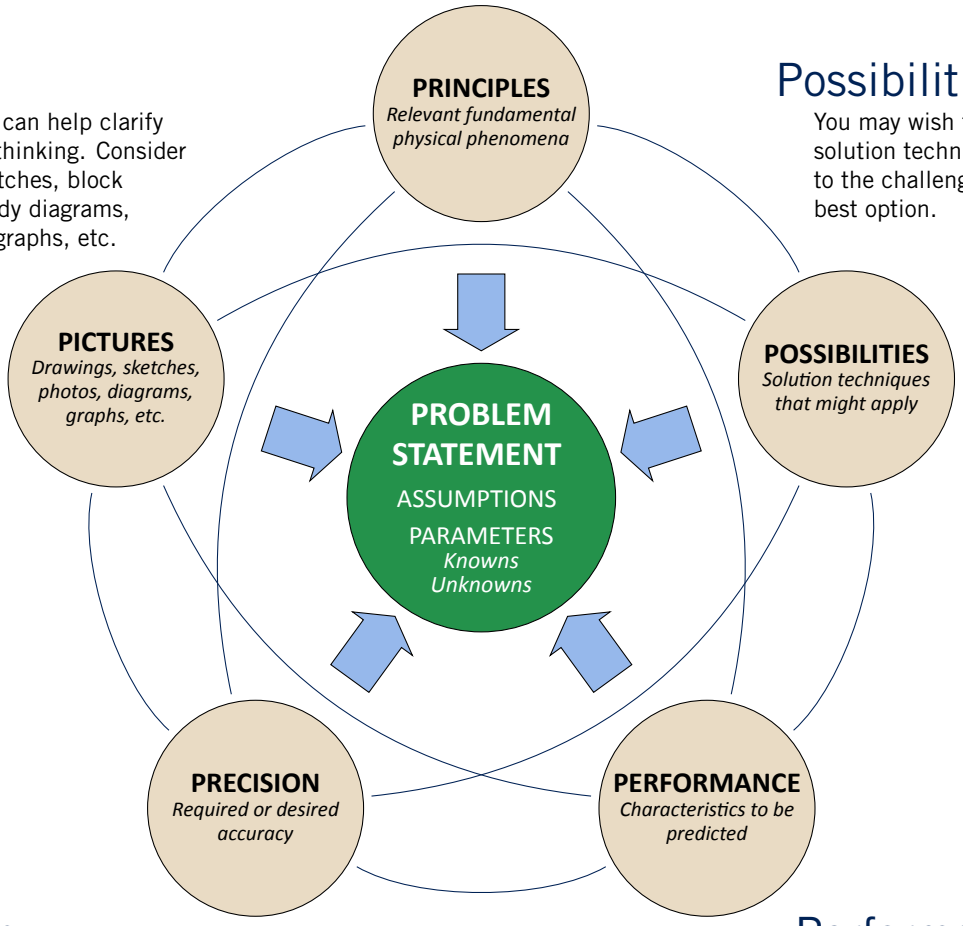
As you consider fundamental physical phenomena associated with the real-world challenge you will think of relevant equations and solution techniques.

Pictures

Graphical images can help clarify and solidify your thinking. Consider using photos, sketches, block diagrams, free-body diagrams, control volumes, graphs, etc.

Possibilities

You may wish to consider various solution techniques that could apply to the challenge, then choose the best option.



Precision

Various problems and models can be created, with different accuracy and fidelity. Try starting with a simple, low-fidelity model, then successively refine it to arrive at a model with sufficient accuracy for the need. The refinement will often include adjusting or eliminating assumptions and improving approximations.

Performance

Identify quantitative characteristics of the real-world challenge that must be predicted (preferably using measurable engineering terms). What do you know about problems and solutions for these characteristics?

BYU Mechanical Engineering

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