International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

FEBRUARY 2011

Welcome to the ICASE February 2011 Newsletter !

The ICASE Newsletter is a regularly distributed publication containing current information about topics of interest in the field of science education. The table of contents for this issue is located in the right hand column.

The International Council of Associations for Science Education (ICASE) was established in 1973 to extend and improve science education for chldren and young people throughout the world. Today, ICASE is a huge network of science education associations, institutions, foundations and companies, facilitating communication and cooperation at the regional and international level.

UNESCO has declared the year 2011 as the International Year of Chemisty. Does this apply to Chemistry Education (and hence school chemistry) as well, or is chemistry education, as a social science rather than a natural science subject, not intended? We welcome your views (Send to jack@ut.ee; bulentcavas@gmail.com)

Join the ICASE Community to receive the Newsletter

For information please visit our web page:
http://www.icaseonline.net

Read or Submit a Manuscript to the ICASE Journal:
Science Education International

For information please visit our Journal web page:
http://www.icaseonline.net/seiweb

Contents of Newsletter

Editorial;
Jack Holbrook
ICASE Past President
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Bulent Cavas
Publications Committee Chair
bulentcavas@gmail.com

ICASE News

Jack Holbrook, ICASE Past President

1. Mailing System for ICASE Newsletters

In future, the ICASE Newsletters will be sent to interested science educators using a list serve. ***In order to receive future newsletters from the list serve, please subscribe to the new mailing list following the steps below:***

1. Please visit the web page below:
http://host246.hostmonster.com/mailman/listinfo/icase_newsletter_icaseonline.net
2. Fill in the form there using your correct e-mail address and your name & surname and then press the subscribe button.
3. You will receive a confirmation e-mail with a link. Just visit the link in the e-mail to complete your mailing list inclusion.

2. ICASE Executive Committee

Committee members are planning a meeting in Penang Malaysia to discuss the next steps in the development of ICASE. For readers who are unfamiliar with ICASE, this umbrella organisation seeks its mandate and its direction from its member national/regional organisations. It does not have individual members, but is delighted to have the opportunity to disseminate to teachers (hence the newsletter going to anyone who has an interest) and to play whatever role it can in enhancing science education around the world; especially working with, or in support of, its national member organisations.

Your role, as a reader of this newsletter, is to support your local science teacher organisation and to help further the link between the organisation and ICASE. The ICASE role is very much dissemination of developments (at whatever level) for the benefit of science teachers worldwide. Not surprisingly in this regard, a major ICASE concern is that the newsletter (and other materials) are, at the moment) only in English. But as a voluntary organisation, ICASE depends solely on the interests of others for its effectiveness in other languages.

Future newsletters will relate to the follow up from the ICASE Executive meeting.

ICASE News (Cont.)

3. ICASE/RECSAM seminars

Also in Penang, at the time of the Executive meeting, ICASE officers will offer a series of seminars for science teachers. At the time of developing this newsletter, not all titles are available, but the following are a sample:

• Student Self-Actualisation through Science Education: the Role of Teaching Modules.

• Implementation of a New Curriculum - Lessons Learnt in the New Zealand Context.

• Engaging Students in STEM Education.

GLOBE: Connecting the Next Generation of International Scientists and Global Citizens.

• Meeting Teacher Needs for embracing a 3-stage Science Teaching Model aimed at developing Students' Scientific Literacy (STL).

• The New Zealand Science Learning Hub: Three years into development.

4. PROFILES Project

This is one of the largest European Commission FP7 projects on 'Science in Society' and has 22 partners in 20 countries. One partner is ICASE, which will be mainly involved with dissemination. What will ICASE disseminate?

As the project focuses on continuous professional development of science teachers to give more meaning to inquiry teaching/learning and the role of the teacher in making science teaching more meaningful for students. A major thrust will be to convince teachers that science education is more than content from the textbook just as inquiry learning is far more than experimental work using worksheets.

5. Invitation to the Dennis Chisman Memorial Lecture

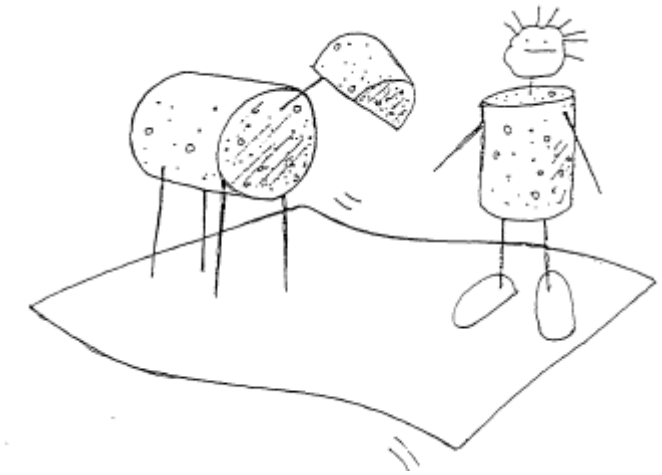
Speaker: Kabir Shaikh
"Where next for Science, Technology and Maths Education in the Commonwealth"
Wednesday 16 February, 6.00 for 6.30PM
The University of Westminster
309 Regent Street
London
W1B 2UW
RSVP to Chris McLaren Tel: 01962 826388 or email chris.mclaren@winchester.ac.uk

Science Activities

STEP ACTIVITY

Where do legs go? Challenge: Where is the best place for legs?

What you need
- corks, plasticine or playdough for animal bodies
- toothpicks or matchsticks for legs
- stiff cardboard



What to do
Using corks or some plasticine, or playdough, design a four legged animal's body and attach toothpicks, or matchsticks as its legs.
Make a similar body, but change the position of the legs.
Make a two legged body and support it with two legs so that it stands upright.
You may have to make some feet using plasticine, or playdough.
Put all the animals on the stiff card and wobble them.
What happens?

More to do
- Can you alter the position of the legs so that the bodies are more stable (so that they do not fall over easily)?

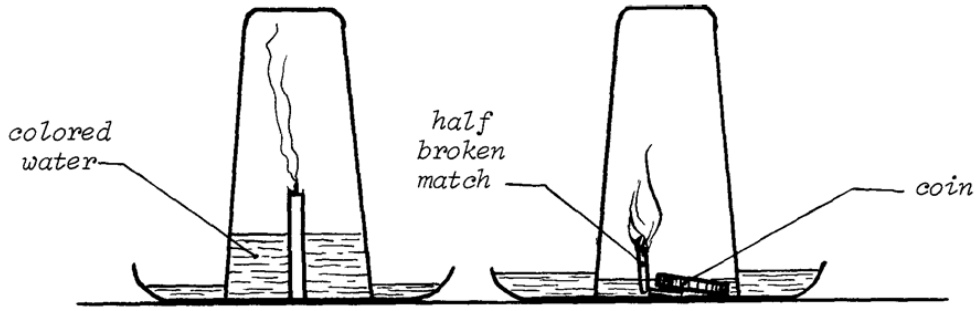
- How does the type of body determine the number of legs and their position on a body?

Science Activities

What causes the water to rise?

What you need

1. A small saucer and a glass cup.
2. A birthday candle or wooden matches and a coin.



What to do

1. Attach the candle in the center of the saucer with a drop of melted wax (see Sketch A), or if no candle is available: break a short end of a couple of matches halfway and place them vertically on the saucer (using a coin as a weight to support them: see Sketch B).
2. Fill the saucer with about half a cup of water.
3. Light the candle or the two matches and cover it immediately with the inverted cup. Observe the water level.

Inquiry Questions:

1. Why did the water level under the cup rise?
2. What does the candle need in order for it to burn?
3. Did the water level under the cup rise immediately after covering?
4. What did the heat of the flame do to the air under the cup?
5. Would the burning of two or three candles bring up the water level under the cup to the same height?
6. How would the size of the cup influence the rising of the water level? How can we set up experiments to test this?

Explanation:

The burning of the candle needs oxygen and is therefore taking away all the oxygen under the cup. The flame is extinguished as soon as all the oxy¬gen is used up. As the space under the cup does not contain any oxygen any more, it is exerting less pressure compared to the atmospheric air. The water is therefore pushed into the space under the cup. Another major factor contributing to the decrease of pressure inside the cup, is the fact that the heat of the flame expanded the air under the cup, just before it hit the water. At that moment air escaped from under the cup. After the flame extinguished, the remaining air cooled off and contracted and in so doing it sucked up the water.

Teaching Scientific Thinking 3 *

Colin Smith and Sinclair Mackenzie

In the previous two issues, a model of scientific thinking was introduced and an example provided of its use in analysing a science class investigation into renewable energy to show its support for aspects of scientific thinking in the pupils. This issue, another example is presented that one of us (Sinclair) has tried. This example is included because, as well as illustrating the use of the model of scientific thinking, it raises some interesting issues about the relationship between teachers' knowledge, pupils' perceptions and the conduct of investigations in science classes.

Example 5: Analysis of Investigation of effect of colour of light on plant growth

Although the question ("Does the colour of light affect plant growth?") underpinning this investigation was provided by the teacher, the aim was to give the pupils as much control as possible of the experimental design. It was also a deliberate attempt at an investigation involving more than one science. The pupils were about age 13 and were required to design the experiment, select the criteria and build the equipment.

Lightproof cardboard boxes were fitted with light emitting diode (LED) circuits for red, yellow or blue monochromatic illumination. Pupils were required to learn about circuit diagrams, wiring of LEDs and how to solder components onto a stripboard.

Pupils agreed as a class that plant height, leaf width and leaf colour would be used as criteria to determine plant health. In the case of width and height, a ruler could be used. For leaf colour, pupils generated colour charts similar to those used in DIY stores to display paint ranges (Figure 1). A progressive sequence of green shades was painted on white paper. When dry, squares were cut out and glued to a piece of card to provide a range of reference colours.

Figure 1 Construction of comparative leaf colour chart.

Additional information available at
http://blog.mrmackenzie.co.uk/2008/04/07/is-there-really-dead-time-in-the-school-year/

* The work reported here is part of the S-TEAM (Science Teacher Education Advanced methods) Project.
https://www.ntnu.no/wiki/display/steam/SCIENCE-TEACHER+EDUCATION+ADVANCED+METHODS

Table 1: Analysis of investigation of effect of colour of light on plant growth

Aspects of scientific thinking)	Analysis
I observe with any or all of my senses, as required	Supported
I categorise what I observe as things and events	Measurements of plant height, leaf width and leaf colour all used to determine plant health.
I recognise patterns in the categories of events of things and events	Information obtained from plant observations were plotted to give visual representation of findings. Pupils used these to identify relationships in the data. Pattern recognition was also inherent in the manufacture of the lighting circuits. Pupils soon discovered for themselves that light emitting diodes (LEDs) only operate when connected the correct way round. Similarly, defects, such as overheating or using too much solder, could prevent the circuit from functioning correctly.
I form and test hypotheses	Supported in plant analysis by prediction of leaf colour (comparison with colour chart), leaf width and plant height for each of the light colours in use. Pupils involved in electronics work were able to design circuit layout and test for equal brightness on all LEDs.
I think about cause and effect	Through use of colours, height, leaf width and function of electronic circuit, all pupils were able to provide an input into this at their own level.
I effectively support theory with evidence	This was easier for those working on the electronics tasks as problems with a theory could be spotted and rectified relatively quickly. With plant growth, several weeks of data from each group (red, yellow, blue) were required before pupils could test their hypothesis.
I visualise	Supported through use of weekly leaf width and plant height line graphs. Also “paint chart” for leaf colour.
I am aware of my thinking and control it	This was encouraged through group updates to teacher on findings each week and discussions on the causes on week-on-week changes. For electronics tasks, discussions around problems encountered and strategies adopted to obtain the required functionality, sharing of soldering advice, best way to clean soldering iron tips, etc.
I use metaphor and analogy	Unsupported
I use the ‘confirm early-disconfirm late’ heuristic	Unsupported
I collaborate in thinking	See ‘awareness of thinking’ entry above. Weekly reviews with each group to discuss findings of plant health, comparison to other group data. Soldering “masterclasses” where pupils share their solution to a common issue.

As for last issue, you might want to consider how much you agree with this analysis and how the same activity could be ‘tweaked’ to provide even more support for scientific thinking.

Perhaps due to this investigation’s open nature, some interesting issues arise. First, all pupils were convinced by one pupil’s point that the investigation would only be “fair” if the lights were turned off at night. They reasoned that outdoor plants do not receive sunlight 24/7 and deviating from the “natural” would be invalid. So, the pupils decided that a timer would be fitted to provide the plants with light from 7am to 7pm.

While this facilitated the pupils' sense of ownership, it also indicates the role of knowledge in investigations. More advanced (but hardly expert) knowledge of photosynthesis involves viewing it as having two stages – one of which is light dependent and one of which is not – and that the products of the light dependent stage accumulate faster than the non-light dependent stage, with the result that the latter continues after daylight to use them up. We might suspect that constant daylight would not really be an issue. However, have we enough knowledge to be sure? Can the plant cope indefinitely with an excess of the products from the light dependent stage of photosynthesis? Faced with this uncertainty, the pupils, with less knowledge than ours, may have designed the best procedure in this case, but in others could the lack of knowledge be counter productive? Faced with our own incomplete knowledge, can we really be sure that our pupils, whether alone or in cooperation with us, have designed a valid investigation? Does it matter, as long as they are engaging in the scientific process? Perhaps not, as science, to use Popper's phrase, can be said to proceed by *conjectures and refutations.* New findings lead to the rejection of what was once thought true. Nevertheless, we may feel unhappy if pupils, or ourselves, hold what are currently regarded as misconceptions.

The second point relates to the selection of criteria to determine whether or not plant growth had taken place since the previous observation. Pupils used "everyday" knowledge to explain that one symptom of a houseplant failing to thrive is yellowing of the leaves. They had real world evidence for looking at leaf colour, despite the measurement difficulties that it may entail in the classroom. Of the other indicators chosen, there was agreement on plant height but a 50/50 split between "leaf width" and "distance between leaf shoots on the main stem." Supporters of "leaf width" persuaded their classmates to switch sides and so the former metric was chosen as the third response measurement. The teacher did not influence their choice but, without more botanical knowledge, could only *think that* the latter option may have been a better indicator. Again, the utility of background knowledge on both the part of the teacher and the pupils is highlighted. Again, when does this matter and when does it not?

We suspect that these knowledge issues are best left to individual teachers to think about (in relation to their own pupils and contexts, including their national assessment systems). In relation to your teaching aims, does it matter or not, regarding possible misconceptions, or not using the most appropriate techniques? Next issue's example presents a case in which a common misconception was only revealed and tackled through an investigative approach to a topic.

Colin Smith, retired Biology Teacher, currently working as a Research Associate on Work Package 5 of the S-TEAM Project and based at the University of Strathclyde (colin.a.smith@btinternet.com).

Sinclair Mackenzie is a Physics teacher at Thurso High School, Highland Council, Scotland. He blogs about science education at http://blog.mrmackenzie.co.uk (sinclairm@gmail.com).

Supporting the ICASE Declaration

Jack Holbrook, ICASE Past President

Do you support the Tartu Declaration ?

In the last newsletter, the issue of teaching using an inquiry approach was raised. This is mentioned in the Tartu declaration which states -

We resolve that:

- **an inquiry approach is central to STE, where students formulate scientific and technological questions, investigate those questions and build and apply conceptual understanding;**

But there is some evidence to suggest teachers do not understand the meaning of an inquiry approach. These teachers do not appreciate what is means by suggesting that the students formulate scientific and technological questions and then investigate those very same questions as they strive towards obtaining an answer? After all, it is the teacher who does the teaching. And the learning undertaken by the student then follows.

If the teacher is to be a facilitator and not simply a supplier of knowledge and wisdom, it is obvious that the teacher requires feedback from students and that an obvious way of seeking this is to ask questions. Asked in the appropriate manner, these questions can solicit useful responses from the students. They can even stimulate a motivational response from students – that is the student is, or becomes, internally motivated to want to answer the question, or questions.

If sufficiently motivated, the student may even wish to go further and start asking questions of his or her own. And where these questions are divergent, are within the science and technology learning being proposed and they lend themselves to an inquiry through which to seek a solution, then we have the beginnings of inquiry learning. How far the student can respond without further support and encouragement from the teacher will obviously depend on the strength of the motivation and the student's prior learning in organising and undertaking inquiry activities. So perhaps it is suggested that inquiry is, as Anderson (2002) claims, "good science teaching and learning." It is heavily aligned with the teacher's ability to ask stimulating, divergent questions which are within the realm of the students ability to respond. It is, as Vygotsky (1978) would suggest, associated with the teacher's ability to operate within the zone of proximal development for the student, in learning with that particular teacher. And it seems that in many cases, either teachers find the handling of good teaching and learning, in this manner, difficult, or they do not believe this is the essence of good teaching and learning. There is the alternative suggestion that teaching is about delivering knowledge, information, or stipulating values to the student so as to be 'brainwashed' in this new sphere of so-called learning. Obviously, in such a situation, inquiry is not needed. No divergent questions need be asked – convergent responses, focussing on the information or values, are all that are needed. In this day and age, in the 21st century, is any teacher who is willing to be called a professional, really wanting to dismiss inquiry teaching and learning?

References

Anderson, R.D. (2002). Reforming science teaching: What research says about inquiry. Journal of Science Teacher Education, 13, 1–12.

Vygotsky, L. (1978). Problems of Method. In: M. Cole (trans.). Mind in Society. Cambridge, MA: Harvard University Press.

Why Teach Lab Safety?

Jim Kaufmann,
Chair, ICASE standing committee on Safety in Science Education

There are five reasons why teaching lab safety is important:

1. legal
2. career
3. safety program
4. moral … and …
5. lifetime value.

Each of these areas gives motivation to teach about lab safety.

The law makes it perfectly clear that it is the teacher's duty to protect the children in school. Also, it is the responsibility of the employer to provide a safe and healthy workplace for the employee. To meet these requirements, teachers and employers need to provide instruction in the hazards that are present and the methods for proper self-protection.

There are many career opportunities related to health and safety. Providing both safety instruction and information about potential careers not only addresses the issues of personal protection but also shows another important application of the training. The need for safety professionals, industrial hygienists, public health officials, industrial doctors and nurses is considerable. Each provides a career application of safety training and service to fellow man.

Safety programs are part of most well run organizations. These programs consist of the activities, functions and practices that address the health and safety needs in your workplace. They must instruct the people about hazards and protection from those hazards.

In our society and culture, life is to be cherished and protected. Therefore, morally we have a responsibility to protect the safety of our students and employees. We help to meet this moral responsibility by teaching people about the hazards that surround them and how to protect themselves.

The most important reason is the lifetime value of teaching about lab safety. All the hazards of life are present in the lab under more controlled and supervised conditions. When we as science teachers take advantage of the opportunity to teach children about life's hazards, they learn how to identify those hazards, how to protect themselves, and can go on to lead safer, healthier, longer lives.

Turkish Science Education and Research Association (SERA)

On be half of Executive Board Members,
Assist. Prof. Dr. Gultekin Cakmakci,
Turkish Science Education and Research Association.

The Turkish Science Education and Research Association (SERA)[1] was formed at the 9th National Science and Mathematics Education Conference held in Izmir, in September 2010. SERA is a community of teachers, researchers, scientists, science communicators and policy makers who are committed to support science education and research. SERA is an independent organization committed to the improvement of science teaching and learning through research. SERA offers an open forum for debating issues related to science teaching [2]. It also brings recent research findings to the attention of science teachers and researchers. SERA's aims are to make reliable research findings accessible to the people who need them, whether they are involved in policy, practice or personal decisions, and to ensure that professionals and policymakers have constantly updated access to the findings of good quality research. SERA is wishing to cooperate with other educational and scientific societies to influence science teaching and educational policies. SERA is particulary wanting to participate in collaborative projects in science education in different countries.

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[1] http://www.fead.org.tr/
[2] http://groups.yahoo.com/group/ScienceEducationinTurkey/

NESES (Nepal Science Educational Society) – 20th Anniversary

Prof.Dr.Kedar Man Shrestha,
Nepal Science Educational Society

20th anniversary of Nepal Science Educational Society was successfully celebrated on the 1st January 2011 at Orchid Hotel, Kathmandu. The program was chaired by the President of the Society (NESES) Kedar Man Shrestha. Many guests, life members and general members were presented on the occasion. On the occasion "Prof.Dr.Kedar Man Shrestha Chemistry Education Medal" was awarded to Mr. Rishi Ram Subedi for scoring highest mark in Chemistry Education at M.Ed.level examination. Similarly the "Prof. Dr. Kedar Man Shrestha Science Education Medal" was presented to Mr Rajan Nepal for securing the highest score in the 3 year B.Ed level examination, with Science Education as major subject. These medals were being awarded to excellent achiever students of MEd and B.Ed levels in order to promote awareness among students towards Science Education and Chemistry Education.

Moreover the society had organized essay competition among secondary school students on the topic "Science Education for National Development." The first, second and third winners of the competition were also awarded medals on the 20th anniversary program.

Some of the photos of the event are attached

Calendar of Events

NSTA National Science Teachers Association

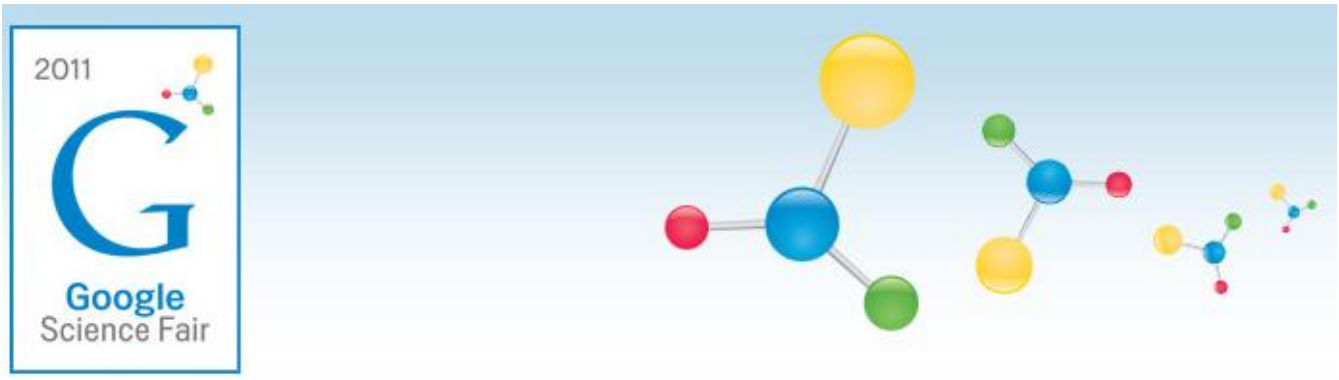
NSTA National Conference on Science Education San Francisco, California March 10-13, 2011

Join thousands of science educators at NSTA's National Conference on Science Education, March 10-13 in San Francisco for workshops, presentations, symposia, and sessions that will build your PD portfolio. Learning innovative techniques and strategies, devoting time for developing new content knowledge, testing cutting edge products, analyzing your exhibitor lab results are just a few of the more than 2000 sessions you might take in. You're invited-preservice teachers to the experienced curriculum specialist or administrator - will find much to be passionate about. Check out some of our planned events:

- Engaging ELL Students in Scientific Discourse Using Seven Strategies: Experience interactive, language-rich tasks structured with collaboration and participant talk to facilitate academic language success. Middle-High
- Assessing Students' Understanding of Scientific Inquiry and Nature of Science: Elementary
- Diagnosing What Students Know Before Science Instruction: General
- Playing with Ecosystem Science: Learn games that model the living components, nutrient cycles, and human impacts on ecosystems. Middle-High
- Using Mathematical Representations to Talk About, Model, and Explain Scientific Phenomena: Ticketed 8am-4pm session
- Integrating Science and Emerging Educational Technology in the Science Classroom: Ticketed, 7am-3pm session including meals
- Science—It's Not a Book of Knowledge…It's a Journey: Dr. Jeff Goldstein presenting.
- The Total STEM Learning Ecology: Dr. Dennis M. Bartels, executive director of the Exploratorium.
- The USS *Pampanito*—Where History Meets Science, Field Trip (ticketed)
- Explore the Exploratorium, Field Trip (ticketed)

Visit www.nsta.org/sanfrancisco for more information. Register by Feb. 4 to save the most.

Google Science Fair



On the 11 January 2011, Google is launching the inaugural Google Science Fair. We have partnered with NASA, CERN, National Geographic, Scientific American and the LEGO Group to create a new STEM competition that is more open, accessible and global than ever before. We wanted to reach out to educators prior to launch to let you know "the Google Science Fair is coming" and to extend an invitation to schools and teachers to get involved early in what we hope will be a large global initiative.

The Google Science Fair is a global competition that any student aged 13 - 18 from around the world is eligible to enter.

Students can enter as individuals or as teams of up to three. There is no entry fee and registration and submission will happen online. The deadline for submissions will be the 4 April 2011. The Science Fair will culminate in a "once in a life time" celebratory event at Google headquarters in California in July 2011 where finalists will compete for internships, scholarships and prizes in front of a panel of celebrity scientist judges including Nobel Laureates, tech visionaries and household names.

We want to celebrate and champion great young scientific talent and give students from around the world the opportunity to compete for amazing experiences, prizes, scholarships and internships.

We hope you are as excited about this upcoming competition as we are are! To sign up for fun and free resource kits for your classroom or school (Google bookmarks, stickers, posters and more!) and a reminder notification when GSF registration opens, please visit the Google Science Fair at: google.com/sciencefair

Best,

The GSF Team

Mini-symposium, Reading, 20-21 June 2011, UK

20-21 June 2011 (welcome reception on 19th)

Contemporary Issues in Science and Technology Education

The symposium is open to all working in the field of science and technology education, including established researchers, Masters and Doctoral students, and practising teachers in schools.

We invite papers on completed empirical research and theoretical issues in science and technology education.

In the first instance, send a 1000 word abstract in Word format to the coordinator, John Oversby (j.p.oversby@reading.ac.uk) including the frame for the research, the research questions, methodology, outline data, analysis, interpretation, implications, and selected references, for empirical papers and parallel areas for theoretical papers by December 31st 2010. Abstracts will be blind reviewed and invitations for full papers up to 12 pages sent to successful authors by January 30th 2011, to be received by March 30th 2011. We intend to seek a publisher for presented papers.

Oral papers at the symposium will have 20 minutes followed by 10 minutes discussion. If there is sufficient response, we will also accept posters for a special session.

Reading is close to Heathrow and Gatwick airports by frequent public transport, and easily accessible from budget airline Stansted and Luton airports.

IOSTE home page: www.ioste.org. Symposium home page www.IOSTE-NWE

The registration fee and other details will be available by October 2010

The Future of Science Education, 22-24 July 2011, Singapore

Blending traditional conference formats with 21st century technology, Science Singapore 2011 will be a unique meeting where the latest research and best practice in science education come together, presented by educators from around the world. There will also be multiple opportunities for social gatherings and sightseeing in this fascinating city and surrounding countries!

Features of Science Singapore 2011:
Three parallel presentation strands consisting of
Keynote speakers in science education, web-based technology, and inspiring lives;
Continuous short (20 minute) talks—two per hour with breaks,
45 minute presentations and 90 minute double sessions for interactive, practical workshops.
Session strands scheduled as one block and repeated during the conference for more attendance opportunities;
• Internet networking to promote the conference via Twitter, Facebook. Google, and Email;
• Long distance interaction with breakout groups via internet chats;
• Forums via Skype;
• Live online streaming of sessions;
• Technology mentors for participants;
• Download session videos;
• One half day devoted to "un-conference" format of posted topics, participant voting and flexible scheduling of most popular choices;
• Electronic and traditional message boards;
• "Viewing party" prospects for distance discussions in small local groups;
• Live and eight-hour delay broadcasts of sessions.
Coordinators: John Stiles, Bangkok, Science Educator and Consultant; and Rob Newberry, Singapore, Educational Technology Consultant who organized the first TEDx conference in Bangkok. Conference information: http://sites.google.com/site/scisg2011/

6th Science Centre World Congress, 4-8 September 2011, South Africa

6th SCIENCE CENTRE WORLD CONGRESS
4 - 8 SEPTEMBER 2011
CAPE TOWN, SOUTH AFRICA
Science Across Cultures

Science Across Cultures

The 6th Science Centre World Congress will be held in Cape Town, South Africa, 4-8 September 2011. Enjoy stimulating congress sessions, challenging workshops and lively debates. And enjoy all that Cape Town and South Africa have to offer - whale watching, wine tasting, a unique floral kingdom, big game safaris, beautiful beaches, unparalleled scenic beauty, and a friendly and diverse culture. With the theme "Science Across Cultures", the 6th Science Centre World Congress will encourage reconciliation between different cultures and a greater appreciation of the role that science centres can play in highlighting each culture's unique contributions to science, technology and science education.

Registration Fees and Information

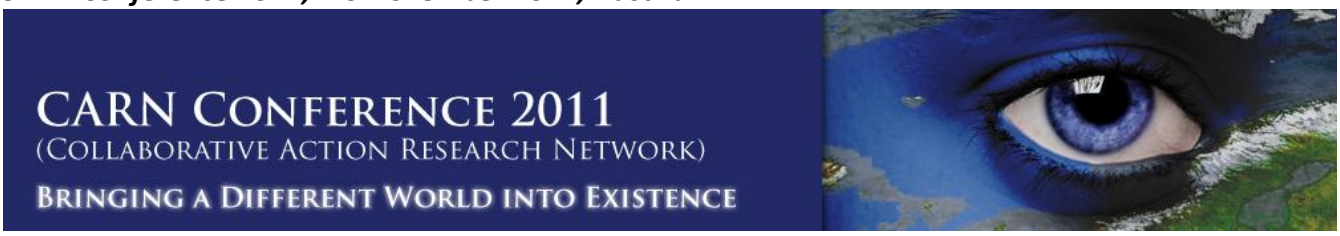
Registration for 6SCWC will be opening in September 2010.
Congress Registration Fees
Registration – Early (until 3 June 2011) ZAR 5,525.00
Registration – Standard (until 19 August 2011) ZAR 6,525.00
Registration – Late ZAR 7,525.00
*Registration - Discounted (until 3 June 2011) ZAR 4,250.00
* Residents of low-GNI (gross national income) countries are eligible for a discounted registration fee.
If you would like to make your own accommodation arrangements at a B&B, hostel or guesthouse, the 6SCWC

Congress Secretariat recommends www.capestay.co.za. Please note that the Congress Secretariat can only make bookings at the designated congress hotels and cannot be responsible for accommodation booked independently by delegates.

Rates quoted are per room, per night, including breakfast, including 14% VAT, excluding a compulsory 1% Government Tourism Levy.

More details from the website www.6scwc.org

CARN Conference 2011, 4-6 November 2011, Austria



Bringing a Different World into Existence

The Collaborative Action Research Network (CARN) was founded in 1976. Since that time it has grown to become an international network drawing its members from educational, health, social care, commercial, and public services settings. CARN aims to encourage and support action research projects (personal, local, national and international), accessible accounts of action research projects, and contributions to the theory and methodology of action research. In line with the tradition, we would like to invite academics and practitioners by welcoming a diverse range of contributions, no matter what stage the research is at (from initial ideas through to completed reports and papers). There will also be opportunities to consider methodological issues.

Keynote Speakers
Peter Posch Herbert Altrichter Ingo Eilks Katherine Froggatt

Indicative Themes
- AR for unity and diversity
- AR for coping with the challenges of a knowledge society
- AR and workplace cultures
- AR in teacher education and professional development
- AR in palliative care and in nursing homes
- AR in health promotion
- AR and community development
- AR methodology and methods
- AR and Participatory Research in fields of social work
- AR in science education, environmental education/education for sustainable development
- AR in curriculum development, school development, networking and system intervention

Indicative Dates
30th April 2011 deadline to send a proposal
20th June 2011 answer for the approval of a proposal
1st July 2011 deadline for early bird registration
Call for papers and posters end of January 2011. Participative workshops are particularly welcome.

For more information please visit: http://ius.uni-klu.ac.at/carn

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Call for Papers

Chemistry Education Research and Practice

Themed issue:

Sustainable Development and Green Chemistry in Chemistry Education

Scheduled for publication in April 2012

GUEST EDITORS: **Prof. Dr. Ingo Eilks** University of Bremen - Department of Biology and Chemistry, Institute for the Didactics of the Sciences (IDN) - Chemistry Education Leobener Str. NW2, 28334 Bremen, Germany ingo.eilks@uni-bremen.de	**Prof. Dr. Franz Rauch** Alpen-Adria-University Klagenfurt Institute of Instructional and School Development Sterneckstraße 15 9010 Klagenfurt, Austria Franz.Rauch@uni-klu.ac.at

Sustainable development is vital for maintaining the prosperity of our society while safeguarding resources for future generations. Chemistry is one of the central science disciplines to enable sustainable development because chemistry is the key to the production of a broad range of old and new materials and goods that make our life easier, more comfortable or healthier. Developing new products and new production pathways under environmentally more benign conditions is vital for modern chemistry and industrial production to combine both development and sustainability, and this issue should become part of chemistry teaching also. The importance of sustainable development in the field of education has been stated e.g. in the Brundtland report and can be seen by the fact that the years 2005-2014 became the UN decade of education for sustainable development (DESD).

CALL FOR PAPERS

Contributions are invited for a themed, peer-reviewed issue of CERP on Sustainable Development and Green Chemistry in Chemistry Education

The contributions can be of four kinds:

(a) research-based papers'

(b) papers on good/effective practice in teaching sustainability issues and aspects of green chemistry from both secondary and tertiary level chemistry teaching'

(c) theoretical papers about students' or teachers' understanding of the field of sustainable development and green chemistry (position papers / perspectives)'

(d) reviews of research on teaching about sustainable development and green chemistry.

Possible topics for contributions include, but are not limited to:

Using *Education for Sustainable Development* (ESD) with the aim to acquiring a reflective action ability to shape the world in a sustainable way involving ecological, economic and social-political dimensions.

Close observation, analysis, evaluation, and the shaping of concrete situations about sustainable development and green chemistry as creative and cooperative processes.

Call for Papers

Sustainable development in chemistry education as a means to make students in school and university aware of the emphasis that chemistry as a scientific discipline, and the chemical industry is placing on the development of more sustainable products and procedures.

School and university students' learning how chemistry is dealing with the challenge of sustainable development and green chemistry, about their guiding principles and their methods and successes.

Showing that learning about sustainability issues in chemistry education is necessary both to make students aware and competent in the field and enable them to participate in societal debates about the future development of chemistry and the chemical industries.

Using sustainable chemistry to improve students' potential career choices and to get a balanced view of recent efforts in the domain of chemistry.

For the instructions on submission of manuscripts, please consult the journal website.
Enquiries concerning the suitability of possible contributions should be sent directly by email to:
Ingo Eilks ingo.eilks@uni-bremen.de, or Franz Rauch Franz.Rauch@uni-klu.ac.at
Please copy your correspondence also to cerp@rsc.org

IMPORTANT DATES: Manuscripts should be submitted by 30 September 2011 and will be subject to the journal's usual peer review process. Where revisions are required, these must be submitted by 31 January 2012.