

Reading 3.2–The Bearings, Axles and Wheels

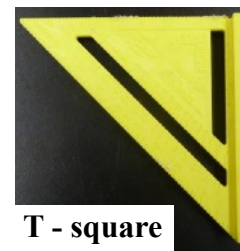
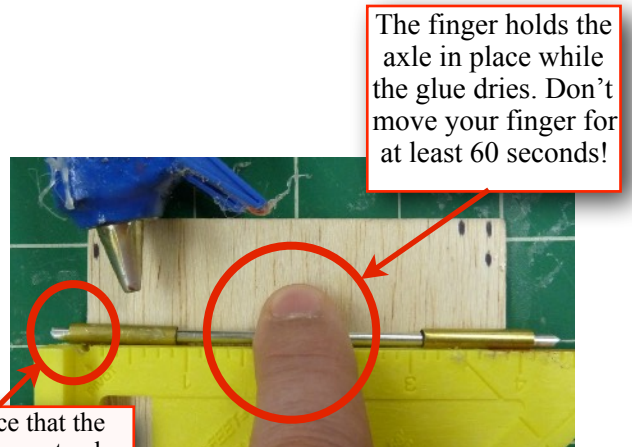
The bearings are four small plastic tubes. Your axles spin inside these tubes and allow your car to roll. The bearings are the most important factor in determining the success of your solar car. Poor installation of your bearings can lead to a car that turns too much and/or a lot of friction! Take your time and do this well!

The tubing(bearing) must extend a little beyond the side of the chassis so that the wheels or gear will not make contact with the chassis. This will cause a ton of **FRICION**.

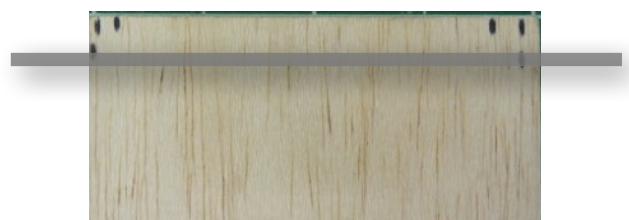
Use the T-square to mount the bearings to the chassis. This tool creates a perfect 90 degree angle and mounts your bearings on perfectly(when used correctly) and will make your car runs very straight. If your car does not run straight, it will run along the side of the track creating a lot of **FRICION**.

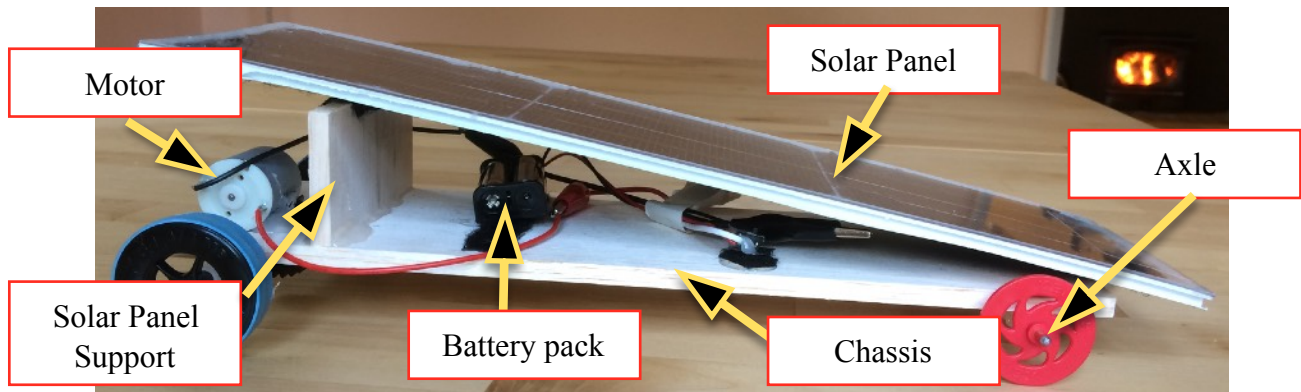
Reading Questions for the BEARINGS:

1. What are the bearings and what are they for?
2. Why do you need to glue the bearings on so they stick out about 1/8 inch from the side of the chassis?
3. On the chassis below, draw two bearings on the axle to show how you need to position the bearings for the least amount of friction.



T - square





The Axles

Axles are metal bars that spin inside of the bearings and attach your wheels and gears to the chassis. Axles must be straight! A bent axle creates a lot of FRICTION. You have two material options for your axles:

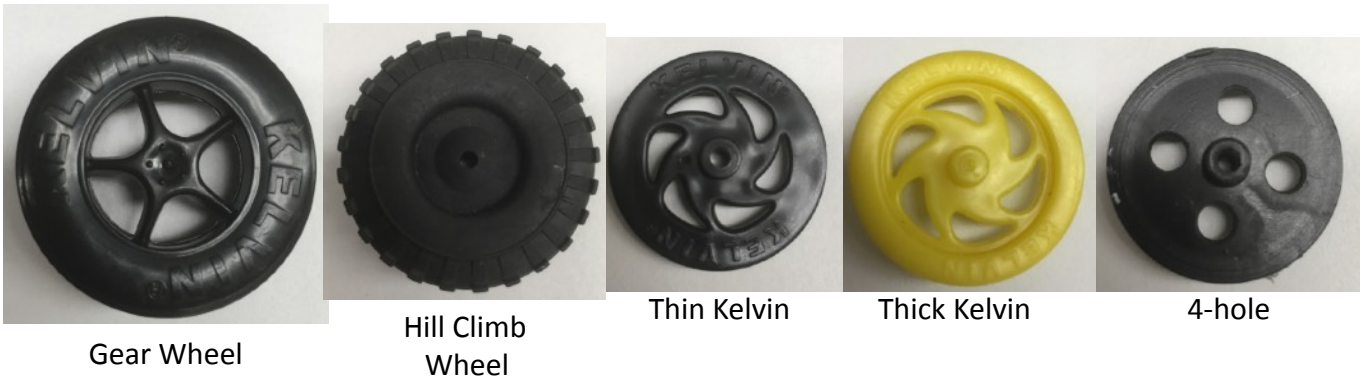
- **Steel:** Steel axles are heavy, but they are hard to bend. Everyone starts with steel axles because they are much easier to work with. Once you get your car done you can then switch to aluminum if you want.
- **Aluminum:** Light, but they bend VERY easily. It is more important for the car to have a straight axle than a little weight loss. However the lighter your car, the faster it will go. You can only get aluminum axles after you have built your car and you are trying to improve it for the final race.

To test an axle and see if it is straight, you roll the axle on the desk. It should easily roll 3-4 inches without wobbling.

NEVER get glue on the axles! It is easy to do and will slow your car down a lot because of **FRICTION**.

Reading Questions for the AXLES

1. What are axles and what are they for?
2. Why does everyone start with steel axles?
3. How do you test an axle to see if it is straight?
4. What type of axles do you think you want for your final car? Explain why.



The Wheels

Wheel diameter matters. A larger wheel will be harder for the motor to turn, but will have a higher top speed.

Sometimes **FRICTION** is good. It is essential to have friction between the wheel and the ground or your car wheels will only spin and not move. You also need friction between the wheels and the axles. If there is not enough friction between the wheels and the axles, the wheels will fall off!

Reading Questions for the WHEELS:

1. How does wheel size change the performance of the car?

2. What are two places you WANT friction in your car?

3. What kind of wheels do you think you want for your car? Explain why.