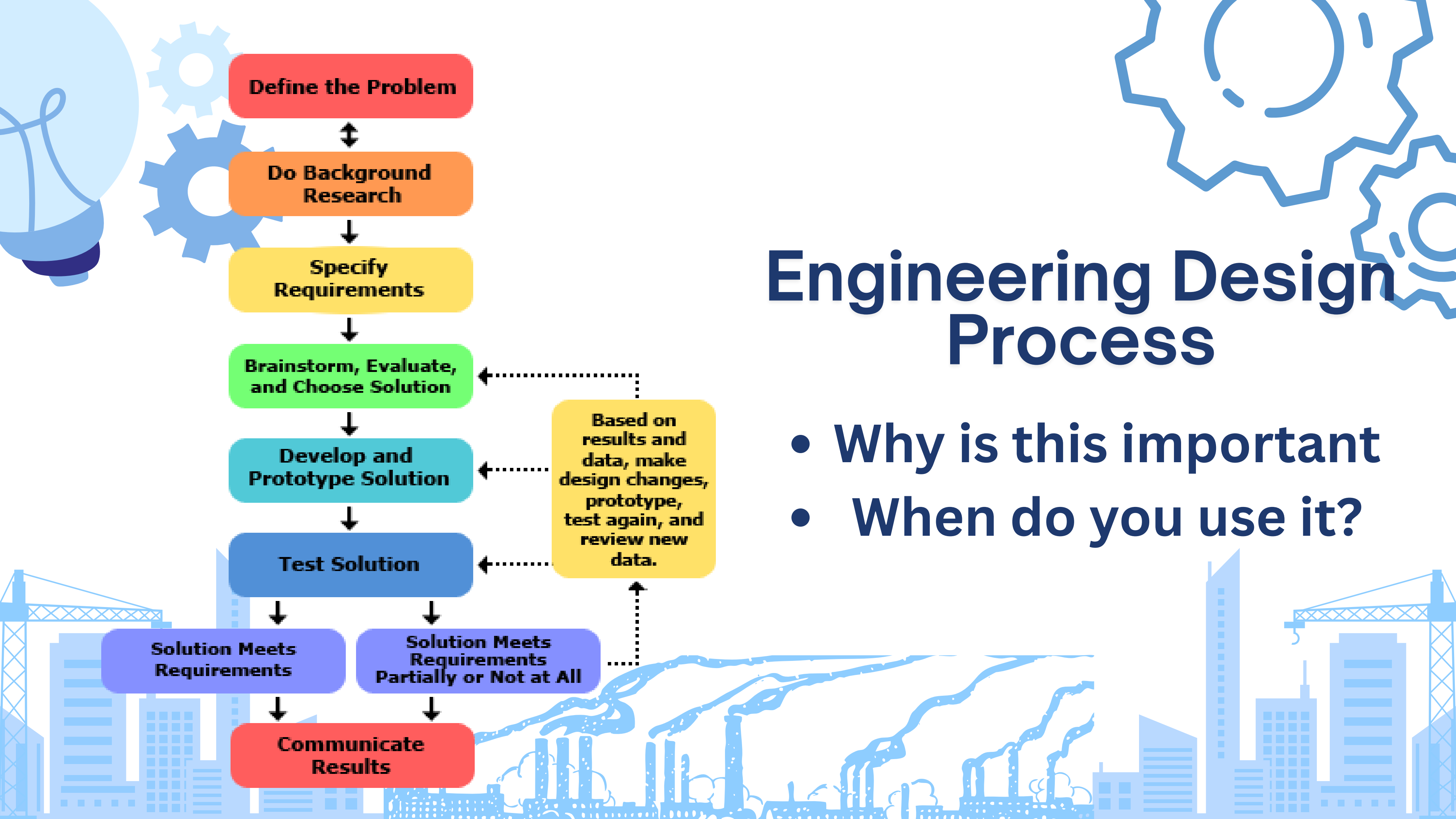


# **VEX ROBOTICS**

**The engineering  
design process**

# Engineering Design Process

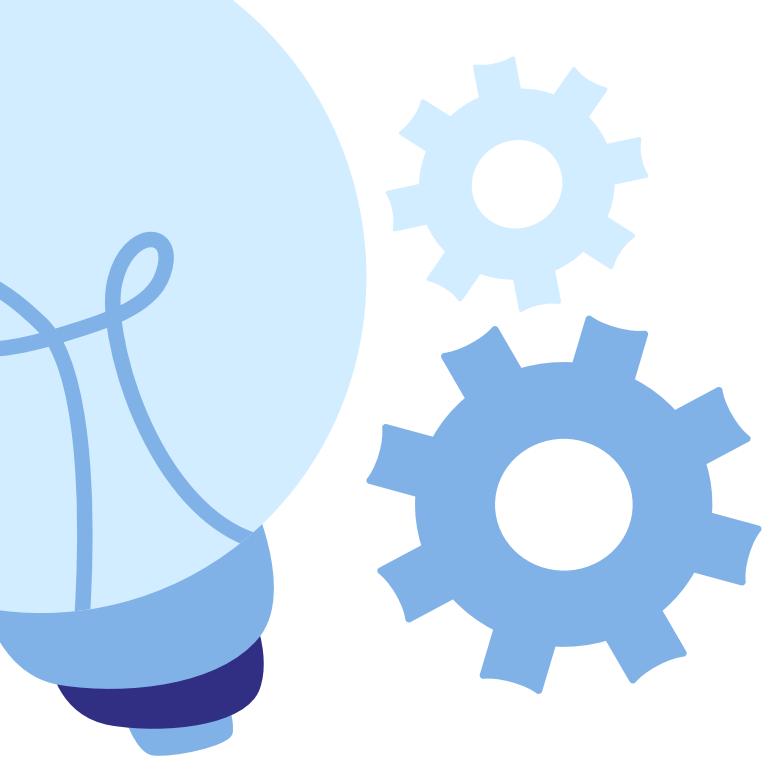
- Why is this important
- When do you use it?



# VEX game

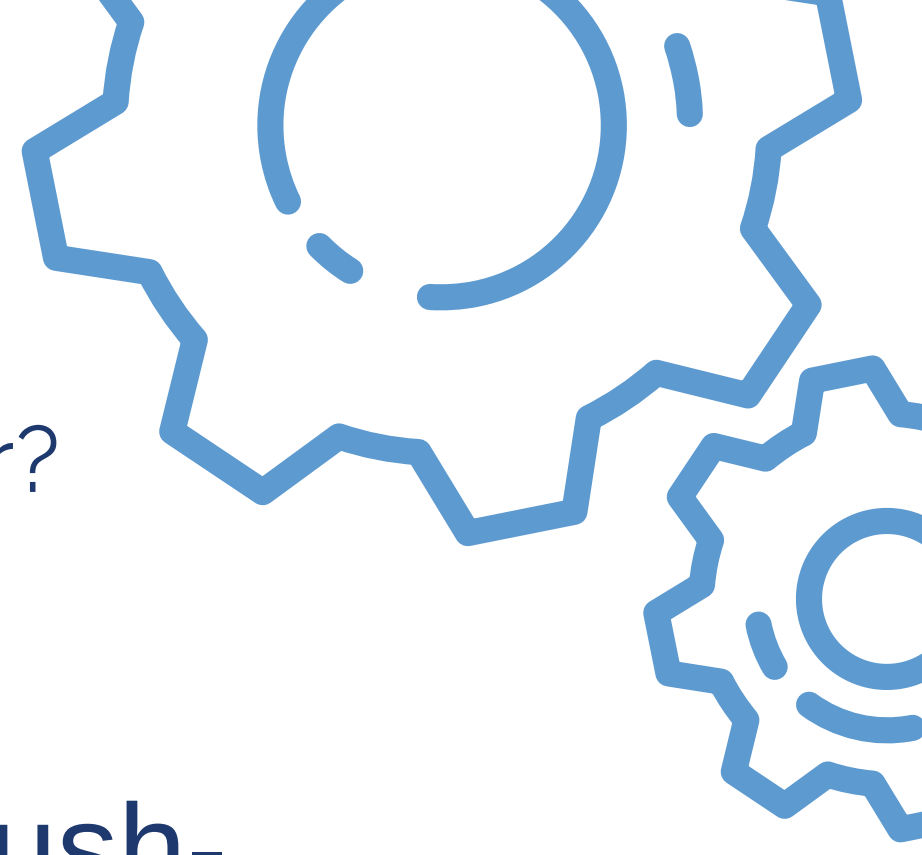
What do you know about YOUR game so far?





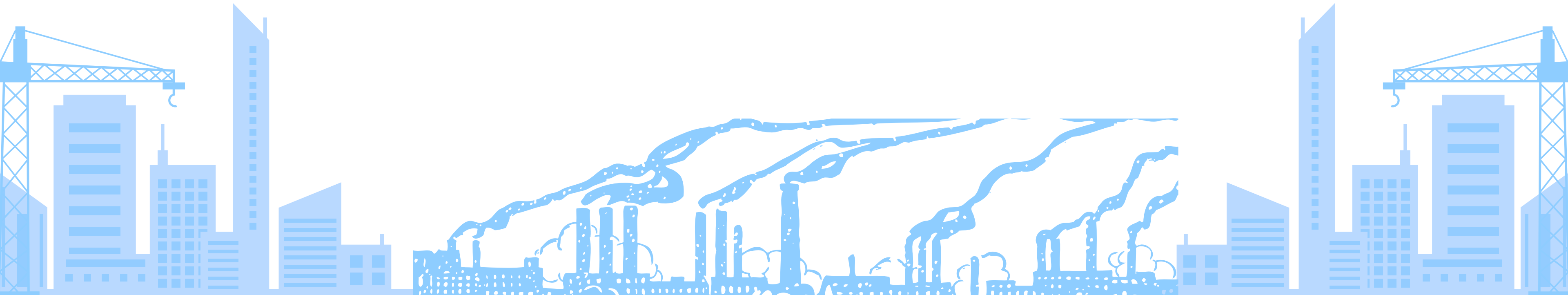
# VEX game

What do you know about YOUR game so far?



<https://content.vexrobotics.com/docs/25-26/v5rc-push-back/docs/Push-Back-2.2.pdf>

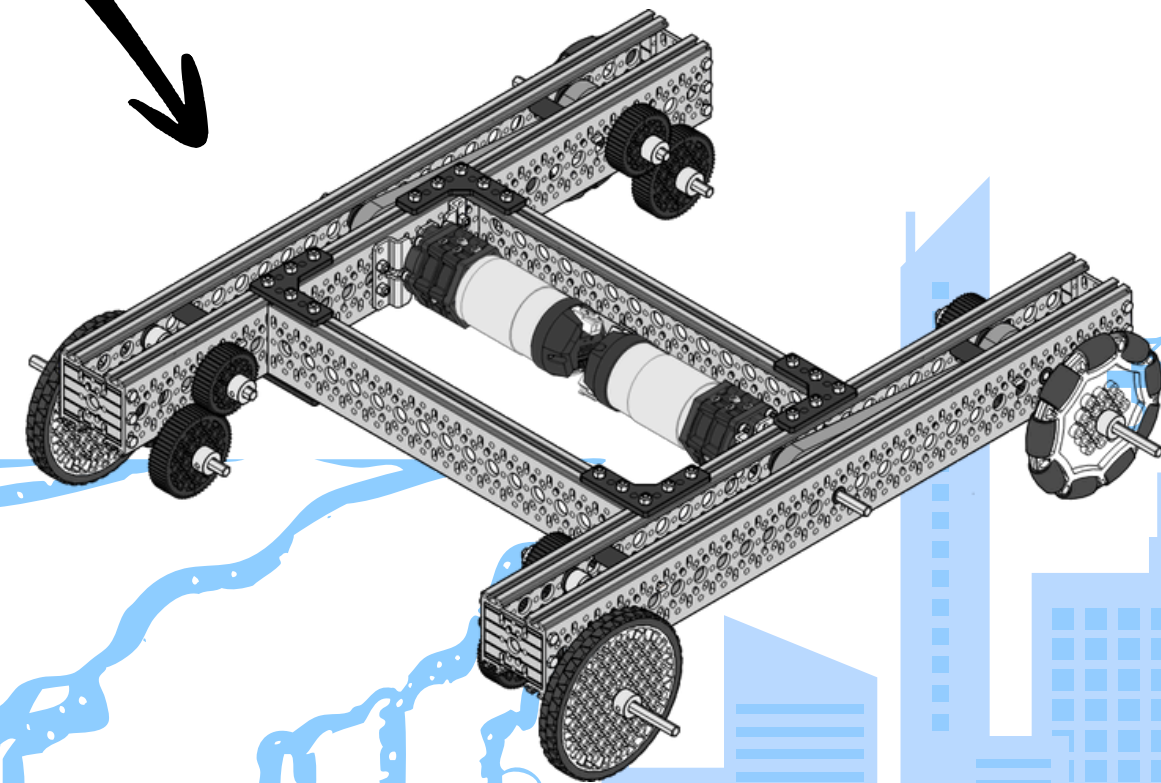
or search up: VEX robotics v5 2025-2026 game manual



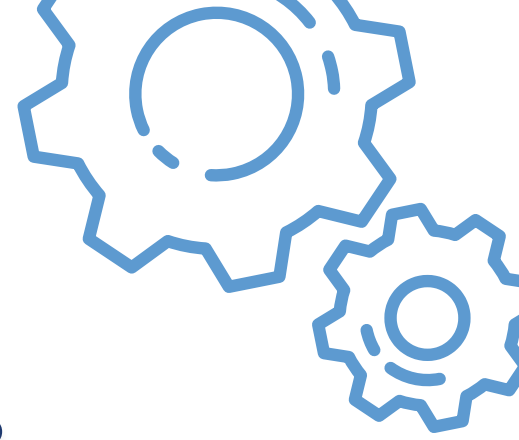
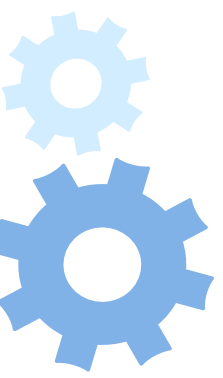
# Drivetrains

Types of drivetrains and drivetrain shapes:

- **Tank (U...kinda)**
- Mecanum (H, Square, U)
- Holonomic (H, U, x, Square)







# Drives:

## Tank

- Easy to build and code
- Fast
- Only requires 2 motors
- Consistently pretty good
- Cannot move sideways w/out turning
- Takes up a lot of space
- Can be pushed sideways easily

## Mecanum

- Easy to build
- Can move sideways w/out turning
- Slow
- Slow moving sideways
- Requires 4 motors
- Takes up a lot of space

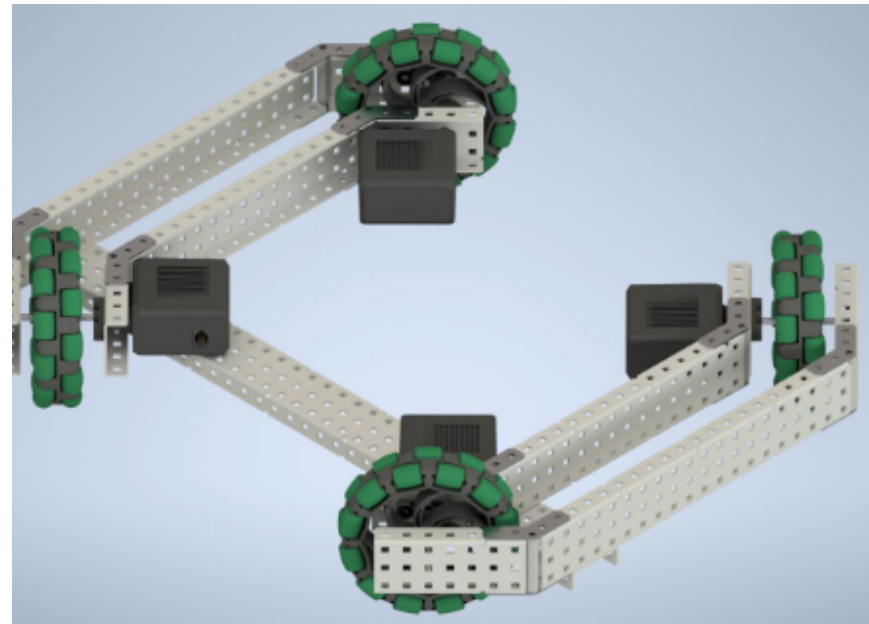
## Holomic

- Can move sideways and diagonal without turning
- Fast
- Hard to build and code and adjust
- Takes up a lot of space

# Shape:

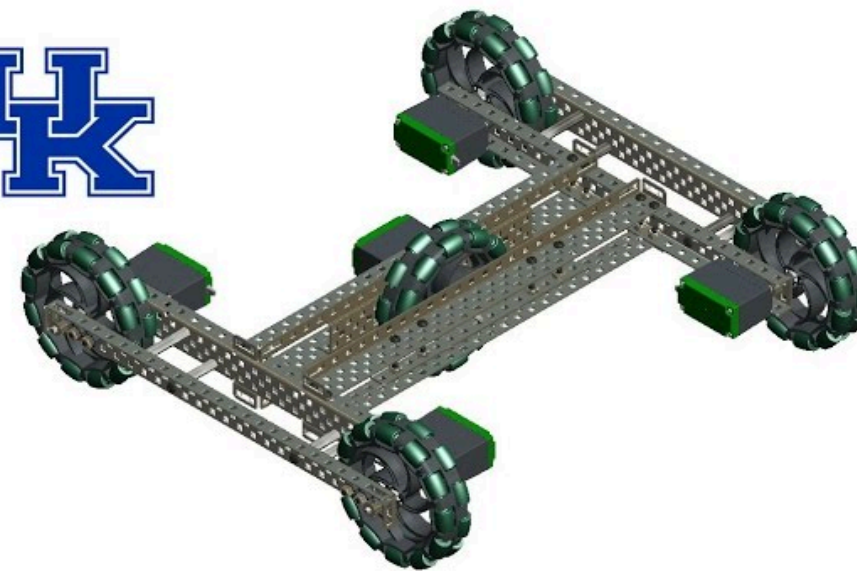
## U

- Space in the front of bot for intake
- Less sturdy
- Game pieces can get stuck in it



## H

- Space in the front and back of bot
- Less durable/sturdy

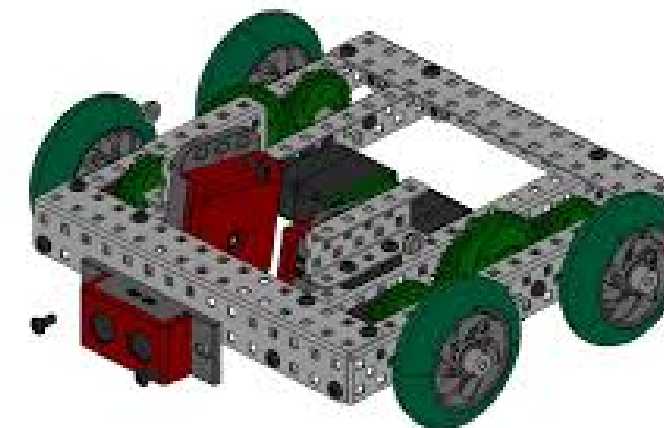
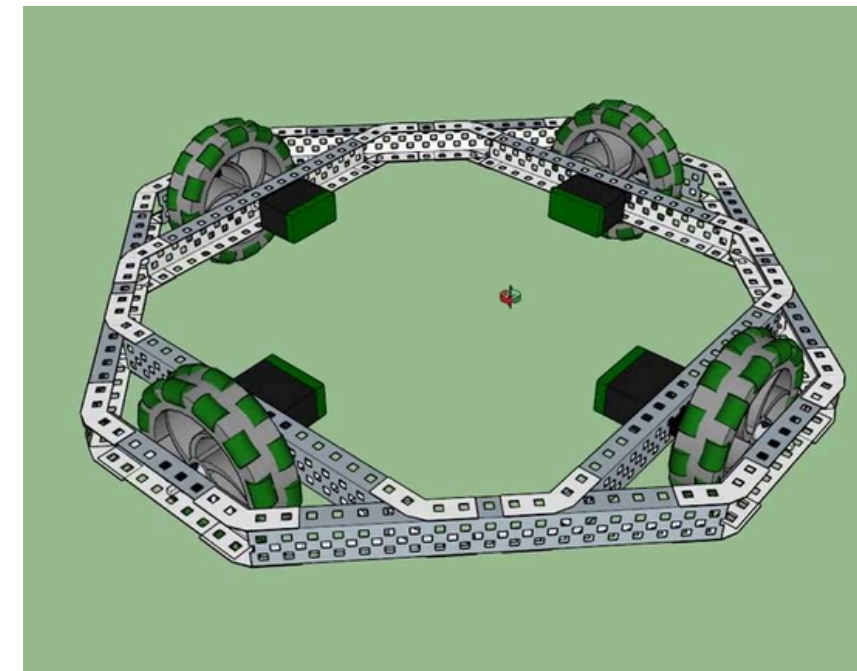


## X (Holonomic)

- Fast(est) and agile
- Moves sideways well
- Wheels take up lots of space
- Holonomic, so difficult to make and code

## Square

- Sturdy
- Game pieces will not get stuck
- Takes up a lot of space



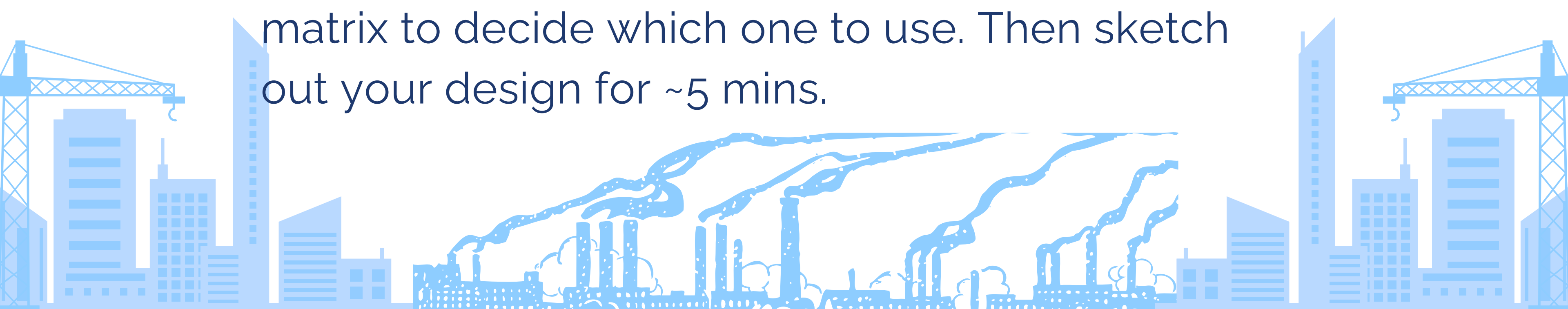


# Brainstorm and Sketch

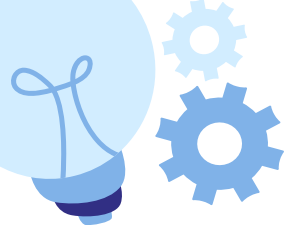


What are your priorities (ex. speed, durability, simplicity)?

Brainstorm in a group for 10 minutes. When brainstorming, say all your ideas and write them down in bullet points, then, once you don't have any ideas left, figure out which ideas you like most (and that fit your priorities) and use a decision matrix to decide which one to use. Then sketch out your design for ~5 mins.





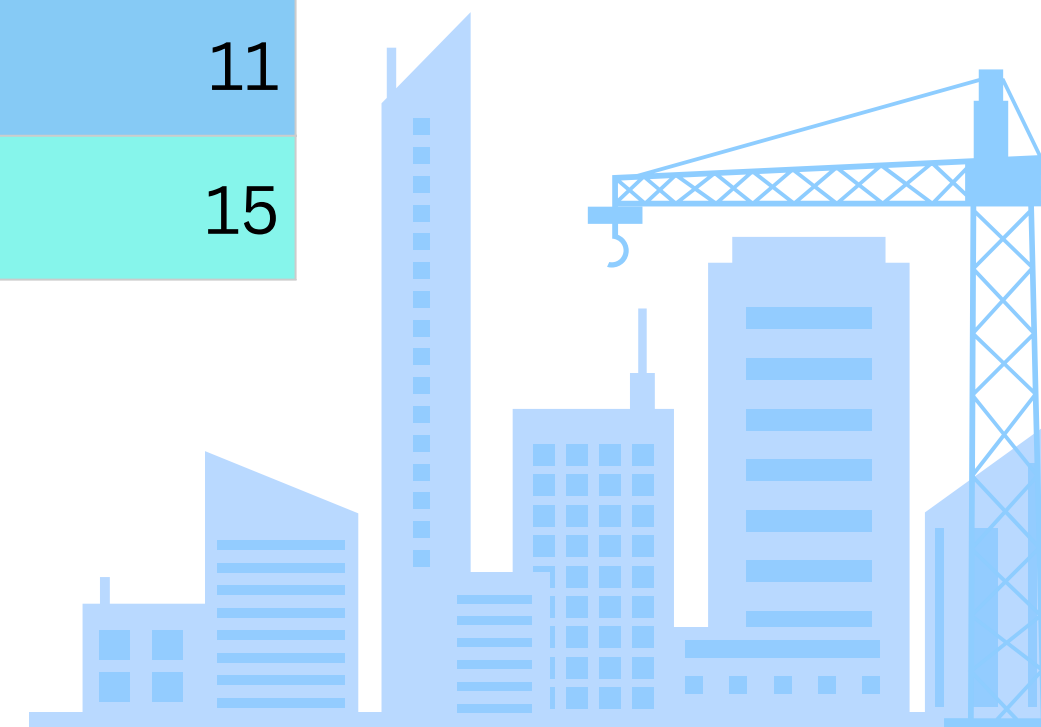
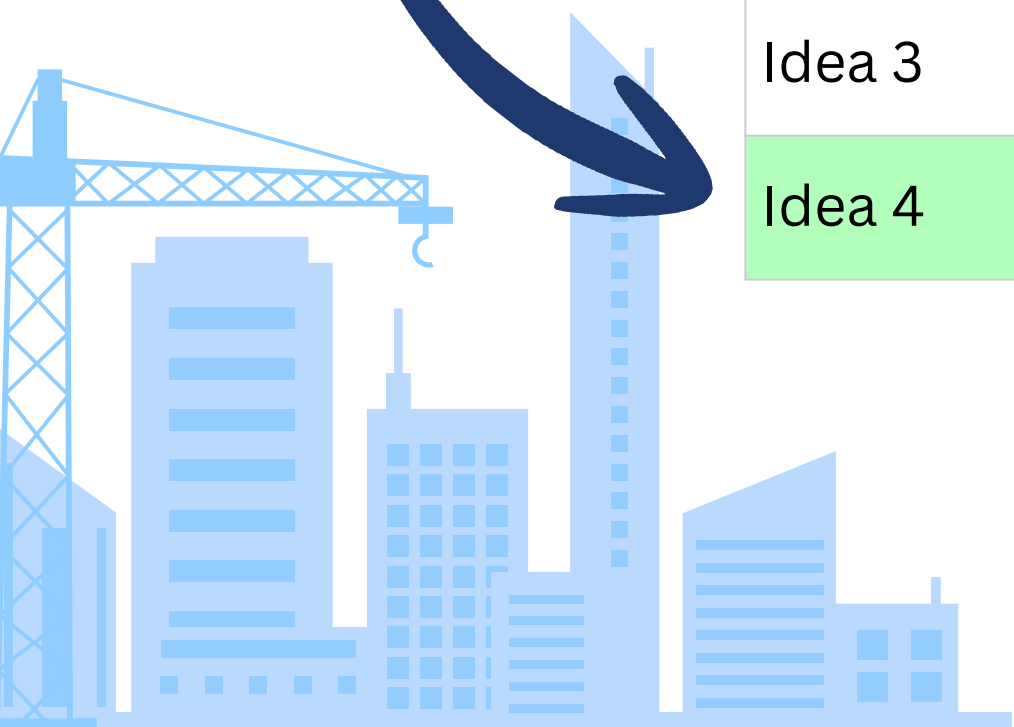


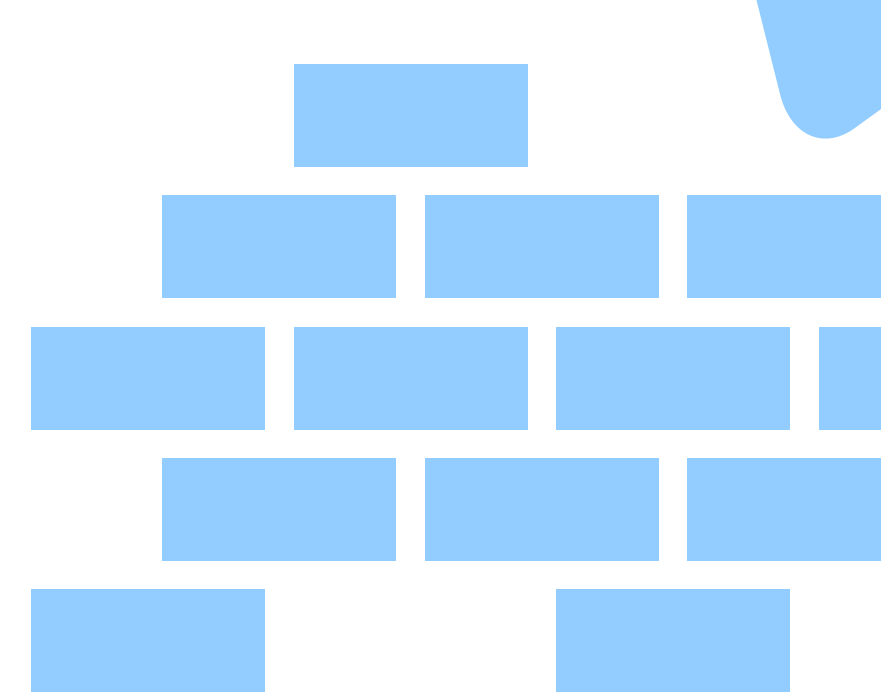
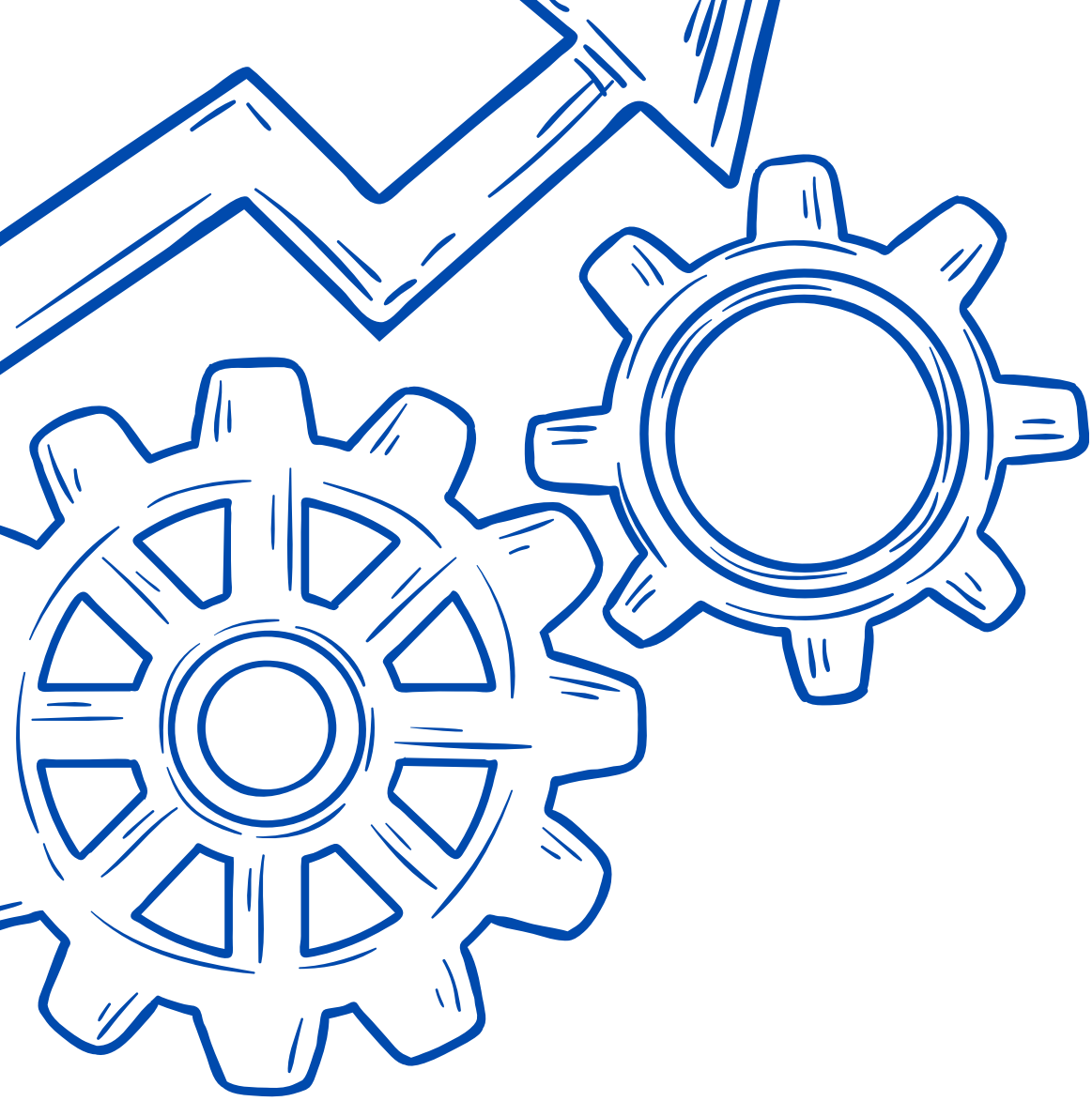
# Decision matrix

In order to figure what designs have the best combination of features, use decision matrixes. Input your ideas and priorities, then rank how well each idea works for each priority, and add all the scores for each idea up in the end.

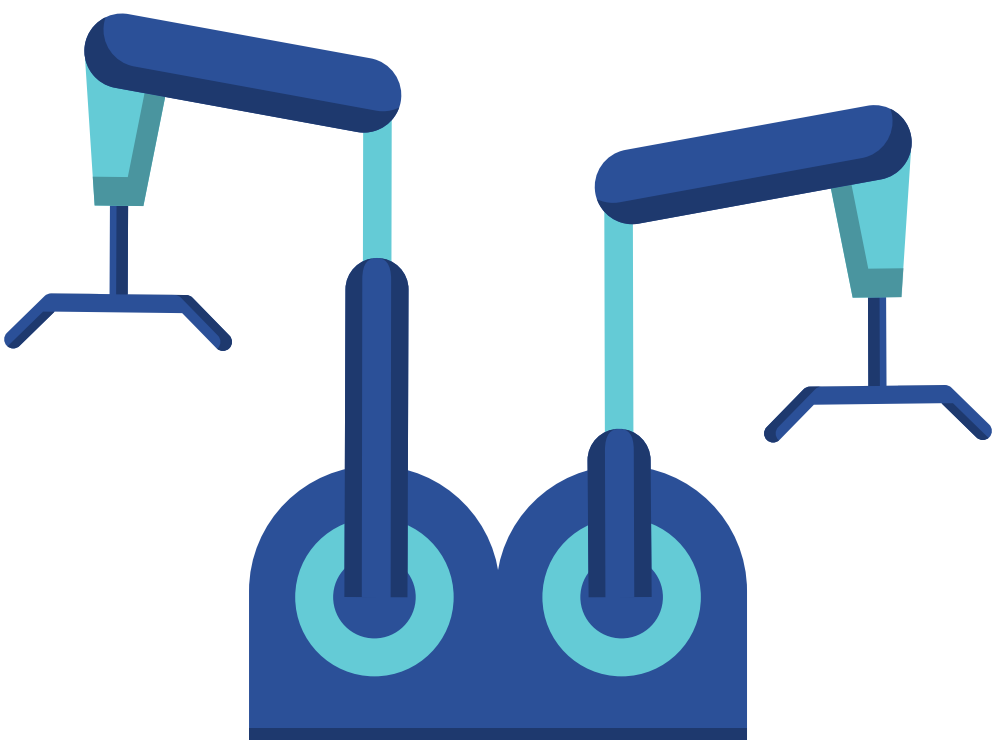
Idea 4 is the best choice!

	Priority 1	Priority 2	Priority 3	Priority 4	Overall
Idea 1	4	3	2	1	10
Idea 2	2	2	5	4	13
Idea 3	3	1	2	5	11
Idea 4	4	3	4	4	15





***Thank  
You***



# Who are we?

We are members of Brooklyn Technical High school's robotics team: Team 334.

We compete in yearly robotics competitions. This was our robot last year:

