

# Pack 505 2022 Pinewood Derby Official Rules & Format

## 1. Location, Dates, and Times:

All events will take place at Palmetto Presbyterian Church

Friday, February 25th, 5:30-7:30 PM Registration and Inspection

Friday, February 25th, 7:30-7:45 PM Scout Judging / 7:45-8:15 PM Car Design Judging

Saturday, February 26th Pinewood Derby

8:30-10:00 Set-up (Leaders and Volunteers)

10:00-10:40 Lions, Tigers

10:50-11:30 Wolves, Bears

11:40-12:20 Webelos & AOL

12:45-1:15 Grand Finals

1:15-2:00 Clean Up

## 2. CAR

The car must be newly built for the current Cub Scouting year. The car should be substantially built by the Scout. Parental supervision in the car construction is part of scouting and is important for safety, but the Pinewood Derby is **for the boys and girls**. Time permitting, Akelas and siblings will be able to run their own cars after racing is complete.

### 2.1. Body

The car body must be made from the block of wood provided in an official B.S.A. PD Kit (Item 17000 or 17006). All added car parts such as canopies, stickers and any appendages must fit within the car measurement box and must be firmly affixed to the car. Loose pieces that fall off during a race will not be re-affixed to the car. Glitter or other items that could affect the integrity of the track may not be used.

### 2.2. Dimensions

The maximum car width, including wheels, may not exceed **2.75 inches**. The maximum car length may not exceed **7 inches**. The maximum car height cannot exceed **5 inches**, so as to not hit the finish line display. The motion of the car may not be mechanically aided (motor, springs, rubber bands, CO2 cartridges, etc. are prohibited).

### 2.3. Weight

The total car weight may not exceed **5 ounces** as determined the pack's official scale. An electronic scale will be used to weigh cars. Cars will not be accepted if their weight exceeds 5.0 ounces by even the smallest resolution. A minimum weight of at least 3.0 ounces is recommended, so that the car can successfully make it to the finish line. It is recommended that weights are not added to the bottom of the car unless it is submerged into the car body as they have shown to interfere with the track in the past. The maximum dimension between the car body bottom and the track is 3/8", in a perfect scenario.

### 2.4. Axles

The car axles must be from the official B.S.A. PD Kit (Item 17006) or an official PD wheel replacement kit (Item 17007 or 17553,-54,-55,-56,-57). Pinewood Derby Axle Guard (Item 17107) is permitted, but it must be properly installed so as to meet dimensional car requirements. Axles must be firmly attached to the car. Wood glue, model glue or rubber cement may be used to keep axles in place, but inspectors must be able to verify that the axles are not solid, therefore, do not use opaque glue, wood filler, or paint. The axle grooves provided on the official wood block must be used; **extending the wheel base is not permitted**. This will be verified at judging through the use of an axle alignment tool. The use of a flexible suspension system of any type is prohibited.

### 2.5. Wheels

The car wheels must be from the official B.S.A. PD Kit (Item 17006) or an official PD wheel replacement kit (item 17007 or 17553,-54,-55,-56,-57 or ). Minor wheel sanding is permitted to remove burrs and mold projection defects. Grooves (H or V-style) ground into the wheels are not permitted. See Figure 1 for additional examples of wheels that will and won't pass inspection. The decorative dots on the wheel treads may not be removed. The wheels must be attached to the car with the pins provided in the kit. No cars will be accepted where bearings, washers, or spacers are used as part of the wheel assembly. The official wheel width is **0.34 inches**. Wheels may not be designed to ride upon the track guide strip (no rail-riding).

### Wheel Profile Illustration:

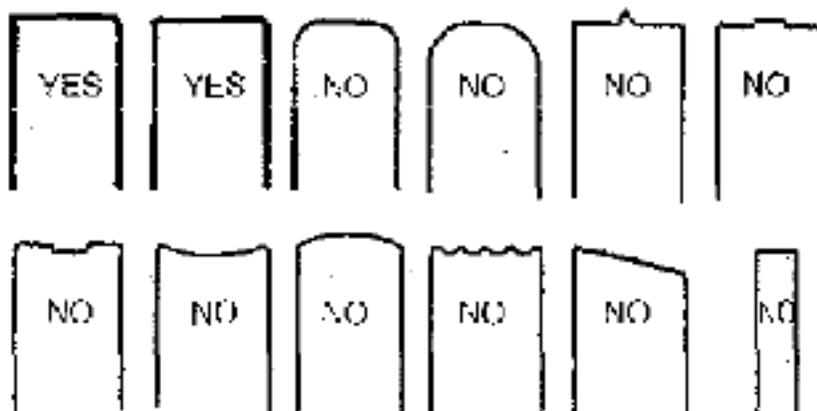


Figure 1

#### 2.6. Lubrication

Only graphite powder or the new B.S.A. white lube T102/polytetrafluoroethylene may be used to lubricate wheels. Warning - other lubricants may damage the plastic wheels and keep them from turning freely. Once a car has passed inspection it will not be lubricated by race officials.

#### 2.7. Head Start

The car cannot be designed such that it attains a head start upon race commencement. The car front cannot have material carved out such that the pin holding the car at the start line drops below, allowing the car to start rolling, before the other cars in the heat can start rolling. See the yellow car in Figure 2 as an example of a car built to have such an advantage at the start. This car will not pass inspection, nor will any car built per the Ultimate Car's "quick start" design in the Pinewood Derby Speed Secrets book.



Figure 2

### 3. CAR DESIGN AWARD CATEGORIES

#### 3.1. Awards

One award will be awarded for each of the following car design categories:

1. Most Realistic Car
2. Best Truck
3. Most Patriotic Car
4. Best Use of Scout Theme
5. Best Use of Camping Theme
6. Best Paint Job
7. Most Original Design
8. Best Wedge Car
9. Best Animal Design
10. Best Racer That's Not a Car
11. Funniest Design
12. Most Innovative Design
13. Most Creative Use of Weight
14. Best Military Theme
15. Strangest Shaped Car
16. Best Video Game Theme
17. Best Engineered
18. Slowest Looking Car
19. Fastest Looking Car
20. Judges' Choice
21. Scouts Choice - VOTED FOR ONLY BY SCOUTS

### 3.2. Judging

Judging is “Open”- Any Pack 505 adult can participate. Judging will begin at time specified above or after all cars are checked-in, whichever occurs first. Those cars not checked in before judging starts will not be in the design contest.

Scouts Choice - All scouts that are present at the end of check-in will be allowed to vote in the Scouts Choice award.

### 3.3. Judge Selection

Each judge will be able to select one car for each of the categories. **A judge cannot select the same car for more than one category.** A judge may vote for his/her child’s car if he/she believes it is best in a given category. Each judge can fill out only one ballot, regardless of the number of children in the Pack. Ballots will be entered via an online voting system, requiring a smartphone.

### 3.4. Tally

Ballots will be tallied automatically via electronic app. Ties will be broken by a coin flip.

### 3.5. Votes

If a car receives the most votes for more than one category, it will be awarded the category for which it receives the greatest margin of victory by vote count. If margin of victory by vote count is the same, it will be awarded the category for which it receives the greatest margin of victory by percentage of total votes in the category. The car receiving the second-most votes in the category not awarded to the first car will win the category not awarded to the first car. If the car receiving the second-most votes has already won a different category, the car receiving the third-most votes will win the category. This will continue until a winner is determined.

## 4. RACE PROCEDURE

Cars may be raced only by the qualifying Cub Scout, who must be officially registered at Council as being a member in good standing of Pack 505, based on the official recharter roster. The pack will do its best to account for social distancing during this event, as it does with all events.

As with all official Pack 505 activities, scouts are expected to attend in full uniform. Registration of all cars will be at the location and time specified above. At the sole Derby Manager discretion, and only in extenuating circumstances, a participant may be permitted to check-in on Saturday morning, but must be registered by 9:00 AM on Race Day. Once the cars have passed inspection, race officials will maintain possession until the car has completed its Pinewood Derby racing. The Pinewood Derby will be conducted at the location and time specified above, with racing proceeding by the groups shown.

## 4.1. Race Format:

### 4.1.1. Preliminary Rounds

Based on rank numbers, the races will be ran in groups:

- Lions and Tigers will race as a group
- Wolves and Bears will race as a group
- Webelos and AOL will race as a group

First and second place in each rank will move on to the Grand Finals. **The next four fastest cars in each grouping will also make it to the Grand Finals as wild card entries, regardless of rank.** A parent or guardian will need to leave their phone number for texting purposes if their Scout makes a wild card spot. Cars will need to be picked up at the end of the race.

The racing software will generate a racing schedule, mixing up the racers and lanes used each time. During the preliminary rounds, each car will race in four valid heats. The racing software starts a timer at the moment the race begins, and records each car's time when it crosses the finish line.

### 4.1.2. Grand Finals

For the Grand Finals, sixteen heats will be conducted using the same format as used for preliminary rounds. Trophies will be awarded for 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> place. At intervals of approximately each twenty heats, and between all rounds, the track will be swept down to minimize the buildup of debris on the track.

### 4.1.3. Ranking Results

Overall ranking results (1<sup>st</sup> place, 2<sup>nd</sup> place, etc) will be determined using the cumulative time of each car's three fastest heats. The slowest heat for each car will be thrown out (won't count).

### 4.1.4. Trophies

Trophies will be awarded for 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> place in each rank.

### 4.1.5. Control Car

A "control car" will be used during the race to obtain statistical information. The intent is to try to understand if and how speed of a given car changes over the course of the day. The control car will be included as a participant in each preliminary round, but not in the Grand Finals.

### 4.1.6. Tie

In the event of a tie cumulative score in the top four finishers in the preliminary rounds or in the Grand Finals, a tie-breaker round will be conducted. Only those cars that actually tied will participate. Example: If two cars finish tied for first, a three-heat tie-breaker will determine 1<sup>st</sup> and 2<sup>nd</sup> place. The car that finished just behind those tied for first will automatically finish 3<sup>rd</sup>, and so on.

## 4.2. Do-Overs

- If one or more cars in a heat do not finish, but no car interferes with another car:

The track will be inspected by the judges. If a track defect is identified, the heat will be declared invalid and will be repeated after track repairs. If no track defects are identified, the heat will be declared valid and results recorded. The car(s) that did not finish will be inspected for worthiness to continue. If mechanical defects are identified, the official race mechanic will have 5 minutes to fix the car, and then racing must continue whether or not the car can be repaired. The car repair is intended to restore it to its condition at the time it was inspected.

- If judges determine that one or more cars interfered with one or more other cars:

The track will be inspected by the judges. If a track defect is identified, the heat will be declared invalid and will be repeated after track repairs. If no track defects are identified, the heat will be declared invalid and will be repeated. The car(s) that did not finish will be inspected for worthiness to continue. If mechanical defects are identified, the official race mechanic will have 5 minutes to fix each car, and then racing must continue whether or not the cars can be repaired. The car repair is intended to restore it to its condition at the time it was inspected.

- If an error is made by the starting official, the judges may declare the heat invalid and it will be repeated.
- The race director reserves the right to resolve all disputes if judges are unable to resolve in a timely manner. Disputes involving a race director's son will be resolved by the head judge.
- If a timer system fault is detected, the heat will be declared invalid and repeated. Previously completed heats will be reviewed to determine if they were affected by the timer system fault. Any heats determined to have been run with the timer system fault will be declared invalid and will be repeated.
- At the end of each rank racing, a timing audit will be performed by the race management software. Any heats identified as anomalies will be reviewed and, discussed by the judges and, at the race director's discretion, the affected heat(s) may be re-run.

## 5. Checklist

- Car substantially built by the Scout
- The body made from the block of wood provided in an official B.S.A. PD Kit (Item 17000 or 17006)
- The maximum car width, including wheels, does not exceed 2.75 inches
- The maximum car length does not exceed 7 inches
- The maximum car height does not exceed 5 inches
- The total car weight does not exceed 5 ounces
- The car axles are from the official B.S.A. PD Kit (Item 17006) or an official PD wheel replacement kit (Item 17007 or 17553,-54,-55,-56,-57)
- Use the axle grooves provided on the official wood block
- Wheel base is not extended
- Axles are not solid
- The car wheels are from the official B.S.A. PD Kit (Item 17006) or an official PD wheel replacement kit (item 17007 or 17553,-54,-55,-56,-57)
- Followed proper wheel profile
- The decorative dots on the wheel treads are not removed
- The wheels are attached to the car with the pins provided in the kit
- No bearings, washers, or spacers are used as part of the wheel assembly
- Wheel width is 0.34 inches
- Wheels not designed to ride upon the track guide strip (no rail-riding)
- Only graphite powder or the new B.S.A. white lube T102/ polytetrafluoroethylene used to lubricate wheels
- The car is not designed such that it attains a head start upon race commencement
- The car motion is not mechanically aided
- There are not any loose items that could fall off the car and affect the track (sparkles or glitter as an example)