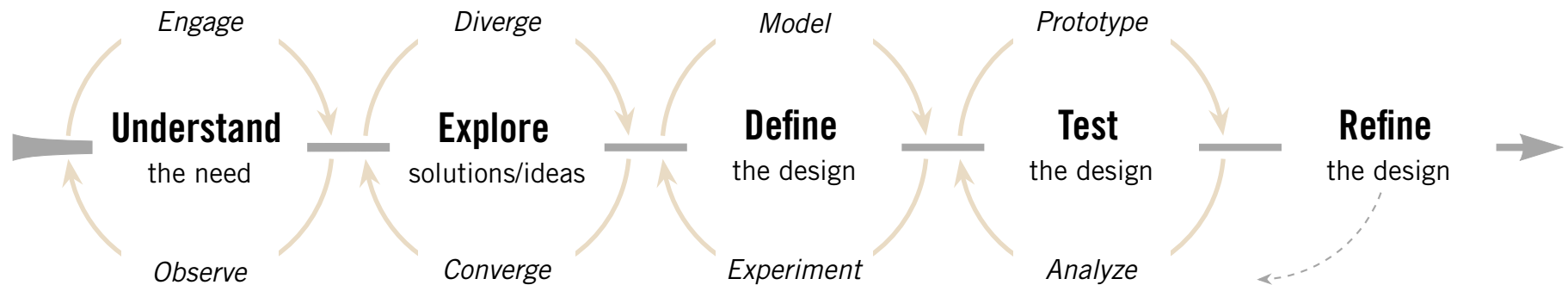


Basic Design Process

This process is used to develop a refined solution to real needs. The process is general, effective, and taught throughout the Mechanical Engineering curriculum at BYU.



Understand

Start by trying to understand the problem that needs to be solved. Learn about who has the problem and their needs and wishes for the design. Try engaging in research and discussion to learn. Try observing users to learn about the problem.

Explore

Once you've come to understand the main problem that needs to be solved, you can start exploring ideas and solutions to that problem. It's helpful to explore the possibilities by considering lots of diverse options. With lots of options on the table, you can confidently converge on the basic idea you believe has the most potential to solve the problem.

Define

Add details to the converged-upon solution (now becoming a design) so that you can model its behavior with engineering analysis. Experimenting with models that represent the design's performance will help you define a good design. Experimenting with prototypes will also be useful. It will help you understand phenomena not captured in your engineering models.

Test

Carry out one or more tests to explicitly see if your design meets the needs laid out in the first step or if it solves the problem. Try making and using prototypes to better learn how well your design works in a real-life setting. Try using engineering models to analyze how well the needs are met by the design.

Refine

If the tests reveal that improvement should be made, the design can be refined by returning to the previous steps. Expect the design to need refinement; it is unlikely for anyone to converge on the best design with just one pass through the process. Eventually the tests will reveal that no additional refinement is needed.