

**PATHFINDER DISTRICT**

**PINEWOOD DERBY**

**March 7th 2020**

**Check in 8:30am – 10am**

**Race 10:15am – 3pm**

**Wild Acres Banquet Hall**

**2500 Ashby Road**

**Overland, MO 63114**

Dear Cubmaster,

Pathfinder District’s Pinewood Derby is scheduled for fun and excitement. I have enclosed a registration form and the rules for the race and the show.

A car can only be entered in one category RACE or SHOW.

This event is very popular with the Cub Scouts. We have had problems in the past because the information is not being shared with the parents in the Pack. Please make sure that each family has an equal chance by getting all information to them.

THE FOLLOWING INFORMATION COVERS SPECIFIC PROCEDURES FOR THE RACE.

**RACE COMPETITION**

* Each pack may enter Six (6) cars for the race made from BSA approved kits.
* One car from each rank; Lions, Tigers, Wolf, Bear, WEBELOS, and Arrow of Light
* Additionally, each pack may enter one car for the race in which the car’s body was made using a “3D Printing” method.
* The Scouts and cars should arrive about 15 minutes prior to the scheduled race time.
* All cars (traditional and 3D printed) must meet weight requirements, basic dimensions and have legal wheels and axles (nails) as described in this manual.
* The Scouts in the pack will race among themselves to determine the two fastest cars.
* The two fastest cars will advance to the semi-finals.

**CARS WILL NOT BE ALLOWED TO RACE IF THEY DO NOT MEET ALL OF THE FOLLOWING RULES:**

* For the traditional cars, each Cub Scout must use the current Cub Scout Pinewood Derby kit issued by the pack from the Scout Shop.
* For the traditional cars, only the block of wood that comes with the kit is allowed for making the car’s body. The wheels and nails may come from the kit or from a BSA approved set.
* 3D printed cars may be made from any commercially available printing material. 3D printing services are provided for a small fee at several local libraries (e.g. University City, Kirkwood). Survey your pack families, charter organization, and local schools to determine other 3D printing capabilities available to your Scouts.
* For 3D printed cars, Scouts may use wheels and nails from a traditional kit, or they may use wheels and nails from a BSA approved set.
* A **NEW** car must be made for the current program year.
* No pre-cut kits can be used.
* No Hobby Shop car kits or wheels can be used.
* OFFICIAL BSA WHEELS USED RIGHT OUT OF THE BOX OR TUBE ONLY WILL BE ALLOWED. No modifications **PERIOD**. Any modifications will be cause for the judges to deem the car ineligible for racing.
* Wheel bearings, washers and bushings are not permitted. Use of wood glue or airplane cement to hold the nail axle in the car body is acceptable.
* Axles may be mounted in to the car body with the aid of tubing.
* Wheels must be mounted as intended. Not inside out.
* No hub caps will be permitted on the wheels. Spokes must be viewable.
* The overall body width must not exceed 2 3/4” and the length can no exceed 7”.
* No loose material of any kind is permitted on car.
* No oil, grease or silicone spray should be used on axles or wheels. ONLY powdered graphite is permissible and must be applied prior to entering the car through the inspection process. **ABSOLUTELY NO GRAPHITING OF WHEELS IN THE RACE BUILDING**. Graphite in the building can permanently stain floors and tables. Graphiting in the building will be cause for immediate disqualification. If cars need graphiting prior to the inspection process, it must be done outside of the building.
* Cars will be weighed in and must not be over 5 ounces. If they weigh more than 5 ounces, the parents or adult is responsible for making adjustments. RACE OFFICIALS WILL NOT MAKE THE ADJUSTMENTS TO THE CAR.
* NO CAR WILL RACE UNLESS IT MEETS THE WEIGHT REQUIREMENTS.
* Registered cars will be given a Derby participation number by the registrar at weigh-in and will then be placed immediately in the pit area.
* Cars will not be allowed to leave the pit area for adjustments after it has been checked in. Cars will not be touched by anyone other than the race officials until it is time for the Scout to race.
* No work may be done on the cars once they are checked in, except in an emergency such as a wheel falling off if it loses the wheel during the race. The Cub Scout and one adult will be permitted to try and fix the car in the pit area.

**THE RULING OF THE JUDGES IS FINAL. ARGUING WITH ANY RACE OFFICIAL, EITHER BY A CUB SCOUT OR AN ADULT IS GROUNDS FOR IMMEDIATE DISQUALIFICATION OF THE CUB SCOUT’S CAR.**

The biggest problem with the cars has been the wheels. In order to be fair to all Cub Scouts, all wheels and axles must follow the rules and be uniform. If wheels are found to be altered in any way (not as is in “***right out of the box or tube”***), the judges may allow for all wheels to be replaced with new wheels available for purchase at the repair station and shall be placed on car by the OFFICIAL that is working the repair station. NOTE: **No graphiting will be allowed in the building** and once the OFFICIAL has replaced the wheels, car **MUST** immediately return to the CHECK-IN Official for re-inspection.

**SHOW COMPETITION**

In addition to the race, there will also be a show car competition in which each pack can enter 4 cars that are not racing. If a pack has six (6) Scouts or less, cars not advancing in the race category may be entered in the show car competition.

All show cars must check-in at the same time as the race cars check-in. You do not have to determine the category of the car. The judges determine the best category for the cars. You can request to have your car in a specific category.

**It is essential on Saturday that someone from the pack picks up the show car entries after the award presentation.** It will be up to the Cubmaster or the parent to make arrangements to have the car picked up. The ticket given to the Cub Scout when the car is registered must be returned to pick up the car. Show car awards will be presented immediately following the championship races about 2:00pm. Each car will receive a certificate and a ribbon.

**SHOW CAR CATEGORIES**

**MOST REALISTIC**  The car represents the balance, shape, proportion and finish of an actual racing car.

**NOVEL DESIGN**  The car reflects a novel approach to shape, motif and design that departs from the expected car.

**JUDGE’S SPECIAL** The car in the view of the judges deserves recognition but the car does not fit into a specific category.

**PATRIOTIC SPIRIT** The car reflects the best use of Red, White and Blue colors and Patriotic symbols.

**KID DID** The car in the view of the judges deserves special recognition for it demonstration of a Cub Scout skill level

**CUB SCOUT SPIRIT** The car best reflects the use of Blue and Gold and Cub Scout Spirit.

**CLASSIC DESIGN** A car that reflects a representation of an American Classic car design from the past years.

**TIGER CUB SPIRIT** The care reflects the best use of Tiger Cub colors, orange and black and Tiger Cub spirit (the car does not need to be made by a Tiger Cub)

**GSLAC**

**DIRECTIONS**

STEPS:

1. Start with body dimensions being 1 ¼ inches wide and exactly 7 inches long.
2. With an 11/32” inch drill bit, drill 3 holes to the following requirements. These holes will contain the lead to give it additional weight. (Molten lead is best)
	1. 1st hole: 3/8” up from bottom of car and 3/8” in from rear drill a hole exactly 1 5/8 inches deep. (SEE ATTACHED DRAWING)
	2. 2nd hole: 3/8” up from bottom of car and 1” in from rear drill a hole exactly 1 5/8 inches deep. (SEE ATTACHED DRAWING)
	3. 3rd hole: 3/8” up from bottom of car and 1 5/8 inches in from rear drill a hole exactly 1 5/8 inches deep. (SEE ATTACHED DRAWING)

1. On wood block, measure up from bottom rear exactly ¾ of an inch and mark. Then, on bottom front of car, measure up 3/8 of an inch and mark. Now, draw a line from rear mark to front mark. This is the line you will cut along to form a wedge shaped car.
2. In this step, you will be drilling two holes that will contain the brass tubing that will hold the axle nails for the wheels. (Detailed in Step 6)
	1. 1st hole: 1/8” up from bottom rear and 5/8” in from rear drill a 1/8 inch hole through wood block. (SEE ATTACHED DRAWING)
	2. 2nd hole: 1/8” up from bottom front and 5/8” in from front, drill a 1/8 inch hole through wood block. (SEE ATTACHED DRAWING)
3. At this time, cut along the angled line (Drawn in Step 3) from front to rear. Cut just above the line to allow for sanding. At this time, sand all surfaces to a semi smooth finish using 100 grit sand paper.
4. Using 1/8” outside diameter and 5/64” inside diameter brass tubing cut (2) two pieces to exactly 1 31/64” long. With 400 grit sandpaper; remove all burrs from ends of tubing.
5. With a fine course file, remove the molding burrs from the underside of the axle nail heads. Then using 600 to 800 grit wet/dry sandpaper along with a soft cloth and jewelers rough, sand and polish underside of nail head, and 3/8” of nail shaft to a high polish. (This step helps create the best possible surface for the wheels to spin on with the least amount of drag.)
6. With molten lead, fill the three holes drilled out in step 2, to within 1/8” of the surface of the wood. Fill remaining space with non-shrinking wood putty. Let putty dry thoroughly, then sand to a smooth finish, flush with surface of car.
7. Using two-part epoxy glue, install axle tubes fabricated in step 6, into the holes drilled out in step 4. Be careful not to let any glue get into the inside of tube, and also make sure that ends of tube do not protrude past surface of car. On the bottom of the car, drill through the wood and into the tubing. Be careful not to drill all the way thru the car. These holes allow for air to equalize in the brass tubing during step 12.
8. With decorative wood enamel gloss paint and spray lacquer clear enamel sprays that can be purchased from your local hardware store, follow step by step the following directions.
	1. Spray prime body lightly, let thoroughly dry.
	2. Sand lightly with 400 grit sandpaper.
	3. Spray prime body lightly, let thoroughly dry.
	4. Sand lightly with 400 grit, and then with 600 grit sandpaper.
	5. Repeat steps a, b, c and d using paint color of your choice.
	6. Repeat steps a, b, c, and d using the clear enamel spray.
	7. Buff car to a HIGH luster using powder rubbing compound. (Turtle Wax works very well too)
9. USE wheels straight out of the box or tube. NO MODIFICATIONS…PERIOD
10. Assembling one wheel at a time, slide wheels over nail axle. (NOTE: Make sure that outside of wheel is facing out) Using the two-part epoxy glue, apply to the inside of axle tube previously installed in car body. Using a set of mechanics feeler gauge set to 1/32” thick, push the nail into the tube until the feelers gauge is pinched between the surface of the car, and the hub of the wheel. Hold wheel and nail until epoxy has set up. Use extreme caution to keep epoxy from touching wheel hub. Repeat this step for the other three wheels. Let set for one hour to assure curing of epoxy.
11. Using graphite, and only graphite, no oils, greases WD40 or anything of this sort, powder lubricate wheels and axles at contact point. Spin wheels a few times, and repeat process until a free spin of 20 to 40 seconds obtained.

This is the critical step. You must now bring the car up to the maximum weight of 5 ounces. If you have followed these steps, you should be close. However, there more than likely will be a need to add a little more lead to get you there. The best method for this is to drill as close to center on the bottom of the car within the back 1 ½” of the car, a shallow 11/32” hole that you can fill with lead. Once this is done, you can have the car weighed and if overweight, using a smaller diameter drill bit remove and re-weight the car until you are exactly at 5 ounces of weight. If you don’t have access to a calibrated digital scale, ask the manager of your local Super Markets deli department if they can weigh it for you. Chances are, they will be more than happy to help you out as long as you do this during a slower time of the shopping day. NOTE: If you have to do this step, once done, it is suggested that you put a small piece of scotch tape over the hole to help restore a flat flawless bottom.

Dear Scouters, Parents and Cub Scouts,

The Pathfinder District Pinewood Derby committee has had in effect a set of rules and regulations for the fair, even, fun and enjoyable racings for Cub Scouts for many years. These rules incorporate not only the standards for the body of the car in length, width, height and weight, but also that of a fair and practical, yet limited amount of modifications allowed to the wheels to enhance the speed and balance of the wheels.

In recent years however, there has been an ever increasing problem within the Pathfinder District Pinewood Derby races regarding the use of car wheels not conforming to the Pathfinder District Rules and Regulations regarding the modification of BSA Kit Wheels.

It has come to the decision of the Pathfinder District Race Committee through multiple conversations and discussions regarding the increase of non-conforming wheels that steps must be taken to bring these yearly non-conforming and over modified wheels to a halt.

Therefore, a new and even more restrained set of rules and modifications regarding the BSA Kit Wheels will be incorporated immediately. These new rules are as followed:

**PATHFINDER DISTRICT PINEWOOD DERBY WHEEL REGULATIONS**

1. Only BSA wheels are acceptable for use on Pinewood Derby Cars. These wheels are those provided with the BSA car kit or those BSA wheels sold separately in tubes or boxes and only those kits bought at an official Scout Shop. **NO OTHER WHEELS WILL BE ACCEPTED**.
2. Light sanding of any kind will not be allowed. Running surface **SHALL NOT** be sanded or lathed flat for any reason.
3. Wheel stub surface that makes contact with the car body **SHALL NOT** be rounded over or modified in any way,
4. Inner surface of wheel opposite of running surface **SHALL NOT** be sanded or lathe turned in any way and must be left as is upon purchase.
5. The raised letter on the BSA wheels that read: PINEWOOD DERBY BSA TM, may not be removed from the wheel. Painting to simulate **Raise White Lettering** is acceptable.
6. Only BSA Wheel nails provided with BSA car kit or BSA wheels sold separately in tubes or boxes are allowed.
7. Only the manufacturing burrs directly under the nail head at shaft may be removed. No modifications to the nails are acceptable.

These new rules will be strictly enforced by the Pathfinder District Pinewood Derby Race Officials. Any race car entered for inspection at the Pathfinder District Pinewood Derby Races not conforming to these new rules will be rejected immediately and Cub Scout and Parent will be asked to replace the non-conforming wheels with official BSA race wheels without modifications before proceeding through the inspection process. Refusal to change wheels upon request will result in immediate rejection of participation in the Pathfinder District level races. No graphiting will be allowed on the replaced wheels and the car must go directly to re-inspection.

BSA Kit Wheels will be available for purchase at the Pathfinder District Pinewood Derby Races for the standard fee, the same as that of the BSA Scout Shop and a Pathfinder District Race Official will be available to help with the removal of rejected wheels and installation of new BSA wheels.

This will include the use of new wheel nails provided with the BSA wheels if the cars current wheel nails are damaged during the removal of rejected wheels. All care will be taken to remove the cars current wheel nails when possible, but cannot be guaranteed by the Race Official to not be damage if removal of the rejected wheels requires current nails to be damage.

In recent years, it has been determined that Pathfinder District Pinewood Derby race contestants have been using the book **Pinewood Derby Speed Secrets** by David Meade to modify their race wheels. It should be noted that in the book, on Page 4 titled **A Scout Is Trustworthy,** the last line of the second paragraph clearly states, **“Ask your local race committee for a copy of your rules and then abide by them”.** This statement pertains to not only the wheels, but the race car itself. Please…be a Trustworthy scout and follow all Pathfinder District Pinewood Derby rules and regulations. If in doubt, it probably isn’t acceptable.

Pathfinder District Pinewood Derby Staff