

# HAMPSHIRE SOLAR ENERGY CHALLENGE 2008

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**TEST VALLEY**  
BOROUGH COUNCIL

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## SOLAR ENERGY ACTIVITY GUIDES, TECHNICAL INFORMATION & OTHER DOWNLOADS

**SOLAR-ACTIVE.COM**

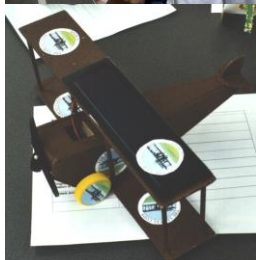
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[www.solar-active.com](http://www.solar-active.com) and [enquiries@solar-active.com](mailto:enquiries@solar-active.com)

### INTRODUCTION

The [car assembly](#), activity guides and technical information provide assistance to use components in the solar car resource to create one's own chassis design, make components and to use the kit to create different solar devices. Access all the guides and technical information via the [links](#):-

- **Design and construct components** to improve performance of the car [re: [Learning via "trial and improvement"](#) <http://original.solar-active.com/troubleshooting2.doc>]
- **Create solar powered devices** [with recycled materials] using double solar cell in the kit.
- **Create your own design** for a solar vehicle. **The special gold plugs on motor wires and 2 additional extension wires supplied allow you to place the solar cell anywhere on your design.** You can also insert an LED light. Design can be related to the function of a vehicle: -
  - family, tractor+ trailer, moving heavy loads, racer, bus, boat, lorry, van, taxi, etc.
- Create 'wacky' designs as seen in the gallery of pictures: - plane, crab, dinosaur etc.



- Solar challenge reports include pictures of ‘wacky’ ideas: -
  - [North-East 2005](#)   [Kent 2004](#)   [Hampshire 2007](#)

Encourage creativity, invention and problem solving in designing and making a solar device from recycled materials e.g. credit or the retainer of sim cards and tetra-packs.

Teach STEM [Science, Technology, Engineering and Mathematics] subjects. QCA considered using solar energy to help pupils “transfer knowledge and skills between different subjects to develop engineering skills in a cross curricular context “

Meets “Enjoy and Achieve” outcomes of Every Child Matters and to carry out “Leading Teachers for Gifted and Talented Education” activities.” The solar resource is considered to be a useful way of addressing “Enrichment and Enhancement “ needs of schools. As well as, CPD needs to strengthen the knowledge and skills in Science & Technology related to sustainability.

### **FLEXIBLE SOLAR CELL**


The flexible solar cell in the kit is waterproof and has the ability to generate **useful output during partial shading and under diffuse light conditions**. Output: 300mA & 3V [accurate to +/- 10%]

### **WHERE TO START**

- How the solar cell is manufactured and works – includes OHP’s for teaching  
<http://www.original.solar-active.com/xous.pvtec4.doc>
- How the solar motor works - Two guides have been written in how the solar motor works: - [Emotor](#) AND <http://original.solar-active.com/xcvl.pvmot3.pdf>

### **BUILD COMPONENTS TO IMPROVE PERFORMANCE OF THE SOLAR DEVICE<sup>1</sup>**



The building of the solar car with the [assembly guide](#) is more challenging when making your own components e.g. wheels. Use recycled materials or what can be found within school resources.

	<p>Simply push out the black reducer in the coloured plastic wheel supplied, and insert reducer into the centre of any wheel you design. Link: - “Maths for solar engineers” - <a href="http://original.solar-active.com/centreofwheel.pdf">http://original.solar-active.com/centreofwheel.pdf</a> - download off our website<sup>2</sup>.</p>
<p>C-D wheel</p>	<p>Use “Maths for solar engineers” to find the centre of a circle - the centre of a CD in this case. Insert the white gear cog supplied into the centre to assemble a CD wheel</p>

<sup>1</sup> Design solar devices around projects you are undertaking in school. Extra recycled retainers from mobile phone sim cards are included in the kit or collect them yourself from any mobile phone shop.



<sup>2</sup> Solar-Active.com is being up-dated – visit the old site by clicking on **HERE** – then **go to left hand corner and CLICK ON Technical/Educational Downloads** and type in password [morephotons](http://original.solar-active.com/morephotons) [http://original.solar-active.com/morephotons.htm].

	<a href="#">Front axle support construction instructions</a>
	<a href="http://original.solar-active.com/Angle%20Adjustment%20Guide-long.pdf">Angle Adjustment construction instructions. [http://original.solar-active.com/Angle%20Adjustment%20Guide-long.pdf]</a> This guide allows you to adjust the angle of the solar cell in relation to where the sun is in the sky. For example, at mid-day it is best to have the solar cell horizontal.

## SOLAR CELL EXPERIMENTS

<http://www.original.solar-active.com/xnes.pvinvestigation.pdf>

**OTHER GUIDES AND ACTIVITIES:** - The solar kits and teaching method support and engage pupils in stimulating projects - empowering pupils to take ownership of their learning while expanding their repertoire of personal skills to improve personal capabilities of teamwork, communication, foster creativity and problem solving

### Energy and Renewable Energy Resources posters: -

[\[http://original.solar-active.com/posters.htm\]](http://original.solar-active.com/posters.htm) <http://original.solar-active.com/poster2.htm> and <http://original.solar-active.com/poster1.htm> and **worksheets** [classroom worksheet](#)

Energy In Short Supply- <http://original.solar-active.com/case1.pdf>

Sound/light - [http://original.solar-active.com/sound\\_light\\_activity.pdf](http://original.solar-active.com/sound_light_activity.pdf)

Propeller Spinner - [www.solar-active.com/xtdx.spin3.pdf](http://www.solar-active.com/xtdx.spin3.pdf)

Handling Data - <http://original.solar-active.com/case2.pdf>

Performance of the cars - <http://original.solar-active.com/case3.pdf>

Maximum speed – [www.solar-active.com/xdfi.maxspeed.pdf](http://www.solar-active.com/xdfi.maxspeed.pdf)

Mini-water pump - <http://original.solar-active.com/pump3.pdf>



## SCHOOL & HOME ENERGY EFFICIENCY ACTIVITIES

- How [a school in Sheffield saved £530/year](#) on their electricity bill.
- **[INTERACTIVE ENERGY CALCULATOR](#)**: - Find out how much energy and money you can save by changing to energy saving light bulbs.

**Roke Manor Research Limited**

Roke works closely with schools and colleges in Hampshire to enthuse children about the fascinating world of science and technology. Find out more at [www.roke.co.uk](http://www.roke.co.uk).