Supporting and promoting science education internationally

The ICASE Newsletter October 2009

Newsletter of the International Council of Associations for Science Education.

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1. ICASE News

ICASE is a Non-Governmental Organisation, set up by its member National STAs, Science Societies, Science Centres, etc to form an International Science Education Communication Network. Are you a member of a national/regional organisation which is a current member of ICASE ? It is possible for all organisations interested in international science and technology education to belong to the ICASE network. Contact Miia Rannikmae, ICASE Secretary, for more information (miia@ut.ee).

ICASE World Conference 2010 June 28-July 2, 2010

The call for papers is now out (see www.worldSTE2010.ut.ee or www.icaseonline.net).
PLEASE NOTE – the deadline for submissions is the 31st OCTOBER, 2009. Submissions are welcome from science educators and especially from teachers of science subjects. The submission needed is an abstract plus a 3-page synopsis of the presentation. BUT SHOULD THIS PROVE TO BE DIFFICULT, PLEASE CONTACT THE CONFERENCE ORGANISER (miia@ut.ee) so that guidelines can be given on how best to proceed. The synopsis is intended to help the reviewer to provide feedback to the presenters if appropriate and to help to group presentations into meaningful sessions within the conference. This is also of particular help where workshops are planned requiring appropriate facilities.

To Office Bearers of Science Associations/Organisations, especially STAs – a special plea

ICASE is the only world organisation which gives special attention to presentations under the banner of a science teacher association or science organisation. *This is deliberate and in line with the role of ICASE as an umbrella organisation promoting the sharing of ideas among science teacher associations/science organisations around the world.*

In fact, insofar as it is possible, ICASE would like to give recognition to such associations/ organisations in all documents and to ensure they receive priority in making conference presentations. ICASE strongly welcomes submissions under the banner of the association/ organisation sharing innovative ideas whether these are related to research findings (research in the classroom), association/organisation policy, or to the role the association/organisation plays in guiding and supporting classroom science practice.

Where submissions are made under Science Teacher Associations or Science organisation banner, please indicate this clearly so that due recognition is made. The ICASE President (Jack Holbrook – jack@ut.ee) will be extremely interested in assisting an association/organisation in making submissions and in making sure their innovative contributions (as a set of papers, symposium or workshops) are entertained in the conference in a suitable manner.
BUT PLEASE MAKE CONTACT BEFORE THE OCTOBER 31 DEADLINE INDICATING PLANS.

ICASE General Assembly

ICASE member associations and organisations form the Governing Body of ICASE. The General Assembly is held every three years so that the Governing Body can guide the future directions of ICASE and elect ICASE officials ready to carry out the wishes of the Governing Body. Although observers are invited to attend the General Assembly, the participants are representatives of member organisations and thus need authority to act on behalf of their association/organisation. The General Assembly will be held on the 28 June in conjunction with the World Conference. A quorum of one half of the full membership is necessary for the General Assembly to function.

ICASE World Conference 2013

Call for Expressions of Interest to be a partner with ICASE as host organisation for ICASE2013 - World Conference on Science and Technology Education

ICASE intends to hold another World Conference on Science and Technology Education during 2013. In order to achieve this, ICASE will form a partnership with a 'host association/organisation' located in the country where the conference will be staged. ICASE and the host association/organisation will assume shared responsibility for the conference and each will nominate a co-convenor and will contribute people to the necessary conference committees. This is a call for expressions of interest from associations/organisations interested in becoming a partner with ICASE as host association/organisation for ICASE2010.

Proposals should be submitted by January 15th 2010 to: Dr Robin Groves. Chair, ICASE World Conference Standing Committee: Email: grovesr@ozemail.com.au or Mailing address: PO Box 244, Mount Hawthorn. WA 6016, Australia.
Enquiries may be directed to the email above.

A decision will be made by ICASE by March 15th 2010 and the successful proposer and all other bidders will be notified. It is anticipated that the planning for ICASE2013 will commence immediately, and that advance information about it will be made available at the ICASE 2010 World Conference in July 2010.

2. Science Activities

These following activities are from a collection built up by ICASE through its former primary science newsletter (STEP) and other sources. They are put forward to bring attention to small activities which can be carried out in the science classroom with minimal equipment.

ICASE would be delighted to publish your favourite activities. Please send to jack@ut.ee

A) STEP ACTIVITY

STEP ACTIVITY

New England magnet sticks

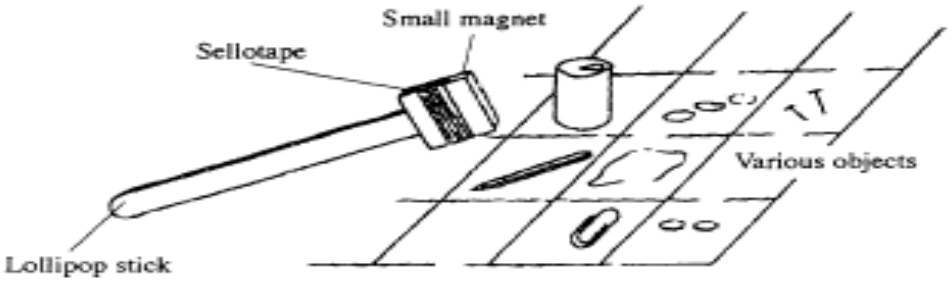
United States of America

Challenge: How can you investigate whether or not the magnet will attract all of the items?

What you need:
* clean lollipop sticks
* clear tape or glue
* small round or square magnets
* squared paper or similar grid
* things to test such as toy cars of various materials, pebbles, cloths with metal fastenings, coins, tin cans, paper clips, screw, nails etc.
* a recording sheet

What to do:
1. Show children the lollipop sticks and invite them to design and make a magnet stick to use in their item testing.
2. Ask them to plan a fair test and organise how they will do the testing and how they will record their results.
3. Let them do their investigation.
4. Is there any pattern in their results? Do certain materials attract magnets while others do not?
5. Make sure that you have plenty of non-magnetic materials available for children to test.

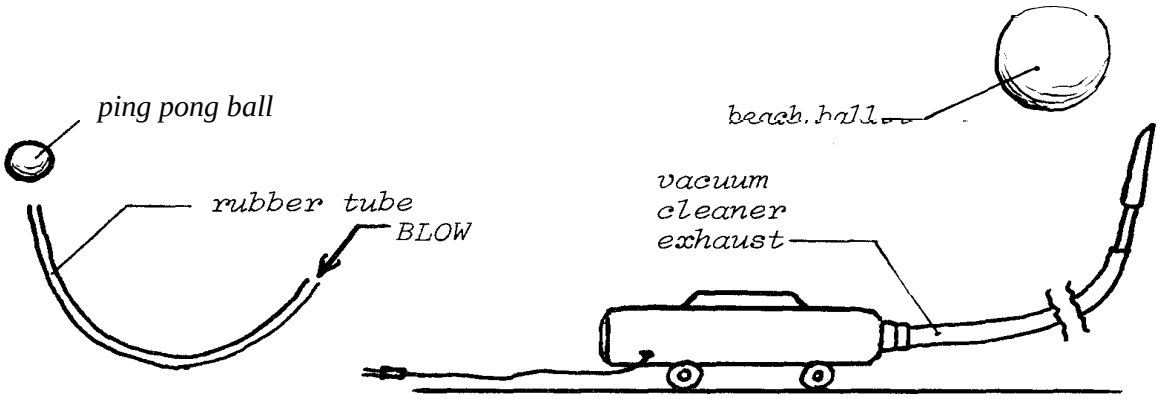
More to do:
* Suggest children walk around the classroom and predict if furniture and fixtures are or are not magnetic. After writing down their predictions with reasons, test each item with a magnet and record the result.
* Compare these with their predictions.



B) ADDITIONAL SCIENCE ACTIVITY

THE FLOATING BALL

Materials:
1. A ping-pong ball or a beach ball.
2. A 25 cm length of rubber tubing
3. A small compressor to produce a constant air flow (optional
4. A vacuum cleaner (when using the beach ball).



Procedure:
1. Take the rubber tubing with each hand on one end of the tube.
2. Place the ping-pong ball on one end of the tubing and blow through the other end, and balance the ball in the air flow.
3. When using a beach ball, you will need a vacuum cleaner. Detach the vacuum cleaner hose and attach it to the exhaust end, so that it blows through it rather than producing a suction.
4. Blow air into the beach ball and let the ball hang in the air stream that the vacuum hose is producing.
5. When a small compressor is available, attach a small orifice to the exhaust tube and hang a ping-pong ball in the air stream.

Questions:
1. Will we be able to do the same thing with other round objects?
2. What property of the round object is critical for it to stay afloat?
3. What does the blowing do to the movement of the air molecules?
4. How does the pressure of flowing air compare to that of stationary air? 5. Why does the ball stay afloat in the air stream?

Explanation:
By blowing through the rubber tubing or by using the compressor or the exhaust of the vacuum cleaner, we are creating an air flow. This air flow causes the existence of a lower pressure area compared to the surrounding air, which is stationary or not moving as fast. *Bernoulli's Principle* states that: *the faster the flow or air, the lower the pressure.* This means that at the place of exhaust (end of the tube or hose), a cone of lower pressure is created. All the surrounding air is exerting a higher pressure and thus the ball is kept in the lower pressure area, which is the cone above the exhaust.

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 sections *'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 from 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 is the person who answers these questions. In fact it would be interesting to learn of situations where the students, themselves, are both asking and then answering 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, although perhaps this is appropriate for the younger students.

So what would be the investigatory questions for these experiments ?

This is a challenge left for you to consider.

3. An Introduction to Ideas for greater Relevance of Science Teaching for the Enhancement of Scientific Literacy

Jack Holbrook, ICASE President

In the last newsletter, this column considered:

- *the purpose of linking stage 1 with stage 2 and hence the manner in which a* contextualised beginning *(situated within the social frame) can stimulate student motivation, but be* decontextualised *(removed from the social frame and the science considered in isolation) for stage 2 so that the scientific ideas can be explored in an appropriate setting.*
- *The need to begin the teaching from a scenario to which the students could identify.*
- *Hypothesising that science teaching, conducted using an approach based on the so-called 'fundamental' or 'basic' ideas of science, is not conducive to a relevant teaching approach and is probably not motivational for the majority of students.*

This leads to 2 key questions to be developed further -

What is an example of a scenario ?
What is stage 3?

There is no absolute format for a scenario and hence this can be developed in many forms. A common consideration is to develop a story to which the students can identify from their everyday life experiences and which can provide the basis for discussion. The example cited is geared to teaching about the use of alternative fuels to diesel and whether vegetable oils, as an example, could, and in addition, should be used. The teaching module is entitled 'should vegetable oil be used as a fuel?' The scenario, having both a social and scientific link, goes as follows:

'Old' Sin Yin lives in Shanghai. He suffers from bronchitis and finds it difficult to breathe. His doctors advise him to move away from Shanghai to somewhere where the air is more fresh and contains much less hydrocarbon and sulphur.
Alas 'old' Sin Yin cannot afford to move, but instead plans to interest diesel vehicle manufacturers in a cleaner fuel. Fuels based on vegetable oils produce much less hydrocarbon emissions and practically no sulphur emissions. Although, direct use of the oil itself is possible only with modification to existing diesel engines, 'old' Sin Yin suggests vegetable oils can be changed to biodiesel and used in existing *vehicle engines.*
Unfortunately biodiesel, made from vegetable oil, is based on foodstuffs such as corn. It can take away food from hungry mouths!! Is this a wise thing to do ?

Another example is taken from a module entitled "Shampoo – is there truth behind the Advertising?"

You have seen commercials on TV about new fantastic shampoos which for some reason caught your interest. Anna, a grade 11 student, decided to try one of these new brands because the advertisement looked so convincing. Sadly, after a couple of weeks she noticed that her scalp was very irritated. It itched and she was tempted to scratch it very often. What should she do - simply change the shampoo or investigate the problem?

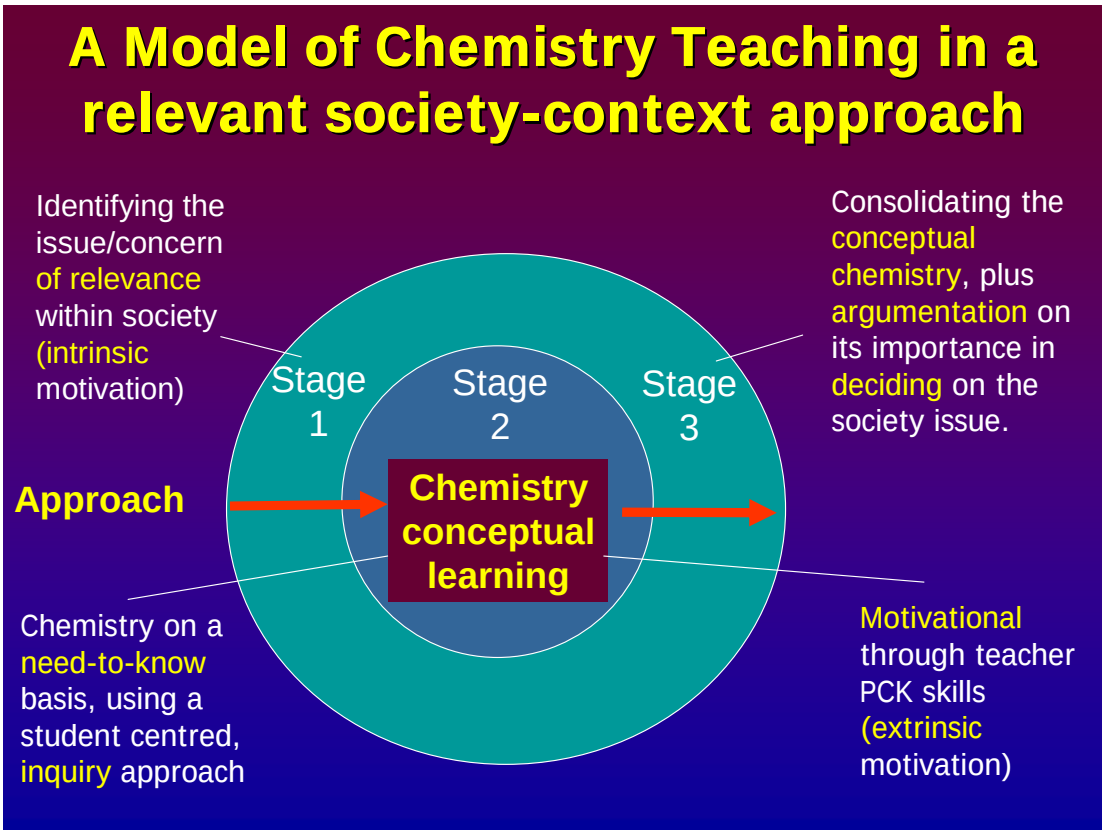
A more simple approach can be a description followed by a question. The following example relates to a module entitled "Should Zero Emission Cars Be Made Compulsory – Is It Feasible?"

The development of societies depends on supplies of energy. Today energy is used for three purposes, electricity, heat and movement (transportation). Most of the world's energy comes from fossil fuels like coal, oil and natural gas. Other sources like nuclear power and different renewable sources also supply energy. Alas fossil fuels cause pollution. CO_2 creates the so-called greenhouse effect causing global warming. Other emissions, like SO_2, NO_x, CO and hydrocarbons, cause smog, acid rain and affect human health, especially in large cities. To

keep up the global progress and prosperity, a change to more sustainable and clean energy systems is needed. What cleaner fuel might be feasible for powering cars ?

Stage 3 completes the teaching approach in the type of module being advocated. The science learning associated with stage 2 is now utilized to input the scientific component into the discussion of the issue which was missing when the issue was first considered in stage 1. The situation is thus again contextualised (*it is re-contextualised*) and through a general discussion, role play, debate or otherwise, the students illustrate their new-found science learning (they consolidate their learning from stage 2) and enter into a decision-making phase in a socio-scientific context. This demands the use of a new set of skills as the students try to convince others of their point of view while refuting opposing views put forward by others. The goal is a consensus on the decision reached, first within groups and if appropriate, as a second stage, across the class as a whole. The decision reached needs to be recognised as pertaining to the conditions under which it was put forward. Where conditions change so can the decision. The decision is thus not a permanency, but that which is considered appropriate at a particular point in time and under particular circumstances. There may well be a dominant factor which sways the decision (often this is the economic argument), or it may be that a number of factors carry similar weighting.

This leads to a model for teaching where relevance as perceived by the students as a major factor. Such a model is considered as 3-stage, as illustrated below:



This leads to further questions to be addressed in the next newsletter.
Why is relevance considered so important ?
In striving for relevance, what should be considered to be science education ?

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

ELEMENTARY SCIENCE SAFETY!

I. GOOD NEWS! BAD NEWS!

Elementary or primary level educators are doing more hands-on science over the past decade. General curriculum and instruction has moved once again from memorizing by reading about science to learning by doing science. Science education curriculum and instruction – especially at the elementary level, tends to rise and fall like the ocean tides! Given the high tide of hands-on science is in, what is the bad news? With the resurrection of students doing science, few elementary educators are prepared safety-wise. What then are some areas which should be addressed for a safer approach to elementary science?

II. MAKING ELEMENTARY SCIENCE SAFER!

How can we help make hands-on elementary science safer for both students and teachers? There is no magic bullet but there are some basic areas of focus. Consider addressing the following safety items to help make the hands-on science experience for students an enriching and rewarding learning experience:

A. Safety Training: No matter the grade level of the students, safety training is crucial. It sets the tone and expectations for appropriate best behavior. Look at safety protocols for all science hands-on activities – be it working with soil or using hot water.
B. Acknowledgement Form: Share those safety expectations with both the students and parents/guardians with a written acknowledgement form. The acknowledgement form lets the student and parents know hands-on science activities are fun, but also need to address safety issues. This differs from a contract which is not legally binding for young students. The acknowledgement form lets the students and parents know there are best practices which must be followed in order to make it safer in the classroom. This protects not only the students, but also the teacher from a legal perspective.
C. Reinforcement: Throughout the school year, before each hands-on activity is performed, teachers should review and reinforce safety. It should not be a once a year experience, but an ongoing reinforcement opportunity.
D. Age-appropriate Science Activities: Make sure hands-on activities are age appropriate for students. Can the students, developmentally, handle both the concepts, content, application and safety behaviors required?
E. Keep it simple and organized: Young students learn best by making things simple, not complicated. Simplify activities providing fewer steps in the process with reinforced summaries and assessments.
F. Provide appropriate supervision: If possible, try to secure volunteers to work with your students on about a 1: 5 ratio. This allows all students to be involved – and to stay involved in the learning experience.
G. School Health & Safety Protocols: Make sure you have reviewed all relevant health and safety protocols required by your school – e.g., evacuation, use of fire extinguishers, etc.
H. Housekeeping: Remember to remove all trip/fall and slip/fall hazards from the work area when doing science activities. This includes things such as back packs, books, clothing, spilled liquids on the floor, etc.

I. Food and Drink Prohibition: Science work areas should be void of food and drink during any hands-on activities. Once activities are completed, work tables should be washed with soap and water. Floors should be swept and in some cases washed.
J. Personal Protective Equipment (PPE): Yes – even at the elementary/primary level, there are some types of activities which required PPE! Examples are safety glasses when using solids, projectiles, etc. Indirectly vented chemical splash goggles which using hazardous liquids – this even includes vinegar, or acetic acid solutions. On some occasions, hand protection may be required – gloves and clothing protection or aprons.
K. Security: Make sure all chemicals, equipments, etc. are secured under lock and key. There could be legal issues for teachers if a student takes science materials out of the classroom and gets hurt in the process of using them.
L. Practice Make Perfect: The teacher should have undertaken the hands-on activity prior to having students doing it. This goes for all activities including commercially prepared kits, journal activities recommended by peers, etc.
M. Hygiene: Remember – no matter what the activity, students should wash their hands with soap and water upon completion of the class. This is appropriate whether gloves are used or not.
N. Equipment: Be very careful what equipment is used at the elementary/primary level – especially if it is hand-me-downs from the middle or high school. Also watch for donated equipment. Heat sources are especially problematic. Under no circumstances should alcohol lamps be used, save the few that are designed with safety in mind. Gas burners are another faux pas. Hot plates under adult supervision may be used. In some cases, candles could also be used – again under adult supervision in the upper elementary grades.
O. Flora and Fauna: Caution must be exercised when bring plants or animals into the elementary classroom. Never bring in animals caught in the wild! They may have disease that could challenge both the health of students and teachers. Be sensitive to students with allergies – especially respiratory. Know your plants – especially those which may be poisonous or toxic.
P. Blood and Body Fluids: Never use any blood or body fluids. This includes cheek cells and blood typing. The risk to bloodborne pathogens is too high!
Q. Hazardous Chemicals: Make sure you have reviewed the material safety data sheet or safety data sheet in making judgments about chemical use. This includes alcohols and other flammables, indicators, vinegar and other acids, and other chemicals.
R. Fungi, Molds, Bacteria, Other Microbes: Given the rise of MRSA in the 1960's, Strep bacteria, molds, etc., teachers should not involve students with any activities requiring the culturing of microbes. Use preserved slides, or bacteria slides made from live yogurt or kefir cultures. Again, the risk is too high, especially with the potential for immune suppressed students on board.

In summary, the items listed provide an outline for making the science experience safer at the elementary level. Make use of peers, professional conferences, publication articles/safety columns and safety training to enhance your effectiveness in the classroom or supervisor.
Live Long & Prosper Safely!
RESOURCES:
Elementary Science Classroom (U.S.A.): http://www.nsta.org/elementaryschool/?lid=hp
Science Central.Com: http://www.sciencecentral.com/category/9822/index4.html
Science Lesson Plans K-8 (Canada):
http://canadaonline.about.com/od/sciencelessonplans/Science_Lesson_Plans_K8.htm
U. K. Elementary Science Resources (U.K.):
http://www.iss.k12.nc.us/tech/jparker/elemscisites.htm

5. Multiple Intelligence and classroom teaching

By Asoka Weerasinghe, a headmaster in Sri Lanka and Chairman of SLASME.

Use of MI theory in Science lessons

During this decade, multiple intelligence theory has received more and more recognition worldwide. However, there are two issues concerned with the theory. First, educationists find it difficult to formulate tools to identify the different intelligences in different people. Secondly, educators are grappling with the ways and means of using the theory in actual educational practices. The proponent of multiple intelligence theory, Howard Gardner, identified 9 intelligences, but still more evidence is needed to accept the ninth intelligence suggested by him. The eight intelligences accepted by many are as follows:

Linguistic intelligence	("word smart"):
Logical-mathematical intelligence	("number/reasoning smart")
Spatial intelligence	("picture smart")
Bodily-Kinesthetic intelligence	("body smart")
Musical intelligence	("music smart")
Interpersonal intelligence	("people smart")
Intrapersonal intelligence	("self smart")
Naturalist intelligence	("nature smart")

Since the technical terms for intelligences are hard to remember for the layman, simple terms have been included within brackets and are used in the text of this article.

Recognising MI theory in teaching a lesson on the chemical activity series

The "word smart" students

Mnemonics comprise of group of words arranged in some order which can be remembered easily. The word smart students love to play around with words and make mnemonics. Some elements according to the activity series can be arranged using a mnemonic such as the one indicate below which was made by one word smart students.

Kenneth Nancy's caddish mongrel at zoo cried feeling sinned publically
He cut highways against point Augusta

She remembered the following elements in the activity series in order using the first letters of the words of the mnemonic - K Na Ca Mg Al Zn Cr Fe Sn Pb H Cu Hg Ag Pt Au

The word smart student had no difficulty in working out the order of the metals in the activity series. If the activity series could be remembered properly he or she had no difficulty in working out the following equation. Since magnesium is higher in the activity series, it displaces copper from copper sulphate which is lower in the activity series

Magnesium + copper sulphate = magnesium sulphate + copper

The "number smart student"

The "number/reasoning smart" students may give numbers to the elements in the activity series in descending order thereby arranging them in an order which can be remembered by them.

The “Picture smart" students
The "picture smart" students can draw picture of big figures depicting elements high in the activity series and small figures depicting elements lower in the activity series and show the stronger element push away the weaker element from the sulphate radical. He or she may colour the figures making it more attractive to him or her

The "body smart" students
The "body smart" students love to get up from their seats in the classroom and move about in class. The teacher can get, for example, a taller boy to represent an element higher in the activity series and a smaller student to be an element lower in the activity series. A girl can be the sulphate radical and show by movement how the tall boy pushes away the smaller student and grabs the girl [the sulphate radical] thereby showing correctly how the reaction between magnesium and copper sulphate takes place. This activity also reinforces the concept that copper cannot displace magnesium from magnesium sulphate.

The "music smart" students
The "music smart" students may compose songs and sing them describing the reaction. The following song was composed by a student to the tune of “*ten green bottles standing on the wall*”.

If there is copper sulphate found in the flask[three times]
If a piece of magnesium accidently falls
There will be magnesium sulphate found in the flask.

The "people smart" students
The "people smart" students would love to work out a quiz contest in connection with the activity series. They love to do activities which involve interaction with other students and an activity like this could be entirely organised by them with little supervision from the teacher

The "self smart" students
The "self smart" students may be encouraged to make mind maps. This helps them to understand how their own mind works in remembering facts.

The "nature smart" students
The "nature smart" students may like to assemble metals in their natural form according to the activity series these students will have the ability to remember these better when they see them. For example they see for themselves sodium corroding while they watch and copper existing for a longer time without corroding showing sodium is more reactive then copper.

Drama or role play
Drama, or role play during science classes is usually not heard of, but these help to satisfy many intelligences of students. The trail of sodium is one such drama worked out in a science classroom. The story goes like this:

Sodium is the village ruffian. While chlorine was taking a swim in the round bottom flask, sodium passed by and peeped into the flask. He took one of his electrons, - the outermost one - and threw it toward chlorine. It got stuck on chlorine’s outmost shell, completely changing her from an atomic to an ionic structure. In shock and dismay she went home. Her sisters, fluorine and iodine, could not even recognize her. They decided to go to the police to make a complaint. Sodium was arrested and produced in court where carbon was the judge [why?] Sodium’s counsel was magnesium [why?] and chlorine’s counsel was sulphur [why?]. chlorine was put on the stand

and she told what happened. On cross examination, oxygen charged that chlorine belonged to the halogen family. That family loves to collect electrons to obtain the octet structure. Therefore, in fact, she grabbed sodium's outmost electron and thus sodium did not throw it at her.

As sodium's witness, Dr Mercury was called to the stand where he said that sodium is not a violent person and that he mixes well with him [sodium - mercury amalgam], but on cross examination it was found that when the amalgam was put into water, sodium leaves mercury with a violent noise indicating that sodium is a violent person.

The jury retires and brings in a verdict of guilty with recommendation for mercy since there was some provocation by chlorine. The judge sentenced sodium into the custody of kerosene for the rest his life.

The drama written and enacted by the students will help to satisfy the needs of many types of intelligences such as linguistic special musical if students wish to have some music associated with the drama. Kinesthetic since there will be acting, interpersonal, because there will be interactions between students during the drama. What a lot of Chemistry is to be learned during this drama!

Bridge Building

Some teachers use what is known as bridge building so that many of the known, as well as unknown, intelligences are catered for. Even though Howard Gardner identified 8 intelligences, critiques of Gardner state that there are many other intelligences yet to be discovered. A teacher, for example, can use a flower for dissection and show all the parts of the flower. After that the teacher could take another flower and invite students to admire the beauty of the flower and inhale the scent of the flower, thereby bringing the students into another world -the world of aesthetics, where scientists fear to tread - colour perhaps for those with special intelligence or the flower itself for those who are nature smart or have naturalistic intelligence. The linguistic intelligent students will write about the flower and remember the names of the parts of the flower. And then what about the smell? Is it an intelligence yet to be recognised?

Rainbow

An example from physics is the rainbow. The "word smart" students will again make a mnemonic like VIBGYOR to remember the colors of the rainbow in order - violet indigo blue green yellow orange red. The picture smart student may want to draw the colors on cards, mix them up and put them in the correct order again. The cards containing the names of colors could be given to different students and teacher may ask them to move about freely in the class and then, on a signal by the teacher, they arrange themselves according to the colors of the rainbow. The body smart students, along with people smart students, will love this. The naturalistic intelligent students will be asked to make rainbows using light passing through prisms or water tanks.

Concluding remarks

Of course most of these activities have been carried out by progressive science teachers in the past to make science lesson interesting to the students. However, now lesson planners and teachers who are in sympathy with the MI theory do it not as an optional activity, but as an important activity to satisfy the needs of different intelligences of students. Once the lessons planners and teachers focus themselves this way, options for teaching and learning are many and hopefully there will be new exiting developments in learning and teaching science during the next decade.

6. Calendar of Events

Guangxi Normal University
广西师范大学

The Second International Workshop on Innovative Science Teaching

Nov. 1-3, 2009

Guangxi Normal University, Guilin, China

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

Organized by ICASE-GNU Guilin Teacher Training Center(GTTC)

Research Institute of Science Education (RISE), Guangxi Normal University（GNU）

THEME: Developing Quality Resources and Creative Classroom Utilization to Make Science Teaching Innovative and Effective.

OBJECTVES: Following the success of founding workshop of the ICASE Guilin Teacher Training Center, this workshop 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 create and wisely use high educationally valued teaching materials in order to make genuine 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.

VENUE The workshop will take place at the Yuchai Campus of Guangxi Normal University, Guilin, P. R. China. All the academic activities will be accommodated by RISE facilities.
DATE 1st – 3th Nov. 2009
ACCOMMODATION Accommodation will be reserved upon request. Special room rate will be arranged in nearby hotels, details of which are available from the secretariat.
PROGRAMME The updated information about workshop arrangement will be available in the RISE website: www.risechina.org
INVITATION FOR PARTICIPATION AND VISA APPLICATION On request, the secretariat of the workshop will send an official invitation for participation in the workshop.
LANGUAGE The language of the workshop will be English**.**
REGISTRATION FEES The registration fees are as follows:
Active participants 1,000□ Accompanying person 700□
(7□≈1$, all payments will be collected in RMB□ or US$ in cash on registration day)

SECRETARIAT
Miss Handan HUANG, Research Institute of Science Education
Guangxi Normal University, Guilin 541004, P. R. China E-mail: gxnucsc@sohu.com

Cosmed 2009, the 3rd International Science and Mathematics Education conference will be held at RECSAM, Penang, Malaysia from the 10-12 November 2009. The theme of the conference is Improving Science and Mathematics Literacy, Theory, Innovation and Practice.

The objectives of the conference are:

To provide a forum to review views, exchange ideas and share experiences, especially on the development of scientific and mathematcial literacy at all levels
To review and recognise the integrationof ICT to develop sciecn eand mathematics literacy
To review and enhance continuous professional development as a means to sustain the development of sciecne and mathematcis literacy
To encourage the sharing of knowledge skills and epxerineces of experts working on new strategies to sustain sciecn eand mathematcis literacy reforms in teaching and assessment
To strengthen professional networkinng among sciecne and mathematcis educators both locally and globally
To maintain professinal contacts to enhacne among a consortium of internationla orgnaisations and educational institutional to facilitate greater dissemination and exchange of expertise at an international level.

Key note speakers are Kaye Stacy, Foundation Professor of Mathetical Education, University of Melbourne, Australia and Profesor David Treagust, Deputy Dean of Graduate Studies, Science and Mathematics Education Centre, Curtin University of Technology, W.Australia. Participants can registr online at www.recsam.edu.my/cosmed.

The Association for Science Education, UK will hold its annula conferecne att he University of Nottingham from Thursday the 7th january to Saturday, 9th January, 2010. This year's conferecne theme is 'Inspirational Science: the Best in Science Teaching and Leanirng.' Please consult the website www.ase.org.uk fo rfurther details..

National Science Teachers Association (NSTA), Philadelphia, USA

The next NSTA **National Conference will be held in** Philadelphia, PA from March 19-21, 2010. Please consult the NSTA website for more details. An international day will be held on the 18th March

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.

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

[See website for more details about the call for papers - www.WorldSTE2010.ut.ee]

10th ECRISE and 4th DidSci conference, Krakow, Poland July 4 – 9, 2010

The organizing committee cordially invites you to attend and participate in the 10th European Conference on Research In Chemistry Education (ECRICE) and 4th International Conference Research in Didactics of the Sciences (DidSci). We kindly invite all academicians, doctoral students, science teachers, and researchers to take part in these events.

Based on a long tradition, ECRICE is organized under the auspices of EuCheMS (formerly FECS), in relation to the activity of the Division of Chemical Education. This meeting follows successful conferences held in Istanbul (2008), Budapest (2006), Ljubljana (2004), Aveiro (2001) etc. This Conference is an opportunity to exchange experiences on research in chemical education (ECRICE) and research & practice in natural science education (DisSci) carried out at every education level from primary school to graduate studies. The aim of the conference is to familiarize participants with the most recent achievements in the various scientific centres.
The programme will feature a wide variety of plenary, invited and contributed lectures, as well as poster sessions. Topics include:

- Results of science/chemical education research and reports on evidence-based and/or research informed practice at all levels in the fields.
- Teaching and learning chemistry/science at all level of education (from elementary schools to universities, general and vocational schools).
- Life long learning in chemistry/science.
- New technologies in chemical/science education.
- Laboratory work (Micro Scale Chemistry, safety issues etc.).
- Chemistry/science teachers' education (pre- and in-service training).
- Teaching chemistry/science to students with diverse abilities (teaching gifted student, teaching students with learning difficulties).
- Critical analysis of chemistry/science textbooks and curricula.
- Green chemistry and environmental chemistry education.
- Ethical issues in chemistry/science education and research
- Chemistry and Society, public understanding of chemistry.
- History and philosophy of chemistry/science.
- Chemistry/science and industry.
- International programmes and projects in chemistry/science education.

Abstracts of oral contributions and posters will be peer reviewed. The language of ECRICE will be English, whereas the language of the DidSci component of the conference will be English, Polish, Czech, and Slovak. For more information contact: Iwona Maciejowska ECRICE 2010 secretary at e-mail address: ecrice2010@ap.krakow.pl or Małgorzata Nodzynska DIDSCI 2010 secretary at e-mail address: didsci2010@ap.krakow.pl

SPECIAL NOTICE to Science Teacher Associations and Science Education Organisations

Why not advertise your conference, symposium or meeting in this newsletter!! Whether the event is national, regional or international, or your organisation is large of small, activities and events can be of interest to science teachers and others worldwide. Please send details, especially for events in 2010 to Jack Holbrook the ICASE President (e-mail jack @ut.ee. Insofar as space permits, this section of the newsletter can carry all information you supply.

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
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Treasurer
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Regional Representative for Africa
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(Member Organisation – Science Teachers Association of Nigeria)

Regional Representative for Asia
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Regional Representative for Australia/Pacific
Dr Beverley Cooper
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Regional Representative for North America
Prof Norman Lederman
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Chairs of Standing Committees
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Dr Ken Roy
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