Human Powered Dragsters

Challenge and objectives

- Your challenge is to create a human powered vehicle powered only by the driver's arms, legs, or whatever method you choose for movement. No motors! If you need someone to run behind and push that is ok but not as awesome!

- Maximum 6 teams per class

Design constraints:

- The total length of the vehicle body should be 4-5 ft or less (not counting the wheels)
- It must be able to fit through a standard doorway and be stored easily. Max 30” wide
- The vehicle must be able to steer and stop/brake using some sort of braking system
- Your vehicle should be able to be driven by all members of the team at least once.
- Vehicle can be driven by 1 or 2 members at one time (like a tandem bike) but not required
- Must be strong enough to be driven multiple times over the course of testing and final race days
- Wheels are not allowed to damage the ground (shouldn’t destroy the gym floor, etc)

Research:

- The planning process will be as important as the build itself. We will spend 6 classes planning and designing. This can include sketchup, CAD drawings, on paper, and prototypes.
- You may want to make a miniature model as a prototype as well.
- You shouldn’t need to use too much effort to drive your vehicle. It should roll easily!
- You will need to come up with a pricing sheet for total costs
- Keep it simple!

Materials

- Teams will need to source the majority of their materials themselves.
- Finding old bikes and using them for parts is a great idea! DO NOT STEAL!

Materials

- You will be provided with some limited materials for free from Mr. Holbrook. Some will need to be given back to be used again in following years. If they are damaged by students the team will pay for replacement costs. More material is available for a cost. See Mr. Holbrook for pricing.
  - 48x48” (approx) sheet of ½ plywood
  - 4 wheels – to be returned
  - axles – to be returned
  - bearings – to be returned

Competitions:

- Fastest 100m on the school track (or indoors in the gym)
- Fastest total lap
- Timed obstacle course
- Hallway obstacle course
- Carry an certain object during the course of the 100m race with a forklift type mechanism (an egg perhaps?) TBA

Recommended materials:

- 2x4 wood – Cheap at $3 per 8 foot 2x4!
- Plywood
- Don’t under-estimate the strength of cardboard
- Bicycle or wheelchair wheels and accessories
- Nuts and bolts

Must haves!

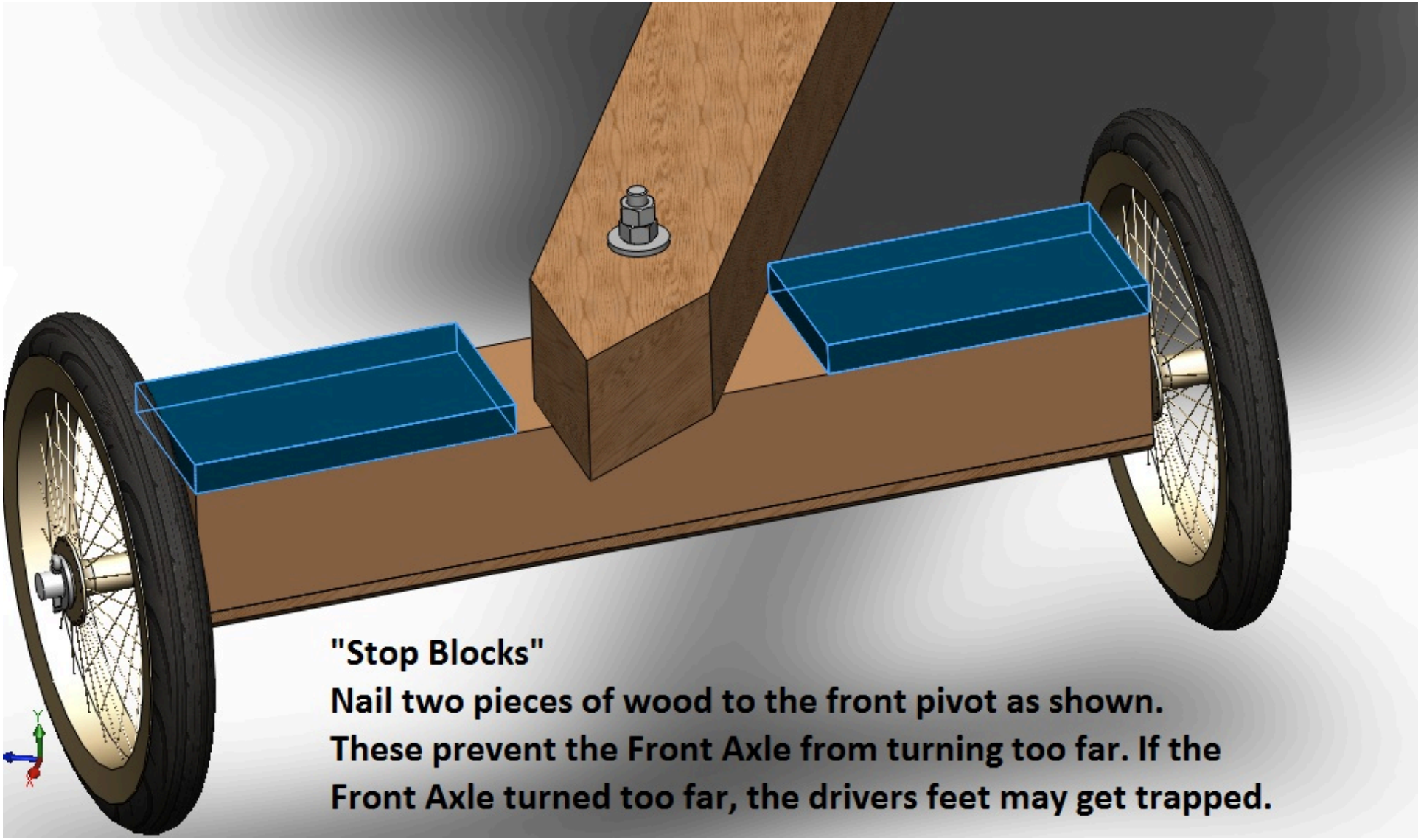
- Your dragster must be able to:
- Go forwards
- Brake
- Steer
- Hold at least one person

You will need to research and design a system that will allow you to do all these things

Tips

- The lighter the vehicle the less weight to be ‘pushed’
- The lighter the vehicle the less strong it might be depending on materials used.
- Gearing can make your life easier
- Belt driven, chain driven, rope driven, foot driven…… all possible

Gravity cart



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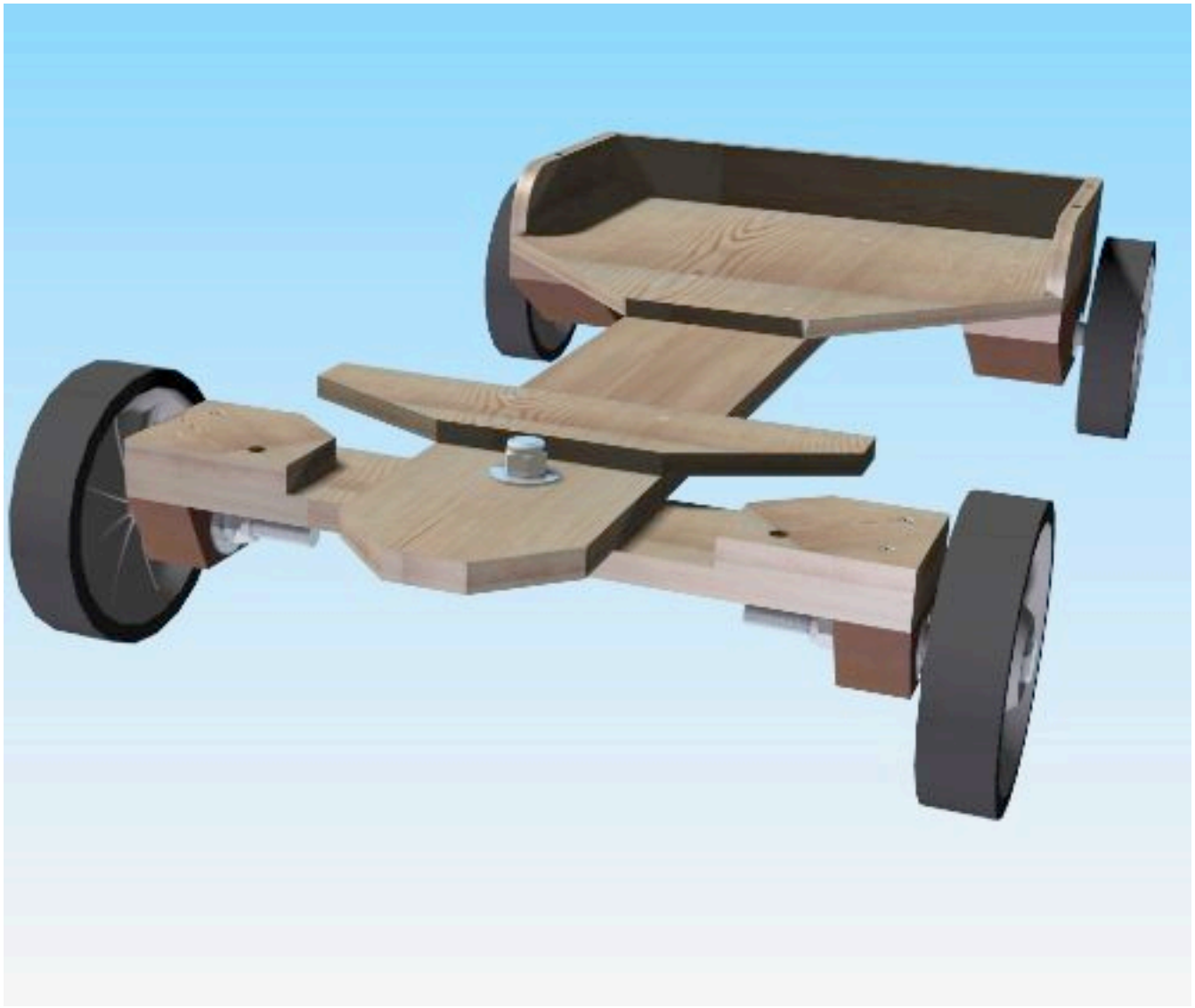

- http://www.frasercoastchronicle.com.au/news/challenge-teams-hit-120-maximum-racq-technology/1508498/
- http://www.beaconsfield.vic.edu.au/page/97/HPV---Human-Powered-Vehicle
- http://www.recumbents.com/wisil/whatsup.htm
- http://www.kartbuilding.net/Wooden_Go-Kart_Plans/

Links:

- Electric but the general idea is the same
- https://youtu.be/LjC-FDmds7c
- https://youtu.be/yjO6xp-Tz8Y

- Human powered
- https://youtu.be/S_k6Gk6BAMw
- https://youtu.be/MSJA7NkWbHM
- https://youtu.be/EQ_Lx88XEvQ
- https://youtu.be/hfZX-2SLEjQ


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