

Junk Drawer Races: Hydraulic/Pneumatic Machine Design Document - Regional Round

School Board:

School Name:

Grade(s):

Team Number:

Team member name(s):

List all materials used in your project and how much of each material:

SAFETY QUESTIONS:

1. During construction, is there anything that can easily catch on fire around you?	☐ Yes ☐ No
2. Are fire extinguishers accessible in case of fire?	☐ Yes ☐ No
3. If there is a fire, do you know how to safely exit/get out from where you are?	☐ Yes ☐ No
4. Is there anything on the ground that might get in the way from exiting?	☐ Yes ☐ No
5. If you hurt yourself, is there someone around that can help?	☐ Yes ☐ No
6. Do you know where to get a bandage if you cut yourself?	☐ Yes ☐ No
7. Does someone close by have their First Aid Certificate?	☐ Yes ☐ No
8. Do you know the proper procedures if a trip or slip happens while you are working?	☐ Yes ☐ No
9. Are you wearing appropriate PPE for the tasks you are completing?	☐ Yes ☐ No
10. Are you using equipment safely?	☐ Yes ☐ No

Design Plan

Include all parts of your project and a drawing. Use the checklist to guide your design sketch(es):

- ☐ Labels and dimensions (cm)
- ☐ Arrows for motion (vertical, horizontal, extension)
- ☐ Material notes (what is used where)

Iteration Timeline (document how your design evolved):

Initial Sketch(es)	Tested Changes

Final Crane Drawing

Draw and label your final crane design below. Be sure to note improvements since your first sketch.



Key Improvements:

Team Collaboration

Document team roles, responsibilities, and contributions.

Team Member	Role	Responsibility	Evidence of Contribution
Alex	Lead Designer	Create crane sketches, decide boom length	Uploaded two design sketches with labels; suggested shortening boom for stability

Process & Reflection

Use the prompts below to reflect on your project. Connect your design process to your final crane.

1. Describe one major design change and why you made it.
2. What teamwork or communication challenge did you face? How did you solve it?
3. Which part of your crane worked best? Which part would you improve?
4. How did your testing process shape the final outcome?

Team Reflection:

Photos of Final Crane

Include at least three clear photos of your final crane build. Photos must show the full build and all mechanisms.

- Top View: Show the entire crane from above.
- Side Views (Right & Left): Show both sides of the crane, including any joints or syringes.
- Front and Back Views: Show the crane base and lifting arm clearly.