Supporting and promoting science education internationally

The ICASE Newsletter March 2009

Newsletter of the International Council of Associations for Science Education.

Contents of this issue (to go to any item, select and click on left mouse button)

1. The Role of ICASE

ICASE is a Non-Governmental Organisation, set up by its members [National STAs, Science societies, Science centres, etc] forming an international science education communication network.

The ICASE Role is to:

1. *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.*
2. *provide and support activities and opportunities that will enhance formal and non-formal science and technology education throughout the world.*
3. *assist and support all members and other organisations throughout the world which are involved in formal and non-formal science and technology education.*
4. *establish and maintain an international communication network for member organisations and their members involved in formal and non-formal science and technology education.*
5. *encourage and support the establishment and development of professional science and technology organisations, especially teacher organisations in all countries.*

This newsletter is intended for all science educators and can be freely distributed. Science Teacher Associations are strongly encouraged to translate relevant parts for their own newsletters or distribution systems. And news from STAs for inclusion in this newsletter, is very welcomed. In case of queries, please contact jack@ut.ee.

For more information and knowledge of past issues of this newsletter see www.icaseonline.net

2. Science Activities

For a number of years ICASE produced a pre-secondary newsletter which often contained one page of science activities (STEP activities which were designed to allow young children (roughly grades 1-4) to take a *step into science* by direct experience). The newsletter has been disbanded as a publication, but the ideas, strongly supporting inquiry teaching, are still valid.
In this section each month ICASE includes a **STEP activity,** plus an additional activity not taken form the STEP sourcebook. Take a look !

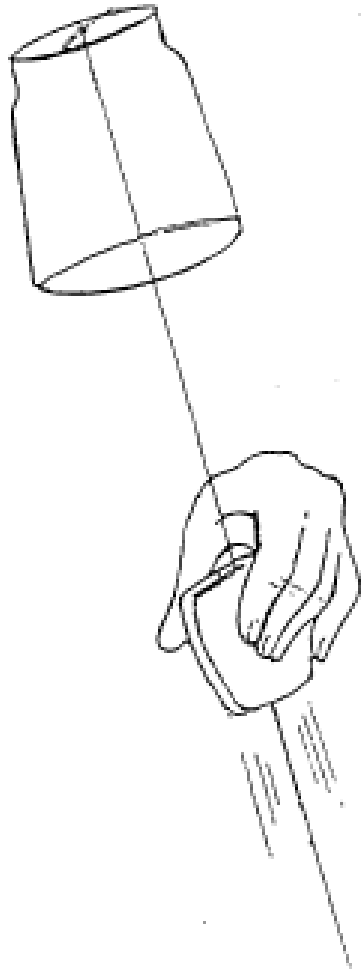
A) STEP ACTIVITY

Turkey gobbler

Contributed by *CESI, USA*

Challenge: How can you make wild noises?

What you need
paper or plastic cup
toothpick
small piece of paper towel
string
water



What to do
Use a toothpick to make a small hole through the bottom of the cup. Put one end of the string through the hole and tie it to the toothpick as shown. Wet the paper towel and pull it along the string. First, try making short, jerky movements as you pull.

Can you make a sound like a gobbling turkey? Try making different wild sounds using the cup.

What happens to the sounds produced if you use different size cup; or cups made of different materials?

What happens if you use different types and thicknesses of string? Try using cotton, wool or fishing line? Does the length of the string make any difference?

What happens if you use dry, instead of wet paper toweIIing,? What other materials can be used instead of paper towelling?

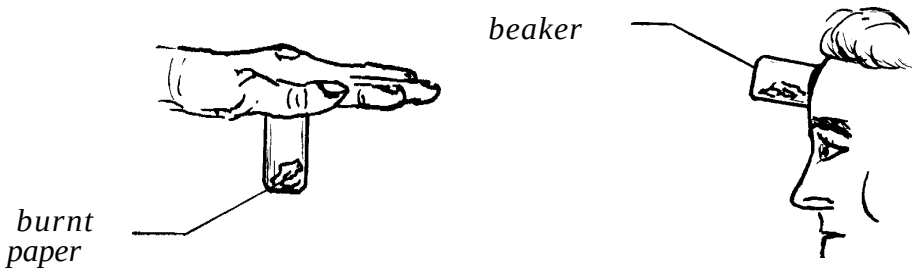
B) ADDITIONAL SCIENCE ACTIVITY

AIR EXPANSION

THE MAGIC BEAKER

Materials:

1. A small jar (50 ml) or small wine glass.
2. A piece of paper and matches.



Procedure:

1. Show that the jar or wine glass is empty by inverting it.
2. Crumple a small piece of paper.
3. Strike a match and start burning the paper.
4. Place the burning paper in the jar or wine glass and immediately place the jar against your forehead or against the palm of your hand (keep pressing until the flame is out, or until you feel suction).
5. When you feel suction inside the jar, slowly let go of it (it stays stuck against your forehead, or palm).

Questions:

1. What was inside the jar or glass before burning the paper?
2. Why did the flame inside the jar go out?
3. What does the heat of the flame do to the air inside the jar?
4. What was left inside the jar after the flame went out?
5. What made the jar or glass stick to the forehead or palm?

Explanation:

Although you showed the pupils that there was 'nothing' in the beaker by holding it upside down, there was naturally air in it. By placing the burning piece of paper in the jar, the air inside the jar was *heated and expanded*. The expansion made some of the air come out of the jar. When pressed against the forehead or palm of the hand, the jar was closed from the outside air. This caused the flame to go out, when there was insufficient oxygen to allow the burning process to continue. The extinguishing of the paper allowed the air inside the jar to cool down and thus to contract. Therefore the pressure inside the jar became less than the atmospheric pressure outside the beaker. This higher outside air pressure kept the jar against the forehead or palm. In other words, *a partial vacuum was created* inside the jar, which kept the jar stuck against the skin surface.

Warning: This experiment can leave a red spot on the skin, which disappears in a few hours or longer, depending on how long the beaker has been left against the skin.

C) USING EXPERIMENTAL IDEAS IN SCIENCE TEACHING

This newsletter contains two experimental ideas. It is hoped that these will be of interest. But how to use these experiments in teaching ? Teachers need to be free to include experimentation as they feel best, but given below is ICASE thinking in putting forward the experiments in this newsletter. Teachers and science educators are welcome to comment.

1. Who does the experiment ?

Clearly these experiments can be undertaken as a teacher demonstration. However, the intention is that the students are involved, either working individually, or more likely, in small groups. The apparatus is kept as simple as possible and can often be brought from home, or made by the students themselves.

Why is student involvement preferred ? We note the old Confucius saying – I hear and I forget; I see and I remember; I do and I understand. The belief is that the more students are engaged, the more they learn. Teacher demonstrations, or large group experiments, limit student involvement and are thus not preferred.

2. Should instructions be given to students ?

The section *'What to do'* and/or *'Procedure'* clearly spell out how to undertake the experiment. But it is not intended that the experiment must be used in this way. By following instructions, a *'cookbook,'* or *'follow a recipe'* situation is created. This highlights the **doing,** but **probably not** the understanding. Where instructions are provided, the student learning can be expected to be the explanation that follows. And the teacher is then focusing on students' explanatory skills. The questions have been added to the first experiment to encourage moves away form a 'cookbook' or 'do-and-forget' approach and towards a more exploratory approach. In the second experiment the questions seek understanding which can lead to modifications of the experiments for more novel effects. It will a pity if the teacher answers the questions.

3. Inquiry learning

Can the experiments be used in an inquiry approach, whereby the students ***raise questions*** and **suggest the *purpose* and *procedure themselves* ?** This is very much an ICASE recommended approach. It means students put forward the investigatory question, plus the procedure to follow. It promotes science as the seeking of explanations to questions put forward rather than to a 'wondering why' approach more appropriate for younger students.

So what would be the investigatory questions for these experiments ?

This is a challenge left for you to consider.

3. Teaching Goals from US National Science Education Standards

A series of short articles, written by Robert E. Yager, Professor of Science Education, University of Iowa, USA, summarizing each of the Less/More contrasts in the six NSES chapters.

How STS Meets the Four Goals for Science Teaching as Specified in the National Standards

The National Science Education Standards (NRC, 1996) include only four goals for school science. These include preparing students to:

1) experience the richness and excitement of knowing about and understanding the natural world;
2) use appropriate scientific processes and principles in making personal decisions;
3) engage intelligently in public discourse and debate about matters of scientific and technological concerns; and
4) increase their economic productivity through the use of the knowledge, understanding, and skills of the scientifically literate person in their careers.

The goals for science were basic to the 1981 Project Synthesis. In 1981, the justification for teaching science was for preparation of further formal study of science. It was the only one used by teachers to justify their teaching (95% of the time!). This meant goals, 2, 3, and 4 were almost the same as those included in the NSES – but never approached by curricula, textbooks, or teachers.

The goal related to preparation for further study was omitted completely from the NSES in 1996. In its place, as the first goal (and most important?), is engaging all students in the act of 'sciencing' – asking questions about the natural world, offering possible answers, evaluating the suggested answers, deciding on "best" solutions and corrective actions. Does this mean we should no longer justify our teaching as 'preparation for further formal study of science'? Who will tell the setters of external, end of course examinations and tertiary level science educators ?

And I wonder whether these goals should also be applied to learning at the tertiary education level !!!

4. SAFE SCI Be Protected

Article provided by Dr. Ken Roy – Chairman of the ICASE Standing Committee on Safety in Science Education. He is also Director of Environmental Health & Safety, Glastonbury (CT), an authorized OSHA instructor and science safety consultant. Email: Royk@glastonburyus.org

TARGETING BIOSAFETY FOR HIGH SCHOOL/ACADEMY LEVEL! PART 2
(part 1 was published in the February 2009 newsletter)

VIII. WHAT ARE STANDARD OPERATING PROCEDURES FOR BIOSAFETY?

The following standard and special practices, safety equipment and facilities apply to agents assigned to Biosafety Level 1:

A. Standard Microbiological/Biotechnology Practices

1. Access to the laboratory is limited or restricted at the discretion of the laboratory teacher or science supervisor when experiments or work with cultures and specimens are in progress.
2. Laboratory occupants wash their hands with soap after they handle viable materials and animals, after removing gloves, and before leaving the laboratory.
3. Eating, drinking, smoking, handling contact lenses, and applying cosmetics are not permitted in the work areas where there is reasonable likelihood of exposure to potentially infectious materials. Persons who wear contact lenses in laboratories should also wear goggles. Food is stored outside the work area in cabinets or refrigerators designated and used for this purpose only.
4. Mouth pipetting (using the mouth to suck up liquid into a pipette) is prohibited; mechanical pipetting devices are used.
5. All procedures are performed carefully to minimize the creation of splashes or aerosols.
6. Work surfaces are decontaminated at least once a day and after any spill of viable material.
7. All cultures, stocks, and other regulated wastes are decontaminated before disposal by an approved decontamination method, such as autoclaving. Materials to be decontaminated outside of the immediate laboratory are to be placed in a durable, leakproof container and closed for transport from the laboratory.
   Materials to be decontaminated at off-site from the laboratory are packaged in accordance with applicable local, state, and federal regulations, before removal from the facility.
8. An insect and rodent control program is in effect.
9. Only closed toed shoes or sneakers are allowed.
10. Hair must be tied back from the face.

B. Special Practices: None

C. Safety Equipment (Primary Barriers)

1. Special containment devices or equipment such as a biological safety cabinet are generally not required for manipulations of agents assigned to Biosafety Level 1.
2. It is recommended that laboratory coats be worn to prevent contamination or soiling of street clothes.
3. Gloves must be worn, especially if the skin on the hands is broken or if a rash exists.
4. Protective eyewear must be worn for anticipated splashes of microorganisms or other hazardous materials to the face.

D. Laboratory Facilities (Secondary Barriers)

1. Each laboratory contains a sink for handwashing.
2. The laboratory is designed so that it can be easily cleaned. Rugs in laboratories are not appropriate, and should not be used because proper decontamination following a spill is extremely difficult to achieve.
3. Bench tops are impervious to water and resistant to acids, alkalis, organic solvents, and moderate heat.
4. Laboratory furniture is sturdy. Spaces between benches, cabinets, and equipment are accessible for cleaning.
5. If the laboratory has windows that open, they are fitted with fly screens.

IX. REMEMBER THE CODE!

Governments have established blood-borne pathogens standards. These standards often require employers to have an "Exposure Control Plans" if exposure is likely. Blood-borne pathogens include viruses, bacteria, and parasites present in blood, or other body fluids. Although the use of these pathogens would be prohibited in a microbiology or biotechnology course, chance of exposure via some laboratory work is increased. In addition, this standard does cover special practices, access, warning signs, PPE, biosafety and training requirements. For high school and academy science laboratories, an Exposure Control Plan needs to be in place.

X. LOCK ON TO THE TARGET!

Biology at the high school and academy levels has become revolutionary and very exciting with the advent of biotechnology and advances in microbiology. Along with the revolution is the need to maintain a safe and productive working environment. Both can be achieved by locking on to the target - establishment and implementation of an effective biosafety programme.

LIVE LONG AND PROSPER SAFELY!

RESOURCES:

Centers for Disease Control: http://www.cdc.gov

International Centre for Genetic Engineering and Biotechnology: http://www.icgeb.trieste.it

International Rules for Precollege Science Research
http://www.coriell.org/images/pdf/rule2009.pdf

National Centre for Biotechnology Education, Safety Guidelines: http://134.225.167.114/ncbe/

North Michigan University, Department of Clinical Lab Science:
http://www.nmu.edu/cls/links.html

Occupational Safety and Health Administration: http://www.osha.gov

United Nations Environmental Programme, Register on Biosafety: http://chem.unep.ch/biodiv/

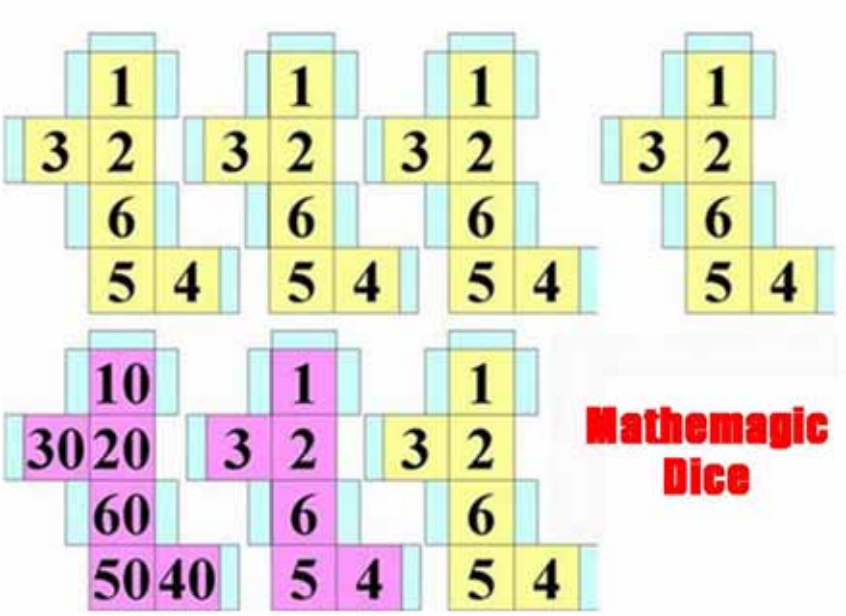
University of Virginia, Biosafety Program: http://keats.admin.virginia.edu/bio/home.html

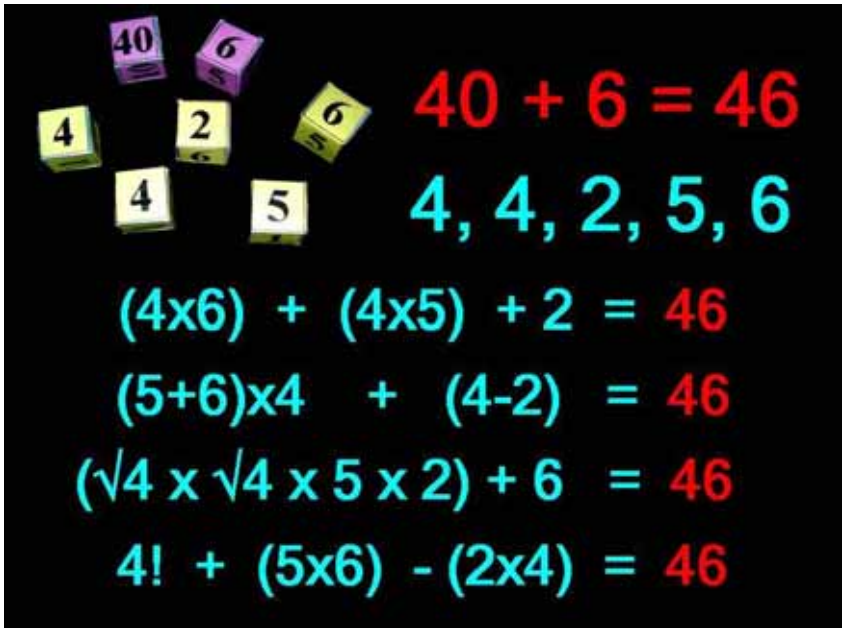
5. Janchai Corner

Mathemagic Dice

Print the dice template into a card paper. Cut the card paper to make 7 dice using glue as show in the picture.

How to Play: Throw the dice onto the table. Use two numbers on the pink dice and add them together to get a main number. Use the 5 numbers for the other dice to by mathematical operations to form the main number. A competition can be set up with rules such as: 1. The shortest time to form the main number, or 2. Find as many ways as possible to form the main number.





6. Calendar of Events

Celebrate the Year of Science in New Orleans

Join more than 10,000 science educators in New Orleans for the most prominent and comprehensive NSTA National Conference on Science Education, March 19-22, 2009. This event kicks off with two exceptional speakers from The Planetary Society. Neil deGrasse Tyson, is an astrophysicist, author, and PBS host, and Bill Nye the Science Guy, a comedian, television host, science educator and mechanical engineer. And that is just the beginning of a full roster of experts in professional development leading workshops, seminars, institutes and sessions to stimulate your imagination, build your skills, enhance your teaching strategies and nurture your passion.

Check out some of our program titles:

- Observe, Question, and Explore Our Solar System
- Exemplary Science Programs-Best Practices
- What We Know About Learning Science in Informal Environments
- A Sustainable Collaboration to Improve Content, Assessment, Reflection, and Efficacy of Science Teachers
- The Murder of Kirsten Knight-Jensen: Using Chemistry to Solve the Crime
- Teaching Core Physics Concepts Through the Lens of Seismology
- A Demo a Week Makes Science Class the Peak

Don't forget day long programs, the Exhibit Hall, graduate credit for program attendance and networking. It's all there in New Orleans with field trips that tap into this city's history and local charm.

Register for the NSTA Annual Conference by January 9, 2009 to save the most.
Visit http://www.nsta.org/ for more information.

FISER'09 May 22-24 2009, Famagusta, Northern Cyprus

A forthcoming international conference on Science and Mathematics education research; *Frontiers in Science Education Research 2009* (FISER'09) will be held May 22-24 2009. The official website of FISER'09 could be accessed via http://fiser.emu.edu.tr.

The conference is organised by the Eastern Mediterranean University, Faculty of Arts and Sciences. Further information can be obtained from Mehmet Garip, Ph.D. Chair, Organising Committee (fiser@emu.edu.tr)

ICASE African Regional Symposium
24-28 May 2009, Abuja, Nigeria
This African regional symposium is being organised under the auspices of STAN (Science Teacher Association of Nigeria)

The theme of the conference is - Meeting the Challenges of Sustainable Development in Africa through Science and Technology Education.
The Venue is the Abuja Sheraton Hotel and Towers
The Conference Conveners are Dr. Ben B. Akpan, ICASE African Representative and Executive Director, Science Teachers Association of Nigeria
Email: ben.akpan@stan.org.ng and Professor Peter Okebukola, Faculty of Education, Lagos State University, Ojo, Lagos, Nigeria. Email: peter@okebukola.com
For more details please visit the website http://www.stan.org.ng/ICASE-2009

CONASTA 58 – The Conference of the Australian Science Teachers Association
4-7 July 2009 at the Hotel Grand Chancellor in Launceston, Tasmania, Australia
The theme for the conference - A Bridge to the Future. Within the theme will be highlighted

- Science – future problem solver
- Educational change and the national curriculum
- Science in a rural context
- Science and literacy

You are invited too submit an overview of a presentation for the CONASTA 58 conference. Presentation summaries are due by Friday 20 February 2009. Abstracts can be submitted through the website via the Speaker's Zone (www.cdesign.com.au/conasta58.

Registration fees Full registration before April 2009 (member A$450; non member A$650). After April (member A$550, non member A$750). More details on the website.
Contact details –
For all enquiries contact - Conference Design Pty Ltd, 228 Liverpool Street, Hobart, Tasmania 7000.
E-mail Info@cdesign.com. Tel (international) +61 3 6231 2999

International Congress of Science Education, 10 years of the Journal of Science Education (Cartagena, Colombia, 15- 18 July 2009). http://www.colciencias.gov.co/rec/cong

The main aim on this Congress is to discuss international experience in science education. The venue in Latin America presents a special opportunity for our community, and your participation would create a high interest and impact for this international event.

The Journal of Science Education, JSE, has an international character and publishes articles about the science education (Physics, Chemistry, Biology, Mathematics, etc.) for the university and secondary or high school levels. Authors from 53 countries have published more than 320 full peer evaluated articles in previous issues, various authors are from your country. Our authors are: from Europe (47%), America (45%), Asia (7%), Africa (1%). About 46% of published works have been about research in science education.

We invite you to take part in this International Congress. We are very interesting in if you can organize a symposium or workshop about one of the several topics to be talked about at the congress.
The two important dates:
* Preliminary registration: 15 December 2008
* Sending the abstracts: 10 February 2009

ICASE Asian Symposium XI, 1-3 November 2009, Guangxi Normal University, Guilin, P.R.China.

The 11th ICASE Asian Symposium will be organised by the ICASE-GNU Guilin Teacher Training Center (GTTC) with the Research Institute of Science Education (RISE) at Guangxi Normal University, from the 1-3 November 2009. The theme of the symposium is Bridging the Gap between Formal and Informal Science Education and is a founding event for the newly established ICASE Guilin Teacher Train Center. The symposium will provide an opportunity for science teachers and education to meet in order to

- Learning from and interact with invited science education experts on how top create ad wisely use high educationally valued teaching materials in order to make genuine improvements in science learning and teaching;
- Share ideas and experiences with each other related to science teaching practices
- Visit and discuss RISE and its partner schools on developing featured science teaching resources.

The symposium venue will be the Yuchai Campus of Guangxi Normal University and all academic activities will take place within the RISE facilities. The language of the symposium will be English
.
Registration fees – Overseas participants 2000¥ (students 1000 ¥)
Local participants (rate to be decided) 7.5 ¥ = 1 US$
Updated details will appear on the **RISE website www.risechina.org**

For more information please contact the secretariat – Miss Handan Huang, Research Institute of Science Education, Guangxi Normal University, Guilin 541004, P.R. China
E-mail gxnucsc@sohu.com

ICASE World Conference, 28th June – 2nd July, 2010, Tartu, Estonia

The 3rd ICASE World Science and Technology Education Conference will be held at the University of Tartu, the oldest University in Estonia dating back to 1632. This Conference will follow on from the previous World Conferences held in Malaysia, 2003 and Australia, 2007 by bringing together policy makers, curriculum developers, scientists, science teacher educators, science teacher association personnel and of course science teachers to consider research developments, policy implications and innovative practices in the field of science and technology education. Estonia has a strong tradition in science, stemming from its former USSR days and today is a widely recognised centre for gene technology.

Conference theme - **Innovation in science and technology education: research, policy, practice.** The Call for Papers will be announced from March 2009 for each of the sub-themes – *research; policy and practice.*

Introducing the conference title

Innovation and Education are heavily interlinked. As countries move along the path of development (and really this is their destiny; unknown is the pace at which this takes place), education is a key factor in promoting meaningful progress. Whether this factor is identified with values such as equity, human rights, tolerance, or preparations for a knowledge-based society, education has been recognised as an essential component in a country's development.

But as movement within a country takes place along the development path, so education itself needs to develop; it needs to be in tune with the moving platform. For this, not only is innovation a hallmark of development, but it is a key ingredient in the required developments in education. Such innovation needs to have a **research underpinning,** guided by **policy makers** towards intentions and introduced at the **level of practice** by the implementation attributes within the country (unfortunately under a heavy threat of distortion by the assessment practices in many countries, unless these are also an essential part of the innovation).

Science and technology education has a crucial role in this innovation. Not only is it involved in preparing innovative citizens within society, but also as part of the education provision within countries, it is at the forefront of educational innovations, undertaking this from within a science frame.

Clearly innovation within science and technology education has a role to play in ***changing society values***, embedded within concepts such as *sustainable development, self-reliance, technological progress and improving the quality of life*. It has a role in utilising its conceptual science base for the *betterment of society* and in helping to drive the innovations needs for a society's development, whether this is in the workplace, the home or in the interactions between members of the society. **Such innovation is a huge challenge for science and technology education**, as it heavily focuses on the breadth of educational innovation and not simply on information dissemination, of innovation in the sciences ideas themselves. Science and technology education is preparing individuals for innovation and to do this ***an innovative science and technology education*** is needed. But what are these innovations for science and technology education – whether these are in the area of research, policy or practice. **These are the challenges addressed by this conference!**

The first and perhaps foremost challenge comes with the *exponential growth in information*. Science education cannot keep up. It must not attempt to. Science education needs innovative ways for students (and adults) to *utilise information,* together with its explanations and applications. ***Science education must move away from information transmission***. A further challenge comes in gaining insights into the *nature of science* (and for this conference, the word science is confined to phenomena in the natural world). What is it that students should understand by the term 'science'? How do we *prepare policy makers* to recognise that science is tentative and not the truth, it is subjective in its interpretations and culturally embedded in its values?

Please see the call for papers accompanying this newsletter

ICASE ASIAN SYMPOSIUM 2009

On

Bridging the Gap between Formal and Informal Science Education

1-3 November 2009
Guangxi Normal University
Guilin, China

Organized by

ICASE-GXNU Guilin Teacher Training Centre
Research Institute for Science Education (RISE)

Guangxi Normal University
广西师范大学

International Council of Associations for Science Education
国际科学教育协会理事会

SOME INVITED KEYNOTE & PLENARY SPEAKERS

……
……

Prof. Dr Jack Holbrook
University of Tartu ,President of ICASE Estonia

Prof. Dr Miia Rannikmäe,
Executive Secretary, ICASE, Estonia

Mrs Cheng Donghong
Executive Secretary, China Association for Science and Technology (CAST)

CALL FOR PAPERS

We encourage contribution of papers to share on listed symposium strands, general theme, research findings, case studies and initiatives carried out in respective countries on efforts put forth to connect/incorporate Community development/ society awareness into the design and implementation of Science, Mathematics and Technology Education.

The closing date for receipts of titles and abstracts (not exceeding 1000 words) is **August 31, 2006.** The format of the abstracts and full paper (or website) may be requested from the secretariat or downloaded from the website. *Please submit abstract and full papers in electronic format only (internet or e-mail).* Please also attach a brief CV (not exceeding 200 words) along with your abstracts.

LANGUAGE

The language of the symposium will be in English

THEME

The symposium will address:

Bridging the Gap between Formal and Informal Science Education

The topics for discussion will surround the following sub-themes namely:

(a) the role of science centres and/or science museums in bridging the gap between formal and informal science education

(b) using informal and non formal approaches in science teaching

(c) teaching science using locally produced equipment

(d) can assessment approaches be used to bridge the gap between formal and informal science education ?

(e) the role of the textbook/teaching materials in bridging the gap between formal and informal science education

(f) promoting life skills through science education - linking formal and informal science education

OBJECTIVES

The symposium provides an opportunity for science teachers and educators to meet together in order to:

- Learn from and Interact with invited science education experts on how to bridge the gap between formal and informal science education in order to make efficient improvement on science leaning and teaching.
- Share ideas and experiences with each other in science teaching practices.
- Visit and discuss with RISE and it's partner schools on developing featured science teaching resources.

……
……..

REGISTRATION

Registration fees

Active participants US$200

……

The fee includes 1 copy of the book of abstracts with papers of keynote and plenary, 3 lunches (1-3 Nov) ……

……..……

VENUE

The symposium will take place at the Yuchai Campus of Guangxi Normal University. Guilin 541004, P.R. China

DATE: 1 – 3 November 2009

ACCOMODATION

Accommodation will be reserved upon request. Special room rate will be arranged in nearby hotels, details of which are available from the secretariat.

SECRETARIAT

Dr. Janchai Yingprayoon
E-mail: janchai@loxinfo.co.th
Ms. Handan HUANG
E-mail: gxnucsc@sohu.com
Research Institute for Science Education

Guangxi Normal University
Guilin 541004, P.R. China
Website: http://www.risechina.org

7. ICASE Executive Committee 2008-2011

Based on the ICASE constitution, the ICASE Management committee as well as Regional Representatives are elected by member organisations. These elected members, in turn, nominate chairs of relevant standing committees. Together these persons form the ICASE Executive Committee and are the persons who make decisions on behalf of the ICASE Governing Body. The ICASE Governing Body is the **ICASE member organisations**.

The Executive Committee **(the decision making body working for the Governing Body)**

President
Prof Jack Holbrook
E-mail jack@ut.ee

Past President
Dr Janchai Yingprayoon
E-mail janchai@loxinfor.co.th

Secretary
Prof Miia Rannikmae
E-mail miia@ut.ee

Treasurer
Adrian Fenton
E-mail Adrianfentonicase@yahoo.co.uk

Regional Representative for Africa
Dr Ben Akpan
Executive Director of STAN, Nigeria
E-mail: ben.akpan@stan.org.ng
(Member Organisation – Science Teachers Association of Nigeria)

Regional Representative for Asia
Dr Azian Abdullah
Director, RECSAM, Malaysia
E-mail: azian@recsam.edu.my
(Member Organisation – RECSAM)

Regional Representative for Australia/Pacific
Dr Beverley Cooper
E-mail: bcooper@waikato.ac.nz
(Member Organisation – NZASE, New Zealand)

Regional Representative for Europe
Dr Declan Kennedy
E-mail: d.kennedy@ucc.ie
(Member Organisation – Irish Science Teachers Association (ISTA)

Regional Representative for Latin America
Gabriela Inigo
E-mail: gabrela_inigo@hotmail.com
(Member Organisation – Albert Einstein Club, Mar del Plata, Argentina)

Regional Representative for North America
Prof Norman Lederman
E-mail: ledermann@iit.edu
(Member Organisation - Council of Elementary Science International (CESI))

Chairs of Standing Committees

Safety in Science Education
Dr Ken Roy
E-mail: Royk@glastonburyus.org

World Conference
Dr Robin Groves
E-mail grovesr@ozemail.com.au