INNOVATING FOR A MILLENIA

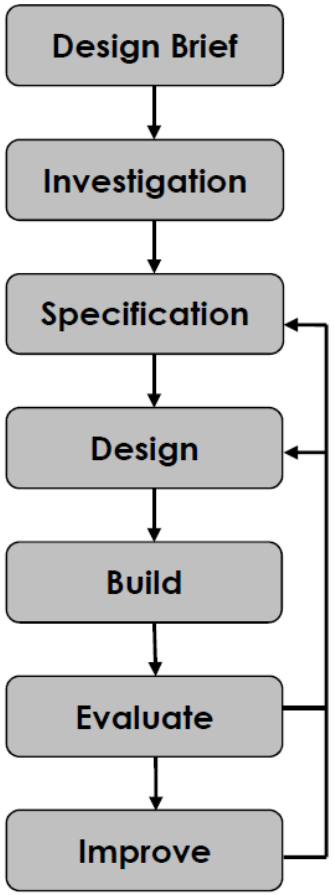
VRC Team 30030A: Celestial, London, UK

"Enjoy failure and learn from it. You can never learn from success."-James Dyson.

- We picked the Dyson company, as their method is constantly being reused and recycled, and is extremely reliable. Furthermore, Dyson is known for his determination and perseverance, having tested nearly 4000 vacuum designs before finding the best design. Furthermore, they are one of, if not the biggest technology companies in the world, specialising in hoovers. They are well known for having the highest quality and one of the widest range of products in the industry.
- Our team has picked the STEM company Dyson, and in this presentation, we shall investigate how this company utilizes the Design Process. We'll also highlight the similarities in how we have used it when creating our own machines.

DYSON

Dyson hoover

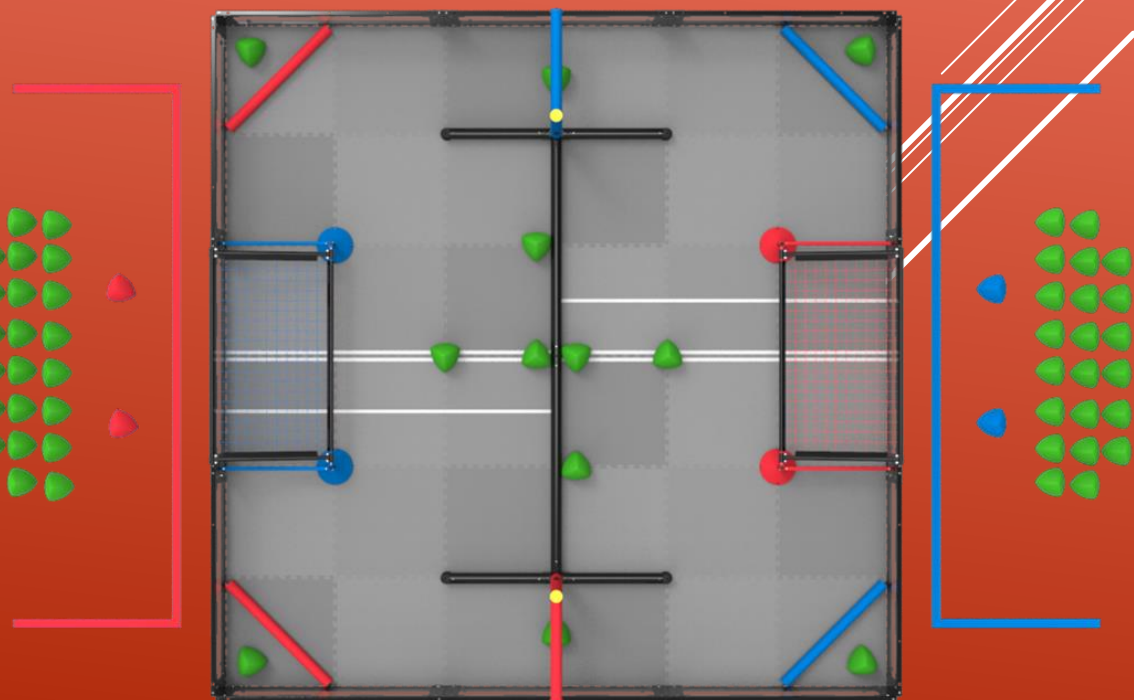


- Dyson's main objective is to help their customers, and each new release and product is constantly being improved on, in order to satisfy the customers and generate income.
- Whenever Dyson creates a new product, they must go through these steps to make sure that the product is as high quality as it can.
- We design and build robots that aim to win challenges, the same way Dyson improves the quality of life for us to live comfortably and well.

DYSON DESIGN PROCESS

DEFINE / IDENTIFY PROBLEM

- As detailed in the first step in both design processes, before any designing can begin, to ensure the vacuum or robot created will meet all the requirements and work within the constraints detailed and other problems must be identified and defined clearly.
- For Dyson, they are looking for customer satisfaction, and this includes how the hoover feels, works and the ease of use.
- In VEX over under, the main goal is to score triballs and prevent the other team with various mechanisms, so we are looking for the design that will best suite our team and also be efficient. Also, the bot must be within certain requirements, such max size of as 18x18x18 inches, and maximum 88W of power

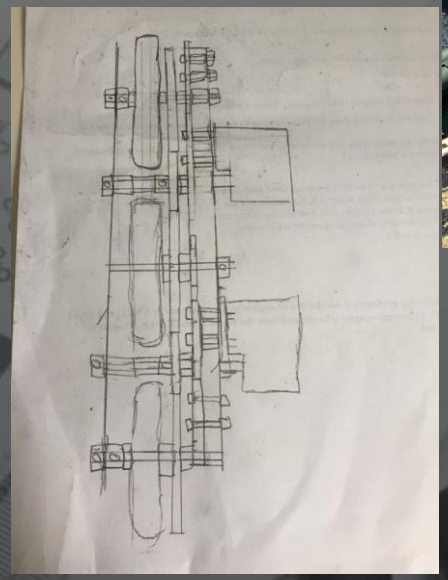


GATHERING DATA AND BRAINSTORMING

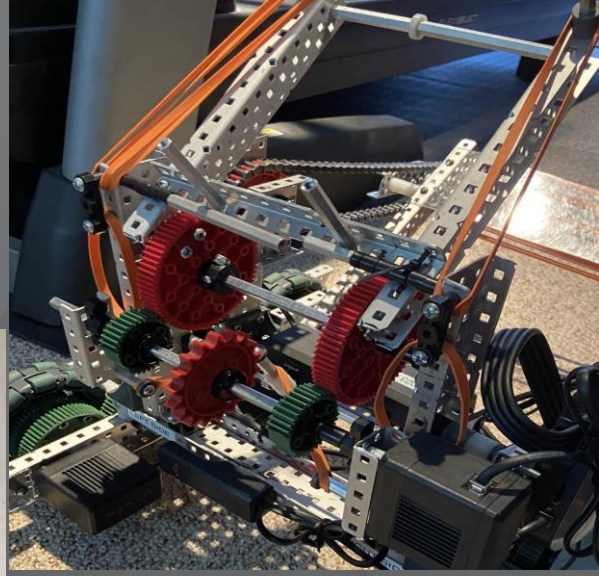
- The next steps in both processes will involve gathering as much data as possible to guarantee the best solution is developed. Following analysis of the data gathered during this research process, brainstorming can start in the form of sketches to aid in the visualization of the intended final design.
- For Dyson, this can include surveys, data, scientific evidence, and statistics on a multitude of topics, such as the most favored grip shape and material, maneuverability and adjustability.
- In VEX, this includes watching many, many videos about other designs and bots.

CREATING SOLUTIONS AND PROTOTYPES

- The next step in both processes is to refine the initial concepts until a workable option can be chosen from which to construct small-scale models and prototypes. For Dyson and ourselves, notebooks outlining the development of ideas are extremely important. Using CAD software, these can then be converted into scaled, accurate drawings to show how everything will fit and function together.

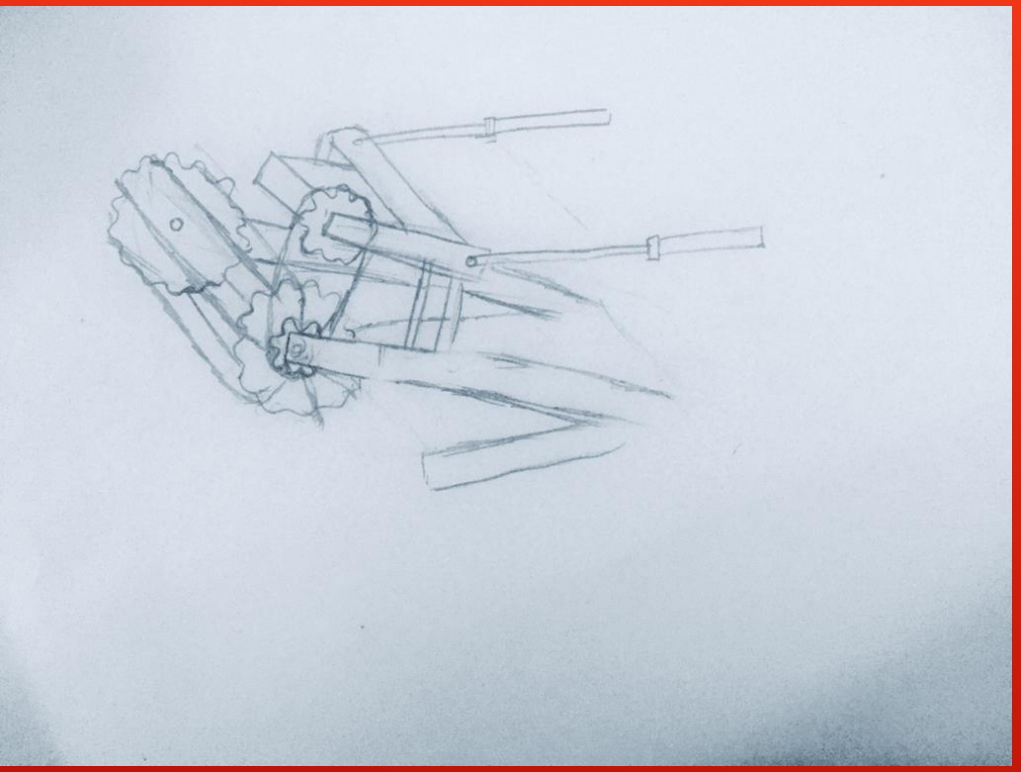


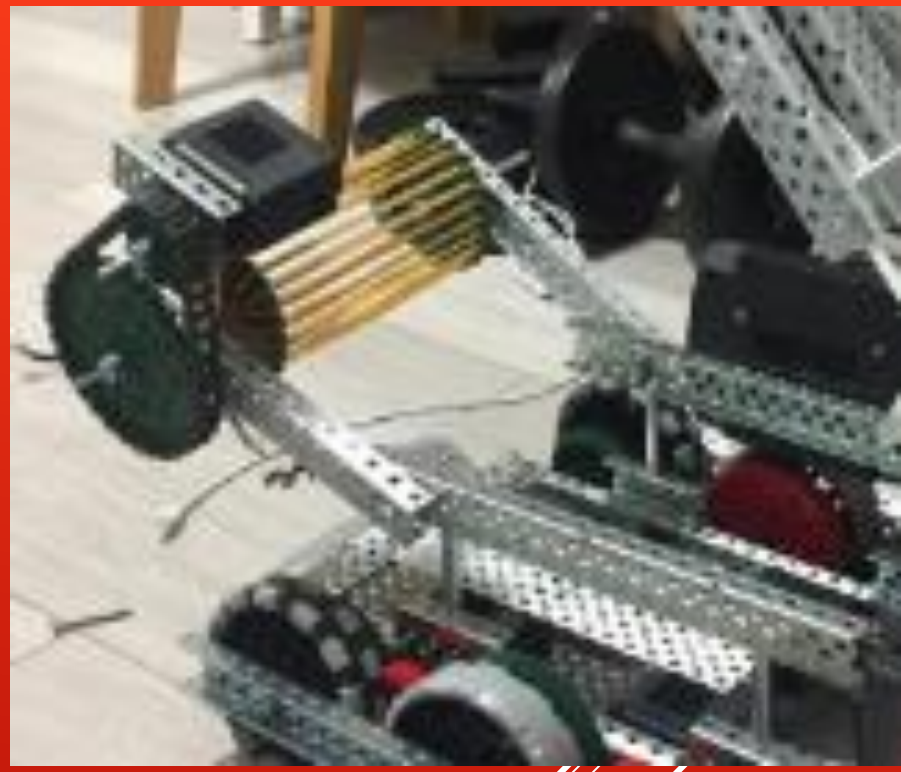
Drive base prototype



Catapult prototype

Harvester CAD

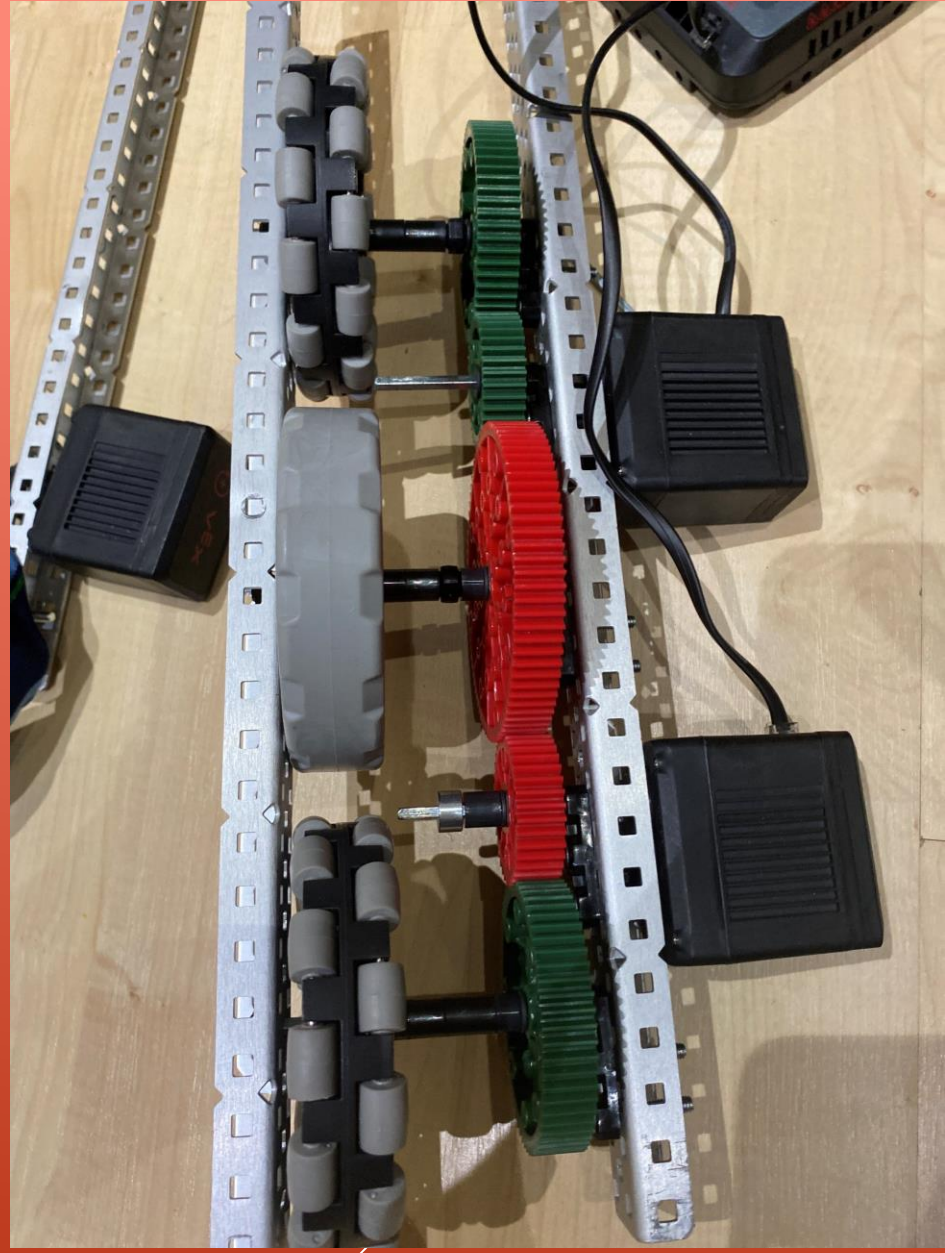




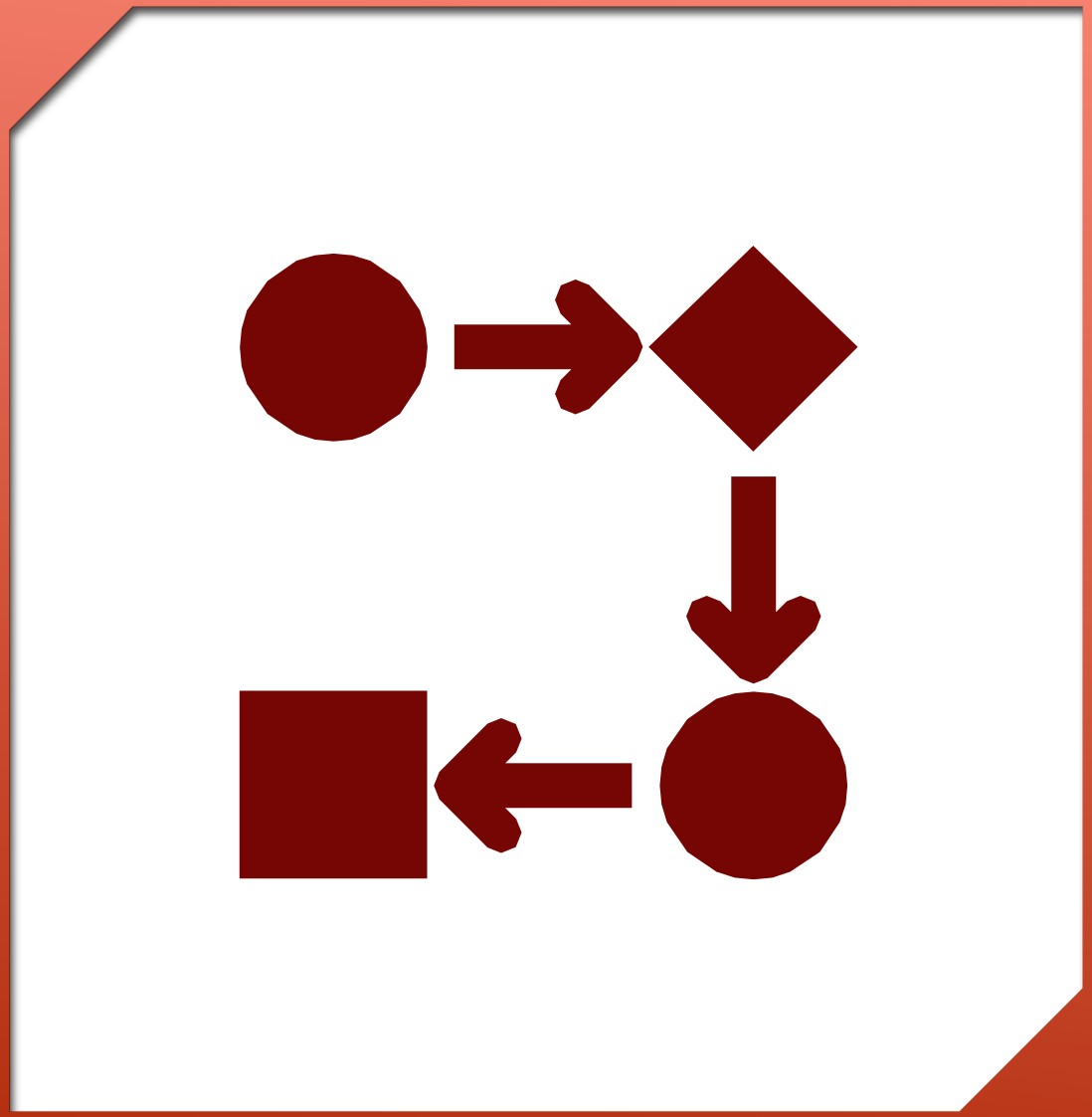
Bringing design to life: Our First Harvester intake device

TEST, FEEDBACK, AND EVALUATE

- Prototypes and scaled models are tested against the original specifications to make sure all goals are met and the hoovers function properly within the client's requirements.
- This can include being easy to use, comfortable and sturdy. The previous and next step can be repeated thousands of times in some designs, such as Dyson's first bagless hoover.
- For us, every part and mechanism must be tested numerous times, just to make sure it consistent and all possible issues are accounted for.



One of our first drive base designs: after testing, we figured out that one of the issues were the unnecessary



- Changes can be made to the solution based on feedback and test results, and this iterative process continues until the finished product, whether it be a building or a robot, satisfies all the goals it set out to achieve. Once this is perfected, Dyson and we have finished the design process, and we are ready to start building the final product with our thorough plans and blueprints.

IMPROVE, REFINE, AND OPTIMIZE

- The design procedures just described are fundamentally the same between VEX and Dyson, which accounts for their many similarities. We can apply the method of resolving complex issues with well-researched, documented, and tried solutions to all facets of our lives.
- The members of our team have learned how to approach challenging tasks in a very methodical and systematic way, break them down into components that can be researched, and design solutions for. It has shown us all how to work both independently and jointly to advance significantly in challenging circumstances. Moments of genius allow us to produce solutions when things seem hopeless.

PLANNING OUR FUTURE CAREERS: HOW VEX CAN ADVANCE PROFESSIONS IN THE FUTURE

Our team have discovered how to be resourceful and resilient while also making the most of every opportunity and making sure that all victories, no matter how big or small, are acknowledged, and all mistakes and failures, are build upon to become an even stronger team and bot than before. These fundamental ideas that we have looked at can be used in any job that is based on the principles of STEM. The principles used to design and construct our small, mobile robots are essentially the same as those we have learned about any creation: its about building We also want to enter a STEM career where our names and accomplishments will always be remembered and built upon, much like Dyson, creator of the first bagless vacuum, and renowned for his innovation and perseverance.

HOW VEX CAN PREPARE US FOR THE FUTURE

Vihaan: Builder, Notebook

Shashank: Builder, Designer

Danji: Builder, Designer

Nimesh: Coder, Notebook.

Akshaj: Coder, Notebook

Yang: Driver, Builder

Veer: Driver, Builder

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