
Pinewood Derby Overview

From



to



December 2, 2006

Why have a Pinewood workshop?

- Share experience
- Build confidence
- Bolster creativity
- Increase enjoyment
- Raise the bar
- Promote open class
- My contribution

Step 0 – Consider your objectives

- **Relationship**
- **Sportsmanship**
- **Integrity**
- **Patience**
- **Craftsmanship**
- **Safety**
- **Creativity**
- **Organization**
- **Learn Physics!**
- **Teamwork**

Step 1 – Understand your rules

- Sets of rules
 - Kit rules
 - Council and Pack rules
- What is allowed
 - Understand benefits
 - Capitalize
- What's not allowed
 - Avoid disqualification
 - Learning opportunity

Pinewood Derby Car Regulations

Attention Pack Leaders:
It is your responsibility to inform the parents and Cub Scouts of your pack of these regulations.

1. **The car must be constructed using the materials supplied with regulation Grand Prix Kit #17006.**
2. The car run in the Council Pinewood Derby shall be the identical car run by the entrant in his own pack derby, and it must have been constructed after April 23, 2005.
3. **Length:** Overall length shall not exceed 7 inches.
4. **Width:** Overall width shall not exceed 2 1/4 inches.
5. **Weight:** Maximum total weight of car, including driver, trims, weights, etc., shall be 5 ounces.
6. **Height:** Cars shall not be higher than 3". This is measured from the bottom of the wheels to the top of anything on the car. This is so all Pinewood Derby Cars will clear all timing devices.
7. **Wheels:** Wheels must be constructed from those supplied in regulation kit #17006 OR REPLACEMENT WHEEL KIT #17007. No modification of wheels will be allowed, except that burrs or excess plastic from the factory molding process (if any) may be removed or sanded. Wheels must be original width and height and the whole tire surface must meet the track surface.
All four wheels must touch the track surface. This will be checked during weigh in and inspection.
If the flat surface of the tire is to be sanded, be careful not to round the corners (crowns) of the wheel. Any rounding of the crown will cause disqualification. An edge should still be present. See illustration below.
The axle bore of the wheel may not be bushed, sleeved, lined, or otherwise modified to change the basic wheel-to-metal axle interface other than the appli-

cation of a non-permanent spray-on, brushed-on, or dusted lubrication compound. Bushings, sleeves, permanent coatings, thrust washers, and enclosed axles (hub caps) are prohibited. **Wheels may not be shaved.**

8. **Axle:** Axles must be constructed from the nails supplied in regulation kit #17006 or replacement kit #17007. Burrs on the underside of the nail head may be removed with a file or emery cloth, and the nail shafts may be polished with fine emery cloth or jeweler's rouge. The mating surface of the nail may **not** be grooved, bushed, sleeved, lined, or otherwise modified to change the basic wheel hub to nail shaft interface other than the use of application of a non-permanent spray-on, brushed-on, or dusted lubrication compound. Bushings, sleeves, permanent coatings, thrust washers, and enclosed axles (hub caps) are prohibited.
9. **Track Clearance:** The car must have an under-body and in-between-wheel clearance which will allow it to travel freely over a track lane strip which is 3/8 inches maximum in height and 1 1/4 inches maximum in width.
10. **Suspension:** The car shall have a solid suspension consisting of the wheels and axles rigidly mounted to the car body. No springs, linkages, shock absorbing materials or other constructions which

ALL RACE RESULTS WILL BE DETERMINED BY THE ASSIGNED TRACK JUDGES, AND ALL TRACK JUDGE DECISIONS WILL BE FINAL. VIDEO REPLAYS, PHOTOS, ETC., WILL NOT BE CONSIDERED.

provide a non-rigid or floating-type suspension are permitted.

11. **Details:** Details such as steering wheel, windshield, driver, exhaust pipes, trim, etc., are permitted as long as they are rigidly mounted to the car body and do not exceed the overall car specifications.
12. **Starting Devices:** The car may not

incorporate any devices which may assist starting. These shall include, but are not be limited to, magnets, liquids, spring mechanisms, etc. There shall be no loose components within the body of the car. The car must also be free-wheeling.

13. **Front Edge:** The front edge of the car must rest against the starting peg on the track so that the entire car is behind the peg.

Race Format

The race format for each category will be a single elimination tournament conducted in heats. No more than 3 cars will race at a time, each car making one run down each of the 3 designated lanes of a multiple lane track. Heat winners will be determined by a total point system for the heat, whereby a car will be assigned 1 point for 1st Place, 3 points for 2nd Place, or 4 points for 3rd Place after each of the three races in a heat.

The car with the least total points at the end of all heats will advance to another heat. The other two cars will be eliminated from the Derby. They may be left, though, to be judged for the "Best Designs Contest" to be held at various times during the session.

Car Inspection

Every car entered will be subjected to and must pass an inspection to the rules and regulations of Grand Prix Kit #17006 and the foregoing Blackhawk Area Council Pinewood Derby Car Regulations.

If the car does not meet the above specifications, it must be altered by a responsible adult or it will be disqualified.

Step 2 – Consider design keys

- Speed vs. show
- Simple vs. complex
- Original vs. duplicate
- Conventional vs. unconventional



Step 3 – Check the kit

→ The block

→ Flat

→ Square slots

→ Test fit axles

→ Axles

→ Heads

→ Wheels

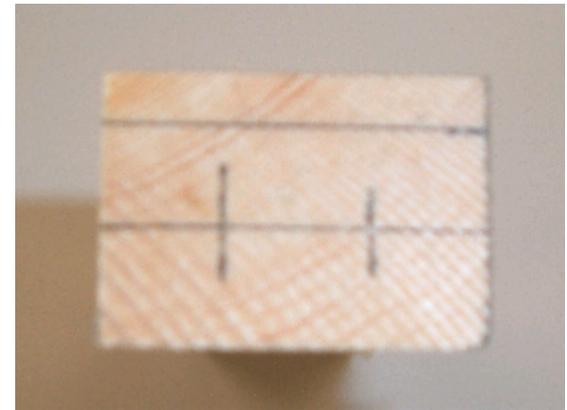
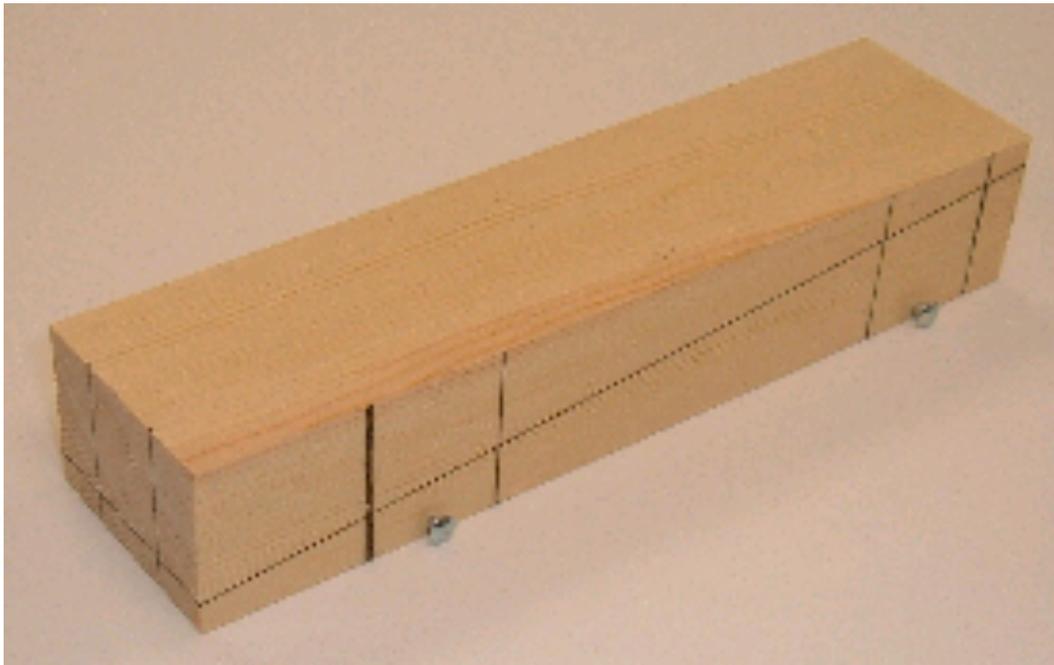
→ Round

→ No defects



Step 4 – Draw the design

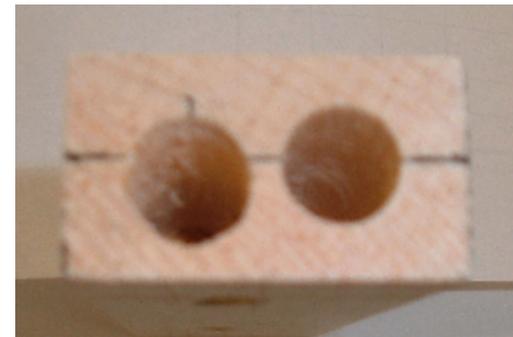
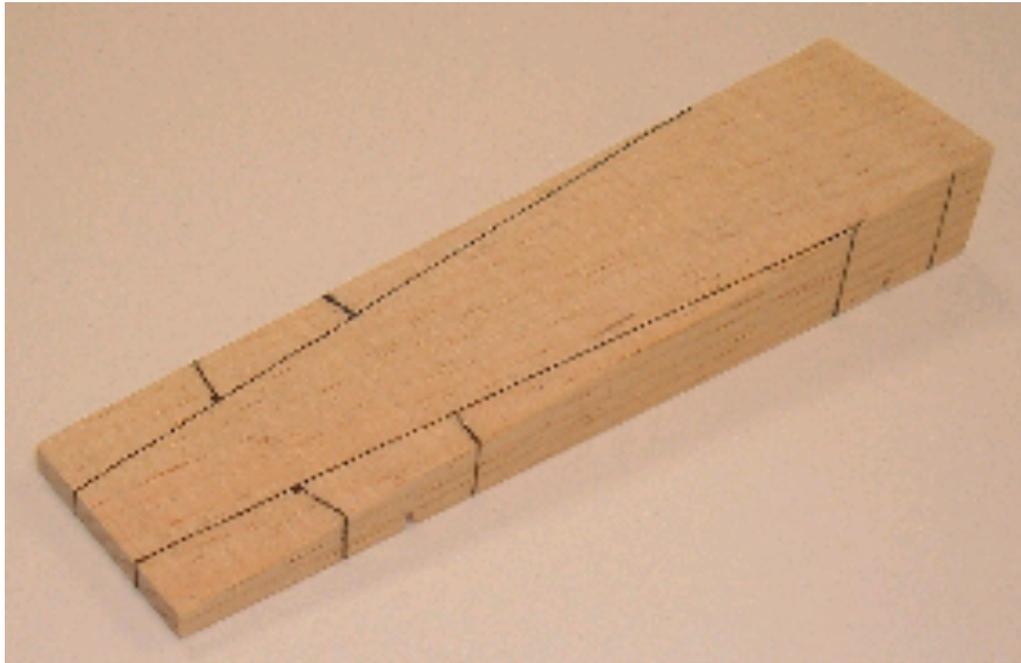
→ Pencil – can use 2nd kit for straight edge



→ Basic wedge design with weight holes at rear

Step 5 – The first cut

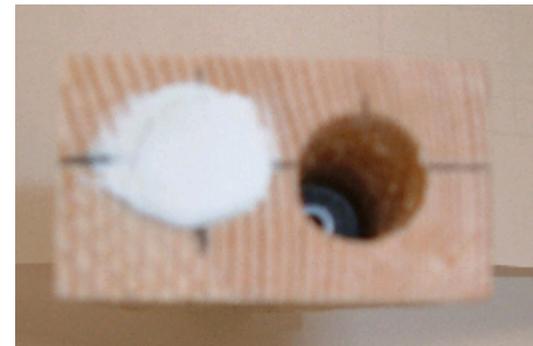
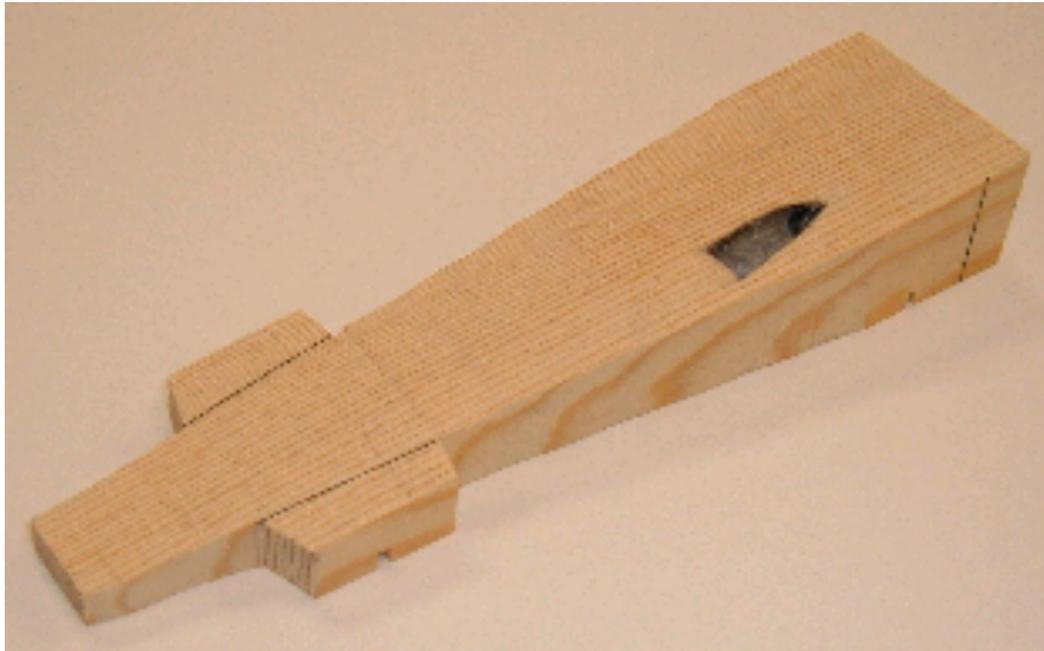
→ Thicker material – more assistance needed



→ Add final design marks, drill holes in back

Step 6 – The remaining cuts

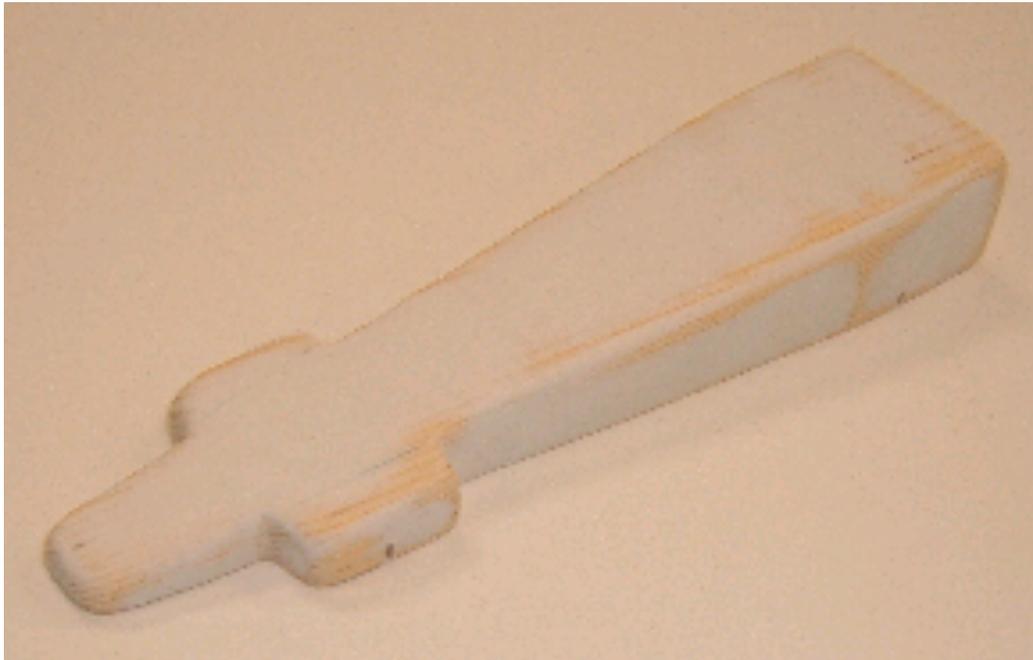
→ Thinner material – less assistance needed



→ Weight added in back

Step 7 – Filling and sanding

→ Fill weight holes, rough surfaces with wood putty



→ Sand off excess, round off sharp corners

Step 8 – Paint, decals, figures

→ Brush on paint for younger children



→ Decals, stickers, etc.

Step 9 – Finish

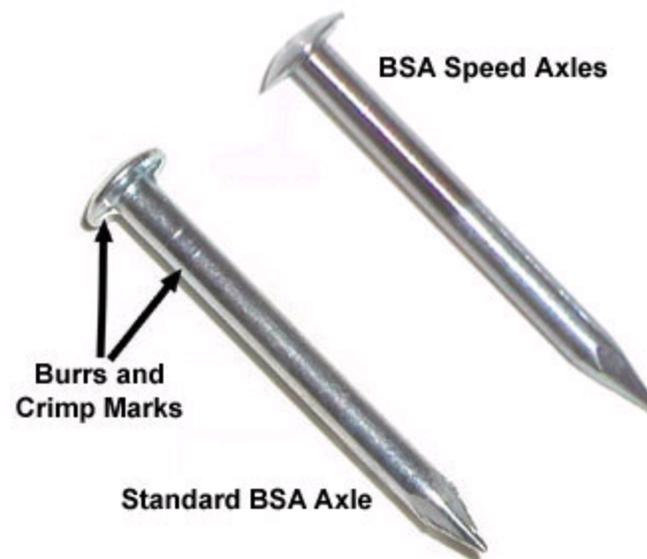
→ Varnish, Lacquer, Polyurethane – Satin vs. Gloss



→ Acrylic + Enamel = not good

Step 10 – Axle Preparation

→ Nail head burrs, axle ridges



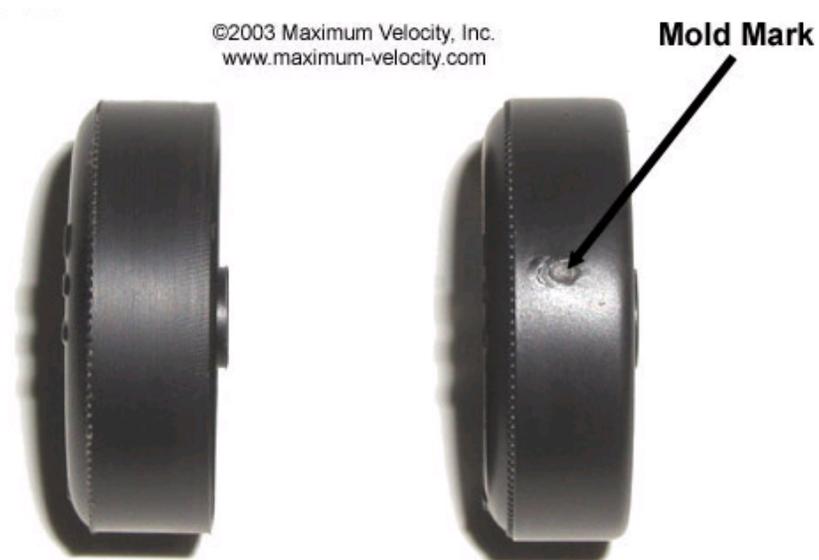
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→ File, sandpaper, polish

Step 11 – Wheel Preparation

→ Molding pits, hub and bore defects



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→ Sandpaper, polish

Step 12 – Lubrication

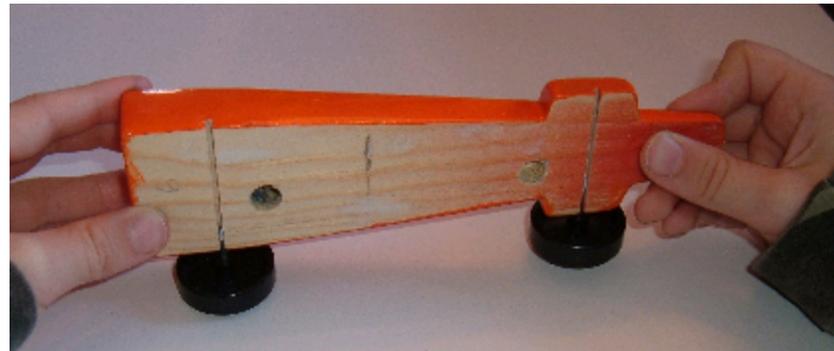
→ Lubricate axle, wheel interface areas



→ Spin for lubricant break in, determine spin times

Step 13 – Installing axles and wheels

→ Insert axle into wheel, lay flat on firm, flat surface



→ Ensure axle slots perpendicular, smooth firm pressure

Step 14 – Pre-race storage

→ Wrap car in dry, dust free material



→ Small storage box for transport

Bring to races

- Lube
- Extra weights
- Pliers
- Glue
- Extra wheels / axles

Resources available

- **Other parents**
- **Current and former scouts**
- **Books**
- **Newsletters**
- **Videos**
- **Internet**
- **Local Hobby shops**

Resource cautions

- **Some recommendations are outside our local and Council rules**
 - **Wheels – coning hubs, modifying bore or wheel surface, raised wheel**
 - **Axles – canting axles, beveling heads, machining / grooves**
 - **Overweighting – 5.04 oz.**
- **Internet cautions**
 - **Objectionable materials**
 - **Sales pitches**

Raw materials

- **Kits (plural)**
- **Wood putty**
- **Paint & brushes**
- **Sandpaper, sanding blocks**
- **Decals, stickers**
- **...**

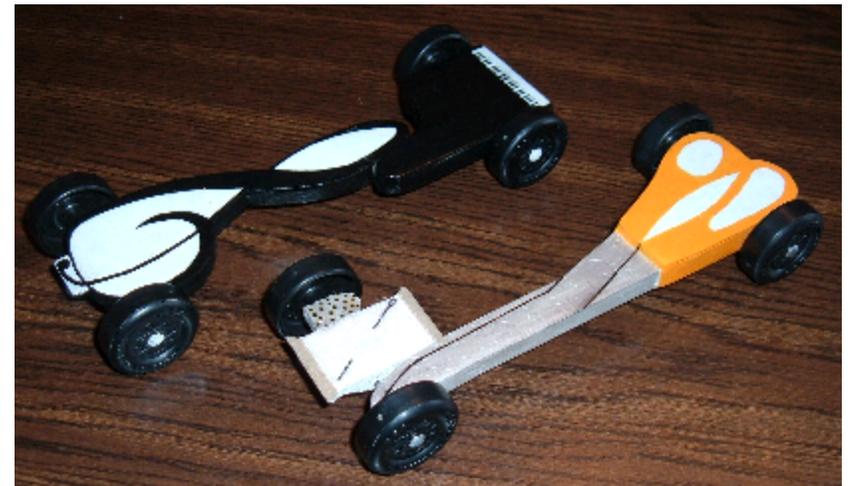
Tools

- **Safety Glasses**
- **Particle mask**
- **Vise / Clamp**
- **Saw**
- **Drill**
- **File**
- **Specialty tools...**



Other fun

- Open class
- Sibling, Grandparent cars
- Gimmick cars
 - Noise
 - Lights
 - Thematic
- Down and Derby movie



History

- **Don Murphy, 1953**
- **Pack 280C, Manhattan Beach, CA**
- **Boys Life Magazine**

Why 2 (at least) cars?

- More learned from more experience
- Transition to independence – parent “hands on” time decreases with experience and skill level of boy
 - 1st yr – together learn from error on 1st car, apply to 2nd car
 - 2nd yr – parent demonstrate on 1st car, boy follow afterwards on 2nd car
 - 3rd yr – parent and boy work cars at basically the same time
 - 4th yr – boy mostly independent, parent has car to work on while waiting to help as needed
 - 5th yr – parent and boy make cars (mostly) independently – race time!

Bring to workshop

- **Raw materials box**
- **Tools box**
- **Construction demonstration model**
- **Misc. cars / pictures of cars**
- **Down and Derby movie**
- **Newsletter copies**
- **Old school kits, Boys Life Oct 1954**