International Council of Associations for Science Education

Supporting and promoting science education internationally
The ICASE Newsletter

MAR-APR 2013

Welcome to the ICASE Mar-Apr 2013 Newsletter !

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

The International Council of Associations for Science Education (ICASE) was established in 1973 to extend and improve science education for chldren and young people throughout the world. Today, ICASE is a vast network of science teacher education associations, institutions, foundations and companies, working together to promote science and technology education around the world. ICASE facilitates communication and cooperation at national, regional, and international levels.

International Council of Associations for Science Education

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Contents of Newsletter

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ICASE News

Jack Holbrook, ICASE Projects & Secondary Journal

ICASE News

Inauguration of UCC as an ICASE Centre

Although the plaque for University College Cork (UCC) to be an ICASE centre was presented during the seminar in Bangkok in December 2012, the actual inauguration ceremony for the University itself took place on 22 February in the presence of the University President, the Head of College for Science, and an audience of officials and school students.

Photo of plaque presentation: Pictured at the official presentation of the ICASE plaque were (left to right): Mr. Noel Brett, Eureka Centre, UCC, Dr. Jill Haynes, Eureka Centre UCC, Dr. Teresa Kennedy, Professor Jack Holbrook, Professor Patrick Fitzpatrick, Head of College of Science, Engineering and Food Science, Dr. Declan Kennedy, Department of Education UCC, Mr. John Lucey, Department of Education at UCC.

Photo at Simon's School: Professor Jack Holbrook making a presentation to Simon Hill in appreciation of his work for the PROFILES project. Also present were Mr. Christy Healy, Principal, Dr. Declan Kennedy, and some of the visiting ICASE teachers from France. The photo was taken outside the school on the occasion of a PROFILES lesson taught by Simon Hill and attended by 4 of the visiting French teachers from Nantes.

PROFILES event: Group of ICASE teachers from Nantes, France, at the Eureka Centre inservice training.

Lab photo: Irish Minister Sean Sherlock, Department of Education & Skills with responsibility for Research & Innovation, learning about the electrolysis of water from students at the official opening of the Eureka Centre, UCC.

ICASE Workshops, Izmir-TURKEY 2013

An ICASE Workshop was held on the PROFILES project and popularisation of science in Izmir on 14-15 March 2012. The event was organised by Dr. Bulent Cavas, the ICASE Chair for the Publications Standing Committee and led by Dr. Jack Holbrook, Chair of the ICASE Projects and Secondary Science Journal Committee, and Dr. Janchai Yingprayoon, the Chair of the ICASE Science and Technology Education Centres (ISTECs) Standing Committee.

Is cloning possible? A presentation by Dr. Jack Holbrook and Dr. Janchai Yingprayoon on the Nature of Science and Science Education.

A PROFILES presentation to Izmir teachers by Dr. Jack Holbrook.

Dr. Janchai Yingproyoon making a presentation on teaching ideas to make science popular.

Teachers attending the Profiles Workshop.

Introducing ICASE-MICE

Brigitte Blanchard (ICASE-MICE)

French teachers from the Nantes area in France collaborated with teachers linked to University College Cork at new ICASE Regional Centre

Last February, 12 teachers of the Nantes area, all members of the MICE association (Innovative Methods in a European Context) flew to Cork.

They attended the official opening of the Eureka Center in the University of Cork and participated in a seminar given by Declan Kennedy, John Lucey (UCC/ICASE) and Jack Holbrook (ICASE).

As president of the MICE association, let me tell you a few words on what happened there and what it meant to all of us.

In France, like in many European countries, less and less money is dedicated to the continuous training of teachers. We decided to create an association to tackle that issue and not wait any longer on state programmes to assure our own development. Our concern met the PROFILES (professional reflection oriented reflection on inquiry learning and education through science) issue of CPD (continuous professional development). Thanks to ICASE we are now involved in the PROFILES project, and more than happy to work with other European teachers and professors on improving our teaching.

Our presence at the official opening of the Eureka center means a lot to me.

We could feel how much we are all linked together and struggling in the same direction. A few young students attended the opening, having won some sort of scientific contest. Those young people could have been our students. Let us really learn from each other, but not only via internet, but in physical meetings too. I truly hope that the Eureka Center will be a good instrument for letting teachers meet, exchange, motivate each other and building a real network of colleagues and friends.

In Cork, we had interesting lectures given by Declan Kennedy, John Lucey and Jack Holbrook. One of them was on how within the Irish education system students are assessed on their inquiry skills at the junior certificate level. The group found this very interesting. In France, we assess lab skills of each student in biology, physics and chemistry during a two hours test. It's not designed to assess much related to inquiry skills.

The inquiry method in science has been implemented in France for a few years now.

It is highly recommended at the junior level, and advised at the upper level. All school books now integrate inquiry activities in each chapter. That doesn't mean that teachers implement such activities in their class, especially when the syllabi are heavy and time is short.

We were extremely happy to meet young Irish colleagues who created new PROFILES modules.

These teachers presented their creations in a very enthusiastic way and were kind enough to offer us the opportunity to visit their classes while they were actually implementing the very same modules.

As far as I'm concerned, I had the pleasure to visit Simon Hill's class. He was just starting the module he created called "Grip it or Slip it?" The module was designed for 16-year old students, but he was trying it out with a class of 14-year old. After a short presentation of the scenario, he suggested the students to draw a mind map on a blank A2 sheet. Once each group of four had thought of several factors that could affect the way a tire stays on the track, he helped each group to select a relevant factor to concentrate on. Very quickly, he showed them all kind of devices they could use, including a data-logging device and asked them to design an experiment. Just before the bell, he asked each group to give him a list of materials they would need for the next lesson.

Of course, everyone is aware of how we affect the behavior of students while observing them.
Anyway, this is what I learned from that experience:

What really surprised me was to see how reactive the students were, how fast they were able to suggest ideas and procedures. Maybe, it comes from a habit of doing so, or it may also come from the confidence they have in their teacher. Obviously, they all seemed interested in the topic. They were very active as at least 80% of the time was spent on team work activities.

What really appealed to us concerning the PROFILES approach is the societal point of view.

Not only do the modules present interesting inquiry activities, but most of them introduce decision making at some point, and that sounds new to us. It is especially appropriate for our science classes taught in English **since it allows students to improve their skills in a larger domain than just science.**

Of course, the use of PROFILES modules is time consuming when used for a regular science class, but here in France, for about three years from now, we have had more and more cross curricula courses and optional courses in which the focus is not on the knowledge, but on developing skills on scientific methods. So, those modules seem extremely appropriate to achieve that objective. In a general studies curriculum, all 15-year old students have a 3 hour course in physics and chemistry, 1,5 hours in biology and geology and 4 hours in math. On top of that, students can choose a 2 hour course called "Scientific methods and practices." They can also have an extra course of science in English as well as another course going into science in depth. So, those offer large opportunities to use the PROFILES modules.

Another point is the amount of time and energy the teacher had to devote for implementing that module: time to gather the equipment and material for the experiments, time to encourage and guide each group's imaginative ideas. For this, the teacher needs to be extremely flexible and open minded so as to be true to the concept of this open inquiry activity. Simon advised us to experiment in a similar way with a module in a knowledge area where we felt to be an expert. That seems very important to me. I agree with this: teachers will be good teachers if they take care of their self-development and gain pleasure at work. This requires time 'out of class' and opportunities for continuous professional development. PROFILES offers this. We experienced it in Cork and are grateful to the teachers and everyone that worked with us - Simon Hill, Marjorie Ryan; UCC support staff David O'Connell, Aine Hyland, John Lucey, Noël Brett, and of course Declan Kennedy (the ICASE European Representative) and Jack Holbrook (ICASE Coordinator for PROFILES).

PROFILES modules represent an advanced tool to teach science.

These modules are useful and innovative. They need to be adapted of course and it is useful for us to create other modules to fit our curriculum. Using the inquiry method is helpful and relevant, but in my opinion, we always need to keep in mind that there are two golden rules for teaching to be effective: vary the activities and ways of teaching, and be enthusiastic about what you are teaching. This leads me back to my first concern about the lack of opportunities for CPD.

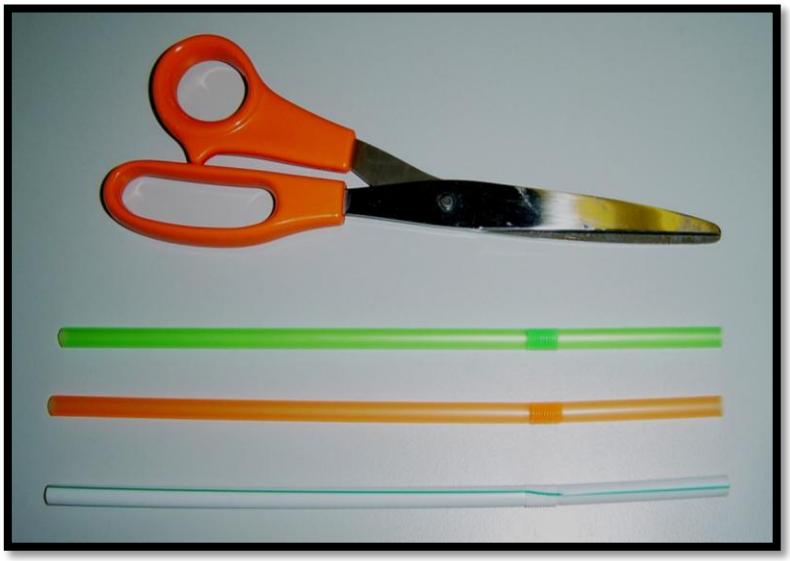
In France, there is a high pressure on headmasters to have the teachers in front of their students for each hour of the school year.

Pre-Secondary and Informal Science Activity:. Oboe

Steven S. Sexton
Chair, ICASE Pre-Secondary and Informal Science Standing Committee

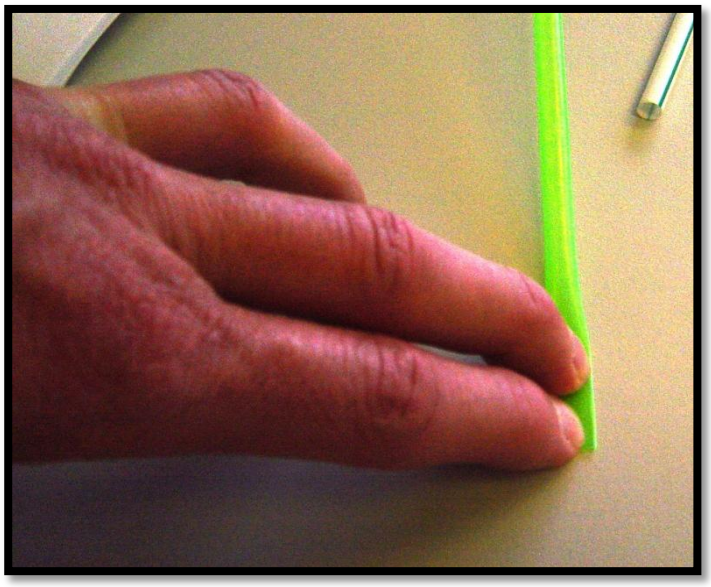
This handmade oboe is a good choice as a non-powered toy as it can easily be made and played with. The added bonus is that the material is readily available and cheap as it only requires a straw and access to scissors.

The limited construction difficulty means that this toy could be used with most age groups. With younger children this would be most difficult with cutting the straw but after that every other component should be fairly easy and straightforward.



The materials required are readily available and easy to source. As you can see you only need one straw (flexi-straws means you can modify this a few times first without cutting) and access to scissors. The straw can be any size but a standard size to start with makes this easier, as students practice one question that will more than likely arise is what would happen if the size of the straw was different – this will be explained later.

An adult should be able to make this oboe in less than five minute. Even for younger children this is very doable in one teaching session. Once students know how the construction of the oboe works then follow-up sessions could be on how to modify, alter, or improve the design of the oboe.



To begin you need to gather the materials needed.

The construction starts with flattening one end of the straw. To do this use the long end of the straw (not the flexi-bend end, if this type of straw is being used). Need to flatten about the width of two fingers, as shown. This works so much better if you make the flattened creases very flat.

Next is the only 'tricky' part and really only depends on how sharp your scissors are. Using the end that you have flattened, you need to cut it into a point as shown:

Notice, I have not made the cut the entire length of the flattened end, you can if you want as this does not prevent the oboe from working. Once again students may ask what happens if you make the cuts the full length or even shorter, this will also be addressed later.

Now the oboe is almost ready to be used. Just pick it up and using your own mouth, place the cut end in your mouth and blow. It will most likely be necessary to flatten your cut point again and as you use it to re-flatten it. It will probably take a few tries to get a noise out but with a bit of practice and repositioning the oboe in your mouth you should get a sound, see pictures.

The sound is a result of vibration. In 'reed' instruments the sounds or vibrations are made when the air travels across a thin piece of wood called a reed. The reed vibrates making the sound. Some instruments have one reed, like the clarinet and the saxophone. Other instruments use two reeds to vibrate against each other, like the oboe and the bassoon. In this case we have an 'oboe' like instrument with a 'double reed.' This double reed is made from the cut plastic end into a point.

Notes are made in woodwinds by covering holes on the long tubes. This changes the length that the air must travel when vibrating, causing the note that is played to change. The longer the tube or column of air the lower pitch the note will be. This means that to get the lowest note out of our woodwind you

should extend the flexi-bend to its fullest length. For the highest pitch, leave the flexi-bend 'scrunched' up. A further question student may ask is, can they make holes in their straws to change the sound, and this will also be addressed in a later section.

The size of the woodwind determines its pitch. Smaller woodwinds make high pitched notes, while large woodwinds make low notes, i.e. the bigger the diameter of the straw the lower the note, the smaller the diameter of the straw the higher the note.

As already mentioned, three potential questions student could ask to show that they are thinking about the science have already been included: what would happen if the size of the straw was different; what happens if you make the cuts the full length or even shorter; and can they make holes in their straws to change the sound. All three of these questions show that the students are thinking about the science of how their oboe works. Understanding about science requires students to ask questions about the science they are doing, in this case exploring how vibrations can make a useful noise. If the straw was larger, then the notes would be lower. Through further explorations of the impact of changing the size or shape of the 'reed' allows students to ask a question and then seek to find the necessary data to give an answer to own questions, similar with the impact of making holes along the length of the oboe.

As the case with most science activities, understanding about the science and further investigating in science often go hand-in-hand. The questions raised by students offer opportunities for further investigations in science. In this case, students are limited by materials available (if no larger straws are available, the question goes un-investigated but this does not necessarily mean unanswered – students with practice learn to make informed answers with the data available and then have to wait until further data is presented to challenge what they currently know). Most questions students ask have the potential to be investigated but limitations on class time tend to be the over-riding issue with whether or not more investigations or how many more investigations occur.

Specifically to investigating in acience, the students are making a model of how an oboe works. Then through playing with ways to change the sound they make, they are making further explorations to broaden their world. Being able to communicate in science about this toy is rather limited and not the primary intent of the activity. Students need to be able to use the term 'vibrations' to discuss how the oboe works. Older students or more capable students could include 'pitch', 'tone', 'resonance' and 'harmonics' depending on how far this activity was taken. The key component in science requires students to make connections between their world and science. This would be most poignant with students interested in music or orchestrates. However, most students would enjoy being able to make a toy that has an explicit intent to make a noise/sound then exploring how to make the sound change to include louder, higher or lower.

SAFE SCI: Be Protected!

By Dr. Ken Roy. Director of Environmental Health & Safety
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Ending the Lab sessioon with the Safety Dozen!

It does not matter if it is a biology, chemistry, Earth/space science or physics academic science laboratory. Ending the laboratory activity is just as important as the preparation for starting the activity safety-wise. Yet how many times do students hear the following statement from their instructor: "Oh – sorry students but time has gotten away from us and the class is over. Try putting things away before you leave." Recently a fire in a high school chemistry lab resulted from students improperly dumping chemical reaction products into the wrong waste containers while rushing out the door. The mixing of the reactants served as new products for another reaction which burst into flames. Improper and rushed clean-ups are unsafe and can lead to potential hazards such as fire, explosions, theft, etc. Teachers need to include clean-up time in their lesson planning for laboratory work. The following safety dozen for the end of lab are a good place to start:

1. Time Check: Always keep an eye on the clock and let students know that they have about 10 minutes prior to clean-up. Also allow for approximately 10 minutes of time for the actual clean-up activity. Depending on the activity, amount of equipment and labware used, etc., more or less time may be appropriate.

2. All activities stopped and finalized: Make it the standard operating procedure that as clean-up begins, all laboratory activities are to be finalized and stopped. However, personal protective equipment is to remain on all laboratory occupants until the teacher indicates it can be removed.

3. Hot plates turned off: If hot plates were used, make sure they are shut off. It might also be a good idea to use signage indicating the plate is hot if unattended.

4. Gas shut down: If gas was used, make sure the master gas control is shut down and all burners are cooled, cleaned off and put away.

5. Electrical Equipment: If any electrical equipment was used, make sure it is unplugged and stored appropriately. This would include items like microscopes with powered lights, lasers, centrifuges, ripple tank motors and lights, etc. Make sure all cords are wound up and there are no trip/fall hazards on the floor.

6. Chemicals put away & secured: One of the most important things is to make sure all chemicals are accounted for and put away. Chemicals can be placed on a cart in preparation for placement back in the secured chemical storage room or cabinets once students leave the laboratory. Also inspect containers to make sure they are sealed and properly labeled.

7. Chemical waste disposal jars: Chemical waste products need to be appropriately disposed of in assigned and labeled chemical waste jars. Remind students where the specific chemical products go – waste jar, recycled, etc.

8. Biologicals ready for sterilization: In cases of micro-organism use, have trays labeled and ready for placement of bacteria cultures to be autoclaved for sterilization and disposal.

9. Labware/glassware cleaned and away: Make sure all glassware and other labware are cleaned, dried and put in appropriate storage areas.

10. Counter tops cleaned and wiped off: Once all laboratory biologicals, chemicals and physicals are put away, have students apply appropriate cleaners to work station counter top work areas and then wipe them dry. Also make sure all slip/fall and trip fall hazards, trash, etc. are removed from the floor area.

11. PPE put away and sanitized: When the teacher determines that that laboratory is cleaned up in total, he/she can then have students remove their personal protective equipment like chemical splash goggles, aprons and gloves. These items should also be cleaned as appropriate and stored. For example, safety glasses and splash goggles should either be washed with an appropriate cleaning solution and/or placed in a goggle sanitizer.

12. Hands washed: The final act before leaving the laboratory is to require students to wash their hands with soap and water.

In The End!

Again, the clean-up laboratory procedures need to become a ritual! This helps students to be more responsible as part of doing safer laboratory work. It also helps make for a safer working/learning environment when the next class of students coming in to the laboratory.

Editors Note: Students should not do #11 until everyone in the class has completed #1-10.

ICASE World Conference on Science and Technology Education (WorldSTE2013)

29th September to 3rd October 2013
Kuching, Malaysia

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Invitation

The International Council of Associations for Science Education (ICASE), in official partnership with UNESCO, invites you to attend the World Conference on Science and Technology Education, to be held in Malaysia on the magnificent tropical island of Borneo from Sunday 29th September to Thursday 3rd October 2013.

Call for Papers

Call for papers close on the 31st January 2013. To review the submission guidelines and to submit a paper please log on to www.worldste2013.org

Delegate Registration

Special Offer - Register and pay before the 28th February 2013 and receive a further 25% discount on early bird registration. Normally ~~AUD$630~~, now AUD$475 (approximately EUR375 or GBP304). This registration fee includes

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Don't miss out, to register log on to www.worldste2013.org.
Delegates may book their own accommodation in a wide range of hotels at prices that are extremely good value. The conference recommended hotels may be found on the above website. In addition, pre and post conference tours have been organised and full details are given on the website.

Travel Arrangements

For information on travel arrangements being made for groups travelling from Europe to Borneo Malaysia, please contact Dr Declan Kennedy, ICASE European Representative, Department of Education, University College Cork, Ireland at d.kennedy@ucc.ie

Universität Bremen

Technische Universität Dortmund

Science Education Research and Education for Sustainable Development (ESD)

22nd Symposium on Chemistry and Science Education
to be held at the University of Bremen, June 19-21, 2014

(First Announcement)
www.chemiedidaktik.uni-bremen.de/symp2014/

Conference dates: June 19 - 21, 2014

Conference language: English
Venue: University of Bremen, Dept. of Biology and Chemistry building, Leobener Str. NW 2, 28334 Bremen, Germany

Conference fees:
None. Travel costs, accommodation and social events are the responsibility of the participants.

Conference chairs:
Prof. Dr. Ingo Eilks, Department of Biology and Chemistry, Institute for Science Education, University of Bremen, Leobener Str. NW 2, D-28334 Bremen, Germany,
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Prof. Dr. Bernd Ralle, Department of Chemistry, Didactics of Chemistry I, Dortmund University of Technology, Otto-Hahn-Str.6, D-44227 Dortmund, Germany,
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Further information:
Current information will be published at *www.chemiedidaktik.uni-bremen.de/symp2014/* from January 2013.

A 2nd announcement will follow in Autumn 2013.

ICASE Executive Committee 2011-2013

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

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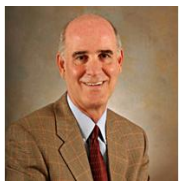

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