



OFFICIAL PACK 77 PINWOOD DERBY EVENT RULES AND PROCEDURES

Last Updated for Saturday, February 1, 2020 Race Day
Cale Elementary School Cafeteria

Table of Contents:

- I. **RACE-DAY OFFICIALS**
Information on the race-day officials and their responsibilities.
- II. **GENERAL: (Applies to all Race Events)**
Rules about entering your car.
- III. **CUB SCOUT RACE CAR DESIGN STANDARDS**
Rules about building your car.
- IV. **CONDUCT OF THE RACES**
Rules that will be used during the races
- V. **THE RACING ENVIRONMENT**
Things you need to know about the track, timers, and scoring
- VI. **ALL-COMERS RACE CAR DESIGN STANDARDS**
A race for Leaders, Parents, Guardians, and Siblings
- VII. **SPECIAL NOTE TO ALL CONCERNED**
Some notes on Sportsmanship!



I. RACE-DAY OFFICIALS

The following Race Officials (listed with their associated responsibilities) will be determined and announced prior to the race and are referenced throughout this rule document:

1. **Trackmaster:** Responsible for maintaining the race track in good working order during the race and for ensuring the safety of all racers. Also responsible for rulings on damaged cars, interrupted race heats, and other unusual events.
2. **Inspection Committee Judge(s):** Responsible for registering all cars and ensuring that all cars meet the race rules and design requirements.
3. **On-Deck Crew Officials:** Helps each scout find their car, gets the scouts seated in the correct order in the on-deck area, and helps the scouts place their cars on the track. Responsible for enforcing car impound rules.
4. **Pit Crew Officials:** Responsible for assisting with any repairs that may be necessary during a race, with repair authorization of the Trackmaster.
5. **Finish Line Judge:** Responsible for monitoring the finish line sensors for correctness (note: may be augmented or replaced by video recording equipment).
6. **Pinewood Derby Chair:** Responsible for judging of appeals or rules interpretation. Note that all rulings of the Pinewood Derby Chair are considered final.

II. GENERAL RULES: (Applies to all Race Events)

G-1. Qualification and Competitor Categories: There are typically a minimum of five race categories divided by den ranks and All-Comers. All registered Pack 77 Lions, Tigers, Wolves, Bears, and Webelo Scouts may design, build and enter cars that are eligible to participate in their den category, respectively. Small dens may be combined (e.g. Tiger/Wolf) into a single category if members agree to balance numbers and ensure competition. Leaders, parents, grandparents, guardians, and siblings of Cub Scouts registered in Pack 77 may design and build new or borrow previously built cars that are eligible and participate in the All-Comers category. Scouts outside of Pack 77 (e.g. BSA, friends/classmates in other Packs, etc.) are also welcome to race with cars that are eligible by Pack 77 standards. The All-Comers category may be further divided to include BSA, LEGO (for younger siblings), etc. as interest/competition warrants.

G-2. Essential Materials: All cars entered shall be constructed from the "Official Grand Prix Pinewood Derby Kit" (referred to below as the kit) as distributed at the December Pack meeting. Additional kits may be purchased from the Scout Shop, Waynesboro, VA (Kits may be purchased elsewhere if they are of the exact type manufactured by the BSA as specified above.) Note that the "All-Comers" racers are exempt from new or racer required construction, but must meet all other dimensional and weight restrictions. If an All-Comer LEGO category is established, components containing wheels, base, and weights from Pinewood Pro are permitted.



G-3. Attendance: The Cub Scout MUST enter his/her own car. This means that the Cub Scout must be present at "Inspection and Registration" to enter his/her car into competition. Any exceptions due to special circumstances must be approved by the Pinewood Derby Chair prior to race-day.

G-4. Construction Effort: SCOUTS should work with their parents or guardians to design and build their cars. Except for hand cutting or using power tools, Lion, Tiger, Wolf, and Bear Scouts are expected to complete (with supervision and assistance as needed) all steps necessary to complete their car. Webelos are expected to complete ALL steps in the construction of the car with adult safety-related supervision only. To race in the den category, construction of all SCOUT entries must have begun after last year's Pack 77 Pinewood Derby Race. All-Comer entries may be constructed by someone other than the racer at any time but must meet design requirements.

G-5. Single Entry per Person: Only one car may be registered by any Scout, leader, parent, guardian, or sibling in the Pinewood Derby (i.e. Scouts may not enter a car in the both the den and the All-Comers race).

G-6. Inspection and Registration: Each car must pass a technical inspection before it may compete. Technical inspection and registration of cars occurs on race day from 11:00 a.m. to 2:00 p.m.

G-7. Late Registration and Inspection: Cars MAY NOT be registered after 2:00 p.m. No exceptions.

G-8. Failure to Pass Inspection: The Inspection Committee Judge(s) shall disqualify cars which do not meet the rules as described herein. If a car does not pass inspection, the owner will be informed of the reason his/her car did not pass. Cars which fail the initial inspection may be modified and inspected again until they pass inspection or until 2:00 p.m.

G-9. Impound: No car may be altered in any way after it has been registered. After a car passes registration, it will be stored by the On-Deck Crew Officials until race time. Note that no scouts are allowed to touch or handle any cars in the impound area except for transferring their own car to and from the race track when instructed to do so by the On-Deck Crew Officials.

G-10. Car Design Rules Interpretation: Interpretation of the rules described in G1 through G-9, and T-1 thru T-10 are at the sole discretion of the Inspection Committee Judge(s) present during the Registration and Inspection process.

G11. Race-Day Rules Interpretation: On Race-Day, the racer must make all questions of rules interpretations and procedures to the Pinewood Derby Chair or Race Officials promptly. Decisions of Race Officials on questions of rules interpretations and procedure may be appealed to the Pinewood Derby Chair. All decisions of the Pinewood Derby Chair are final. Decisions of Race Officials on questions of fact (i.e. the result of a specific race) may not be appealed beyond the Trackmaster and/or Finish Line Judge(s).

Note: Unsportsmanlike conduct by any participant or spectator will be grounds for expulsion from the competition and/or the race area.



III. CUB SCOUT RACE CAR DESIGN STANDARDS

T-1. Material: Race cars shall be constructed for this event from the parts contained in the Official Grand Prix Pinewood Derby Kit (referred to below as the kit) as sold by the Scout Shop, Waynesboro, VA. Materials from the kit may be supplemented but not replaced (except for replacement of BSA wheels with BSA colored wheels). When offered, All-comers racing with a LEGO derby car shall use Pinewood Pro's PRO wheel – axle assembly or chassis components available at <https://www.amazon.com/> or <https://www.pinewoodpro.com/>.

T-2. Weight: Race cars may weigh no more than five (5.0) ounces (total weight) as determined on the official scales during the pre-race check-in.

T-3. Wheels and Axles: The car shall roll on official BSA wheels from the kit or official BSA colored wheels from the Scout Shop. The wheels shall turn about the axle nails from the kit. The axle nails shall be firmly affixed to the wood of the car body, and MUST be placed in the original 'axle grooves' in the supplied wooden block. When offered, All-comers racing with a LEGO derby car shall use Pinewood Pro's PRO wheel – axle assembly or chassis components. It must be obvious to the Inspection Committee Judge(s) that the specified materials are being used.

T-4. Size: Race cars may be no longer than 7-3/8 (7.375) inches, nor wider than 2-7/8 (2.875) inches, as determined by the official gauges during the Registration and Inspection. Underside clearance of at least 3/8 (0.375) inches and inside wheel to wheel clearance of at least 1-3/4 (1.75) inches is recommended, so that the car will run on the race track. In order to pass under the electronic sensor, no part of the car may protrude more than 3.0 inches above the surface of the track. Adequate clearance is the responsibility of the race car builder. Note that the height and width requirements are absolute to ensure no interference with the finish line sensor and cars in adjacent lanes and cannot be violated under any circumstances. Any violations of the length requirement may be appealed to the Pinewood Derby Chair who may permit the car to race if the extra length is deemed to not give a competitive advantage and further will not cause interference or damage to the track.

T-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, etc.

T-6. Wheel Treatment: Wheel treatment (hub and tread smoothing and polishing) may not result in substantial removal of mass nor in reducing the wheel width or track contact area from the original kit wheels. Some of the original "tread marks" on the wheel face must remain intact, i.e. apparent to the Inspection Committee Judge(s). Wheels may not be machined to a beveled condition and the portion of the wheel surface that contacts the track must not be reduced and must remain parallel to the axle.



T-7. Unacceptable Construction: The following may NOT be used in conjunction with the wheels or axles: hubcaps, washers, inserts, sleeves, or bearings.

T-8. Gravity /Motor Powered: The race car 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 motors or electrical/mechanical movement aids of any sort are permitted.

T-9. Lubricants: Only dry lubricants such as black graphite or powdered Teflon "white lube" will be allowed for lubricating the wheels. *Lubricants may not foul the track.* There will be a lubrication table set up at the race. Note that the use of "white lube" is NOT recommended as it will slow the car. No "wet" lubricants such as oils, non-stick sprays, WD-40 are allowed.

T-10. Start Pin Clearance: The front center of the car must contact the closest edge of the lane start pin on the track, and no parts of the car may extend past this contact point in such a way as to give a competitive advantage (by tripping the finish line sensor ahead of the front of the car). Examples of this type of car would be a tank design with a gun turret extending past the front of the car, or a slanted car front design that rests on top of the start pin (extending past the closest edge of the pin). Please refer to R-4 for details on the start pin arrangement.



IV. CONDUCT OF THE RACES

Race Officials are responsible for the proper conduct of the races. Competition will consist of heat races with a random mix of the predetermined Den & All-comer categories. The race software will automatically determine the winners in each of the categories by separating the individual heats accordingly.

C-1. Inspection Gauges: The race-day “Pit Stop” area will have the official scale and length box. That check-in equipment will be the official equipment for the race. *All Cub Scouts should be prepared to make adjustments to their cars if necessary.*

C-2. Race Day Lubrication: There will be a lubrication table set up at the race. The cars must be lubricated before final inspection. No lubrication will be allowed after the car has been registered. Note that the use of “white lube” is NOT recommended as it will slow the car.

C-3. Car Handling Responsibility: Scouts are responsible for presenting their own cars at the starting line for staging and for placing their cars on the track. If, in the opinion of the Trackmaster, a Scout's physical limitations prevent him/her from fully complying with this requirement, the scout may nominate an assistant of approximately the same age who serves subject to approval of the Trackmaster. In any case, the Scout shall participate up to his/her limitations.

C-4. Lane Assignment: Lane assignments will be randomly assigned by the Trackmaster or the race management software. The software will make every effort to ensure that each car runs on different tracks for each race.

C-5. Car Leaves Lane: If, during a race heat, a car leaves its lane of its own accord but proceeds down the track in a manner that does not interfere with any opponents, then the heat will be re-staged and re-run at the sole discretion of the Trackmaster. If the car leaves its lane and interferes with another car, the race will definitely be re-staged and re-run. If the same car consistently leaves its lane or is deemed to be a danger to the race electronics, the race will be re-staged and re-run without that car. In this situation, the race software will automatically apply the worst-case timeout of 6.0 seconds to that car for the current heat.

C-6. Car Leaves Track: If, during a race heat, a car completely leaves the track the re-stage/re-run protocol in C-5 shall be applied.

C-7. Car Repair (Without Fault): If, during the race, a wheel falls off or the car becomes otherwise damaged, then the racer may, to the best of his/her ability perform repairs with the assistance of his/her adult partner or Pit Crew Official. The exception to this rule is the replacement of improperly secured metal weights that fall off during the race and may present a road hazard to other racers. If this occurs, then the Trackmaster, at his/her sole discretion, may require that the remaining heats be run without the weights in place.

C-8 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/her sole discretion, may allow additional repair assistance to the racer.



C-9. No Finishers: If, during a race heat, no car reaches the finish line on the track, the car which went the farthest in its lane shall be declared as the heat winner for manual tracking purposes only. In this situation, the race software will automatically apply the worst-case timeout of 6.0 seconds to each car for the current heat.

C-10. Call to Race: Competitors will be called by car number prior to each heat. When his/her car number is called, each racer will retrieve his/her car from "the stage" and present himself, with his/her car, to the starting area. If the racer does not respond, his/her car number will be called a second and third time. If the racer has not presented himself in time for his/her heat, he/she will be judged as placing last for that race heat. If no competitor is present, the Trackmaster may, *at his/her sole discretion*, defer the race heat in a manner that does not interfere with progress of the racing.

C-11. Track Fault: If a car leaves its lane, at his/her 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.

C-12. The Race Area: Only Race Officials may enter the track area which will be identified by caution tape or tape on the floor. This rule will be strictly enforced.

C-13. Rewards and Recognition: The most important values in Pinewood Derby competition are parent/Scout participation, good sportsmanship and learning how to follow rules. The Awards Committee is responsible for recognizing and encouraging these qualities in addition to traditional racing awards.

Racers will be recognized as follows:

1. Every participating Scout will receive a Pinewood Derby ribbon for his/her car winning its own unique appearance category (Most Creative, Most Humorous, Most Colorful, Best Paint Job, and so on).
2. Trophies will be awarded to the first, second and third-place finishers in each category.
3. Trophies and/or special recognition ribbons will be awarded to the first, second and third-place finishers (by popular vote) in the "Fan Favorite" drawing.



V. THE RACING ENVIRONMENT

R-1. Track Length and Drop: The track shall have a racing surface (starting line to finish line distance) of approximately 35 feet with a drop of approximately 4 feet.

R-2. Track Slope: The track slope shall decrease from approximately 30 degrees at the starting line to approximately 0 degrees at the finish line.

R-3. Lanes: Each lane will consist of a straight, smooth wooden strip approximately 1-1/2 (1.50) inches wide and approximately 1/4 (0.25) inches thick, centered on a smooth surface no less than 4 inches wide. Each race car shall straddle such a strip during its heats.

R-4. Starting Mechanism: The "starting line" shall consist of vertical pins of approximately 5/8 (0.625) inch diameter, extending approximately 1-1/2 (1.50) inches above the track surface and approximately centered in the each lane.

R-5. Finish Line Sensor Location: The track has an electronic finish line sensor, "The Judge," that shall be in alignment with the corresponding starting line pin and be approximately centered in its lane.

R-6. Finish Line Judging: A Finish Line Judge shall be at station to observe each heat, on each track. Heat finish judging is 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 Judge, the race will be re-staged and re-run. Note that video recording equipment may be used in addition to, or in replacement of the Finish Line Judge.

R-7. Finish Line Judge Backup: The Finish Line Judge will temporarily excuse themselves if they know that one of the heat contestants is a Scout or relative. Backup Finish Line Judges shall be available in case a judge needs to be excused for any reason.

R-8. The "Big Board": The result of each heat will be displayed on an event chart called the "Big Board."

R-9. Finish Line Electronics Sensitivity: Track Finish Line Electronics, if used, must trigger correctly if a lead pencil is passed 3/4 (0.75) inches above the track surface at a speed of 15 feet per second.

R-10. Finish Line Clearance: Track Finish Line Electronics and other track accessories, if used, must be no closer than 3 inches above the track.



VI. ALL-COMERS RACE CAR DESIGN STANDARDS

(... or "Why should they have ALL the fun?")

The purpose of the All-Comers Race event is to have a little fun, to test our Pinewood Derby skills, and to provide reasons to gloat for the rest of the year. It will also help us to 'bleed' off some of our nervous competitive anxiety allowing us to be calm and collected during the Scouts race! (Right?)

All adults are encouraged to build their own cars. Any leader, parent, grandparent, guardian or sibling of a Cub Scout who is registered in Pack 77 may enter this race.

P-1. Technical standards: The Technical Standards for the Cub Scout race (above) will be used in the All-Comers Race with the exception that cars are not required to have been built within the last year and are not required to have been built by the racer.

P-2. Number Of Entries: You may race only one car. You must race your own car (scouts cannot race the car for you).

P-3. The Car: You may NOT use your Scout's current car for this race.

P-4. Weigh-In: Cars will be inspected, weighed, and registered during the normal registration hours.

P-6. What Do The Winners Get? Winners will be recognized with honor, glory, and bragging rights. Trophies for the All-Comers category (or categories) will be presented as Pack funding permits.



VII. SPECIAL NOTES TO ALL CONCERNED

This project is a parent and Scout event, and is recommended as such by the National Boy Scouts of America. The Pinewood Derby Committee **STRONGLY SUGGESTS** that each parent emphasize this idea with your Scout.

Sportsmanship:

Two things the Pinewood Derby requires each participant to learn are 1) the craft skills necessary to build a car, and 2) the rules that must be followed. Even more important, though, is how we act and behave while participating in the Pinewood Derby or any other group activity. This is called sportsmanship.

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. You can always be a good person, whether or not you have good car-building skills. Remember, you and your friends are individuals first and racers second. This idea is often called having respect for others.

The second thing to remember is to follow the rules. 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.

The third thing to remember about good sportsmanship is that 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.