

# Official Pinewood Derby Rules

## OFFICIAL CUB SCOUT CLASS RACE RULES

### General

The car must be newly built for the current Cub Scouting year.

The Scout should substantially build the car. Parental supervision in the construction of the car is encouraged.

### Body

The body of the car must use the block of wood provided in an official B.S.A. Pinewood Derby Grand Prix kit (either current or original Grand Prix kits made by the Beta Craft company are acceptable) as its basis. Other materials can be added to the original block as long as the axles are attached to the wheel slots in the original block.

Older style vintage kits with tall skinny wheels are not permitted to be used by cub scouts in official races, nor are "PineCar" or other non-official kits.

### Wheels and Axles

1. Scouts may use the original axle slots **or** drill new axle holes. This allowance exists because factory-cut slots may be uneven or damaged, which can negatively affect alignment and performance. Drilled holes must maintain the standard BSA wheelbase and comply with all other Pinewood Derby rules.
2. Wheels may not be designed to ride upon the guide strip of the track.
3. Loose pieces that fall off during a race are not permitted.
4. 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, the car will be disqualified.
5. The axles of the car must be from an official B.S.A. Pinewood Derby kit or an official Pinewood Derby wheel replacement kit. No solid axles are allowed.
6. Axles must be firmly attached to the car and may not pivot in the body. 7. Axles may be polished, but may not be machined or reduced in diameter more than 1% of their original diameter. The heads on the axles may not be modified or reduced except to remove flashing or to polish. Reshaping, tapering or otherwise modifying axles will disqualify the car.
8. The use of a flexible suspension system of any type is prohibited. 9. The wheels of the car must be from the official B.S.A. Pinewood Derby kit or an official Pinewood Derby wheel replacement kit (both 12-spoke or 14-spoke wheels marked "OFFICIAL BSA MADE IN USA" are permitted).
10. Wheel treads or axle bores may not be altered in any way other than removal of defects and polishing. Mold projection defects on wheel treads may be removed by sanding lightly. The wheels may be sanded to enhance performance but not reshaped. If

excessive wheel sanding is detected, the car will be disqualified. The bore of the wheels may be polished but not otherwise altered.

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11. No cars will be accepted into the race where bearings, washers, spacers, or any materials other than graphite are placed between the axle/body assembly and the wheel or are used as part of the wheel assembly.
12. Hubcaps or coverings that hide the end of the axle are prohibited.

### **Lubrication**

1. Only graphite powder or Teflon powder may be used to lubricate wheels. Other lubricants including those with a petroleum or non-dry base may damage the plastic wheels and keep them from turning freely, or can damage or contaminate the track.
2. Each car should be lubricated prior to check in.
3. Once the car is impounded after the inspection and weigh-in, it may NOT be relubricated except when the wheel is damaged or becomes dislodged during a race.
4. Graphite must be applied over a trashcan or rag and spills must be completely cleaned up.
5. Lubricant reservoirs that are built into the car are prohibited.

### **Dimensions**

1. The total weight of the car may not exceed 5 ounces.
2. The maximum width of the car, including wheels, may not exceed 2-3/4".
3. The maximum length of the car may not exceed 7 inches.
4. The minimum ground clearance from the bottom of the wheels to the bottom of the lowest part of the car must be at least 3/8 of an inch.
5. Minimum width between wheels is 1-3/4 inches.
6. The maximum height of the car is 3-1/2 inches.
7. The motion or thrust of the car may not be mechanically aided. Motor, springs, rubber bands, rocket propulsion, etc. are all prohibited.
8. 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.
9. Movable or liquid weights (weights that shift the center of gravity of the car when the car is tipped or rolled) are prohibited.

### **Build Techniques Not Specified**

1. Other than the prohibitions and limitations described in this document, the car MAY employ any other "tricks" such as favoring front, mid or rear weighting, streamlining, or any other techniques that the builder feels will make the car faster.
2. The judges may disqualify any car that in their determination is not in compliance with the spirit of the race rules.
3. In rare circumstances, race officials reserve the right to perform a teardown 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.

## **OPERATIONAL RULES FOR ALL CLASSES**

### **The Track**

1. The racetrack used at the Discovery District Pinewood Derby is built to the dimensions (except the length) specified in the latest copy of the Cub Scout Leader's How To Book (Cat. No. P3831A).
2. The track is a 4-lane all-aluminum track and is 50 feet in length (this is longer than most tracks because of the higher speed reached by the cars on the aluminum racing surface).
3. The start incline is approximately 30 degrees, and the cars start at approximately 54" above the finish line.
4. The surface and guide rails of the track are smooth aluminum and are cleaned prior to the race with household spray-on furniture polish.
5. The track is equipped with an electronic timer and finish order detector system. Software is used to determine timing and finish order, but race officials will verify each race heat.
6. 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.
7. The finish line detector is comprised of infrared light beams centered within each lane at the finish line of the track. The distance from the starting pin and the finish line beam is identical on each lane.
8. The track will be adjusted to be level across it's width over the entire length of the track.
9. Joints between sections of the track will be adjusted to provide a smooth transition by the car.
10. Every attempt shall be made to insure that all running lanes of the track are equal, but each car runs on each lane to make sure that all effects of minor differences in lanes is compensated for.
11. Race standings and results are displayed on a video monitor for all participants and spectators to see.

### **Race Procedure**

1. All cars will be inspected for conformity with the rules. Owners have an opportunity to make modifications to their car if necessary to comply with the rules.
2. Cars may not be handled after inspection. No additional lubrication may be applied to the car after passing inspection.
3. During registration, all cars will race on each of the four lanes. The cumulative time on those four runs will represent their qualifying time.
4. The top qualifying cars submitted by a Tiger, Wolf, Bear and Webelos and the next top four

- qualifying times will advance to the semi-finals (eight racers total).
5. Each car in the semi-finals will race eight heats (twice on each lane). The four lowest cumulative times in the eight semi-final heats will advance to the finals.
  6. Each car in the finals will race four heats (once on each lane). The winner will be the car with the lowest cumulative times in the finals.

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7. 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 available for pick-up at the Foster City Scout Office during regular business hours after April 20. **TRACK OFFICIALS ARE NOT RESPONSIBLE FOR CARS LEFT AT THE DERBY SITE.**
8. After the car has passed inspection, it will be taken by a race official to the staging tables to await the race. Cars may not be handled after inspection.
9. Cars will be protected from handling by everyone except the race officials (and the car owner only if the owner is making a repair).
10. No additional lubrication may be applied to the car after passing inspection.
11. Bye runs may be used when there is no opponent because of an uneven number of Scouts 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, and no Scout should receive more than one bye. During a bye run, the Scout will be required to run his car down each of the lanes as if in an actual race. Race officials should assign multiple bye runs in the early levels of the race so that there will be no bye runs during the later levels.
12. Each heat will begin with the Official Race Starter positioning the cars on the track.
13. Cars will switch lanes between the first, second, third and fourth races.
14. Scouts will be given time to position themselves in the four chairs at the finish end of the track before the race starts.
15. Officials will return the cars to the starting gate between races.
16. In the event of a breakdown of a car during the race, the participant will be given five (5) minutes to repair the car. Only the damaged portion of the car may be modified. Work should only be done by the Scout with assistance from his 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.
17. 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 (wrong lane, car positioned backwards in the lane, etc.), the heat affected by the breakdown will be re run and the original result, if any, will not be factored into the final results.
18. In the final heat to determine 1st and 2nd place, the winner of the heat will be declared the overall winner regardless of his previous record. Car dynamics change in time and it may be possible for a car with one loss to beat a car with no losses. The Judges decision will be final.
19. 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.