

Here are some tips to get the best performing car possible. There are many videos on youtube that can help for each of these items. Some tips may also be found at this link  
<https://boyslife.org/hobbies-projects/projects/2952/speed-secrets/>

1. Aerodynamic shape. Shape the car so that it will move smoothly through the air.
2. Weight: Make the car as close to the 5 ounce maximum as possible and position the weight as close to the rear of the car so that the center of gravity is about 1 inch in front of the rear axle.
3. Polished axles. Insert the axle into the chuck of a power drill or drill press. With the axle spinning in the drill, first, very lightly, use a metal file to remove any imperfections in the axle. Next, use 2000 grit sandpaper dipped in water to polish the axle to a mirror finish. If more polish is desired, finish with 0000 steel wool. Repeat for all 4 axles
4. Wheels. Remove any imperfection from the wheels by lightly sanding with a 120 grit or higher sandpaper. It is important to only remove any imperfections here, do not remove any noticeable portion of the wheel itself
5. Lubrication. Liberally apply graphite or silicone lubricant to the wheels and axles. No wet lubricants may be used. There are many theories on this part, do some research and pick what you like best.

Advanced Tips! Fully research these topics online before deciding if you want to use them

1. Steering. There are 2 options here.
  - a. Make the car ride as perfectly straight as possible
  - b. Rail-riding: Intentionally have the car lightly steer in one direction so that it rides into the rail. While this may seem counterintuitive at first, this technique reduces the bouncing back and forth against the rail which could reduce the performance of the car.
2. Bend the rear axles 1.5 degrees upward. This technique makes the wheels push outward against the head of the axle, reducing the possibility of the wheel rubbing against the wood of the car. It also reduces the surface area of the wheel contact with the track, therefore creating less friction.
3. Raise one of the front wheels ever so slightly so that it doesn't make contact with the track. Again, this reduces the friction against the track.
4. Bend the other front axle 1.5 degrees downward, this reduces contact area with the track and allows you to rotate the placement of the bent axle in order to steer the car into the rail.