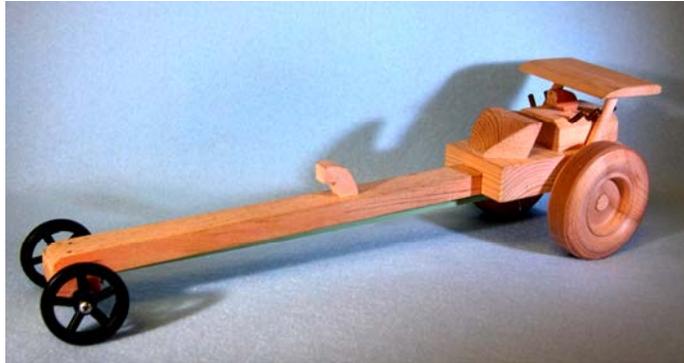


## Dragsters

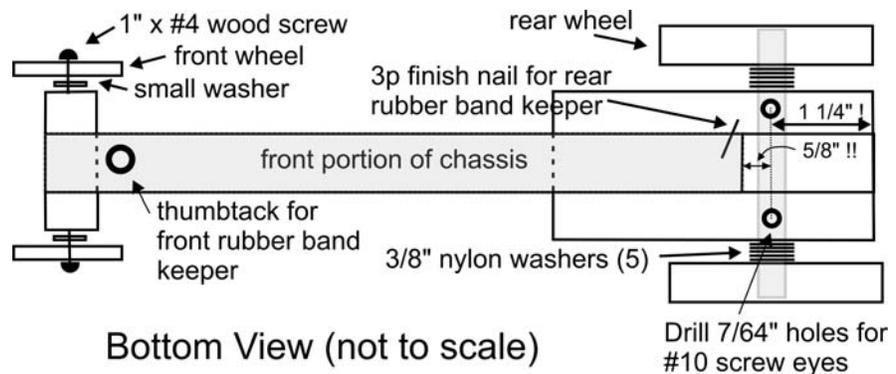
Building and racing rubber band powered dragsters is one of the most popular activities for boys (and their dads). This is a great special event.

**Materials:** One - 10 1/2" x 5/8" x 3/8" spruce for front part of chassis ('parting stock' or 'brick molding'; one - 2 1/2" x 4" slotted (5/8" x 3/32" deep) spruce block for rear part of chassis; one - 3/8" x 5/8" x 1 1/2" spruce front axle; one - 1" x 2" x 3" block for making the cockpit, two large (2 1/2") rear wheels (cherrytree toys.com, #69), two small wheels (1 3/8", kidder.ca, item 19-



1015). You will need to pre-drill the wheels with a 1/8" bit so axles (1" x #4 screws) fit nicely. One - 4 1/8" x 3/8" dowel for rear axle, two - #10 screw eyes for rear axle mounts, ten - 3/8" nylon washers for rear wheels, two - small #6 washers for the front wheels, two - 1" x #4, Phillips head zinc-plated wood screws (Boltdepot.com, Item # 147, stock #11581) for front axles, 1 - 3/4" x #18

brads to drive into the hole in the 3/8" rear axle to hold the rubber band; 1 thumbtack to drive into the center of the front main body just behind the front axle to attach the front end of the rubber band (see photo below), 1-3p finish nail (for rear rubber band holder), 1 - 7" rubber band (Guillows or equivalent).



**Hint:** 3/8" dowels vary in size and will not fit!! Find a wheel that is tight onto a 3/8" bit, drill out that wheel, then take it to the store to sort thru their bin of 3/8" dowels to select dowels that fit your 3/8" hole.

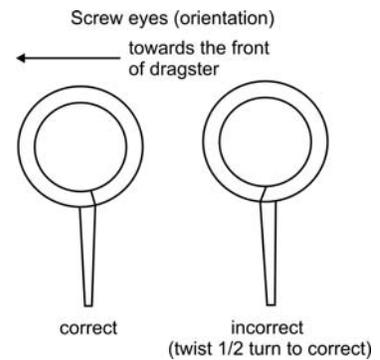
### Before the meeting:

1. Cut and sand (as needed) all wood parts.
2. Using a jig, drill a (7/64") pilot hole for the screw eyes to prevent splitting the wood. Drill the holes completely thru the chassis block, turn over chassis block and drill second hole so both holes are exactly the same distance from the back of the chassis and square to the axis of the chassis. If these holes are not square to the chassis axis, the rear axle will be crooked!
3. Glue the front (long) chassis (10 1/2" x 5/8" x 3/8" spruce) part to the rear chassis part (ending 5/8" in front of the 7/64" holes for #10 screw eyes! see 'Bottom View' diagram above).
4. Drill 3/32" holes into the front axle, so the 1" x #4 screws don't split it. Glue front axle to front part of chassis. Let dry overnight.

5. Drill a 1/16" hole about 2/3 thru the rear axle (3/8" dowel), centered. If the hole is completely thru the axle, the #18 x 3/4" brads will be loose and must be glued.

### Assembly at the meeting: Part 1:

**Note: The screw eyes are not symmetrical!** It is critical that you start the screw eyes into the 7/64" holes as shown in the diagram (right). If one is facing forward and the other facing the rear, the axle will not be square to the dragster and it will run sidewise!



1. Screw in the #10 screw eyes 'rear axle mounts' part way. Insert the 3/8" axle. Check to see if the axle clears the chassis by at least 3/8". Continue to adjust screw eyes so the axle has 3/8" to 7/16" clearance on both sides. (and that the axle is parallel to the chassis!!).

2. Add 5 nylon washers on each side of axle before putting on rear wheels. Put a drop of white glue inside each wheel and push the axle into each rear wheel onto axle.

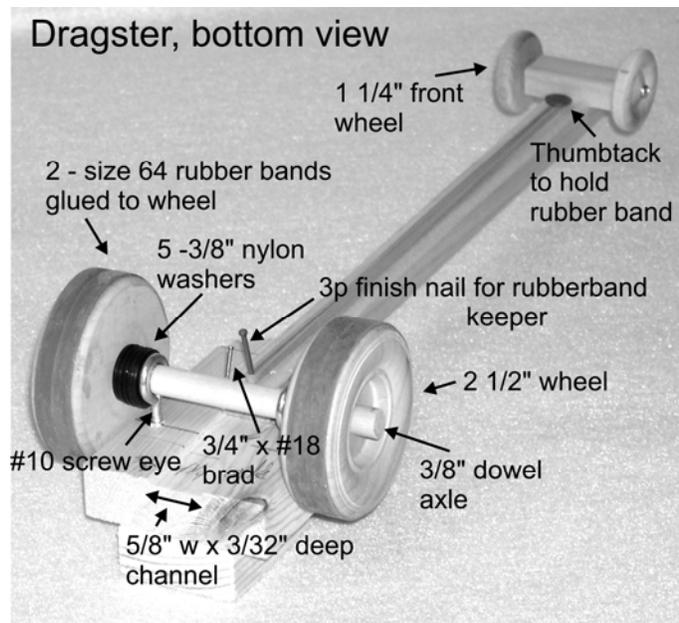
3. Adjust wheels on the axle so that the brad is now centered between the screw eye axle mounts and you have about 1/16" clearance (**This is critical!!**).

### Part 2.

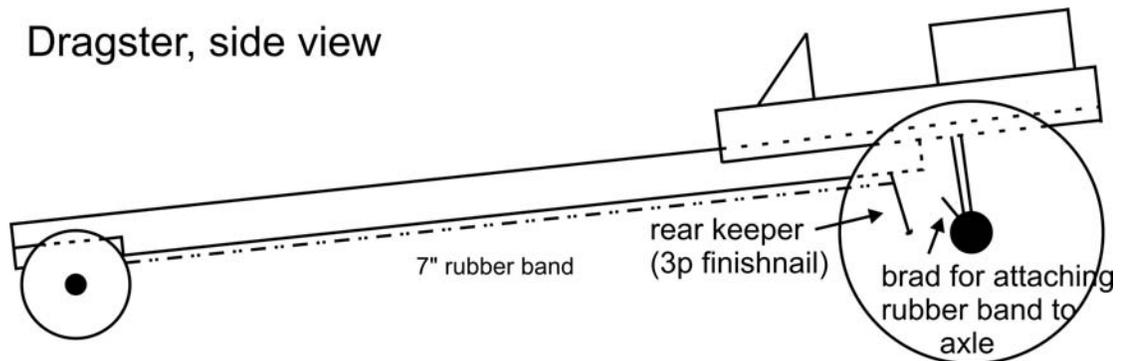
**Shape, sand and paint the body, wheels, etc., before putting it all together!**

### Part 3.

1. Drive a thumbtack just behind the front axle until about 1/8" is exposed.
2. Drive a 3p finish nail into the chassis (as shown in the photo, right) to act as the rear rubber band keeper nail.
3. Attach front wheels, using small washers and 1" x #4 zinc Phillips head wood screws.
4. Glue two #64 rubber bands on each rear wheel for traction.



### Dragster, side view



**Competition: Option A.** Use the two flat sections of the pinewood derby track. Tape four strips of rubberized material (i.e., shelf lining) to the track to give traction for the first 10 inches (else the dragster's wheels will slip when you set it down behind the starting gate). If you have electronic timers, set them up about 25-30 feet away (down the track). Place a cardboard box with some soft plastic bags, etc. to catch the dragsters at the end of the 2-section track. Race two dragsters at a time. Keep their best time (3 or more tries). Rank the times to get the place finishes. It is very convenient to use a piece of Plexiglas hinged onto a 1" dowel rod to rotate up to start the dragsters (and the timers if you have them).

The boys will check in their Dragsters and get their id number attached to their dragster (a duplicate id number saved for use during the race to keep track of the lane assignments with the clocks for each lane). From this point on, we don't let the boys touch their dragsters until the competition is finished. This saves lots of time and prevents lots of accidents to the dragsters.

**Awards:** Trophies for speed (1st, 2nd, 3rd in each division, plus, trophies for most unusual dragster(s) and outstanding dragster models. (Use the same judging criteria as for the Pinewood derby), plus a Dragster Patch (see Special Events Patches).

**Option B.** Race on a parking lot or gym for distance or accuracy (between 2 pylons).

**Propulsion (Option A or B):** Wound up rubber band. The fairest way we have found for an adult leader to roll the dragster backwards 5 ft. (or 4 ft. etc.) on a table. A greater distance may wind the rubber band too much, and it may become lodged between the axle and the plastic housing. Do some trial wind-ups a few days before the competition to determine the optimum distance to wind them up.

### **Dragster specifications**

A. Width - Maximum of 4 1/2", minimum of 1 1/2" between wheels (to straddle track rail).

**Note: you need to check your track to be sure this width is right for your track!**

B. Length - 13 inches      C. Height - 5 inches      D. Weight - no limits

E. Details - additional wood, plastic, string, etc. may be added for decorating as long as the above limits are not violated.

F. Attachments - no device may be added that will offer additional propulsion.

G. Inspection - all dragsters will be inspected before the race and those dragsters not meeting the specifications above will not be allowed to participate until the dragster is brought into compliance.

**Option:** An alternative is to use 2 plastic rear axle mounts (Mize NAC 7, 7/16" molded nylon harness brackets, get at auto parts house) with 2 sheet metal screws (1/2" x #6) instead of #10 screw eyes.

Leaders need to provide to each boy: Sand paper, steel wool, spackling, etc. Boys will provide their own paint, extra parts, etc. to customize their dragster.