

Building a Pinewood Derby car

The Pinewood Derby has been a GREAT tradition of the Cub Scouts since it started in 1953. The race is fun, but the true spirit of the event is not to showcase an individual's precision, or ability to reflect competitive edge....it is simply to mark the achievement of a scout and his akela working together to further help the scout grow in a sense of self worth and accomplishment.

Safety First:

- Power equipment with adult supervision
- Safety goggles
- Breathing mask to prevent breathing sawdust
- Gloves to prevent splinters
- Glove when using lead weights
- When cutting the block with coping saw, clamp the block to worktable
- Do not melt lead (toxic fumes)

Designing the car

There are many designs that can be made for a Pinewood Derby. Some people are worried about aerodynamics, but most experienced racers don't think this is a major factor. Let the boys be creative. It is helpful to trace the block of wood on a piece of paper so the boy can draw the top, sides, front and back on a template. Drawing the template on the block will help to make the cut.

Cutting the wood

The directions call for the use of a coping saw to cut the car. This is not an easy task. If you have access to a band saw, let an adult make the rough cuts with the band saw and let the boy use a rasp file to get the shape to the desired design. Multiple grits of sandpaper can get the smoothness desired.

Painting the car

When ready to paint, a sanding sealer will allow for a smoother finish, and prevent the paint from soaking into the dry wood. This is optional. Do not get the paint where the wheel hubs rub against the wood. The graphite can be worked into the wood to help reduce friction while racing.

Weights

It is best to have the Pinewood Derby weigh as close to 5.00 ounces as possible since the speed comes from gravity acting on the weight of the car.

There are many weight kits available at the hobby stores. My favorite are the zinc rods that can be inserted into the wood block by drilling 3/8" holes in the back of the car. The rods look like turbo boosters. By drilling deeper than the length of the rods, you can insert lead fishing weights to bring the car close to the 5.00 ounce limit. Other weights can be used to add to the look of the car. Make sure the weights are secure.

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Do not use weights that attach to the bottom of the Pinewood Derby Car. These weights can cause a clearance problem with the track and will not be able to race. You must have 3/8" clearance under the car when sitting on all four wheels

The Weight should be as far back in the car to increase the potential energy caused by gravity, but far enough forward to prevent the front wheels from bouncing. Most web sites recommend the center of mass to be 1 ¼ inch in front of the rear wheel.

Wheels

Official BSA Wheels must be used. No aftermarket Wheels. Wheels should be smoothed with sandpaper to remove burrs, mold marks and sharp edges. Use a high grit wet/dry emory paper to get the edges smooth. You can even use a pipe cleaner with a plastic polish powder to smooth the inside of the axle space of the wheel.

Wheels may not be modified:

- Coned wheel hubs not allowed

- Shaved wheels are not allow (wheel diameter and width must not be altered)

Axles

Official BSA Axles must be used. No aftermarket axles. Axles may be filed and sanded to remove burrs, mold marks and sharp edges. It is best to place the axle in a drill to rotate while rubbing with various grit wet/dry sandpaper (400, then 800, then a dryer sheet to polish).

Axles may not be modified:

- Channels cut in axle are not allowed

- Flanging the axle head is not allowed

Assembly of the wheel and axle

When placing the wheel and axle into the axle slot, it is best to have the axle inserted perpendicular to the side of the block. The side of the wheel needs to be as parallel to the side of the block. You do not want the wheels to have any angle, which will slow down the car. Holding the nail with needle nose pliers can hold the nail while you gently hammer the nail into the axle slot. Use a credit card as a spacer between the wheel hub and the block of wood. This should give a good amount of clearance without being too tight or too loose.

After a successful assembly, you may want to place a drop or two of glue to the nail, away from the side of the car, to keep the axle secure. Do not allow the glue to get to the edge of the wood since that might slow the wheel rotation and the car.

The cars MUST use the original axle slots that come pre-cut into the block of wood.

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Graphite

During check-in, all cars will have a graphite with molybdenum power placed on the axles and wheels. Do not use anything other than a graphite powder to make the wheels go faster. After graphite application, it is best to spin the wheels to work in the graphite. New graphite is actually slower than old graphite.

Check-in

The cars must be checked in to the Pinewood Derby Committee on Thursday, March 1st. This allows the car to be verified to meet the specifications of the official Pack rules. The car is then quarantined until race night. If you cannot make the check-in night, please make prior arrangements to have your car checked in with the committee.

There will be an extra scale and some tools etc. available to get the car within specifications before getting in line for final check-in.

Good luck and have fun!