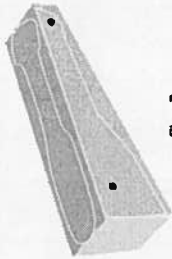


Prototype construction steps:

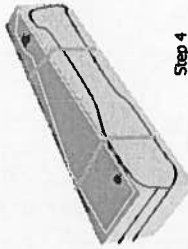
1. Photocopy / trace your final design drawings and cut out the top and side views.
2. Use sticky tape to attach these cut outs onto your Styrofoam / prototype blank.
3. Use a ball point pen or sharp pencil to trace around the template and transfer it to the prototype blank, make axle wholes and remove templates (remember to keep them to make your final dragster).
4. In order to cut out around both the sides and top of the prototype, it is important to keep all the pieces together as we cut them out. This can be done in two ways, either by putting rubber bands around the block and removing them as you cut your shape, or, by using tape to rejoin the pieces. By doing this, the block will stay whole which will enable you to cut through the second side.
5. After you cut out both sides to the required shape, use sand paper to carefully smooth out your dragster design.
6. REMEMBER this is only a prototype and will still be a rough version
7. Mount the axles and wheels to check that your design will meet the requirements. It is also a good idea to let someone else review your idea as they may see any potential problems you may not.
8. If there are any problems with your design NOW is the time to go back and change it.



Step 2



Step 3



Step 4

Final Production

So your idea was great, your prototype worked and everything matches the specifications. Now its time to start the final production of your dragster. The steps are very similar to making your prototype, so any problems you may have should have been solved during that phase.

The construction steps are as follows:

Cutting.

1. Using the same templates from your prototype, trace around and transfer your design to the balsa block.
2. Using the measurements off the wheel placement diagram (page 4) or those selected as part of your design, mark and drill out the axle holes. This is done while our block is whole as it makes the drilling process easier and more accurate.
3. As you did with step 4 of prototyping, cut around the template markings using either tape or rubber bands to keep the off cuts together.
4. After cutting the block to its basic shape, use a file or coarse sand paper to help shape your design further.
5. Once the basic shape has been achieved, gradually use fine grade sandpaper to create a smooth finished surface. REMEMBER, Doing a good sanding job now will help create a great paint finish.

Painting.

1. It is a good idea to start by marking the positions of the screw eyes (line guides) before painting. This can be done by inserting small nails or pins where they are to be placed.
2. The methods used for painting your dragster can be varied. You may use acrylic or enamel paint and you can use a brush or spray can to apply the paint. Whichever you chose it is important that you do the following.
 - A Use a primer or sealer before painting. This helps that paint to stick to the balsa as well as helping to increase the resistance of the balsa to being dented.
 - B Put on at least two coats of paint. This helps create a better finish
 - C Use a very fine grade sand paper to smooth out any imperfections during each coat of paint.

HINT

Using a mixture of PVA glue and water to coat your balsa before painting helps build up a hard layer that is more resistant to damage. Applying a clear coat of varnish will protect the paintwork and any lettering or transfers you may add to your dragster.

Assembly.

1. Before attaching the axles and wheels it is important to correctly adjust the straw bearing to the desired length. When measuring the front wheels, also remember that the axle may also need to be shortened to accommodate for the thinner wheels.
2. Once the axles and the straw bearings have been cut to their sizes, it is a good idea to place a small spot of glue on the outside of the straw before sliding it into the axle hole of the dragster body. This stops the straw bearing from sliding out if hole is slightly big.
3. To help with speed and reducing friction, it is a good idea to make sure the plastic wheels are smooth and free of any imperfections that may be left on them from the plastic moulding process. Graphite powder can also be used to help reduce friction between the axle and straw bearing.
4. To finish off, take out the small trails or pins which marked the screw eye positions. Screw in the screw eyes with the eyelet facing the front of the dragster.

Testing

Before any race it is important to make sure your dragster is working the best it can. To make sure it is, there is some simple testing that can be done.

1. Make sure your dragster rolls straight when pushed. If it swerves heavily to one side, check that the wheels are aligned straight (50degrees to the side edge) and parallel with the bottom of your dragster.
2. Make sure the wheels spin freely. Remember, the better they spin the less friction and faster your dragster will go.

Racing

Congratulations you are ready to race!

Set your car up in the CO2 Dragster starting gates and see how well your design goes against other dragsters. Good Luck!

Design/Production Specifications

PRODUCTION SPECIFICATIONS	MIN	MAX
Dragster Body		
Dragster body length	200 mm	305 mm
Dragster body height at rear with wheels		75 mm
Dragster body mass / weight with wheels	45 g	170 g
Dragster body width at axles - front & back	35 mm	42 mm
Dragster Body width (including wheels)		90 mm
Axles / Axle Holes / Wheelbase		
Number of axles	2	2
Bottom of axle hole above bottom of dragster	5 mm	10 mm
Rear axle hole from rear of dragster	9 mm	100 mm
Wheelbase	105 mm	270 mm
Spacers / Washers / Clips		
Spacer washers		8
Axle clips or similar		8
Power Plant (CO2 Cartridge Hole)		
Power plant: depth of hole	50 mm	52 mm
Power plant: housing thickness (around entire housing)	3 mm	
Power plant: housing (diameter) Please use a 3/4" Drill for best results.	19.5 mm	3/4"
Power plant: lowest point of chamber diameter to race surface with wheels	28 mm	36 mm
Screw Eyes		
Screw eye or eyelet inside diameter	5 mm	8 mm
Screw eyes (2) distance apart at farthest point	155 mm	270 mm:
Wheels		
Wheels: front diameter	32 mm	37 mm
Wheels: front width at surface contact point	2 mm	5 mm
Wheels: rear diameter	30 mm	40 mm
Wheels: rear at surface contact point	15 mm	18 mm