

# Pinewood Derby Tips

*These ideas come from a number of sources including: Cub Scout Grand Prix Pinewood Derby Guidebook #33721*

## Body Design

1. Cars should be built by the Cub Scouts with some adult guidance.
2. Measure twice, cut once. Start early and take your time. Scout Shops are happy to sell more cars.
3. Help your Cub draw out his design on paper and then on the wood.
4. The low wedge is a fast design. It is also easy to make.
5. The official rules require you to use the BSA kit, wheels, & axles.
6. A wide, flat front edge gets a better start off the starting pin and hits the end timer beam sooner.
7. Aerodynamics is not a factor at 10 MPH. Weight, Axles, wheels, & lubrication are more important.
8. Slick gloss paint reduces friction where the wheels rub the car body.

## Axles and Wheels

9. A longer wheelbase increases stability. Think of a dragster. Drill axle holes as far apart as allowed.
10. Axles need a 90-degree angle so the car goes straight. Check angles with a square or protractor.
11. Pre-drill your axle (nails) holes with a bit just under the size of the axle to prevent splintering.
12. Lightly smooth wheel treads with fine sand paper to smooth tread. The treads must be left flat.
13. After the car is painted, attach the wheels with a 1/32 to 1/16 inch gap. Don't glue the axles on yet.
14. Some raise a front wheel slightly saying it reduces friction to have only 3 wheels touching the track.

## Add Weight

15. Weigh your car with wheels, axles, and any accessories (driver, steering wheel, etc.).
16. The car may not weigh up to 5 ounces. Get your car as close to 5 ounces as possible.
17. Weight Theory 1 – says to keep the weight centered for better speed on the flat part of the track.
18. Weight Theory 2 – says to keep the weight in the back to push the car down the ramp longer.
19. The car may be hollowed out & weight inserted up to the 5 oz. maximum.
20. You can also drill holes & insert fishing sinkers. Do not glue weights in yet.
21. A precision 1/100-ounce digital scale is under \$20. A 1/2 ounce resolution scale shows 4.8 to 5.2 oz as 5.0 oz!
22. Ask to weigh your car on the official scale before check-in. It does not matter what your scale says.

## Lubricate the Car

23. Use a dry, fine powdered lubrication (graphite). Liquids or sprays can melt the wheels.
24. Shake wheels in baggy with graphite to coat the outside of the wheel first. Remember: graphite is messy.
25. Lube the wheel hole, axle, & axle head. Lube where the axle will touch the car. *You didn't use enough graphite!*
26. Spin the wheels repeatedly on the axles to work in the graphite. *You still didn't use enough graphite!*
27. Roll the car on a flat floor. It should travel in a straight line. If not, your axles may need to be trued to 90°

## Test the Car

28. Now glue the axle only at the axle (nail) tip & attach wheel to car. Use epoxy or non-resin glue.
29. Don't get any glue on the surface of the axle where the wheel rides. It can bind.
30. Check your weight one last time and glue weights into place. Weights cannot be loose.
31. Lube your wheels again immediately before the race. Bring lube with you to the race.
32. Protect your car. Carry your car in a shoebox lined with tissue or other gentle padding.
33. Do not play with the car until after the last race. 33 1/3. Most important tip – make sure it is *FUN!*