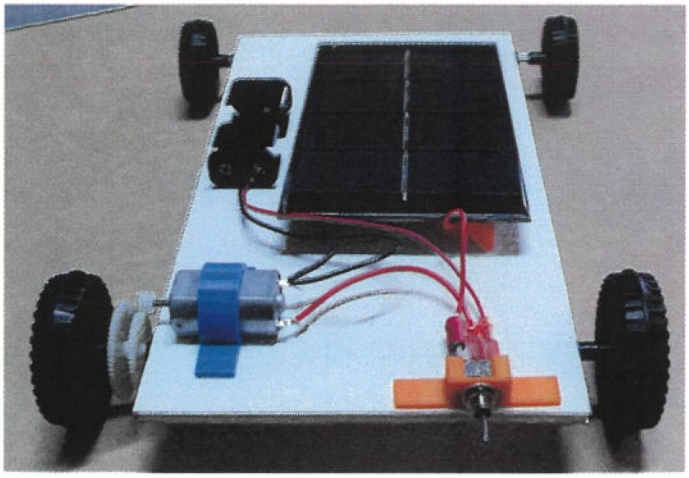
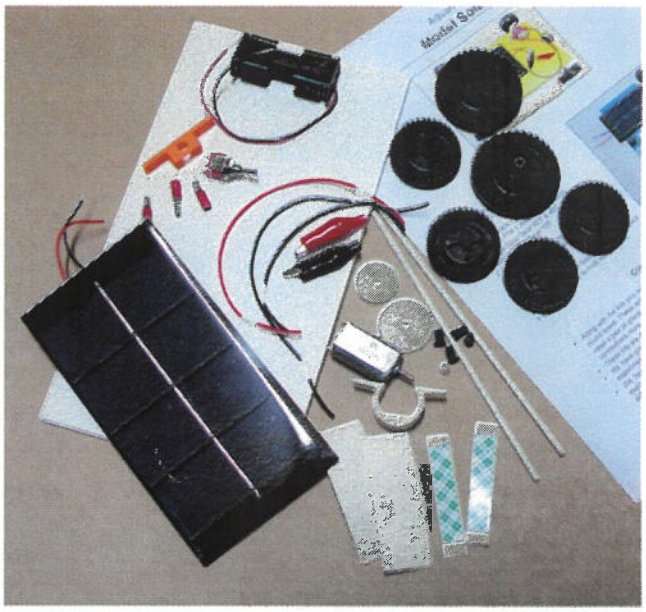
Hunter Valley Mini EV Challenge
Primary Solar Car



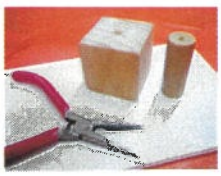
Each Kit includes

1 Solar Panel – 2v, 700mA
6 Wheels, 2 x 50mm, 4x40mm
2 Axles – 167mm f/glass rod
4 Axle Collars - small black tube
1 Motor - F18 + ABS 3D printed Mount
2 Large Spur Gear 60T & 48T
1 Small Pinion Gear 10T
2 Alligator Clips
3 Pieces of wire – 2 long 1 short
1 Chassis(Coloured Corflute 130mm x 240mm)
1 Battery pack 2 x AA
1 2 way switch & Switch Mount
3 Connectors for the switch
2 White tapes to hold panel & battery pack
2 Double sided tape for motor mount & switch



Take care with fibreglass axles. You can get small splinters of f/glass if you touch the ends with your hands. Please use the block sets provided.

Comments and tips



- Along with the kits you will have received a square block of wood and a round dowel. These will be used to help put the kit together. You will also need a pair of pliers. Although not necessary a soldering iron can make connections more permanent and secure.
- These kits are designed to be push fit and don't require glue.
- We have provided 6 wheels even though it is a 4 wheeled car. We hope you will experiment with different wheel sizes and of course the "look"!
- We hope you will experiment with gear ratio, wheel size, battery and solar and explore different ways of putting this kit together. Maybe you can come up with different uses for the kit.

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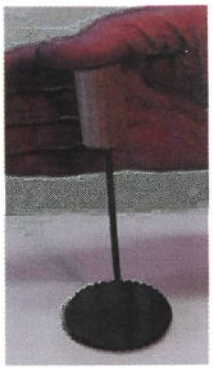
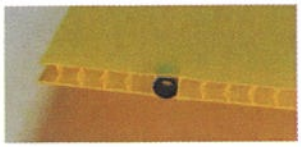
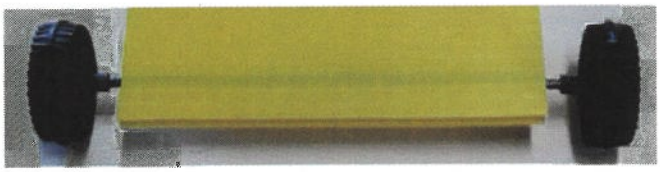
Steps to put your Model Car Together

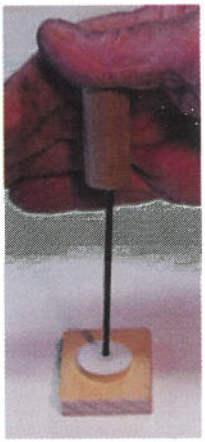
1. First, let's set up the chassis. We will need to put together the front and rear axles and place these through the corflute chassis. The front axle consists of two wheels, an axle and two axle collars. Place the round wooden dowel over the end of the axle and use this to push the axle into the wheel. Now push an axle collar into the side of the corflute near the front, follow the channel across and place another collar on the opposite side. Slide the axle through the collars and push the other wheel onto the end of the axle. It should now spin easily and look like the picture below.

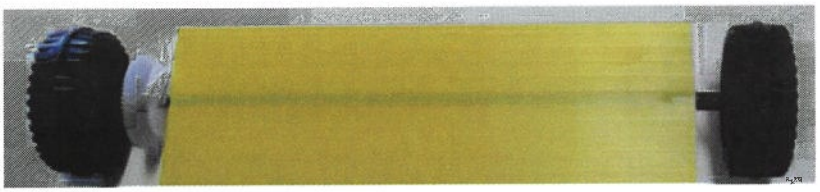






The back axle is similar but you need to put the two large spur gears in place. This time you will need to also use the square block. Place the smaller 48 tooth gear on the block where the hole has been drilled. Now push the axle through the gear using the round dowel "pusher". Now place the larger 60 tooth spur gear on the block and push the axle through both. See the photo to the right. Now push the axle end with the two gears into a wheel. Place the two axle collars into the corflute at the other end of the chassis in the same way you did for the front axle. Slide this axle through the collars and push a wheel on the other end. This rear axle should spin freely but not wobble from side to side.

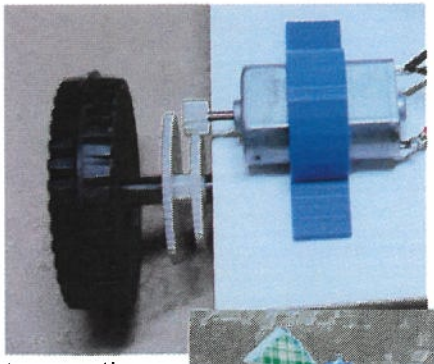




2. Now push the small white Pinion Gear onto the end of the motor shaft. Place the pinion gear on the table with the hole face up and push the motor into it.

3. The next step is to put the two long wires on each alligator clip. Take the plastic cover off the two alligator clips. Twist the end of the red or black wire and place it through the hole at the rear of the alligator clip. Wrap it around the two spiky teeth and then use a pair of pliers to clamp the teeth over the wire, which will hold it in place. To slide the red cover over the red wire and alligator clip simply place the other black clip in the jaws of the red alligator clip and it should go over easily. The picture should help. Do the same with the Black one.

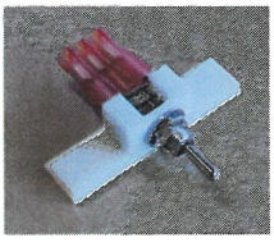
4. Now comes the wiring. Start by studying the wiring diagram on the last page. There are a few ways to do this and here is one approach. Connect one of the alligator clip wires to one side of the switch and this will connect to one of the solar panel wires. Join the centre connector on the switch to the motor using the short wire. Connect the other alligator wire to the second connection on the motor and this will connect to the other side of the solar panel. This is one half of the circuit. Now connect the battery wires as per the diagram. The switch will now allow you to select either the solar loop or the battery loop.



5. You now have all the electrical components connected but they are not on the car. You should be able to now position them with the double sided tapes.

6. To place the motor on the chassis you will need the plastic motor mount. Place the mount over the motor and it should stay in place. With the car on the bench now place the motor so it lines up with the large(60T) or small(48T) spur gear. Roll the cars backwards and forwards to ensure the pinion gear rotates on the motor. If it is in the right position place a double sided tape under the mount and reposition the motor & mount to the same place. Having the two spur gears on the axle allows you to change the gearing, which will impact the acceleration and final speed. To change the gear ratio, you need to move the motor, it can only line up with one of the spur gears at a time. The green double sided tapes are more permanent so you might start the testing by just taping down the mount.

7. To position the switch place the mount as per the picture. Use a double sided tape to position.



8. At this stage you can connect the solar panel and with a little bit of sunlight you should get some action – make sure the switch is on. If the car goes in reverse, just reverse the connections (alligator clips) on the solar panel and it will go the other way. One alligator clip will go from one side of the motor and the other will come from the switch.

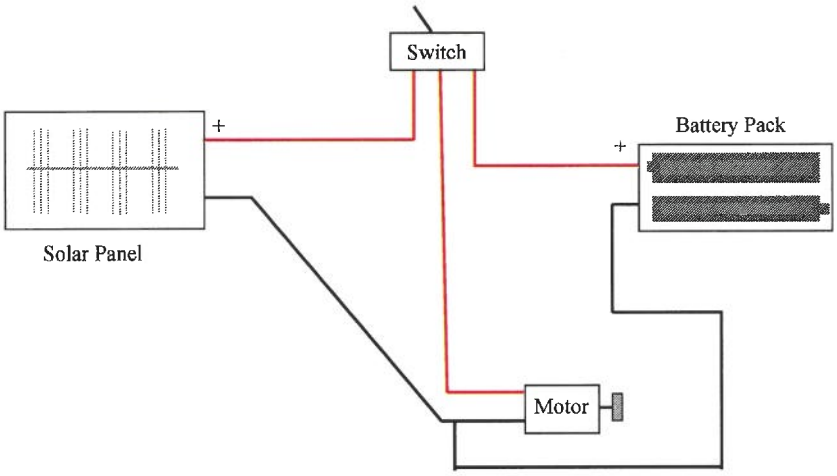
9. Now it is time to add your style to your car. You can use all sort of materials to make the body but remember to keep it light. More weight will slow your car down.

10. Solar power is a renewable energy, as long as the sun shines the panel will power your car. We have included a battery pack so you can have some fun with the car at any time, day or night, sun or no sun. The solar produces 2.2 volts in full sun, how much does the battery pack deliver? What impact does it have on the car?

There is lots to explore. Have Fun.

If we can help in any way please call or email, Michael

Solar Challenge – Wiring circuit diagram



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