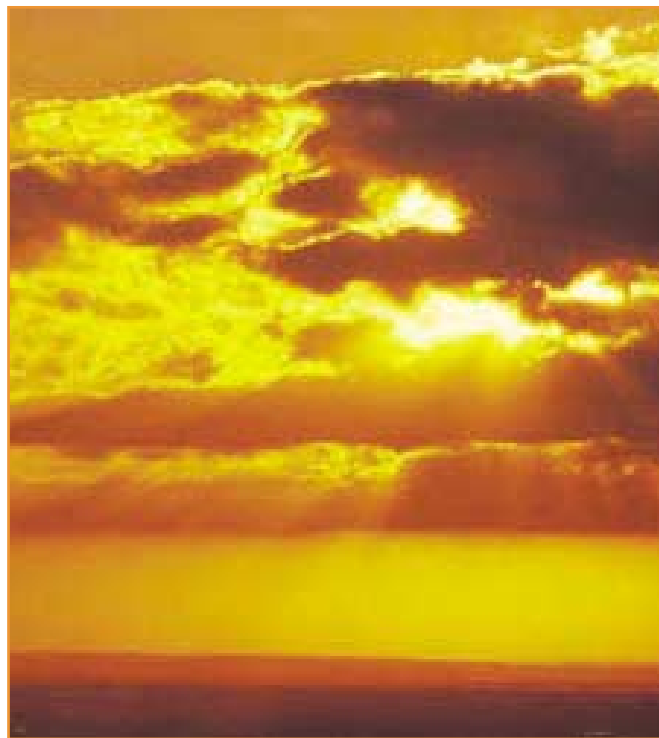
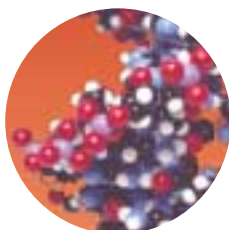


Teach Assist Resource Worksheets

Series 13 of 16



"Solar Energy"



Teach Assist Resources

TeachAssist resources are written with the practical needs of science teachers in mind. Each resource covers a practical activity that is integral to the QCA schemes of work to provide quick and easy preparation for practical classes.

Please feel free to photocopy the sheets to suit your needs.

Each TeachAssist resource contains:

- Student worksheet with practical instructions and activities.
- Technicians' equipment list for a class of 30 students.
- Reference to allow trouble-free ordering of materials and resources.

A summary table links each resource to the National Curriculum programme of study which allows TeachAssist practical activities to be quickly included into lesson plans and schemes of work.

If you require other booklets in the series, please telephone the Griffin Education sales team or send your request to the following address:-

Griffin Education
Bishop Meadow Road
Loughborough
Leicestershire LE11 5RG

STUDENT WORKSHEET



Important information:

Follow all the safety instructions that your teacher gives you.

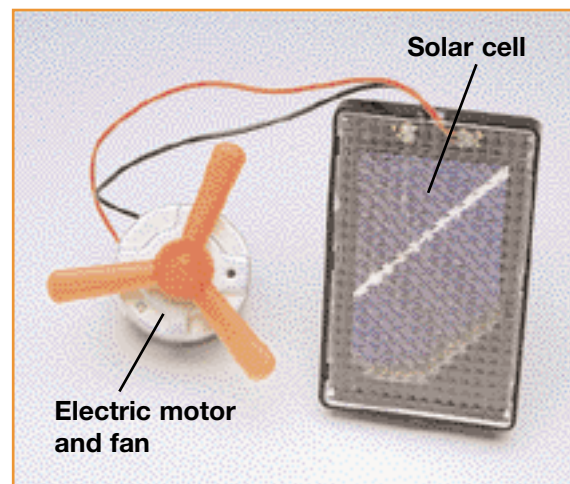
Solar energy

Millions of joules of energy hit the earth each year in the form of sunlight.

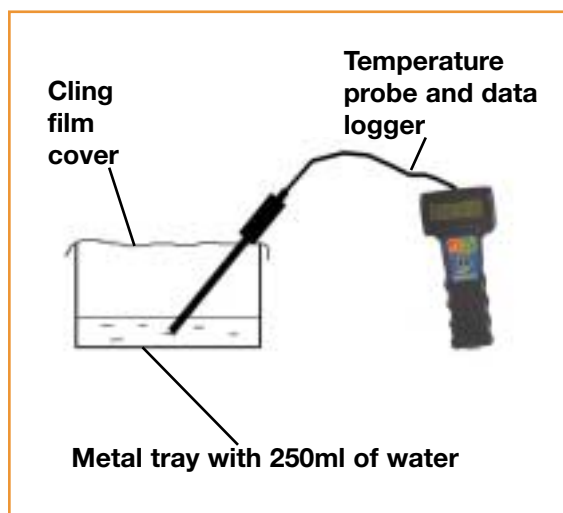
Solar cells can absorb the energy in sunlight.

Set up the solar cell and put it in the sunlight.

- What energy conversion is taking place in the solar cell?
- What energy conversion is taking place in the motor?
- Are these energy conversions 100% efficient? How is energy being “wasted”?
- Draw a flow diagram to show how the energy in sunlight is used to drive the fan.



Do dark surfaces absorb more solar energy than shiny ones?



1. You will be given a shiny metal tray or one that has been painted black.
2. Put 250ml of water into the tray.
3. Cover the surface with cling film. Leave a small hole for the temperature probe.
4. Put the tray and logger into sunlight near a window.
5. Leave the probe in the water and record the temperature change during the lesson.
6. Download the data to a computer. View the graph to show how the water temperature has changed.
7. Compare your results to a group who have used the other type of metal tray.


- What happens to the temperature of the water? Does it go up or down?
- Does the temperature change more in the dark tray or the shiny one?
- Which tray has absorbed the most heat energy?
- What will happen to the temperature if the tray is left in sunlight for a long time?

TECHNICIANS' EQUIPMENT LIST

QCA Unit 7I: Energy resources

Date:	Room	Time/Period:
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Equipment Class of 30 pupils, working in pairs.	Quantity	Check	Out	Back
Solar energy cell and fan kit	10			
Thin metal food trays (shiny)	5			
Thin metal trays (painted matt black)	5			
LogIT Explorer data loggers	10			
LogIT explorer temperature probes	10			
250ml beakers	10			
Cling film	roll			
Alternative to data loggers				
Thermometers	10			

	<p>Important Information:</p> <ul style="list-style-type: none"> ● The activity contains procedures that can be hazardous. It should not be performed unless an appropriate risk assessment has been made. ● Water temperature can be monitored using a thermometer but regular readings must be taken. Do not remove the cling film to take readings.
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ORDER REQUISITION

Equipment	Griffin Catalogue No.	Page	Unit cost (£)	No.	Cost (£)
250cm ³ beakers, borosilicate glass (pack of 10)	FB33112	362	11.70		
Solar energy cell and fan kit	XHV-150-E	57	16.10		
LogIT Explorer temperature probe	CRD-650-010H	325	19.99		
LogIT Explorer (starter pack, Windows™, USB)	CRD-600-030N	324	179.99		
Alternative to data loggers:					
Thermometer -20 to +150°C, 30.5cm, mercury-free	THL-460-060L	534	3.50		
Total cost					
VAT					
Order total					

Complete the order form above and place your order with Griffin Education in your usual way. Prices are correct at time of print, please contact the Griffin Sales office or check on the Griffin Education website for the latest prices.

By phone: 01509 233344
By post: Griffin Education
 Bishop Meadow Road
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 Leics. LE11 5RG

By fax: 01509 231893
By email: griffin@fisher.co.uk
On-line: www.griffineducation.co.uk

SUMMARY TABLE

QCA unit	KS3 NC programme	Y7 TeachAssist	Activity	Relevant experience from Key stage 2
7A: Cells	Sc1.2f Sc2.1a	1	How to use a microscope and prepare an onion epidermis slide	Use of hand lenses and basic microscopes. Plants and animals, including internal body organs and plant structures
7C: Environments and feeding relationships	Sc1.2g	2	Using a data logger to monitor environmental conditions	Some use of data loggers How organisms are suited to their environment
	Sc1.1a,c,d Sc1.2h,k,o	3	Wood lice in choice chambers	Asking questions and designing a fair test How organisms are suited to their environment
	Sc2.5b,e	4	Organisms and food chains in leaf litter	How organisms are suited to their environment Food chains as a feeding relationship
7E: Acids and alkalis	Sc3.3d	5	Finding the pH using universal indicator solution	Little or no previous coverage of pH
	Sc1.2g Sc3.3e	6	Using a data logger to monitor changes in pH when an acid is added to an alkali	Some use of data loggers Identification of patterns and trends
	Sc3.3e	7	Investigating the neutralisation of acids with antacid tablets	Use of tables and line graphs to represent data Mixing materials can lead to a change
7F: Simple chemical reactions	Sc3.3a	8	Reactions of metals with acids	Describing how materials change when mixed or heated and how irreversible changes produce new materials
7H: Solutions	Sc1.2a Sc3.1h	9	Purifying salt from rock salt	Use of dissolving, filtering and evaporation to separate mixtures
	Sc3.1h	10	Simple distillation	Knowledge of evaporation as a separation technique
	Sc3.1h	11	Paper chromatography of ink	Separation of colours in food colourings such as sugar-coated sweets
7I: Energy resources	Sc1.2f	12	Using the Bunsen burner	Possible use of methylated spirit burners or candle-burners
	Sc4.1c Sc4.5a,e	13	Demonstrating solar energy: solar cells and absorption of heat energy by different surfaces	Little or no previous coverage of energy
	Sc4.5a	14	Finding the energy content of foods	Little or no previous coverage of energy
7J: Electrical circuits	Sc4.1a	15	Current in series and parallel circuits	Construction of series circuits from circuit diagrams
7K: Forces and their effects	Sc1.2f,g,j,k Sc4.2b	16	Extension of springs and elastic bands	Push and pull in springs Testing elastic band catapults. Some may have extended bands with masses Measurement of forces and weight