

# **PACK 142 2013 PINWOOD DERBY**

*(Revision date 11/14/2012)*

## **Welcome!!!**

Welcome Cub Scouts, to our 2013 Pinewood Derby. Many of you may be experiencing the derby for the very first time and some of you may be experts. The derby is one of the Cub Scout's most favored events. The Derby is meant to encourage your Cub Scouter's self esteem, allows for creativity, and to teach important life lessons. It emphasizes such values and morals such as fairness and sportsmanship. And its FUN!

Contained in this manual are the rules, regulations, procedures, ideas, and requirements to participate in Pack 142's Pinewood Derby. Although not every instance is covered in this manual, it is important that you do not create your car without confirming with the Derby Chairperson if certain techniques are 'legal'. You must have your idea validated to avoid your car being disqualified. The concept of the Pinewood Derby is for each child to have as much fun as possible building their car, and it is the Derby Chairperson's job to ensure each boy has equal opportunity to win. The Pinewood Derby Committee does not want to disqualify any cars, but we have a responsibility to uphold the Cub Scout ideals and must make the race fair for all. With this in mind, please read this manual with your Cub Scout and "do your best!"

## ***The track and how the winners are determined***

The track is 32 foot in length. The cars can reach a peak speed of 10 MPH. The Derby is controlled by a laptop Personal Computer with software developed specifically for Pinewood Derbies. The computer and track electronics are on an uninterruptible power system. All wiring is shielded to prevent false race results. The PC will determine which Scouts will race against one another and all lane assignments, tracking each race's results. Races are always within the same age group. Tigers will run against Tigers, Wolves against Wolves, etc. It is possible for the software to run some heats from other age groups prior to the finals (as mentioned later) of a given group. The race results are based on fastest times. Each car will race at least 4 times, once in each lane. The software will run as many heat races as necessary to narrow the field of cars to 4. The remaining 4 cars will race in 4 races, called "Finals". These cars will race one time in each of the lanes. This eliminates any advantages that a car might have in one lane versus another. The software might assign a dummy car to compete with your car in order to have 4 racers on the track. The track has manual starting gate and finish line connected to the PC. When the cars are released from the start gate, the trigger opens and starts the race timer. As soon as each car passes beneath the finish line, it will trigger a sensor, its finish order and time will be displayed on the finish line as well as on the PC. This can measure a finish line difference of one thousand of a second, which translates to about 1/16 of inch. The results are final. The approximate cost of this entire setup is \$2,000.

## ***Off to the races - Date, Time, and Place***

Race Check in Will Take place on Friday January 21<sup>th</sup>. Time will be announced in January prior to that date. Bring your car in a padded container (i.e. shoebox), so it won't get dropped or knocked around. Bring extra weights (coins seem to be a popular alternative for the desperate) so you can attach them with a glue gun at the last minute if you need extra weight. You must provide, or have made arrangements in advance, for your own tools. A parent from our Pack will be the official weigher and will use the official BSA 5-ounce weight to calibrate our official digital scale. Once you have officially weighed and entered your car you will not touch your car after this point.

**If your car is not checked in on Friday night you will be unable to race. If you can't drop off your car that night please check with your den leader to make other arrangements.** The date and time for our Pinewood Derby is January 12<sup>th</sup>, 12:00PM at Isbell Elementary.

Don't forget to bring your camp chairs for something to sit on—unless you want to sit on the floor. Cameras will help everyone remember the day.

This is a uniform event. To race, you must be in uniform. If you do not have a uniform, please contact your Den Leader for assistance. Show your pride in Cub Scouting!

Scouts should arrive at 10-15 minutes prior to race start time. This will give you time to grab a seat and be ready for the races to start.

Your car will be placed on the track by an experienced volunteer. Parents from Pack 142 will be supervising this. If your car qualifies for further racing, it will be put in position for further racing by the pit crew.

The races will be run by Rank, starting with the Tiger Cubs, followed by Wolves, Bears and Webelos. The last race will be the Finals which will be comprised of Rank winners.

Tiger Races will start at 12 noon on Saturday. Wolves will follow at 12:30, Bears at 1:00 and Webelos at 1:30. Please note start times are approximate. We will not start races before that time, but we may start a few minutes late depending on how long the prior races take.

Winners in each rank will be awarded. The Family Division will run after the Finals. The family division is for Parents and Siblings only to race cars. Cub Scouts will not be allowed to race in the Family division. This schedule may be subject to change. All awards will be presented following the completion of all racing and the judging for special awards. Please be courteous and wait for all racing to finish—cheering for all participants. If you must leave, you may designate someone to pick up your car and awards. We prefer that everyone stay as a show of good sportsmanship and pack unity, however, we understand that there may be situations that cannot allow everyone to stay. Please use your own judgment in this instance.

## ***And the winner is....***

Trophies for first, second, and third will be awarded to all Ranks. Trophies will be awarded for each Rank level winner (Tigers, Wolves, Bears, Webelos). A separate set of trophies will be given to the overall Cub Scout winner, 2<sup>nd</sup> and 3<sup>rd</sup> place. Special awards will be given for the Fastest Looking Car and Most Original Design. Judges will be from the administering pack. The final judgments on all matters concerning the registration, scheduling, racing, or judging, will be made by the Derby Chairperson and the Derby Parents Committee which will be final.

### ***Special awards***

#### **Criteria for Fastest Looking**

(Will be selected by the panel of judges administering the track.)

Sleek

Aerodynamics

Paint job and decoration suggest speed

#### **Criteria for Most Original Design**

(Will be selected by the panel of judges administering the track)

Out of the ordinary design

## ***Building your car***

Included in the kit is a block of pine wood with two notches pre-drilled for axles, four plastic wheels and nail axles. You must use the kit provided by the Pack. The supplied wood, wheels and nails **MUST** be used. Do not substitute any part of the kit without prior approval from the Pinewood Derby Committee. If a piece is missing or broken please see your Den Leader for a replacement piece. Also included in the kit is a document containing the rules; however the rules we will conform to are the ones noted here. Replacement parts or accessories purchase from the BSA Scout shop are acceptable (including the official BSA colored wheels).

Determine if the axle holes are square with the car. If they are crooked, the car will go down the track rubbing the side of the track, causing it to go slower. You can make new axle holes if they are crooked, by turning the wood over.

Trace the profile of the car on a piece of paper. Cut out the paper. Trace the edge of paper on the side of the block of wood. Make sure the car will pass the size specifications. Cut out the design that you traced on the car. Sand the wood so it is as smooth as possible. Weigh the wood, wheels and axles. The car cannot weigh more than 5 oz. If you do not have an accurate scale, go to the Post Office. Add the wheels to the car by using the individual axles (nails). Try to leave some play (loose) in the wheels so they will turn as easily as possible. Paint the car and add decals if you want. Try to put your Scouts name and Rank on the bottom of the car.

Cars must be no wider than 2.75 inches and no longer than 7 inches. Cars cannot weigh more than 5 ounces. The bottom of the car must clear the track by no less than 3/8 of an inch, so it will clear the guide strip. There can be no loose material. Anything falling off the car will not be reattached with the exception of wheels and axles. The participant (with parent's help as needed) will have no more than five minutes to reattach the item(s) that fall off the car. These pieces are limited to the axles and wheels, and does not include decals, weights, and decorative items. The car will then be checked in again and the race will continue. This is very inconvenient so please make sure that all items are securely attached to the car prior to check in. Minimum width between wheels is 1.75 inches, so the car will clear the guide strip. Wheel base (distance between the front and rear axles) must be 4.5 inches apart. Maximum height will not exceed 4 inches in order for the car to safely pass under the electronic finish line. There can be no protrusions from the front of the car and all four wheels must be able to turn.

The motion of the car may not be mechanically aided. Motor, springs, rubber bands, etc. are prohibited.

Original equipment can be replaced only with equipment of the same type, and dimensions as the original equipment and the Derby Chairperson must be informed. For example, the nail axles cannot be replaced with continuous steel axles. Axles must be firmly attached to the car. **Light sanding may be used to remove casting defects on axles and wheels, however any other modifications are illegal, including, but not limited to beveling, tapering, thin sanding, wafering, or lathe turning of wheels or axles, reduction of tread width or thickness, use of wheel bearings, washers, springs, spacers, and bushings. The surface area of the wheel that touches the ground must not be changed. The wheels must remain in size and shape.** Additional wood or weight may be added as long as the total weight and overall size does not exceed the limits defined above. All parts of the car should be permanently attached, no string or taped on parts are allowed. No 'V shaped cars. The forward-most point of the car **MUST** be in the center. Additional types of decorative material like paint, decals, drivers, steering wheel, may be used

and are encouraged.

For lubricants, only BSA approved powder, or the new BSA white lube T102/polytetrafluoroethylene is permitted. Bring your own lubricants with you and be very careful not to make a mess using them, for the sake of everyone's safety and health. (Warning: other lubricants may damage the plastic wheels and keep them from turning freely.) Cars will not be able to be re-lubricated after registration. Equipment such as weights, decals, etc. can be added to the car as long as size and weight restrictions are not infringed. **Cars with wet paint or dripping glue will be disqualified. Remember, the use of oil is strictly prohibited.**

During registration, if a car does not conform to the rules, the owner will have an opportunity to correct the reason for nonconformance and try registering the car again. There will be electrical hookups available, but you must bring your own tools.

A space of about 40 feet by 20 feet is used for the race area allowing for the track, tables for car staging area, table for monitor and laptop and race officials. Outside of this area there is plenty of room for spectators. The track area will be cordoned off. Spectators should stay clear of this cordoned off area.

### ***Car Specifications:***

Total car length: 7 inches maximum

Total car width:  $2\frac{3}{4}$  inches maximum (including wheels/axles)

Wheel width:  $1\frac{3}{4}$  inches between wheels (across the car)

Wheelbase (length between axles):  $4\frac{1}{2}$  inches maximum

Car height: 4 inches maximum

Car weight: 5 ounces maximum

Body to track clearance:  $\frac{3}{8}$  inches between body and the track at all points between the wheels (at maximum separation.)

Please start on your designs now! Don't wait until the last minute, or stores may not have the decals you want and you may not have dry paint. Perhaps you want to do this over the holidays. Make this a memory and a keepsake! Please make sure that you assist your Cub Scout with the use of power tools.

Look on the internet for car ideas. There is a whole subculture dealing with this and it can really draw you in! It is a lot of fun!

You might want to make this the focus of a Den Meeting and ask boys and parents who participated in past years for advice.

If you have proper tools you would be willing to share with others (we have a lot of young parents, single parent families, and families who have moved from overseas who may not have power tools), please let this be known and we can email the Pack of your willingness to share or have an "open shop" day at your garage.

There will be a time before the race where you can weigh your car to confirm its weight. This should eliminate last minute disqualifications for heavy cars. The post office or one of those little mailing franchise stores is a better bet than grocery stores for weighing a car ahead of time.

Each car will be checked by the Derby Committee according to the rules and regulations stated in this document specifically for total size, weight, and wheel spacing.

### ***How to make the car faster***

#### ***Weight***

The closer the car weighs to 5 oz the better. If more of the weight is in the rear of the car, the faster it will go. Try not to make the car too light in the front. The flat weight is an excellent way to add weight and keep the car balanced. Small pieces of the weight can be broken off if it puts the car over the 5 oz limit. If it does not add enough weight, you can add some of the designer weights to the side of the car. Remember paint and decals will add weight to the car. If you don't have an accurate digital scale at home, take the car to the post office; I promise you won't be the only one doing this.

#### ***Friction***

The least amount of friction generated when the car goes down the track, the faster it will go. The main source of friction in a Pinewood Derby car is the wheels and axles, the place where things rub! Oil is not allowed because it will drip on the track and **will** prevent your car from being allowed to race.

#### ***Smooth/Balance ride***

The wheels that come with the car may not be perfectly round. If your wheels are not round please do not attach them to the car. Contact the Derby Chairperson immediately for a new kit. The Pinewood Derby wheels and axles should be perfectly round. The track is very smooth and if the car has wheels that are not perfectly round, it will bounce down the track. This could cause the car to go slower and/or jump lanes. The smoother it rolls along, the better.

#### ***Proper alignment***

The wheels need to be aligned just like those on a real car. If they are not, the Pinewood Derby car will rub on side of the track the entire race. This will definitely slow the car down. The axles need to be square with the car. If they are not, the car will not roll as easy. Remember continuous steel axels are not allowed.

#### ***Appearance***

A nice looking car will make for a great keepsake, but has little effect as to whether the car will be fast or slow. The template/decals will help make the car look nice and of course can win a 'design' award.

## ***Sportsmanship and Behavior***

Sportsmanship should be exhibited at all times. One of the most basic Cub Scout ideals is sportsmanship. We should treat people as we want to be treated. As we would want our fellow Cub Scouts to cheer and congratulate us, we should do, as well.

The derby venue is a public area and children should be supervised at all times.

The Derby Parent's Committee will judge your car on all dimensions, wheel sanding and distance, wheel base, axles, protrusions, no oil used, weight, all tires flat on a surface, and other rules listed here. I recommend that every Cub Scout take advantage of this opportunity so that if your car has any issue you will know immediately and have time to fix it before the race at the end of the month.

## ***Pre race clinics***

There will be a pre-derby workshop at Bill Woodard's house December 30<sup>th</sup> and January 6<sup>th</sup>, times will be announced prior to the clinics. You can weigh your car, check dimensions, or even begin work on your car at this workshop. Tools will be provided.

***Good Luck!***