Pinewood Derby Rules and Information

General Information

PURPOSE OF EVENT: The primary goal of the Pinewood Derby is to use an enjoyable activity to provide an opportunity for fathers to spend quality time with their children. The racer is to be built and designed in the true tradition – a Father/child project. It should be a home project on either an individual or circle basis. Dad should encourage the child to build as much of the racer as she/he is capable of doing. This pertains to both construction and decorating. The intent of this event is to be a race for the kids and not a contest for the Dad's (yeah, we know how it goes though). This project should be undertaken with good conscience and a true dedication towards fair, competitive and exciting event for participating children and parents.

TROPHIES: Trophies will be awarded for 1st, 2nd and 3rd place winners or as decided on a yearly basis based on entries. We will also award many different certificates for categories such as Fastest Looking Car, Most Original Car, etc.

Every participant will receive some type of award and recognition for their hard work at building, completing and racing the car. Awards are more likely to be given to cars that look like the child did the decorating and not the father.

For the Race Coordinator

All car kits shall be the exact same make and model and be from the same supplier with the exact same wheels and axles. Please verify that all kits are identical before providing kits to dads. This means checking the wheels for spoke pattern and size as well as all axles have the same finish. In addition, please make sure that these rules are included with each kit so that all dads know what to expect race day.

Car Rules

GENERAL: The Car must be made from the Kit supplied to you by the race coordinator. No other kits will be allowed to be used. Each child may have only one entry. No child may race the same car of another child. Only cars made specifically for this derby will be permitted to race. No cars from previous Pinewood Derbies will be allowed.

Important: You SHOULD use the nail type axels. Other axles are prone to breaking during the race. Use others at your own risk. Nail axles will generally be faster than others also.

CONSTRUCTING THE CAR: This activity is a fantastic opportunity for kids to learn basic hand craft skills. The Father should do shaping of the car because it involves the use of potentially hazardous tools. Don't forget that the child should still be present and do what they are safely capable of. They should certainly be in charge of the design and giving dad instructions as the car takes shape. Sanding should be 100% the child's task. The child may not stick with this step very long but the Father can supervise how much should be done and what the end result should look like. Painting is 100% the child's task. The Father must be sure the child is in an environment in which he/she cannot do much damage to other objects. The Father will need to add weight in most cases for two reasons. 1. Younger children may not be developmentally ready to be computing in fractions and decimals of ounces. If they are, they should do the calculations. 2. Many weights require the use of small screws and screwdrivers that children may not have the strength and coordination to use safely. If they are, they should do the work to learn valuable skills.

The parent should probably attach the axles because it may require the use of a hammer and is generally recommended that the axles should be as straight as possible. It is a critical factor to car performance.

Customizing the appearance of the car should be the child's task which might include special painting, striping, decals or attachments so long as it still meet the specification requirements.

The task of weighing-in the day of the race is for both Father and child. It may offer a fine problem solving experience for the child if the car is under or over weight limits.

CAR SPECIFICATIONS: Weight shall not exceed 5.0 ounces (142 grams) and all cars will be weighed before the races begin on the official scale by a race official. The car may be hollowed out and built up to the maximum weight by the addition of wood or metal, provided it is securely built into or affixed onto the car body. Metal weights may be purchased from any hobby store, Michaels or CraftMart (look in their hobby section for a Pinewood Derby display). A good source for pre-race weighing is the scale available at the local US Post Office.

No loose materials of any kind are permitted in or on the car as to eliminate the chance of something interfering with another racers car. Details such as steering wheel, driver, decals, painting, etc. are permissible as long as these details do not exceed the maximum length, width and weight specifications.

Maximum car size, including wheels, may not exceed 7.00" long and must not exceed 2.75" wide as to eliminate the chance of bumping a car next to it. *If you are using canted axles, you may need to narrow the car body to make sure the bottom of the wheels does*

not exceed this measurement and bump a car next to you. Minimum width between wheels can be any distance but the center track is approximately 1.625" so cars should be a little wider than that to avoid friction. Minimum ground clearance should be over 0.25" because that is the approximate height of the center rail on the track. Maximum height of the car shall be 3.5" to avoid contact with the timing hardware on the track.

There can be no change in the length of the wheelbase as prescribed in the original block (the axles must reside in the pre-formed slots on the bottom of the car block, however the slots may be made deeper if you would like to raise or lower a wheel).

The number assigned to the car must be clearly painted on the top part of the car. This number should be assigned by the race coordinator before delivering cars to dads. Don't forget this step as it may create problems when you check in.

Only the stock wheels and axles from the original issued Car Kit can be used. No alteration, narrowing or reshaping of wheels is allowed. Wheels may be sanded to eliminate roughness only. Wheel bearings, washers or bushings between the wheels and body are prohibited. All cars must have exactly four (4) wheels. All four wheels do not have to touch the surface of the track (hint hint). The car must be freewheeling with no starting devices.

Cars may be lubricated before giving to the race officials at weigh-in. Cars cannot be lubricated thereafter and may only be handled by race officials after check-in. Violation of this rule may result in disqualification. Any kind of lubrication is permitted, but Dry Graphite is highly recommended. No lubrication shall be dripping from the car at time of weigh-in or it will not be accepted until corrected.

Race Day Rules

Although a Pinewood Derby is a fun event, simple rules are necessary to ensure fair and equal competition.

Cars will be closely inspected and weighed in prior to the beginning of the races and alteration by racers may be made if the car does not meet the specification requirements. We encourage some of the older children who have built and raced many times to be car inspectors and officials on race day. The following things should be inspected closely before a car is allowed to be checked in.

1. The scale should be checked frequently with a test weight and calibrated if needed. Only the race official may touch the scale after the weigh-in begins.
2. Weight not to exceed 5.0 oz with as many decimals as the scale displays. So 5.01 is too heavy and weight must be reduced. (Calibrate the scale prior to weigh in.)
3. Overall length of the car must not exceed 7.00".

4. Overall width of the car must not exceed 2.75” with the wheels lightly pressed to the outside of the axles. (meaning the widest possible race configuration)
5. Inspect the wheels to verify they are the same type as all other cars and have not been noticeably modified or purchased separately. Sanding the track contact surface smooth is OK. Sanding it enough so you can see a difference in thickness of the wheel is a disqualification. The wheel thickness and width should be checked and verified it is the same as all other cars.
6. The nail/axle heads should be inspected to verify they are the ones given in the race kit. All cars should have the same nail and nail finish.
7. If there are any questions as to the car meeting these rules, 3 race officials shall be called to discuss and make a final determination. In the spirit of fun, if a car cannot be modified to meet the requirements in time for the race, the car should probably be allowed to race but shall not be allowed to enter the second round race-off. There is no need to bring attention to mistakes that are made in front of small children and cause hurt feelings.

The Derby will be run using timing software and consist of several races for each car. Each car should get one run on each track and the times all added for a total time. The fastest 5 or 6 cars will compete in a second round to determine the top 3 places. Only cars that have strictly met all of the check-in requirements may be entered in the second round race-off.

Cars damaged during the Derby may be repaired to their original, inspected status at a supervised repair table. No lubricant or weight may be added and the car must be examined by a race official before continuing to race. If a collision or other interference interrupts a race, the race will be rerun if the software allows it. After the second interference of the same car, the interfering racecar shall be examined to see if there is a potential for continued interference. If it is determined the car could potentially interfere again, the car may be removed from the rest of the race at the coordinators decision. A borrowed car could replace it but it shall not be allowed to enter the second round race-off.

When placing cars on the track, the official should make sure each car is centered on their track with no wheel contact on the rail as to allow each car a low friction start. Care should be taken to make sure all cars start fairly and evenly.

Cars should be kept in a secure and safe location after check-in. Extreme care should be taken so no car is dropped or rolls off a table. Simple tools can be setup on a table to secure cars from rolling off.

Only cars made by children 13 and under may run in the second round race-off.

All decisions of the race officials are final.

HELPFUL HINTS FOR FASTER CARS

This can be a great lesson in physics so we encourage parents to sit down with their kids and search youtube and other sources on ideas for making cars faster. Thousands if not millions of hours have been put into pinewood derbies so there is a lot of information available.

Make sure the car is durable and the axles are glued in with high quality glue like epoxy. There is a lot of force on the wheels and we always have cars witch axles that come out due to insufficient glue. (don't glue your wheels to the axles. Ha!)

Our track is made of wood and does have some imperfections as compared to aluminum tracks. Therefore it is kind of undetermined if perfectly straight wheels or rail riding is better. Take your best guess. Cars of both configurations have won.

Lookup rail riding and do some research, decide if it is something you would like to try.

Canted rear axles are supposed to increase speed though this is tested on aluminum tracks not wood tracks. Look it up and give it a try if you like. If you do this, it may be necessary to shave down the width of the car so the wheels don't rub the body of the car when mounted on the axles. If the wheels don't turn freely, the car won't run well. It may also cause the wheels to exceed the maximum car width. Do some testing!

You definitely want the car to be as heavy as possible but within the specifications. Easy and well worth the time to buy some tungsten putty or lead.

Do some research with your child on the optimal placement of the weight or the center of mass of the car. It is a great science lesson and it will make a huge difference in speed! Hint: you want the highest potential energy without causing the car to be unstable.

Though not as important as other factors, you may want the car to be aerodynamic. Sometime you have to weigh the tradeoffs of cool vs fast.

You should inspect the axles for burrs and remove them with a file or similar tool. Inspecting the wheels and removing any burrs is a great idea also. Just don't make them worse than they were when you started. Ha!

You may want to slightly shape the head of the axles to reduce friction. Do some research!

You may want to polish the car axles. Many people do this with a drill and polish or ultra-fine sand paper. Do some research before trying.

You may want to polish the wheel hubs. Do some research and see if there are tools available to do this.

You definitely want to use a high quality lubricant on the axles. Almost everyone agrees that a type of graphite or moly graphite are the best lubricants for pine cars.

Here is a great educational video for dads and kids.
https://www.youtube.com/watch?v=-RjJtO51ykY
#