

Pinewood Derby Tips

- **Specifications:** Cars must be official BSA cars (Official BSA kits from a craft store are allowed) and meet these specifications. **Weight:** Max 5 Ounces, **Length:** Max 7", **Width:** Max 2 ¾", **Height:** Max 4 ½", **Clearance:** 3/8", **Wheels:** Unmodified BSA Approved and at least 1 ¾" Apart
- The Scout and adult should make the car together as a project! It is not the intent that the parent show the Scout the garage door then walk away; nor is it the intent that the Scout play video games while the adult cuts and sands. Parents should shape with the power tools and then direct the rest of the action while showing the Scout each step in building a car.
- Have fun! After all, this is what it is all about.
- Know the rules. Being disqualified can be very embarrassing. The full rules are on the Pack website: <http://pack131dekalb.org/pinewood-derby.cfm>
- Safety first. Let's not lose any fingers.



Design Tips

- Have your Scout draw a design on paper then cut it out and use it as a template. Use graph paper to make it easier.
- Draw a side and top view on the paper by tracing around the block of wood.
- Keep the car a full seven inches. It has to do with the physics of velocity and length of travel of the weights.
- Use the full 2 ¾ inches (outside wheel to outside wheel) that the rules give you.
- This will allow the wheels to travel farther before hitting the center strip.
- Find creative ways to incorporate removable weights in order to make the 5.0oz limit.
- Leave a lot of wood in the back to put in weights.
- Use the groove closest to the end of the block of wood as the rear axle.
- Do not make the front of the car pointed. It is hard to set up against the starting dowels.
- Use your imagination. Be creative. Shape has the least to do with winning. A beaver driving a log or even a pickup truck is more interesting than a wedge and will be just as fast. The aerodynamics of a small block of wood doesn't mean much in thirty feet.

Lubrication

- Be sure to polish your axels. Lightly smooth wheel treads with fine sand paper to smooth tread. The treads must be left flat.
- Use graphite lubrication only. Oil damages the paint, collects dust, and can ruin our track. I'm told that the graphite works better than the new white Teflon.
- Break in the wheels by spinning them with lots of graphite.
- After the car is painted, attach the wheels with a 1/32 to 1/16 inch gap.
- Put a small drop of white glue where the axle goes into the car body and put powdered graphite on it there. That causes less friction if the wheel should rub against the car body.
- Do not get glue on the axle shaft or inside the wheel!
- After a good polishing of the axels with fine sandpaper, dump the axels and wheels in a ziplock bag with some graphite and shake them for a few days prior to the race. That way the wheel and the axels are as slick as can be.

It's Time To Go Straight!

- Axles must be in straight front to back. That is square to the body. True the axles, don't trust the slots! Do not move the location of the axle holes.
- After pressing in the axles, test the car for crooked wheels...roll it on the floor. If the wheels are on straight, the car should roll 8-10 feet in a fairly straight line. Should the car turn left or right, you need to tinker with the axle placement without removing them from the car body, until it rolls straight.
- Glue the axles in place. Nothing is worse than having the wheel fall off as you cross the finish line.
- Once you match a wheel and axle together, keep them together. They wear into each other as a matched set.

Weigh In

- Get the weight as close to the 5 ounce limit as possible. Add the last little bit of weight with lead tape from the golf shop. This can be trimmed with scissors at the last minute. Remember, the official scale may not weigh the same as yours.
- Everyone has an opinion on where to put the weight. My belief is that the weight needs to be predominantly in the rear so that gravity can act upon the weight further up the incline and for a longer period of time. A car with more weight to the rear generally grabs more speed down the slope. Many suggest having the center of gravity at 1 to 1 1/2 inches in front of the rear wheels. But be careful not to put too much in the rear or you'll pop a wheelie.
- What kind of weight? Do not use melted lead! Tubular weights can be sunk in the sides; flat weights, like those sold at hobby & council stores can be attached to the car. Incremental weights (with pre-marked grooves) are easier to snap off into the size you need. Some folks just use BB's, nuts & bolts, coins, etc., but these must be glued so that they cannot move. If you attach weight to the bottom to the car, make sure it doesn't extend more than about 1/8 inch, otherwise it may scrape the track and slow the car down.
- I like the round weights found at the hobby shops and craft stores. This allows us to stick the weights on the top or sides of the car. People paint them and tell everyone that they are jet engines or tail pipes. What they really do is allow us to get the weights as far back as possible. Just make sure your car doesn't exceed 7 inches.
- Keep the weight low on the car and in the center (Left/Right of the car). Put the weight just in front or behind the rear wheels for less wheel chatter.



Race Day-Be Prepared

- Have a derby tool kit handy. It should include superglue, sandpaper, a drill, extra screws for your weights, extra weights, a small screwdriver. The Pack will supply some tools for tune-ups prior to race time. Remember, once a car is checked in it cannot be modified and new lubricant cannot be applied. Any repairs must be approved by a judge.
- Transport your car in a shoebox. Dropped cars are unfortunately a too common experience.
- Add LOTS of graphite right before check in.
- Explain to your Scout that running the car along the floor prior to the race may cause it to lose!
- Respect other Scouts' cars! They worked hard on them, just like you!

More Tips & Template Ideas

NOTE: Some of these tips may not be allowed as per our Pack Rules: <http://pack131dekalb.org/pinewood-derby.cfm>

Tips

- <https://boyslife.org/hobbies-projects/projects/2952/speed-secrets/>
- <http://www.scoutorama.com/derby/>
- <https://www.maximum-velocity.com/free-speed-tips/>
- <https://www.abc-pinewood-derby.com/basic-guide.php>
- <https://sugarbeecrafts.com/tips-for-fast-pinewood-derby-car>
- <https://tipjunkie.com/pinewood-derby-ideas-tips-and-tutorials/>

Templates

- <https://www.template.net/design-templates/print/pinewood-derby-template/>
- <https://www.derbymonkeygarage.com/free-pinewood-derby-templates-s/1869.htm>
- <http://www.the-blueprints.com/blueprints/cars/>
- <http://www.pack798.org/pinewoodderbytemplates.htm>