

“The best way to learn to invent is to invent.”

- Professor Mert Flemings

Introduction: Inventions are useful. They solve real problems for real people. Below are two examples of inventors who identified a problem and created a technological invention to solve that problem.

- A group of college students learned that healthcare workers during the 2014 ebola epidemic were at risk of infection because they couldn't tell if the decontamination bleach spray covered their entire safety suit. Their invention, [highlight](#), solves this problem because it is a powder additive that colorizes the bleach, allowing users to see if the surface is completely covered—and therefore disinfected!



- A group of high school students in Oklahoma City, Oklahoma learned that security bins in their local airport were never cleaned, so they could potentially transmit diseases between people. To solve this problem, they are inventing a sanitizing system using UV light to ensure that the dangerous bacteria are killed and viruses are denatured in between each use. You can learn more about their work here: [Francis Tuttle Technology Center InvenTeam](#)

Goal: Use the contents of your tool kit to invent a solution to a real-world problem.

Begin by selecting the problem you'd like to work on from the problem bank listed below. Each of these problems comes from needs expressed by police officers and firefighters in Massachusetts. First responders in your community probably have similar needs, too!

- Police officers experience extreme back pain due to the weight of their utility belts and items on the belt digging into their backs when they're seated in a chair or car.
- Firefighters often experience dehydration while fighting fires.
- Police officers have a very difficult time staying awake during overnight shifts while waiting for calls in their cars.
- Firefighters often have a difficult time navigating buildings and homes, as they are unfamiliar with the layout.
- Police officers are often concerned that suspects will use the officers' batons or other items on utility belts against them.
- Firefighters have a difficult time keeping helmets securely on hooks in the cab of the fire truck.

After you've selected the problem you'd like to solve, prototype a solution!

- Some people like to brainstorm different ideas before they start in with the materials. [SCAMPER](#) is a great technique to help you come up with a lot of ideas quickly!
- Some people like to spend time sketching and drawing ideas on paper before building. The best part about sketching is that you don't need to be an artist to do it! This [series of videos](#) is a great introduction anyone can use to learn how to sketch design ideas.
- When you get to building your prototype, think about building to scale. Architects often create scale models of buildings to communicate their ideas in a size that fits onto a table top. You can do the same with your prototypes.

Share: Take a picture of your prototype and share it on the [forum](#)! Be sure to include the problem you are choosing to solve and a brief description of your invention!

Resources for Educators and Parents:

- Techniques for prototyping with cardboard and foam core if you want to improve your skills: https://www.productdesigny.com/media/viewer/sketch_modeling_sheets
- Download a printable version of this activity [here](#)