How To Build a
Pinewood Derby Car

Building a pinewood derby car for Cub Scout Pinewood Derby involves several steps:

1. **Design the Car**:
    - Choose a design that fits within the event rules (size, weight, etc.).
    - Draw the design on paper, considering aerodynamics, weight distribution, and appearance.
2. **Prepare the Block**:
    - Start with the pre-cut pinewood block that comes with the kit.
    - Use a saw (or a coping saw) to roughly cut out your car shape based on your design.
3. **Shape the Car**:
    - Use sandpaper or a file to smooth and refine the car's shape. Focus on making it aerodynamic and lightweight.
    - Be careful not to make any parts too thin or fragile.
4. **Paint and Decorate**:
    - Sand the car until smooth, then apply paint or decorations as desired.
    - Let the paint dry completely before proceeding to the next step.
5. **Install the Axles and Wheels**:
    - Attach the wheels to the axles, ensuring they spin freely and are securely attached.
    - You can lubricate the axles with graphite powder for smooth movement.
6. **Weight the Car**:
    - Add weight to the car (usually towards the rear) to make it as close to the weight limit as possible (often 5 ounces).
    - Secure the weights inside the car, ensuring they are firmly in place and won’t shift during the race.
7. **Test and Adjust**:
    - Test the car on a track (if available) to see how it performs.
    - Make adjustments as needed, such as improving the alignment of the axles or adding more weight for stability.
8. **Final Check**:
    - Inspect the car to ensure it meets all the event’s specifications.
    - Double-check the wheels, axles, and weight.

Once the car is complete, it's ready to race in the pinewood derby!

And most importantly …. Have Fun!!!

Pinewood Derby Construction Guidelines

Single Entry per Cub: A Cub Scout may enter only one car in the event. Cars must have been made for the Pack Pinewood Derby held in the current Scouting year.

Essential Materials: All cars entered shall be constructed from the Official Grand Prix Pinewood Derby Kit (referred to below as the kit) as issued to the scout. Cars are to have been built by the Scouts with limited parental/ adult supervision and help. Scouts should do most of the work including painting. Decorations on the car are also allowed (e.g., Lego mini-figs, electronic lights, etc.). These decorations cannot be used to accelerate the vehicle in any way.

Weight: Race cars may weigh no more than five (5) ounces (total weight) as determined on the official scales during race check-in. The car may be hollowed out and built up to the maximum weight by the addition of a solid material, such as wood or metal provided it is securely built into the body.

Wheels and Axles: The car shall roll on the wheels any official BSA Wheels. All markings must be intact on wheel. The wheels shall turn about the axle nails from the kit. All four wheels shall be used, and all four wheels must touch the track. Wheels must be directly across from one another. No railing or raised axles allowed. Wheel treatment (hub and tread smoothing and polishing) may not result in substantial removal of mass nor in reducing the tread (track contact) width from the original kit wheels. Milling and turning of the wheels is especially prohibited. Therefore, use of a mandrel to turn the wheels is prohibited. Wheel treatments must not be reshaped in any way to minimize tread contact or alter aerodynamics. The small, detailed fluting on the outside edge of the wheel must remain visible around the entire circumference. The words "Official B.S.A. Made in U.S.A." on the wheels shall remain intact and clearly visible to the inspector. Some of the original "tread marks" on the wheel face must be intact, i.e. apparent to the inspector. Axle holes may be drilled into body of the car as long as the specs are met. The axle nails shall be firmly affixed to the wood of the car body. It must be obvious to the judges that the wheels and the nails from official BSA kits/supplements are being used.

Size: Race cars may be no longer than 7 inches, nor wider than 2¾ (2.75) inches, as determined by the official gages during race day check-in. (Underside clearance of at least 3/8, (0.375) inches and inside wheel to wheel clearance of at least 1¾ (1.75) inches is recommended, so that the car will run on the racetrack. The car’s height must not exceed the track equipment’s finish line gate. (Adequate clearance is the responsibility of the race car builder.) The wheelbase (distance between front and rear axles) may not be changed from official kit (17006). The center of the front of the car cannot be pointed or indented and must be the furthest piece forward of the front wheels; it must have a flat area of at least 1/2 (0.50) inches wide, for track starter pins.

Weights and Attachment: Weight may be added to the car and will be considered part of the car for purposes of all measurements. "Weight" is considered to be any material on the car that is not provided in the kit. All weight must be securely fastened to the car, e.g. by permanent glue, nails or screws, but not by "sticky substances", e.g. tape, or tack spray. Weights shall be passive, i.e. non-moveable, non-magnetic, non-electric, non-sticky, etc. Weights can be added to the underneath side of the car as long as the underside clearance is met.

Unacceptable Construction: The following may NOT be used in conjunction with the wheels or axles: hubcaps, washers, inserts, sleeves, bearings.

Gravity Powered: The race car is to be solely gravity powered. No springs, motors, rubber bands or any other supplemental power source is allowed. The race car may not be constructed or treated in such a way that the track's starting mechanism imparts momentum to the car. (For instance, this provision disqualifies cars with sticky substances on the front of the car and protrusions which may catch on the starting pin.)

Lubricants: Lubricants may not foul the track. Dry lubricants such as graphite are recommended.