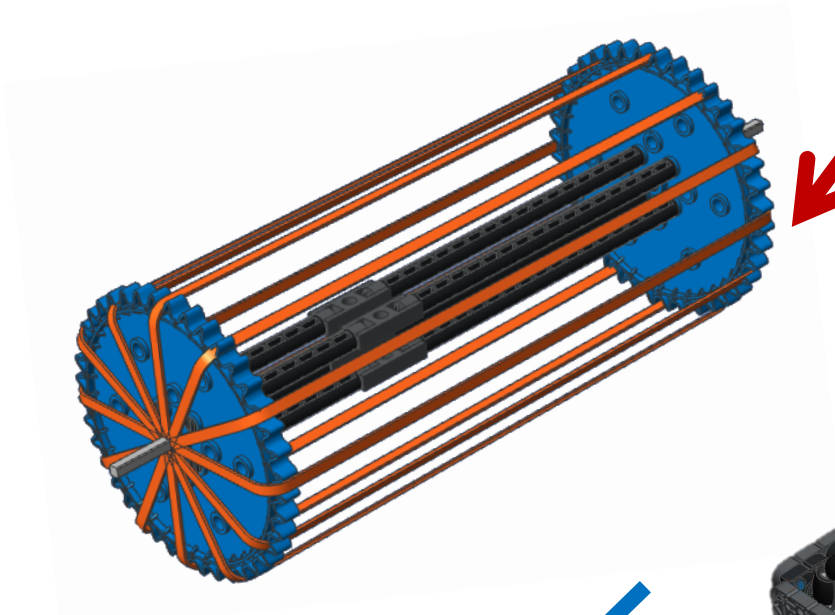
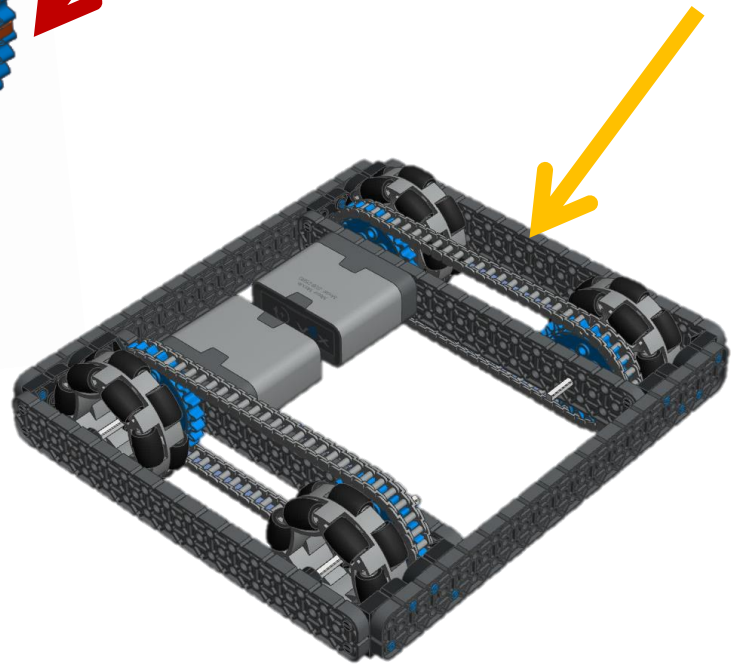
WECLOME TO

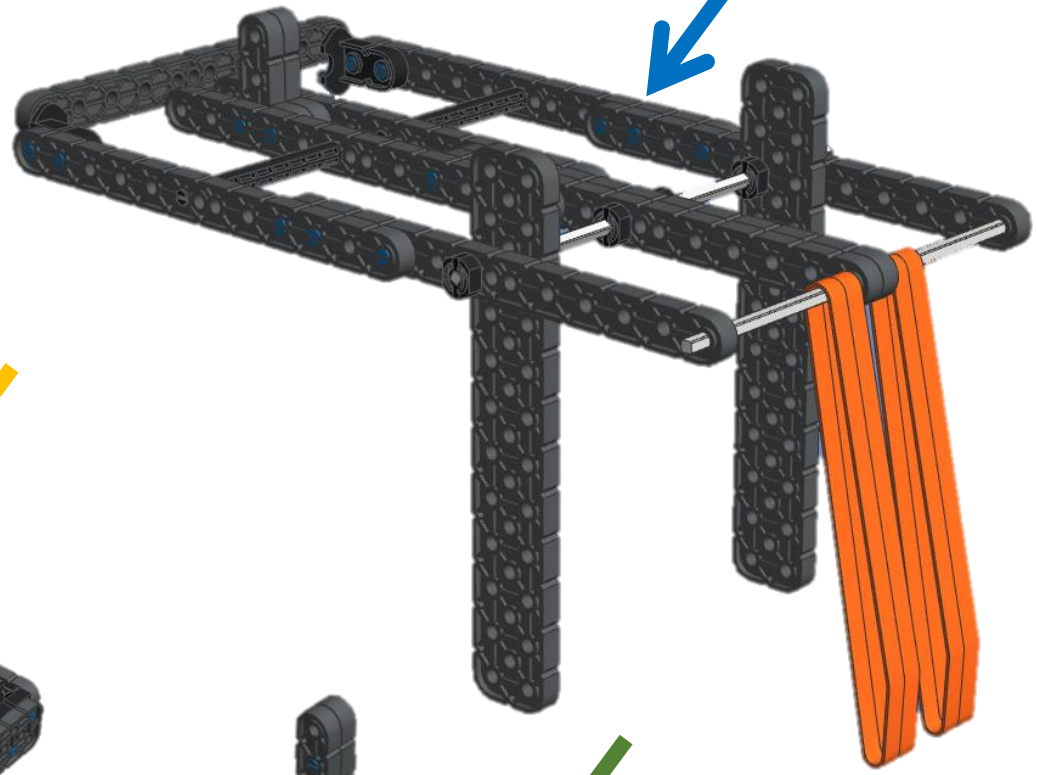
VEX IQ ROBOTICS

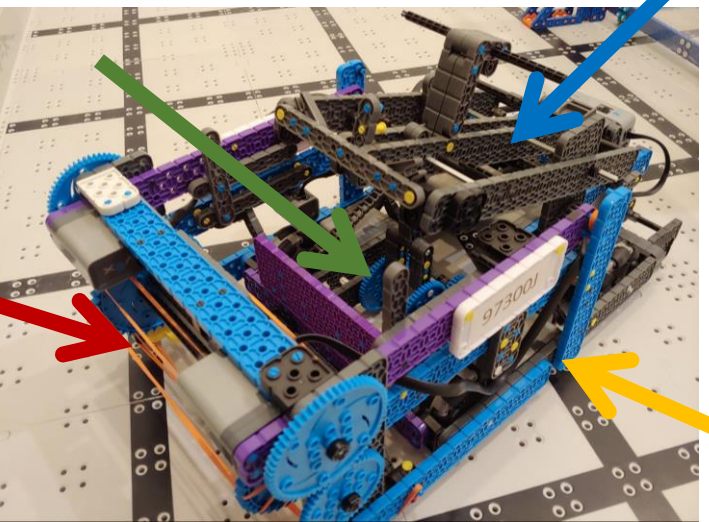
MASTERS

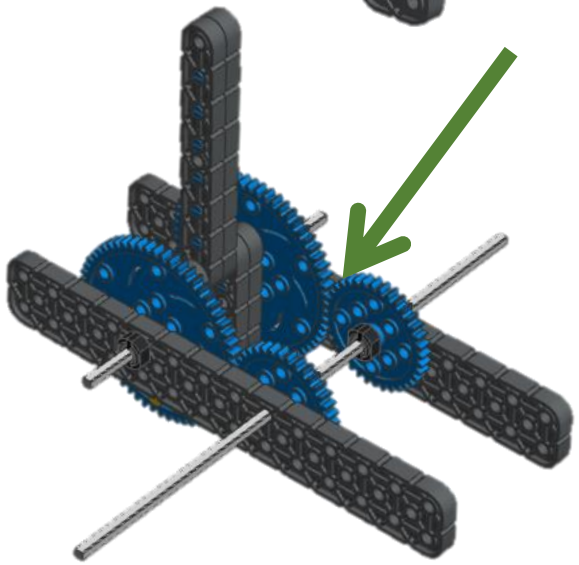
Build this robot – Chunking





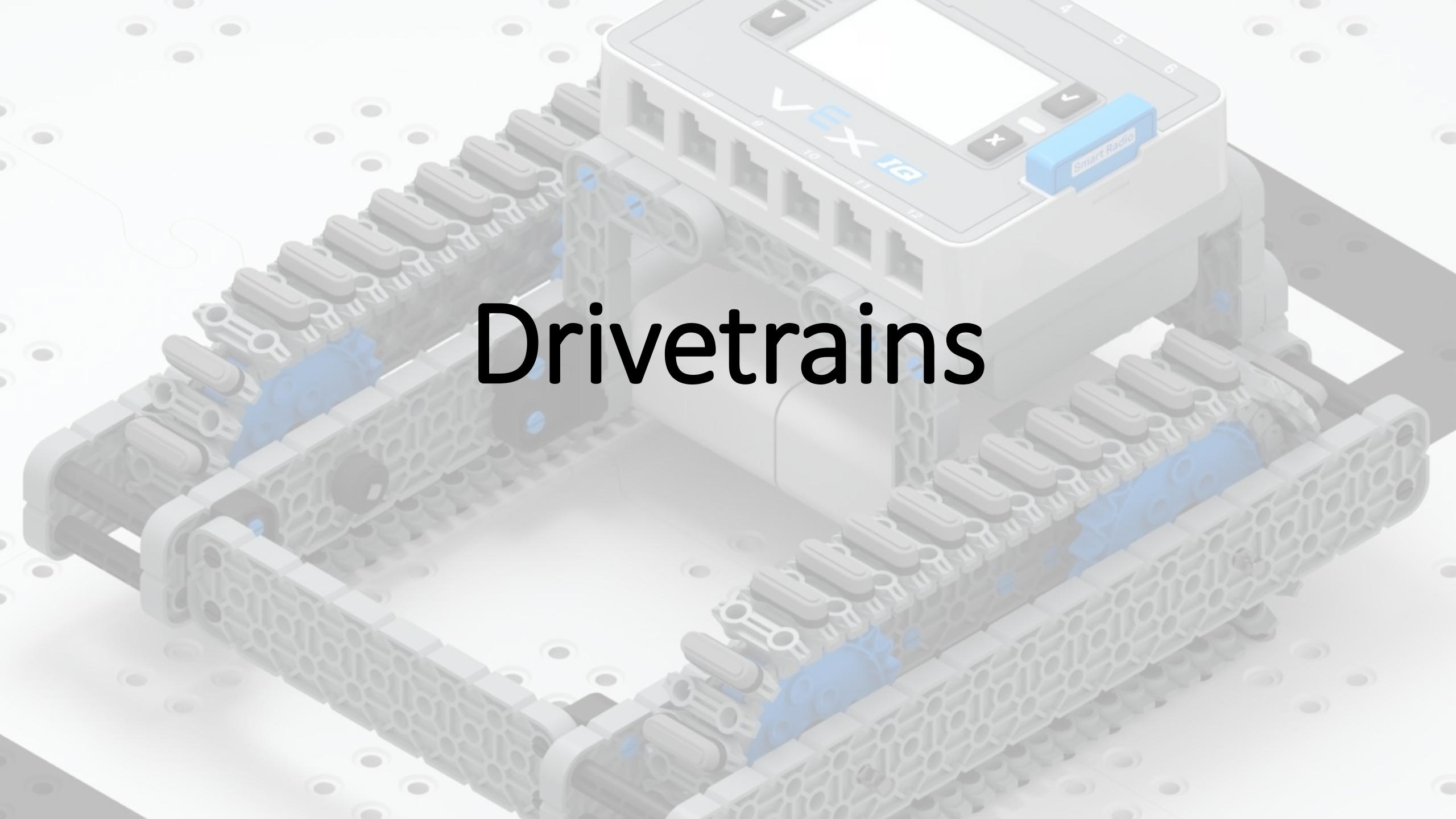






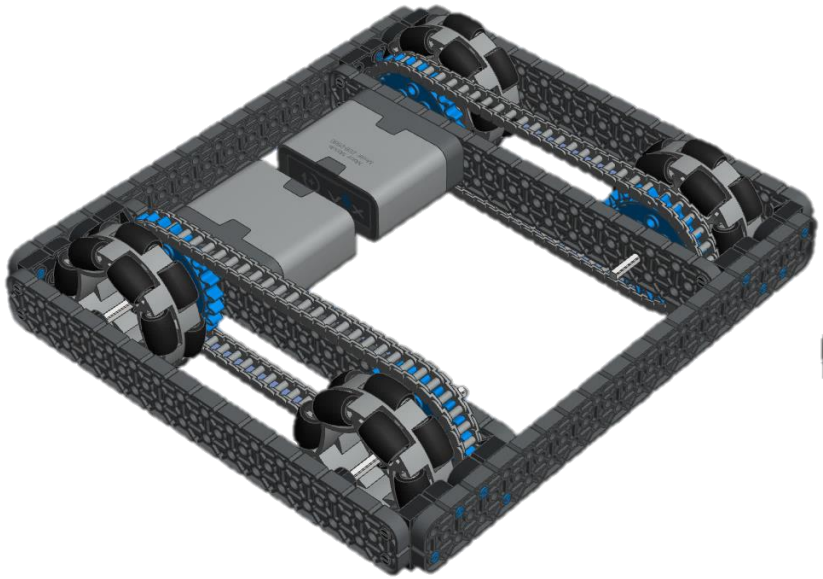
Robot “Chunks” (A.K.A. Subsystems)

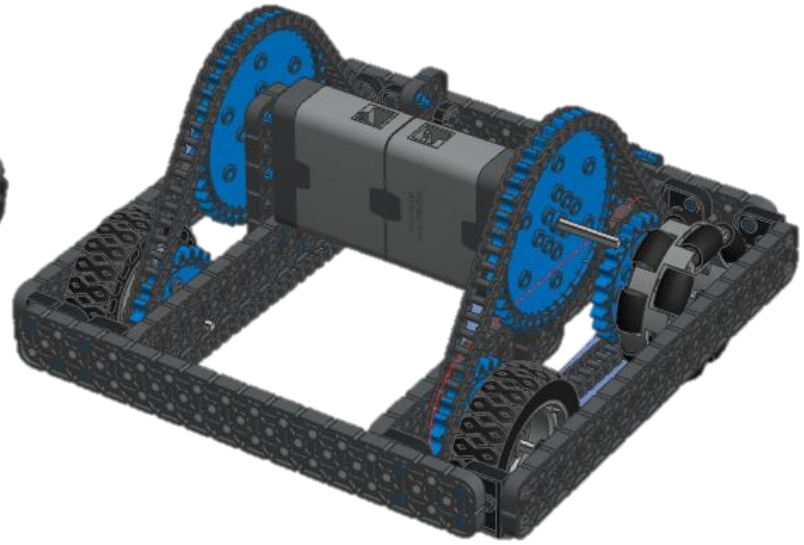
- Drivetrain
- Rollers (AKA Rolly-grabbers) & Intakes
- Flywheels
- Catapults (rubber band arms)
- Pull-back-and-release mechanisms
- Adjustable tensioners



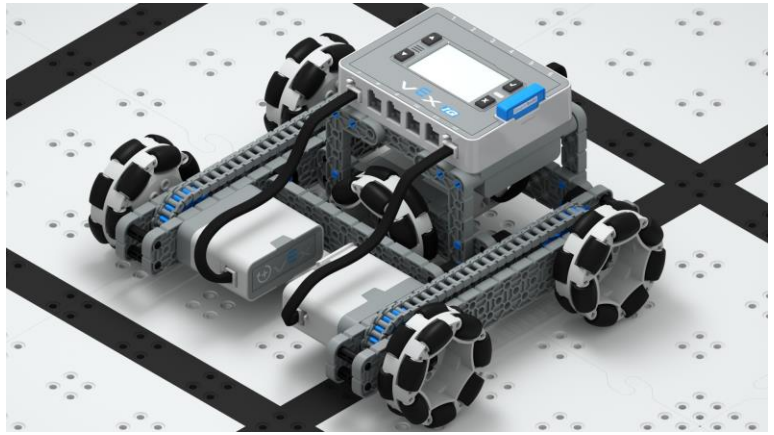
Drivetrains

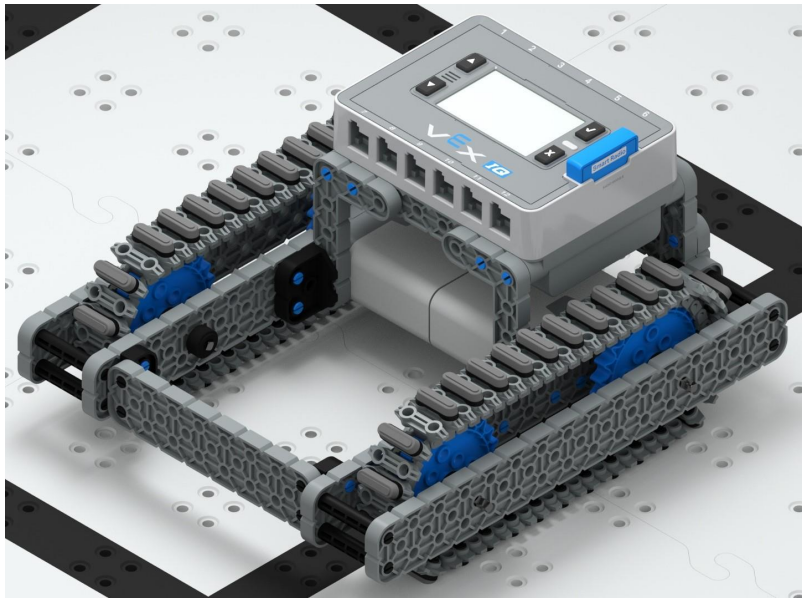
Different robot models





Different base models – BE CAREFUL!

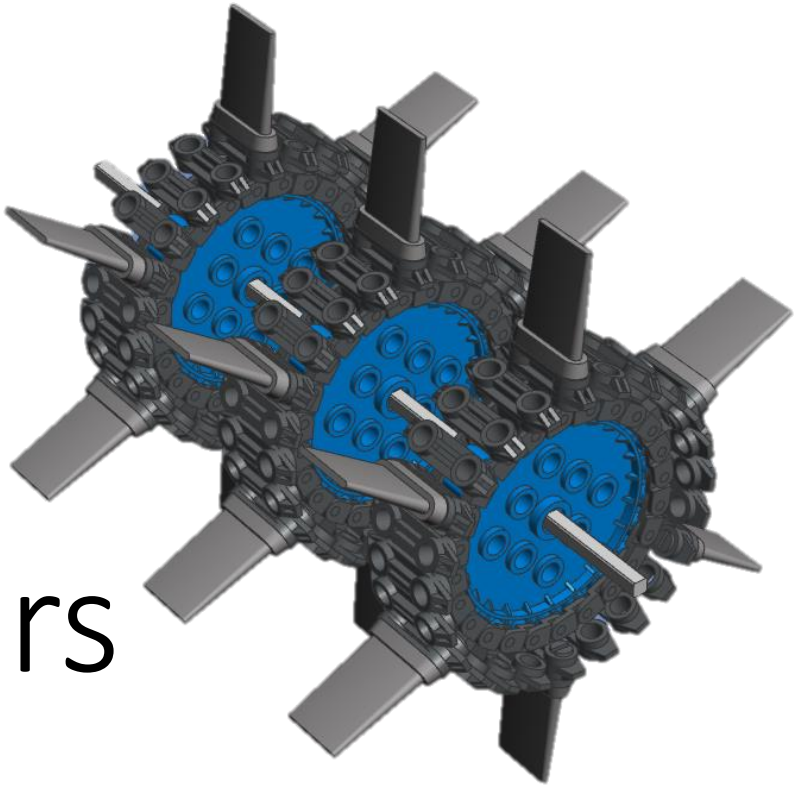




Quick test – super simple robot (mod claw)

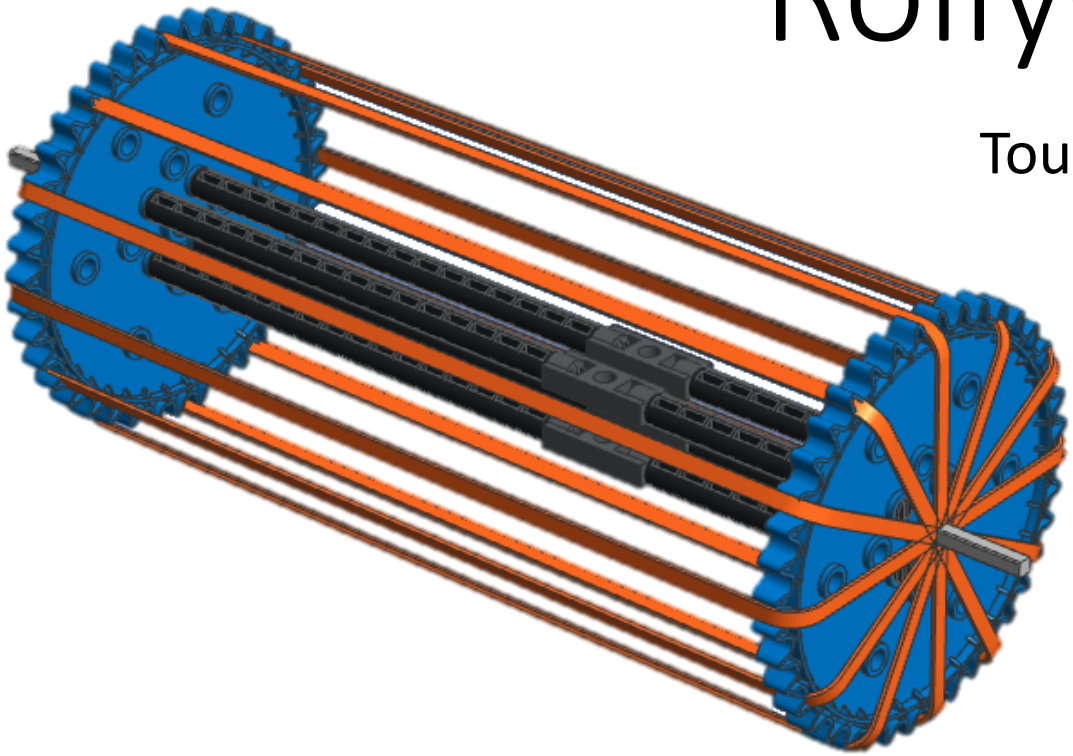
Build this first

Then build this



Rolly-Grabbers

Touch It and Own It

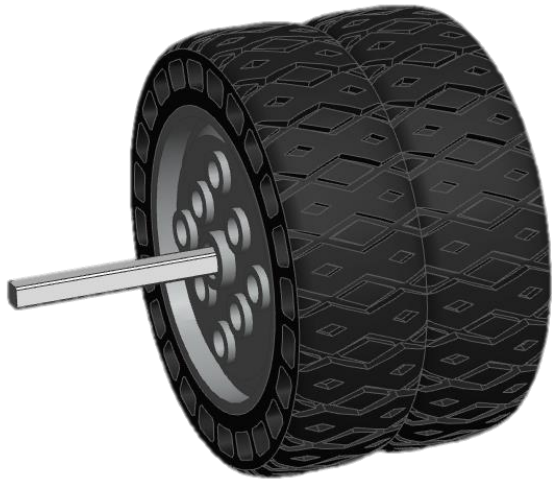


Passive Intakes & claws

- Passive intakes
  - Simple, light, large
  - Require a wall or ramp
- Claws
  - Require precision
  - Small & hard to use
- Pretty uncommon & bad

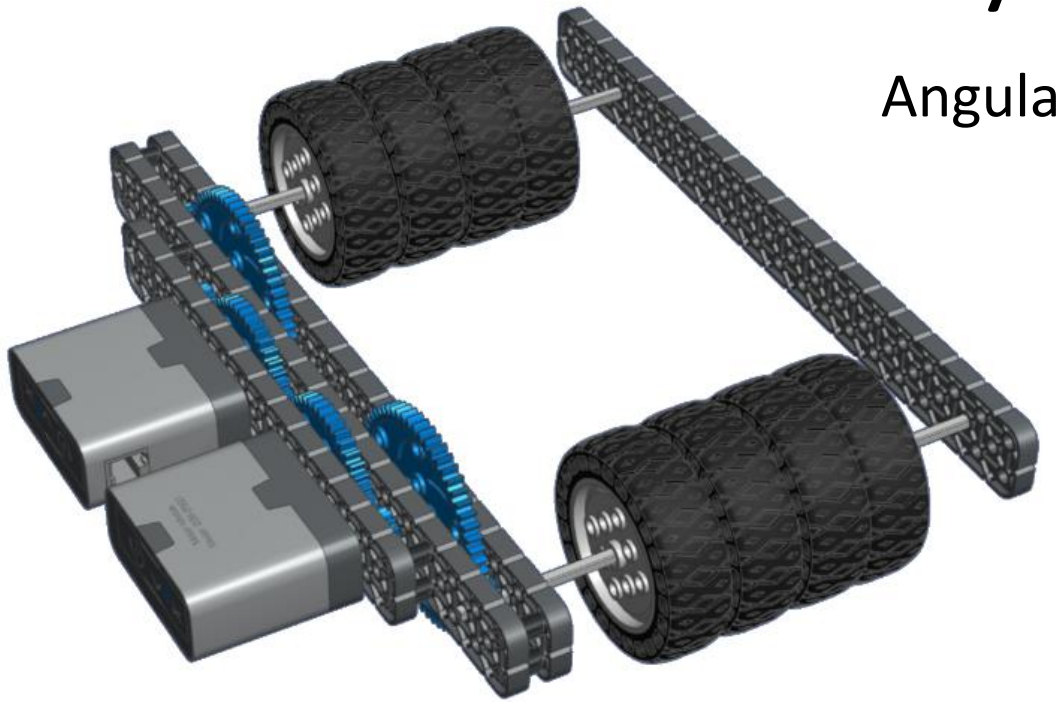
Where does energy come from (in VEX IQ)?

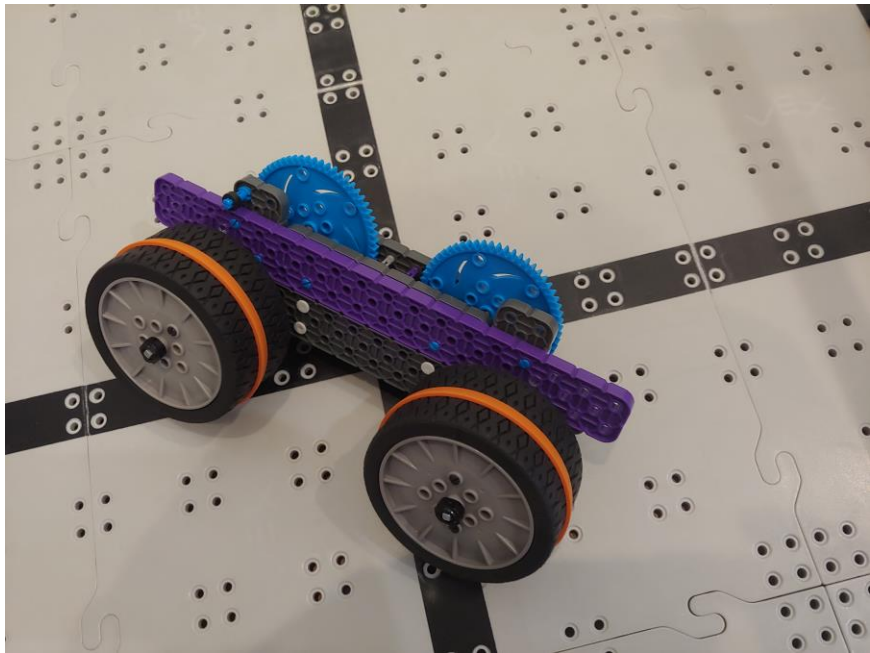
- **Chemical (Battery)**
- Angular Kinetic (flywheels)
- Elastics (rubber bands, springs?)



Flywheels

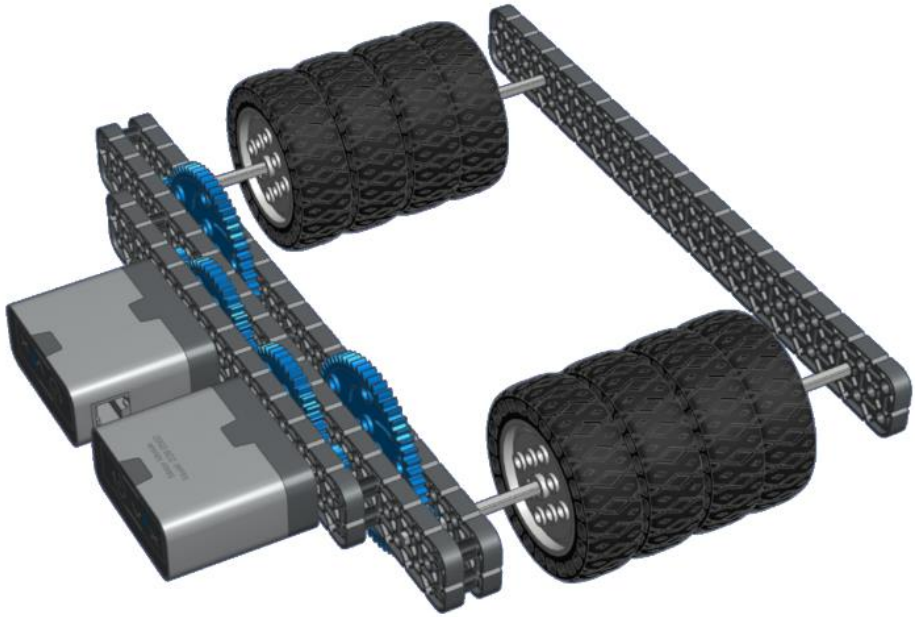
Angular Kinetic Energy

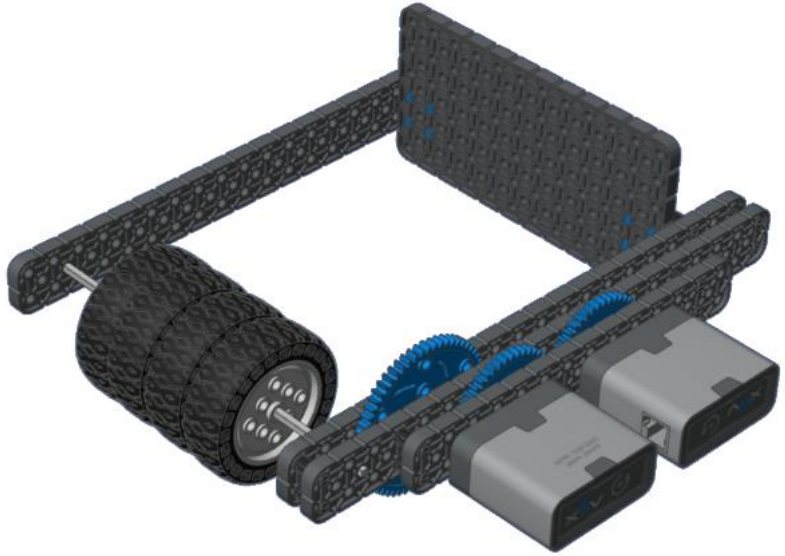


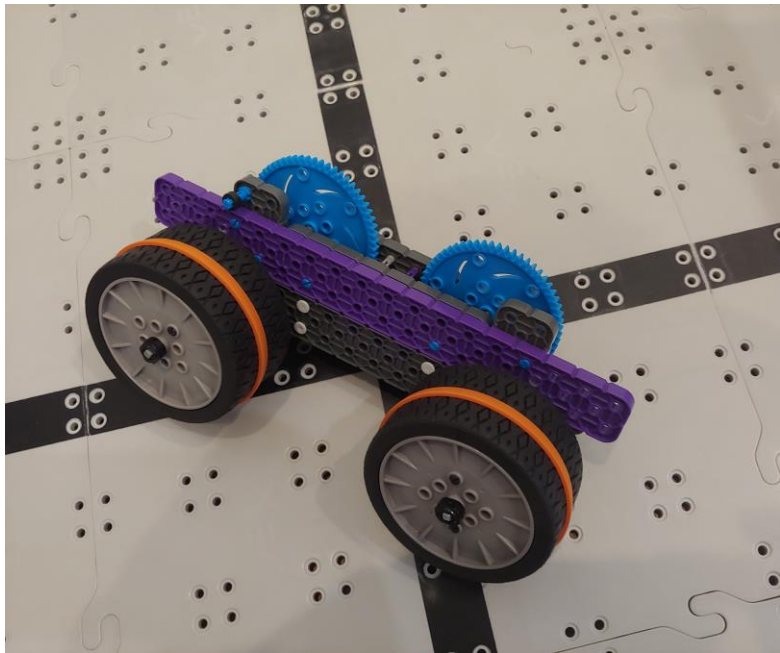


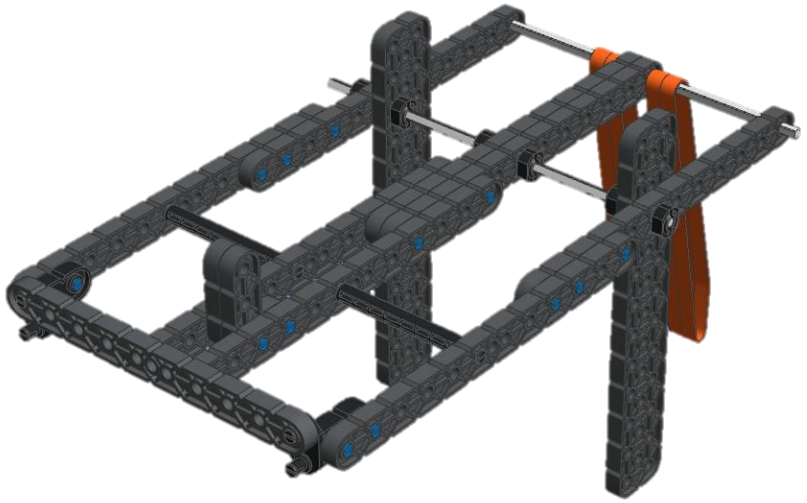
Flywheels – Key Points

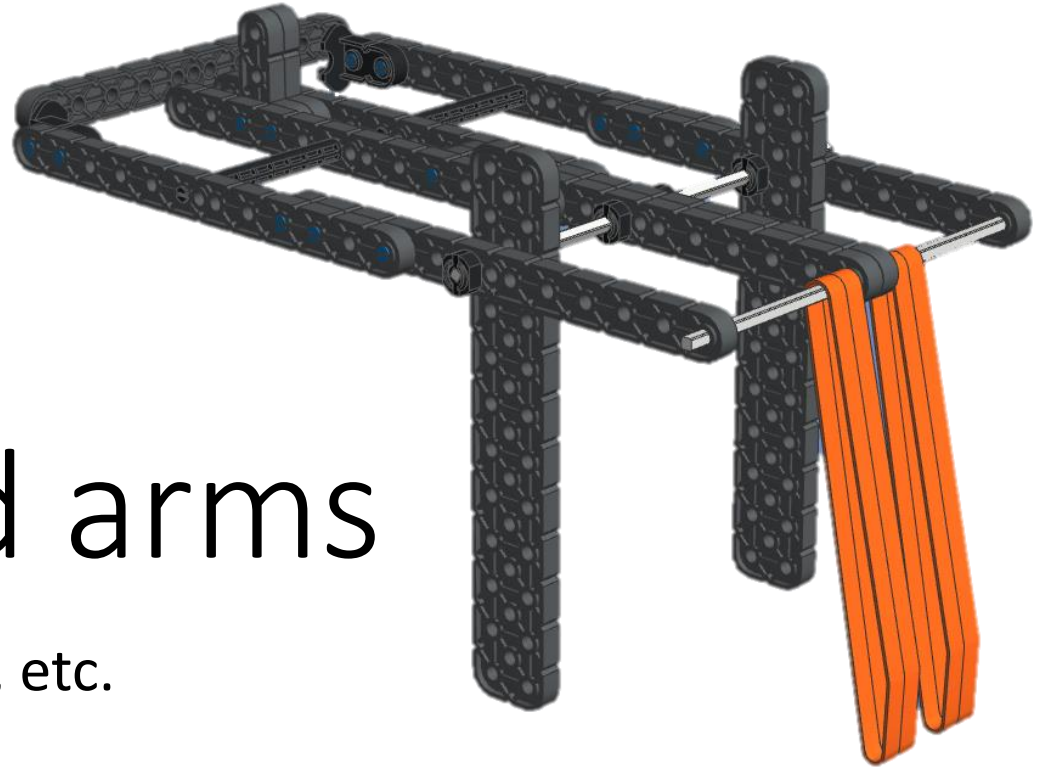
- Flywheel must be Heavy & Fast – this is energy!
- Can be single or double flywheel
- Use compound gear ratios









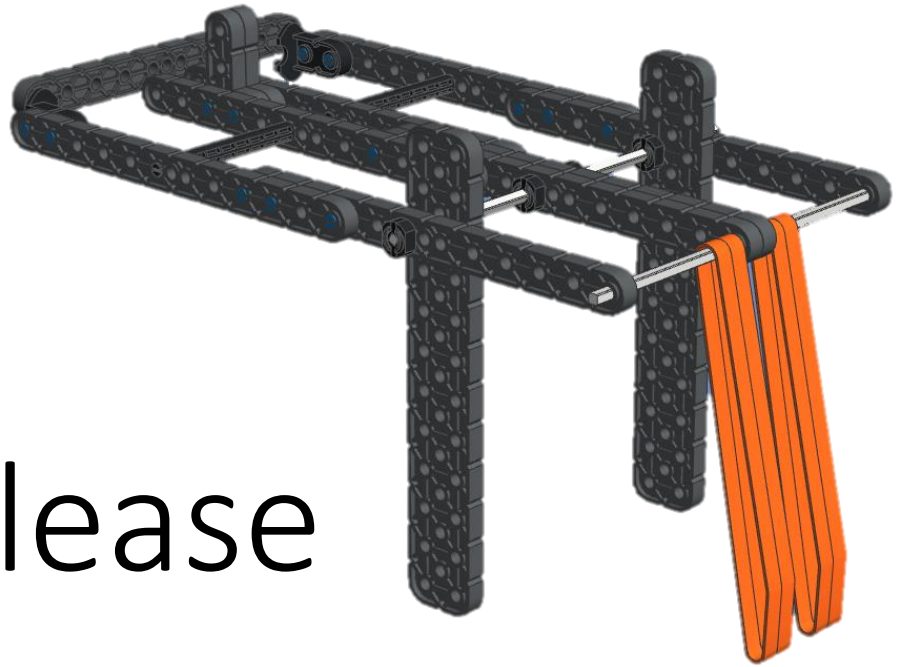


Rubber-band arms

Catapults, Launchers, etc.

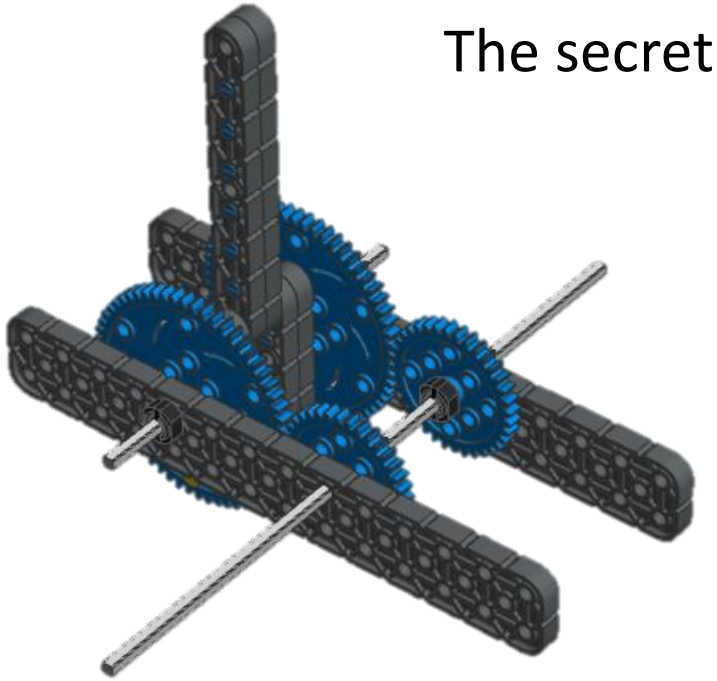
Rubber-band arms

- Single-jointed arms (usually)
- Pulled one direction by a motor
- Released and “shot” with rubber bands



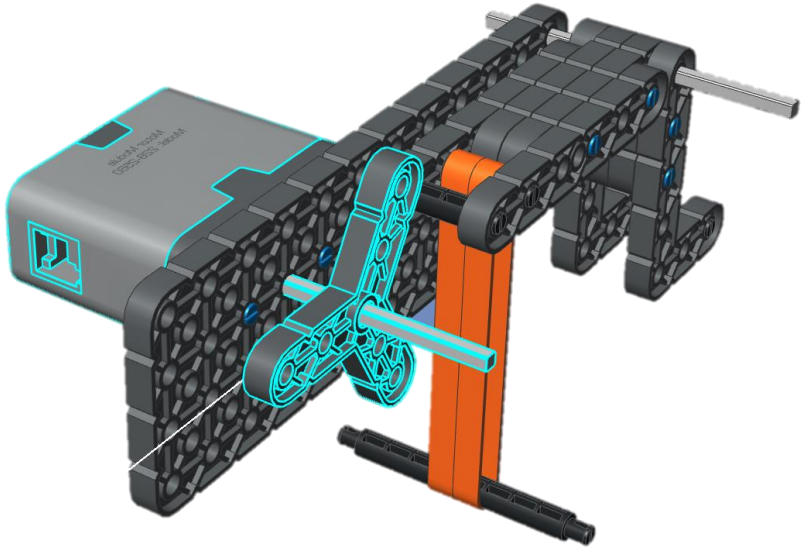
Pull-back-and-release

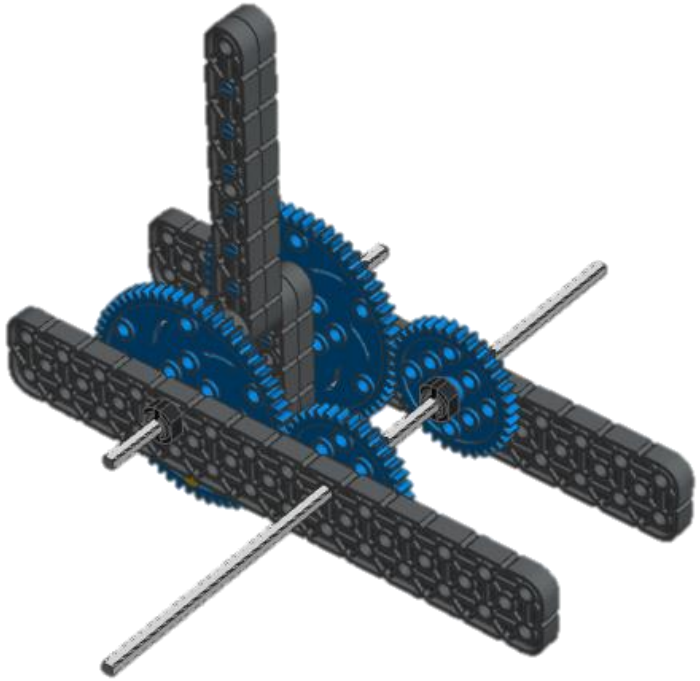
The secret to making rubber band arms go

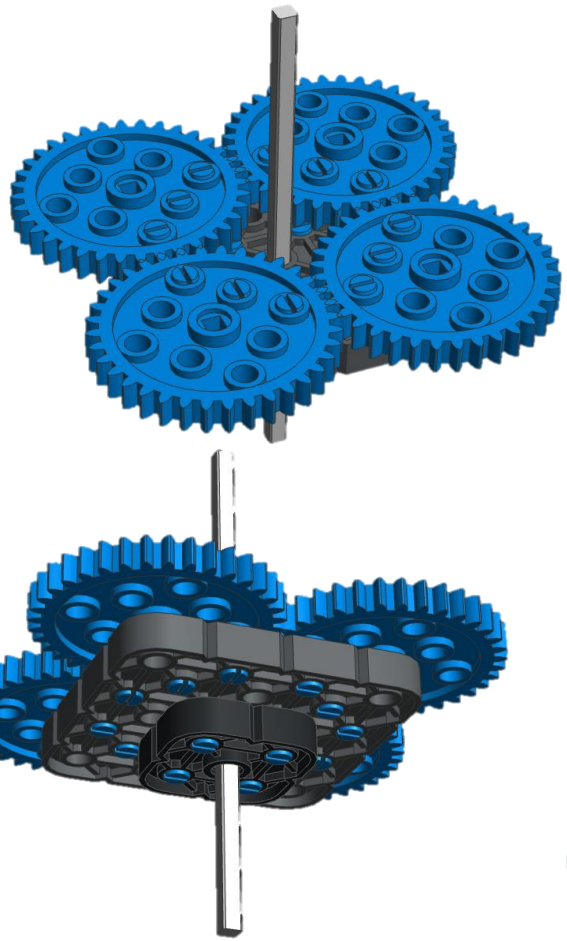


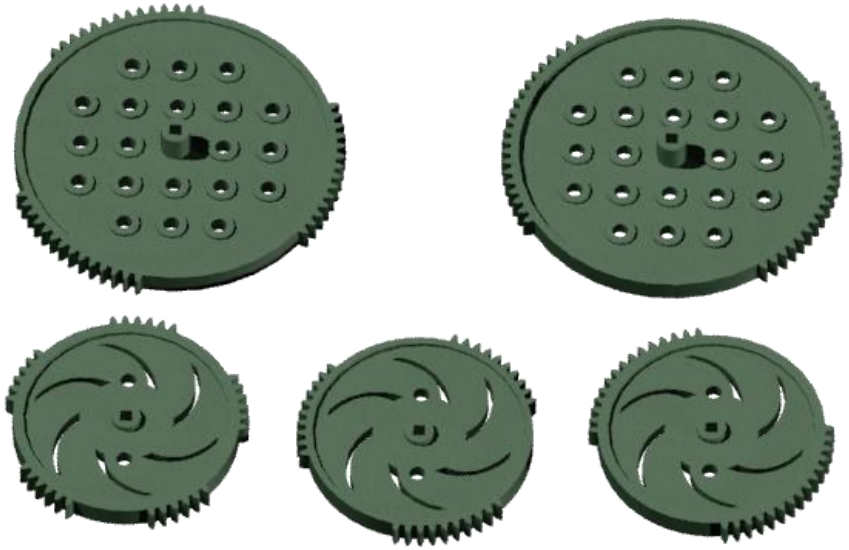
Pull-back-and-release

- Simple star spinner
- Choo-Choo
- Slip-gear

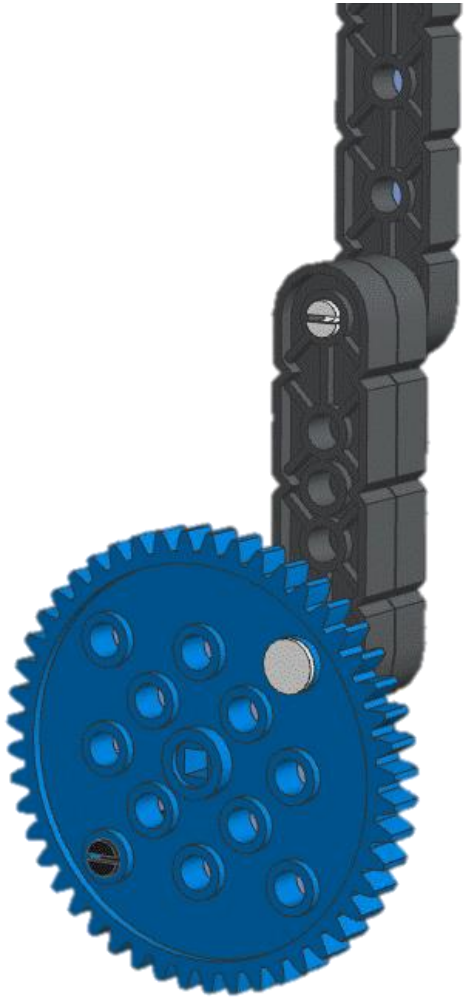




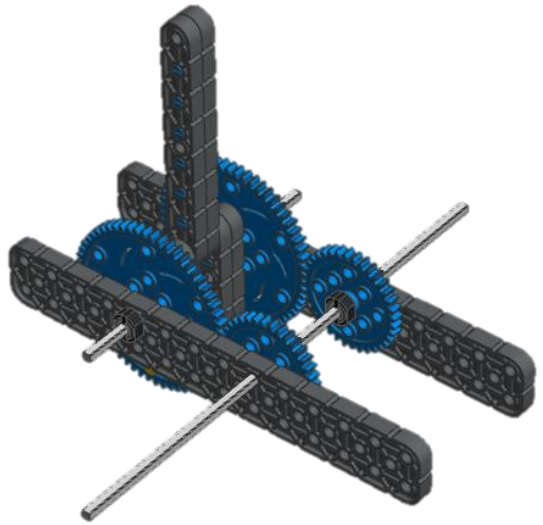


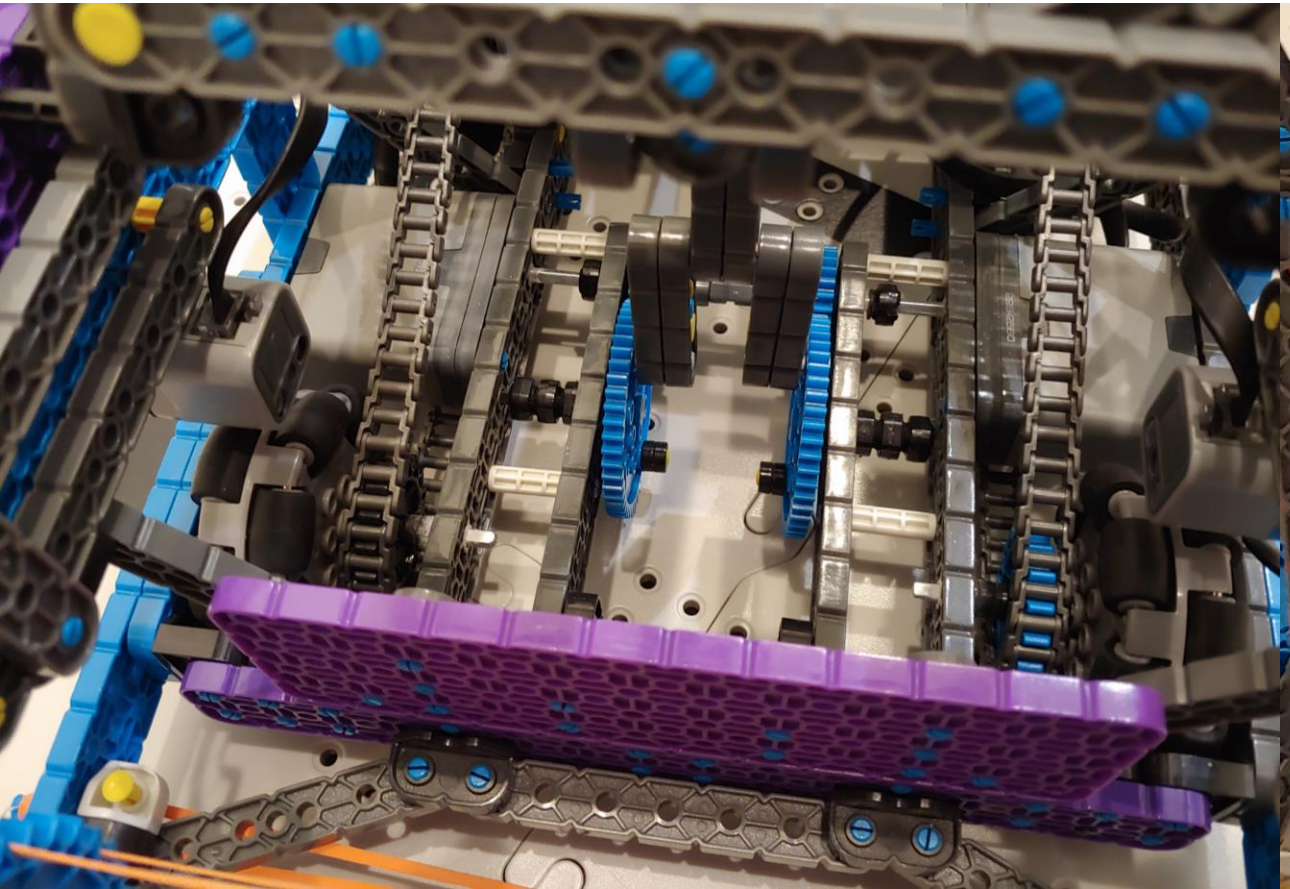


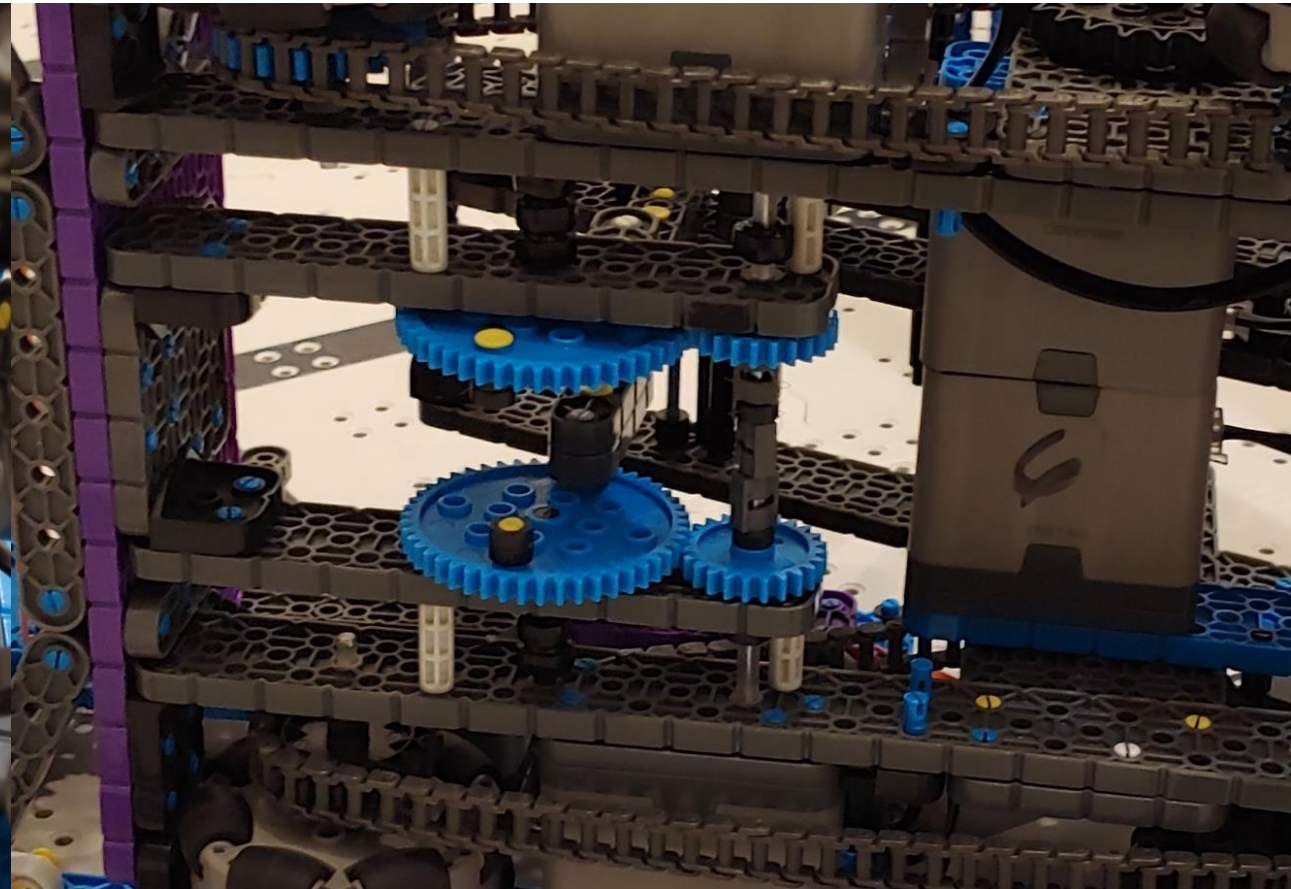
Choo Choo Mechanisms



Choo Choo In Action

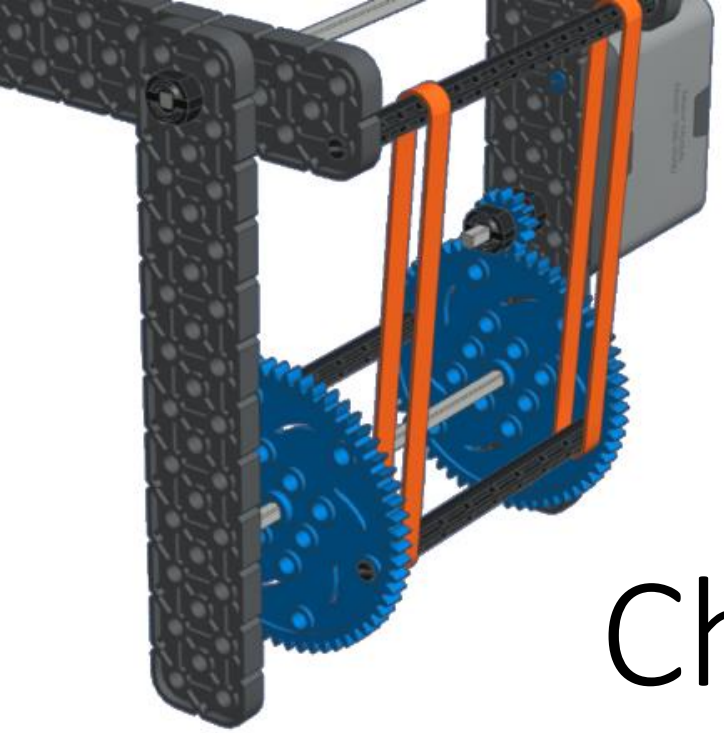


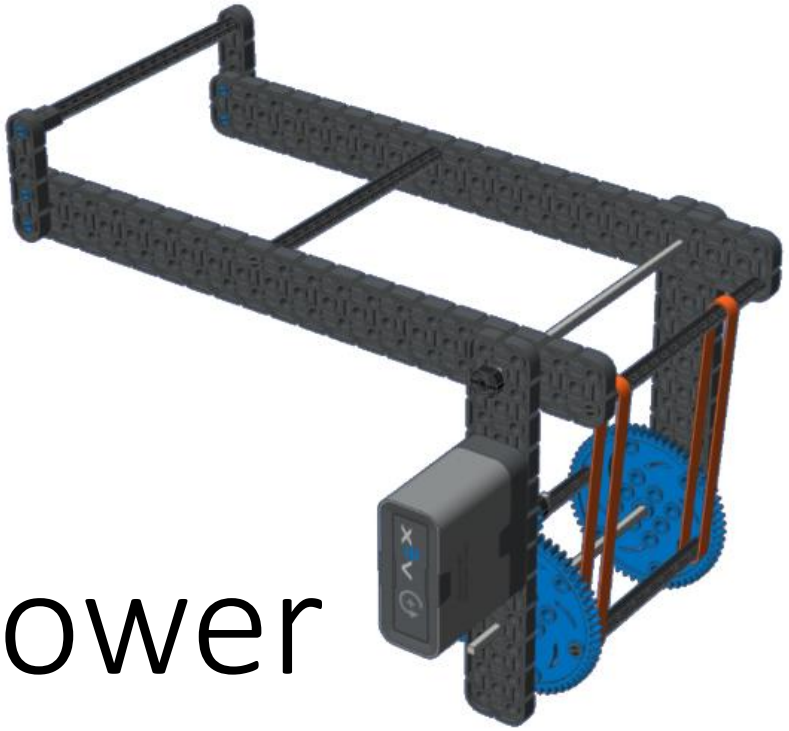




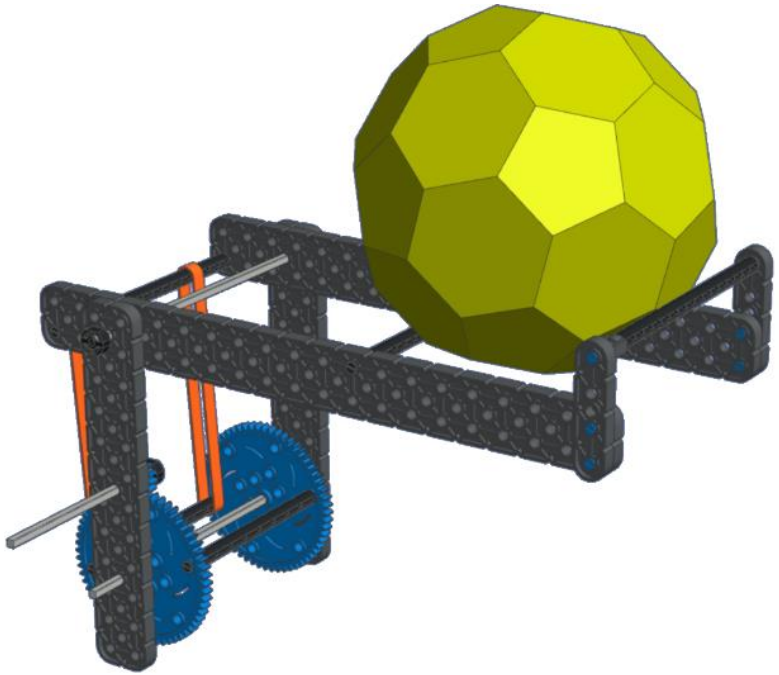
Adjustable Tensioners

Adjust your shot power in real-time





Changing shot power



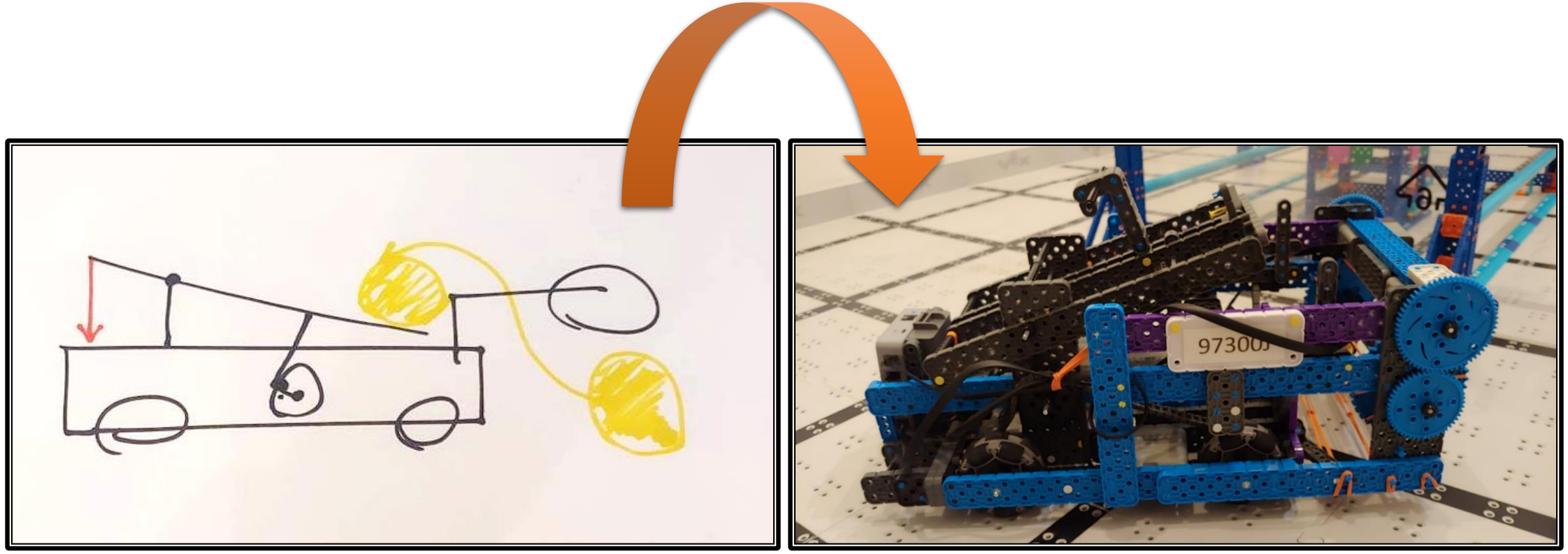
Motors

Pneumatics?

Putting the subsystems together

- Plan and build together
- Don’t try to bolt on at the end
- Sketch it out first
- Game piece path in robot

Putting the subsystems together - Example



Putting the subsystems together - Example