For Teacher Review - Sumobot Project Summary

It is helpful to think of Sumo wrestlers as you attempt to envision this project. However, our combatants are small vehicles instead of humans. The Sumobot is a small, wheeled device that is designed to be able to push a similar device out of a 4-meter square or circle. They run on a tether attached to a controller that allows each wheel of the vehicle to move independently. In its simplest form it is made of wood, two wired DC motors, plastic gears and some miscellaneous fasteners. I used this as a grade 9 project and made it from wood. It was very well received by the students and they had fun with the whole project. I should have allocated more time the first time I did the project as many students struggled to finish. I would like to make it out of aluminum as a grade 11 project, which is what the safety recommendations reflect.

Do the design process in whatever way suits you. Students need some kind of end result to work toward.

You need a band saw, milling machine, lathe and MIG welder for major machines. Some assembly is also required. Safety details are attached.

The first manufacturing step might be to cut the wheel blanks and turn them to the appropriate diameter and thickness (2 3/8" to 3 1/8"[some diameter variation can be allowed] x 3/8" thick). Drill a hole in the center for the axle. Gears will need to be attached so some layout, drilling and taping are required. Attaching the gears correctly (at every stage) is very important. A basic introduction to gearing is helpful before the project starts.

Second, cut the chassis to the correct dimensions (6" x 3" x ½") and drill the axle hole and holes for the gear train axle. Add the motors and assemble gearing. It is critical here to make sure the gears are running smoothly and the gears are in the correct position.

Add the superstructure (aluminum square stock 3/8" X 80"). This will involve band sawing the pieces to create the desired length and shape for the superstructure. After they are cut they will need to be deburred with a file. Some filing might be necessary at assembly to get the proper fit. Secure them with MIG (other fastening options are possible). Do any final deburring or cleaning.

A contest will be held to determine the best design. Two Sumobots will be placed in a four-meter square (or circle). They go like crazy so even more space is OK. Students use a wired remote control attached to their Sumobot and attempt to push the other Sumobot out. The Sumobot left in the ring is the winner! I would do an elimination tournament to arrive at a final winner and this was great fun and a nice way to cap the project.