

Pinewood Derby Car Design Guide

What Is This Page For?

This page helps you **plan your Pinewood Derby car before you start cutting wood.**

Before building, every Scout should:

- Think about how their car will **look**
- Decide what wood will **stay** and what will be **cut away**
- Make sure the car will **follow the Pack rules**
- Draw a **cutting guide** that an adult can help build safely

You do **not** need to be perfect — this is a planning page!

Step 1: Start With an Idea (Brainstorm Space)

Start at the bottom of the page in the “Brainstorm Space.”

Ask yourself:

- Do I want my car to look **fast, cool, or fun**?
- Do I want it shaped like a **wedge, race car, rocket**, or something else?
- Do I want it **low, flat, wide, or long**?



In the Brainstorm Space:

- Draw rough ideas
- Write words
- Try more than one idea



This is just for thinking — nothing here has to be perfect.

Step 2: Understand the Two Drawings

Your car is shown **two different ways** on the page:

Top Down View (Looking from the Sky)

- This shows how **wide** your car will be
- Imagine you are flying over the car

Side View (Looking from the Side)

- This shows how **tall or low** your car will be
- Imagine you are standing next to it

You will draw **both views** so adults know how to cut the wood.

Step 3: Draw the Top Down View (Width & Shape)

Now look at the Top Down View rectangle.

Ask yourself:

- Should the front be **pointy or flat**?
- Should the car be **wide or skinny**?
- Do I want straight lines or curves?



What to draw:

- Draw the **outline** of your car inside the rectangle
- This line shows the **wood that stays**
- Anything outside the line will be **cut away**



Important Rules:

- Do **NOT** draw over the wheels
- Be sure to leave wood around the area where the axle nails get inserted
 - If it's too thin, the nails can split the wood when inserted which is very difficult to repair.
- Wheels must stay where they are
- Your car cannot be wider than the wheels

Step 4: Draw the Side View (Height & Profile)

Now move to the Side View rectangle.

Ask yourself:

- Do I want my car **low and sleek** or **taller**?
- Should the front be lower than the back?
- Where can we remove wood to make the car lighter?



What to draw:

- Draw the **side shape** of your car

- Show slopes or flat areas
- Keep lines simple and smooth

⚠ Important Rules:

- Wheels must be able to spin freely
 - Leave enough wood so the car is strong
 - The front of the car must have a **flat spot** for the starting gate
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Step 5: Think Like a Builder

This drawing is a **cutting guide**, so think about tools and safety.

Ask yourself (with an adult):

- Can this shape be cut safely?
- Are there any tiny or weak pieces?
- Is this shape strong enough to race?

✓ Good designs:

- Smooth shapes
- Gentle slopes
- Thick, strong sections

✗ Avoid:

- Thin spikes
 - Tiny cut-outs
 - Very sharp corners
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Step 6: Check the Rules Before Building

Before cutting, check these important rules (with an adult):

- The car must fit:
 - **7 inches long**
 - **2¾ inches wide**
 - **4 inches tall**
- All wheels must:
 - Touch the track

- Roll flat
- The car must:
 - Weigh **5.0 ounces or less**
 - Be made from **BSA kit parts only**
 - Have **no loose or moving parts**

Complete rules are included in this document

Step 7: Final Review

Before building, have an adult ask:

- Does this drawing match the rules?
- Can we cut this shape safely?
- Is the Scout doing the main work?

If needed:

- Erase
- Simplify
- Redraw clean lines

That's part of learning!

Remember

🔲 **Planning makes better cars**

🪵 **Wood is harder to fix than pencil lines**

🤝 **Scouts build — adults guide**

Have fun designing your Pinewood Derby car!

Pack 289 Derby Car Regulations for Scouts and Siblings

- 1) All cars, wheels and axles must be from the BSA Model Kit ONLY. Only BSA official parts are permitted. No parts manufactured, modified or machined by any third party are allowed.
- 2) All cars must be made by the Scouts. Parents or other adults may give assistance, but the Scout should do the main portion of the designing and building of the car.
- 3) All cars must pass inspection to qualify for the race. The inspection points are as follows:
 - a) The car must have been made by the Cub Scout during the current year.
 - b) Dimensions of the car shall not exceed 7 inches long by 4 inches tall by 2-3/4 inches wide including the wheels. Wheels must be at least 1 5/8 inch apart; track clearance at least 3/8 inch.
 - c) The weight of the car shall not exceed 5.0 ounces. No loose, moving or liquid weight will be permitted. The official weight is determined by the district scales.
 - d) Scouts may sand and polish their own wheels and axles. Wheel bearings, washers and bushings are prohibited. Grooved or machined axles or wheels are prohibited.
 - e) The running surface of the wheels must be flat. Rough edges and mold marks may be removed. Wheels may be polished. Coned hubs are allowed. Do not reduce the weight of the wheels. The beading must be intact. Wheels modified beyond what a Scout can do WILL NOT BE ALLOWED TO RACE. Specifications of the wheel will be based on the year the wheel was manufactured. Wheels that have been rounded, thinned, machined, lathed, weight reduced or otherwise modified will not be allowed.
 - f) New axle holes and differing wheel bases are allowed. The car must be freewheeling. ALL wheels must touch and roll FLAT on the track. No canting.
 - g) The front of the car must have a flat area to accommodate the starting gate. The flat surface must be perpendicular to the bottom of the car so there is no starting advantage.
 - h) No part of the car may extend past the starting gate. The car shall not ride on any kind of spring. No starting devices are allowed.
 - i) Axles may be lubricated with dry lubricants only, i.e. graphite. All lubricants must stay on the car and must not foul the track. Oil based or liquid lubricants are prohibited.
 - j) No hubcaps are permitted.
 - k) Any Scout car that does not meet these specifications will be given the option of fixing the car before final check-in.
- 4) The scout/sibling must be present for inspection and once the car has been weighed and inspected, the car will be placed on a table to await the start of the race. No one except the designated pit crew will be allowed to handle the cars until after the race. No further modifications can be made to the car. If the judges see a problem, it is up to their discretion to ask the Scout/Akela to correct the problem so the car can race. Every attempt will be made to have every Scout race and be successful.
- 5) Each heat will be announced. The Starter/judge will make sure the cars are on the track properly and then the race will start.
- 6) Pinewood Derby Cars that have loose parts either will have to remove the loose parts or the car will not be able to race. Cars that cannot stay on the track during the race will not be able to race.
- 7) If a rule violation is suspected, the car will be examined by the Race Official, which may include removal of axles or wheels for inspection if required.

Top Down View

Front

Back

Side View

Front

Back

Brainstorm Space

