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# Navigating the Road to Success

2023-2024 CAREER READINESS CHALLENGE - ELEMENTARY

Team: 96000A (WIRED WARRIORS)

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Location: Exton, Pennsylvania, USA

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# Introduction

We are a team of **five** elementary school kids participating in **VEX IQ-Elementary** for the first time with team number **96000A**, also known as **Wired Warriors**.



# Career and Company Selection



For future career we picked

→ **Electric Automobile Engineer**

and work in a company like

→ **Tesla**



# Why We Picked this Career and Company?

We feel passionate about electric cars as we believe the clean energy sources like electricity are good for the earth.

## Key Benefits of Electric and Smart Cars Like Tesla:

1. **Clean Energy source** - minimal pollution.
2. **Save on Fuel and Maintenance** - no gas refill or oil changes.
3. **Fun and comfortable to Drive and Ride** - less vibration and noise.
4. **Good for Planet Earth** - and for all living and non-living due to zero tailpipe emissions.
5. **Autonomous Driving** - Prevents accidents by self correcting human mistakes.



# Why We Picked this Career and Company?

Our team has been researching this on **Google** and interviewing **our parents, teachers and coaches**. Many of them are engineers and experts in various STEM fields.

## Some of the benefits of being an EV Automobile Engineer:

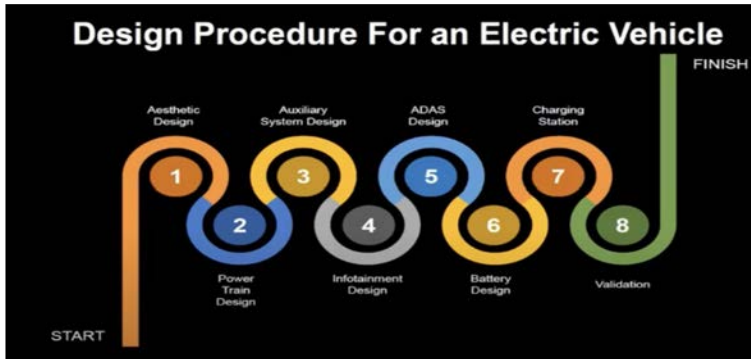
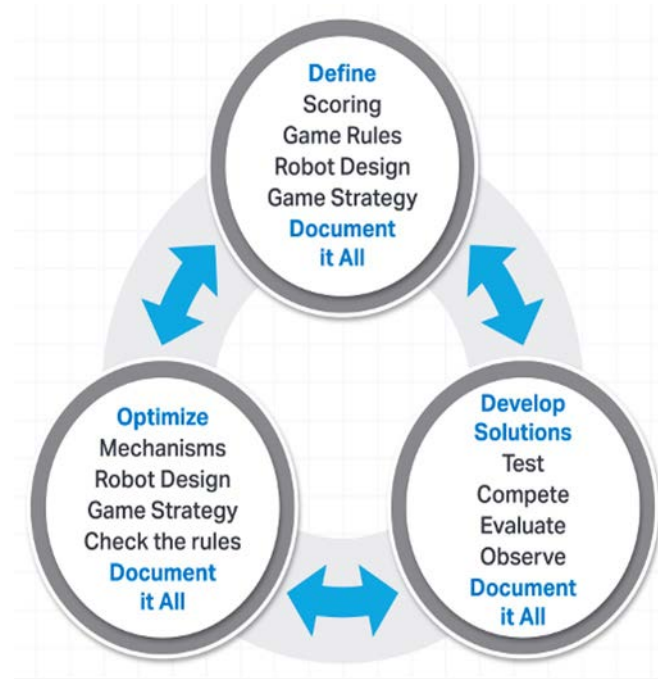
1. **Multiple Skills and Job Opportunities**: Electric Automobile engineers need to know **Automotive, Electrical, Mechanical, and Software Engineering** concepts to build best in class Electric cars.
2. Work on **Latest Technologies** and Innovations.
- 3 **High Paying Jobs** while **Feeling Good** for helping environment.

We would love to make EV cars when we grow up and Tesla is leader in EV Car Development



# Engineering Design Process (EDP)

We found a lot of similarities and some differences between our team's EDP and EV's EDP. We are now going to compare Tesla EDP with our Robot, Trident's EDP in **"Define"**, **"Develop Solution"** and **"Optimize"**



# EDP Comparison – 96000A and Tesla

## “Define” Phase



### 96000A Define Phase

- Design the robot on paper.
- Define goals of our robot such as capabilities and target score.
- Define powertrain Type, number of batteries for each sub-system. Review the field and game elements.
- Review rules and limitations.
- Document it all.

### Tesla Define Phase

- Design the car on paper.
- Define goals of car like type of roads, speed, size, seats, mileage, safety requirements.
- Design powertrain, battery type and charging.
- Review legal requirements.
- Document it all.

# EDP Comparison – 96000A and Tesla

## “Develop Solutions” Phase



### 96000A Develop Solutions Phase

- Generate a list of parts required and acquire the parts.
- Build drivetrain, intake mechanism and outtake mechanism.
- Assemble the prototype.
- Test the robot.
- Document the process and issues

### Tesla Develop Solutions Phase

- Generate and acquire a list of essential parts that company is going to either acquire or manufacture.
- Build a prototype by assembling each sub-system.
- Test the car prototype.
- Document the process and issues.



# EDP Comparison – 96000A and Tesla

## “Optimize” Phase



### 96000A Optimize Phase

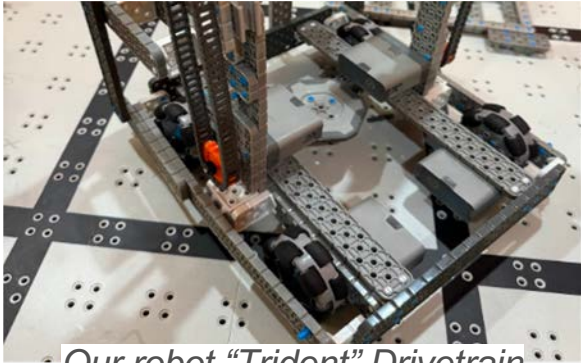
- Based on the testing, fix systems and test again.
- If fixing doesn't work, go back to define phase.
- Once a robot is functioning, start strengthening and optimizing by making robot stronger, better, and consistent.
- Document all the changes and findings.

### Tesla Optimize Phase

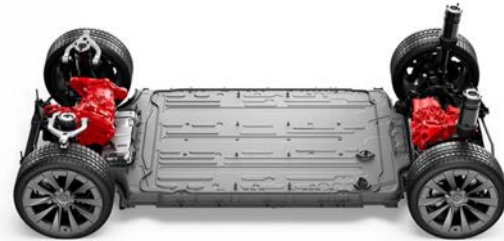
- Based on the testing, optimize, fix, and test again.
- Repeat the process till the car is manufactured as per the requirements. If not, go back to the define phase.
- Once car has been developed and passed all the tests, start production.
- Document all the changes and findings.

## Outcome/Example of Creating Drivetrain using EDP

An Example of one of the subsystems while following EDP by comparing Tesla Drivetrain vs our robot Trident's drivetrain



*Our robot "Trident" Drivetrain*



*Tesla Drivetrain: (Source: [Tesla](#))*

## Final Products Using Similar EDP



Tesla Model X: (Source: [Tesla](#))

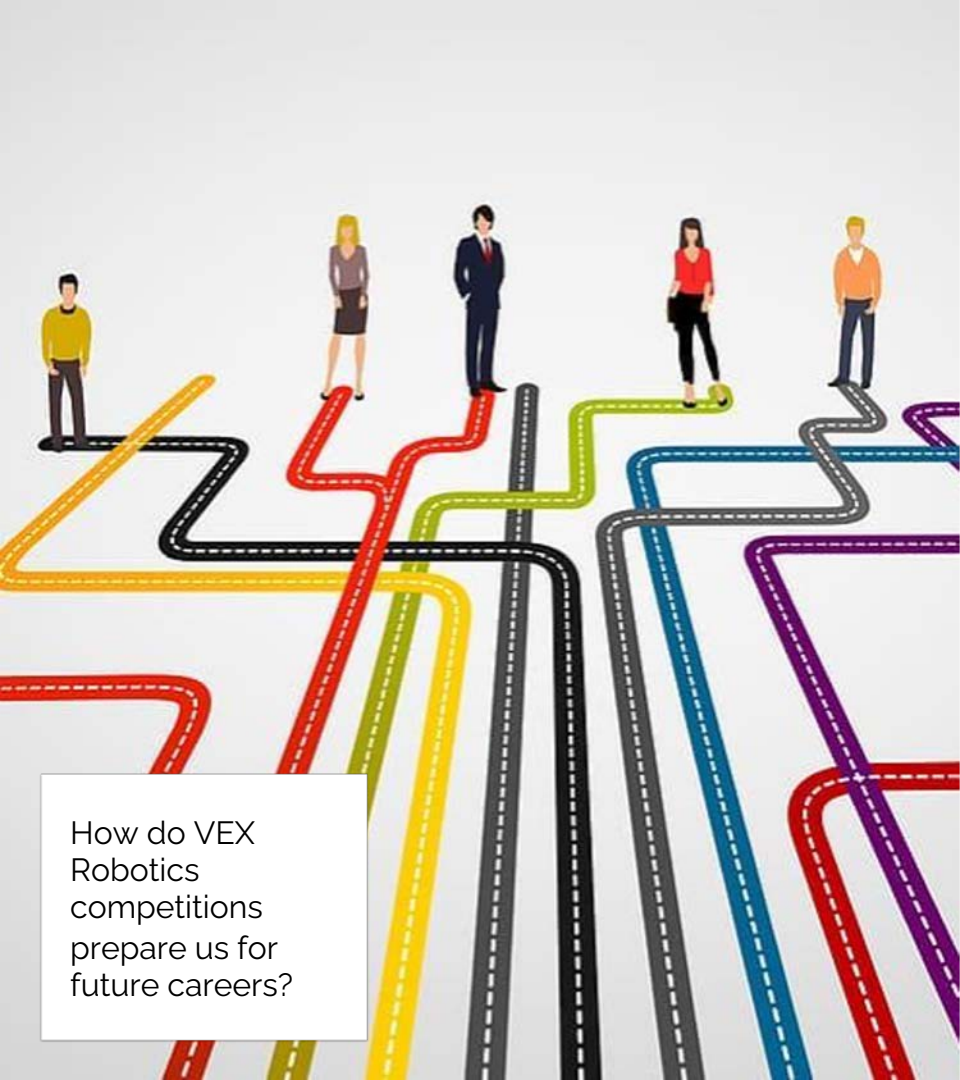
# Difference between our EDP and Tesla EDP

is that Tesla can

**manufacture** parts as per

their design, but we must **imagine**  
our robot design based on the parts that we  
have from VEX.





How do VEX Robotics competitions prepare us for future careers?

# Career Readiness

Vex Robotics has helped our whole team in different ways and now we are going to talk about some of the careers we might have due to robotics



# Engineering Career

Participation in VEX can help us become future **Engineers** in these fields as we learn these concepts

→ **Mechanical Engineer**

Gears, pulleys, chain-sprocket and machine concepts

→ **Electrical Engineer**

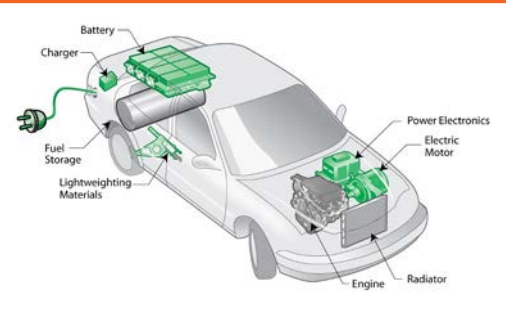
Motors, wiring

→ **Structural Engineer/Builder**

Robot Beams, connectors

→ **Software Engineer**

Block programming



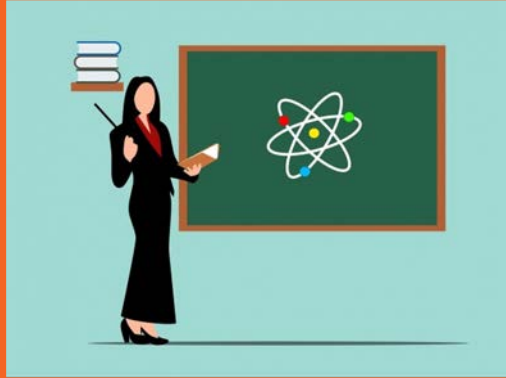
# Leadership Career

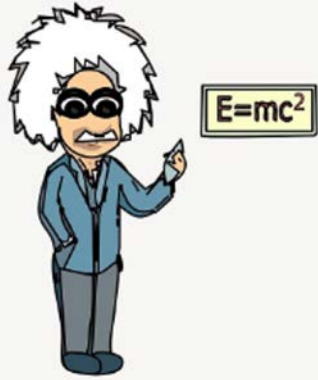
**Interviewing process** and **robotics competition experience** teaches us how to work within our team and with other team. We participated in **three VEX qualifiers**:

1. First qualifier - made it to the finals but lost due to **lack of communication**. **Lesson Learned**.
2. Second qualifier - made it to finals again, and **we communicated well** with the other team and ended up winning the **Teamwork Championship**.
3. Third Qualifier - Other team's robot broke down in finals, **but** we **celebrated** with and **congratulated** other team. And we won Excellence.

Participation in VEX taught us **interviewing** skills, **teamwork** and how to **negotiate, celebrate, motivate, and congratulate** each other if we win or we lose.

→ **Teachers, Leaders, Coaches, Politicians.**





# Innovation Career

Biggest change we see in ourselves this year building robots is learning "Patience" and "Problem Solving"

Sometimes due to one wrong peg, we had to repeat the same steps so many times repeating hours-long building process. **VEX taught us how to have patience** and go into **problem solving mode rather than getting upset.**

These skills can help **Robotic teams to be ready for innovation careers** where they must do a lot of failed experiments before successfully making a formula, vaccine, medicine, or invention..

- **Mathematicians**
- **Doctors**
- **Scientists**





# Conclusion

We have **learned** a lot during our robotics journey, and we are well prepared to make our **career decisions** based on the learnings from VEX when we grow up. Some of the memories from our robotics journey.



**Wired Warriors Team**  
**96000A**  
Some of the memories from  
our robotics journey.





# References

[Tesla](#)

[Google](#)

[REC Foundation](#)

[US Department of Energy](#)

Our parents and VEX coaches



 ENERGY.GOV

Google