Primary Science & Technology Bulletin

Ideas & inspiration for teachers in Primary Schools & S1/S2

Number 42 Winter 2007

CfE - Planet Earth Special

Primary Science CPD event highlights

Experiences and Outcomes within Planet Earth

The graphic below can be found on the ISE website: www.ise5-14.org.uk/Prim3/head2.htm. This is called the Science Wheel and provides links to the draft experiences and outcomes that were published in September 2007. They provide expectations about learning for ages 3-18.

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Highlights from the Primary Science CPD event (Nov. 8-10)

Primary teachers from across Scotland gathered at the Glasgow Science Centre for an activity-packed CPD event. The group of thirty teachers explored the Science Centre, taking in the Planetarium as well as some of the exhibits on a whistle-stop tour. They were encouraged to think about ways of integrating the sights and sounds they experienced into their classroom learning and teaching. In the evening, they dissected a wide collection of children's magazines searching for topical science ideas. This culminated in a poster presentation from each of the groups.

Figures 3 & 4
Sunshine, Shadows & Stone Circles Workshop
"When the Sun is over here my shadow is down there"

Figures 1 & 2 - Some sound activities from Dr. Bunhead's workshop

The next day began with a wonderful presentation by Walter Whitelaw from Midlothian Council, on teaching today and then Marjorie Smith of Dollar Academy demonstrated the new resources, *Let's Talk Plants* and *Let's Talk Environment*. Bob Kibble of Moray House led a workshop on *Sunshine, Shadows and Stone Circles* (see also page 4) and Gregor Steele of SSERC nurtured the teachers through an interactive session with their very own video digital cameras. That evening saw the use of Drama and Stories in the Primary Science classroom and the teachers experienced the realities of limited resources for families in a simulation activity called *Basic Needs*.

CONTINUING PROFESSIONAL DEVELOPMENT
Teaching in Scotland

Upcoming CPD events/activities for Primary in 2008

February 6-9th at the Glasgow Science Centre - Stand Alone course
- Something old, something new, something borrowed, something green...
http://www.ise5-14.org.uk/Prim3/Events.htm

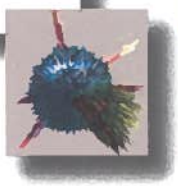
March 7-8th at Crieff Hydro Hotel - ASE Scotland Annual Conference
http://www.sserc.org.uk/public/Events_News/list.htm

CPD Events at the Glasgow Science Centre
http://www.ise5-14.org.uk/Prim3/Events.htm#GSC

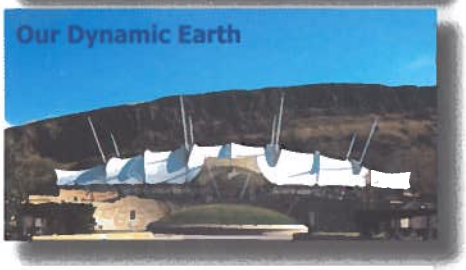
CPD Events at Our Dynamic Earth
http://www.dynamicearth.co.uk/index.asp?cat=Education

CPD Events at Sensations Dundee
http://www.sensation.org.uk/index.php?p=112

SETPOINT Scotland



Stemnet and Setpoint Scotland http://www.setpointscotland.org.uk/



sensation
The LIVE Science Centre: DUNDEE

Introduction - *Some suggestions to support the new draft Experiences and Outcomes within Planet Earth*

The Earth as we see it doesn't seem to change much. However, Scotland has been a desert, a tropical swamp, a volcanic landscape, an ocean floor and has gone through many ice ages. We know this from the rocks that are all around and which give us clues to Scotland's past. In terms of what the Earth has gone through human history is but a blink of an eye in geological time. In this issue we look at activities and resources for the Planet Earth draft experiences and outcomes (not quite tablets of stone yet!)

Cover photo (Figure 5) - A fossilised beach of Old Red Sandstone from the shores of Lake Orcadie when the Orkney Mainland (near Warebeth) sat close to the Equator around 320 million years ago. Find out more about Orkney geology at http://www.fettes.com/Orkney/

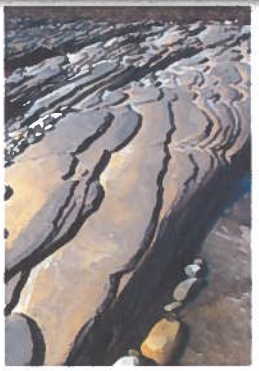


Figure 5 - A fossilised beach.

Sustainability

I have investigated materials around me and I can sort them for reuse or recycling. **SCN 001A**
Through my experience of different materials, which I use, I can talk about the need to conserve the Earth's resources at home and in school and what I can do to help. **SCN 101A**

Rubbish!

Figure 6 - Bottle-top bugs

Much of what we throw away can be returned to the Earth to provide nutrients for the soil rather than going into a landfill along with non-biodegradable materials. Record what your class throws away for a few weeks by collecting, weighing, and categorising them as recyclable, reusable, biodegradable, or rubbish. How much of what we throw away could be recycled or is biodegradable?

Reuse plastic bottles into bird feeders or sports bottle tops into colourful beasties (Fig. 6)

Health and safety - Adult help/supervision is essential for making holes into plastic bottles - risk of puncture injuries.

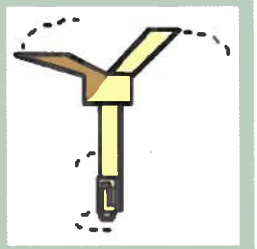
Useful websites (all www.) wasteawareschools.org.uk, ecoschoolsscotland.org.uk, recycling-guide.org.uk

Problem Solving - Modifying a Y-copter using scrap paper saved from the wastepaper bin - an activity that could link into blade design for wind farms.

Your team of flight engineers will make and test a Y-copter and then modify the existing technology and test their new models. Use scraps of paper or card.

Follow the pattern below (25 cm x 5 cm) and, using scissors where indicated, fold as shown. Cuts are made on the solid lines, folds on the dotted lines. Paper clips can be used on the bottom instead of folding the paper. Using a stopwatch, time how long the team can keep the Y-copter in the air. Now change ONE variable. Discuss with the team what that could be. Remember controls and repeated trials.

Figure 7 - Y-copter



Write up a report that will include:

- The problem on which the test is based
- The solution to the problem, including the relationship between the variable chosen to change and the dependent variable (flight time)
- Detail outline of steps followed
- Observations presented in a table or graph
- A conclusion based on the data collected.

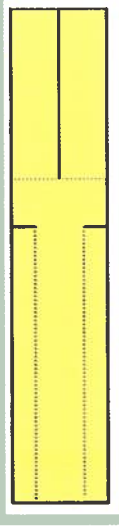


Figure 8 - Y-copter pattern (25 x 5 cm)

Biodiversity

From a range of sources including my local environment, I can identify and classify examples of living things to help me appreciate their variety. **SCN 205B**
I can research examples of extinctions in the past and recent times and use my understanding to develop arguments that could be used in a campaign to save an endangered species. **SCN206B**
I can express an informed opinion on the role of zoos, wildlife parks and botanical gardens. **SCN 207B**
Having carried out a series of activities and research, I can contribute to a display showing how plants have benefited society and will continue to improve our quality of life. **SCN 209B**

Schools have begun to use the materials from the "Let's Talk project, which have been produced by Marjorie Smith from 'Science and Plants for Schools' (SAPS). The resources are from a project called 'Let's Talk' which has been supported by the Wellcome Trust's 'Engaging Science' grants scheme.

The resources contain "activities to encourage primary pupils to explore scientific issues". They enable young people to become responsible citizens who are able to:

- make informed choices and decisions
- evaluate environmental, scientific & technological issues
- develop informed, ethical views of complex issues

The materials use approaches such as drama and the expressive arts to promote debate for engaging pupils in scientific issues. The areas include Human Reproduction, Environmental Issues and Plants Matter:

Plants Matter – a little taster - In groups, the pupils are given one of the plant environment pictures and asked to rate the importance of the statements. Each picture has 10 statements. The pupils have to give each statement an 'importance mark' out of 5 but they only have 35 points to give out. For example if a group was looking at the farm and decided that the statement 'Farms throughout the world provide almost all the food which we all need to survive' was very important they would assign a score of 5 to box F on the pupil sheet. They need not use all their 35 points but must not use more than 35 points. They need to think about "what matters most?" and prioritise their points.

Figure 9 - Let's Talk Farm

The activities can be used with pupils from age 9-11 when they are studying plants and perhaps at a point when they are learning about the importance of plants as foods, medicines, habitats for animals etc. The activity aims to encourage the pupils to discuss some of the issues and conflicts associated with preserving forests, providing habitats for wild animals within farmland, food transport issues etc.

For more information about these resources:

Email Marjorie Smith at lets.talk@btinternet.com

A Professional Development Unit about this resource will soon be available at: www.azteachscience.co.uk

Climate and Earth Science

Using my senses, I have experienced, described and recorded the weather and changes in the environment. Through discussion I can relate these to the seasons and show how these affect me. **SCN 003C**

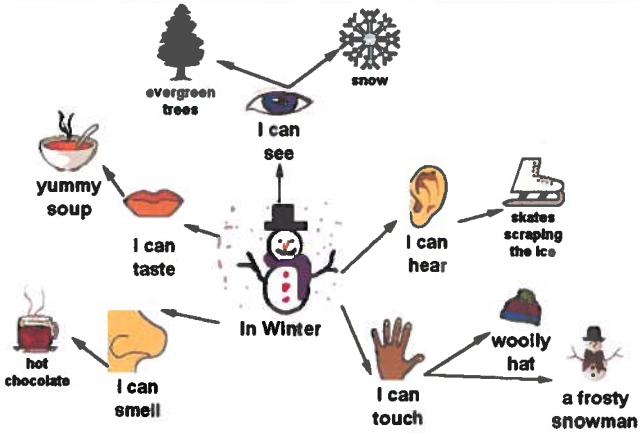


Figure 10 - 'In Winter' Mindmap

Weather, Melting and Freezing

I can investigate melting, freezing and boiling, and relate my findings to my everyday experiences, including weather. **SCN 104D**

It is important for pupils to understand that water can be a solid, liquid or gas when investigating the effects of heating and cooling on water. The children will probably be familiar with making ice cubes from water and will be aware that when snow melts it turns to water. They will query where the water from the puddles goes to since they cannot see the water vapour in the air. The air around us is full of water molecules – think how much water appears on the windows as condensation on a cold morning – energetic, gaseous, water molecules hitting the cold surface give up their energy and return to the liquid form. The same happens when a drinks can is taken out of a very cold fridge – water molecules in the air suddenly hit the cold surface, lose their energy and become liquid water.

Some activities:

- Observe puddles of water in the playground 'disappearing'
- Discuss how to change water into ice and what happens when water is heated.
- Record and explain what is seen when a drinks can is taken out of the refrigerator.

For more info. see www.ise5-14.org.uk (register free). Another useful website is www.kidzone.ws

Ice Is Nice - Improve observation and questioning skills through freezing and melting ice. Add water to an ice cube tray and set it in the freezer. Ask your pupils how long it will take to freeze. For variety, use different levels of water in different sections of the tray and get them to predict how long they will take to freeze. Set ice cubes on a table. Ask your pupils how long they will take to melt. Why do they melt? Place the ice cubes in different areas of the room. Do they melt faster in some places than in others? Why?

Figure 11 - Ice cube melting

Astronomy

I have experienced the wonder of looking at the vastness of the sky, and can recognise the Sun, Moon and stars and link them to daily patterns of life. **SCN 004E**
I have observed and recorded the position of the Sun and Moon at various times. I can make connections between the shape, position and size of shadows and the Sun at different times of the day. **SCN**

Sunshine, Shadows and Stone Circles
(booklet and CD, available 2008)

Bob Kibble, a senior lecturer in Science at the University of Edinburgh has developed this resource for all teachers. It begins by investigating through first hand experiences of shadows and sundials (get those torches ready). It then moves onto the more critical issue of night and day and the rotating Earth. There are sections on building in some simple research into your classroom and also a storyline approach to using stone circles as a learning resource. The resource contains many activities and some super suggestions as to how these can be integrated into learning and teaching in the classroom. Publication is scheduled for 2008.

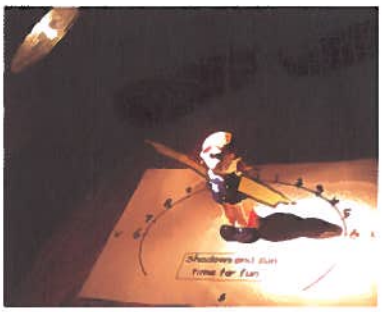


Figure 12 - A simple model showing the light and shadow relative positions

If you would like further information on the publication date please contact:

info@millgatehouse.co.uk or bobk@education.ed.ac.uk

Other useful resources can be found on BBC Science Clips. Where there are interactive experiments and quizzes. Each unit also has an associated set of teacher resources on topics such as light and dark and light and shadows.

www.bbc.co.uk/schools/scienceclips

Figure 13 - Sun dial on Aberdour Castle in Fife (dates from 1630)