



Don't Be A Cart-Aleck

Indulge your resourcefulness by building a classic go-cart!
(If you have a favourite youngster, you should probably know how to build a go-cart.)

Materials:

- Four wheels with internal bearings
- Axles: Two 3' steel rods that fit the wheels
- Eight bushings with setscrews to fit the steel rod
- Axles: Two six foot 2"x 4" boards
- Pivot: One 1/2" x 3" bolt with locking nut and two washers
- Steering: One 3" square Lazy Susan
- Frame: One four foot 2" x 8" board

Tools

- Metal file
- Allen keys/wrenches
- Circular saw or table saw
- Drill with bits including 1" spade bit

Steps:



Wheels come in different sizes

Four Wheelin'

Choose wheels for your vehicle. Most hardware stores carry lawnmower replacement wheels, and [Lee Valley](#) carries heavy duty wagon wheels that work great. (You can carry half a ton on four of those babies.) Remember that wheels with a diameter of 6" or more will travel over uneven ground or gravel more easily than smaller wheels. I went with the Formula One look - larger wheels at the back and smaller ones at the front.

You'll also need to buy some steel rod to fit the interior dimension of the wheels you've chosen. The rod will remain stationary, but the wheels will rotate on the rod. To secure the wheels in place on the rod, use "bushings", little rings that slide onto the axle on either side of each wheel, and tighten in place. Sometimes the bushings don't slide easily onto the rods so you may have to smooth the ends of the rods with a metal file.



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Use a file where necessary on the axle



A grinder works well too



The axle is a steel rod available in a hardware store



Slide on a bushing and secure it in place with the set screw



Slide on a wheel and another bushing



Back axle and wheels



Front axle and wheels

Note: All these parts can be found in a good hardware store. You may have to go to a couple of places to make all the parts work together, but scrounging and improvising are the two key principles of go-cart building. If you're in a pickle, describe what you're creating to the clerk and he or she may be able to suggest something different than what I used. No hardware clerk can resist the attraction of solving a go-cart dilemma.



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Cut a one-half by one-half inch channel in the centre of the 2x4



It should fit snugly over the axle



'Sandwich' the axle with another 2x4 and screw the boards together

Back Axle

Next, build a wooden casing for the axle so that you can easily attach it to the chassis later. One of the easiest ways to do this is to sandwich the axle lengthwise between two 2" x 4" boards. To make the sandwich work, you have to create a channel in one of the boards for the axle to nestle in. Make two parallel saw cuts half an inch deep along the center of one 2" x 4" board. The channel should be just wide enough for the steel rod. Then chisel out the material between the two sawcuts. When you're done, the axle should fit snugly in the channel with enough room at each end to allow the wheels to spin freely.

Cut a matching length of 2" x 4" and clamp it on top of the board that is holding the axle. Pre-drill and then drive at least four 3" screws to lock the boards together.



Drill a one inch diameter hole half an inch deep followed by a half inch hole through the board



The bolt head should fit below the surface of the 2x4

Front Axle

You build the front axle in the same sandwich configuration, except there's an extra step, because the front axle has to accommodate the steering mechanism.

So repeat the same steps as you did for the back axle, cutting two matching pieces of 2" x 4" and chiseling out a groove in one board.

The front axle has to pivot, so you need to be able to insert a big honkin' bolt through the center point. But bolts have big heads, so you have to allow for this. With this in mind, drill a 1" wide hole half an inch deep in the centre of the plain 2"x4" (the one without the channel). Next, finish drilling the rest of the way through the board using a 1/2" drill bit. Insert a 1/2" x 3" bolt. It should slip easily but not sloppily through the hole and the head should sit in the 1" diameter recess so that the bolt head is flush with the level of the wood. Don't fasten the bolt yet!





Drill a half inch hole in the chassis

Connecting the Axles

Center the 3" square Lazy Susan hardware at the end of your 2" x 8" board and make a mark in the centre hole. On that mark, drill a half-inch wide hole through the board.

Okay, the next section won't make any sense until you're doing it, so be forewarned.



The 'lazy susan' hardware is centred on the bolt and attached with screws

Assemble the steering mechanism by first attaching the Lazy Susan hardware between the 2" x 8" board and the 2" x 4" axle. You'll have to spin the 2" x 4" in order to get to the screw holes. Pass the 1/2" x 3" bolt up through the 2" x 4" axle and then through the 2" x 8" frame. Put a washer and nut over the bolt and snug it down but don't over-tighten. (A nut with a nylon gasket inside will hold the nut in place and won't vibrate loose.)



The front axle is bolted to the chassis



Attach the rear axle unit to the chassis with screws

Attach the front wheels and axle by setting the axle in the channel in the 2"x4" and clamping it to the one with the bolt through it. Then use 3" screws to sandwich the two 2" x 4" boards together. Attach the rear axel to the 2"x8" using 3" screws.





Attach a support piece to the chassis leaving enough room to steer easily

Attach a 3' piece of 2"x4" under the 2"x8" chassis about 8" back from the front axel. Test for the appropriate location by turning the front axel to see where it will intersect the new 2"x4". The radius shouldn't be so great that the wheels bind by turning too far but it isn't good to limit the turning radius too much either. Once you've found the right spot, use some 3" screws to attach it to the chassis.



Install a floor and side supports



Install the side pieces

Next, cut and attach two 2"x4"s, one on each side of the chassis, to the back axel and to the cross piece just behind the front axel. They will be at the same level as the chassis forming the floor of the wagon.

Cut and attach four 2"x4"s, one for each corner, using 3" screws. The 2"x4" should be about 12" to 16" long depending on the material used to make the sides of the wagon. I've used some slats from a recycled forklift skid which are made of oak and are about 1/2" x 4". It helps to lay it out flat to see just how the side will look and then add enough length on the 2"x4"s to allow for screws into the frame, usually another 3" depending on your stock. Attach the slats to the sides forming the box for the wagon.



Rope steering mechanism



Completed wagon

Drill holes in the front axel to allow for a steering/pulling rope at the front. Reflectors are also a good idea for the back and have fun.



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