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Balloon Car Physical Prototype

- What are the main functional components of the prototype - in terms of the vehicle, not the materials

The main functional components of our car consist of axles, base, and propulsion.

Axles:

- 2 cardboard wheels at the ends of wooden skewer axles

Base:

- A cardboard base with straw axle tubes

Propulsion:

- A balloon attached to a small straw for giving fuel to our balloon car

- Note any design choices considered, issues encountered, and/or changes that you needed to make in order for your physical prototype to work as best as possible in the time allowed

We considered the aerodynamics at the beginning, making sure our axle tubes were placed in a spot where it would make the most sense aerodynamically. Eventually, we realized that the balloon on top would kind of destroy any hopes we had of being aerodynamic.

After one test, we decided that the balloon needed more reinforcement and the wheels needed to be closer to the car on the axles so that the axles wouldn't slide around in the axle tubes. We also needed to shorten the axles so that they didn't stick out from the end of the wheels and move the weight away from the center of the car.

- How far did the balloon car travel? Did it go mostly straight, or turn? Did you time it - how long did it travel?

At our first test, the car traveled only a few feet, before veering off to the right and crashing into a backpack.

After some adjustments, we made our second test.

- Added a tape buffer between the body of the car and the back wheels to keep the axles from shifting right/left as the car moved
- Added tape to reinforce the connection between the balloon straw and the cardboard body

For the second test, the car traveled slightly further than in test 1 but still veered off to the right.

After some adjustments, we made our third test.

- Shortened the wooden skewer axels
- Reduced the distance between the front wheels and the cardboard body

- How would you change your design, so your new Balloon Car design will travel a longer distance?
 - In future designs we would center the wheels better to ensure that the wobble did not impact its ability to move straight, for the current iteration we eyeballed it.
 - Improving the stability of the balloon would be another change made to ensure that it wasn't veering slightly as air was released.
 - Lastly we would find a better way to space the wheels so that it did not have friction, but also so that the axle would not easily shift around.
- Take a few pictures of your final prototype, so that all aspects can be clearly seen. Add the pictures to your document.



