



# PINEWOOD DERBY

## OFFICIAL RULES

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# 1 GENERAL RULES

## 1.1 Qualification

All registered Pack 104 Cub Scouts may design, build and enter cars. Siblings, parents and other family members of registered Scouts may also enter and compete in a separate category.

## 1.2 Essential Materials

All cars entered shall be constructed from the official BSA Pinewood Derby Car Kit (referred to below as "the kit") as distributed by the Boy Scouts of America Supply Division. **The use of pre-shaped car bodies, machined wheels or axles acquired from the Internet or other sources is NOT allowed.**

**Race Competition:** Cub Scouts will compete with others Cub Scouts in a series of race heats. Non-Scouts will compete with other non-Scouts in a separate series of race heats.

**Design Competition:** All cars will be automatically placed on display, however, only registered Pack 104 Cub Scouts are eligible to compete for awards in the design categories.

## 1.3 Attendance

The Cub Scout SHOULD enter his own car. This means that the Cub Scout should be present at "Inspection and Registration" to enter his car into competition. If the Cub is unable to be present, then the Cub may select another Cub Scout to act as his proxy for "Inspection and Registration" or the entire Pinewood Derby event.

## 1.4 "New Work"

**ALL work (including improvements to wheels, axles, and car body) must be done by the scout and the parent (Akalea.)** The intent is to have the scout build as much of the car as reasonably and safely as possible. Construction of ALL entries MUST have begun DURING the current Scouting year (same as the school year). Last (or previous) Scouting year's cars are not acceptable.

## 1.5 Single Entry per Person

Only one car may be registered per person. A Cub may not enter separate cars in the race and design competitions.

## 1.6 Inspection and Registration

Each car must pass a technical inspection before it may compete. Technical inspection and registration of cars will occur at dates, times, and locations specified by the Pack 104 Pinewood Derby organizing committee (also referred to as "the committee"). All registration and inspection will take place prior to the date of the event. All competitors will be notified of the registration details prior to the event by e-mail and/or by a posting on the Pack 104 website, <http://elcerritoscouting.org/>.

## 1.7 Late Registration and Inspection

All registrations must be completed by the deadline specified. Late registrations will not be accepted. No exceptions. **There will be no provisions for registration and inspection on the day of the event.**

## 1.8 Failure to Pass Inspection

The Pack 104 Pinewood Derby organizing committee shall disqualify cars that do not meet the rules as described herein. If a car does not pass inspection, the owner will be informed of the reason his car did not pass. Cars which fail the initial inspection may either be modified at the registration site or taken home for modifications and brought back for final inspection and registration no later than the deadline specified by the Event Committee.

## 1.9 Impound

No car may be altered in any way after it has been registered and inspected. After a car completes registration it will be impounded and stored by the committee until competitions begin. Cub Scouts will have an opportunity to lubricate their cars one last time at the registration site before the car is impounded. Neither Cub Scouts nor their adult helpers will have access to cars after they have been impounded.

### 1.10 Car Design Rules Interpretation

Interpretations of the rules described in sections 1.1 through 1.9, and sections 2.6 through 2.10, are at the sole discretion of the Pack 104 Pinewood Derby organizing committee representative(s) present during the Registration and Inspection process.

### 1.11 Race-Day Rules Interpretation

On Race-Day, the Cub Scout must make all questions of rules interpretations and procedures to the Pack 104 Pinewood Derby competition officials promptly. Decisions of competition officials on questions of rules interpretation and/or procedures may be appealed to the Pack 104 Pinewood Derby Chairperson. All decisions of the Pack 104 Pinewood Derby Chairperson are final. Decisions of competition officials on *questions of fact* (i.e. the result of a specific race) may not be appealed beyond the Trackmaster and/or finish line judges. **Note:** Un-sportsmanlike conduct by any participant or spectator will be grounds for expulsion from the competition and/or the race area.

### 1.12 Changes to the Rules

The Pack 104 Pinewood Derby organizing committee, at its sole discretion, reserves the right to modify these rules to ensure smooth conduct of the event.

## 2 CUB SCOUT CAR DESIGN STANDARDS

### 2.1 Material

Race cars shall be constructed for this event from the parts contained in the official BSA Pinewood Derby Car Kit (referred to below as "the kit"). Materials from the kit may be supplemented but not replaced, except as specified below.

**The use of pre-shaped car bodies, machined wheels or axles acquired from the Internet or other sources is NOT allowed.**

### 2.2 Weight

Racecars may weigh no more than five (5) ounces (total weight) as determined on the official scales during the pre-race check-in.

### 2.3 Wheels and Axles

The car shall roll on the wheels from the kit or identical replacement wheels purchased from an official BSA Scout Shop. The wheels shall turn about the axle nails from the kit or axle nails that came with identical replacement wheels. The axle nails shall be firmly affixed to the wood of the car body. The Cub may cut new axle slots (or drill new axle holes) in the original block from the kit. The original axle-to-axle spacing of 4.40" ( $\pm 0.125"$  ( $1/8$ )) must, however, be maintained. It must be obvious to the judges that the original groove spacing, wheels, and the nails from the kit are being used.

Axle nails must be mounted parallel to the track surface. Tilted or canted axles that cause the car to run on the edge of the wheels are not allowed. Wheels must run flat on the track surface. At least three wheels must be in contact with the track surface at all times as the car rolls.

### 2.4 Size

Cars may be no longer than 7.00 inches with a maximum width of 2.75 ( $2\frac{3}{4}$ ) inches and a maximum height of 4.00 inches as determined by the official gages during the Registration and Inspection process. Underside clearance of at least 0.375 ( $3/8$ ) inches and inside wheel to wheel clearance of at least 1.75 ( $1\frac{3}{4}$ ) inches is required to allow the car to clear the racetrack's center guide-strip. Adequate clearance is the responsibility of the racecar builder.

**IMPORTANT NOTE:** Wood blocks supplied in the official kits are often slightly longer than 7.00 inches to allow for final shaping and sanding. Be sure to check the final dimensions of your car carefully. Do not assume that the dimensions of the block supplied in the kit will automatically be legal.

**2.5 Weights and Attachment**

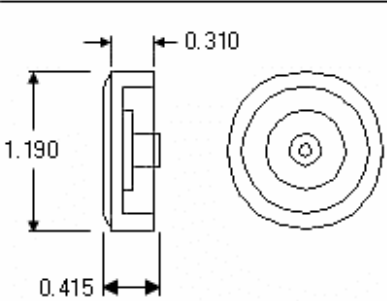
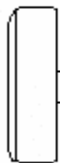
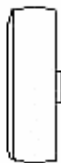
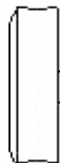

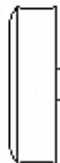


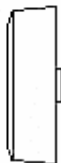
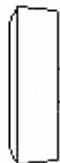

Weight may be added to the car and will be considered part of the car for purposes of all measurements. "Weight" is considered to be any material on the car that is not provided in the kit. All weight must be securely fastened to the car, e.g. by permanent glue, nails or screws, but not by "sticky substances", e.g. tape, or tack spray. Weights shall be passive, i.e. non-moveable, non-magnetic, non-electric, non-sticky, etc.

**2.6 Wheel Treatment**

**NOTE: This rule does not apply to cars entered ONLY in the Design Competition.** Wheel treatment (hub and tread smoothing and polishing) may not result in substantial removal of mass or in reducing the wheel width or diameter from the original kit wheels. Some of the original "tread marks" on the wheel face must remain intact, i.e. apparent to the inspector. ("Tread marks" are the small zigzag lines visible at the very outer edges of the wheel when it is viewed parallel to the axle line.) Wheels may not be machined or sanded to a beveled condition. At least 80% of the original wheel width must contact with the track surface, and the portion of the wheel surface that contacts the track must remain parallel to the axle

The hub through which the axle nail passes cannot be shortened. The area between the hub and contact surface of the wheel cannot be drilled or otherwise opened.

Examples of wheel treatments NOT allowed as specified in 3.2.2.

 <p>STANDARD WHEEL</p>	 <p>ROUNDED WHEEL</p>	 <p>"V" WHEEL</p>	 <p>CUPPED WHEEL</p>	 <p>REDUCED DIAMETER</p>	
 <p>"H" WHEEL</p>	 <p>RIB WHEEL</p>	 <p>SPEED WHEEL</p>	 <p>SLANTED OUT</p>	 <p>SLANTED IN</p>	 <p>KNIFE EDGE</p>

**2.7 Unacceptable Construction**

**NOTE: This rule does not apply to cars entered ONLY in the Design competition.** Hubcaps, washers, inserts, sleeves, and bearings may NOT be used in conjunction with the wheels and/or axles.

**2.8 Gravity Powered**

**NOTE: This rule does not apply to cars entered ONLY in the Design competition.** The racecar may not be constructed or treated in such a way that the track's starting mechanism imparts momentum to the car. For instance, this provision disqualifies cars with sticky substances on the front of the car and protrusions, which may catch on the starting pin. No portion of the car may protrude in front of the starting pin when the car is placed on the starting line.

## **2.9 Lubricants**

Only dry lubricants such as graphite or powdered Teflon "white lube" will be allowed for lubricating the wheels. **Lubricants may not foul the track.**

## **2.10 Exceptions for DESIGN COMPETITION Cars Only**

Technical Standards from the above rules (except as noted) apply to all design-only cars with the following exceptions: The block of wood from the kit, or portions thereof, must be *prominent* in the design. "ADD-ONS" are not restricted. Wheels must be from the kit (or official BSA replacement wheels) but the axle nails from the kit need not be used.

# **3 CONDUCT OF THE RACE AND DESIGN COMPETITIONS**

## **3.1 The Design Competition**

Cars will be displayed for judging side-by-side in assigned spaces on display tables prior to the Race Competition. Cars should be judged based on the skill displayed in each car's unique design. Careful consideration should be given to the creativity expressed in the car's appearance and the technical merit expressed in the car's design. Every Cub Scout that enters this event and/or the Race Competition will be recognized with a Pinewood Derby event patch.

### **3.1.1 Design Competition Judging**

Scouts will vote, by way of ballot for their favorite car in each of the Design Competition categories.

### **3.1.2 Design Competition Awards**

All cars will be judged together for all of the categories listed below. When completing their ballots, Scouts will use their discretion on which category they think the cars best fit. There will be no judging by Rank. A certificate will be awarded to the car which receives the most votes in each category. The number of awards and categories are subject to change as determined by the race committee. The possible categories are:

- |                            |                    |
|----------------------------|--------------------|
| 1. Best Scout Spirit       | 5. Funniest Car    |
| 2. Best Design             | 6. Most Futuristic |
| 3. Best Detailing/Painting | 7. Most Original   |
| 4. Best Use of Accessories | 8. Most Realistic  |

## **3.2 The Race Competition**

The Race Competition will consist of several race heats, with each competing car racing one time on each lane of the track. Track officials are responsible for the proper conduct of the races.

### **3.2.1 Car Handling Responsibility**

The Pack 104 Pinewood Derby organizing committee will make sure that all impounded cars are transported to the Race Competition area after voting in the Design Competition has concluded. Designated members of the "Pit Crew" will stage cars on the tracks.

### **3.2.2 Race Heats**

Competitors for each race heat will be automatically assigned by the race competition software. Cars will not necessarily race against the same competitor cars from heat to heat. Heats are arranged such that each Scout's car will race one time on each lane of the track. A car's times from each of the lanes will be averaged to determine that car's Overall Time. This race format has been selected in order to minimize the effect of any defects or idiosyncrasies that may be present in any given lane.

### **3.2.3 Car Leaves Lane**

If, during a race heat, a car leaves its lane but proceeds down the track in a manner that does not interfere with its opponent, then the race will be called normally. If the car leaves its lane and interferes with another car, the race will be re-staged and re-run. If the same car again leaves its lane and interferes with another car, that car will be judged ineligible for that race heat, and the race heat will be re-staged and re-run without that car.

### **3.2.4 Car Leaves Track**

If, during a race heat, a car leaves the track without interfering with its opponent, it shall be considered to have ended its heat at that point.

### **3.2.5 Make-Up Heats**

If time permits, the Trackmaster may, at his or her discretion, order that make-up heats be run at the conclusion of all regular heats to give cars that left the lane/track (or for some other reason did not make it to the finish line) in the regular heats an opportunity to complete a heat on the lane(s) for which they did not previously record a time.

### **3.2.6 Car Repair (Without Fault)**

If, during the race, a wheel falls off or the car becomes otherwise damaged, then the SCOUT may, to the best of his ability perform repairs with the assistance of his adult partner or a member of the "Pit Crew". In order not to unduly delay the event, a maximum time of five minutes will be allowed to complete all repairs to a car. If repairs cannot be completed within the five minutes allowed, the car will be retired from racing and the heat will continue with the remaining cars. Tools and supplies required to complete repairs are the responsibility of the entrant. Please note that the Pack 104 Pinewood Derby organizing committee will not provide any tools or supplies at the event site.

### **3.2.7 Car Repair (With Fault)**

If a car is damaged due to track fault, or damage caused by another car or person, then the Trackmaster, at his sole discretion, may allow additional repair assistance to the Cub. The repair time limit described in section 3.2.5 will apply.

### **3.2.8 Track Fault**

If a car leaves its lane, at his sole discretion, the Trackmaster may inspect the track and, if a track fault is found which probably caused the initial violation, the Trackmaster may order the race heat to be rerun after the track is repaired.

### **3.2.9 The Race Area**

Only race officials and members of the "Pit Crew" may enter the track area. This rule will be strictly enforced.

### **3.2.10 Rewards and Recognition**

The most important values in the Pinewood Derby competition are parent/son participation, good sportsmanship, and learning how to follow rules. Cubs will be recognized as follows:

- a) Every participating Cub Scout will receive a Pinewood Derby patch.
- b) Awards will be granted to the Scouts whose cars have the best Overall Times at each Cub Scout rank level.
- c) First, second and third place trophies will be awarded to the Scouts whose cars have the best Overall Times in the overall Race Competition.

## **4 THE RACING ENVIRONMENT**

### **4.1 Track Slope**

The track's slope shall decrease from approximately 30-45 degrees at the starting line to approximately 0 degrees at the finish line.

### **4.2 Lanes**

Each lane on both tracks will consist of a straight, smooth center guide-strip approximately 1.50 (1½) inches, but less than 1.75 (1¾) inches, wide and approximately 0.25 (¼) inches, but less than 0.375 (¾) inches thick, centered on a smooth surface no less than 4 inches wide. Each racecar shall straddle such a strip during its heats.

### **4.3 Starting Mechanism**

The "starting lines" shall consist of vertical pins of approximately 0.25 (¼) inch diameter, extending approximately 1 inch above the track surface and approximately centered in the each lane.

#### **4.4 Finish Line Sensor Location**

Both tracks will utilize electronic "finish line sensors" that shall be in alignment with the corresponding starting line pin and be approximately centered in its lane.

#### **4.5 Finish Line Judging**

In the case of mechanical difficulties, an impartial finish line judge shall be at station to observe each heat. Heat finish judging will be determined by the finish line sensor, but may be challenged by the finish line judge. If the track's electronic finish line sensor's result is challenged by the finish line judges, the race will be re-staged and re-run.

#### **4.6 Finish Line Judge Backup**

Finish line judges may temporarily excuse themselves if they know that one of the heat contestants is a son or relative. Backup finish line judges shall be available in case a judge needs to be excused for any reason.

#### **4.7 The "Big Board"**

The electronic finish line sensors will be connected to a computer that will collect and display results on a large projection screen. We will be using proven, commercially available derby software to manage the race results.

#### **4.8 Finish Line Electronics Sensitivity**

Track finish line electronics must trigger correctly if a lead pencil is passed 0.75 (¾) inches above the track surface at a speed of 15 feet per second.

#### **4.9 Finish Line Clearance**

Track finish line electronics and other track accessories must be no closer than 4.50 inches above the track.

## **5 SPECIAL NOTES TO ALL CONCERNED**

The Pinewood Derby is a parent/adult partner and Cub event, and is recommended as such by the Boy Scouts of America. It is strongly suggested that each adult partner emphasize the following with your Scout:

The three things the Pinewood Derby requires each participant to learn are:

1) **Learn the craft skills necessary to build a car.**

The first thing to remember about sportsmanship is that everyone's skills are a little different. You may be good at something like singing or drawing, but not as good at something else like basketball or computers. Parents have different skill levels, too. This doesn't mean that you are a good person one time and not good another time. Remember, you and your friends are individual first and car builders second.

2) **Rules must be followed.**

Without rules, there would be no Pinewood Derby. You will never know if you are really good at doing something unless you follow the rules. This is often called being honest.

3) **Behavior and sportsmanship.**

There are winners and losers in every competition. You accept this when you choose to compete. There may be times when you win and feel happy, and times when you lose and feel unhappy. Being a winner is easy, and losing is sometimes hard. If you win, you must not brag or gloat. If you lose, you must not feel jealous or bitter. To be a good sportsman, you must be able to say, "I did my best" and be satisfied with the results. You must also be able to appreciate and feel happy for someone else when they run a good race or build a neat car.

*Special Acknowledgement: These Rules were largely adapted for Pack 104's use from the Blackhawk 500 "Official Event Rules and Procedures"*