

Solving Engineering Problems

Name/Team _____

Date _____

Types of Engineers

<p>Mechanical - mechanical engineers make machines like cars, toys, robots, and wind turbines. These engineers might be Industrial, Materials, or Aerospace Engineers.</p>	<p>Civil - These are engineers that work to plan structures and systems of structures like buildings, highways, airports, and bridges. This type of engineer might work as an Architect, City Planner, or work in transportation.</p>
<p>Electrical and Software - This includes people who design and make electronics and computers, but also engineers that write and implement programs to run computers and devices. This may also include engineers who work to harness energy in innovative ways.</p>	<p>Chemical and Biological - Chemical engineers design chemicals that help us to clean, keep things safe, make food, or medicine. Biological engineering includes creating medical solutions, agricultural solutions, like how to improve farming practices and food products. This category could also include environmental engineers working to make energy, buildings, and cities more sustainable.</p>

Engineering Problems

<p>1. A fancy restaurant in Phoenix, AZ wanted to save more of the money they make by paying less to food suppliers. They also noticed some of their bills were really high at the end of every month - they were paying a lot to their electricity company, spending a lot on fuel for their stoves, and because the restaurant was in a really warm place, their air conditioning was running for 9 out of the 12 months of the year!</p>
<p>2. A new town noticed that they were such a pretty, clean, happy place to live that more and more people wanted to move there. The only issue this town has is occasional earthquakes and being a little isolated from other towns and cities. As a small town, everyone there was able to walk or bike to work and school so they had very little air pollution. While they considered building more houses, apartments, schools, office buildings, and stores to grow their town, they also wanted to keep the air, ground, water, and streets in their town clean. They also thought that if the town was going to get bigger, they should help the residents be able to get to and from other towns. What transportation options might they need?</p>

3. A magician wanted to put a new trick into his show. He had an idea to stand high on a platform, wave his cape, throw his top-hat (with his rabbit inside!) disappear, and then reappear again on the stage before the hat and rabbit hit the stage floor. What kinds of inventions and innovations could help him accomplish this illusion?

4. A mad scientist thought that people would eat more brussel sprouts if they tasted like graham crackers, and eat more broccoli if it tasted like chocolate, and more spinach if it tasted like marshmallows. He wants to make these vegetables with different tastes, but without losing any of their vitamins, fiber, or healthy food properties. He also wants to make them locally, and find a way to box, bag, package, and ship them without using harmful plastics or too much fuel. What kinds of inventions, innovations, and solutions does he need to go from this idea to having broccoli-chocolate in a grocery store?

For each scenario answer the following questions on another sheet of paper.

1. What is the problem?
2. What kinds of engineers might work together to solve these problems?
3. What kinds of solutions could we design and build that would change this situation?
4. When we test it out, how will we make sure our solution works well and that our solution is successful at solving the problem?