

Date: Thursday, October 28, 2021

Team: Nolan McCracken, Bradyn Light, Bryce Armstrong, Abraham Luna, Evan Creason

Location: Indianapolis, Indiana; 46236; Fall Creek Valley Middle School

Rules of the Challenge

How does a professional's use of the design process match yours? As the world continues to become more technical, an increasing number of professions rely on some version of the engineering design process to identify and solve problems. Your submission will use a combination of text and images to identify a specific career or company and explore how its professionals apply and document the steps of a design process in the tasks of their job.

Things to keep in mind for a successful submission:

- Which STEM career or company did you select, and why?
- What resources did you find to learn about professionals in this career or company and how they use the engineering design process?
- How do professionals in this career or company apply steps of the engineering design process?
- How does the professional approach to engineering design match or differ from the approach used by your team?
- How has participation in VEX Robotics prepared you for a future career?

Technical Details

A submission must meet these minimum requirements in order to be judged.

1. Entry is created and produced solely by student team members. It is acceptable for adults to assist with downloading any necessary resources or submitting the story where students may need permission.
2. Format: One PDF file (up to 20MB) that includes all content, including images.
3. Size: Summary report up to 500 -1000 words.
 - Title page, credits, complete parts lists, image captions, and any appended citations are not included in word count.
 - Judges may use a software-based word counter such as <http://www.montereylanguages.com/pdf-word-count-online-free-tool.html> to verify word counts.
4. Title Page: Each entry must include a title page that includes
 - Title of submission
 - Names of students who participated (using first names only is acceptable)
 - Team number
 - Location of team

Judging Information

- Up to 15 points for a submission that identifies a career or company and describes why it was chosen
- Up to 15 points for a description of how the chosen profession or company applies steps of the engineering design process, and how their process compares to the team's process
- Up to 15 points for describing how participation in VEX Robotics prepares you for a future career
- Up to 15 points for clear presentation of findings and organization of content
- Up to 15 points for the quality of quality and readability of the writing, including spelling, grammar, and sentence structure
- Up to 15 points for the quality and thoroughness of images used to document the project

Define the Problem:

We need to create a poster exploring the design process and other pieces of information about a certain STEM career.

Generate Concepts:

We utilized Twig Education's "10 Exciting STEM Careers for 2021 and Beyond" to find some interesting careers.

Name	Creativity	Interesting	Total	Check
Gameplay Engineer/Programmer	10/10	8/10	18	X
Certified Ethical Hacker	7/10	9/10	16	X
Underwater Archeologist	6/10	7/10	13	X
Nanosystems Engineer	6/10	9/10	15	X
Atmospheric Scientist/Storm Tracker	5/10	7/10	12	X
LEGO Designer	8/10	9/10	17	X
Mobile Application Developer	10/10	9/10	19	✓
Aerospace Engineer	4/10	9/10	13	X
Photonics Engineer	3/10	8/10	11	X
3D Printing Engineer	9/10	10/10	19	✓

This means we will either do a Mobile Application Developer or a 3D Printing Engineer and I chose the Mobile Application Developer.

Design Solution:

Skills used for VEX and how it prepares you for the job and how VEX prepares you:

The skills that are used for this job are taught by VEX. On a robotics team, we have a coder that creates code for a robot to score points in the year's goal "Pitching In". The coder role teaches that person about being a coder or developer. Also, everyone on a robotics team learns to understand the code written and learns other important life skills vital to an App Developer. VEX prepares you for your future career and your life in general! VEX teaches you leadership skills, problem solving, coding, etc.

A Mobile Application Developer's Design Process:

We utilized Appinventiv's Mobile Application Development Design Process

Step 1: Planning

- Problem Definition and Value Proposition
- Market Research
- Target Users
- Info Map

Step 2: Wireframing

- Wireframing
- Prototyping

Step 3: Presenting/ Designing

- Create UI
- Final Prototype

How theirs is similar to ours:

The design process of an App Developer is quite similar to the design process of a Robotics Team.

Resources Used:

[10 Exciting STEM Careers for 2021... and Beyond - Twig Education](#)

[12 Interesting Facts About Software Developers \[2021\]](#)

[13 Amazing Facts About Mobile App Development | Activate Design](#)

[The Mobile App Design Process That Appinventiv Follows](#)

The Design Process of VEX and App Devs

There were over 200 billion app downloads last year! Isn't that crazy! There are so many jobs that require STEM expertise. Those that require STEM expertise are quite prevalent and very interesting. I am Nolan McCracken; the Notebook, Stem Leader and Researcher, and Back-Up Driver for Robotics Team 1024F. Our team consists of five dedicated members (Nolan McCracken, Bradyn Light, Bryce Armstrong, Abraham Luna, and Evan Creason) that are located in Indianapolis, Indiana. There are many STEM careers and we chose 10 to choose one amongst. We chose to decide one of the following: Gameplay Engineer/Programmer, a Certified Ethical Hacker, an Underwater Archeologist, a Nanosystems Engineer, an Atmospheric Scientist/Storm Tracker, a LEGO Designer, a Mobile Application Developer, an Aerospace Engineer, and finally, a Photonics Engineer. We decided by a decision matrix, that we would research the career of a Mobile Application Developer.

App Developers becoming increasingly important today and this goes hand-in-hand with its high salary. Developers have skills in many subjects, many of those that are pertained by a robotics team member. Robotics members and developers need to be creative as well as having coding experience. To be a successful app developer, you need a design process to help you to define, plan and produce the product you're building. By being a part of VEX, you learn the necessary skills to be a developer. On a robotics team, you have a coder that creates code for a robot. Being the coder on a robotics team teaches you about how to code and the skills to be an application developer. Also, everyone on a robotics team learns to understand the code written and other important life skills vital to an App Developer. VEX prepares you for your future careers! VEX teaches you leadership skills, problem-solving, planning, etc.

App developers have a design process that consists of three major steps; planning, wireframing, and visual design. We as a robotics team, also have a design process that differs in major steps, but when looking more into the details, they are quite similar. Our design process consists of 6 steps that are stated thusly: define the problem, generate concepts, design a solution, build and test, evaluate the solution, and finally, present solution.

App developers' design process has 3 steps that consists of its own sub-steps. The first step is planning. This consists of the following sub-processes: define the problem, research, and identify the target Audience. The second step is wireframing and prototyping. The third and final step is creating a visual design involves creating styles for the app, making the UI, and final prototyping. Our design process as a robotics team design process is similar in that our first step is defining the problem and well as having to research for the second step. Then, you prototype and create a final design. So, our process is quite similar to an app developer's design process.



Define the Problem
What is the problem you're trying to solve?
Define constraints

Generate Concepts
Brainstorm all possible solutions to your problem

Design a Solution
Find a final design to the problem

Present Solution
Share out your prototype and results

Evaluate Solution
Find if the design meets requirements and if not, go back to drawing board

Build and Test Prototype
Create the Solution and test it

