# Road warrior

Louis Podbielski shows you how to make a unique wooden go-cart.

To make this go-cart, which is ideal for a child's birthday present, start by sawing the 2,1m plank to 400mm (front axle beam), 500mm (rear axle beam) and two 370mm pieces for the steering supports. Measure 350mm from the front of the 1,5m plank (chassis beam) and draw a line across the chassis beam. The support is 32mm thick so measure 32mm further back or use the off-cut (32mm thick) to draw another line across the chassis. Then draw two similar lines for the second support – the distance between the supports – inside measurement is 350mm.

Use a square to draw all round the chassis beam. Use a marking gauge set at 12mm and mark between the lines drawn on the chassis beam for the pieces to be cut out for the supports. Draw a line across each support 32mm from one end and on both sides. Using the marking gauge draw down from the lines 12mm from each side.

Mark the hole to be drilled on the other end of one of the supports for the steering rod, 50mm from the top end. Do not drill the holes separately – clamp both supports with the cut off piece underneath and then drill with the spade bit. I found that the holes were just not in the middle and I found that I had to mark the supports 'front' and 'rear' and keep them facing the same direction they had been drilled for the steering rod to fit the holes. I also had to sandpaper the inside of the holes for the rod to turn smoothly.

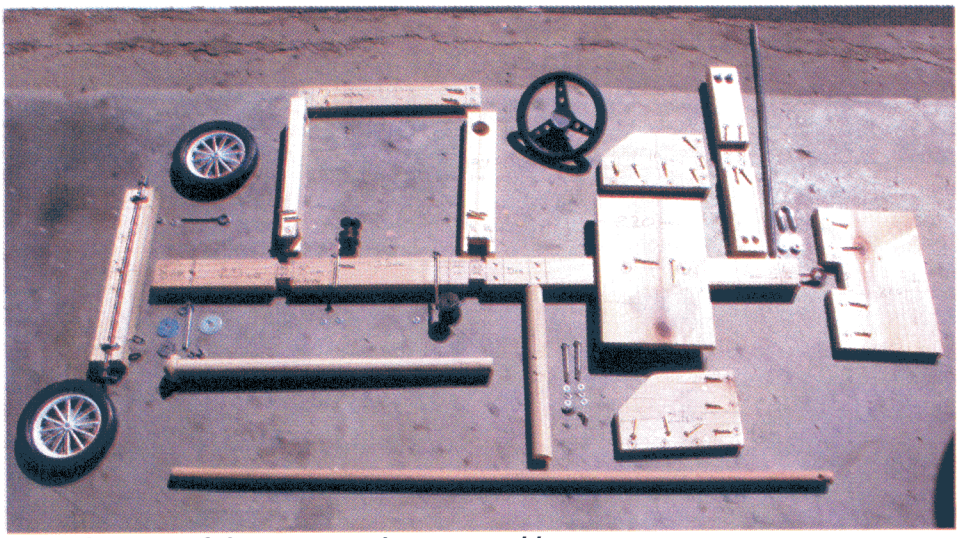
I sawed just inside the lines on the chassis (for the supports) and also just inside the lines on the supports to make the legs that fitted over the chassis beam. I then chiselled out the wood and used a rasp on the chassis and supports until the legs of the supports fitted perfectly into the slots of the chassis beam.

The piece of wood joining the tops of the two supports will be 41,4mm. I could not find a piece of wood 64mm wide and thinner than 32mm and had to use a circular saw to cut the width from 67mm to 64mm. I could have used a piece of the chassis beam if I had got both 2,1m long instead of one 1,5m. Drill the holes for the screws in the middle of each leg of the supports and drill two holes at each end of the top piece for the screws into the chassis beam and supports respectively. Drill the hole for the bolt in the chassis beam 80mm from the front end.

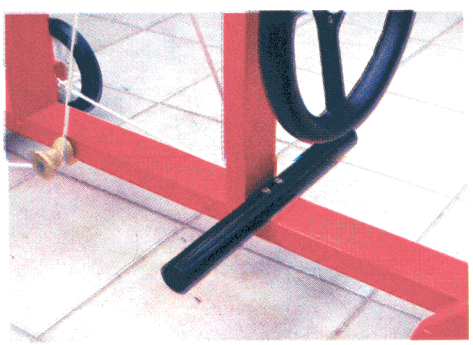
Next drill the hole on the axle beam for the bolt. However, as the axle and the front bolt cannot both go in in the middle of the

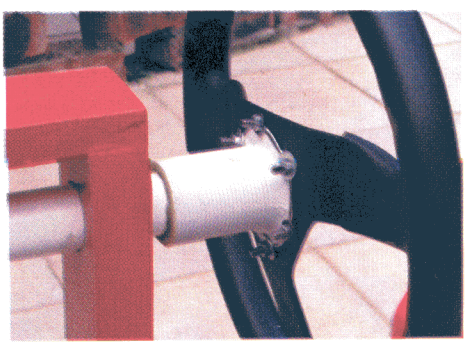
## Materials

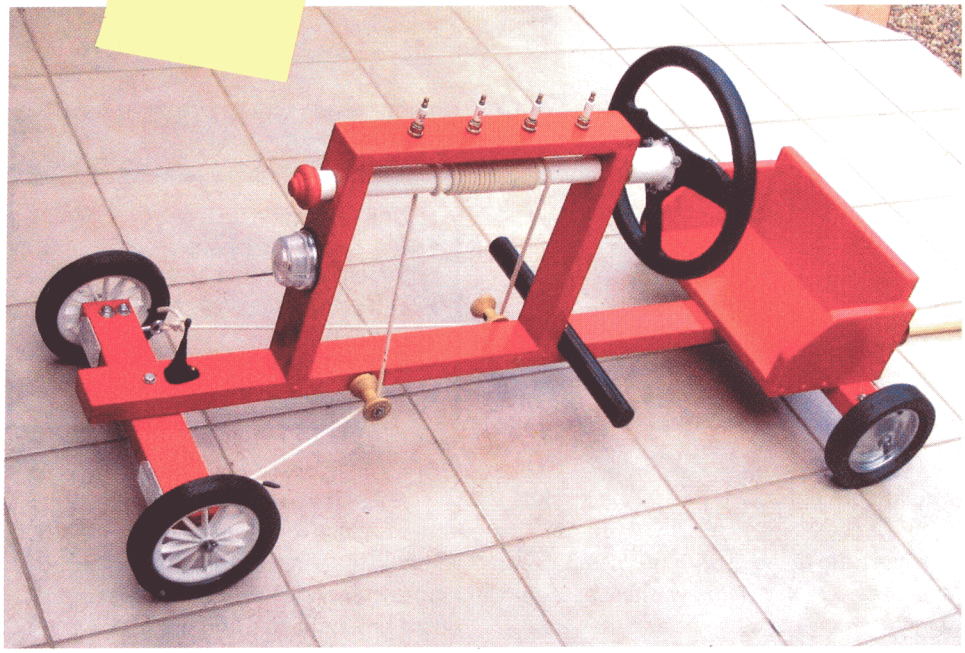
- Pine
  - 1,5m x 32mm x 64mm
  - 2,1m x 32mm x 64mm
  - 1,5m x 21mm x 67mm
  - 1,2m x 21mm x 220mm
- Wooden curtain rod – 1m x 34mm
- Window sash cord – 4m x 5mm
- 4 x rope clamps
- 2 x eyebolts – 7mm, 1 x eyebolt – 800mm
- 2 x thin flat washers – 45mm
- Washers and split pins
- 2 x large nails – 150mm x 5,6mm or 125mm x 5mm
- Broom handle
- Iron rod – 2m x 10mm and 2m x 12mm



*All the parts of the go-cart, prior to assembly.*







*The finished, go-cart – fast, safe and offering an authentic driving experience.*

front axle beam, I drilled the hole and cut the groove for the front axle so that there was about 2mm between the bolt and axle. Make a groove in the front beam for the axle with a router. I used a 3/8 inch router bit and set the depth to 8mm.

I did not have a router so I used a circular saw set to a depth of 7mm and made two parallel cuts about 8mm apart and then used a rasp, wood file and round file to widen and deepen the groove so that I had to force the axle in leaving it about 2mm proud.

## The wheels and axles

I found wheels with a hub diameter of 10mm and used a 10mm rod for the axle. I cut the rod to 47mm, but the length will depend on the width of the wheel hubs and space for the washers on each side of the hub, and the space for the hole at each end for the split pins. I found that I had to secure the axle in a drill press vice and had to mark the hole with a punch so that the 2,5mm bit would not wander when I drilled the holes for the split pins.

Use a file over the split pinholes and round off the ends. I then put the one end of the axle in the drill and got my son to hold the drill whilst I used emery paper to remove the paint off the ends of the axle (about 40mm on each side) and to smooth the axles to a shiny finish and also so that the wheels with a 10mm hub turned freely on a 10mm rod. You could invert the drill in a press and then insert the axle if you do not have help.

I then placed the clamps over the axle which was fitted in the front beam slot and marked and then drilled holes 1mm larger than the diameter of the clamp legs about 30mm from each end. I found that I had to use a round file to widen the holes and even a hammer to knock the clamps in, as the legs were not parallel.

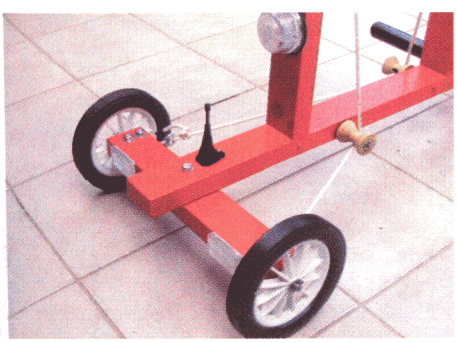
Fit the washers and bolts to the legs of the clamps but only hand tighten – I found that if I tightened the clamps with a spanner the middle of the axle bent away from the beam so I put the axle and beam in a vice and then tightened the clamps. I then cut the groove in the beam for the rear axle and cut and made that axle – I then used a 5/8 inch router bit set to a depth of 7mm – the axle beam is only 16mm in the middle.

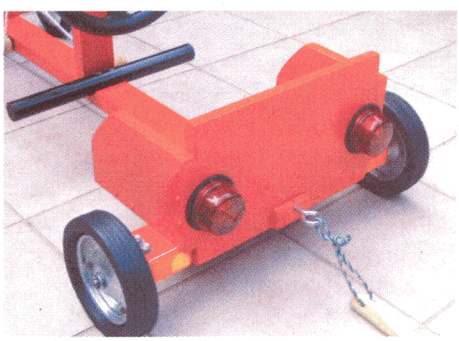
Before fitting the rear axle you have to cut a space out on the other (top) side for the chassis beam to fit into. You must also cut a space in the chassis beam – also 64mm wide and both 16mm deep (half-way) so that they fit level (the seat fits on the chassis beam and rear axle beam) but before you do this you must decide on the length of the chassis. I cut the beam to 1,3m to suit children aged 2-8 years but for older children you may find that the chassis should be 1,4m. There must be a piece of the chassis beam sticking out to rest the broom handle on when pushing the car.

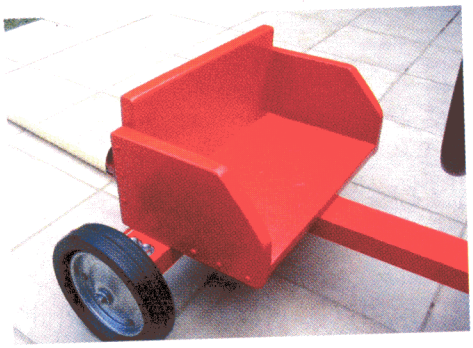
Place the chassis beam on the axle beam with 40mm of the chassis beam protruding past the axle beam and mark the parts to be cut out on both beams. Use the marking gauge set at 16mm to set the depth to be cut out on both beams. Fit the axle beam into the chassis and secure with four screws from underneath – two on each side of the axle.

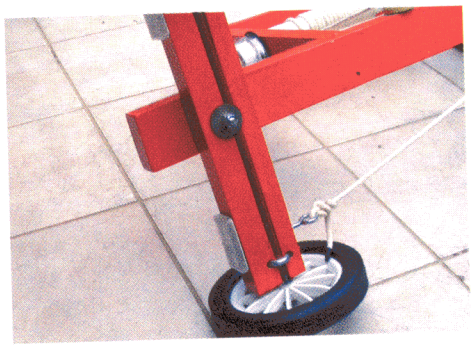
## Making the seat

Now for the seat – I first fitted the backrest and used a width of 340mm. The height of the backrest is 220mm (although the sticker on the wood indicated 220mm I found it to be 215mm). I then cut out a piece 32mm x 64mm in the middle of the backrest so that the backrest would fit over the chassis beam and be level with the bottom of the axle beam. This enables you to secure the backrest to the axle beam with the four screws.









## Tools

- Drill and stand
- Tenon and hacksaws
- Square and marking gauge
- Chisel, cabinet rasp, wood file and round file
- Centre punch, 35mm spade bit and 2,5mm steel bit

Next cut the seat which must be 340mm wide and 220mm long – the same size as the backrest. Then cut the sides. I made the sides 150mm high and the width 230mm, but if you want the seat and the sides to be level, the width must then be 220mm plus 21mm.

Secure the backrest with screws and then fit the seat which you secure with two flat screws to the beam – counter sink the two holes. Then secure the sides to the backrest and seat with screws – about three to the backrest and three to the seat. Now fit the supports and top piece and secure with screws.

I cut the rod to 600mm so that it can be pushed in or pulled back to suit the size of the child. I fitted a finneal to the end of the curtain rod – having cut off the fancy part and sanded it – by drilling a hole in the end of the steering column and using glue. This is a safety feature so that the end of the rod is not pulled back through the front support.

Make a footrest between 370-380mm in length. Use a piece of curtain rod or 21mm x 67mm piece of wood but then smooth the edge on which the feet will rest. Secure the rest with two screws or drill two holes through the rest and through the chassis beam and secure with bolt and washers and spring washers and butterfly nuts. You can then drill two holes on the chassis beam about 100mm nearer the seat to accommodate a smaller child.

Drill holes for the eye bolts right through the front axle beam about 5mm from the end so that you have to screw the eyebolt in. The washer and nut on the end of the bolt will be for show. I used eyebolts 8cm long with the width of the thread about 6mm. You can also use a shorter and thinner bolt that does not go all the way through but again the bit must be just less than the thread.

Insert the bolt through the chassis beam and place two thin, large washers between the chassis and axle beams and then a thicker washer under the axle beam. Use two bolts or a bolt and a lock nut underneath. The deep V cotton reels are no longer made so I had to get a friend with a lathe to turn the two runners for me. I could have used two eyebolts as there is very little friction.

I used nails to secure the runners to the chassis. You can use a 120mm nail which is 5mm thick. The hole in the runner will then be about 6mm. The hole to be drilled in the chassis beam will be just less than the width of the nail – say 4,5mm and if allowance is made for the washer on each side of the runner then the nail will just not protrude but may split the other side of the beam – so cut 5mm off the nail and round the end with a file. You may want to file down the notches below the nail head.

I used a 150mm nail which is 5,7mm wide and the hole in the runner was 7mm. As the notches below the nail head were just too prominent I cut 30mm off the nail and drilled a hole near the end for a split pin and then drove the nail right through the chassis beam and fitted the runner and washers and split pins on the other side.

It does not matter whether the front nail is on the left or right of the beam. The front nail is about 80mm behind the front support and the rear nail about 40mm in front of the rear support. Tie the sash cord to the eyebolt near the front nail and then the cord goes under the runner and underneath the rod and then wound over the rod 17-20 times. The cord again comes underneath the rod from the other side.

Finally drill a hole in the back of the chassis beam to accommodate the large eyebolt 95mm long; again just less than the width of the thread so that some force is used to screw it in. Drill a hole in the end of the broom handle and use a rope or nylon cord to connect the broom handle to the eyebolt.

The idea behind this car was to put the steering device and steering wheel on so that it could be enjoyed so much more by a child rather than holding a rope in both hands all the time. The other idea was for the parent to stand upright and push without breaking his back bending over to push the car. The broom handle is also safer when going down a hill – it can be held.

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