

PACK 1702
OFFICIAL
PINEWOOD DERBY RULES

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SECTION 1: SPORTSMANSHIP

Pinewood Derby racing requires participants to learn two main items; the craft skills necessary to design and make a car; and that the rules that govern the Race must be followed. Each Cub Scout, with age appropriate adult guidance and assistance, should build his own car. Any technical assistance should be fully explained to the Cub Scout so that he can use that knowledge to learn for future projects.

There is also a third key component to such a competition – **sportsmanship**. One must strive to be fair, honest, and respectful. More importantly, each Cub should be able in the end to say, “**I did my best**”, and be satisfied with the results of participation in the event.

The first thing to remember about sportsmanship is that everyone's skills are a little different. One Cub may be good at singing or drawing, but not as good at basketball or computers. Parents have different skills and skill levels, too. Some will have better car building skills than others, but no matter a parent's or Cub's skill or skill level, all are good. Each are individuals first and racers second. This idea is often called having respect for others.

The second thing to remember about good sportsmanship is that there are winners and losers in every competition. Each person must accept this when they choose to compete. There may be times when a Cub wins and feels happy, and times when that Cub loses and feels unhappy. Being a winner is easy, and losing is sometimes hard. If a good sport wins, that person does not brag or gloat. If that good sport loses, he is not jealous or bitter. To be a good sportsman, each Cub must be able to say, "I did my best", be satisfied with the results, and be able to appreciate and feel happy for someone else when he runs a good race or builds a neat car.

SECTION 2: GENERAL RULES

2.1 Qualification to Race

- All Tiger, Wolf, Bear, and Webelos I and II Scouts who are currently registered in **Pack 1702** may enter this Pinewood Derby. Cubs will compete with others in their same Den.
- Each Cub may register only one car in the Pinewood Derby.
- The Cub **must** be present at "Inspection and Registration" to enter his car into competition.

2.2 Construction of Cars

- ***All cars entered must be constructed from the "Official Grand Prix Pinewood Derby Kit", Number 17006 (hereafter referred to as the kit) as distributed at the Pack meeting.***
- Construction of all cars must have begun after **Pack 1702's** Pinewood Derby Race of the previous year.

2.3 Inspection Requirements

Each car must pass a technical inspection before it may compete (i.e. be within proper weight, length, width, height requirements). The technical inspection of cars, conducted by Race Officials, occurs immediately prior to each Den's Race on Race Day. The inspection and race schedule is promulgated separately before Race Day.

- a. **Technical inspection requirements.** In order to be allowed to race, a car can not exceed the following specifications:

- **Weight:** The overall weight of the car shall not exceed **5.000 ounces**.
- **Width:** The overall width of the car shall not exceed **2 ¾ inches**.
- **Length:** The overall length of the car shall not exceed **7 inches**.
- **Height:** The height of the car from the bottom of the wheels to the highest point should not exceed **3 inches**.
- **Clearance:** Clearance between car bottom and track must be at least **3/8 inch**.
- **Wheel Base:** Lateral distance between the wheels must be at least **1 ¾ inch**.

b. Additional inspection items.

- **Wheels and Axles:** *Official Cub Scout Grand Prix Pinewood Derby* wheels and axles (see diagram in Section 3.10) must be used as provided. Flash present in the wheel's axle hole or on the outside may be removed. Similarly, burrs on axle shafts and heads may be removed by polishing (see Section 3.10). **Wheels cannot be wafered, beveled, ridged, crowned, drilled, or similarly functionally altered.**
- One Piece axles are not allowed.
- **Loose materials** are not allowed on or inside the car. The car may be hollowed out and built up to the maximum weight and dimensions by additional materials that are firmly secured to the car
- **Lubrication: No Lubrication of any type** is allowed to be used on the wheels or axles of the cars.
- **Detailing:** Detailing such as steering wheels, driver, decals, and paints are permissible as long as they are secured and do not exceed the maximum length, width and weight specifications outlined.
 - **Cars must be constructed such that all parts of the car** can be placed behind the starting gate (see section 5.2 Starting Mechanism) prior to the start of each race. No part of the car including wheels may protrude beyond the Starting Mechanism.

Note that sharply pointed car noses (e.g. less than about ¼ inch) may look sleek, but may not be able to be properly positioned at the starting gate. There is no prohibition to this, but improper positioning may adversely affect the car's race, since the Track officials will have to place the car to ensure the entire car is behind the Starting Mechanism.

- **Prohibited Items:** The car must be free-wheeling; no starting or launch devices; and cars shall not ride on any type of springs or suspension system. Wheel bearings, washers, bushings, and **one-piece axles shall not be used.**

2.4 Tune-up Night

A pre-inspection of cars is offered on "Tune-up night", typically the Tuesday before race day, at Fulton Elementary School. This is an opportunity to have the car weighed on the Official Race Scale to determine if it is within the weight requirement, and have the **Pack 1702** "Pit Crew" help ensure that the car meets each of the other requirements. Additionally, the Pit Crew can help with other last minute questions. The Pit Crew can help with suggestions on adding and deleting weight, and suggestions on last minute changes that will make the car pass inspection and be as competitive as possible. The

pre-inspection is a “free look” at the car, will speed-up each Racer’s check-in on Race Day morning, and help ensure that all requirements are met.

2.5 Failure to Pass Inspection

On Race Day, the Race Officials will disqualify cars that do not meet the requirements as described above in Section 2.3. If a car does not initially pass inspection on Race Day, the owner will be informed of the reason the car did not pass, and will be given time within the official inspection period to make adjustments to allow it to pass inspection. If a car cannot pass inspection prior to the Den’s race time, the car will be disqualified from racing.

2.6 Registration and Impound

After a car passes inspection, it is considered officially registered for the day and will be impounded by Race Officials. No car may be altered in any way after it has been impounded unless the car is damaged while handling or during racing. All reasonable efforts will be made to repair and re-inspect a damaged car so that it can continue racing. Only Race Officials may handle impounded cars during Racing, with exception of specific instances as deemed by the Pinewood Derby Chairman.

2.7 Rules Interpretation

Prior to Race Day, please refer any questions regarding the Pinewood Derby or the Pinewood Derby Rules, to the Pinewood Derby Committee. Each Den has a representative who can help direct your questions as necessary. Questions of rule interpretations and procedures will be resolved by three or more members of the Pinewood Derby Committee.

2.8 Race-Day Rules Interpretation

On Race Day, interpretation of the rules described in this paper will be made by the Race Officials present during the Registration and Inspection process. Any concerns on rule interpretations and procedures should be made to the Race Officials promptly. Decisions of Race Officials on questions of rule interpretations and procedure may be appealed to the Pinewood Derby Chairman.

All decisions of the Pinewood Derby Chairman are final.

Decisions of Race Officials on questions of fact (i.e. the result of a specific race) may not be appealed beyond the Track Officials.

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

SECTION 3: RACECAR DESIGN STANDARDS

3.1 Material

All Pinewood Derby cars will be built from the official BSA car kit (*Official Grand Prix Pinewood Derby Kit*, Number 17006). Additional BSA kits may be purchased from the Scout Service Center in Baltimore or from many local hobby stores, if so desired. Purchased kits must be of the exact type (BSA Part Number 17006), however. Materials from the kit may be supplemented (weights, detailing, attachments, decals, etc.) but not replaced. As an example, if a mistake is made in construction of the car, a second BSA Kit, may be obtained to redo. The wheels from either official BSA kit may be used in final construction.

3.2 Size requirements

- Racecars may be no longer than **7 inches**,
- no wider than **2-3/4 (2.75) inches**, and
- no taller than **3 inches** (to allow the car to fit under the finish line)

A car's dimensions will be as determined by the official gages during pre-race Inspection and Registration. 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 properly on the racetrack. Adequate clearance is the responsibility of the car builder.

3.3 Weight requirements

An official scale will be assigned for Race Day. The Scale will be calibrated as accurately as possible. The will then be the scale that all cars will be weighed. As determined on this Official Scale during the pre-race Inspection and Registration, racecars may weigh no more than **5.000 ounces (about 141.7 grams)**.

3.4 Moving Parts

The only moving parts allowed on the car are the wheels, which shall rotate around the axle nails provided in the kits. Straight axles are not allowed.

3.5 Weights and Attachments

Weight may be added to the car and will be considered part of the car for purposes of all measurements (i.e. weight, length, width, height). "Weight" is considered to be any material on the car that is not provided in the kit. In addition to standard weights, a lego

driver, exhaust pipes, or additional wood to build up the car can also be used as weight up to the maximum of 5 ounces. All weight must be securely fastened to the car (such as by permanent glue, nails, or screws) but not by "sticky substances" (such as tape or tack spray). Weights must be passive, i.e. non-moveable, non-magnetic, non-electric, non-sticky, etc.

3.6 Car Number and Direction of Travel

Each car has been assigned a unique number that should be **clearly visible from the top** of the car. In addition, cars should be legibly marked on the bottom with the Cub's name and year.

3.7 Direction of Travel

The FRONT of the racecar, if not obvious, must be labeled indicating the preferred direction of travel. If, in the opinion of the Track Officials, the FRONT of the car is not obvious, an arrow will be drawn on the bottom of the car, or other indication somewhere on the car, to show proper direction of travel.

3.8 Wheels and Axles

- The car shall roll on the *four wheels* from the kit.
- 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.
- It must be obvious to the judges that the wheels and the nails from the kit are being used.

Straight axles are not allowed.

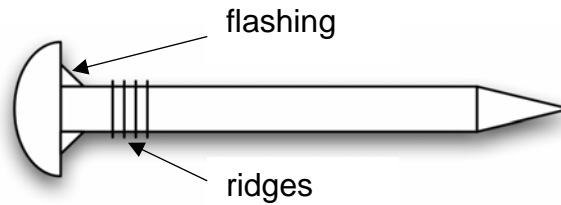
- No part of the wheels may extend beyond the front of the car.

3.9 Wheel Treatment

- Wheel treatment (hub and tread smoothing and polishing) may **not** result in substantial removal of mass, reduction of wheel width, or change of contour from the original kit wheels.
- Wheels may not be machined to a beveled condition and the portion of the wheel surface that contacts the track must remain parallel to the axle.

3.10 Axle Treatment

Axle treatment is limited to the removal of flashing and ridges that remain from manufacturing, as shown below.



3.11 Unacceptable Construction

The following may **not** be used in conjunction with the wheels or axles:

- hubcaps,
- washers,
- bushings,
- inserts,
- sleeves, or
- bearings.

3.12 Gravity Powered

The car must be freewheeling with no starting devices. The 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 that may catch on the starting pin.

3.13 Lubricants

In the interest of fairness, no lubricant is allowed to be used on any car.

Use of lubricants will be cause for disqualification.

3.14 Car construction

No part of the car may protrude past the starting line. That is, while being staged at the starting line, all parts of the car must be behind the Starting Mechanism (see section 5.2).

SECTION 4: CONDUCT OF THE RACES

Competition will consist of a series of heat races within each den, and a series of final heats at the Pack level. Track officials are responsible for the proper conduct of the races.

4.1 Inspection Gages

The race-day inspection area will have the official scale and length box. That check-in equipment will be the official equipment for the race. Please be prepared to make weight adjustments to your car if necessary.

4.2 Race Day Lubrication

No Lubrication of any type is allowed to be used on the cars.

4.3 Car Handling Responsibility

Race officials will move cars from the impound area to the track, will stage cars at the starting line, and will move cars from the finish line back to the impound area as required.

4.4 Lane Assignment

Cars will be placed in lanes randomly as selected by a computer program to equalize differences between track lanes. Each car will run in multiple heats, and the computer will randomly assign the lane each time. In general, each car will race in every lane.

4.5 Race Winners

During Den racing, the first and second place cars as determined by the lowest combined time in the Den heats will advance to the Finals. In general, there will be enough Den race heats to allow each car in the Den to race in every lane. The race times for the multiple heats will be added together. The racecar with the lowest combined time is the first place winner, the racecar with the second lowest combined time is the second place winner, and the racecar with the third lowest combined time is the third place winner, etc.

4.6 Car Leaves Lane

If a car leaves its lane during a race heat but proceeds down the track without interfering with its opponents, then the race will be called normally. If the car leaves its lane and interferes with another car, the race will be re-run. If the same car again leaves its lane and interferes with a car, it will be judged last place, and the race will be re-run without that car.

4.7 Car Leaves Track

If a car leaves the track during a race heat without interfering with its opponents, it will be considered to have ended its heat. A dummy car will be passed through the stop gate to stop the clock for that lane.

4.8 Track Fault

If a car leaves its lane or the track, the Track Officials may inspect the track for defects. If a defect is found, it will be corrected (if possible) before running the next heat. If the fault cannot be corrected, the Track Officials may close the defective lane for coming heats.

If a track fault is found which probably caused the initial incident, Track Officials may order the race heat to be rerun after the track is repaired.

4.9 Car Repair (With Fault)

If a car is damaged due to track fault or by another car or person, then Track Officials may allow additional repair assistance to the Cub.

4.10 No Finishers

If, during a race heat, no car reaches the finish line on the track, the car that went the farthest in its lane shall be declared as the heat winner. Any car that does not reach the finish line will be hand-pushed through the finish line to stop the clock for that lane.

4.11 Pack Finals

The First and Second place cars (normally the two fastest cars) from each Den will advance to the Finals, as well as the next six fastest cars **Pack-wide** that did not place First or Second in their respective Den. These six cars will be determined by examining the lowest combined times from Den racing of all cars Pack-wide that did not previously advance to the Finals as a result of finishing first or second in their respective Den. This will help ensure that every Den is represented in the Finals, and that the rest of the fastest cars Pack-wide also advance to the Finals, regardless of Den standing. All qualifying cars for the Finals will be entered in the race. The computer will randomly assign races and lanes.

The standings of the cars in the Finals will be determined by the lowest combined time in the Finals heats. The racecar with the lowest combined time is the first place winner, the racecar with the second lowest combined time is the second place winner, and the racecar with the third lowest combined time is third place winner, etc.

4.12 The Race Area

The Race Area will be considered the Inspection area, the Track area, and the Impound area. Only Race Officials will normally be in the Race Area.

Note: *Violation of this rule by any participant or spectator will be grounds for expulsion from the competition and/or the race area.*

4.13 Awards and Recognition

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

- a) Every participating Scout will receive a Pinewood Derby participation patch or pin.
- a) Every car will be awarded a ribbon for winning its own unique appearance category (Most Creative, Most Humorous, Most Colorful, Best Paint Job, and so on).
- b) Medals will be awarded to the first, second and third-place finishers in each Den.
- c) Trophies will be awarded for the first, second and third-place finishers overall in the Pack.

SECTION 5: THE RACING ENVIRONMENT

5.1 Race Track

- The track has a racing surface (starting line to finish line distance) of approximately 32 feet with a drop of approximately 4 feet and a horizontal length of approximately 28 feet.
- The track slope decreases from approximately 30 degrees at the starting line to approximately 0 (zero) degrees at the finish line.
- The track has six (6) lanes.
- Each lane consists of two ridges approximately 1-1/2 (1.50) inches apart, and approximately 1/4 (0.25) inches high, to allow a car to straddle.

5.2 Starting Mechanism

The "Starting Line" consists of a set of six (one for each lane) vertical 1/4-inch diameter pins extending approximately one inch above the track surface and approximately centered in the each lane. Each of the pins are connected to a central rod which when turned by a Track Official allows all cars to start rolling down the incline at the same time. This Starting Mechanism is electronically connected to the Race Computer and to the respective lane Finish Line Sensor to allow for accurate elapsed time from start to finish for cars in each lane.

5.3 Finish Line Sensor Location

Finish Line Sensors are located at the finish line for each lane, approximately centered in each lane. Each lane's sensor is connected to the Starting Mechanism electronics.

5.4 Track after the Finish Line

After the cars pass through the "Finish Line Sensors", the cars are slowed by a ramp in each lane that gradually raises each car off its wheels and brings each car to a stop. In addition, cushioning at the end of each lane helps to minimize any potential damage to the cars.

5.5 Track Judging

Track Officials will be stationed to observe each heat, normally at the starting line and along the Track. Heat finish judging is determined by the finish line sensor, but may be challenged by a majority rule of the Track Officials. If the track's electronic finish line

sensor's result is challenged by the Track Officials, the race will be re-staged and re-run.

5.6 Staging Cars at the Starting Line

Track Officials will move cars from the impound area for placement in specific lanes for a given heat. Car to lane combinations will be computer generated to ensure that all cars race in all lanes for Den Racing, and for Finals Racing. Track Officials will be responsible for placing each car on the starting line and in the proper lane. Track Officials will make every effort to place cars in the intended orientation (see Section 3.7). Track Officials will also ensure that all cars are behind the Starting Mechanism (see Section 3.14).

5.7 End of Heat

Following the end of each heat, the Track Officials will move cars from the finish line back to the impound area as required. Only Track Officials may handle cars.

SECTION 6: IMPORTANT NOTES

References: Boy Scouts of America, "Cub Scout Grand Prix: Pinewood Derby Guidebook," copyright 1997

Boy Scouts of America, "Official Grand Prix Pinewood Derby Kit," copyright 1997, Kit No. 17006

Web Resources: <http://www.maximum-velocity.com/>

<http://members.aol.com/randywoo/pine/>

<http://members.aol.com/StanDCmr/pwdesign.html>

<http://www.winderby.com/h-links.html>

All cars entered shall be constructed from the "Official Grand Prix Pinewood Derby Kit," Number 17006 (hereafter referred to as the kit) as distributed at the Pack meeting.

Competitor Categories

All Tiger Cub, Wolf, Bear, and Webelo Scouts that are registered in Pack 1702 may enter this Pinewood Derby. Cub Scouts will compete with others in the same Cub Scout Den. The first and second place winners in each Den will move on to the finals.

Attendance

The Cub Scout MUST be present at "Inspection and Registration" to enter his car into competition.