Supporting and promoting science education internationally

The ICASE Newsletter September 2009

Newsletter of the International Council of Associations for Science Education.

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

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 Journal

The journal will continue to be a peer reviewed journal concentrating on 'what research says to the science teacher,' or 'what science teacher organisations see as innovative ideas.' ICASE had hoped to get the new version up and running by June 2009, but this is delayed while the ICASE website is being upgraded. Nevertheless, **ICASE now welcomes submission of articles**. As always, ICASE will publish articles in English and will help with the editing of English for those writing who are not native English speakers. Submissions from member organisations related to their operations which may interest an international readership are very welcome.
For more details and how to make submissions online and for other matters related to the journal, please contact, in the first instance, the ICASE President, or your regional representative (see section 7 of this newsletter).

ICASE World Conference 2010

The call for papers is now out (see www.worldSTE2020.ut.ee). Shortly details for making online submissions will be available on this website. The conference website will be linked also to the main ICASE website – www.icaseonline.net.

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 organisation' located in the country where the conference will be staged. ICASE and the host 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 organisations interested in becoming a partner with ICASE as host organisation for ICASE2010.

ICASE World Conferences have previously been held in Penang, Malaysia in April 2003 and Perth, Australia in July 2007. The 2010 ICASE World Conference will be held in Tartu, Estonia from 28 June to 2 July.

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.

Guidelines for expression of Interest in being a partner with ICASE as host organisation for ICASE2013
Proposals should include the following information.

1. Name of host organisation
2. Nature of organisation, including:
   - size
   - numbers of volunteers and staff
   - names of key individuals
3. Experience of organisation in managing major events, including:
   - examples of other events
   - technological infrastructure to manage registrations
   - financial capability eg. ability to process credit card payments
4. Details on country and city where the conference would be held, including:
   - climate
   - access for international visitors, including travel and visa arrangements
   - other attractions for visitors
5. Potential venues for conference and range of available accommodation
6. Likely approximate date for conference, with reasons for the choice
7. Potential local partners and supporters
8. Potential sponsors for the World Conference or for events at the conference such as the Conference Dinner
9. It is expected that the ICASE General Assembly will be held during the ICASE2013. Please indicate ways in which you can support this.
10. Other advantages of your proposal.

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.

Using a SCENARIO APPROACH to the teaching of Basic and Primary SCIENCE in Nigerian schools – submitted by Remi Olaniran Nesto College, Oyo, Oyo State based on outcomes of an annual Oyo State STAN meeting.


Teacher panel groups at work

Contributions from Panel 1 - INTEGRATED SCIENCE PANEL

1st Scenario - To teach BLOOD CIRCULATION

When a teacher enters a class, he/she finds a student bleeding from the ankle. The colour of the blood attracts the teacher's attention. The blood has clotted already. The teacher asks the students for the constituents of blood i.e. red blood cells, white blood cells, platelets, plasma... The red colour is due to heamoglobin, the clotting is due to Vit. K and fibrinogen, the liquid state of blood is due to plasma etc. With this scenario Blood and blood circulation can be taught.

2nd Scenario - To teach PHYSICAL & CHEMICAL CHANGE:

A student reported that in their compound some boys were running after one another with a lighted candle. When the saw the mother of one of them coming the one holding the candle blew it out, dropped it on the floor and ran away. When they came back to the scene after some time it was discovered that the candle the boy dropped has completely melted and changed to liquid form. The teacher can use the scenario to explain that the candle changed from solid to liquid state and other examples like iced blocked to water and then to gas after boiling could also be demonstrated.

3rd Scenario - To teach Properties of Acids

A student was found with burns on his arm containing bloody patches and he claimed that his mate poured acid on him when they went to the senior's practical class. This can be used to teach the properties of acid whereby the corrosiveness of acids is seen. Other properties like the taste and combination with alkali to form salt and water could also be demonstrated.

4th Scenario - To teach EYE DEFECT AND CORRECTION

A teacher noticed that a student could not write when he moves closer to the chalkboard. The teacher asked the boy to go to the back of the class and he could now see well. This scenario can be used to teach eye defect and their corrections i.e. myopia, hypermetopia etc.

MEMBERS OF THE INTEGRATED SCIENCE PANEL

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Contributions from Panel 2 - PHYSICS PANEL

1st Scenario - To Teach Light, Electric Charge

A teacher enters a class; suddenly it becomes dark and cloudy, it is about to rain. The students could no longer see the board. The teacher used that to introduce Light Energy and Reflection.

2nd Scenario - To teach MOMENTUM

Two students running for lectures/lesson and inadvertently they collided. Luckily they are not hurt. The scene forms an interesting case which can be used to teach about momentum.

3rd Scenario - To teach MACHINE

A student came late to class. The teacher asked what happened. The student said his father was driving him to school when the car had a flat tyre. There was no jack to lift the car, so he and his father lifted the car using a rod and a plank. This formed a scenario to teach about machines.

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Contributions from Panel 3 - CHEMISTRY PANEL

1st Scenario

The teacher entering a cafeteria and seeing a student eating an unripe fruit (citrus fruit-orange). The teacher uses the scenario in class to introduce a topic "ACIDS" Teaching the students that the unripe fruit consist of citric acid. The fruit can then be used to treat some properties of acids

2nd Scenario

A student reported that at a birthday party he attended his younger sister complained of stomach upset after taking four bottles of coca-cola. The teacher can then use a bottle of drink in the class and allow students to observe the gas given off immediately the bottle top is opened. Tests can be carried out on the gas (like making it come in contact with lime-water, with which it turns milky)

to make the students see that it is carbon (IV) oxide. The teacher can guide the students to explain that the volume of the gas caused the stomach upset.

3rd Scenario

A girl in class discovered that her friend had a stain on her uniform and was just squeezing the surface to see if it could be removed. The chemistry teacher on her way to the class saw them in the corridor, asked them to come in and uses the scenario to introduce the action of chlorine as a bleaching agent.

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10. Mr Amusat A.I – Nesto College, Oyo.

Contributions from Panel 4 - PRIMARY SCIENCE PANEL

1st Scenario - To Teach Heat & Temperature

A student observed in class, 90% pupils were wearing their cardigans in the morning session, but immediately after the long break around noon, all those wearing cardigans in the morning had removed them. The teacher used this to explain ideas of Heat and Temperature.

2nd Scenario - To teach Friction.

After the morning assembly, as the pupils were marching to their classes, a girl slipped and fell, her mates laughed at her and eventually a friend helped her up. The teacher can refer to that scenario in class to teach the topic of friction (and how science is also about team work).

3rd Scenario

A pupil forgot her food flask in the school on a Friday, retrieved it on Monday. She opened it in class. The foul odour from the flask could be used to teach pollution, and effect of germs on food.

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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.

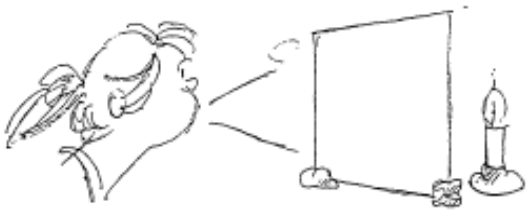
ICASE would be delighted to publish your favourite activities. Please send to jack@ut.ee

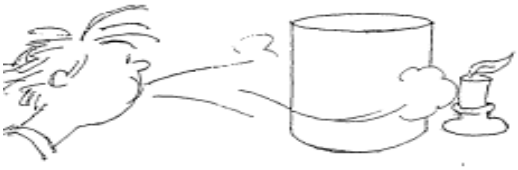
A) STEP ACTIVITY

Blowing Out Candles

Challenge: How is it possible to blow out a candle when it is behind something?

You will need
Matches
Candle
Cardboard
Plasticine
Large tin can
Jar lid or saucer
Safe surface





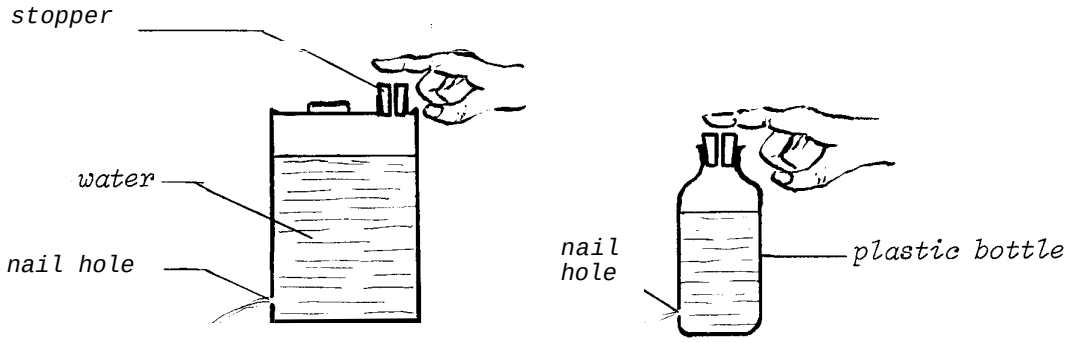
What to do
Prepare a safe surface to work on – aluminium foil or a large metal cooking try will help to keep this activity safe. Use plasticine to hold the cardboard upright.
Use a little plasticine to hold the candle upright in a lid of a jar or a saucer. Place the candle behind the cardboard. Light the candle.
Try to blow out the candle by blowing towards the cardboard. What happens to the candle flame?
Next place the candle behind the large tin and light the candle. Try to blow out the candle by blowing towards the tine. What happens to the candle flame. Can you blow the flame out?

More to do
How could you shape the cardboard so that you can blow the candle out? Are there shapes other than a cylinder which enable you to blow out a flame?
Place the candle in front of the tin. Blow out the candle so that a trail of smoke remains. Can you see the smoke trail bending around the tin when you blow gentle blow towards the tin?

B) ADDITIONAL SCIENCE ACTIVITY

STOP THE LEAK

Materials: 1. An empty can or plastic bottle.
2. A one-hole stopper fitting the neck of the can or bottle.



Procedure

1. Punch a hole in the side near the bottom of the can or bottle with a small nail
2 Fill the can or bottle with water and show the leaking container.
3 Ask "How can I stop the leak without wetting my finger?"
4. Put the one hope stopper in the can or bottle and cover the hole with your finger: the leak is stopped!
5. Release your finger from the stopper: the leak will start again.

Questions

1. Why did the water stop flowing out of the can?
2. How could we stop the leak without the one hole stopper?
3. Does the water stop flowing immediately after the hole is covered?
4. How does the air pressure inside the can compare with the atmospheric air pressure after the water stops flowing?
5. What is it that we prevent from entering the can by covering the hole?

Explanation

The water does not stop flowing immediately after covering the stopper, but it still keeps dripping out of the can for a while. This increases the volume of the air pocket above the water. The amount of air stays the same because air is prevented from coming into the hole in the stopper. The increase in volume causes a decrease in pressure (Boyle's Law). The outside atmospheric air pressure pushes against the water and prevents it from flowing out.

This is why we always punch two holes in a can of evaporated milk in order to pour the milk out. Also on a gallon frying-oil can, it usually is recommended to punch a hole in a corner opposite the pouring spout. This hole will allow air to enter the can while oil pours out. It will promote a smooth flowing of oil out of the can.

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.

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 value of using a scenario to initiate a context-based approach to the teaching of sections of the science curriculum.*
- *The need for the scenario to relate to issues that have a scientific input, that is, the issues can be considered as both social and scientific – that is, socio-scientific. The science cannot supply the answer to the issue by itself, as other considerations impact on the decision, but an understanding of the scientific ideas underlying the issue enables an enriched discussion of the issue and the type of decision that might be appropriate.*

This leads to 2 key questions to be developed further -

1. If in stage 2, as indicated in the last article, teaching becomes decontextualised, why should this be any more relevant than teaching where the teacher uses an interesting scientific example to begin the lesson?
2. What does a scenario look like?

The stage 1 approach, using a scenario, considers an issue related to a familiar context where a major goal is to establish relevance of the science teaching in the eyes of the students. Using an interesting scientific example, or demonstration, as the introduction to the teaching tends to focus on 'interest in, or popularity of, the subject. While the popularity is helpful and can trigger student motivation, this lead into the teaching is confined to the science and is thus limited in its relevance value with respect to everyday life. For students in grades 6-9, where a scientific career has yet to be established, placing emphasis on relevance has been shown to be important. This, however, does not negate the 'set' (the introduction) of lessons being used as interesting stimuli.

Stage 2 is the gaining of an understanding of the science pertaining to the issue so as to better appreciate the scientific ideas involved in resolving the issue (put forward in stage 1). By and large, stage 2 can be considered as problem solving in a scientific sense. It is decontextualised from the socio-scientific issue so that the scientific ideas can be approached in a more simplified manner. However, the learning is still derived from the issue and hence the issue sets the parameters for the scientific learning. Using the scientific ideas that have been developed in relation to the issue promotes a further state – stage 3 – which will be considered in a later column.

In a social constructivist manner, the problem solving in stage 2 can involve the students in exploring the science and in so doing, take on a student-centred, inquiry learning approach. The degree of decontextualisation is governed by the teacher. This means the teacher decides whether scientific ideas within a topic are studied as a whole, or whether components of different topics are combined in a scientific sense. The decision will depend on the extent of relevant teaching perceived by the teacher as suitable for the students. Under these conditions, the depth and width of scientific conceptual ideas are now guided by the perceived relevance to the issue. This contrasts with a scientifically arranged sequencing of ideas perceived appropriate from a scientist's point of view.

With relevance as the driving force, the teaching is driven by educational considerations. For example, the teacher can use Vygotsky's idea of students taking responsibility for their learning,

with the teacher extending their 'zone of proximal development' through individual supportive/challenging measures. This contrasts with teaching 'covering the curriculum,' or the textbook 'topic' without consideration of the student's prior learning. It contrasts with situations where the teacher deems it necessary to cover everything in the stated sequence and to the stated depth of treatment (in the curriculum or more likely, the textbook). The relevance approach suggests the teacher needs to be in-charge. The teacher determines when the teaching, in a given scientific area, is no longer interesting (popular) or meaningful (relevant) for students. This approach rejects the notion of the textbook/curriculum document being the driving force. It rejects the notion that the students are compelled to learn in the stated sequence and stated depth at a time determined by others, no matter whether relevance and popularity are being established.

Within the stage 2 approach, relevance is maintained. It is first established through the relevance of the scientific problem solving being triggered by stage 1 and second by the teachers relating the decontextualised learning to its purpose, which is being able to further consider the issue.

It is therefore hypothesised that science curricula, based on so-called 'fundamental' or 'basic' ideas of science, and developed in a scientific logical fashion (fundamental to complex; simple to difficult; experimental to theoretical; observable to abstract, etc), are **not conducive** to establishing the relevance of science learning. Even more, the concept map approach to teaching (linking science concepts in a logical pattern) is no longer advocated as the desired initiation of the science teaching. In fact, it is exactly the opposite. Scientific conceptual interlinking is the applied outcome of the learning by the students, as the students, themselves, demonstrate their conceptual learning by forming the links. Thus the approach to student learning is through relevance to the society, although the scientific literacy being attained is much wider. The learning aspires to students making connections both at a biology or chemistry or physics level and also at an interdisciplinary level. The pace of teaching and the number of lesson devoted to stage 2 is thus determined by the teacher who is noting the situation as it unfolds. As it is suggested that this stage involves inquiry learning, the minimum number of lessons envisaged is 2 (otherwise there will be insufficient time for development of learning at a conceptual level, process skills level, personal development level and even in this stage social developmental learning e.g. through cooperative learning). More realistically, stage 2 will take 4 or more lessons, being greater for older students where the conceptualisations are likely to require more consolidation time. The need for emphasis on student self-learning now becomes more evident.

In the learning approach being suggested, the scenario is an important part of the teaching for relevance. Although it is not introduced every lesson, but interrelates to a series of lessons - (anywhere from 4 to 10 lessons depending on the issue, the time required for consolidation of the ideas involved and the student interest) – the scenario provides a focus on the socio-scientific issue which the teacher can utilise in providing the rationale for the teaching.

The scenario does not have a fixed format. It is best considered as a suitable trigger to allow students to be involved in considering a socio-scientific issue or concern.. It can be visual, but is usually presented in written format and seeks emotional engagement by students in an interactive manner. An example of a scenario is given in the next newsletter, but it is important to note than this example is in no way intended to be representative and it will interesting to learn from teachers of the diversity of potential scenarios that can be utilised.

This leads to further questions to consider in the next newsletter.

What is an example of a scenario ?

What is stage 3?

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

Sun Safety In Science!

I. Sun Statistics and the Science Teacher!

The American Cancer Society statistics indicate that most of the more than 1 million cases of non-melanoma skin cancer diagnosed yearly in the United States are considered "sun-related." Melanoma, the most serious type of skin cancer, accounted for about 60,000 new cases of skin cancer in 2007 and most (about 8,100) of the approximately 11,000 deaths due to skin cancer each year. In addition, more than 1 million Americans will develop non-melanoma skin cancers this year, and more than 2,800 will die from the disease.

According to a 2006/2007 report by the Australian Institute of Health and Welfare (AIHW) & Australasian Association of Cancer Registries, Australia has the highest rate of skin cancer in the world. Skin cancers account for around 80% of all new cancers diagnosed each year in Australia. Each year Australians are four times more likely to develop a common skin cancer than any other form of cancer. Over 380,000 Australians are treated annually for skin cancer. That equates to over 1,000 people every day. The melanoma incidence rates in Australia and New Zealand are around four times as high as those found in Canada, the United States and the United Kingdom. This is a result of a combination of tropical latitude, fair-skinned population, outdoor lifestyle, and a high amount of ambient ultraviolet radiation (UV). In response to this situation, the Australian government has a rigorous offensive against UV exposure, with a focus on school-aged children.

Looking to the future, the U.S. Environmental Protection Agency warns that Americans could suffer 40 million cases of skin cancer and 800,000 cancer deaths in the next 88 years because of depletion of atmospheric ozone.

So what does all of these statistics and the concern about skin cancer have to do with the teaching of Science? Here are two ideas to think about:

1. With the resurrection of hands-on science, science teachers and their students seem to be spending more time out in the field. With this comes the increased exposure to UV rays.
2. With the increase in skin cancers forecasted at younger ages, science teachers need to get the word out about sun safety using the "power of the chalk!"

II. A Primer: What Are The Common Types Of Skin Cancer?

The two most common types of skin cancer are basal cell and squamous cell carcinomas. Basal cells are small and round cells found in the base of the outer skin layer. Squamous cells are flat cells forming the surface of the skin. Both of these are highly curable if caught in early stages. Melanoma, the third most common skin cancer is more dangerous. Melanomas are skin cancers formed from the skin cells that make melanin pigment. The exact role played by ultraviolet light in the genesis of .melanoma is controversial and subject to debate. Genetic as well as environmental factors (sun exposure) are involved.

Skin cancer can be found early, and both doctors and patients play important roles in finding skin cancer. The following symptoms may indicate skin cancer and should be shared with your doctor:

- any change on the skin, especially in the size or color of a mole or other darkly pigmented growth or spot, or a new growth;
- scaliness, oozing, bleeding, or change in the appearance of a bump or nodule;
- the spread of pigmentation beyond its border such as dark coloring that spreads past the edge of a mole or mark;
- a change in sensation, itchiness, tenderness, or pain;
- A persistent non-healing skin lesion.

III. What Are The Risk Factors?

The Centers for Disease Control and Prevention or CDC notes certain risk factors more likely to cause skin cancer. They include the following:

A. Lighter natural skin color.
B. Family history of skin cancer.
C. Personal history of skin cancer.
D. Exposure to the sun through work and play.
E. A history of sunburns early in life.
F. Skin that burns, freckles, reddens early or becomes painful in the sun.
G. Blue or green eyes.
H. Blond or red hair.
I. Certain types and a large number of moles.

IV. How To Reduce or Prevent Skin Cancer – Using Safer Behaviors!

The most effective way to reduce or prevent skin cancer is to protect yourself from sun exposure. The CDC recommends five options including:

A. Seek shade, especially during midday hours (10 am - 4:00 p.m.)
B. Cover up with clothing to protect skin. There are several companies that offer special sun protective clothing that offers significantly greater protection than "ordinary" clothing.
C. Use a wide brim hat which will shade the head, ears and neck.
D. Use sunglasses or shades that wrap around and block 100% of UV-A and UV-B Rays.
E. Apply sunscreen with a sun protective factor (SPF) of 15 or higher with both UVA and UVB protection.

Note that although the CDC recommends an SPF of 15 or higher, most dermatologists today would now recommend SPF 30 or higher.

V. Skin Cancer Prevention Guidelines for Schools!

In the 2002 CDC report titled, "Guidelines for School Programs to Prevent Skin Cancer," seven broad guidelines were included that school programs can use to reduce the risk for skin cancer among students. This included policy, environmental change, education, families, professional development, health services and evaluation. Each guideline includes suggestions regarding key elements, steps for implementation, and realistic expectations for change. The report states the following:

- **Guideline 1: Policy** --- Establish policies that reduce exposure to UV radiation.
- **Guideline 2: Environmental change** --- Provide and maintain physical and social environments that support sun safety and that are consistent with the development of other healthful habits.
- **Guideline 3: Education** --- Provide health education to teach students the knowledge, attitudes, and behavioral skills they need to prevent skin cancer. The education should be age-appropriate and linked to opportunities for practicing sun-safety behaviors.
- **Guideline 4: Family Involvement** --- Involve family members in skin cancer prevention efforts.
- **Guideline 5: Professional development** --- Include skin cancer prevention knowledge and skills in preservice and inservice education for school administrators, teachers, physical education teachers and coaches, school nurses, and others who work with students.
- **Guideline 6: Health services** --- Complement and support skin cancer prevention education and sun-safety environments and policies with school health services.
- **Guideline 7: Evaluation** --- Periodically evaluate whether schools are implementing the guidelines on policies, environmental change, education, families, professional development, and health services.

V. Science Teachers – An Important Role!

The trend for skin cancer is showing increases worldwide. Schools and especially science teachers need to play a major role in helping to protect students from unnecessary exposure to sunlight and UV radiation. Science teachers can be effective in this area relative to curriculum development, professional development, policies and environmental changes. Their expertise and influence with students make them a critical catalyst in providing essential skin protection safety and modeling appropriate sun exposure behaviors. A majority of skin cancer can be prevented. Help make the difference in your students' future quality of health and life

RESOURCES:

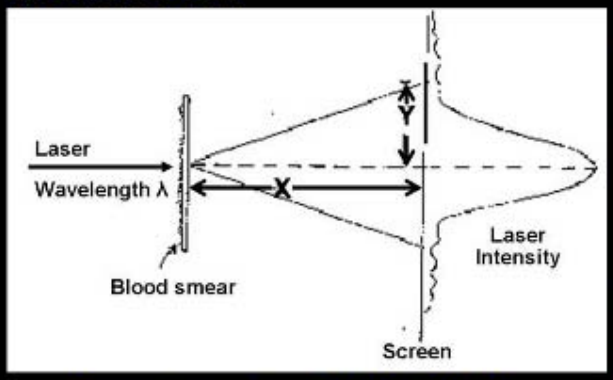
American Cancer Society – http://www.cancer.org
American Academy of Dermatology – http://www.aad.org
Australian Institute of Health and Welfare - http://www.aihw.gov.au/
Centers For Disease Control and Prevention- http://www.CDC.gov
CDC 2002 Report: Guidelines for School Programs To Prevent Skin Cancer
http://www.cdc.gov/MMWR/preview/mmwrhtml/rr5104a1.htm

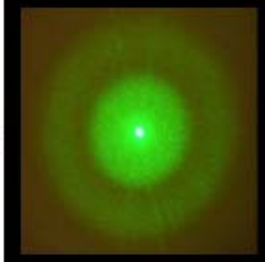
EDITOR'S NOTE: Special thanks to dermatologist Andrew V. Atton, M.D., Glastonbury, Connecticut, USA for his professional review and contributions to this article.

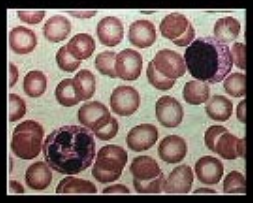
5. Janchai Corner

Measurement of red blood cell size

Particles smaller than wavelength of light can be measured by diffraction of laser light. Diffraction equation can be applied to measure the size of particles like red blood cells.





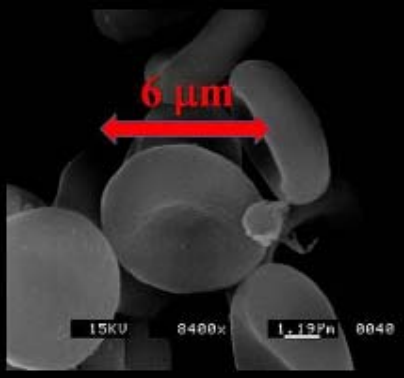


$$\text{Diameter } d = \frac{\lambda.(X^2 + Y^2)^{1/2}}{Y}$$

d = Red blood cell diameter

λ = Wavelength of a laser beam

From the Experiment



Green Laser Experiment
X = 41.0 cm, Y = 3.5 cm
λ = 532 nm, d = 6.2 μm

Red Laser Experiment
X = 41.0 cm, Y = 4.3 cm
λ = 650 nm, d = 6.2 μm

$$\text{Diameter } d = \frac{\lambda.(X^2 + Y^2)^{1/2}}{Y}$$

Red Blood cell Size = 6.2 μm

close to result from Electron microscope

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.

National Science Teachers Association (NSTA), Philadelphia, USA
The next NSTA **National Conference will be held in** Philadelphia, PA from March 17-21, 2010. Please consult the NSTA website for more details. An international day will be held on the 16th 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)**

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Chairs of Standing Committees
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Pre-secondary and Informal Science Education
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