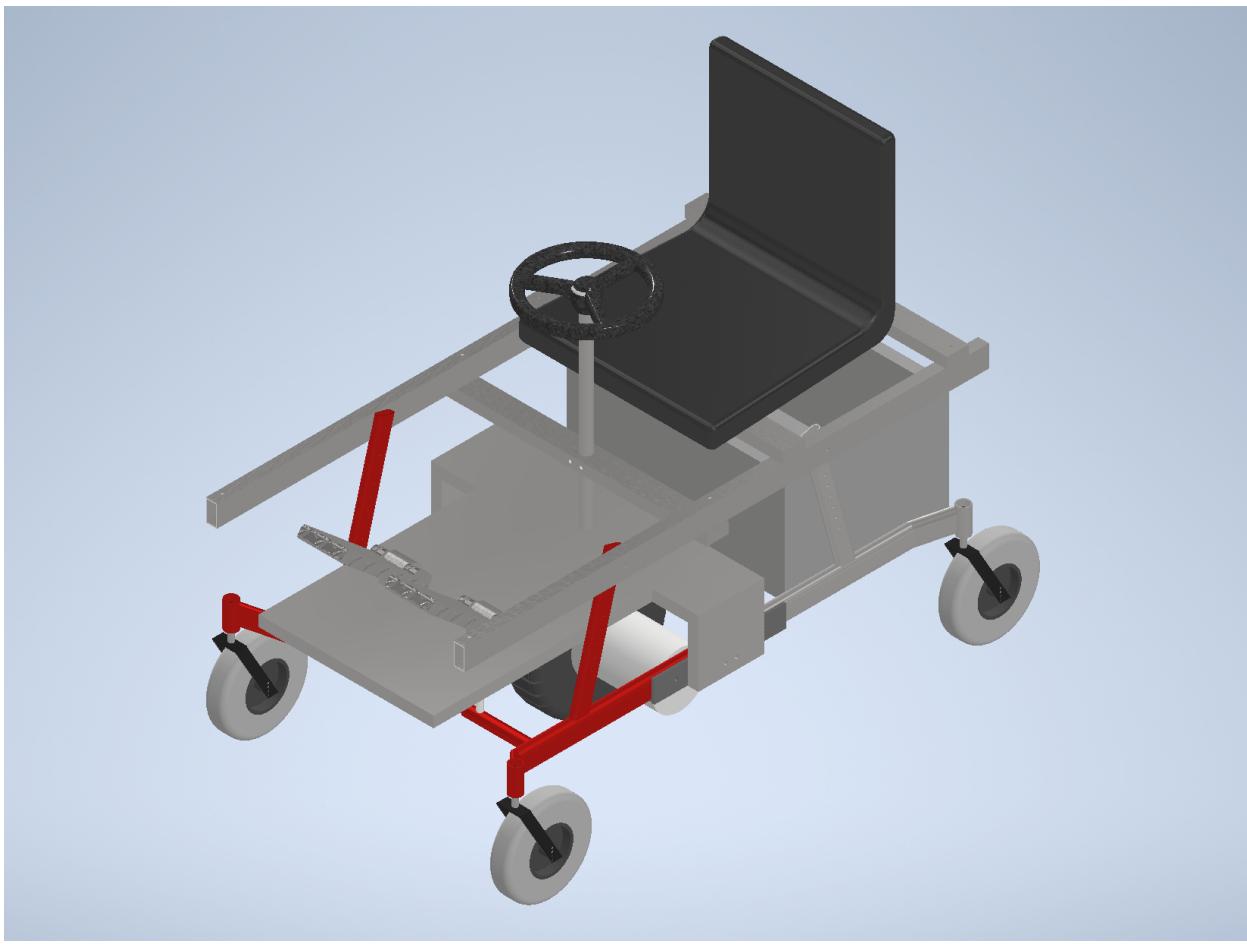
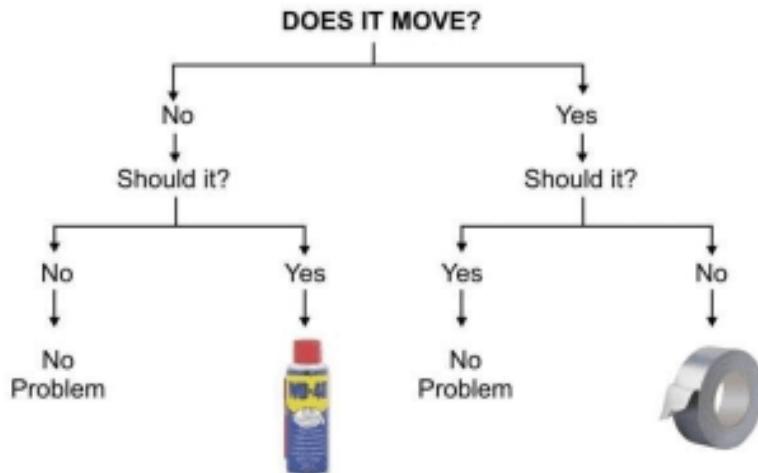


Preliminary Design Ideas:**Disclaimer:**

Due to work ethic and the demand of concentration and progress we hold ourselves too for the current Createers Krazy Kar, documentation can be incomplete and visual evidence and logging can be incomplete and lacking. Please disregard such issues, as most will be described in the future in a retrospective sense. Our results and final product(s) should and will speak for themselves. Thank you!

Engineering Flowchart



Our schedule:

Monday	Tuesday	Wednesday	Thursday	Friday
Period 6 - Thomas and Vedic and Wilson Period 5 (sometimes)- Wilson, Thomas, Ben, Vedic Period 8 - Ben Period 9- Wilson	Period 5 (sometimes)- Wilson, Thomas, Ben, Vedic	Period 4 - Thomas, Wilson, Vedic, Ben Period 5 (sometimes)- Wilson, Thomas, Ben, Vedic Period 9- Wilson, Vedic, Ben, Thomas	Period 9- Wilson Period 5 (sometimes)- Wilson, Thomas, Ben, Vedic	Period 1- Ben Period 2- Vedic Period 1,2,3- Wilson Period 5 (sometimes)- Wilson, Thomas, Ben, Vedic

Estimated Hours Logged (per week):

9.25 hrs

This is only an approximation based on the number of 45 minute periods spent per week, this can vary depending on availability, school schedules, and other circumstances. The estimated number of hours can be more or less than noted above, with an estimated tolerance of about ± 2 hours per week (engineering joke LOL).

Logged Work:

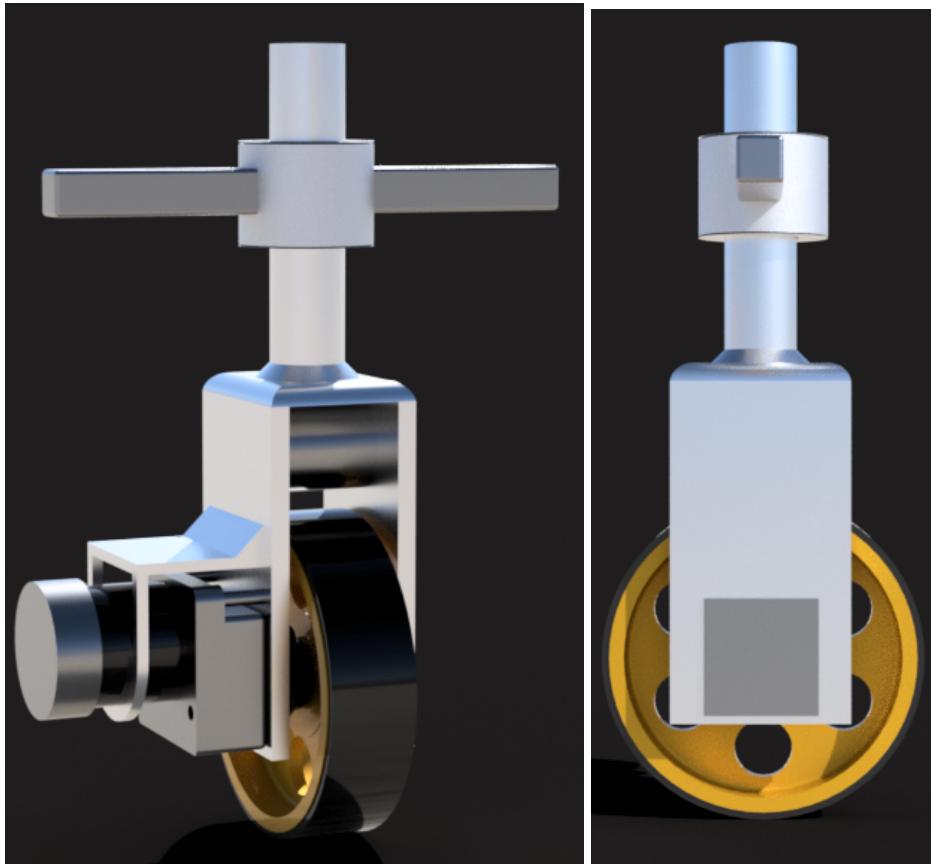
1/10/2022:



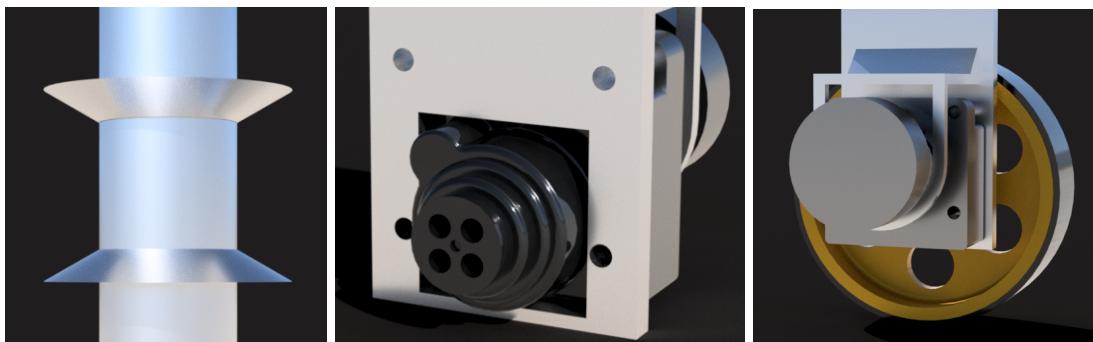
Thomas and Vedic: We aimed to attach the chair to the frame today and we accomplished this goal. We did so by taking a frame from a dismantled wheelchair and drilling it into the aluminum side bars. Although it sounds simple, we ran into some problems, such as drilling off of the centerpoint which caused one of our screws to be difficult to screw in and also trying to squeeze the new frame piece to the side bars. Even when we ran into these problems, we were able to fix them and gain some new knowledge. Lastly, we also attached the chair to the new piece by drilling some holes into the actual chair then using screws to attach it to the piece's already existing holes.

1/14/22:

Ben Brnic

**Sample Steering Mechanism For The Krazy Kar:**

- Will Sit in the center of the kar
- Drive wheel can pivot/spin 360 degrees from a center tube that connects to the steering wheel.
- Motor is directly attached to the wheel.
- Mechanism secured to the frame of the kar using a mechanical bond to allow the tube not be able to slide out from the frame while still being able to rotate 360 degrees.
- Will have to cut metal plates to make our custom motor mount.
- Wheel secured on both sides to avoid a shear twist when under power.



Mechanical Connection

Motor Mount

Motor Directly Attached to wheel

1/24/22:

Vedic:

We decided to attach a frame to the Crazy Kar that would house the battery box. We also put a cabinet top on top of the frame, in order to keep the box from falling through the robot. I drilled 2 holes through the rear frame and used 2 screws to keep the frame attached to the kar. We used clamps to lessen the gap between the kar frame, and battery box frame. Thomas and I each took a side and took turns clamping the 2 frames together before screwing them together. We tested this with the battery box and if it fit meaning we were successful. The only thing we were unable to do was screw the cabinet floor to the frame. For now it's just sitting there.

Thomas: Attaching a frame from a dismantled wheelchair would allow for a perfect support for the battery box. This box will house all the electronics that include the battery, wires, microcontrollers, etc. We attached this frame by firstly making a centerpoint for the drill and then drilling into the aluminum frame which supports the chair. We then used screws, washers, and a nut to properly secure this frame. The washer we used was put in between the metal frame and the new frame to prevent any damage to the parts. We then marked a point for which we will put a flat piece of metal on top of this new frame.

1/26/2022



January 31, 2022

Ben Brnic



Prototype Steering Mechanism For The Krazy Kar:

- Will Sit in the center of the kar
- Drive wheel can pivot/spin 360 degrees from a center tube that connects to the steering wheel.
- Motor is directly attached to the wheel.
- Motor Mount made out of wood.
- Steering cane is mounted by C-clamps and screws and is secured to the motor mount.
- Notes - *Still have to check screws holding the motor mount to the motor.

Worked 8th and 9th period to get it done, finishing what we started on Friday January 28th.

February 2nd, 2022

We needed a bar, preferably metal, to support the wheel and allow it to spin 360 degrees. We decided on pvc tubing for the free body support. Only looking through Mr.N's room we were not able to locate any sufficient pieces until we were approached by a stainless steel bar from an old workout machine. We needed to cut a 1 and $\frac{1}{4}$ inch hole in the center and this was extremely difficult because of the material. We drilled a pilot hole and we later cut a hole in one side where the drill bit then broke.

February 4th, 2022

A piece of marine wood was drilled and used as motor mount support to attach it to the kar. This piece of wood is strong and sturdy. The hole was then outfitted with a pvc pipe it was attached to the upper frame of the kar, using two nuts and bolts. Future modification of this mount may include making it of metal, as we originally hoped, however more tool research may need to be done. The motor mount and powered wheel were also attached to the wood mount and the kar. After some preliminary testing, it was found that the kar is comparably designed in terms of motor mount positioning for the user. Some issues/worries could be the 360 degree rotation of the wheel, the wooden mount plate next to the wheel and the left edge of the wheel get very close to the metal L-Bar that supports the bottom frame of kar. Another issue is the wobble of the wheel. The wheel is heavy and not fully centered so it can not be held firmly with wooden plates and 2 U-Bolts that attach the rotating shaft to the powered wheel. This will need to be fixed with a secondary wooden mount that is a few inches lower than the current one. This will allow for increased stability and rotational support. On a better note, with current stability aided by the driver, the kar goes with the turn of the powered wheel, promising good turn and rotational drive results in the future. The overall frame does look clean for extra addons and the structure and weight distribution is solid. The clearance is also currently decent, though, depending on the future modifications of wobble stability and powered wheel rotation, an increased clearance or new modificational location set for the wheel shaft may need to be done. Such hypotheses are pending however. For now, planning and design of the secondary mount support needs to be done. Simple and preliminary planning has finished taking place, with crude design drawings being done. Possible CAD schematics or more formal planning are still TBD at the moment, as current weather decisions are affecting productivity. A total of 2 hours have been logged of work today. Pictures and video to be added soon, thank you.

February 7, 2022

Problem: Steering system wobbles, very unstable. We now have to draft solutions.



Prototype:

- Change sleeve from PVC to Metal: Better fit = less wobble.
- Reinforce metal sleeve with a second piece of wood. This will eliminate a single pivot point that the sleeve can pivot on.
- Fixed center of gravity problem with an added ball caster to support the weight of the motor without affecting the drive wheel.

February 11, 2022

As mentioned above, our main problem with the steering wheel and its wobbliness was due to an unbalanced force coming from the motor side. We decided to eliminate this problem by adding a ball caster attached to a wooden board connected to the motor by a U-Bolt. Today we aimed to execute this idea and we did most of the work starting with the wood support for the ball bearing. Cutting a pine 1x4 resulted in the clearance needed for the caster to correctly touch the ground and level with the main wheel. With this, we drilled holes at an angle into the pine board so we can screw the u bolt

into it. When we did put the U-Bolt in, the bolts were too long so we had to cut them off to ensure correct height. All while this was going on, other members were using an angle grinder to cut a piece of metal to place in the wooden structure by the seat to reduce the sway in the steering mechanism. This piece of metal was the right diameter to fit the steering bar in but was still too big to fit into the hole drilled into the wood. An o-ring was needed between the metal and wood for this to work. We decided to 3d print this part to customize our needs at a low cost. Lastly, we drilled holes into another pine board that was going to be placed underneath the first board next to the seat. This would again reduce the sway in the seat. We then attached the O-ring and installed plastic shims into the metal shaft coupler for the motor mount. After quick preliminary testing, it was found that there is nearly 0% wobble, with the nearly being there in the event that the wheel is pushed up or down due to varying ground distribution. Plans for a new safety system are being made, and some cosmetic addons, as well as, approaching admin are in the talks. Testing of the motor and speed tests are going to be the next step. We plan on getting a good converter and/or power source for the powered wheel by Monday, and will hopefully be able to do some isolated testing. We are currently unaware of the speed and performance of the wheel, with verbal estimations from Nodarse of about 15-25 mph, though those are questionable due to their age and the state of the car, in comparison to the wheelchair. We will be using a connected power source in the indefinite future, until we can find a suitable portable power source such as high power car batteries, so testing will be safer and much more controlled for now. Plans for administration conversations and approaches for resource help and future modification are in the talks, with minimal planning for now. We also plan on making a better body around the frame and painting it school colors, black and gold, maybe even adding a Titanium Knight! Plans for adding an electronic joystick system for controlling the wheel speeds are being planned and thought off. We are also working on a manual handbrake system for safety. Today was overall a successful day, with minimal issues.

Feb 14

January 10: Started work on making a basic frame from a wheelchair. There are 4 large castor wheels on an adjustable frame with 2 L-bars supporting the structure. This will allow for better support and integrity of the frame as we build upon it.

January 24: Planning out better layout for kar. We made a plan to put the different areas such as a seat, battery pack, foot rest, pedals, and the wheels. This will be improved upon in the future.

January 26: Drilling into frame for installation of structural supports and improving upon the integrity. We are also installing a better battery pack mount and front foot rest bar.

January 31: Finalized and installed motor system for kar. This will run the motor smoothly and allow for the shaft to rotate when attached to the shaft.

Feb 2: Looked for different materials we could use to improve upon the motor bar. Looking for metal bars, but failed to find any.

Feb 4: Started work on mount. Drilled pilot holes, and made a singular shaft to mount the wheel, with PVC hole guide. This will allow for proper rotational balance and speed.

Feb 7: Worked with different materials to make mount, and cut out holes to make proper mount to put steering wheel shaft in. We added second mount to better stabilize shaft.

Feb 11: Wobbly Steering Motor Mount. Fixed by 3d printing and cadding O-Ring to stabilize.

Feb 14: Got the Motor to work for the first time. Connected the motor to the 120v outlet through the power conversion box. First time driving the car, I had the issue of grip.

Feb 23: Finished drive shaft v2 with newscaster. This was the new wheel castor, rather than the metal ball castor we had before.

Feb 25: got the killswitch to work. Installed the wiring and improved wire management. We also mounted it to a handle on the side of the car.

March 2: drive shaft v2 broke, aluminum failed. The amount of pressure and failure of caster equilibrium put too much pressure on the shaft, rupturing the structure. We are working on a solution.

Marth 9: Back to cading, made switch mount, end caps, and redesigned the steering column. Started 3d printing parts and working on stabilizing the wheel shaft with better, double layered aluminum.

Createers (former) Krazy Kar 12

Vedic, Wilson, Thomas, Ben

March 11: CADding of different castor sleeve mount and of the new motor system. This will help better plan and execute future designs of cars.