

Pinewood Derby Rules and Purpose

There's nothing wrong with wanting to build the fastest pinewood derby car you can. But it is important to remember why the pinewood derby races exist. The pinewood derby was started to promote learning, competition, and sportsmanship.

Learning is an important part of the pinewood derby races. The Cub Scout should not only learn about concepts such as friction and gravity, but they should learn how to work with power tools safely. Depending on the experience of the Cub Scout, it may be necessary for adult supervision while building the pinewood derby car. This is a great way for an adult and a cub scout to spend time together.

In competition, there is always a person that wins and a person that loses. Competition drives us to do our best. By participating and competing, we broaden our knowledge, skills, and become a better person. The only loser is the person that refuses to better themselves.

Sportsmanship involves both following the rules and how you behave at the race. No matter how your car performs, you want to behave in a manner that will allow you to feel good in the days to follow.

It is important to follow the rules as established by the BSA and by our Pack.

1. The overall width of the car shall not exceed 2 ¾ inches.
2. The width between the wheels shall not be less than 1 ¾ inches.
3. The overall length of the car shall not exceed 7 inches.
4. There shall be a 3/8 inch clearance under the bottom of the car.
5. The weight of the car shall not exceed 5 ounces.(143 grams)
6. The bottom of the car must be smooth in order not to damage the car stoppage area.
7. Wheel bearings, washers, and bushings are prohibited.
8. The car shall not ride on springs.
9. Lubricants should not be put on in a messy manner. (no liquids)
10. The car must be free-wheeling with no starting device.
11. Cars may not protrude beyond the starting post.
12. Wheels may be slightly sanded to remove the mold projections on the tread. Beveling or tapering of the wheels is prohibited. The tread on the wheel must still be visible.

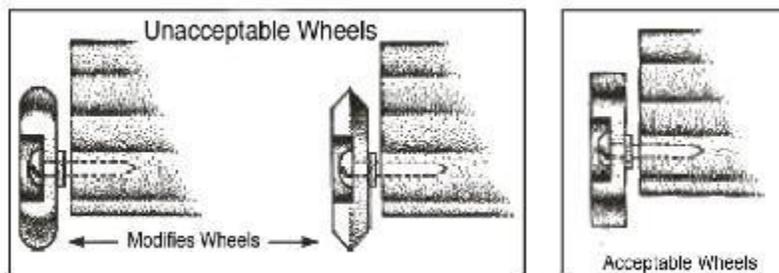


Figure 3 - Example of Rule Breaking Modified Wheels

13. Cars must be built using the materials in the Official Pinewood Derby kit. This includes the pinewood block, axels, and wheels. With the exception of decorative and construction items (weights, glue, lubricants, finishing materials), only materials from the official BSA car kit or BSA wheels and Axel kit may be used. Separately purchased items (premade bodies, machined wheels, polished axels) are specifically prohibited.

14. If a car suffers a mechanical problem or jumps out of the lane during a heat (loses an axle, breaks a wheels, etc.) the participant or a designated adult will have 5 minutes to fix the car and the heat will be rerun.

15. Cars shall be made by the scout and their adult. Cars must have been made for this year's race. Cars made for prior races are not allowed.

16. The car must pass on inspection procedures at registration before it will be allowed to race.

Pinewood Derby Speed Tips



The first secret that I can share with you is to follow the instructions that come with the car and to make sure you follow the Pack 740 rules. We can't even let you race if you don't follow the rules, so how are you going to win? Make sure to have fun when making your car. We parents can sometimes want to take over and do it ourselves. Make sure to remind us that we can make our own car if we want too and race those. But also realize that this is also a group project and we might have something useful to say.

The Axels: These little suckers will need a lot of work. First off grab your Adult and the electric/battery drill. Put a axel in the drill about 3/8" (sharp end first) and then tighten it down. Secure the drill in a vice if you have one. Get a small Metal file and some fine grit sandpaper (600 plus). Use the file on the back side of the nail head, there is normally some nasty little burrs here that will need to be removed. You can also round the back part of the nail slightly so that it does not cut into the wheel. Don't forget about those little crimp marks on the nail, get rid of those little guys too. Once the large burrs are removed feel free to sand it to perfection and then give it a good polish. Use a strip of leather or cloth with some polishing powder on it and make the whole axel shine. 1500 grit wet sand paper will work fine also. Some metal polish will only make it shine more. Shiny things are good.

The Wheels: Sure the wheels that come with the car will make it go down the track. But we don't want to just go down the track. We want to go down the track FAST! So grab your parent and an electric drill. Take one axel nail (make sure to deburr the axle first) and slide it into a wheel, then put the nail into the drill chuck and tighten it down right up next to the wheel. Steady the drill the best you can (in a vice) and with the drill running use either a razor knife or sharp knife and gently hold it against the wheel surface to remove any imperfections and to make the wheel nice and round. Then, lightly sand with super fine sand paper (600 grit or finer). Then Polish the surface of the wheel. Remember the wheel surface must remain flat. Do not change the shape of the wheel! Next check inside the wheel hub for any rough surfaces, sand if necessary. Make your wheel as smooth as you can! Don't forget to polish the wheel bore.ooo shiny things.

Wheel Placement: Now this one you may want to be careful with. You've been warned so don't blame me if you don't get the wheels on right. Don't trust the slots for the axels to be aligned. If you want to use the same spacing as the original block you can drill new holes on the other side of the block with the same spacing or drill into the top of the slots to square them up. Use a drill press if possible and a drill bit of a slightly less diameter than the nails. You can also move the wheels to the ends of the block. This can give a longer and more stable wheelbase. Don't raise the wheel height on the block, you must maintain the minimum clearance under the car of 3/8" or the car will not go down the track.

Aerodynamics: A clean, smooth and aerodynamic car can help to shave off a little time from the total but it is not a significant factor when dealing with cars this small. Have fun designing the car. Having said that, mine will be as aerodynamic as I can get it, because I am a true fanatic!

Weight: Get the car as close to 5 ounces as you can, try to make it easy to add or take away weight. If your car is over and you don't have an easy way to reduce the weight, we will have to drill holes in the bottom until we remove enough material that it is 5 oz. There is no proven best place to put the weight. Some say the front some say the back. The most popular placement seems to be in the back, with the balance point of the car about 1" in front of the back axels.

Lubricants: Graphite or dry lubricants are acceptable as these keep the track clean for other racers. Graphite is available at most hobby stores, Hob E lube is a common type, call around and see who carries some. When you are ready to mount the wheel, lube the portion of the car that may come into contact with the wheel. Lube the portion of the axel that will be inside the wheel. Lube the wheel on the inside and front and back. Now carefully put the wheel on the axel and install it on the car. Leave a gap of about a credit card between the wheel and the car. Now lube the inside of the wheel and the rolling surface to reduce friction. Now grab a newspaper and roll the car back and forth on it, this will break down the bigger pieces of lube and make it run smoother.

Test: make sure to test that each wheel spins freely. Then roll the car on a clean flat surface. Does it roll straight? If not you will need to adjust the axels. Once you are confident in the ability to run straight you can put the car up until race day!! Is the Pack having a test run this year? If so find out the date and time and run your car down the track prior to the actually race and make last minute modifications. Once a car is checked in on actual race day you will not be allowed to make adjustments.

Thank you, Daniel Carter