

The purpose of this information is to provide the car builder / teacher with a simple way to get a fast, reliable car platform using readily available & inexpensive parts & tools.

The most difficult task has been to make a solid platform to mount the motor and gear train on so that the gears run freely and do not slip or bind.... It finally happened when I went to Michael's and got a little package of fine plywood 'Woodsies' approx 3" x 7" to mount the motor and axel brackets on..

The wheel & axel brackets are actually 14-16 gauge wire' butt connectors' available in most hardware stores... They must be drilled to fit the axels however... Michael's has a nice Hand Drill kit that includes three bits and a nice knurled handle to chuck up the bits.... Use the bit which is slightly larger than the axel to drill out the butt connector.

I also got a # 47 drill bit at True Value / ACE Hardware to ream out the wheel holes so they fit snugly on the axels supplied in my solar kit... The #47 drill bit is also needed to ream out the gears supplied in the Solar Kit... Be careful though... Too much reaming and the wheels and gears are rendered worthless... I would **not** use an electric drill or Dremel tool to ream out the plastic gears or wheels.....

The axel bearings can be hot glued to the 'Woodsie' base for a secure axel mounting.

The 3 Volt electric motor needs to be mounted in the metal bracket provided. A tiny screw holds it in place. Don't use the larger screws as you may damage the motor. The larger screws are used to secure the motor to the 'Woodsie' platform..

With the motor gearing and drive wheels solidly mounted the rest of the car should be pretty easy to construct as there is lots of room to use your imagination...

Here are some tips on hooking up the electrical part of the project....

#1 Go to Radio Shaq and get yourself a little bag of alligator clips.... They don't tell you the wire size but get the smallest... They are about 14" long and you get about a dozen...

Using alligator clips instead of soldering will save you a lot of grief when you are experimenting with the motor and Solar Panel as the leads to both don't tell you what is positive and negative and which way the motor will turn when hooked up....

Keep it Simple is the byword here... No need for a switch as that is just another thing to go wrong... You can get by with two alligator clip wires (there is an alligator clip on both ends of each wire)

Get yourself a cheap multimeter (\$4.99 at Harbor Freight)... \$ 10 -12 bucks at ACE hardware.... Digital is best but an analog unit (has a needle on the front) will work.

Learn to use the Multimeter to check solar panel voltages as various angles to the sun so you can optimize the panel installation on your racer.... Use the 20 volt scale... Your panel should put out 3 -3 ½ volts on a sunny day... (It helps to be outside when you do this... : )

The multimeter can also be used to check electrical resistance.... An open circuit will read 'infinite' ohms.. a 'shorted' circuit will read 0 ohms... (Ohms or omega, is the standard representation for a unit of electrical resistance.) Volts represent electrical 'pressure' ) Now you know why General Motors named their battery powered car a 'Volt.' GM also name a car exported to Mexico a NOVA. (Nova in Spanish is 'No Go')

You can practice using your multimeter by 'testing' flashlight batteries and light bulbs. Once you learn to use your multimeter you will never want to be without it.... It is the handiest tool in your too box...

Good Luck....

Dave B. Mar 2012

### **Tools and Supplies needed to build your Solar Powered Sprint Cars.**

The Solar Power kit consisting of Solar Panel, 3 Volt motor, wheels, gears and axles.

A package of '3" x 7" (approx) Woodsies from Michael's Hobbies. ( balsa is too soft)

A package of 14-16 gauge wire butt connectors... ACE, Home Depot, Harbor Freight.

A package of Alligator clips with wires attached... Radio Shack, Harbor Freight, ACE

A Hot Glue gun and a package of glue sticks... Michael's Hobbies.. About \$4...

A pair of needle nose pliers... Harbor Freight, True Value, and Ace etc... About \$4.00

Several small screwdrivers including Phillips and straight blade... for those tiny screws.

Some pinch clamps to hold things in alignment while you Hot glue... Harbor Freight.

A Mini hack saw so you can saw a notch in the Woodsie platform... Harbor Freight.

A pair of 1 ½ volt batteries you can wire in series to test your running gear with no sun.

A battery box to hold two AA 1 ½ Volt batteries... Makes testing (and cheating) easier.

A hand drill and assorted bits... Michael's Hobbies.. about \$4

A #47 wire gauge drill bit... I only found these at ACE and True Value Hardware. \$2.99

A package of Velcro or double sided tape so you can mount your solar panel..

A package of cup hooks or paper clips to hold your car on the guide wire while racing.

A multimeter... Available at Harbor Freight \$4.99 True Value or ACE Hardware.. ~\$12

A package of popsickle sticks to build the frame to hold the solar panel on your car.

I'm sure you will find better alternative ways and means to accomplish this project...Db