

Pinewood Derby 03

WHAT: CLF Annual Pinewood Derby

WHEN: Saturday, March 8, 2003

WHERE: Christian Life Fellowship
Hwys 54 & 73, Port Edwards

FOR: Everyone (Boys, Girls, Youth,
& Adults)
*Participants from other churches
are invited!



CAR KIT COST: \$2.50
LEAD WEIGHTS: \$3.00/each
RACE ENTRANCE FEE: \$3.00/car

Other Calendar Dates To Note:

Sale of Car Kits:	Wednesdays	(2/5, 2/12, 2/19, 2/26)
	Sundays (AM)	(2/2, 2/9, 2/16, 2/23)
Cut Out Nights:	Wednesday	2/19 & 2/26 (All ages)
Test Run Night:	Wednesday	3/5 (All ages)

On Race Day (preliminary schedule):

Registration:	9:15 – 10:15 am
First Race:	10:30 am
Concession Stand (opens):	9:30 am

On the special “Cut Out Nights” Royal Ranger commanders and equipment will be available to help those who are unable to cut out their car design at home. Some of the Royal Ranger outposts will be working on their cars on club nights, but much of the work on the cars can be completed at home.

On the Wednesday before the race a “Test Run Night” has been scheduled to allow entrants to tryout their and cars and make final adjustments.

On race day, there will be a convenient and thrifty lunch available for you and your family (BBQ’s & Hot Dog plates, soft drinks, and treats).

All are invited and welcome to come and observe the race free of charge.

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Car Design Sheet

Side view – draw outline of the side of the car

Top view – draw outline of the top of the car

CLF Pinewood Derby – Race Rules

Purpose and Goals:

The CLF Pinewood Derby is sponsored by our Royal Rangers outpost with the thought of having a project that a father and son could work on together, and to give the boy without a father at home an opportunity to interact with an adult sponsor, elder brother, or commander. The goal is to promote a healthy family activity, competition and sense of accomplishment. This event is open to

Competition Classes:

Racing heats and "Best of Show" judging will be done in separate classes:

Class A	Grades K - 2	(Boys & Girls) (Ranger Kids, Daisies, & Prims)
Class B	Grades 3 - 5	(Boys & Girls) (Discovery Rangers & Stars)
Class C	Grades 6 - 8	(Boys & Girls) (Adventure Rangers)
Class D	Grades 9 - 12	(Boys & Girls)
Class E	Ages 18 and up	(Adult - Male & Female)
Class F	Alumni	(Cars from previous years - Male & Female)
Class G	Unlimited	(Any reasonable weight & size)

**anyone making a car under age 5 would be included in Class A*

In the age based classes for entrants under age 17, the car should be designed and built by the entrant as much as possible. Leaders, parents, and friends should supervise, instruct and help, but allow the child the enjoyment of creating the car and the satisfaction of completing it.

The unlimited class is open for any cars which do not conform to the basic design rules listed. It must be a reasonable weight and size, so as not to damage the racetrack. Unlimited cars may utilize alternative forms of propulsion – no thermonuclear devices please ☺

Awards:

1. There will be a trophy, medal or ribbon for first place through sixth place in each class for fastest car and also for "Best of Show".
2. A special award will be given for overall fastest car.
3. A special award will be given for each class for the "People's Choice Award".

Car Specifications (ALL CLASSES – excluding “Unlimited”):

1. Weight - is not exceed 6 ounces.
2. Wheel bearings, washers and bushings are not permitted.
3. No wafering of the wheels is allowed.
4. The car shall not ride on any type of spring.
5. Only "Official" Pinewood Derby Kits may be used. These kits are available from Outpost 117, a hobby store or the Ranger Supply Store, Santa Clara, CA, may be used.
6. No starting devices are allowed. Cars will start and roll by forces of gravity alone from a standing start at the starting line of the track.
7. To ensure that a car will be able to race on the track without interfering with other cars, **ALL CARS** must meet the following requirements. This includes all parts of the car whether it be the car body, weights, decorations, fenders, etc.:
 - a. Width - the overall width is not to exceed 3 inches at any point.
 - b. Length - the overall length must not exceed 8 inches at any point.
 - c. Clearances -
 - 3/8 inch minimum between bottom of car and top of table,
 - 1 3/4 inch minimum between wheels on each axle.
 - d. Height - the maximum overall height from bottom of wheel to the highest point on the car must not exceed 8 inches.
8. You may use any lubricant you feel is best for your car. However, powdered graphite is the preferred lubricant. The lubricant **must not** come in contact with the track, as this may effect track performance and will be grounds for car and race disqualification.
9. **CARS FROM PREVIOUS YEARS WILL ONLY BE PERMITTED TO COMPETE IN THE ALUMNI CLASS.**
10. Cars may not be modified to start ahead of the starting line. All parts of the car must be at or behind the starting line when racing.
11. No moving parts (except wheels) or loose materials of any kind will be permitted on the car.

12. Details such as steering wheels, driver, decals, painting and other exterior and interior details are permissible as long as they are securely attached and comply with these specifications.
13. Weights must be an integral part of the car. Weights will not be allowed to be taped or set on a car. All weights must be incorporated within the design of the car and be securely attached to the body of the car.

Registration:

1. Each entrant must register their car(s) in person unless prior arrangements have been made with the "Race Director". A car can be registered in only one class.
2. The car will be inspected and checked for compliance with these specifications by a judge, whose decision is final.
3. There **will not** be weights provided at registration, and we would appreciate it if each entrant would check their own cars for compliance before registering, to save time and to eliminate confusion and last minute changes to cars.
4. No one except the "Racing Officials" will handle cars once they are registered, except as noted in racing procedures. The car must be surrendered to officials at registration and be ready for competition.
5. Each entrant will be given a color I.D. with an identifying number when their car is registered. This I.D. is to be placed on the bottom of the car.

Racing Procedures:

1. All heats will be run solely on a system to find the fastest car within each heat. Actual racing time will have no bearing on the placing of winners.
2. All cars will start by gravity from a standing start at the starting line of the track.
3. The car whose most forward part trips the detectors at the finishing line wins the heat.
4. Once a car has been registered, no adjustments or lubricating is allowed.

5. If either a car leaves the track or its parts fall off before crossing the finish line on the first run of a heat, there is no contest and the heat will be re-run. If the same car either leaves the track or any of its parts fall off before crossing the finishing line on the re-run of the heat, the car is then disqualified from that heat.
6. If a car is damaged, the race judge, at his discretion, may release a car to its owner. In such a case, only the repairs necessary to allow the car to race are permissible, **no modifications or lubrication is allowed**. Repairs are only allowed after the heat is complete.
7. No heat will be held up for a car(s) being repaired. If a car is unable to run in its scheduled heat, the car is disqualified from that heat.
8. Non-Christian conduct, attitude, language or sportsmanship is grounds for immediate disqualification from all competition. The decision of any "Racing Official" or Royal Ranger Commander in these matters is final.

Construction Hints:

1. If you would like a deeper pilot hole in the wood axle use a 3/32 drill bit.
2. After assembling the axles, wheels and screws to the car body check that all four wheels properly touch the track, **before** final gluing of the wheel assembly. The wheels should be perpendicular to the track surface and parallel to one another.
3. To eliminate vibrations and friction polish the portion of the screws that contact the wheels with emery cloth.
4. To remove any rough edges on the wheels **lightly** sand each one evenly.

"Best of Show" Judging Guidelines:

1. The judges will not converse or discuss while they are judging.
2. Any and all comments will be in writing and will consist of the car number and score using the Judging Worksheet. This worksheet will be given to the "Race Director" as soon as the judge has completed judging.
3. The areas used to judge and score the cars are:
 - a. ORIGINALITY The idea of the builder. You must take into account how much creative thought went into the design.
 - b. WORKMANSHIP The skill the workman shows in cutting, carving, sanding and detailing out the car. The selection of materials and general construction are also factors in this score.
 - c. APPEARANCE Consider the use of color and overall outward appearance. Take into account the painting of the car, it's overall texture, is the color and paint even, is it pleasing to the eye.
4. All entrants are encouraged to include a 3" x 5" card with their car at registration giving a brief description of the work completed indicating which parts were handcrafted and which were purchased. The card could also give information about the origins of the design.

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Construction Steps:

- \$ If you would like a deeper pilot hole in the wood axle use a 3/32 drill bit
- \$ Prepare wheels and axles
- \$ Draw profile of car on side of block
- \$ Cut car's profile
- \$ Draw top view
- \$ Cut top view (scroll saw is good for this)
- \$ Shape and Sand
- \$ Weigh body, axles, wheels...add lead to total 6 ounces
- \$ Glue lead pieces to car body-(5 minute epoxy works well)
- \$ Trim to weight limit; final sanding
- \$ Paint/Decorate (keep body clean where hubs will touch)
- \$ Install & align wheels
- \$ Add graphite and work into wheels

Design Tips:

- \$ Keep the car the full length if possible. It has to do with the physics of velocity and length of travel of the weights.
- \$ Use the full 3/4 inches (outside wheel to outside wheel) that the rules give you. This will allow the wheels to travel farther before hitting the center strip.
- \$ Leave a lot of wood in the back to put in the weights.
- \$ Do not make the front of the car pointed. It is hard to set up against the starting dowels.
- \$ Be aware of how sensitive your electronic timers are. You want the car to set them off at the end of the race and not before.
- \$ Use your imagination. Be creative. Shape has the least to do with winning. The aerodynamics of a small block of wood doesn't mean much in thirty feet.

The Finish:

- \$ Buy a gloss finish for the car. Its worth it. After all that work, this is the final touch. The more coats that you put on...the shinier your car will be. Be sure the paint is dry before putting on the gloss coat.
- \$ Sand in the direction of the grain when smoothing and against the grain when shaping.
- \$ Use a sandable primer or wood sealer. White is for light colors and grey for dark colors.
- \$ Water based paints dry quicker (1 hour) than oil based paints(24 hours)

Friction Is Your Enemy:

- \$ Debur the wheels. Take off the flashing and seam that was produced when the wheel was molded with a 600 grit or better sandpaper. Inside as well as out. Sand any bumps off the wheel with the sandpaper. Metal polish will restore the gloss. Be careful not to break any rules your race has regarding wheel modification. Don't sand too much or you'll create a flat spot.
- \$ Polish the axles. First with a 400 grit if you have a really bad spot. Then a 600 grit.
- \$ Have only three wheels touching the track. Raise a front one slightly. There is less friction with 3 wheels rolling than 4.
- \$ The head of the axle should be tapered about 15 degrees so it rubs against the wheel less.
- \$ Wax the wheels with furniture polish. Make sure the polish does not contain a solvent of any sort.
- \$ Use graphite . Oil damages the paint and collects dust.
- \$ Break in the wheels by spinning them with lots of graphite.

Weigh In:

- \$ Get the weight as close to the 6 ounce limit as possible. Remember, the official scale may not weigh the same as yours.
- \$ Everyone has an opinion on where to put the weight. One suggestion is that the weight needs to be predominantly in the rear so that gravity can act upon the weight further up the incline and for a longer period of time. A car with more weight to the rear generally grabs more speed down the slope. Many suggest having the center of gravity at 1 to 1 ½ inches in front of the rear wheels. But be careful not to put too much in the rear or you'll pop a wheelie.
- \$ What kind of weight? Melted lead is dangerous and unnecessary., Incremental weights(with pre-marked grooves) are easier to snap off into the size you need. Some folks just use BB's , nuts & bolts, sinkers, etc., but these must be glued so that they can not move. No movable weights or mercury are allowed.
- \$ Keep the weight low on the car and in the center(Left/Right of the car). Put the weight just in front or behind the rear wheels for less wheel chatter.

It's Time To Go Straight!:

- \$ Axles must be in straight front to back. That is square to the body
- \$ After pressing in the axles, test the car for crooked wheels...roll it on the floor. If the wheels are on straight, the car should roll 8-10 feet in a fairly straight line. Should the car turn left or right, you need to tinker with the axle placement without removing them from the car body, until it rolls straight.
- \$ Once you match a wheel and axle together with graphite, keep them together. They wear into each other as a matched set.

Race Day-Be Prepared:

- \$ Transport your car in a shoe box. Dropped cars are unfortunately a too common experience.
- \$ Add LOTS of graphite right before check in
- \$ Running the car along the floor prior to the race will cause it to lose!

Pinewood Derby Websites (design tips):

<http://www.rangerdj.com/pinederby.html>

<http://www.macscouter.com/CubScouts/Pinewood/index.html>