Google

Behind the Scenes

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What is Google?

We are all familiar with Google. When you think of Google, you probably think of the search engine.

But, through concepts such as Google Earth, Google Maps, and Google Drive, **there is so much more to Google than meets the eye.**

Images from Adobe stock images [1]

Why Google?

We chose Google because we realized how important Google is in our everyday lives. We use Google everyday.

We wanted to learn about Google, how it works, and about the people who work there. We wanted to go **behind the scenes.**

Images from Adobe stock images [1]

What careers are at Google?

We researched different careers at Google. There are software engineers, website developers, marketing managers, healthcare providers, hardware engineers, and so many more. [2]

To learn more about working at Google, we interviewed a **hardware engineer**.

Image from Google Docs

Career: Hardware Engineer

We interviewed **Christina Peabody**. She is a hardware engineer who designs backup batteries at Google. The work she does keeps Google data centers running.

We asked her about how she ended up at Google and how she uses the **Engineering Design Process** (EDP) everyday.

About Christina Peabody

- Mechanical Engineer
- 9 years at Google

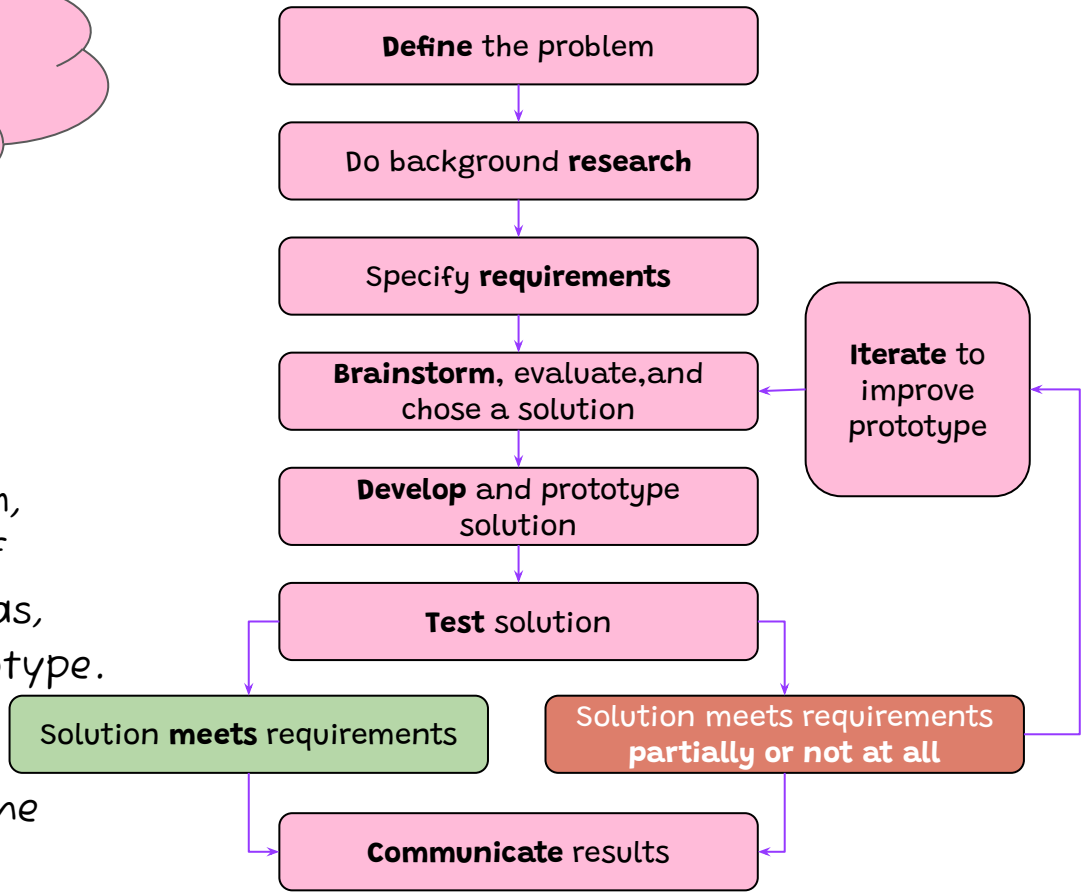
Image courtesy of Christina Peabody

What is the Engineering Design Process?

The EDP is a **series of steps** for coming up with solutions to problems. [3]

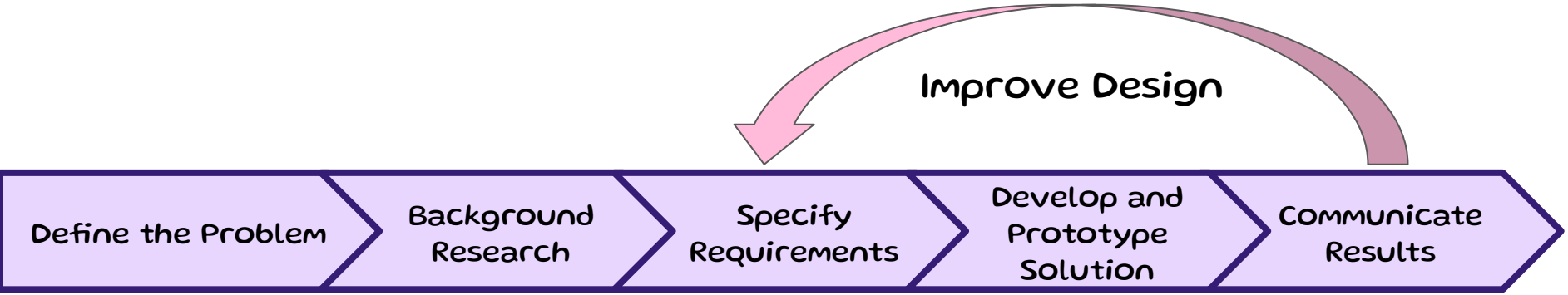
It starts with defining a problem, researching and making a list of requirements, brainstorming ideas, and making and testing a prototype.

If requirements are not met, steps are repeated to **improve** the prototype.



Adapted by 3701D [3]

How does a hardware engineer at Google use the EDP?



She needed to design a safer battery. It must be fully contained, reliable, and easier and cheaper to make than the current battery.

She learned about current batteries and the data center.

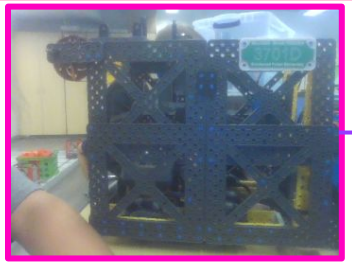
She needed to know how long the batteries needed to last, their environment, how much power they needed.

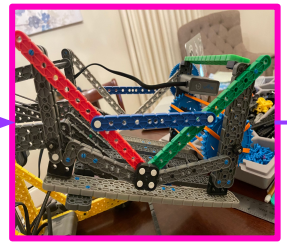
She developed a prototype, tested it, and figured out if it could be mass produced.

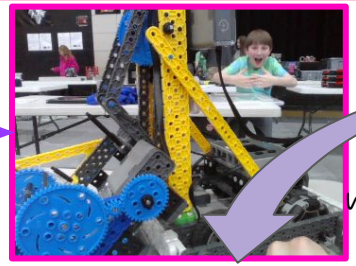
She had to talk to other teams about whether the design met the requirements.

Image made by 3701D

How do we use the EDP for VEX IQ robotics?







Improve Design

We made changes and rebuilt everything to improve our robot.

Define the Problem	Background Research	Specify Requirements	Develop and Prototype Solution	Communicate Results
We had the Full Volume Challenge!	We researched the Full Volume Game Manual, point scoring, coding, block sizes, and available parts.	We needed the robot to meet Vex IQ regulations, pick up, move, and dump blocks.	We built a robot with a chassis, arm bucket, and an roller intake.	We recorded in our Engineering notebook. We talked to other teams at competitions to strategize.

Image made by 3701D

EDP Comparison: Differences

Google's EDP is **different** than the EDP we use for VEX IQ in some ways.

How Google uses EDP

Google has big teams and different roles.

They design batteries to use all over the world.

They have to stay on budget.

If the battery fails, it could catch fire!

How we use EDP

We have a small team with 3 people.

We designed a robot to compete in the Full Volume Challenge.

We write down our ideas in an Engineering Notebook.

We have specific parts and rules that we have to follow.

If our robot breaks, we have to fix it!

EDP Comparison: Similarities

Both processes have **similarities**, too.

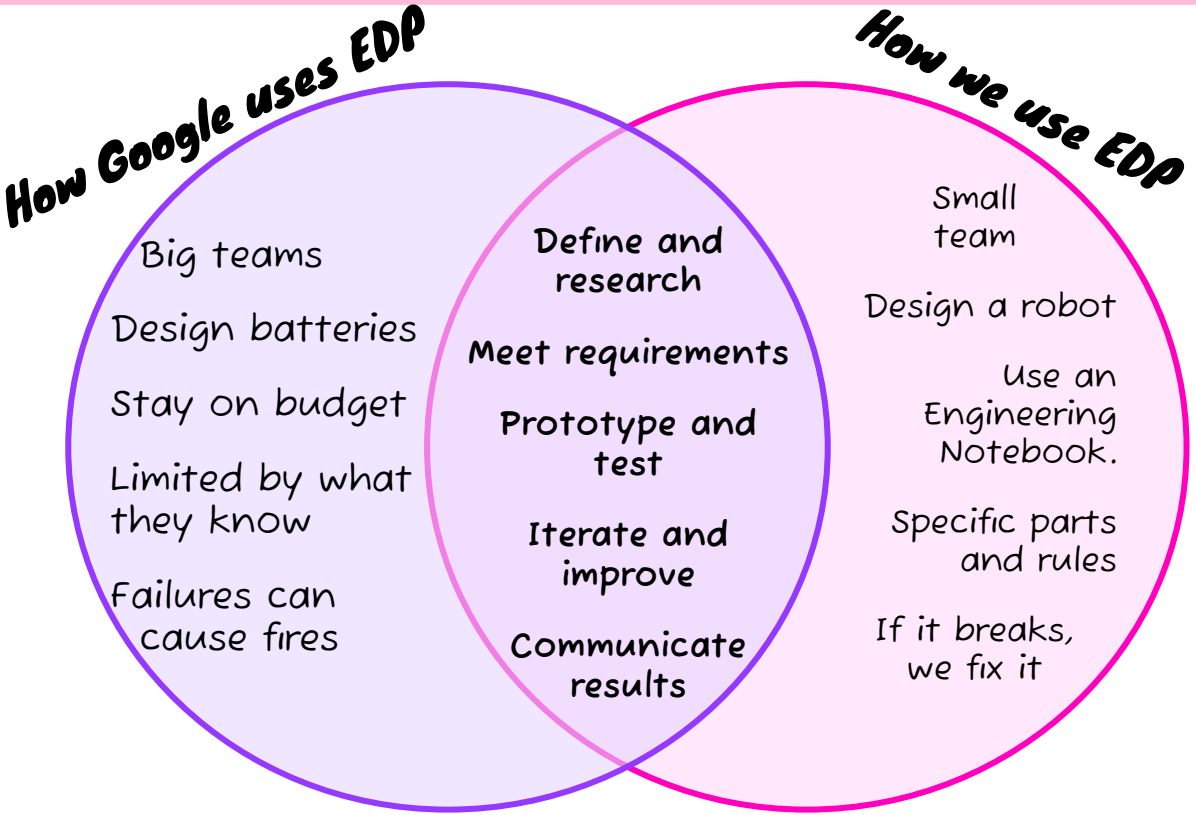
We both **define** our problem and do **research**.

We both have specific **requirements** to meet.

We both have to make a **prototype** and **test** it.

We both **iterate** and **improve** our designs to make them better.

We both **communicate** our results.



How VEX Robotics has prepared us for future career

VEX Robotics competitions are a great way to prepare for future careers.

- Through VEX Robotics, we learned how to work as a team. We learned to compromise and settle disagreements with respect.
- We learned different roles so that we can be efficient. We also alternate jobs so that we all have a chance to learn new skills.
- We have gotten better at finding solutions to problems that we have encountered. Sometimes parts of the robot need to be made stronger.
- Working with a team and during competitions, we have had to communicate effectively.

Image from viqrc-kb.recf.org and google.com

Conclusion

We have realized that so many of the skills we are learning through **VEX Robotics** will be able to be used in our **future careers**. We may not be designing robots, but we are learning important **life skills** that can be applied to almost all careers.

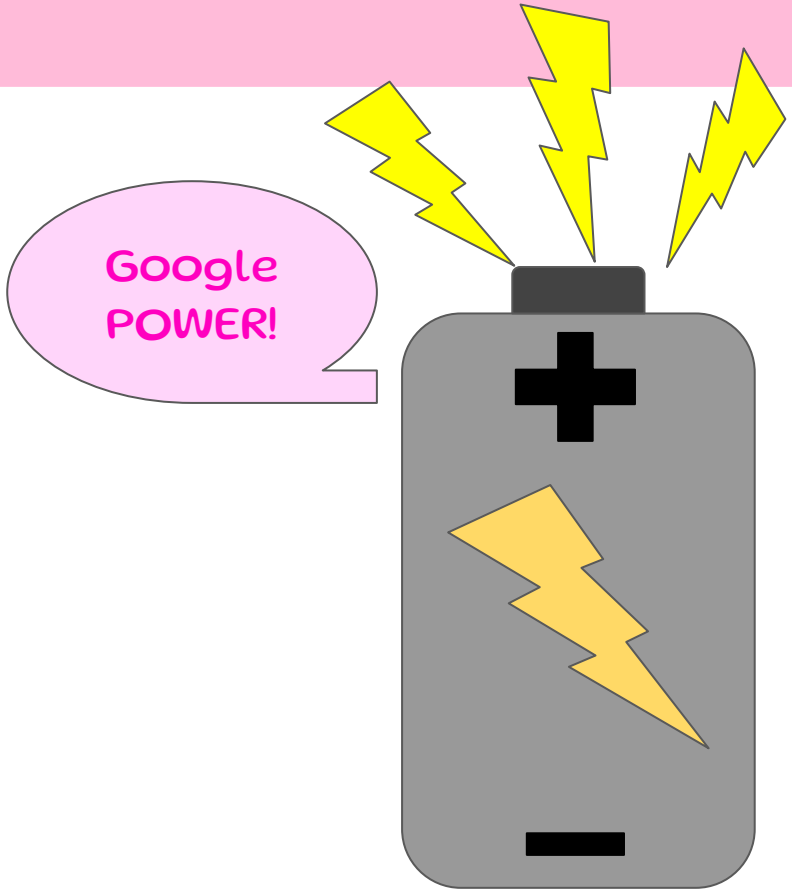


Image by 3701D

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