

Science & Technology Equipment News

For Primary Schools and Teachers of S1/S2 courses



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STS

National Support Services in
Science, Technology and Safety

SSERC

SCOTTISH SCHOOLS EQUIPMENT RESEARCH CENTRE

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Understanding Earth and Space

We apologise for the lateness of this Newsletter. Let's be honest - in practice we've missed a whole issue (Winter 1998). It's not that we have been idle. Even the most luddite of SSERC staff can't ignore ICT (Information and Communications Technology) forever. We have been busy updating our computers and installing a new network. These were state of the art two or three months back. Such is the pace of development if they were books they would by now be on the remainder shelves. Familiarisation with new equipment and the learning curve for new software have taken up precious time in an already busy period. Enough of this whingeing! Once you've got modern kit of your own we trust you'll like the materials on which we've been working. We've decided to use this latest, steam-driven, Newsletter to detail a momentous happening this year - that of the solar eclipse. We have also included a number of useful addresses for more resources. The relevant key feature is of course, *Earth in Space*. The ideas could be introduced to P1/P3 in a discussion on *My Shadow*. You might then ask what could cast a shadow over the earth. P4 could make models of the sun, moon, and earth - using a torch as the sun and, say, a golf ball for the moon. They could then attempt to make their own mini eclipse by casting a shadow onto a white balloon or beach ball. The third party resources we have listed also may each help to make this an exciting happening. It's almost a shame that you'll all be on holiday when the real thing occurs.

Shadow over the land

Imagine a pleasant summer morning in August, at about 10 am. The land is in darkness, not one bird sings. Silence descends. A chill wind begins to blow. No, not the end of the world nor the opening paragraph of a science fiction thriller. A description, rather, of one of Nature's great spectacles.

The onset of a total eclipse of the sun.

On the 11th August 1999 such a rare event will occur in Britain. The word *rare* is chosen with care. The last total eclipse observable in Britain was on the 29th June 1927. The next one will be seen by few folk reading this. It is not due until the 23rd of September 2090.

For the 1999 eclipse, the area of *totality* in Britain - those places where the sun is completely blacked out - will be relatively small. It will be in the far south-west of the UK roughly between Penzance and Plymouth. The map shows the approximate percentage of solar cover (area of Sun apparently covered by the Moon) for the rest of Britain. Were it not for all the other *grockles* this might be a good time to holiday in Cornwall. Some bits of France and Germany should also be good. As they might say in another medium - "Viewers in Scotland will nonetheless witness a most exciting, dramatic event!".

Question: If the total eclipse begins at 11.10 in Penzance and 11.12 in Plymouth; at what time will it start in Rouen? (From the younger children "earlier or later?" would do).

Answer: "Later". Next questions - "Why?" and "From what direction does the moon appear to come on its journey around the Earth?"

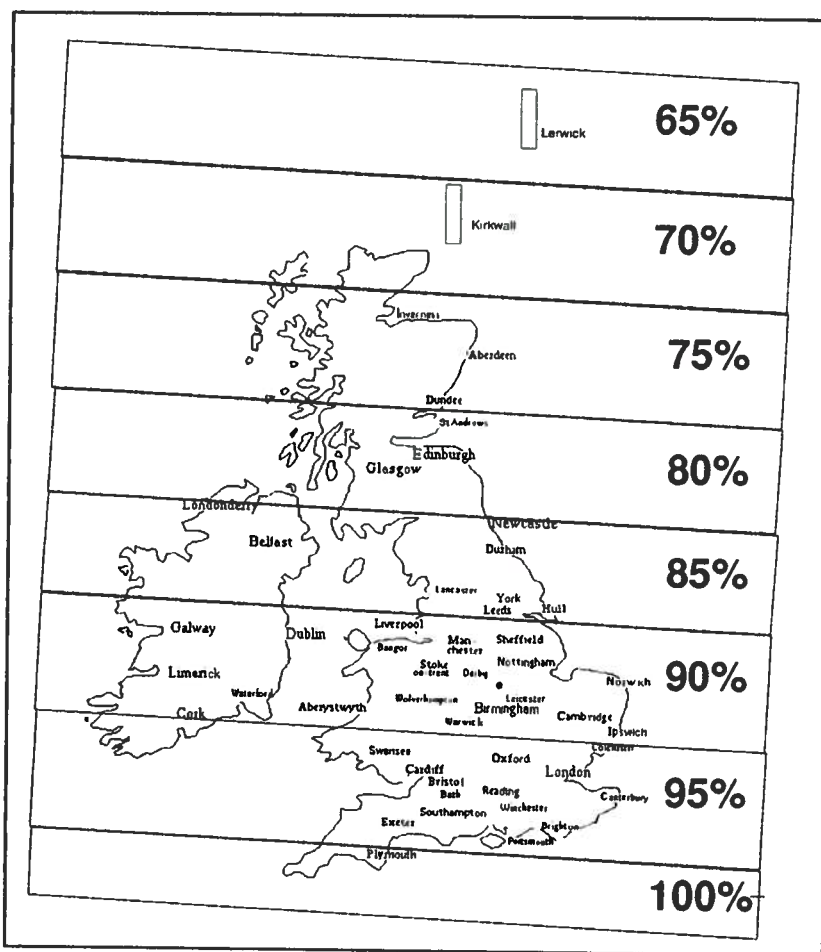


Figure 1 - Approximate percentage solar cover (see also table overleaf).

FREE Space CD-ROM! For details see next page.

Science specific primary resources

The 5-14 Science Pack

A collection of support materials produced by primary and secondary teachers in Renfrewshire in a project managed by Bill Fleming, Science Adviser. In a ring binder at £25 for a school photocopying licence (some EAs have purchased for the whole authority). For more detail contact Bill at Renfrewshire Education Services. SSERC has also recently begun collaborating with Bill Fleming looking at the potential for basing interactive electronic publications (in particular lesson, or course, planning tools) on these materials. The current conventional paper and disk based pack features:

- ✓ individual stage booklets with lesson plans
- ✓ facility for adaptation (Claris Works 4 files on disk)
- ✓ planning from P1 to S2 with progression flagged within each attainment outcome

Scottish Science 5 - 14: Stage P1

Joe Boyd, Lesley Cameron, Sheila Jackson and Walter Whitelaw. Published by John Murray. This is the first of a planned series of books covering the science within Environmental Studies 5-14. Although titled for P1 this resource could be used with P2 pupils and perhaps with other children with special needs. The pack consists of:

Teacher's resource book (ISBN 0 7195 7425 0)
Picture pack (ISBN 0 7195 7500 1) and
Assessment workbooks (ISBN 0 71095 7543 5)

Resources from British Steel

Protecting the Environment - a booklet produced by British Steel with a collection of simple but effective investigations on electricity, water and materials. The resources can be used, with progression, from P2 to P7. Relevant to "*Forms and Sources of Energy*" and "*Materials from Earth*". Available from British Steel at

General Steels, Scunthorpe Works,
PO Box 1, Scunthorpe, XDN16 1BP.
Tel. 01724 280280 Fax. 01724 282040

Educational Resources from Rio Tinto

Rocks, Minerals and Metals

A resource pack which includes Teacher's Guide, subject cards and work cards. The first pack per school is free and any additional sets cost £4 per 10 (Intended stages 7-13 or P3-S1). Included investigations cover *Planet Earth*, *People and Places* and *Technology*.

Mineral samples

Twelve different samples with details of each mineral and its origin. Free pack. (Intended age range 7-16, P3 to S4). This pack covers *Materials* and *Earth's Resources* (Planet Earth). Orders for Rio Tinto resources should be sent to:

Intermail plc, Horizon West, Canal View Road,
Newbury, Berkshire RG14 5XE.

British Heart Foundation materials

This charitable organisation offers an Interactive CDROM to schools. Entitled *Fit or Twit* it is intended as suitable for ages 10-13 (ca. P6 to S1/2). It is relevant to some aspects of science as well as to more general health education. Further details from the Distribution Department:

BHF, 14 Fitzhardinge Street, London W1H 4DH.

Modelling an eclipse

One suggested method of demonstrating what happens during an eclipse is illustrated in Figure 2 below. If the objects representing the Earth and the Moon can be suspended on a thin cord, then it helps make the demonstration a little more realistic. We have deliberately left out the shadow. The children could be asked how they think it will appear on the globe. Some person with a steady hand could stand in for the Sun. They should slowly move the torch around the sphere representing the Moon so as to simulate the Moon's shadow moving across the Earth's surface. An alternative approach might be to instead first discuss the problem. It might then be presented as an investigation with the teacher asking the children how they might make a simple model to simulate an eclipse.

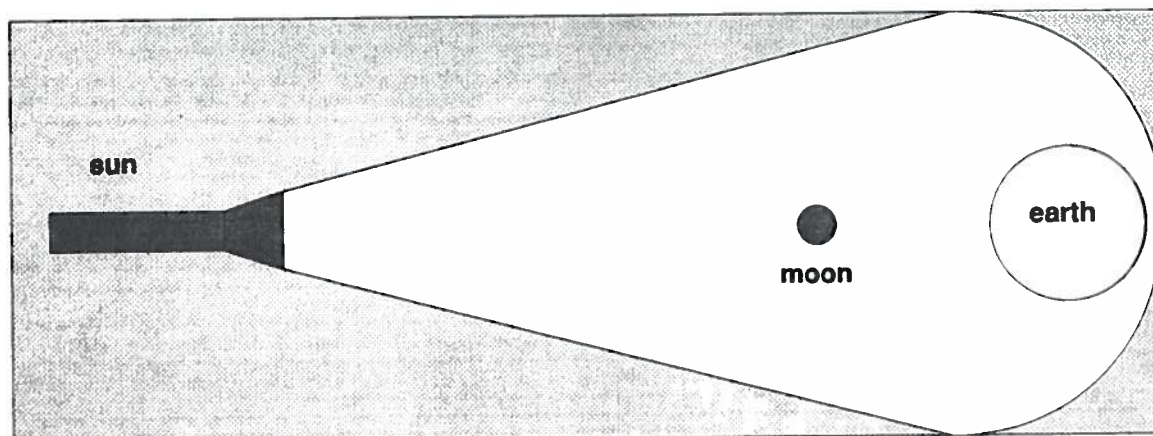


Figure 2 Demonstrating or simulating an eclipse

Places and approximate times of the eclipse

ENGLAND :

Town	Start of Eclipse	End of Eclipse	Period of totality
Penzance	09:56:37	12:31:38	125 seconds
Falmouth	09:57:06	12:32:25	126 seconds
Plymouth	09:58:14	12:33:51	102 seconds

SCOTLAND

Town	Start of Eclipse	End of Eclipse	Degree of totality
Lerwick	10:13:30	12:34:07	65% cover
Aberdeen	10:08:26	12:34:39	75% cover
Edinburgh	10:05:45	12:33:42	82% cover

Table 1 - Eclipse statistics

Third Party Resources

Please note that, apart from the free CD, the materials described in this section will have to be obtained from the source(s) quoted.

Eclipse and space

Website : Relevant to the eclipse and, or, space in general : an excellent eclipse Website at

<http://www.eclipse.org.uk>

Wallchart : Eclipses wallchart from the Pictorial Charts Educational Trust, 27 Kirchen Road, West Ealing, London, W13 0UD; Tel. 0181 567 9206 Chart size 70 x 100 cm, Reference - Eclipses T808. Price - £7.60 inc. VAT

Resource packs : Total Eclipse of the Sun (Primary) from ASE Booksales, College Lane, Hatfield, Herts, AL10 9AA. Tel. 01707 283000. The ASE pack contains information on :

Safe Viewing,
Recording and Reporting,
Modelling and Explaining,
Using IT and the Internet and
Understanding the Science of Solar Eclipse.

Resource packs cont : Investigation Pack 1 from Sheffield Hallam University, telephone for further details on 0114 225 4881.

Free CD-ROM : Window on the World was jointly produced by the British National Space Centre and the Remote Sensing Society. While this CD has little to do with the eclipse it has lots to do with *Earth In Space*. It contains videos, sound, photographs and to childrens' delight - some interactive games. An added bonus is in the design of the CDROM which simulates the experience of web browsing - without the need of an internet connection. We have a good supply of these CDs together with installation instructions and they will be sent out on a first come, with a self addressed and stamped A5 envelope, basis.

Other, general, resources for 5-14

Association for Science Education (ASE) Publications :

1. **Primary Science Equipment** - by Rosemary Feasey, ISBN 0 86357280 4 - 67pp - £6.75 (members) £7.50 (non-members). A comprehensive, illustrated, guide to basic science equipment to support all stages of the English/Welsh primary science curriculum. Contains much which is directly transferable to science within Environmental Studies 5-14.

2. **Symbols in Primary Science** ASE, ISBN 0 86357 281 £3.60 (members) £4.00 (non-members). A guide to signs, symbols and terminology used in primary science. A tad turgid in a few places but still a useful complementary publication to Be-safe!

3. **IT in Primary Science** Roger Frost, ISBN 0 9520257 3 6, £11.25 (members) 12.50 (non-members). A book packed with science experiments and investigations. The language is non-threatening for newcomers to either science or ICT. Has an excellent section on other related resources.

The above ASE published resources are available from :

ASE (Booksales), College Lane, Hatfield, AL10 9AA.
Tel. 01707 267411 Fax. 01707 266532

Worthwhile web sites

Tip - to speed up searches for British sites, use a specific UK search engine such as Mirago at <http://www.mirago.co.uk>

SSERC (us) - <http://www.svtc.org.uk/resources/sserc>

ASE - <http://www.ase.org.uk>

British National Space Centre - <http://www.bnsc.gov.uk>

Natural History Museum - <http://www.nhm.ac.uk>

The Science Museum - <http://www.nmsi.ac.uk>

BBC Education - <http://www.bbc.co.uk.education/home/today>

LEGO - <http://www.lego.com>

*Leonardo da Vinci** - <http://www.mos.org/sin/leonardo>

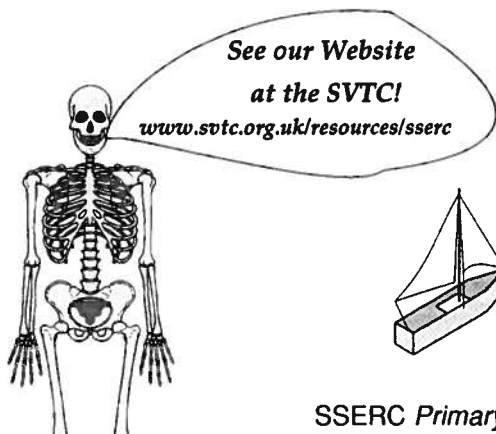
(*This last named is an American site, so visit early morning)

Components & Materials

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| <p>593 Miniature motor, 1.5V to 3V, 2mm dia. shaft 30p
 614 Miniature motor, 3V to 6V, 2mm dia. shaft
 Both motors above can be used for project work but they run at fairly high speeds, some form of gearing will be required. See worm/gear, item 811 45p</p> <p>621 Miniature motor, 1.5V to 3V, <u>now with 8 tooth pinion</u>. The open body of this motor makes it ideal for showing how such a motor is constructed. 25p</p> <p>798 Pack of 24 gears, 6 each of 12, 20, 30 or 40 teeth, dia. 15, 22, 32, 40 mm. 12 tooth gear fits motor shaft and 40 tooth gear is push fit in cotton reel £2.00
 799 Pack of 24 cams, 6 of each of 4 shapes £1.00
 800 Pack of 100 wheels, 39 mm diameter, assorted colours, 3 mm axle hole £5.25
 811 Worm and gear, gives a 34 to 1 speed reduction. 35p
 817 Axles 3 mm dia., nickel plated, round ends. push fit on SSERC plastic wheels, gears and pulleys: 70 mm long, per pack of 4 40p
 818 As above but 95mm long, pack of 4 40p
 819 As above but 120mm long, pack of 4 40p</p> <p>820 Worms to fit 2mm electric motor shaft, pack of 5 £1.00
 821 Reducers 3mm to 2mm enables gears, pulleys and wheels, to be fitted to motor shaft, per 5 25p
 867 Reducers, 4mm to 2mm, as above, per 5 25p
 868 Reducers, 4mm to 3mm, as above, per 5 25p</p> <p>710 Sonic switch. Clap your hands, the motor starts, clap again the motor reverses, on the third clap the motor stops. Needs 4 AA cells, not included. 85p
 723 Microswitch miniature, lever operated 40p
 822 Plastic toggle switch, low voltage 40p
 688 Crocodile clips, red, miniature, insulated. 5p
 759 As above but black. 5p</p> | <p>788 Crocodile leads, assorted colours, insulated croc. clips at ends, 36 cm long, pack of 10 £1.35
 835 2 x AA Cell ('battery') holder 15p
 845 2 x C Cell ('battery') holder 20p</p> <p>789 MES (miniature Edison screw) bulbs 3.5 V. 9p
 691 MES battenholders for above. 20p
 508 LED (light emitting diode) 3 mm, red, per 10. 50p
 761 LED 3 mm, yellow, per 10. 60p
 762 LED 3 mm green, per 10. 60p</p> <p>790 3V buzzer. 55p
 846 Sound module with 'melody' chip £1.00
 838 Solar cell, 100 x 60 mm, 3.75 V per cell, max. £2.10
 839 Solar motor, body 25 dia.12 mm long with shaft 2 mm dia 6 mm long. £1.70
 840 Solar pack : one of each solar cell, solar motor, propeller (801), and 3 V buzzer - with notes. £3.75
 836 Motor mounts, plastic, push-fit with self adhesive base pad for SSERC motors 593 & 614, 10pk £1.95p</p> <p>801 Propeller, 3 blade, to fit 2 mm shaft. Blade 62 mm long 35p
 792 Propeller kit with hub and blades for ten 3 or 2 bladed propellers. £3.50</p> <p>794 Cotton reels (for making buggies, rubber powered tanks etc.) pack of 20. 75p</p> <p>796 Pack of 20 pulleys, 5 of each of 10, 20, 30 and 40 mm diameters. £2.50
 837 Ring magnet, 40 mm o.d., 22 mm i.d. 35p
 815 Ceramic square magnet, 19 x 19 x 5 mm 15p
 824 Ceramic magnets, poles on face, 25x19x6mm 35p
 823 Ceramic magnets, poles at ends, 10x6x22mm 12p
 825 Forehead temperature strips, liquid-crystal type, 36-40°C (96-104°F), [store in cool cupboard] 50p
 833 Floppy disks, 5 1/4" double density, box of ten 60p
 834 As above but double sided high density, ten 60p</p> |
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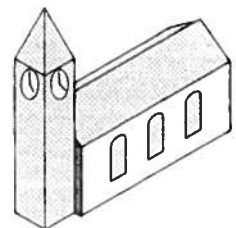
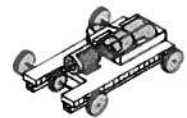
Cash with order only when total value is less than £5 and please add £1 for carriage solely to these small orders (except where an inclusive price is indicated eg kits, etc). For orders totalling more than £5 please do not send payment etc but await delivery and then pay on our advice note or invoice.

SSERC, St.Mary's Building, 23 Holyrood Road, Edinburgh EH8 8AE



Buggy pack £5 and Paper Engineering pack £2. See News No. 10. Solar cell and motor pack - see Item 840 in the listing above. Copyright free Skeleton template £1.25. For two additional kits - see Science & Technology News 15.

Watch out for new Web based resources and CDROMs from SSERC - coming soon!



SSERC Primary Graphics - soon to be available for PCs