International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

JANUARY 2011

Welcome to ICASE January 2011 Newsletter !

ICASE newsletter is a regularly distributed publication generally about main topics listed right column that are of interest to its subscribers

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.

ICASE wishes all readers a Happy and Prosperous New Year.

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http://www.icaseonline.net

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

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

Contents of Newsletter

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ICASE 2011 and Beyond

Ben Akpan, ICASE President

On behalf of the International Council of Associations for Science Education, it is an honor to greet you as your new President. Together, with assistance from the ICASE Executive Committee and all our member organizations worldwide, we envision working hard to strengthen ICASE.

I would like to share some of the accomplishments from the July 2010 ICASE World Conference on Science and Technology Education (STE) held in Tartu, Estonia, and to provide some indications of what lies ahead as we forge our agenda for the next three years. The Tartu event was well attended and resulted in the Tartu Proclamation, an important statement regarding STE for the 21st century. We are all grateful for the hard work put in by Dr. Jack Holbrook, ICASE Past President, and the entire ICASE World Conference planning committee, as well as the representatives from ICASE member organizations who attended this important event. We also thank all outgoing board members for their service and commitment to the ICASE.

The incoming leadership of the organisation is committed to the Objectives of ICASE as cited in our Constitution and will work diligently to meet these Objectives. For your convenience the objectives from the constitution are listed below:

- To extend and enhance the quality of formal and non-formal science and technology education for all, with particular reference to the children and youth of the world.
- To provide and support activities and opportunities that will enhance formal and non-formal science and technology education throughout the world.
- To assist and support all members and other organizations throughout the world that are involved in formal and non-formal science and technology education.
- To establish and maintain an international communication network for member organizations and their members involved in formal and non-formal science and technology education.
- To encourage and support the establishment and development of professional science and technology organizations, especially teacher organizations in all countries.

We will strive to have an open administration, following a strategic framework including the establishment of a permanent headquarters office for ICASE in the near future, as well as financial autonomy / improvement in the organization's revenue base, modernization of recordkeeping, and improved membership maintenance to ensure that ICASE continues to be a world-class organization.

As we work to take these important steps forward, we hope to establish a new level of cooperation and collaboration amongst us all. We are encouraged by the growth of ICASE as new member organizations join, and those that have been involved for years continue their collaboration. In addition, our Web site will continue to be transformed under the guidance of Dr. Bulent Cavas, ICASE Publications Chair and Webmaster.

Our planned initiatives reflect a continuation of our important objectives to foster collaborations with science education organizations so they have greater impact on science education policy, practice, and research. We will continue our efforts to inform stakeholders about science education research and practices related to the teaching and learning of science.

Another function of our growing organization is to assume more active roles in helping policy makers understand the scientific underpinnings of the science education issues that need to be addressed. As you can see, we are eager to begin the challenge before us to educate those who inspire and prepare the future scientists and engineers for the work force of tomorrow and we look forward to working with all of you.

We thank you all.

Ben Akpan, ICASE President

ICASE News

Jack Holbrook, ICASE Past President

On behalf of the ICASE Executive Committee may I wish all readers a Happy and Prosperous New Year for 2011. And within this I sincerely hope ICASE plays a useful, professional role.

As I hope all readers are aware, the ICASE role is to support science teacher organisations, especially associations, societies, centres or other groups where science teachers get together for professional purposes. Although this newsletter goes out to individuals, its purpose is, through individuals, to establish the links to the national/regional professional organisations. It is thus a New Year wish of ICASE to seek your help and guidance to strengthen and expand such links in your country. In this regard may ICASE seek your help in ensuring:

(a) Appropriate persons in the science teacher organisations are aware of, and as appropriate, are receiving the ICASE newsletter, and
(b) ICASE can receive the latest e-mail contact(s) for person in such science teacher organisations so that ICASE is able to make contact (as desired by the organization)

ICASE Executive Committee

The group of voluntary officers who are steering ICASE (on behalf of the Governing Body – the member organisations) changes from the 1st January 2011. This new body is elected (or appointed) as per the ICASE constitution at the last General Assembly held in Tartu, Estonia in June 2010). The new committee and their contact e-mails are given in section 7 of this newsletter and also appear on the ICASE website (www.icaseonline.net). Old and potential member organisations are strongly requested to make contact with the appropriate officers, especially where they have requests or suggestions to further the role of ICASE.

As the outgoing ICASE President, may I thank all who has helped to re-build ICASE over the last 2 years in which I was standing in as President. May I especially thank all the ICASE Executive members who gave of their time and expertise. And may I thank all those member organisations which have offered support and guidance to ICASE to enable ICASE to sustain this newsletter, see the ICASE journal reach out to a wider readership, enable the website to be a trusted source of information and ideas and to help ICASE establish its worldwide dissemination role to support science education for the 21st century. While national science teacher associations have played their important role in guiding their own members, I hope ICASE has established its role as a disseminator of international ideas, some perhaps controversial, and is moving to live up to its motto of

"Supporting and promoting science education internationally"

ICASE News (Cont.)

The Launch of the project - PROFILES

From the 9-11th December, despite the weather conditions, the 'kick off' meeting for the European Commission FP7 project – PROFILES – was held in Berlin, Germany, with partners attending from 20 countries. One partner is ICASE, specifically represented by myself, but also present were the ICASE Secretary, Miia Rannikmae (also a lead partner for the **University of Tartu, Estonia**), the ICASE European representative, Declan Kennedy (also representing **University College Cork – National University of Ireland, Cork, Ireland** and the Publications and Website standing committee chair, Bulent Cavas (also representing **Dokuz Eylül University, Turkey)**.

ICASE sees the dissemination of ideas and developments from this project as important. It is helpful to ICASE in enabling useful ideas and practices to be disseminated for science teachers around the world. It is also potentially helpful to ICASE member organisations as a source of 21st century ways of thinking about science education. For example ICASE expects to challenge science organisations and science teachers to reflect on questions such as:

- What is the real purpose of education (and hence science education)?
- Is science education really about promoting 'little scientists'?
- What is teacher ownership and how important is it?
- What are stakeholder views about the educational needs of students? How important are they?
- Does student intrinsic motivation exists? And if so how important is it in the teaching of science subjects, especially at the secondary level?
- Is science teaching really about content, or conceptual ideas ?
- Is promoting scientific literacy and developing competencies (capabilities) one and the same?

The project plans to promote teacher ownership of 4 innovations in science education. These as the project title suggests are (1) professional, (2) reflection-oriented focus, on (3) inquiry (teaching)/learning and (4) education through science. And the purpose – enhanced scientific literacy of students. More in future newsletters, but any association interested in being associated with this project in any way is welcome to contact me on jack@ut.ee

Science Activities

STEP ACTIVITY

Challenge: Can you listen to your own heart?

What you need
- rubber or plastic tube
- plastic funnel

What to do
Fix one end of the tube to the funnel. You have made a simple stethoscope! Place the funnel against your chest and the tube against your ear as shown. What can you hear?

Move the funnel to different places until you can hear your heart beating. Count the number of heart beats in 30 seconds. Walk around slowly, then listen to your heart again. Count again the number of heart beats in 30 seconds. Has there been a change? Does your heart sound any different?

Do some exercises or run for a short time. Count the number of heart beats in 30 seconds. Has there been a change?

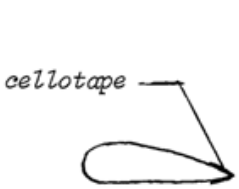
More to do
- What other sounds in your body Gill you listen to? Can you hear the sound of your lungs as you breathe air in and out?
- What else can you use your stethoscope to listen to?
- How can you make your listening device work better? Design and make a better listening device and test it.

Science Activities

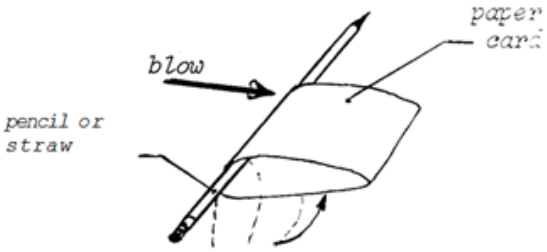
Illustrating how an Aeroplane Wing works

What you need

- A piece of paper or paper card and cellotape
- A round pencil or straw



Sketch A



Sketch B

What to do

1. Cut a piece of paper about 5 x 15 cm and bend it in the shape of an airplane wing (Sketch A) and tape the ends together.
2. Put a pencil or straw through the wide end of the wing and let the paper wing hang vertically down (see Sketch B).
3. Blow over the paper wing (it should move up horizontally).

Inquiry Questions:

1. Why does the paper wing move up when blowing over it?
2. What would happen if you blew under the paper wing?
3. What happens if you blow over the wing, but invert it (with the curved side facing down)?
4. What gives airplanes the air lift?
5. What do airplanes do with their wings when they take off, or land?

Explanation:

Bernoulli's Principle is the underlying idea and this causes the airlift that the airplane wing provides. The wing is built in such a way that the air moving over it flows faster than the air moving under it. The top part of the wing has a greater curvature compared to the bottom side. The faster moving air causes a reduction in pressure causing the wing (and the whole aeroplane) to rise.

When we consider an air molecule on the top side and a molecule B below on the bottom side of the wing, they have to go (with respect to the wing) from one end of the wing to the other in the same time (otherwise there will a vacuum created). This means molecule A moves (relative to the wing) faster than molecule B.
Does this investigation support scientific thinking? See section 3 in this newsletter

Supporting the ICASE Declaration

Jack Holbrook, ICASE Past President

Do you support the Tartu Declaration ?

In the last newsletter, the issue of teaching being innovative was raised. This is mentioned in the Tartu declaration which states -

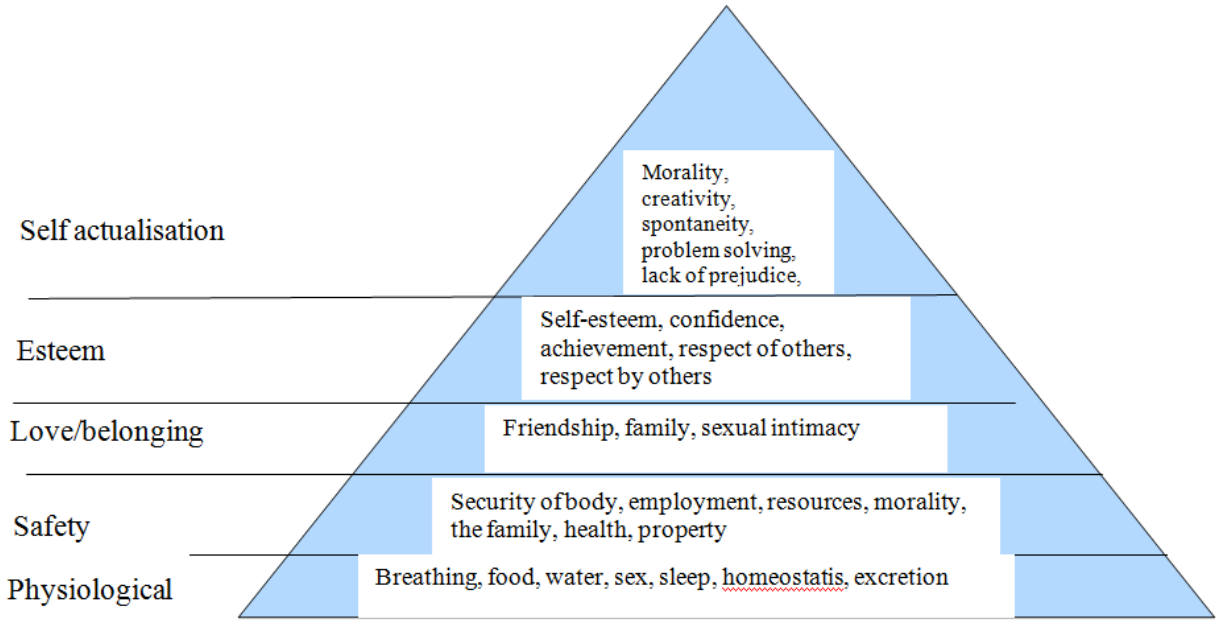
We resolve that:

- **innovative STE is of fundamental importance throughout life commencing at the earliest years** Comments suggested a new project in which ICASE is involved could be useful for science teachers around the world in promoting innovative STE. This new project, called PROFILES, is introduced further in section 1 – ICASE news. Are you interested?

A further component, in the Tartu Declaration, states:

- *an inquiry approach* **is central to STE, where students formulate scientific and technological questions, investigate those questions and build and apply conceptual understanding**; This is also central to the PROFILES project, which will explore how such an approach is initiated and how problem-solving questions can be initiated by the students themselves.

An inquiry learning approach is heavily associated with a student centred approach in which students can be expected to be guided to develop self actualisation (meeting a need – the highest level of need suggested by Maslow in his famous triangle) (Maslow, 1970)



Maslow's Triangle of Needs (1979)

(Self actualisation is the highest level in a hierarchical pyramid of 5 levels put forward by Maslow. The first four levels (lower-order needs) are considered physiological needs, while the top level is labelled as a growth need. This need incorporates morality, creativity, problem solving, etc.)

Student involvement is considered a powerful approach to learning and in science teaching will inevitably involve students in undertaking experimentation activities. And with this a future dimension of self actualisation is introduced – specifically that associated with health and safety issues.

Consider the following, written by Jim Kaufmann, the chair of the ICASE standing committee on safety in science education
"A few days ago, I was riding with two others to pick up four used, mounted snow tires. On the way back I asked where we were going. They said to put the tires on the car. I asked, do you think we should stop first at the gas station and see if the tires needed any air. It turned out they were all about 1/3 low.

The real challenge in health and safety is simply to get STE students and teachers to think (just a little) about the health and safety issues before (rather than) after the event.

Another consideration
"Recently, at Foxwoods Casino in Connecticut, the actor playing spider-man fell 30 feet into the orchestra cracking his skull, breaking other bones and several instruments (I made up that last part about the instruments)."
A New York Times new article noted: "Strict new safety measures have been implemented among the cast and backstage crew since Tierney's shocking accident (the fourth since Taymor's team began readying the production for a twice-postponed opening)."

There are four simple questions that can be beneficially asked and answered before doing "hands on" experimentation, namely:
1. What are the hazards?
2. What can go wrong?
3. What do I need to do to be prepared?
4. What are the prudent practices, protective equipment, and protective facilities needed to minimize the risk (before you're on your head in the orchestra pit trying to pull a piccolo out of your jumpsuit)?

These questions go side by side with student centred teaching and inquiry learning. If students are to realise high levels of self actualisation, then health and safety must be taken serious as a major component.

SAFE SCI: Be Protected

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ALLERGENS IN THE LAB!

I. Does It Come Down To Playing in Dirt?

Allergies and asthma statistics seem to be indicating a rise in the numbers of school age children having these types of health issues. Why is this happening? There are a number of theories that are being entertained. One intriguing theory is well noted by Jane Thurnell-Read who writes popular articles about health and well-being. At her U.K. website 'Healthandgoodness.com' she wrote an article titled "Why Are Allergies On The Increase." Amongst several candidates for the increase in allergies, she notes the following:

Excessive Cleanliness

The obsession with the danger of 'germs' is thought to have led to an increase in allergies. Much of this obsession with cleanliness seems to be driven by the media and advertising. Headlines about 'killer bugs', and advertisements that claim a product kills even more germs have led many people to buy more and more products to wipe out these dangerous enemies. A view now gaining ground among many researchers and some doctors is that a certain level of dirt is good for us, particularly during infancy and early childhood when the immune system is maturing. (http://www.healthandgoodness.com/article/are-allergies-on-the-increase.html).

Whatever the cause or causes of allergies and asthma, however, science teachers need to be aware and be proactive in addressing allergens in the lab.

II. Allergens In The Lab!

There are several sources of potential allergens in the laboratory environment. For example, given that allergic reactions result from exposure to chemicals, the science laboratory is an especially likely place for allergens to be found. For a start – latex burner tubing, plastic gloves and goggle straps may be an issue. Latex gloves present the risk of latex allergy sensitivities. Of particular concern are powered gloves where the use of corn starch tends to absorb the latex protein and disperse it when such gloves are removed. Alternatives to all of these sources can be successfully adopted and help reduce the exposure to this known allergen.

Some chemicals used in the laboratory may provide allergens effecting sensitization issues for students and employees. For example, some individuals are sensitive to nickel products such as nickel metal, nickel chloride and nickel sulphate. Sensitivity to cobalt is another source including cobalt metal, cobalt chloride and more. Other more severe reactions, including asthmatic attacks, can be triggered by chemicals such as ammonia, chlorine, hydrogen chloride gases, isocyanates, and sulphur dioxide, to name just a few likely candidates.

Biological material based allergies can also be a problem. Most common are allergies to plants and animals. In the plant arena, hay, peanuts, pollen, fungi/mold, poisonous plants like poison ivy and sumac, are a few which can be readily found. Animal allergies from rabbits, gerbils and others can also be a problem. Some allergies to peanuts may not just be limited to the solid food eaten. Peanut vapours can also be a problem! Use of hay, pollens, etc in the laboratory may initiate "hay fever" type symptoms.

III. Ideas to Address Allergens!

In efforts to address potential allergen issues, science teachers might consider the following actions as a start:

1. Secure information from the school health office, parents and students relative to allergies and asthma issues at the beginning of the academic year. Treat this medical information as confidential, but necessary to your planning in order to make it a safer working environment for all.
2. In addition to input from the school health office, search the Internet for sites on how strategies to better address environmental issues in dealing with allergies! One such resource is AIR or the Allergy Internet Resource (see "Resources" at the end of this column for the Internet address) which has numerous sources of information on a spectrum of allergies!
3. Use the medical and other information to assess the learning environment – science laboratory.
4. Use the medical information to assess the learning activities.
5. Once assessed, plan and take action to help make the working/learning environment more in concert with allergen reduced or allergen free approaches.
6. Learn how to be aware of allergen symptoms/sensitivities of students and how to deal with them. In some cases – these can be life threatening!
7. Remember also that the field laboratory may have to entertain even more intense allergen level challenges. Always inform parents ahead of time relative to field activities and again ask for input should there be allergy issues or histories of which the teacher should be aware.

IV. In The End!

The noted suggestion list is a start to help raise the level of awareness on the part of science teachers relative to working with biological and chemical allergen hazards in the academic laboratory. Science is intended to be fun – but also safer by a well informed school administrators, science faculty and student body.

References:

AIR - Allergy Internet Resources – AIR; http://www.immune.com/allergy/allabc.html

Australian Government Department of Health and Ageing: http://agencysearch.australia.gov.au/search/search.cgi?collection=agencies&client=445556fb&cool0=41&cool1=15&cool2=5&cool3=0&stem=2&scope_disable=off&num_ranks=20&profile=health&query=allergies&Submit=go

National Institute of Allergy and Infectious Diseases: http://www.niaid.nih.gov/Pages/default.aspx

"Live Long and Prosper, Using Safety!"

Teaching Scientific Thinking *

Colin Smith and Daryl Stanfield

In the last newsletter, a model of scientific thinking was introduced and a promise made that examples of its use in analysing science classroom activities would be provided. Some of you may have tried this for yourselves, as suggested. The aim of such an analysis is to look at the aspects of scientific thinking that are (or potentially are, if pupils and teachers are aware of them) supported by the different activities you do in the classroom. The investigation example presented in this issue is one that one of us (Daryl) has tried. We begin with it because it is unusual among the examples we have so far in that it involved pupils in using the 'confirm early, disconfirm late' heuristic (Feist, 2006).

According to research reviewed by Feist into how scientists actually work, successful scientists first try to confirm their ideas. Only when there seems to be some support for it (enough to make it worth continuing with), do they then, contrary perhaps to common opinion, try to disprove it. Then they can defend it more effectively to the rest of the scientific community. This may be an interesting topic of debate for teachers and educational researchers, as it seems little considered in our attempts to model the scientific process.

Example: Analysis of a S1 Investigation into Renewable Electricity

This investigation used materials from Edinburgh University's Renewable Energy Roadshow (http://www.renewableenergyroadshow.org/index.html). The investigation was designed to enable pupils to investigate how to harness renewable energy sources and gain an appreciation of the complex issues involved in planning and implementing renewable energy generation in the real world.

Pupils discussed the question "What is renewable energy and why do we need it". They then worked through a variety of experiments investigating the properties of wind, wave, tidal, solar and hydroelectricity. Pupils were divided into groups and presented the task of powering an imaginary town via renewable energy. They were provided with a map of the town, accompanied by an information sheet for the area and a power facts booklet telling them about wind, wave, solar and hydropower. These intended to give the students clues as to what types of renewable energy were possible for the town, and what issues they would have to consider in their discussion. The pupils were given a strict budget of £10 million and were required to provide a detailed account of exactly what types of energy they bought, and how much of each energy. The final task was for pupils to present their results to the rest of the class. The table below shows the analysis of this investigation.

* We are interested in collecting your own examples. Just email them to colin.a.smith@btinternet.com with a note of the activity to which your analysis applies. Blank sheets can be obtained from this address or from the S-TEAM Wiki above. Please indicate if you want to remain anonymous, otherwise your examples will be acknowledged if used in any publication. For that, a brief indication of your position would be welcome.

Aspects of scientific thinking	**Analysis**
I observe with any or all of my senses as required	Supported – pupils conduct experiments that utilise all senses to gain an understanding of renewable energy sources.
I categorise what I observe as things and events	Supported? – Pupils gain information/knowledge (by classifying events) from renewable energy experiments, then apply them to solving the renewable energy task.
I recognise patterns in the categories of things and events	Supported? – pupils are expected to recognise that certain environmental conditions provide the conditions for particular renewable energy sources to be appropriate.
I form and test hypotheses	Supported – Pupils continually hypothesize, then test ideas throughout the investigation. For example, during initial practical experiments on investigating properties.
I think about cause and effect	Supported – Pupils must consider advantages and disadvantages of renewable energy sources and how they effect neighbouring environments.
I effectively support theory with evidence	Supported – Pupils are required to provide arguments, backed up with evidence, to support their ideas/theory.
I visualise	Supported - Pupil's present conducted, thought experiments and display their findings by annotating maps.
I am aware of my thinking and control it	Supported – Investigation includes "News Flashes" that alter variables and therefore need to be discussed.
I use metaphor and analogy	Not Supported.
I use the 'confirm early-disconfirm late' heuristic	Supported? - Pupils in the group would lead arguments for an energy source, which was followed by questioning by all in the group of those arguments.
I collaborate in thinking	Supported – Pupils share ideas throughout.

As you can see, this analysis suggests that the investigation supports all of the aspects of scientific thinking, except the use of metaphor and analogy.

The question for practitioners is, "Can we make this activity (or any other we have analysed) even more supportive of the aspects of scientific thinking already supported and can we modify it to include those that are not?"

Reference

Feist, G.J. (2006) *The Psychology of Science and the Origins of the Scientific Mind*. New Haven: Yale University Press.

Colin Smith, is a 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.

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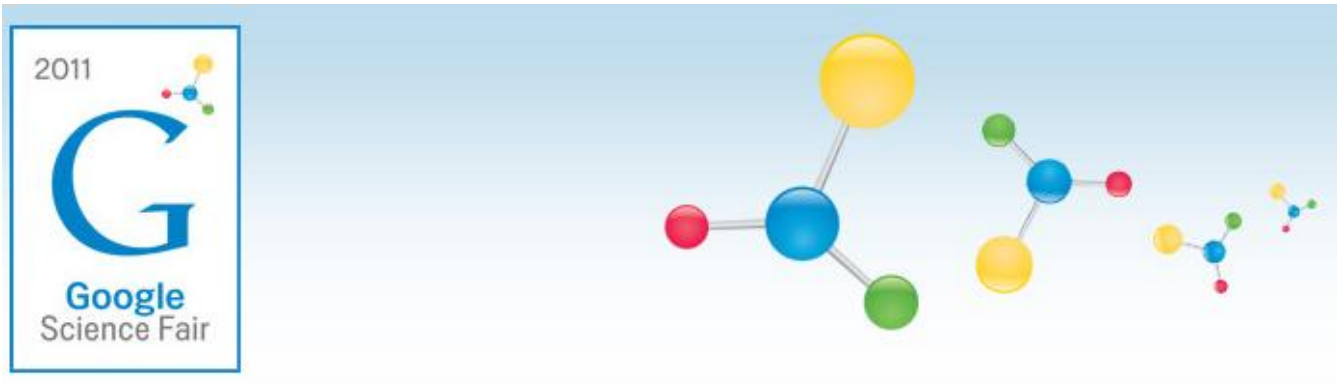
Daryl Stanfield is a Physics teacher at Ross High School, East Lothian Council, Scotland.

Calendar of Events

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

Calendar of Events

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

Calendar of Events

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

The Future of Science Education

22-24 July 2011

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/

Calendar of Events

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

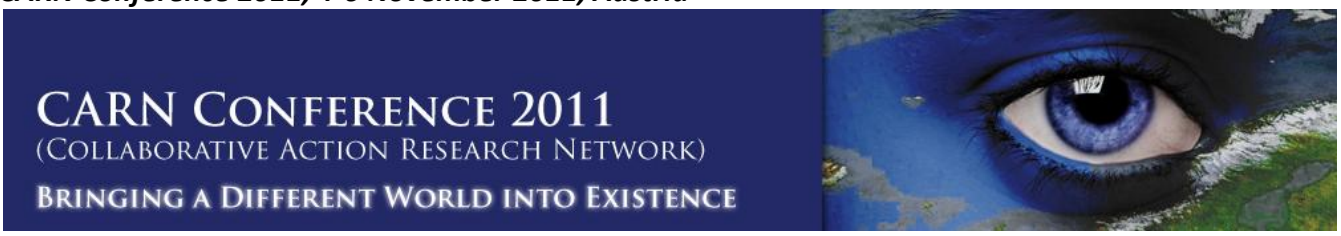
Congress Secretariat recommends www.capestay.co.za. Please note that the Congress Secretariat can only make bookings at the designated congress hotels and cannot be responsible for accommodation booked independently by delegates.

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

Calendar of Events

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.

ICASE Executive Committee 2011-2013

The ICASE Executive Committee are persons who make decisions on behalf of the ICASE Governing Body. The ICASE Governing Body is the **ICASE member organisations**.

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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.