Component Construction Hints

For every component, the directions that come with the kit are optional. You are allowed, and encouraged, to creatively modify your components.

Propeller Car

- Be careful when cutting the wood since it is not very strong and is prone to split.
- If you wind the propeller very tightly, you may discover that the metal wire starts to slip over the notch. There are a few ways to "fix" this. If you wind it the opposite direction, then it won't slip, but this will cause the car to go in "reverse". You could also either bend the metal wire over the plastic to keep it from slipping, or you could glue the metal wire and the propeller together.
- In order to attach the propeller to the tail fin, you will need to shave away some wood in order to create a wooden tab that can be inserted securely into the plastic.
- Once the rubber band is attached to the car, putting some dish soap on the rubber band will reduce the amount of friction on itself and allow it to unwind faster and make the car go faster.

Tracked Vehicle (aka "The Tank")

- Keep track of the little pieces! Don't throw anything away.
- You can choose either high speed or low speed gearing ratios. Most people choose the low speed.
- Don't open the box until you have a "Ziploc" bag in which you can store all the little pieces.
- If the gears are turning, but the axel/wheels are not, check the set screw (also known as a "grub" screw). The set screw is that tiny screw that passes through one of the gears and makes a secure connection to the drive shaft/axel. You will need the hex key (the "L" shaped piece of metal with a hexagonal cross section) in order to tighten the set screw.

Catapult

- **Measure, draw lines on the wood pieces, and double check your lines, before you cut anything!**
- Using hot glue for assembly will work fine, but if you have access to a pin nailer (a nail gun that uses really skinny nails, called pins), that would work great.

- You will need to drill holes through three different pieces of wood that the metal axle will need to pass through. To ensure that the holes will be straight and will all line up with each other, you should use a drill press. If your group does not have access to one, talk to your teacher regarding using one at school.

Hovercraft

- ***Warning: the propeller spins really fast, faster than you are probably expecting. Keep your fingers away from the spinning propeller!***
- You can significantly reduce the hovercraft's weight by removing the battery from the hovercraft. If the battery is not attached to the hovercraft, this also makes it easier to replace the battery.
- If you turn on your hovercraft and instead of being a hovercraft, it's a "suckercraft", switch the wires on the motor. You should feel air blowing out the bottom of the hovercraft when you turn it on.
- It is best not to repeatedly attach/remove the battery harness from the battery. Doing this increases the risk of breaking a wire inside of the harness (covered by black plastic). Instead of pulling on one end of the harness and "pealing" it off the battery (like opening a can of pop), pinching the harness in the middle between the two metal snap connectors and pull it straight off. This minimizes the strain on the wires.
- Running wire (such as speaker wire) from the motor to the battery (located somewhere else in your project) is a useful technique.