Race Car Project

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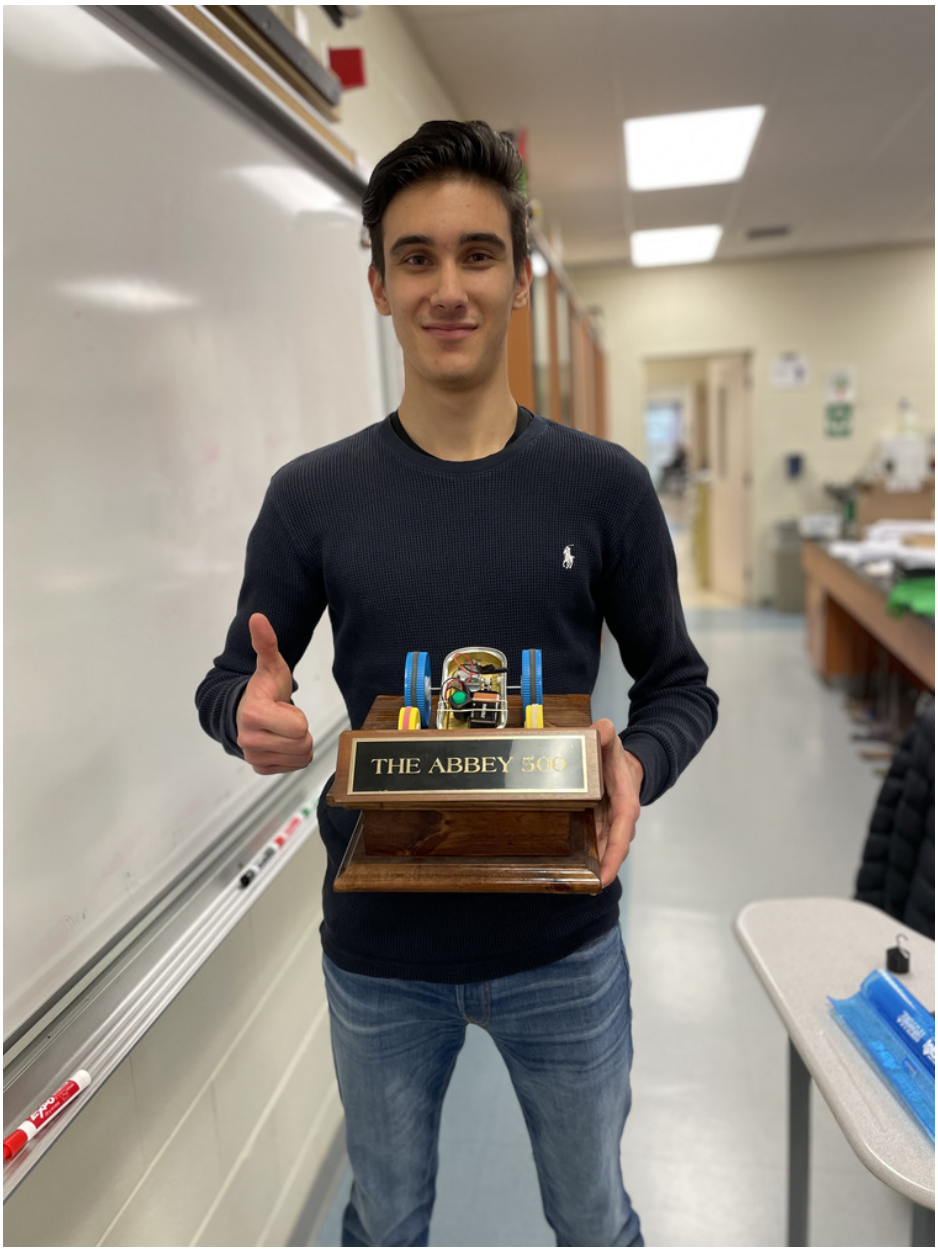

Figure 1: "The Abbey 500" Podium with my first place car design

Description:

The purpose of the project was to design a sustainable and functional race car using any available objects and materials necessary. The whole idea of the design was to not use any pre-built car components and to create the fastest car. The only provided materials were the small motor and gears needed for the movement of the car. With this in mind I creatively designed a fast and efficient race car from a tin can resulting in me winning first place in the competition as well as the "Abbey 500" award.

Design Process:

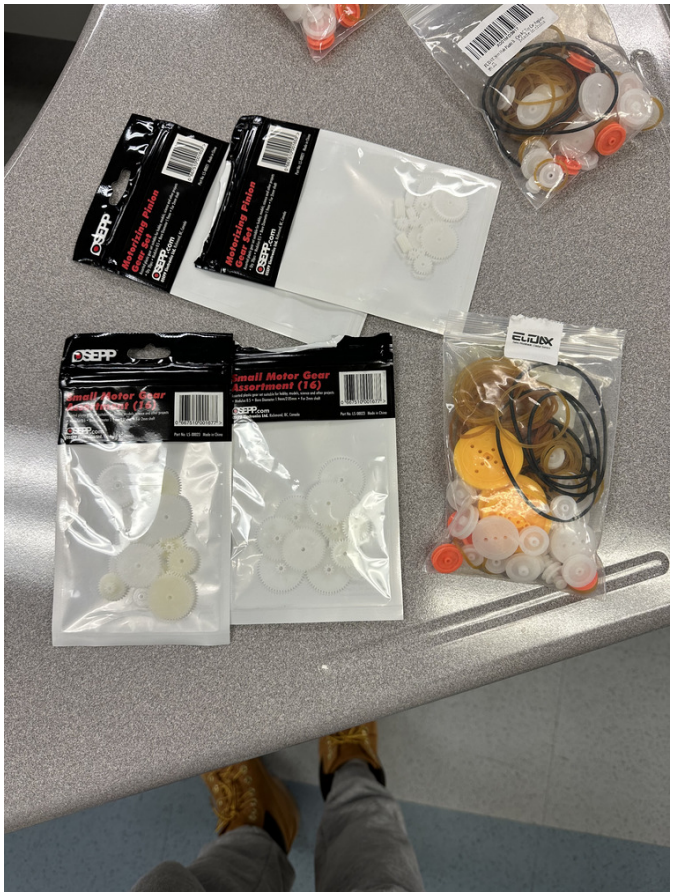

Figure 2: Provided gears and materials

- The gears, motors, and elastic bands were provided

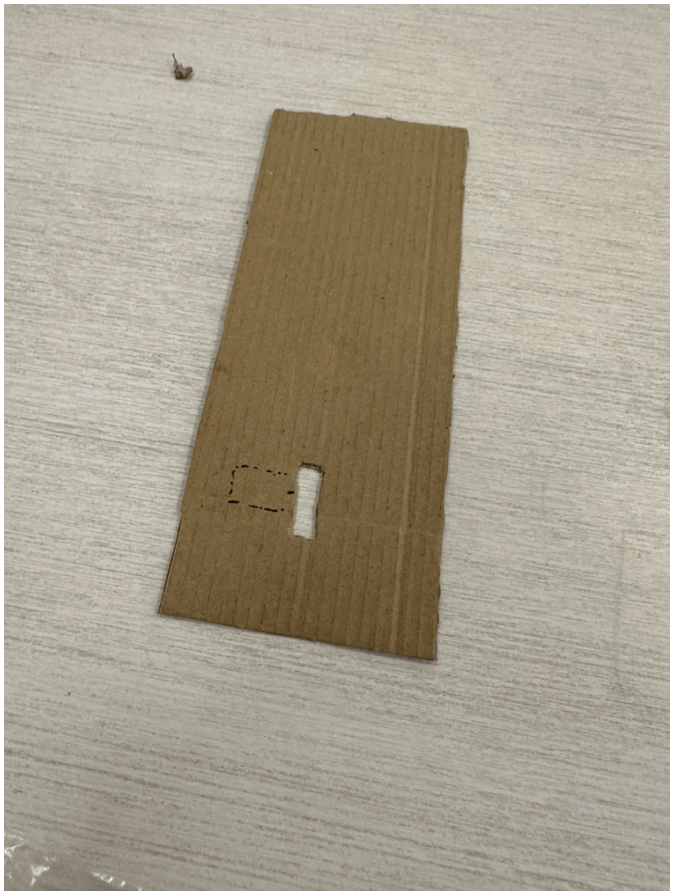

Figure 3: Initial Prototype

- This was the initial prototype for the body of the car
- Realized that there needed to be a more rigid structure to support the weight of motor, gears, and battery
- Decided to use a metal tin can as the car's supporting structure

Figure 4: Adjusting Axle, Bearing, and gear pin

- Used axle configuration on bearings allowing for optimal wheel movement at high speeds
- Bearings allow for minimal resistance on axle for the fastest and most effective design
- Inserted a gear pin in the middle which will allow the motor to transfer rotational power directly to the axle and make the car move

Figure 5: Initial configuration of axle onto the metal body of the car

- Cut a hole at the back of the car to allow space for axle to fit with the gear
- Secured the bearings onto car structure by gluing a thin piece of metal on top of the bearing
- Decided it would be best to shift the gear closer to one side to accomodate the space for the motor

Figure 6: Motor and axle configuration onto the car's body

- Adjusted the position of the hole to fit the motor onto the car structure
- Positioned axle on the bottom
- Used small gear on motor and large gear on the axle for optimal torque and speed

Figure 7: Securing the motor to the body of car

- Secured the motor by adding two metal strips to each side
- Added screws to firmly secure metal strips and wires on top of motor
- Cut two thin slits on each side of motor where the bearings of the axle will be attached with zip-ties

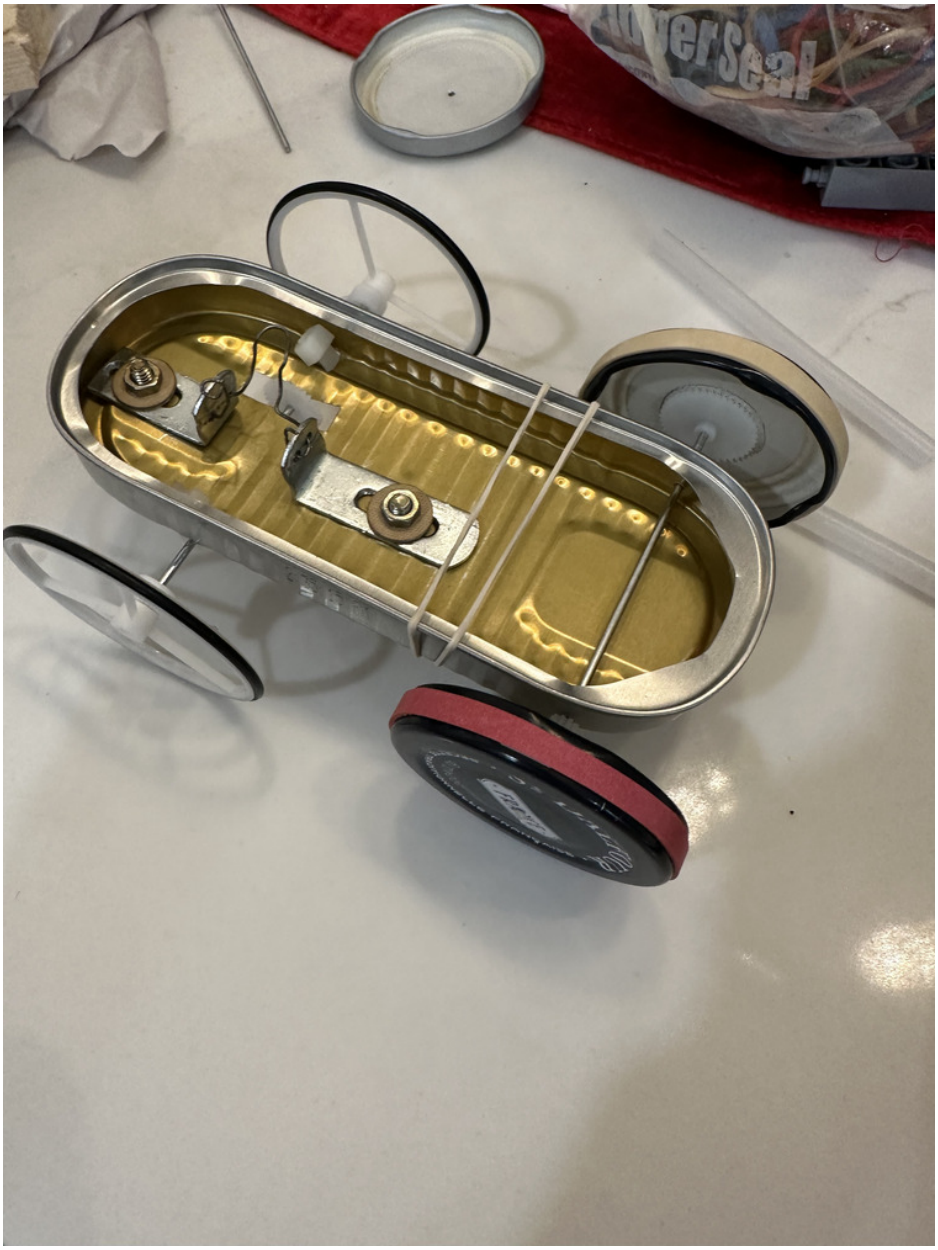

Figure 8: Initial wheel design

- Used some cans from jars as the initial wheels
- Added elastics for added traction
- Drilled two holes on the side of the car in order to slide the axle for the front wheels

Figure 9: Finalizing car interior

- Finishing up the interior of the car with all the required components
- Connecting the 9 volt battery with the motor and setting up push button to start/stop the car
- Taped the connecting wires for added reliability

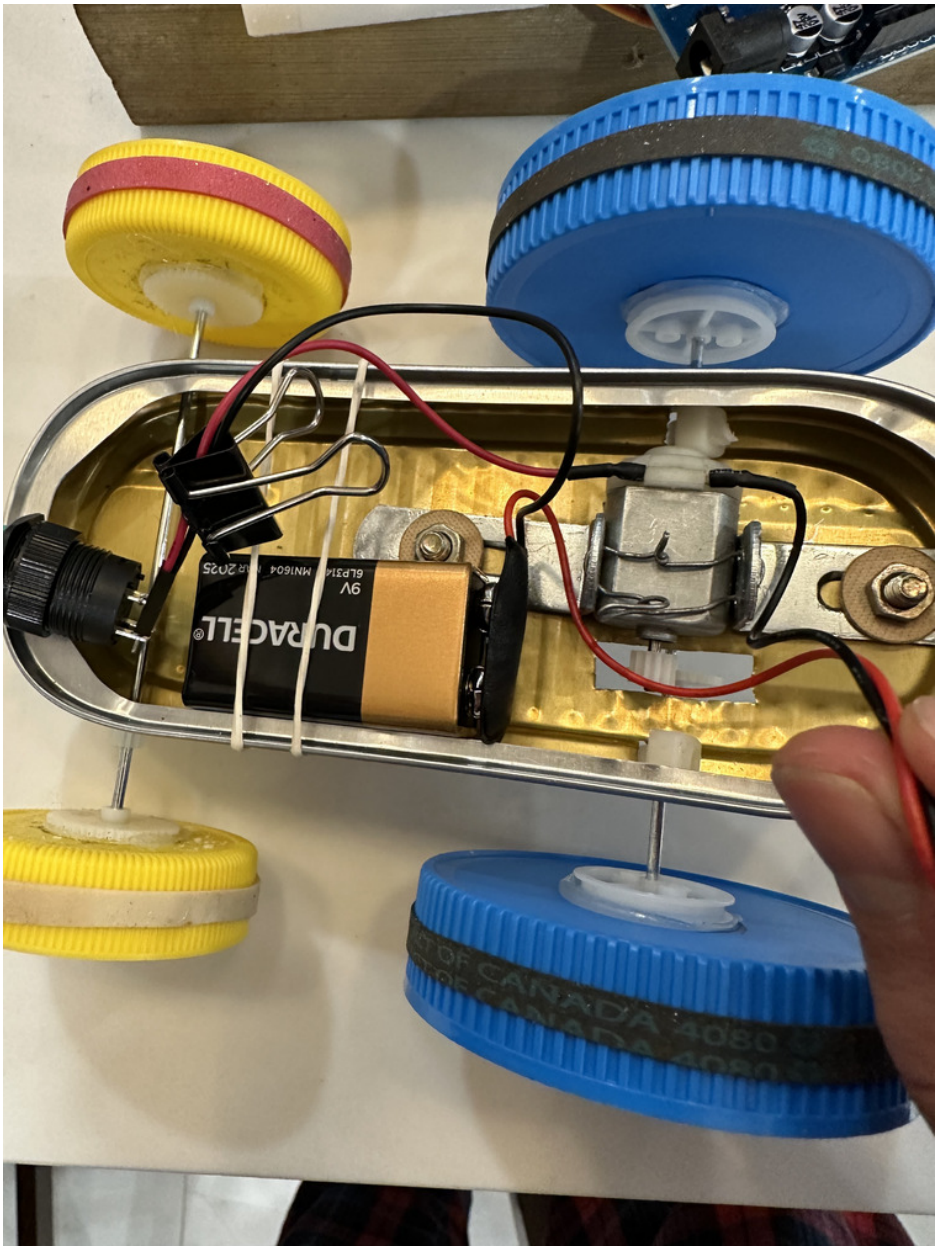

Figure 10: Adding final wheels to the car

- After initial prototype of wheels, decided to use lighter plastic lids as the wheels
- Larger wheels at the back and smaller ones at the front was the best tested design for wheel configuration
- Added rubber elastic bands on each wheel for better traction

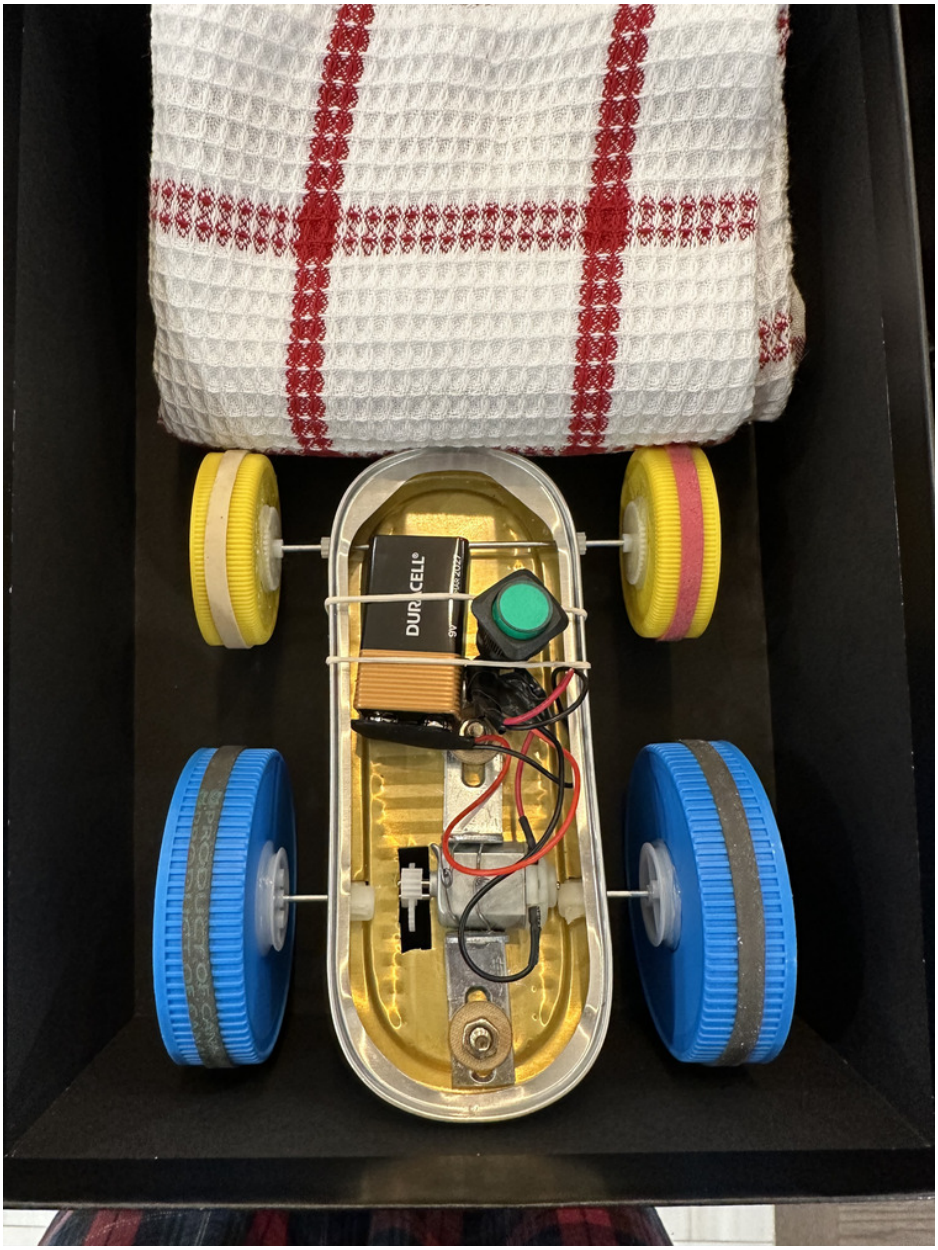

Figure 11: Final Car Design

- Top view of the final car design used in the competition

Figure 12: "The Abbey 500" - First Place Podium with race car