

Science & Technology Equipment News

For Primary Schools and Teachers of S1/S2 courses

 Helpline 0131 558 8180

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STS National Support Services in
Science, Technology and Safety

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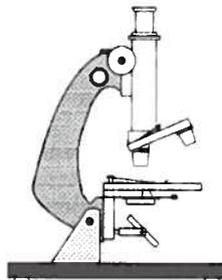
We were pleased with the response to Issue 10, even if somewhat stressed from the ensuing workload. I've started to lose count of how many skeletons, buggies and paper engineering packs we have had to despatch. Despite our tradition of trying always to use Plain English and our best endeavours in working for the secondary and FE sectors - there is obviously still room for improvement here in the "News". The use of a header "Third party resources" threw some readers. They placed orders directly with us for some of the materials mentioned thereunder. That was not the intention since we do not normally act as agents. In SSERC's library one of the guides to Plain English is sub-titled "Know, say and write what you mean". We must try even harder. This lack of direct availability of many items which we might review in these pages is stressed here because this issue again has a number of short accounts of items available from third parties.

AMFES Initiative

So much for our good intentions - the road to jargon is beset, yea paved, with acronyms. AMFES stands for :

"A Microscope for Every School"

This is a campaign promoted by the Royal Microscopical Society (or - here we go again - the RMS). The RMS has set up a fund to help schools purchase approved microscopes.



The society drew up a list of criteria for a microscope suitable for use in primary schools. These take account of considerations similar to those used by SSERC which has thirty years or so of experience in testing such equipment. The model chosen by the RMS was also recommended by us alongside the Offord Scientist in issue Number 2 (Summer 1994) of *The News* under the name Motic MS-2. It is available from various suppliers.

Now for the really good bit : If you buy one of the Motic MS2 type microscopes from a supplier detailed below you can apply to the RMS for a donation of £20 towards the full cost (typically about £62 but check with suppliers for up to date details on price and availability). All you need to do is simply supply a copy of the invoice as proof of purchase. As far as we are aware this offer is still limited to one microscope per school. The addresses of the relevant suppliers and their different names or reference numbers (in brackets) for the RMS approved model are :

Pyser SGI Ltd., Educational & Scientific Products, Fircroft Way, Edenbridge, Kent, TN8 6HA (Motic MS2). Tel. 01732 864111.

Philip Harris Education, Lynn Lane, Shenstone, Lichfield, Staffs., WS14 0EE (Junior Monoscope) Tel. 01543 480077.

Heron Educational Ltd., Carrwood House, Carrwood Road, Chesterfield, Derbyshire S41 9QB (OM7410) Tel. 01246 453354.

NES Arnold Ltd., Ludlow Hill Road, West Bridgford, Nottingham NG2 6HD (NB 8415/2). Tel. 0115 945 2200.

Primary Learning Ltd., Grey walls, Park Road, Southborough, Kent TN4 0NU (Motic MS2). Tel. 01892 546309.

Young Detectives

This is a magazine for primary schools of which, in theory at least, our readers already should know. It is linked with the AMFES Initiative in the sense that it is published by BNFL Community Affairs in association with the RMS. It is published termly and circulated widely to schools throughout the UK. If you haven't yet seen a copy first enquire within the school or of the education authority. If that fails then contact :



Resources for Learning, 19 Park Drive,
Bradford, West Yorkshire, LS23 7EL
Tel. 01274 544155 Fax 01274 549391.

The magazine is a super source of investigative ideas and useful, sometimes unusual, facts. One of the regular contributors and a driving force behind the AMFES Initiative is Dr Peter Evenett of the RMS. He is an inspirational teacher with a fund of simple, yet highly imaginative, ideas for learning and teaching in science. He taught and even impressed your hard-bitten Editor on an RMS Principles of Light Microscopy Course! That was, I admit, several moons ago and I was maturing more than somewhat as a student by then. Nonetheless it is looked back on still as one of the best learning experiences I've ever had.

BNFL educational resources are advertised in the magazine which also runs competitions and offers prizes. So, if you're not getting *Young Detectives* or the school receives it but you don't use it - then - you're missing out. Meantime, here are the address details for BNFL Education and the RMS :

BNFL Education Unit, The Royal Microscopical Society,
PO Box 10, Wetherby, 37/38 St Clements,
West Yorkshire, Oxford, OX4 1AJ
LS23 7EL Tel. 01865 248768 Fax 791237
Freephone 0500 141142

More support on the way

Although there has been no national Scottish training programme as such for science and technology within Environmental Studies 5-14, other forms of support have been developed. A few of these have recently become available and others are just about to be so.



Much of the philosophy behind these resources is based on a consensus as to appropriate approaches to learning and teaching as identified by research and experienced by teachers. It may now be possible to draw up integrated plans for professional development to take forward learning and teaching in science and technology at 5-14. These important new resources include :

- *Interchange 34* : précis of SCRE's (Scottish Council for Research in Education) study of primary teachers' ideas on science and technology.
- *Environmental Studies 5-14 Exemplification* (SCCC).
- *Science CDi* (SOEID and the BBC) - a staff development package with a series of 5 CDi describing an investigative approach and the ideas and concepts underpinning 5-14 key features. Could be a useful tool in developing teachers' knowledge and understanding and thus in further building confidence.
- *Making Sense of Science* (Channel 4, Glaxo Wellcome DTI and the Institution of Electrical Engineers). A video based staff development programme using selected parts of taped classroom based activities and some hands-on activities. This package assumes some science and technology knowledge and deals mainly with appropriate methodologies. A number of training sessions for prospective local trainers will be run in Scotland in 1997-98. The programmes themselves will be on air this Autumn - directly accessible to teachers.
- *Making Sense of Secondary Science* (R.Driver et al, Routledge) - summary of research into pupils' misconceptions in science giving advice on appropriate learning strategies to move pupils' ideas on.
- *Science and Technology Helplines* - SSERC already offers assistance through our telephone and fax helplines. A number of agencies are likely to co-operate in looking at ways in which newer technologies might be used to offer help and deliver resources more efficiently.
- *Control Technology 5-14* (SOEID, Moray House, SSERC and the Technology Enhancement Project). A set of resources due out in the Summer are intended to address some of the problems likely to be met in teaching technological concepts. The work follows on from some of the problems and principles identified by SCRE (in *Interchange 34* see above). The materials start from areas of science (eg The Senses) with which many primary teachers are comfortable and lead on into less familiar territory. The pack comprises of Pupil Workbooks with activities suggested for each Planning Stage (P1-3, P4-6 and S1-2); a Teachers' Guide and a video of primary practitioners using and discussing the pupil material. It is likely that a dedicated telephone helpline will be established to support the material.

Acknowledgement

We are very grateful to Walter Whitelaw, Adviser in Science & Technology Education, City of Edinburgh Council for sight of a draft paper on *Promoting and Sustaining Effective Teaching and Learning in Science 5-14* and on which parts of the above summary are based.

Out of this world!

Strange where you might find ideas for 5-14 Environmental Studies projects. This one was spotted in the "Around the County" section of a recent edition of that August Journal - *The East Lothian Courier*. The Courier obviously has a keen eye for an educational tale these days - not surprising when you realise that it boasts on its reporting staff a no lesser *Cub* than an offspring of Her Majesty's Senior Chief Inspector of Schools (and very well he writes too, the cub I mean, make up your own jokes about his Dad's efforts).

The tale is of pupils at Longniddry Primary School who have turned a walk-in storage cupboard into their very own planetarium. Where once there were books and jotters (and no it wasn't *The Cuts*.) now is Space. Where there were walls and ceiling now are stars, constellations and planets.



It is one of those wonderfully simple ideas that the only surprise was that one hadn't thought of it earlier - in other words - the best kind. What the teacher, Mrs Morrice, and her pupils had done was to line the walls and ceiling with black paper (ceiling to *le ciel* you might say if you were also into languages 5-14). On the black surface they stuck paper stars and circles laying them out in constellations and patterns of part of the night sky. Who needs *Starlab*? The paper shapes are of the type which are energised by light and when the light is then switched off they continue to glow (ie they *fluoresce*).



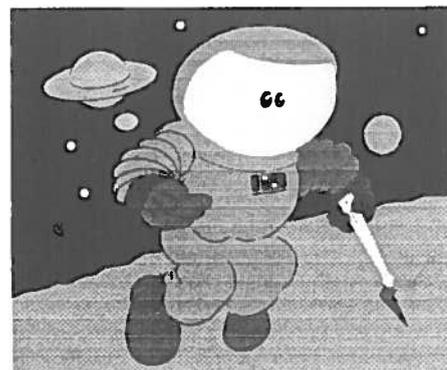
The star and planet shapes can be bought at specialist gift shops and are fairly inexpensive. The only other things you need are a handy walk-in cupboard and a text with maps of the night sky.

It's pretty impressive by all accounts (as it was in my own daughter's bedroom but slow old me never made the 5-14 connection!).

The project even took on entrepreneurial and philanthropic dimensions. This major attraction was opened up to other classes and to parents. Pupils provided guided tours - charging 5p per visitor - and donated the proceeds to the oncology unit at the Western General.

Acknowledgement

We are most grateful to Mrs Morrice of Longniddry Primary School for discussing the project with us and for providing some information further to that reported in the Courier.



An Easter egg

Here is a seasonal offering, or it will be should you receive this Newsletter before Easter - else why not try a dinosaur egg? This exercise gives the children an opportunity to both make and learn a little about a simple linked system, and it's fun.



The templates for the egg and chick can be photocopied to card or photocopied then gummed to a piece of cardboard before cutting out. Cut through the zigzag line on the egg and attach to the strips and the base card as shown. Remember the egg is part of the system and that a little practice with the linkage beforehand is well worthwhile !

The linkage assembly should be easy to follow from the sketch below, the 3 long strips are 220mm x 12mm the 2 short strips 100mm x 12mm.

Two of the long strips are joined by a 12mm paper fastener 50 mm from one end. One of them is then fixed to a thick card (120mm x 120mm) by two paper fasteners, the other allowed to move freely around the pivot point. The two short strips are then joined as shown.

The chick has a hole punched through its lower abdomen and a paper fastener is used to attach it to the pivot point of the short strips, about 80mm from each end. The last part of the link is the final long strip, this should be attached to the end of the movable strip. To make sure the chick remains upright, one wing can be stuck to a strip with a little bluetac. Perforated strip can be bought from a number of suppliers. There even may be bits and pieces in the school that could be used - BRIO or Meccano strip to name but two. Otherwise Opitex, Commotion or Unilab are suitable sources of such perforated strips.

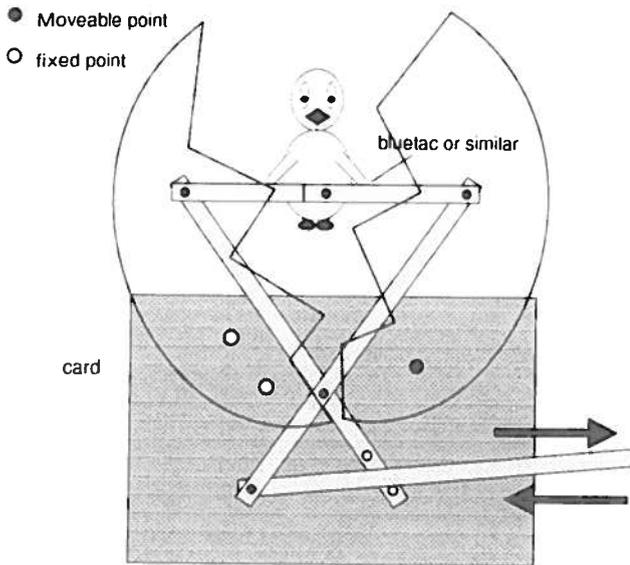


Figure 1 Completed assembly (not to scale)

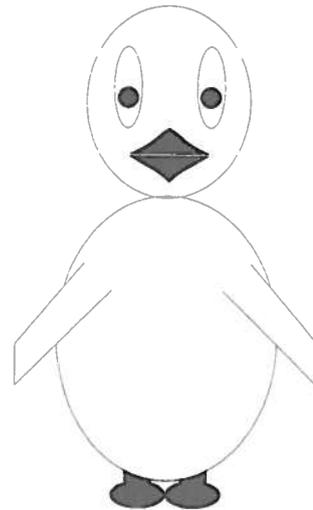


Figure 2 Enlarge by 141% (A4 to A3)

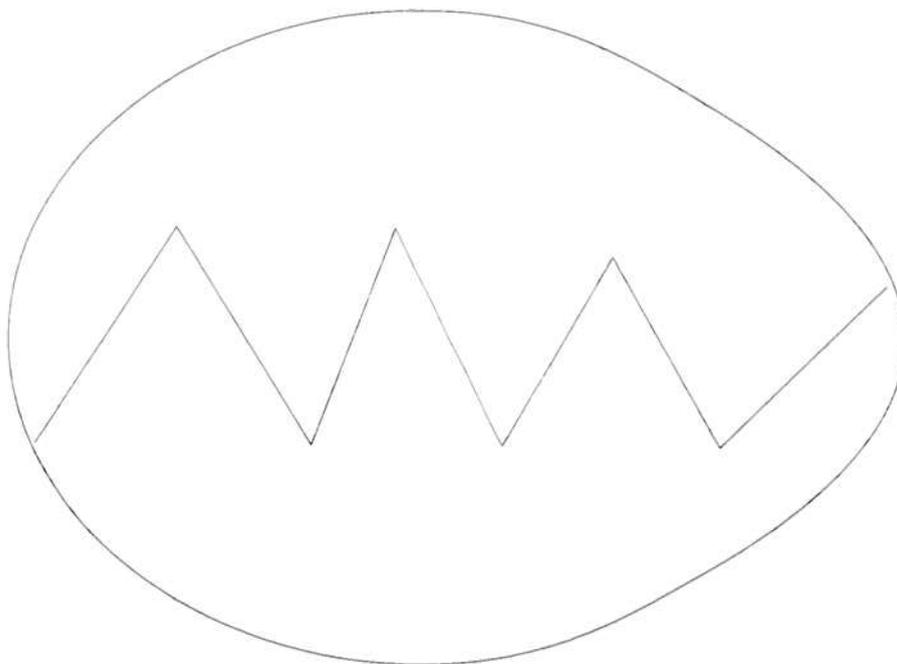


Figure 3 Egg template - enlarge by 141% (A4 to A3) and turn ninety degrees anticlockwise.

Components & Materials List

We apologise to any readers who have experienced delays in obtaining components or packs. We had underestimated the demand and our small staff found it difficult to keep pace with the influx of orders. Some part-time assistance has been enlisted and we shall shortly have cleared the backlog of orders. Please note that our Buggy (£5), Skeleton (£1.25) and Paper Engineering (£1.80) packs are all still available (prices shown include any VAT and postage) for those yet to try them.

| | |
|---|--------|
| 593 Miniature motor, 1.5V to 3V, 2mm dia. shaft | 30p |
| 614 Miniature motor, 3V to 6V, 2mm dia. shaft. | 45p |
| Both of the above motors 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 | |
| 621 Miniature motor, 1.5V to 3V, 1.5mm shaft. The open body of this motor makes it ideal for showing how such a motor is constructed. | 25p |
| 811 Worm and gear, gives a 34 to 1 speed reduction. | 35p |
| 629 Dual tone buzzer with flashing light supplied with PP3 battery clip. | 55p |
| Ideal for model burglar alarms, warning barriers, police car etc.. | |
| 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. | 50p |
| 688 Crocodile clips, red, miniature, insulated. | 5p |
| 759 as above but black. | 5p |
| 789 MES (miniature Edison screw) lamps (bulbs) 3.5V. | 9p |
| 691 MES battenholders for above. | 20p |
| 508 LED (light emitting diode) 3 mm, red. | 50p/10 |
| 761 LED 3 mm, yellow. | 60p/10 |
| 762 LED 3 mm green | 60p/10 |
| 790 3V buzzer. | 55p |
| 788 Crocodile leads, assorted colours, insulated croc. clips at ends, 36cm long. | £1.35 |
| 791 Propeller, 3 blade to fit 2mm shaft. Blade 55 mm long. | 45p |
| 792 Propeller kit with hub and blades for ten 3 or 2 bladed propellers. | £3.50 |
| 793 Cotton reels (for making buggies, rubber powered tanks etc.) pack 10. | 45p |
| 794 As above but pack of 100. | £3.50 |
| 796 Pack of 20 pulleys, 5 of each of 10, 20, 30 and 40 mm diameters. | £2.50 |
| 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 |
| 814 Ring magnet, 24 mm o.d., 6 mm i.d. | 20p |
| 815 Ceramic square magnet, 19 x 19 x 5 mm | 15p |
| 817 Axles 3mm dia., nickel plated, round ends. push fit on SSERC plastic wheels, gears and pulleys :70mm long, per pack of 4 | 40p |
| 818 As above but 95mm long, pack of 4 | 40p |
| 819 As above but 12mm long, pack of 4 | 40p |
| 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 |
| 723 Microswitch miniature, lever operated | 40p |
| 822 Plastic toggle switch, low voltage | 40p |
| 824 Ceramic magnets, poles on face, 25 x 19 x 6mm | 35p |
| 823 Ceramic magnets, poles at ends, 10 x 6 x 22mm | 12p |
| 825 Forehead temperature strips, liquid-crystal type, 36-40°C (96-104°F), [store in cool cupboard] | 50p |

Floppy disks various makes - Precision, Nashua and Verbatim new in unopened boxes of ten disks. The 5¼ inch types are all suitable for use on both IBM PCs and compatibles and BBC Bs or Masters with appropriate drives. The 3½ inch types are suitable for use on later PCs and all Acorn RiscOS computers. (Surplus stock from Fife College to whom thanks are due).

| | |
|--|-------|
| 832 3½ inch, Precision, double-sided, double density, box of ten disks | £1.00 |
| 833 Floppy disks, as above but 5¼ inch, double density. box of ten disks | 60p |
| 834 Floppy disks, 5¼ inch, double sided, high density, box of ten disks | 60p |

Payment with orders totalling less than £5 nett please. Except where the price is described as inclusive (eg kits, packs etc) please allow £1 for carriage then add VAT to the total.

SSERC, St.Mary's Building, 23 Holyrood Road, Edinburgh EH8 8AE Tel. 0131 558 8180, Fax. 0131 558 8191.

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