

Session 5: Procedure notes

Renewable energy

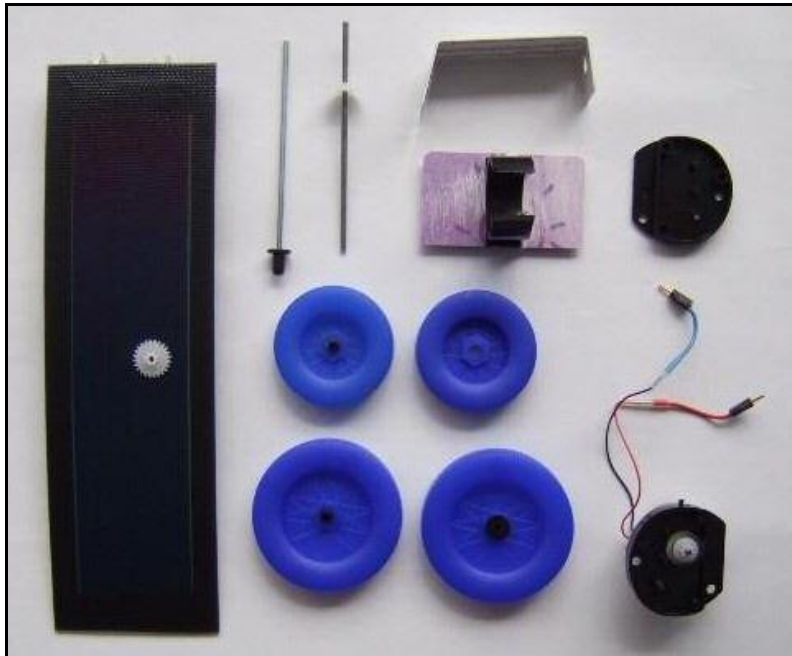
Activity 29 - Solar racers

Time needed: 35 minutes

Set up by dividing the class into pairs and distributing a solar car box - available to borrow from Harrogate Borough Council to each pair.

Explain that there are very small parts that will roll around; also some parts are delicate so to be gentle with them.

Solar Racer parts

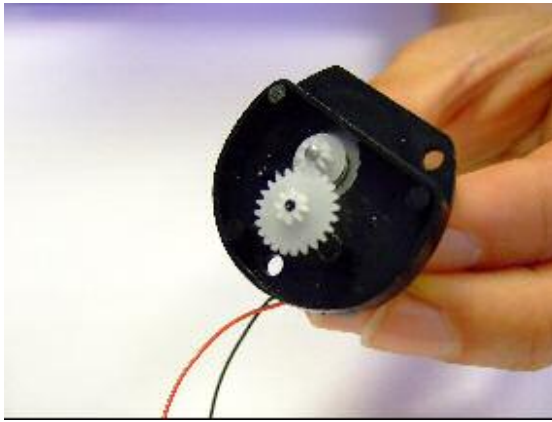


Each kit contains:

- | | |
|--|--|
| <i>1 x Flexible solar panel with two clips</i> | <i>1 x Motor with blue and red wires</i> |
| <i>1 x Black plastic motor casing</i> | <i>2 x rear wheels (diameter 50mm)</i> |
| <i>2 x front wheels (diameter 40mm)</i> | <i>4 x black plastic hubs</i> |
| <i>2 x axels (75mm)</i> | <i>2 x 13mm cogs</i> |
| <i>1 x Black clip, mounted on plastic card</i> | <i>1 x Front axel support</i> |

Give instructions to construct the cars following the directions below.

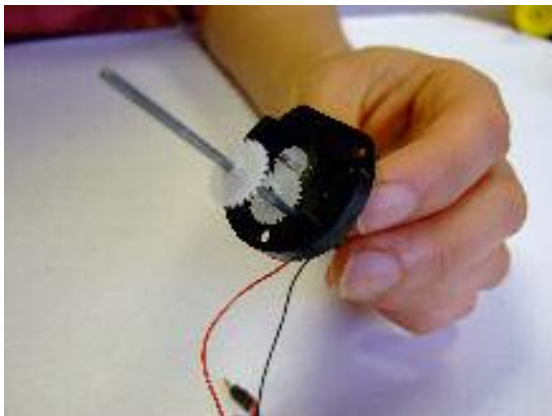
Step one



Take the motor with the two wires attached. You will see that there are three pegs sticking up: one has a hole down the middle; the others do not.

Place the double-layered cog, teeth up, on the middle peg, so that the teeth engage with the cog attached to the motor.

Step two



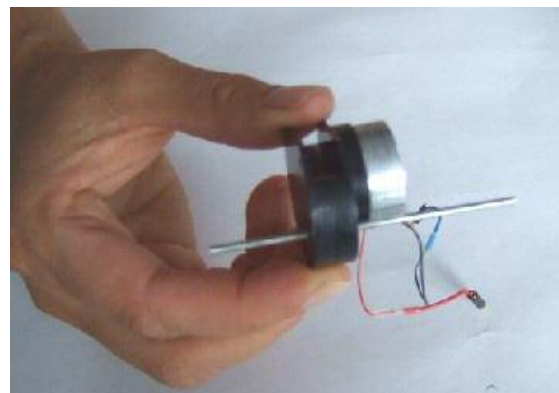
Take the metal axel with the cog attached. Insert this into the peg with the hole, and push it through until the cogs engage.

Step three

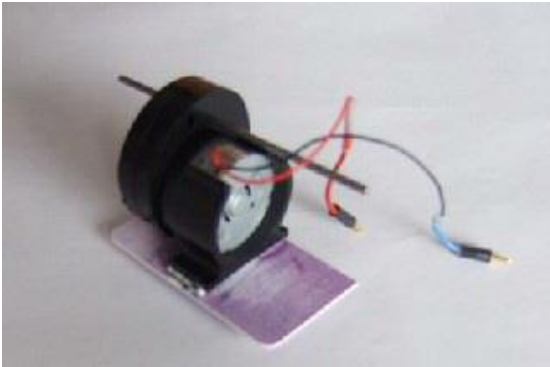


Take the black cover, and slide it along the axel.

Line the pegs up, and push the two black plastic halves together until they clip shut.

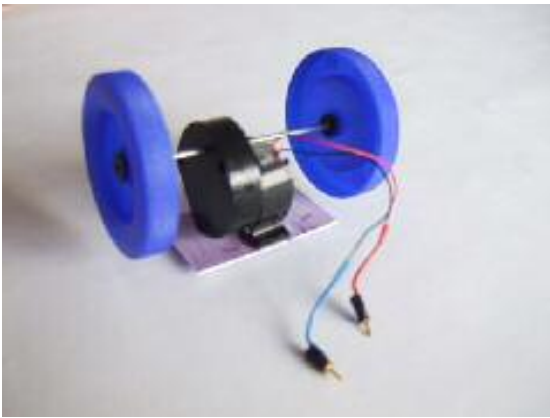


Step four



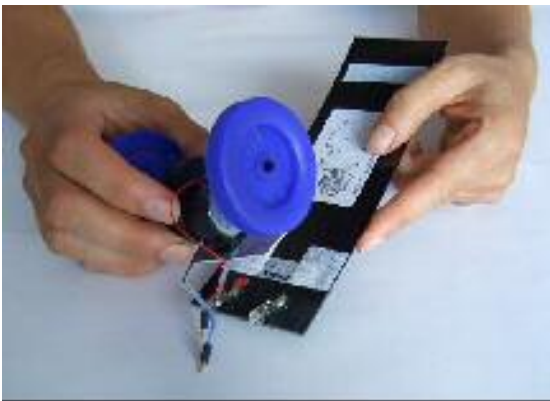
Fix the round part of the motor into the plastic clip.

Step five



Attach the two large wheels to the axel, by pushing them on.

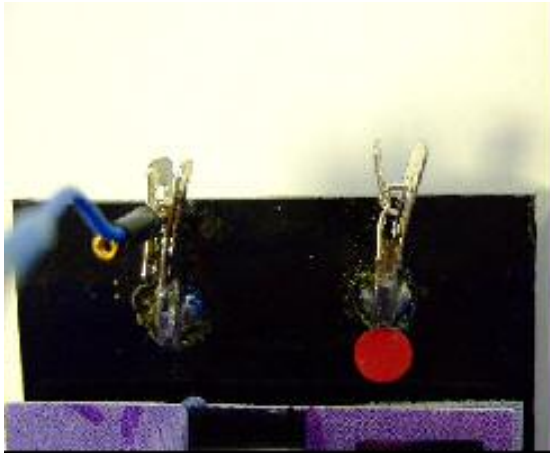
Step six



Attach the motor, axel and wheels to the back of the solar panel with the Velcro pads.

Step seven

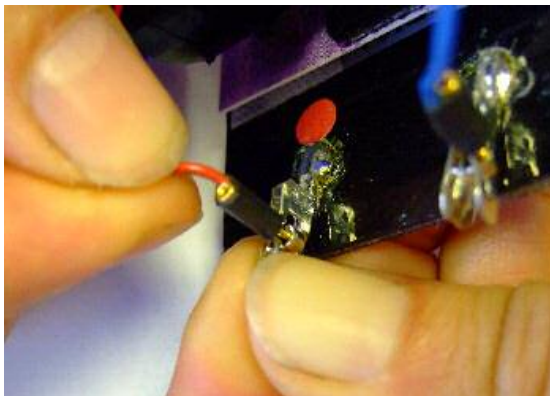
The motor now needs to be connected to the panel.



There are two clips on the panel, one is marked with a red dot – this is for the red wire.



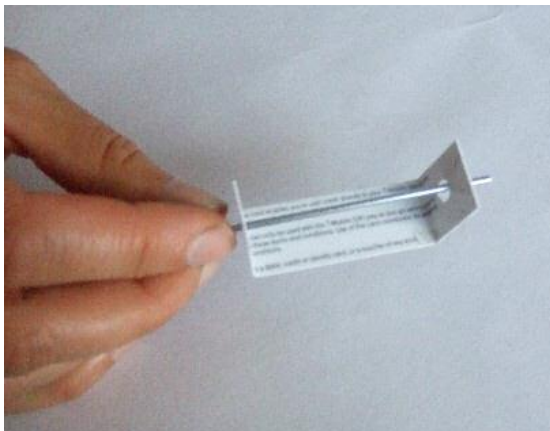
Squeeze the clip closed. A small loop will poke through, forming a "D" shape.



Keep the clip squeezed together, whilst you push the metal end of the wire into the "D". When you release the clip, the wire will be held in place, attached to the panel.

Repeat for the other wire.

Step eight



Put together the front axel, by threading it through the plastic holder

Step nine



Attach the two front wheels to the axel, by pushing them on

Step ten



Attach the front axel and wheels to the panel with the Velcro pads

The finished car



Take the cars outside and give them a test run; if they go backwards swap the motor wires around.

The Grand Prix can be straightforward or involved. Having only 4/5 cars racing at a time in heats with the winners competing together at the end builds the excitement. Check that the students don't put each other's cars in the shade with their shadows.