



## 2022 Pinewood Derby Rules

Pinewood Derby is an opportunity to work with your son on the design, construction and racing of cars. The experience of working together is the most important part of this event, not winning. Please let the boys plan and build the cars themselves with your assistance and help on dangerous actions (e.g. power tools). Boys must build a new car each year, rather than re-running a car from prior year.

To be fair, and clear, the following rules have been created for cars other than those created exclusively for the creative design portion of our Pinewood Derby:

### **Pinewood Derby Car Dimensions:**

- The overall length of the car shall not exceed 7 inches. Note that this is the length of the wood block, so do not attach anything that extends beyond the front or rear (including underside weights) without shortening the block to accommodate.
- The overall width of the car shall not exceed 2 3/4 inches.
- The car must have 1 3/4" clearance between the wheels.
- The car must have 3/8" clearance underneath the body so it does not rub on the track.

### **Derby Car Weight:**

- The car weight shall not exceed 5.00 ounces.
- The weight registered by a race official on the official race scale that is used at car check-in shall be considered final. At check-in, time permitting, you will be allowed to tweak your car to maximize your car's weight. Consider bringing a variety of weights with you and an adhesive to dial your weight in perfectly.

### **Wood, Wheels and Axles:**

- The official pine wood block must be used. The block may be shaped in any way that is desired, including detaching and re-attaching portions of the block, subject to the car dimension limitations. The substantial majority of the car's structure must be made using the wood block.
- Official BSA wheels from the original kit must be used. Except as explicitly noted in these rules, the wheels may not be cut, drilled, lathed, beveled or subjected any other machine modifications. Except as explicitly noted in these rules, the wheels may specifically not be modified in any way with the intent of reducing their weight. You may remove the seams and imperfections from the wheels using basic derby hand tools for purposes of truing the roundness of the wheels.
- Only the nails that come in the kit may be used for axles. They may be altered with files and sandpaper. Use of a drill, but not a lathe, is allowed. Axles may be polished and lubricated (dry graphite only). In keeping with Pack 39 historical allowances, Axles may also be bent and rail riding (deliberately aligning car's wheels so that it rides against the center rail) is permitted.
- The car can have 4 or 3 wheels, in keeping with the Pack 39 historical allowances. To the extent a car is intended to ride on 3 wheels, the 4<sup>th</sup> wheel may still be attached as a means to keep the car aligned on the track and in such case the 4<sup>th</sup> non-touching wheel can be modified to reduce weight, so long as such fourth wheel is glued to the axle or car so that it is not able to spin.

### **Car Modifications Not Allowed:**

- Wheel bearings, washers or bushings are prohibited.
- The car must not ride on any type of springs.
- No starting devices. The car must be freewheeling (which, among other things, means that it may not rely on any means of propulsion other than gravity).
- No loose material of any kind, such as lead shot, may be used (unless firmly glued / epoxied in place).

**Kits and Parts:**

- Do not buy pre-made cars or prepared axels or wheels. Only the wood, axles and wheels in the kit provided to the scout may be used.
- Attachments for decorative or functional purposes are fine, but be careful not to foul the track.
- Attachment of weight is encouraged to maximize your car's weight up to the limit as discussed above.
- Nothing jagged or sharp, please.
- No magnets, sticky substances, wet glue or paint.

**Inspection:**

Each car must pass inspection before it may compete – cars that do not pass inspection will still be eligible for Creative Design Awards even if they cannot race. The Inspectors will disqualify any car not meeting these rules. Certain issues may result in complete disqualification (blatant disregard/cheating) and others may be remediated (such as weight). Any adult or scout may appeal the findings of the Inspectors to the Committee Chair-person, whose decision is final. After a car is checked in and accepted by race officials, only race officials may handle the cars until after all racing is complete. You may not apply additional lubricant after your car has been checked in. Cars may be reclassified or disqualified if they are determined by the race officials to not meet these requirements.

**Repairs:**

Any car losing wheels or any part that prevents it from running cannot be repaired after the inspection and weigh in. EXCEPTION: Race officials may authorize repairs, usually when damage is caused by collision with another vehicle or object. The Cub Scout is in charge of all car repairs. Guidance is allowed and encouraged. If the car cannot be repaired before it's next race starts, the car will be disqualified from the race.

**Behavior:**

GOOD SPORTSMANSHIP AND BEHAVIOR IS EXPECTED.

**Racing:**

- For 2021, Pack 39 used an aluminum track with a spring-loaded start gate (cylindrical rods extending up through the center of the rail) which the cars rest against on an incline. When the start gate is released by a race official, it rotates down extremely fast, allowing the cars to roll forward. Timing results are determined using an electric eye in the center of each lane at the finish line which registers each car's finish and transmits the results to pinewood-derby specific computer software.
- Cars are stopped at the bottom of the track using a combination of a segment of track with a high, foam-coated center, which causes the cars to bottom out and slow the cars down, and ultimately a pillow. The vast majority of cars go fast enough to collide with the pillow. A scout should take care to design their car such that it can withstand these means of stopping the cars without damage.
- Pinewood-derby specific computer software is used to determine the scout racing order and to record and tabulate results. Logistics and technology permitting, race times will be projected and viewable by the audience on a projection screen and the track finish line.
- Each qualifying car is eligible to race in two events: (i) competition by scout rank (e.g., Tiger, Wolf, etc.), and (ii) overall Pack 39 competition. The scout rank competition will be held first, with the top 3 cars for each scout rank then being permitted to race in the overall Pack 39 competition. Times from the scout rank heat have no bearing on the determination of overall Pack 39 winner.
- For each race, each car will race down each lane of the track one time (e.g., for the scout rank race, a car will go down the track 4 times; once in each lane). For 2021, the Pack 39 track had 4 lanes. For each competition, each scout's final result is determined by adding the aggregate time result from each lane.
- If during a single pass, a car leaves its lane and race officials cannot conclude that the lane departure was caused by a design issue with the car, the race officials may allow the pass to be redone with each car in the same lane. Each car will be permitted only one re-do pass per competition. Race officials may disqualify a car leaving its lane multiple times in order to protect other cars.
- Pack 39 intends to use the same track, software and set-up for 2022.
- Cars are also eligible for a variety of Creative Design Awards voted on by the scouts.

**These rules are subject to change by race officials to accommodate any race-day logistics or difficulties (e.g. normal scale fails; computer or timer issues) so long as any changes apply equally to all competitors.**