



Assembling the brake and tether boards

A very effective rocket car braking system can be made from a 1220mm x 610mm MDF or plywood sheet and a pair of garage door draught proofing strips

The draught proofing strip is made from a tough, brush material that quickly and effectively absorbs the energy of the car and protects the car body and wheels from impact damage. The impact protection for the cars this system offers, combined with the new Klima rocket system that allows for cars to be safely fired multiple times, enables schools to carry out cycles of testing and prototyping to improve rocket car designs.

The tethers are secured to boards using a bolt and large washer held with a butterfly nut. This ensures the tether remains captive. The board can be weighed down with waster buckets or stage weights in order to enable tension to be made on the tether line.

Brush strips and tether bolts are provided.

You will need to supply the wood.

Race To The Line Track Kit Contents:

Quantity	Item	Purpose
4	Brush strip (50cm)	Secured in pairs each side to make a 1m brake
12	Screws	To secure the brushes to a wooden base
2	Countersunk M8 bolt	To form a post for the tether loops
2	Flanged nut	To secure the tether post to the tether board
2	Large M8 washer	To retain the tether loop on the bolt post
2	M8 butterfly nut	To secure the washer and tether (removable)
1	30m stainless steel ether	Looped at both ends to secure cars to the track

Additional Parts required:

- 1x 1220mm x 610mm MDF or Plywood sheet. *12-15mm thick sheets are ideal.*

Tools required

- Electric jigsaw or similar
- Screwdriver
- Ruler/tape measure
- Drill with 8mm drill and pilot hole drill
- Sandpaper to remove sharp edges/splinters.
- Paints and/or waterproof varnish

Making the brake

STEP 1: Cut a 1m deep V into the base sheet using a jigsaw. You may want to paint or varnish the material before adding any more parts. An entry gap of around 25cm will provide plenty of space for cars to enter.



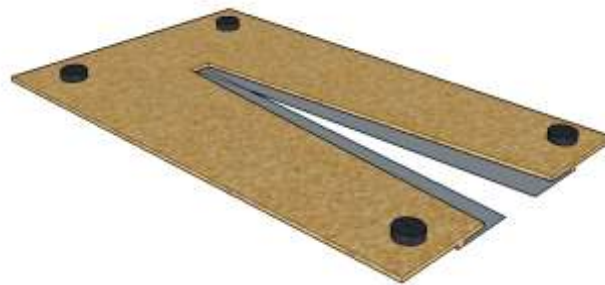
STEP 2: Attach the brushes to each side, ensuring they extend well into the V area. The strips should overlap at the narrow end to ensure no cars can reach the limit of the brake and the end of the V.



It can be useful to install the brushes upside down to help push cars down toward the ground.



STEP 3: Install some rubber feet (or similar) to the underside of the brake

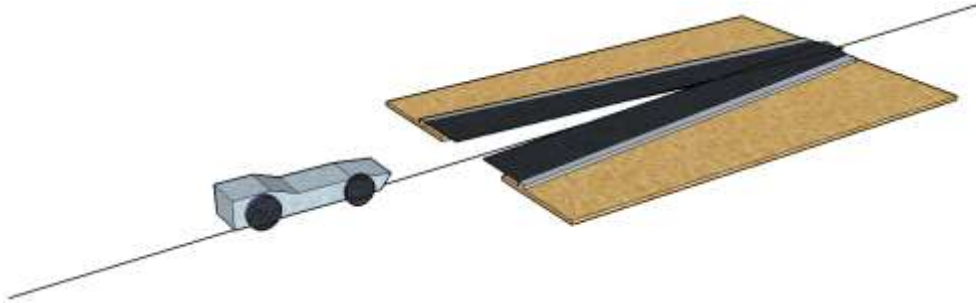


The feet should lift the brake system so that the brushes are set at least half as high as the cars and near the top of an average wheel. (5-6cm) This will help ensure cars do not ride up on top of the brake.

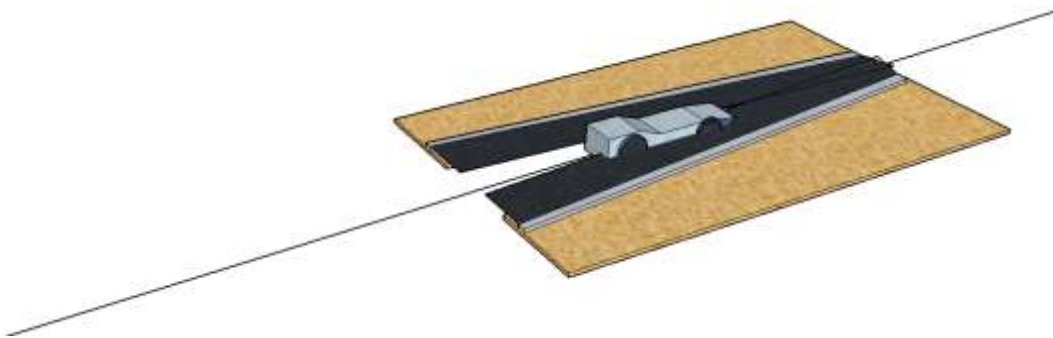
Using the braking system

Lay the brake over the tether beyond the timing area.

All cars should race over the same distance in any recorded competition stage.



When a car is fired into the brake it should come to a rapid halt near the middle of the V.



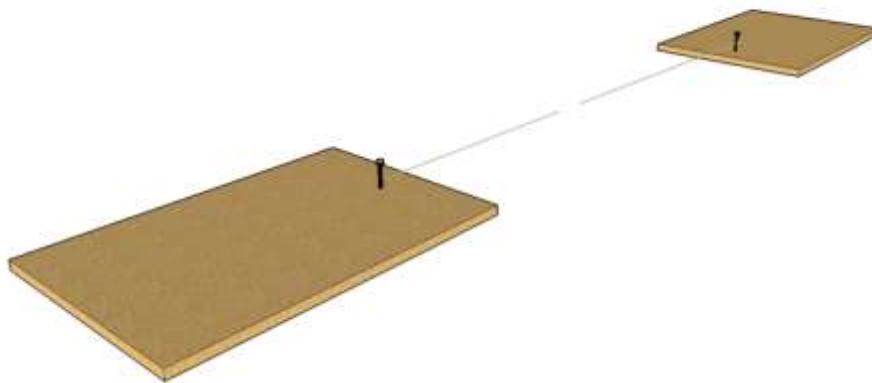
After the car has come to a complete halt and a record of the time/speed made, lift the brake and move the car to the far side or remove it from the tether. Replace the brake and it is ready for the next car. In case of missed timing, the car be taken back and re-fired.



Assembling the tether boards

Use offcuts from the brake board or source some 15 or 18mm MDF or Plywood boards 200x300mm (approx)

1. Drill an 8mm hole 5cm from the end of each board
2. Push through the M8 countersunk bolt from underneath
3. Secure the M8 bolt to each tether board using the flanged nuts and tighten securely
4. Use the large washer and butterfly nut to secure the tether line in a race
5. Store the washer and butterfly nut on the posts between races.



When racing, place stage weights, water buckets or other masses onto the tether boards to enable you to tension the tether wire.

FAQ

Are schools required to use this design?

We will provide some of the resources needed to construct this type of system.

If you want to devise an alternative stopping system or make it a challenge for the students, feel free to adapt the idea.

The key requirements of a braking system are that it:

- stops a car quickly and consistently
- does not damage or destroy the car or its wheels
- should be quick and easy to remove and set up for additional cars coming down the track

Do we need to weigh down the brake system?

MDF or plywood are quite dense and offer a lot of inertia but if there are high winds or the brake moves when cars hit it, you may want to add a brick or other mass to weight it down and stop unwanted movement.