WIZARDS of WRIGHT
LEADERS IN STEM EDUCATION

Wright-Patterson AFB
Educational Outreach
wpafbstem.com

Cube-lets, Intro to Engineering

Mechanical Engineers (Industrial, Materials, or Aerospace Engineers): make machines like cars, toys, robots, and wind turbines	Civil Engineers (Architect or City Planner, or work in Transportation): work to plan structures and systems like buildings, highways, airports, and bridges
Chemical Engineers: design chemicals that help us to clean, keep things safe, make food, or medicine	Biological Engineers: creating medical solutions, agricultural solutions, like how to improve farming practices and food products
Environmental Engineers: work to make energy, buildings, and cities more sustainable	Electrical and Software Engineers: design and make electronics and computers, but also engineers that write and implement programs to run computers and devices, may also include engineers who work to harness energy in innovative ways

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Answer the following questions for <u>Story #1</u>.

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! What kinds of solutions might work and what kinds of engineers can help solve these problems?

1. What is the problem? What situation would we like the change?

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2. What kinds of solutions could make this better? What could we make that would change this situation?

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3. When we try our solution - how well does it work? How do we know if this solution was successful?

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Answer the following questions for <u>Story #2</u>.

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 issues 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 kinds of engineers might help the townspeople to plan to expand their town, provide transportation options to other town, but keep the town very clean and safe?

1. What is the problem? What situation would we like the change?

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2. What kinds of solutions could make this better? What could we make that would change this situation?

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3. When we try our solution - how well does it work? How do we know if this solution was successful?

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Answer the following questions for <u>Story #3</u>.

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? What kinds of engineers could help him?

1. What is the problem? What situation would we like the change?

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2. What kinds of solutions could make this better? What could we make that would change this situation?

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3. When we try our solution - how well does it work? How do we know if this solution was successful?

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Answer the following questions for <u>Story #4</u>.

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? What kinds of engineers could help him?

1. What is the problem? What situation would we like the change?

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2. What kinds of solutions could make this better? What could we make that would change this situation?

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3. When we try our solution - how well does it work? How do we know if this solution was successful?

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