Official Pinewood Derby Rules 2018

"OFFICIAL CLASS" RACE RULES

Key Rules to Keep In Mind:

- Official Class cars must be built new for this season and cannot have been raced in previous years *(see section 1a) excluding the unlimited class.*
- Use an official Pinewood Derby kit. *(see section 2a and 2b)*
- Car must weigh no more than 5.0 ounces or 141.7 grams as weighed on the official scale *(see section 4a)*
- Car must have a wheelbase of between 4" and 4-1/2" *(see section 3h)*
- Wheel treads must NOT be modified in any way *(see section 4j)*

1. General

a. Each car entered in the race must be newly built for the current year. Cars from previous scouting years are not permitted except in the "unlimited class" *(see below)*.

b. The car should be substantially built by the participant. Parental supervision and guidance in the construction of the car is encouraged, but the parent SHOULD NOT BUILD THE CAR. Parents and siblings should show off their car building skills by entering their class races.

2. Only Official Pinewood Derby Kits Permitted

a. The body of the car must use the block of wood provided in an official Pinewood Derby Grand Prix kit as its basis.

b. Old style vintage kits with tall skinny wheels are not permitted in "Official Class" races. Cars made with other than official kits will be disqualified or entered in the the unlimited class. (Non-official kits MAY be used in the unlimited class races. See below.)

c. The axles must be attached directly to the original block of wood (see below for axle slot rules).

3. Dimensions and Weight

a. The total weight of the car may not exceed 5 ounces (141.7 grams). Be careful about using scales at the store or Post Office, as they are notoriously inaccurate. Most digital scales are fairly accurate, but only the official scale will be used for the official weigh-in.

b. The maximum width of the car, including wheels, may not exceed 2-3/4 inches.

c. The maximum length of the car may not exceed 7 inches, but there is no minimum except that the wheelbase must be at least 4-1/2".

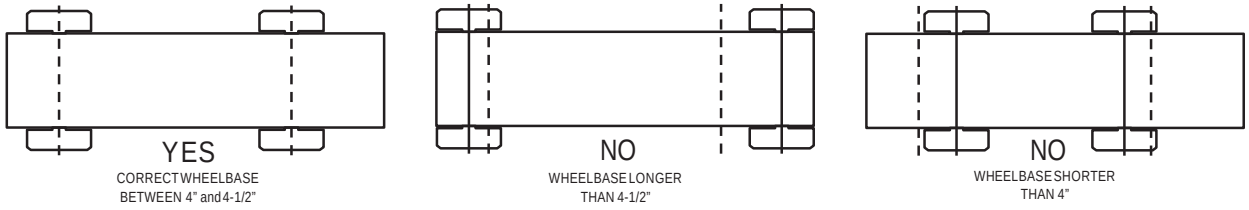
d. The minimum ground clearance from the bottom of the wheels to the bottom of the lowest part of the car other than the wheels must be at least 3/8 of an inch, including weights and accessories.

e. Minimum width between wheels is 1-3/4 inches.

f. The maximum height of the car is 3-1/2 inches including accessories.

g. Other materials such as wood, plastic or metal may be added to the original block of wood from the official kit as long as the car is within the allowed dimensions.

h. If an axle slot is not straight, is broken, defective, or otherwise not usable as determined by the car builder, a new slot or hole may be cut or drilled. The new hole or slots must be spaced apart (or have a wheelbase of) exactly 4-5/16" (4.3125"), but may be between 4" and 4-1/2". Note that too long or too short of a wheelbase is a common cause for car disqualification, so please pay particular attention to this rule. It is acceptable to true the original slots or cut or drill the new slots or holes. If you drill new holes, you should use a saw to cut a slot so that the entire length of the axles can be inspected.



i. Cars must be powered by gravity only! This means no engines, rubber bands, wind up motors, springs as used for propulsion, rocket motors, CO2 cartridges, thermo-nuclear reactors, plasma boosters, rodents on hamster wheels, or any other thrust generation or enhancement devices.

j. Projectiles are not allowed. No part of the car may intentionally detach from the car during the race, come into contact with any other car, or extend outside the allowed dimensions at any time.

k. Movable or liquid weights that shift the center of gravity of the car when the car is tipped or rolled are prohibited (but are allowed in the unlimited class rules).

l. Electronics are allowed as long as they do not provide any propulsion. Examples of acceptable electronics include LEDs, phototransistors, microprocessors, batteries, electromagnetic coils, transistors, relays, transmitters to cause lights or effects, etc. Use electronics to enhance performance or just to make your car look cool. However, you may not use the electronics to create any kind of propulsion or inertial force.

4. Wheels and Axles

a. The original wheel axles (nails) should be placed in the original slots provided in the block of wood in the official kit, if possible (see axle slot rules above under 3h).

b. The car may not be designed so that the wheels ride upon the center guide strip of the track.

c. Loose pieces that are designed to intentionally fall off during a race are not permitted.

d. If the front of the car is designed to gain an unfair advantage by shortening the distance between the start pin and the finish line sensor, or the car design otherwise interferes with a fair start, race officials reserve the right to require the racer to modify the front of the car to eliminate the advantage, or the car will be disqualified.

e. The axles of the car must be from an official Pinewood Derby kit or an official Pinewood Derby wheel replacement kit.

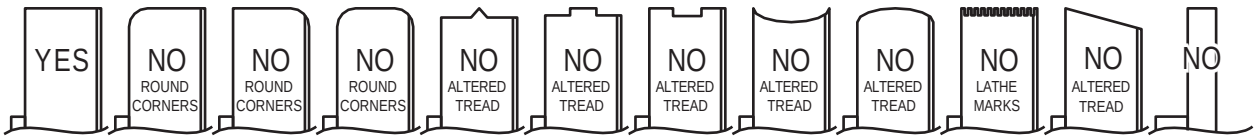
f. Axles must be firmly attached to the car and may not pivot in the body.

g. Axles may be polished, but may not be machined, reduced in diameter more than 1% of their original diameter, or plated or permanently coated with any finish. The heads on the axles may not be modified or reduced except to remove flashing or to polish. Reshaping, tapering, grooving, or otherwise modifying the axles will disqualify the car.

h. The use of a flexible or sprung suspension system of any type is prohibited.

i. The wheels must be from the official Pinewood Derby kit or official Pinewood Derby wheel replacement kit. 12-spoke or 14- spoke wheels marked "OFFICIAL BSA MADE IN USA" are permitted), including official factory-colored plastic wheels. Wheels made after January 2009 are preferred because of the smooth tread that requires no sanding. It is acceptable to use wheels with matching mold numbers from different sets of official Pinewood Derby wheel replacement kits.

j. Wheel treads may not be altered in any way other than removal of defects and polishing (see illustration below). Injection molding defects on wheel treads may be removed by sanding VERY lightly. However, the wheels that have been supplied in the official BSA kits since January 2009 DO NOT REQUIRE SANDING AT ALL because the treads are molded without injection molding pin channels. The wheels may be VERY LIGHTLY sanded, polished, or finished with graphite to enhance smoothness, but they may not reshaped or reformed or rounded off in any way. If excessive sanding or finishing including lathe turning is detected by the presence of turning marks or the slightest rounded-off corners or removal of the tiny bumps at the outside corner of the tread or any other alteration from the appearance of the stock official BSA wheels, the car will be disqualified, no ifs, ands or buts. This is the largest cause of car disqualification, even when caused by a so-called over-eager student who just wanted to sand the wheels and there is no intent to reshape the wheels. Please be warned: DO NOT RESHAPE THE TREAD OF THE WHEELS IN ANY WAY OR YOUR CAR WILL BE DISQUALIFIED REGARDLESS OF INTENT. Below are acceptable and unacceptable wheel profiles:



k. If commercial aftermarket wheels or axles that have been professionally polished, rounded, grooved, lightened, lathed, machined, trimmed, or shaved are detected, the car will be disqualified. You are expected to prepare the wheels and axles yourself.

l. The bore of the wheels may be reamed, coned, and polished, but not otherwise altered. This is not required on wheels made in or after January 2009 because the treads are very near perfect when they come out of the seamless mold.

m. No cars will be accepted into the race where bearings, washers, spacers, or any materials other than dry lubricant or paint are placed between the axle/body assembly and the wheel or are used as part of the wheel assembly.

n. Hubcaps or coverings that conceal the axle end and/or contain a reservoir of lubricant are prohibited.

5. Lubrication

a. Only dry lubricant including graphite powder, Teflon powder, or others, may be used to lubricate wheels. Non-dry lubricants including those with a petroleum, solvent, or non-dry base may attack the plastic wheels and keep them from turning freely, or can damage or contaminate the track, and are not permitted under any circumstances. Do not use oil or grease as a lubricant.

b. Wheels and axles should be lubricated if desired before being inspected and checked in. Race organizers may or may not provide graphite powder lubricant at the race or at check-in or registration dates.

c. Once the car is impounded after the inspection and weigh-in, it may NOT be re-lubricated except when the wheel is damaged or becomes dislodged during a race (see below). This includes on race day when the cars are impounded – you will NOT have a chance to put more dry lubricant on your car's wheels on race day.

d. Dry lubricant must be applied over a trashcan or rag, and spills must be completely cleaned up.

e. Lubricant reservoirs that are built into the car are prohibited.

6. Build Techniques Not Specified

a. Other than the prohibitions and limitations described in this document, it is acceptable for the car to employ any other "tricks" such as making the car ride on 3 wheels, favoring front, mid or rear weighting, streamlining, or any other techniques that the builder feels will make the car faster.

b. The race officials may disqualify any car that in their determination is not in compliance with the spirit of these race rules. You are a Christian, so honesty is very important.

c. In rare circumstances, race officials reserve the right to perform a destructive tear down inspection of wheels, axles, or other systems on any car entered in the Official class. Any such inspections will be performed after all races have been completed, and should a car fail the inspection, the final race results will be adjusted. Race officials will return all parts to the participant, but will not be responsible for restoring the car. Please note that a tear down inspection may affect the ability for the far to compete in the District Finals.

d. Any car not meeting the above criteria can/will be entered in the unlimited class.

"Unlimited Class" RACE RULES

7. There are no rules for the unlimited class race except the following:

   a. There is no minimum ground clearance from the bottom of the wheels to the bottom of the lowest part of the car. In the official race rules, this clearance must be at least 3/8 of an inch, including weights and accessories. However, for unlimited class cars, there is no minimum, but you are responsible for understanding that if your car rubs or touches on the track because of insufficient ground clearance. It is recommended that you adhere to the 3/8" clearance rule unless you are absolutely sure that the bottom of your car will not touch the track.

   b. There are no minimum or maximum wheelbase requirements on unlimited class cars.

   c. Any past years car may be used.

   d. No projectiles are allowed, and no part of the car may intentionally detach from the car during the race or come into contact with any other car.

   e. Other than these rules, anything goes! Think outside the box. Use exotic materials, wheels, axles, bearings, or advanced engineering. Use exotic tools and equipment such as milling machines, lathes, laser cutters, 3D printers, or anything else you can think of to make your car. Put rolling weights or liquid mercury inside the body (as long as it does not create an exposure or spill hazard) or elsewhere to shift the center of gravity or reduce friction. Use a tiny computer and sensors to steer the car and keep it centered on the track so it never touches the center guide rail in order to reduce friction. Think of ways to make the axle bearing surfaces more efficient or even friction-free with magnetic bearings or jewel bearings. Springs can be used for suspension purposes only, but not to aid in driving the wheels or producing thrust in any manner.

The whole point of the "unlimited class" Race is to encourage parents to KEEP THEIR MITTS OFF THEIR CHILD'S CAR and let their kids build their OWN cars with the parent's help.

The parents and siblings should use the unlimited class to show off their technical knowledge and skills and compete directly with other parents and siblings instead of competing vicariously through their child's car. Let your child build his or her own car with your guidance, and then you can build your own unlimited car.

OPERATIONAL RULES FOR ALL CLASSES

8. The Track

Derbywizard is pleased to provide precision anodized aluminum race tracks for Pinewood Derbies. The tracks are designed with strict attention to engineering details. The tracks are tested at the factory and are guaranteed to maintain precision racing surfaces. Considerable emphasis has been placed on ease of assembly.

Lanes: 2,3,4 or 6. Lanes are on 3 1/2" centers.
Length: Standard - 32', 40' or 48'.

a. The racetrack used in the Pinewood Derby is built to the dimensions specified on the Fast Track website.

b. The racetrack to be used is a 3-lane all-aluminum track and is 35 feet in length.

c. The incline from the start line to the level section of the track is approximately 26 degrees, and the cars start at approximately 45" above the ground.

d. The surface and guide rails of the track are smooth aluminum and are cleaned prior to the race.

e. The track is equipped with an electronic starting gate and electronic finish line timer system. Software is used to determine exact heat timing for each car down to five decimal points of a second and the heat and overall finish order.

f. The start line mechanism is comprised of vertical pins that are centered within each lane, and when activated for the start of the race, fall forward so quickly that no car will come into contact once the pins snap down.

g. The finish line detector is comprised of red light beams centered within each lane at the finish line of the track pointing up into light sensors on the underside of the finish line overhead structure. The distance from the starting pin and the finish line beam is identical on each lane.

h. The track will be adjusted to be as level as possible across the width over the entire track length.

i. Joints between sections of the track will be adjusted to provide a smooth transition by the car.

j. Every attempt shall be made to insure that all running lanes of the track are equal, but each car runs at least once on each lane to make sure that all effects of any minor differences in the lanes is averaged out.

k. Race standings and results are displayed on a video projector and screen for all participants and spectators to see.

l. Race officials will strive to make the race as absolutely fair as possible.

m. Our timers display finish times to within 0.001 of a second. There are many elements that go into determining a timer's accuracy. Two important factors are sensor placement and sensor size. The sensors rest under the lanes, and as the car passes over the sensor, it breaks the beam from the source above. This causes the timer to display the car's result.

n. The smaller the sensor, the greater the accuracy. At less than $^1/_8$" in diameter, our sensors are very precise. Our timers always designate a tie in a race if two cars are closer than 0.0002 of a second. We feel this is the highest degree of accuracy that can be reasonably achieved outside of a controlled environment. Scanning the sensors faster than this tends to give false results in the real world of pinewood derby racing. Also, you should create a tie, if the cars are too close to safely determine a clear winner. It is better to have a tie than report the wrong car winning.

9. Race Procedure

a. You are responsible for knowing when your car must be registered and paying any registration fees.

b. Only currently registered participants may enter cars in the Official Class race.

c. Caravan students should be dressed in a neat, clean, uniform at the race event. However, a participant will not be disqualified from racing if he or she is not wearing a uniform.

d. All spectators must stay back from the track and not crowd the barricades. Spectators must NEVER STEP OVER THE TRACK for any reason…WALK AROUND THE TRACK instead!

e. Spectators must keep all food and beverages far away from the track.

f. Race officials will establish and announce the registration deadline time for the race. No registrations will be accepted after the deadline. participants in line for registration before the deadline will be accepted. Any participant who shows up after registration has closed will NOT BE ABLE TO RACE. If you have a scheduling conflict, every effort will be made to accommodate you can participate in the race.

g. After the participant has registered and paid any applicable registration fee, his or her car will be weighed, measured, and inspected to ensure compliance with the official rules.

h. Only an officially designated scale will be used to weigh cars. Cars will not be accepted if their weight exceeds five (5) ounces by even the smallest resolution of the balance. Scales vary widely, especially the scales at the Post Office, so be prepared to adjust weight of your car up or down at the time of inspection. Race officials will have an official regulation 5 ounce reference weight on hand to calibrate and verify the official scale.

i. A wood, plastic, or metal jig will be used to determine if the car complies with the dimension limitations (length, width, height, wheelbase, and ground clearance).

j. A participant whose car fails any part of the inspection will be given the opportunity to make adjustments to the car. Cars will be re-weighed, measured, and inspected until they comply or until the scheduled race starting time. If you are unable to make your car comply with the inspection requirements before the start of the race, your car will not be allowed to run.

k. After the car has passed inspection, it will be impounded and taken by a race official to the staging area to await the race. Cars may not be handled by the owner after inspection until after all racing has been completed.

l. Cars will be handled only by the race officials (and the car owner only if the owner is making an emergency repair).

m. No additional lubrication may be applied to the car after passing inspection or during the race, so be sure to apply lubrication to your wheels and axles before submitting your car for inspection.

n. Bye runs may be used when there is no opponent because of an uneven number of people participating. A bye run is defined as a race with no opponent. Bye runs will be kept to a minimum as calculated by the race management software.

o. Each heat will begin with a race official positioning the cars on the track.

p. Each car will run once in each of the three lanes in a random schedule. If you don't see your car running for a while, rest assured it will eventually run.

q. Race officials will return the cars from the finish line to the staging area between races. Spectators should not touch the cars at any time during the race.

r. In the event of a breakdown of a car during the race, the participant will be allowed to repair the car. Only the damaged portion of the car may be modified. The student must do the work with assistance from his/her parent or guardian. Race officials shall re-inspect any car that is serviced during the race. The Race officials may choose to continue with other race heats in order to avoid long delays in the race. The damaged car must be raced before the race proceeds to the next level of elimination.

s. In the event of a breakdown of the track, electronic finishing or ordering system, or race management software, or in the event of an error in set up of the cars (car jumps from the lane, car positioned in wrong lane, car positioned backwards in the lane, etc.), the heat affected by the breakdown may be re-run and the original result, if any, will not be factored into the final results.

t. Each car will run one time in each of the three lanes. Each car's time from each heat is added together by the race software, and the car with the lowest combined time is the winning car. All cars are ranked for standings by their combined times.

u. There are no elimination rounds or heats. Every car runs once in each lane.

v. If a participant needs to leave the race before all heats have been completed, the participant must leave the car in the care of the race officials. The car will be returned to the participant after the race or by arrangement.

(End)