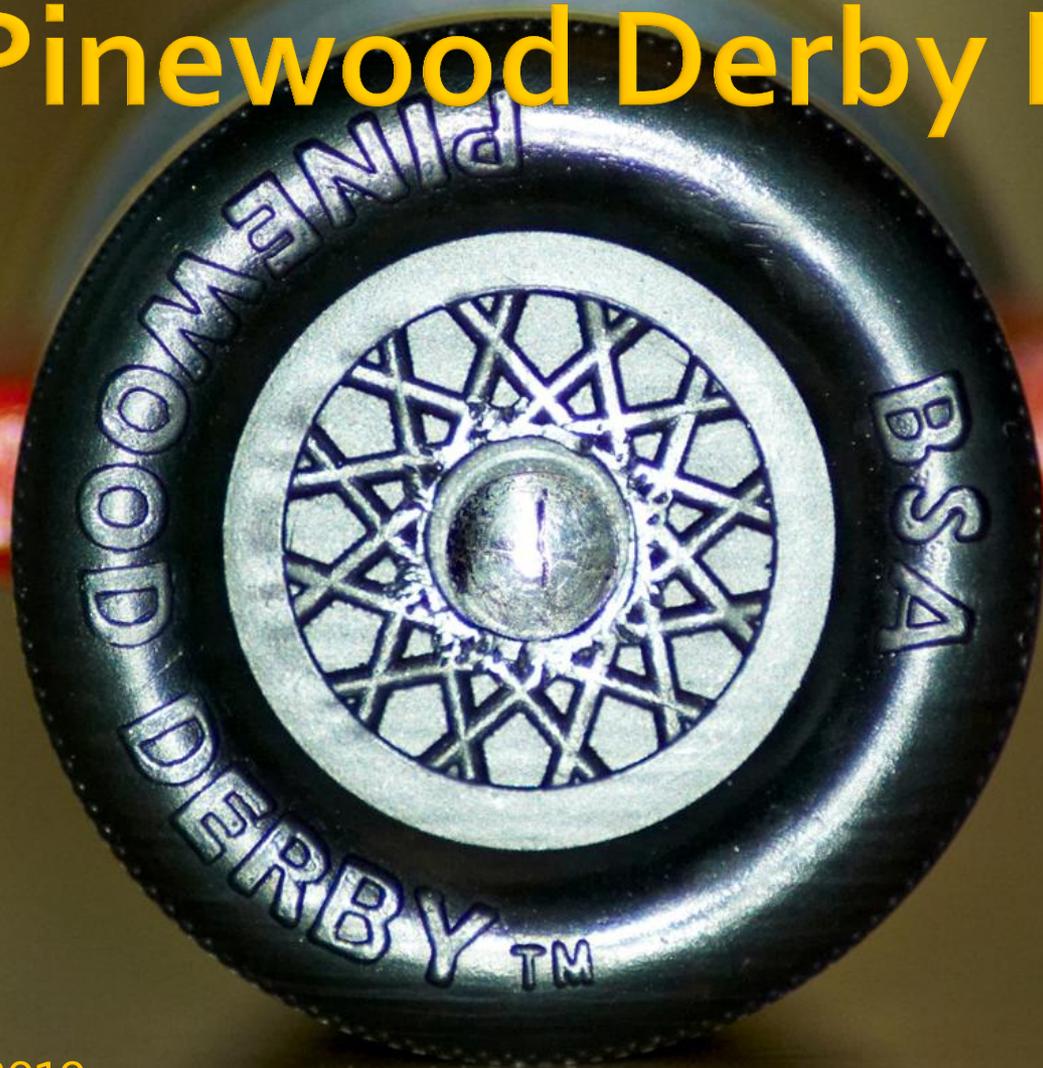


# Pack 1776 Pinewood Derby Primer



# The 10 Purposes of Scouting

- Character Development
- Spiritual Growth
- Good Citizenship
- Sportsmanship & Fitness
- Family Understanding
- Respectful Relationships
- Personal Achievement
- Friendly Service
- Fun and Adventure
- Preparation for Boy Scouts

# Is The Goal To Have The Fastest Car?

No! The goal is for the PWD to meet the goals of scouting. We want our scouts to develop new skills, learn new things, take pride in their work, and to have fun!

# What Scouts Will Learn

- Research
- Shop Safety
- Designing
- Measuring
- Mathematics
- Problem Solving
- Sawing
- Weighing
- Drilling
- Filing
- Sanding
- Using Tools
- Painting
- Applying Decals
- Sportsmanship
- Physics

# What Scouts Will Learn

- Research
  - Books
  - Web

# What Scouts Will Learn

- Physics!
  - Gravity
  - Friction
  - Energy
    - Potential
    - Kinetic

# What Scouts Will Learn

- Pride in their accomplishment!
  - This is their car
    - They designed it
    - They helped build it
    - They decorated it
    - They raced it
    - They keep it on display in their room

# Are the purposes of scouting met if...

- an Akela purchases pre-manufactured parts from outside sources in violation of our PWD rules?
  - No!
- the Akela builds a car while the scout plays a video game?
  - No!

# Are the purposes of scouting met if...

- the Akela builds a car while the scout watches?
  - No!
- the Akela researches PWD physics w/o the scout also learning what is age appropriate about the subject?
  - No!

# Are the purposes of scouting met if...

- there is no pride in accomplishment because the scout didn't try?
  - No!

# How To Get Your Scout Involved

- Make the project fun
  - His design
  - His decoration
- Work in short time bursts
  - Scouts have short attention spans (particularly the Tiger Cubs)
  - It is better to start weeks early and have many short work sessions than a few marathon sessions

# How To Get Your Scout Involved

- Combine the PWD project with other school or Cub Scout requirements
  - Webelos Craftsman achievement
  - The PWD experience provides great essay material for school
- Make every part of the project a learning experience

# How To Get Your Scout Involved

- Let the scout do as much as possible provided safety rules are followed. For example, pulling down on a drill press lever is fun. So is painting with a brush, using sand paper, etc.

# How To Build A Fast Car

- It takes a lot of work to build a fast car.
- Factors include:
  - Shape (aerodynamic)
  - Friction reduction
    - Smoothing and Polishing axles
    - Using a graphite lubricant
    - Tuning wheels (so they don't constantly bang against the center rail)
  - Weight
    - Proper weighting and optimal weight placement

# How To Build A Fast Car

- It takes a lot of work to build a fast car.
- Factors include:
  - Tuning the wheels so the car doesn't wobble back and forth (and bang against the rails over and over again) as it travels down the track.

# How To Build A Fast Car

- Tips

- The further the center of gravity (COG) is toward the rear of the car, the faster the car will start. Note that placing the COG too far back will make the car unstable, causing it to go off the track or constantly wobble into the rail.
- The car should weigh close to the 5 ounces maximum allowed by the rules. A “light” car is generally slower.

# How To Build A Fast Car

- Tips
  - If you don't have time to file the ridges off the nails and sand the axles, simply place the ridges in the "north and south" position when mounting the wheels to the car. When the car rolls forward the wheels will touch the smooth ("east" and "west") part of the nails.
  - Lubricate the nails and wheel hub with graphite.

# How To Build A Fast Car

- Tips
  - Buy an extra PWD kit and build a “shadow” car along with the one intended to race. Accidents happen that can break or ruin a car.
  - A car that is too thin may break.
  - A car that is too thin can easily warp in humid weather, ruining the car’s “tune.”
  - Remember to factor in the weight of paint and glue when estimating how much weight to add to your car. It is easier to add weight than subtract it.

# How To Build A "Show" Car

- It can take a lot of work to build a show car.
- It takes more work to make a fast show car.
- Considerations include:
  - What design the scout wants (Hershey wrapper, wad of \$100 bills, Wii, banana, replica Cobra, etc.)
  - How to decorate the car
    - Paint
      - Time to dry
      - Layers
      - Masking
    - Wrappers and/or decals

# How To Build A “Show” Car

## ■ Tips

- Start early since completing the car may take more time than anticipated.
- Buy an extra car or two since mistakes happen, usually at the worst possible time.
- Take into consideration that paint and grain filler (if used) will add weight to the car.
- Remember that some paints and clear coats take several days to fully dry.

# How To Build A "Show" Car

- Tips
  - Be careful when graphite lubricant is applied to the wheels/axle hub. Graphite is messy, and can ruin a nice paint job. Consider masking the car before graphite is applied.

# Conclusion

- The PWD Akela/scout project should mirror the purposes of scouting.
- Building a car should be an educational experience for the scout.
- Building a car should be fun!

# What To Do Now

- Read the rules.
- Design your car.
- Start building the car in December, so you will have plenty of time to finish before the race!

# Every Scout Who Participates Is A Winner!



# BLACKHAWK 500 PINWOOD DERBY, SUMMARY OF RULES FOR RACE DIVISION

## **Registration**

- Only one car may be registered per scout.
- Building of the car must have begun during the current Scouting year.
- The car must be registered, pass inspection and impounded during the registration period to compete. No further modification or lubrication of the car is allowed after impounding.

## **Car specifications**

- Width: 2.75" or less (including the wheels)
- Length: 7.00" or less
- Height: 4.00" or less (including all trim items)
- Under car clearance: 0.375" (3/8") or more
- Inside wheel-to-wheel clearance: 1.75" or more
- Axle-to-axle spacing: 4.40" +/- 0.125"
- Car weight: 5.00 ounces or less

## **Building of cars**

- ALL work (including improvements to wheels, axles, and car body) must be done by the scout and the parent (Akela). The intent is to have the scout build as much of the car as reasonably and safely as possible. The use of pre-shaped car bodies, machined wheels or axles acquired from the Internet or other sources is NOT allowed.

## **Materials**

- Axles, wheels and body MUST be from the materials provided in the Official Grand Prix Pinewood Derby Kit.
- Additional trim items are allowed as long total weight doesn't exceed maximum weight and size.
- No loose materials (weights, characters or trim) are permitted. Weights must not move.

## **Wheels and axles**

- Axle nails must be mounted parallel to the track surface. Wheels must run flat on the track surface. NO canting. Axle treatment is allowed (i.e. deburring/polishing).
- Wheel treatment is allowed (hub and tread smoothing/polishing) but it may NOT result in substantial removal of mass, or reduction in wheel width or diameter. At least 80% of the original wheel width must contact with the track surface. Wheel hub cannot be shortened or the diameter opened.
- The car must run on three or four wheels.
- Wheel hub caps, washers, inserts, sleeves, and bearings are NOT permitted.
- The car may not ride on springs or other suspension.

## **Gravity powered**

- The car must be powered ONLY by gravity.

## **Lubricants**

- Only dry lubricants are allowed. Lubricants may not foul the track.

*This is a summary of rules for cars in the Race Division. It is NOT intended to be a substitute for the Official Blackhawk 500 Pinewood Derby Rules, available on the website ([www.blackhawk500.org/](http://www.blackhawk500.org/)).*