

ENGINEERING DESIGN PROCESS

The **Engineering Design Process** is a method used by professional engineers to solve problems.

It is an iterative process, meaning engineers are constantly returning to previous steps in the process to improve upon past solutions to problems.

KNOW THE CHALLENGE

Define the problem you must solve. Try to be as specific and succinct as possible.

Example: I must reduce the acceleration experienced by a driver when a car collides head-on with a barrier.

IDENTIFY SOLUTIONS

Research! Gather available information to learn more about the problem.

This information can include material properties, customer surveys, safety laws, existing solutions or patents, and scientific principles involved.

- Brainstorm using *divergent thinking*—a way of generating as many different ideas as possible to solve a problem
- It can often be valuable to think about the problem from different perspectives
- Avoid judging a person's idea too soon

PLAN YOUR SOLUTION

- Now that you have lots of ideas, it's time to evaluate them and choose one that you want to invest time, energy, and resources into developing.
- Sometimes it is helpful to list and rank the solutions to help your team agree on which one is the best choice.
- And remember, it is okay to change your mind later!

PROTOTYPE IT

- Turn your solution into reality!
- Construct a functioning prototype to use as proof of concept that can be tested and evaluated for effectiveness in solving the problem.
- **Prototypes are not final designs!**

TEST AND EVALUATE

- Develop a series of tests for your prototype.
- Record, organize, and analyze data from those tests.
- Use data analysis and results to revise your solution.