



**Saturday, November 9 in Central Park**

(Park in front lot and enter at Door #1 or Park in back lot and enter at Door #4)

**Check-in/Inspection: 12:30 - 1:45pm**

**Racing: 2:00 - 4:00pm**

**CARS** Cubbies (3-5 yr olds) and Sparks (K-2nd Grade) will race toy cars (i.e. Hot Wheels, Matchbox, etc.). T&T'ers (3rd-6th grade) and Adults will race pine cars.

**PINE KITS** \$10 at the AWANA Store (*in the foyer*). Pre-cut cars & trucks are also available!

**RULES** Cubbies and Sparks cars: your favorite used or new retail die-cast and/or plastic toy car, ≤38mm wide, no modifications allowed (*such as added weight or lubrication*). T&T pine cars: see rules on the handout included with your kit.

**TRIALS** Track will be open Friday, November 8, 6:00-7:30pm to test your car before the big race! We can also check pine car weight and dimensions.

**CHECK-IN/ INSPECTION** Starts at 12:30pm and closes at 1:45pm. Cubbies/Sparks cars **MUST** be checked in, and T&T pine cars **MUST** pass inspection by 1:45pm. Pine cars failing inspection and not corrected by 1:45pm may race, but will not be eligible for prizes.

**AWARDS** All racers will receive a Grand Prix participation ribbon.  
Cubbies and Sparks Divisions: 1st - 3rd place prizes  
T&T Division: Trophies for 1st - 3rd place speed & 1st - 3rd place design.

**SEE YOU AT THE STARTING LINE!**

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# Pine Wood Car Tips

## Design

*The heavens declare the glory of God, and the sky above proclaims his handiwork. Psalm 19:1  
For we are his workmanship, created in Christ Jesus for good works... Eph 2:10*

God's perfect craftsmanship is displayed in our Universe and each of us. You can show your God-given craftsmanship by building a beautiful pine wood car! T&T racers will vote for their favorites, and trophies will be awarded for the top 3 cars. Some ideas: Choose a shape based on your favorite Bible story, character, movie, food, animal, hobby, sport, etc. Build a cool, futuristic car/truck/vehicle with a fancy paint job. Use add-on accessories like figures, wings/fins, engines, lights etc. Be creative!

## Speed

*In the beginning, God created the heavens and the earth. Gen 1:1  
All things were made through him (Jesus), and without him was not any thing made that was made. John 1:3*

When Jesus created the Universe, He also created laws so it would operate in an orderly way. One of these laws is the conservation of energy. Understanding this law helps us build a fast pine wood car!

In the starting position, your car has non-moving or potential energy. When your car rolls down the ramp it converts this potential energy into moving or kinetic energy. Some energy is lost due to friction and air resistance. To build a fast car, you want to maximize the starting potential energy and minimize the energy lost to friction and air resistance. Here are some top tips based on the law of conservation of energy:

1. **Weight & center of mass:** To maximize your car's potential energy, make the weight as close as possible or equal to the 5oz limit with the center of mass toward the rear (about 0.9" to 1" in front of the rear axle for stability). Weights can be purchased at local hobby stores or online. Cylinder weights are easy to install by drilling holes. Stick-on alloy wheel balancing weights are another idea.
2. **Shape:** To reduce energy lost to air resistance, shape your car to be more aerodynamic, with a lower cross sectional area and smooth curves. Your car doesn't need to be as thin as a pencil, but a thick school bus or semi-trailer truck shape will be slower.
3. **Three wheeler:** Install one of the front wheels a little higher so the bottom doesn't touch the track. This reduces energy lost turning one of the wheels.
4. **Axles & wheels:** To reduce friction, polish the axles, use graphite lubricant, and lightly sand off any burrs on the wheels (do NOT alter or lighten the kit wheels, or substitute non-kit racing wheels). Also, bend or cant the axles up slightly so the wheels ride against the hubs and not the car body.
5. **Rail rider:** To reduce energy lost from bumping back and forth on the lane rail, adjust the front wheel so the car gently rides against one side of the rail.

There are lots of good websites and videos about how to build fast pinewood cars. Here's one on Youtube by Mark Rober I'd recommend: [EASY Pinewood Derby Car WINS using Science!!! - YouTube](#)

