

# The Engineering Design Process



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## Overview

The class will engage in a creative activity to develop a technological solution to a problem of their choosing.

## Objective:

Gain a firmer understanding of the engineering design process by identifying a problem, developing a technological solution, discussing your solution with peers, and iterating on the solution based on feedback.

## Time Commitment:

10 minutes to 1 hour+

## Materials:

- Sheets of paper
- Coloring pencils, pens, markers, etc.

## Activity Instructions

### Step 1: Identify a Problem

Have students brainstorm a problem that they want to solve. Try to make the problem relatable to their daily lives. Examples might include: walking the dog; waking up on time; staying warm at the bus stop; hunting or fishing for subsistence; or traveling within Alaska in comfort.

If you are short on time, have students choose their problem from this list (or make your own list) rather than having them identify a problem themselves.

### Step 2: Brainstorm Solutions

Have students write down at least three possible technological solutions to their chosen problem. These do not need to be thoroughly thought-out solutions yet. Possible solutions could include futuristic technologies like robots, drones,

nanobots, and artificial intelligence or technologies that are more common in our daily lives.

If you are short on time, you could limit the types of solutions to only robots.

### Step 3: Draw and Diagram

Have students draw and diagram their technological solution in as much detail as possible. Have them label the different parts of their solution and try to explain how those parts come together into a whole.

### Step 4: Workshop the Idea

Have students break into pairs or groups of three to discuss their problems and technological solutions. Before students begin discussing their ideas, explain best practices for giving and receiving feedback. The “feedback sandwich” is a good tool to consider, i.e., discuss something good about the design, then discuss potential problems with it, then end with another good thing.

### Step 5: Re-Draw and Re-Diagram

Starting from a new piece of paper, have the students iterate upon their technological solution based upon the feedback they received.

## Follow-Up Questions

- Why do you think engineers use a process like this?
- What might the consequences be if engineers never iterated upon their solutions?
- What are some devices you use every day? What problem do you think engineers were trying to solve when they designed this device?