



ISSN Number 08190879

Editor: Jessica Boys

LTAV Website
www.ltav.org.au

Science ASSIST re-opens!

CSIRO Education has offered interim funding for Science ASSIST and will work in collaboration with ASTA to secure long term sustainable funding for the program.

The Science ASSIST team has reopened the Q&A section of the website to answer all of your questions regarding school laboratory and science room safety.

You have continued free access to all of the technical resources including SOPs, RAs, Information sheets and the Chemical Management Handbook.

To stay up-to-date on all the latest questions subscribe to the Science ASSIST eNews.

assist.asta.edu.au



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Deadline for next Lablines 2019

15th November 2019

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DISCLAIMER

The views expressed in "Lablines" are not necessarily the opinions of the committee.
There is no responsibility taken for the results of any experiments published in "Lablines" and replicated elsewhere. Risk assessments should be carried out before attempting same.

Front Cover: '3D printed models for display during Science Week', Amy Zdrzalka, Senior Laboratory Technician at Broadford Secondary. Article on page 6.

President's Report

Geoff Gleadall
LTAV President



Congratulations on surviving the first half of the year and battling on with the rest of it.

There are times when it seems like a never ending battle and you keep telling

people that you will worry about draining the swamp when you have dealt with beating off the crocodiles.

On the more positive side, by now you will all be thinking about what sessions you want to attend at LABCON 2019, if you have not already, and are trying to convince the admin that yes they really should be paying for your professional development, then good luck!

Your association works hard at providing resources to help you to do your jobs, it would be nice if your hard work were more often recognised. The STAR week did elicit recognition for some and was ignored in a lot of other cases. The reality is that many never notice us unless something has gone wrong or for some reason we are not there.

Looking back at the last 45 years there has been so much that has simply not changed, but we are working on it.

As we approach LABCON 2019, it is perhaps a good time to also think about what you can do for your colleagues. Some might consider nominating for a job on the LTAV Committee, or perhaps as a Regional Representative, or even just assisting your Regional Representative. Those with some experience might think of helping our colleagues via the list-serv.

Whatever else happens, we hope you have a productive and satisfying time leading up to the end of the year. Remember if you do strike a bump in the road, there are people in LTAV who can help you.



LTAV IS LOOKING FOR A NEW LABLINES EDITOR

LTAV is looking for a new Lablines Editor to take over the collection of content, formatting and publishing of the quarterly Lablines magazine in 2020.

If you are interested in tracking down content, finding out about Lab Techs across Victoria, writing and design, then this could be for you!

You don't have to feel able, qualified or prepared! Just passionate and enthusiastic! You will be provided with thorough training, handover and support from LTAV's current Editor.

Competency in the use of Microsoft Word will prove very helpful.

Please refer all interest and enquiries to:

admin@ltav.org.au



A national week of celebration for School Science Technicians has been organised by Science Education Technicians Australia (SETA). This annual event will be known as #STARweek and be held the week after Science Week each year. This year #STARweek was from 19 August 2019 to 23 August 2019. Jump onto starweek.org.au to join the celebration and see photos.

In the News

Whoops. Did we just accidentally release life onto the moon?

It was a great plan. Let's be the first private space company to land on the moon, they said. Let's send a time capsule into space containing an archive of Earth's history, they said. Let's include some classic books, human blood samples, photographs, Wikipedia articles and thousands of Earth's most durable living creatures, temporarily suspended and encased in an epoxy resin, they said.

It was a great plan, until Israeli space company, SpaceIL, crashed their probe into the moon on 11 April, 2019.

Now, we on earth are left wondering, did the Tardigrades survive?

Tardigrades, known lovingly as 'Water Bears', are eight-legged micro-animals found dwelling in bodies of water across the world, from mountain tops to the deep sea. These 'Water Bears' have the ability to go into a 'tun' state where metabolism

is lowered to a phenomenal 0.01% of normal, and can remain that way, without food and water, for more than 30 years before returning back to normal life. It was in this 'tun' state that thousands of tardigrades were rocketed off to the moon earlier this year.

So, could our little water bears be enjoying a little teddy bear picnic in their new home? Have we inadvertently introduced a new species, possibly a competitor, to an ecosystem that we were yet to even discover?

Well, it seems unlikely. Experts are saying that chances of survival are slim. Even if our little water bears happened to survive the crash and find liquid water on the moon to wake themselves up (none being discovered so far), there is then the issue of exposure to radiation and a vacuum. Unfortunately, these bears are only tough guys in their 'tun' state and are subject to the elements once awake.

Ah well, if anything, it was a fun thought experiment.

Then again, I guess we can't be sure of anything for another 30 years...



Image: Adult tardigrade, also known as a 'Water Bear'.

PRINCIPLES and PRACTICE

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LABCON 2019

*Bringing Excellence to Science Education
The Conference specifically for Laboratory Technicians*

Venue

Melbourne Graduate School of Education
University of Melbourne
234 Queensberry Street, Parkville 3010

Dates

Wednesday 27 November to Friday 29 November 2019

Program Outline

Wednesday 27 November	Thursday 28 November	Friday 29 November
Keynote Speaker	Keynote Speaker	Tours
Concurrent Workshops	Concurrent Workshops	Chemwatch Session
Exhibition	Exhibition	
Annual General Meeting		
Conference Dinner		

We are now calling for workshop presenters to indicate if they are willing to present workshops at LABCON 2019. Sponsors and exhibitors are also invited to email their expression of interest.

Registration Fees for LABCON 2019

LTAV Members attending at least one day of the conference can attend one post conference tour at no charge.

	LTAV Member	Non Member
Full Registration – Wednesday and Thursday includes dinner	\$400.00	\$450.00
Full Registration – Wednesday and Thursday excludes dinner	\$350.00	\$400.00
One day Registration includes dinner	\$320.00	\$390.00
One day Registration excludes dinner	\$270.00	\$340.00
Friday Tour or Chemwatch Workshop	\$75.00	\$110.00
Conference Dinner (extra tickets)	\$95.00	\$120.00

ALL ENQUIRIES

Marg Scarlett

LABCON CONFERENCE MANAGER

pcs@cogroup.com.au

THANK YOU! YOU ARE AWESOME!

MARY L JONES

KEILOR DOWNS COLLEGE

Not sure how to thank enough a person who is modest, ever willing to help and always ready to share the knowledge. A great friend of Lab Techs, a hidden Gem with a wealth of ideas. She is the person who has touched my heart immensely. It is none other than Mary Jones from Keilor Downs College. I have never seen her not active even for a few minutes. She has designed wonderful cars, toys and many wonderful models to test the scientific skills and aptitude of year 7 during orientation programs. She has also designed many models to accelerate learning of students. Amazing capacity to recycle any bit to put to use. She was awarded innovative staff award during ES week from the School way back in 2016. She was so modest and shy that she did not come forward to accept the award. The award was for designing a wonderful model in chemistry to help a blind student. I had the great fortune of working with her in the Lab for 2 years! Thanks to you Mary from the core of my heart!!!!!! Wishing you all the very best. Radhika Iyer.

MAEVE WILD

SHELFORD GIRLS' GRAMMAR

MATT KOPP & PETER BALL

SOUTHERN BIOLOGICAL

I would like to thank Ms. Maeve Wild at Shelford Girls Grammar School for organising the workshop last week. That was a great opportunity to learn more. Also, I would like to thank Peter & Matt from Southern Biological for introducing their techniques, methods and materials to us. The result was great, I've attached a photo from our plate with a good growth of Ampicillin resistant bacteria on it. Shahrzad Mobasser.



KATERINA NYANKINA

WESLEY COLLEGE, ELSTERNWICK

I would like to thank Katerina Nyankina for her help on the cotton reel/motor-mouse topic. She went out of her way to mail me a brand new package of Cotton reel tractor from Prof Bunsen with all the detailed instructions on how to make it plus hints and tips. I am very grateful for your support, thanks again Katerina. Doris Le.

Ever had a Lab Tech do something super nice for you?
Ever seen a Lab Tech do something awesome, far beyond their call of duty?

**This is your chance to say
THANK YOU!
and to recognise those Lab Techs who you think are
AWESOME!**

WANTED URGENTLY RELIEF LABORATORY TECHNICIANS

If you work part time or you know someone who has school laboratory experience and would like to earn some extra money.

Please contact Mary Jones
jones.mary.l@edumail.vic.gov.au

Your name will be added to the Laboratory Technician Relief list for the Melbourne Region. Laboratory Technicians that are available to work in Regional Victoria are also encouraged to make contact!

national science week 2019

10-18 August 2019 www.scienceweek.net.au

Schools across the country celebrated Science Week 2019 with the theme 'Destination Moon: More Missions. More Science.' in recognition of the 50th anniversary of the first moon landing. Many of us chose to base our Science Week around this theme, creating elaborate moon landing displays, launching rockets, watching space movies and organising amazing morning teas. Let's sit back, take a well-deserved breather and enjoy these snippets as we look back at Science Week 2019.

Anica Naumovski

Science/Laboratory Technician
Catholic Regional College, Caroline Springs

What a wonderful Science Week we have produced at Catholic Regional College, Caroline Springs.

A highlight of the week was the Science Staff dress up parade of famous scientists, where the students had to guess who we were after listening to a small introduction of ourselves and how we have made a huge contribution in science.

The other major highlight for the students was Rocket Launch, where a group of students built two different type of rockets which came complete within a kit supplied to us by <https://immersive-education.com.au/>

The kits (Loadstar II, and Liquidator) are supplied with great instructions and guidelines for a smooth assembly, normally they can be assembled in a double period during class time. As this program was a lunchtime activity it ran over two lunch breaks to assemble and another lunch break for the launch. The launch occurred on our school oval with the rest of the school standing well away to observe whose rocket had the highest, fastest and straightest launch.

Such a great day for our school with the students cheering and rockets launching.

Our school runs a Stem Experience in Space year 10 elective class which covers the aspects of rockets and space, the students in these classes then have the opportunity to go on a school trip to NASA which is also run by <https://immersive-education.com.au/>.

I was fortunate to attend the trip to NASA this year. As Immersive Education is run by teachers, the NASA experience was an extraordinarily well organised educational program of STEM Experience in Space.

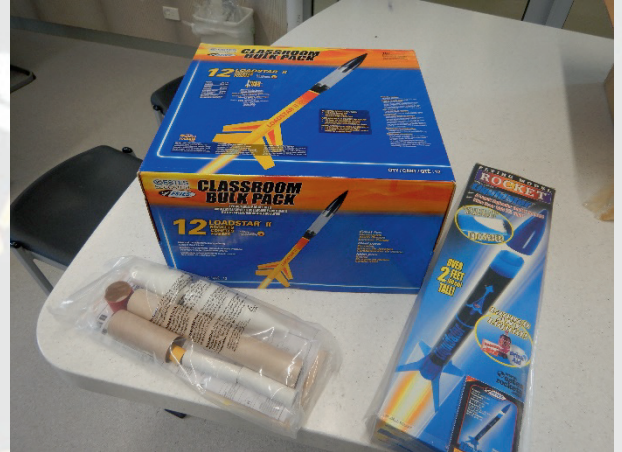


Image: Immersive Education Rocket Kits

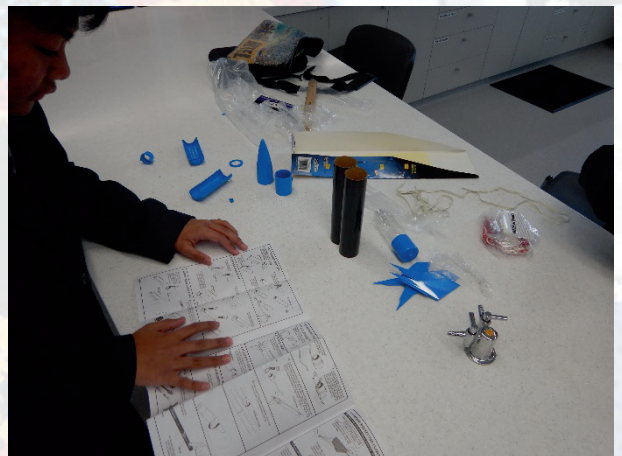


Image: Assembling the rockets



Image: Catholic Regional College Science Staff Dress Up Parade



Image: Loadstar II and Liquidator rockets assembled

Amy Zdrzalka

Senior Laboratory Technician

Broadford Secondary College

This year we celebrated the 50th Anniversary of the Moon Landing and the International Year of the Periodic Table. We were able to nab a classroom to set up as Mission Control for the week, from which we ran our lunchtime activities, including launch of our 3D printing club (designing fins and cones for a rocket launch), Making a Giant Periodic Table (utilising the element posters put out by Compound Chemistry), Moon landing Celebration (footage, astronaut ice-cream, navigate the moon surface with Sphero, make impact craters), The Great Chemistry Scavenger Hunt (Periodic Table based) and finished with a bang launching rockets.

Our two 3D printers have been invaluable churning out models all Term for display. The large Moon took 105 hours of printing. I started it on a Monday afternoon and it was still going when I left on the Friday (I didn't sleep well that week, praying for no power outages). A Neil Armstrong bust, Buzz in his highly detailed spacesuit, the Apollo 11 landing site, a Saturn V rocket, Parkes Telescope, Columbia command module, Neil's footprint plaque and lots of NASA keyrings and moon bracelets for prizes. All thanks to the wonderful resource of www.thingiverse.com



Image: 3D printed models, some with painted finishes



Image: Mission Control room



Image: Moon bracelets and NASA keyrings

Julie Stallwood

Laboratory Technician

Thornbury High School

Here is my new display on the 50th anniversary of Apollo 11 Moon Landing, including:

A moon rock (vesicular basalt) with US flag

Inflatable astronaut from online party supply store - Fandom Frontier

3D printed moon model - thanks to our Tech teacher Cam and Lab Tech lister Amy Zdrzalka

Posters, books and printed materials.



Image: Moon Landing display, Thornbury High School



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CONASTA 68

DARWIN 2019

Reflections from Therese Graham

Who wouldn't want to visit a northern Australian destination during a southern winter?

We were greeted by balmy evenings and sunny days. A welcome reprieve from those chilly wet ones at home.

CONASTA offerings in Darwin commenced with a Welcome Function at Mindil Beach markets, experiencing a taste of what the Northern Territory Tropics can offer at this time of year. These markets were just a short walk down the hill from the main event at Darwin High School. This city has 'grown up' in the 30+ years since leaving during the mid-80's.

The Keynote speakers and the 'Learning on Country' presentations took place in a sports stadium space affectionately known as "The Tank". Interestingly this structure is the refurbished Darwin city water supply tank – can I say massive (impressive) engineering.

The break-out and Exhibition space was an ample (huge) undercover area, no doubt 'Territory styled' and required during Wet Season down pours, known as the Perron Pavilion.

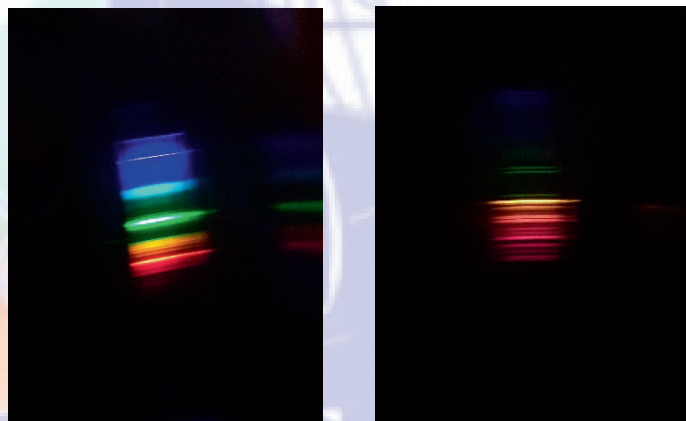
This CONASTA gathering was my fourth immersion with science education leaders, innovators and enthusiasts. I am really enjoying the opportunities to embrace and share what is happening nation-wide, giving me and my 'significant other' some time to experience a working holiday together. It was a wonderful opportunity to have an excuse to revisit a place we called home early in our marriage.

A brief overview of what I liked best and what has stayed with me in

the weeks beyond coming home and back at school for term 3, is difficult to discern. So, what has stuck? Professor Lynn Beasley, former Chief Scientist of WA, and now Patron of both the Science Teachers Association and LabNetWest, gave a memorable keynote address titled "Getting that "Wow" moment for students", that was not to be missed! Her total admiration and support for Laboratory Technicians in schools is to be heard. Every effort is being made for her to present an address at our own LABCON conference in the very near future.

The workshops I most enjoyed were the 'Smartphone Spectrophotometer' and 'Working safely with glassware'.

I have attached the smartphone spectrophotometer template with this article (pg. 11). The spectrophotometer was constructed with medium weight card blackened on one side (inside the spectrophotometer box). The template should be photocopied and accurately cut out and folded. The DVD was cut into wedges and the covering plastic stripped off. The DVD is used as the light ray diffusing grate.



Images: (Left) Spectro image using a sodium lamp, (Right) Spectro image using a neon lamp.

At the Conference Dinner held at the Darwin Ski Club the challenge for each table was set to create a table decoration with the theme "On Safari" and to include a scientific concept. Each table had a tub with a variety of 'maker-space' items available ... just sayn' the Lab Tech table creamed it!!!! Yes, the merry-go-round did rotate – just ask Dale Carroll.



Image: The Lab Tech Whizz Team and the winning merry-go-round model



Image: Turtle building art, Darwin

This was followed by a highly entertaining and fun Trivia Event hosted by Stile Education, who, might I say, saved the day by ordering and serving pizzas for the famished participants!

The "Learning on Country" was informative and somewhat controversial, but also enlightening for me coming from a perspective of observing how the Northern Territory education system is grappling with working with indigenous students for opportunities to learn in their own environments and embracing their ancient culture. We can learn much from their stewardship of the land.



Image: Kakadu crocodile.



Image: Kapok bush flower, Kakadu

During our time in Darwin we were able to have some time to visit the Darwin Museum and the Botanical Gardens, now named the George Brown Botanical Gardens, honouring the work over many years devoted to the area by this passionate, visionary man.

There are many more experiences to share even though there were only a few short conference days in Darwin. I can only encourage any one of you to apply for the CONASTA scholarship offered each year by LTAV and take the chance at becoming a delegate at one of these events. Next year, CONASTA 69 will be hosted in Canberra, with 2021 scheduled to be in Adelaide, then 2022 here in Melbourne, Victoria.

Therese Graham
Science Laboratory Technician
Cathedral College, Wangaratta



ATTENTION NEW LAB TECHS

It has long been recognised that a new technician's first year in education can be very difficult. LTAV has decided to support beginning technicians by offering

FREE first year LTAV membership

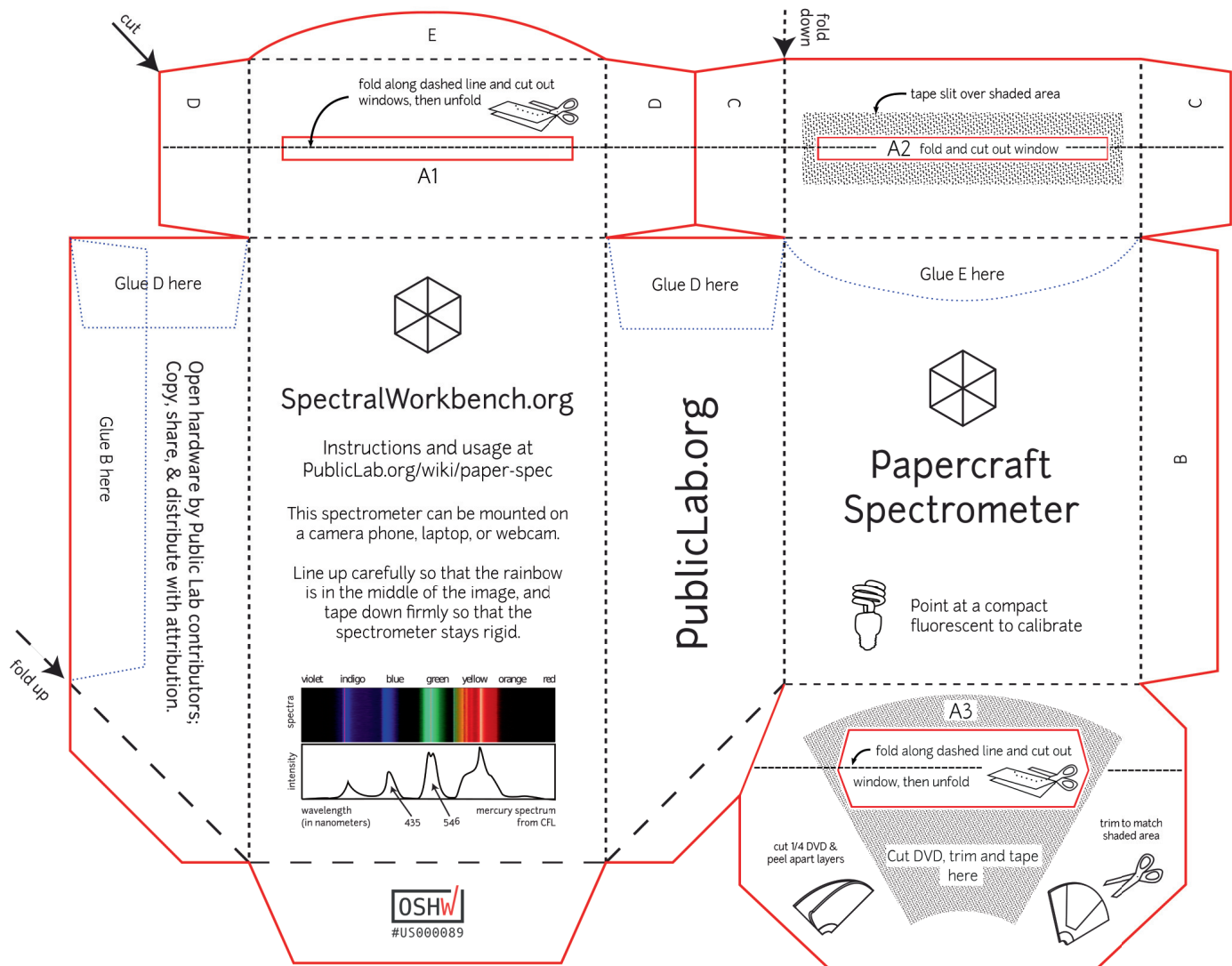
deemed to be paid by the LTAV Committee.

The following conditions apply:

- The payment is at the discretion of the committee and will apply for the course of each membership year,
- The payment is to be made only on behalf of technicians in their first year working in education.
- Members who are given this benefit are expected to continue their membership in subsequent years.
- Such members will have all the rights and obligations of ordinary members, but in accepting the payment also agree not to run for office during that same first year

Please refer all interest and enquiries to:

admin@ltav.org.au



Instructions

(also see PublicLab.org/wiki/paper-spec)

1. Cut out the shape above along red lines (these may be grey if printed black & white)

2. Use a butter knife or ball-point pen to score the dotted lines for folding

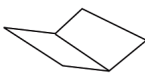


Fold over on dotted lines, then cut out window

3. Fold over and cut out the “windows” at A1, A2, & A3



Mountain fold



Valley fold

4. “Mountain” fold along the dotted lines: - - - - -

5. “Valley” fold along dashed lines: — — —

6. Cut, peel, and attach DVD fragment



7. Tape the slit over window A2 (or make your own with two pieces of black paper); trim as needed. See web link for more.

8. Align tabs B, C, D & E and tape them down. Use black sticker dots if available.

You're done! Go to this address to find activities like calibration, different tests you can do, and see the latest design challenges to solve:

PublicLab.org/wiki/paper-spec

Have **questions**? Ideas for **improvement**?

Want to collaborate with others? Visit the link above!

Open Source CERN OHL v1.2

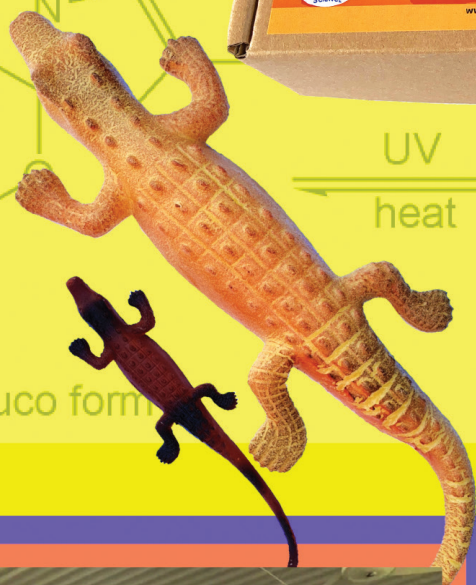
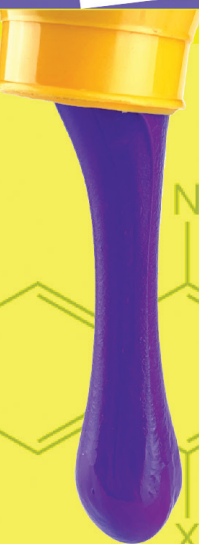
This is an open source hardware design developed by contributors like you. We need your help!

Public Lab's

Papercraft Spectrometer_{v2.0.7}



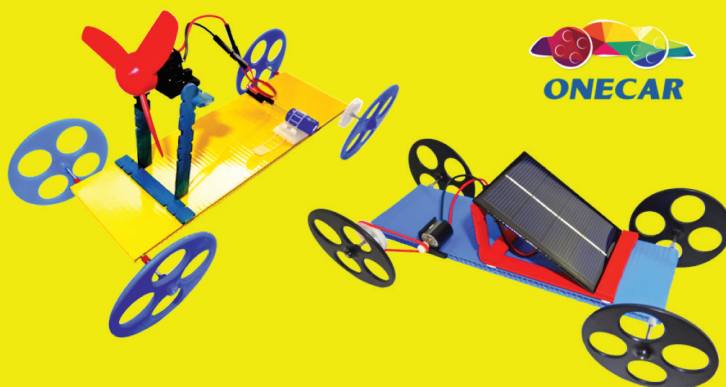
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Fun with Electrophoresis

Using Food Dyes

Radhika Iyer

Laboratory Manager
Mullauna College, Mitcham

It is a general feeling of inhibition and perception amongst some new Lab techs, and even many Teachers who teach VCE Biology, that electrophoresis could be a cumbersome process. They often opt out of it because it is not in their comfort zone, or take the students to GTAC, or tertiary organisations, to learn the technique. This can be expensive and time consuming.

So, for the first timers, here are a few simple steps to make this process easier to follow and encourage you to give it a go!

Materials and Equipment:

A 10-100 μ l Micropipette with tips

Combs (8, 10 or 12 well comb)

Agar / agarose

100 ml beakers

Food dye (different colours)

Glycerol

Masking tape

Electrophoresis kit (combs, plate, power pack, Tank, 2 leads), see Diagram 1

Microwave

Sodium bicarb solution

Black sheet or Tile

Method:

If you have an electrophoresis kit, then it is much easier, if not you can make your own too. Here are a few simple tips to do this, you can find more extensive instructions by googling. You can improvise your design as you go.

You can use a 250mL clean margarine container to serve as the tank and make 8 or 12 well combs from plastic food containers to fit snugly into the margarine container. Drill small holes into the margarine container on either side to make space for small electrodes and the crocodile clips to connect the electrodes to power pack. The only extra item you may need to buy is a power pack which ranges from 50-150V.

There are four simple steps to the process of electrophoresis:

1. Preparation of Agar/Agarose

This can be tricky at the start as you need to seal the plate before pouring the agar/agarose. Agarose is more expensive, so I would suggest agar for beginners.

Use 0.8-1% Agar/agarose, melt it in microwave. Normally 80ml of Agar solution is enough.

Prior to pouring, seal the edges of the plate and place the 8 or 12 well comb. The comb should fit snugly on the plate.



Diagram 1: A complete Horizontal Electrophoresis Mini Gel Kit



Diagram 2: Rainbow gel electrophoresis of food dyes

2. Preparation of Buffer and sample

Before you run the gel, prepare a fresh 1% sodium bicarb solution, this will serve as the tank buffer. Make sure the buffer is filled to the brim to enable contact with the electrodes.

Sample buffer can be made using concentrated food dyes of various colours mixed in glycerol or ethylene glycol. 1ml of concentrated food dye to 1ml of glycerol should work fine. The purpose of adding glycerol is to make the dye sink in the well.

3. Loading the Gel

Once the Agar is completely solidified, carefully remove the comb and tape around the gel before placing it in the tank. Fill the tank up further with buffer to cover the surface of the agar.

Loading the gel can be tricky for the first time, especially if you have weak eyes. A 100W lamp can be useful to help locate the loading well in the tank. Using a micropipette, carefully place each sample buffer, one at a time, into the gel well.

When using food dye, the comb is usually placed at the center of the agar gel to allow any dye which is negatively or positively charged to move accordingly.

4. Running the Gel:

Once the loading is complete, you can connect the leads appropriately on the power pack (red against red, black against black) to generate an electric current.

Start with 60V for the separation of bands to occur, slowly increasing to 80 V in 10 minutes and then 100V. If you start at 100V at the beginning, you may not get a good separation of all the bands.

The running time is usually 25-30 minutes to get all the bands separated.

Hints:

1. You can replace the normal agar with agarose if you are doing DNA band separation. You will need to buy plasmids to do the cleavage of DNA. The tank buffer to be used in this case is TAE (Tris acetate-EDTA) Buffer.
2. If you are loading the sample for the first time, try loading on alternate wells to begin with as you gain confidence.
3. Brands of electrophoresis kits include Sigma, Bio-rad, CBS, Fisherbrand. Happy shopping!
4. If you are stuck, send an SOS to list-serv. There are many Labbies who are stalwarts in using this technique who will rush to your rescue (electronically)!

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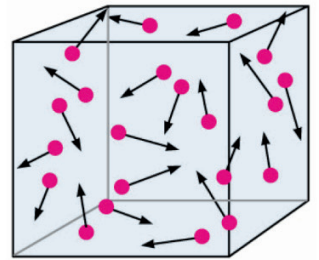


Science Demonstrations that Teach

No 1 Air Pressure: The Bin Liner

Carl Ahlers Prof Bunsen Science

The phenomenon of air pressure is hard to visualise as the pressure is exerted by fast moving air particles. Air pressure is the force at which atmospheric gas molecules hit a certain surface area. At sea level the molecules exert a force of about 10N per square cm. For the average adult with a surface area of 1 sq meter, this results in a push force of 100,000N or the weight of a 10,000kg body. That is a substantial weight to bear. 10 Metric tons!



One of the first questions that comes to mind, is why we do not experience this pressure? The answer lies in the fact that we have air, blood (and bones) in our bodies exerting the same pressure. So we have an equilibrium. In this demonstration we will demonstrate the effect when we have a 5 to 10% difference in air pressure. We will place a person in a plastic bin liner bag and then pull around 10% of the air from the bag. The result is a bag that is stretched, pushed and wrapped around the body by the stronger external air pressure.

Acknowledgement: Original idea from Eric Muller at The Exploratorium, San Francisco

Real world links

A breathtaking experience

- The kitchen food vacuum system uses this principle. The outside air pressure moulds the bag to the food
- Vacuum forming in packaging with plastic being heated



Required

Council bin liners (240L)
Home vacuum cleaner



Action

1. Have a volunteer remove his / her shoes and step into the bag
2. Have him / her sit down with legs crossed
3. The vacuum hose is fed from the top and the end is held close to the stomach. The bag-person pulls the hose end to his body and cups a hand around the opening so air can still move through. This will prevent the bag and clothing being sucked into the hose.
4. The teacher holds the bag around the neck so there are no obvious openings

Safety

- Only to be done under teacher supervision
- One person should be in control of the vacuum switch
- One person assisting the person in the bag. The bag-person may tip over so be vigilant
- **The bag-person should never place their head inside the bag**
- Immediately turn the vacuum off when the bag-person requests so

View the demonstration video under Snippets at www.profbunsen.com.au

*Don't worry, we've seen worse**



The Envirostore.com.au web site has a special “For Schools” section where you will find some handy downloadable materials addressing spills, banned chemicals, the GHS and more and you can enter details of your chemical waste on line for a disposal quote. Michael Pola’s Labcon and STAV presentations for 2018 are also available

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Welcome to the Wonderful World of Waste

and the School Laboratory

Part VI

Michael Pola
Envirostore Chemical Consulting
mike@envirostore.com.au

This quarter's article will make mention of two of the nastiest and filthiest chemicals we have come across during collection and disposal operations. One of these we have only encountered in the school laboratory and both of them have no place in the school laboratory, no matter what the Chemistry teacher says.

The number one rotten chemical, only ever encountered in the school laboratory, is white phosphorous. Yellow phosphorous is the same thing and white phosphorous turns yellow on ageing. Red phosphorous, or amorphous phosphorous, is much more stable and will not burst into flame on contact with air. White phosphorous is a class 4.2 dangerous good i.e. spontaneously flammable, the red is a class 4.1 flammable solid.

The trouble with white phosphorous is its pyrophoric property, requiring it to be stored under water. It is also very toxic at very low levels, not only to us humans, but to marine life like fish. The liver, in both humans and fish, is the target organ. Also, kidneys and heart for humans.

Over years of collecting chemicals from schools, whenever we came across white phosphorous and asked the question as to what it was doing in the lab, invariably it was just to demonstrate its pyrophoric properties by taking a piece out to the school oval and watching it ignite, burn and emit copious white clouds of smoke. Those white fumes are phosphorous pentoxide, a corrosive and choking attacker of mucous membranes and tissues. Why on earth this would be considered educational, let alone safe practice, remains a mystery and we are pretty sure this dubious practice is no longer in vogue.

I worked in various analytical laboratories before I saw the light and became a waste chemist. Phosphorous, in either allotrope, was just never seen in these laboratories. It is too nasty and has virtually zero usage in this form. Phosphorous, as either a phosphate salt or phosphoric acid, is commonplace and a far safer way to study and handle this very weird element. It must be stored under water, and if you do come across some which is not fully covered, you had better call us.

There is a good reference for more phosphorous horror stories, including phossy jaw or osteonecrosis of the jaw (usually fatal and highly painful) that the white phosphorous based match industry workers were often subject to.

The Shocking History of Phosphorous - a biography of the devil's element, by John Emsley, Pan Books

Our other rotten chemical to steer clear of is hydrofluoric acid, HF.

This acid just loves calcium, and as humans do contain a fair amount in their bones, skin and teeth, HF is not welcome. A 160 cm² area of skin exposed to strong HF can cause hypocalcemia (low serum calcium) and is almost always fatal. It will dissolve most oxides and silicates, so is commonly used to dissolve minerals and ores in the analytical laboratory. These procedures, of course, are not common in the school lab. The most common form of silicate that HF will dissolve is glass. HF is therefore always stored in special plastic bottles, rarely in volumes greater than 1 litre and with spill and drip proof fittings. It is used to produce frosted glass and etch printed circuit boards for electronic work. Again, not normal activities in a school. We haven't seen a lot of HF in school labs, unless of course the "gift" of chemicals from a parent or industrial laboratory contains some HF. I have mentioned this before - get the generous donor to wear the disposal cost of these chemicals when invariably we get called in. There is no place for HF in the school lab, along with its good buddy, white phosphorous.

What else? Mentioned below, without further detail, the following really should be phased out of schools. Don't just have them on the shelf to show students or just in case a new practical utilising them comes up.

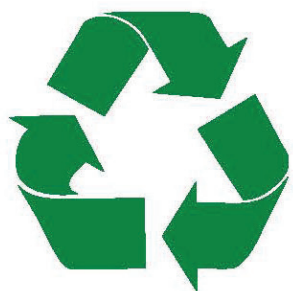
Chromium trioxide and other Cr VI salts. Chrome III salts, such as chromates, are much safer by comparison, but have a good look at these metals, as well as Cobalt and Cadmium salts, especially the water-soluble ones.

Most of the nastier organics are now persona non grata such as toluene, xylene, benzene and other aromatics; halogenated solvents such as chloroform, carbon tetrachloride and dichloromethane; highly flammable solvents such as diethyl ether and carbon disulphide. The latter is a real beauty. It has a putrid odour, is even more flammable and volatile than diethyl ether and will dissolve phosphorous. That's a winning combination if ever there was one.

A genuine and thorough risk assessment should identify many chemicals that are far too nasty for use in school laboratories. Don't forget the first risk control in the hierarchy is always Elimination!

Next article we will look at some nice chemicals, and yes there are plenty.

If you have any comments, good bad or otherwise, please feel free to contact myself, or Jessica, the Lablines editor. If there are any chemical topics that you would like to see addressed, please also get in touch.



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A Week in the Life of a Lab Tech

Sam Gunning

Technician – Laboratory and Curriculum
Braemar College, Woodend



Photo: Sam Gunning, "Sometimes being a Lab Tech gets a little lonely... but two is company!"

Some days, I find myself sticking my fingers into the bronchi of a pair of sheep's lungs. Others, I'm cleaning up enough Elephant's Toothpaste to service a whole herd, and others still, I'm poking and prodding a problematic hot glue gun to ascertain why it is indeed hot, but glue isn't coming out! Such a multi-faceted role, a lot of on-the-job learning – and plenty of things I'm realising my BSc didn't teach me! The joys of being a lab tech...

My week usually begins with checking over my desktop planner pad that sits faithfully in front of my laptop. All of us know that, in this job, planning and organisation are key! Teachers send me prac requests digitally through an online Google form we have created. However, I still prefer having things written down with paper and pen – tangible and in front of me! No risk of a tech glitch or accidentally adding a calendar event in the wrong day. So, as forms come through, I write the details into my planner. I tend to highlight the same prac in one colour, to help me easily see its distribution throughout the week. Some very full weeks, I have quite the rainbow happening (I recently bought some pastel-coloured highlighters, which I'm very excited about!).



Photo: The view at our beautiful campus – Mount Macedon with cloud cover. We had snow last weekend!

Here at Braemar, our school is divided across 2 campuses – a year 5-8 Middle School Campus, and a 9-12 Senior School Campus. I was recruited to service the Middle School Campus when it opened mid last year, while my veteran fellow lab tech, Janelle, takes care of senior school. I must commend Janelle for how awesome she constantly is with her advice to me and sharing supplies, whilst being busy managing senior school! It would be fair to say that middle school science isn't as intense as senior and VCE science can be, so my role isn't too overly stressful. I have a lot of respect for those of you managing an entire secondary school!

My job started with a couple of brand new prep rooms and labs and a whole lot of disorganised equipment! Nevertheless, I was rubbing my hands together at the idea of getting to set up some



Photo: My prep rooms have a window straight through to the labs – so I can always keep an eye on classes, and I guess they can keep an eye on me!



new labs and prep rooms with some beautiful new equipment and supplies. I loved the challenge of setting up a new space. Tubs, containers and labels galore, I had a lot of fun.

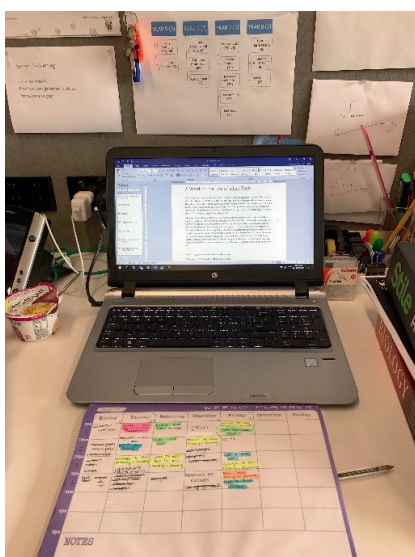


Photo: My little desk & trusty planner. I share an office with about 10 great teachers. Always good to have a chat and have a laugh in my downtime when I'm not alone in the prep rooms!

When I started this job, I had just finished a Bachelor of Animal and Veterinary Science, with a Doctor of Veterinary Medicine in mind. But I wanted a break from study before my post-grad, and I saw this role pop up. Being a lab tech wasn't even in my pool of things I thought I may end up doing. Heck, I didn't even know there was such a thing! My school didn't have one when I was in attendance and such a role had never crossed my mind otherwise. Funny story – my school did recruit a lab

tech after I had graduated... which I found out by coincidentally sitting next to her in a LABCON 2018 workshop! ☺ Small world, indeed.

Anywhoo... enough of my rambling... here's a little snippet of a week in my life as a lab tech!

Monday: Today began with an early trip to the local butcher to collect sheep's kidneys for period 1 and 2 dissection pracs with year 8s. Then quickly across to Coles for a few extra trays. As a cheap alternative to proper dissection trays, I use Coles brand slice baking trays - \$5 each. Safe to say those trays will never see a batch of brownie mix! A quick sweep of my emails when I got into work, then straight to the labs. I'd pulled out all of the equipment Friday afternoon, which I knew I'd thank myself for on Monday morning – and I did! The more that is prepared earlier, the better! Into the class with a quick explanation on how to assemble a scalpel and blade safely, and the class were on their way. 80 minutes later I returned to a tray of chopped up kidneys, and it was time to quickly reset for period 2. With a bit of time to spare during class and a craving for caffeine, I took a seat in the staff room with a cuppa and figured out my workshop preferences for LABCON! After clean-up of period 2's dissections, the rest of the day was given to more emails and other itchy bitzy admin jobs and general lab duties.

Tuesday: Another dash to the butcher on my way into work and another bag of kidneys. Just as I was arriving, their delivery man

was dropping them off! Perfect timing – lucky the prac wasn't any earlier! As soon as I arrived at work, I was asked what I had on today, as they needed me to fill in at front office reception. I tend to be the go-to all-rounder when it comes to extra jobs around campus – but I honestly love it. I enjoy getting to learn new skills outside of my usual role. Happy to jump on reception but had a period 2 prac to set up. Quickly got everything ready for kidney dissections, then back to admin – kids with jarred fingers from basketball at recess, parent enquiries, helping teachers find cleaning equipment and constantly updating the student in/out log! Amongst these tasks, I ordered some film canisters for pop rockets later in the week (a la Science Week – Destination Moon)!

Wednesday: Was a little quiet in the science department but I still found myself busy attending to teacher requests. My official role at Braemar is 'Laboratory and Curriculum Technician', meaning that it is part of my job description to help out in other areas of the school. With Middle School science not always being overly busy, I have time to help out with odd jobs around campus. Today was one of those days! Putting up displays of students' work, tending to some seedlings I'm trying to grow (leftover from a year 8 ecosystems prac) and more emails, emails, emails.

Thursday: Saw the final round of kidney dissections, as well as keeping work going on our 3D printers for another department while the teacher was away. I was glad to be packing up the final lot of dissecting equipment and clearing quite a few kilograms of kidneys from my prep room fridge - it was getting stinky by this point in the week! I played butcher shop and bagged up leftovers into portions for staff with dogs to take home as a treat for them with dinner. Today I also began chatting with year 8 science staff about 'Curiosity Week' which we are holding in October - a science fair-esque event in which students will be designing their own STEM experiments and evaluating their journey, all to delve into the idea of project-based learning.

Friday: Was pop-rockets galore for the end of science week. I ensured a large supply of effervescent tablets and a strong reminder about safety glasses. I crossed my fingers in hopes we wouldn't have too many lost canister lids! A simple activity with a big wow factor that everybody seems to enjoy. My favourite part? Minimal setup and packup by the lab tech!! I had to fill in at reception again today, so much of my time was spent at a desk. We had planned to do water rockets (bike pump, soft drink bottle, cork etc) at lunchtime, but the weather didn't allow it!

Though my ultimate goal is to work with animals, I do love time in the lab, and getting to assist with children engaging in science is so rewarding. It's something I never pictured myself doing but have come to be greatly passionate about.

So whether it be organising enough melted chocolate and marshmallows for 100 kids to make edible 'conglomerate rock'; trying to cut that perfect little portion of onion skin to go under the microscope; or a dash to the supermarket for a questionable 10 packets of Alka-Seltzer, there is rarely a dull moment as a lab tech and ... I love my job!

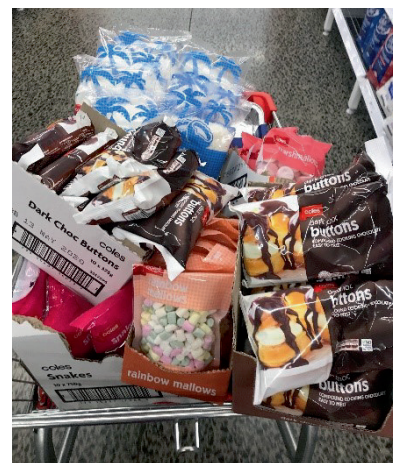


Photo: Ridiculous shopping trips are always fun! We made rocky road 'conglomerate rock' for geological studies (for 100 students...)

Professional Development

Around Victoria

If you would like to find out more about upcoming LTAV Professional Development opportunities in your region, please contact your Regional Representative (contact details p.25). If you are unsure which region you are part of, check your LTAV membership receipt, or contact one of our Regional Liaison Officers (contact details p.26).

Gippsland Regional Meeting

June 2019

Report by Debby Butler, Catholic College Sale, Gippsland Regional Representative

For the Gippsland Lab Tech PD/get together this year we visited the Gippsland Water Factory, just outside of Morwell, on the 12th of June. The Water Factory has been cleaning up a substantial amount of Gippsland's waste water for approximately nine years. Fifteen Lab Techs from across Gippsland met up in the Vortex Centre, which is a resource centre aimed at school students.

We were greeted by Adrian Harper, one of the Senior Engineers at the Water Factory. Adrian explained that at the plant they purify the town waste water, as well as waste water from the nearby Australian Paper Mill, after which it is either recycled for use in the paper mill or piped out to sea at Dutson Downs. He showed us the quality of water at the stages of purification for the two water sources, each go through different processes. Prior to the building of the Water Factory, waste water was pumped to Dutson Downs



and put in settling ponds, prior to being pumped out to sea. Besides the pollution, one of the issues with this was the level of deterioration in the pipes brought about by the high level of sulphuric acid in the mix. The sulphuric acid was derived from the tannins and lignins in the water from the paper mill.

After the initial presentation, Adrian took us on a walking tour around the Water Factory site which featured a reverse osmosis unit for purifying water to be returned to the paper mill. There were also several biological digesting units, including one containing thiobacillus to consume the sulphur in the mill water. Some of the by-products were re-used; methane to generate power and digestion waste to be turned into compost and sold. We were taken to the laboratory area where they routinely test samples taken from around the site to maintain the quality and look for contamination. For most of us who have worked in laboratories in past lives it reminded us of how much we appreciate the variety that school laboratory life has.

After the tour we met up for lunch at the Italian Australian Club in Morwell. Our group were the first to arrive at the clubs' restaurant for the lunch session and the last to leave!

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South Yarra/Moorabbin Regional Meeting

August 2019

Report by Christine Nolan, St Michael's Grammar School

Event hosted by Maeve Wild, Shelford Girls' Grammar

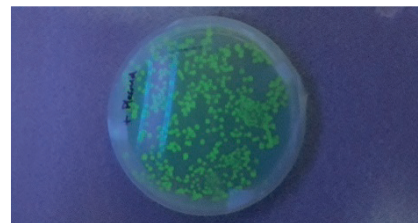


Photo: Luminous agar plate

Over 20 Laboratory Technicians gathered at Shelford on Wednesday Aug 7th to enjoy some light refreshments followed by a Professional Development session conducted by Peter Ball (Southern Biologicals' former owner). Matt Kopp (SBS new director) was also present to chat with us.

The session involved conducting "pGreen Bacterial Transformations" practical using a kit provided by SBS, to implant the DNA from a plasmid into a strain of E.coli. A plasmid is a small double stranded ring of DNA that can replicate independently from the chromosomal DNA in a bacterial cell.

Iced Calcium Chloride solution and heat shock are used to open the ring of the plasmid to release its genes.

Peter Ball talked us all through the theory and practical elements of this fascinating experiment.

Our aim was to transform bacterial cells from a particular strain of E.coli by inserting a gene from a plasmid that has bioluminescent properties.

The result being that when the transformed E.coli is plated out on a petri dish of Luria broth (LB) in sufficient numbers and without being overwhelmed by non-transformed E.coli, the single colonies of transformed bacteria will glow in the dark. Ampicillin is used to kill off non-transformed bacteria. It does not affect the transformed E.coli.

If this practical is to be conducted in the classroom, there is quite a bit of preparation to be done by the technician first. Sterile technique must be used throughout the preparation and the experiment.

The instructions provided by SBS are very detailed. Here is a summary of the main steps.

Two types of LB plates need to be produced.

- 1) A bottle of LB is melted, and poured into petri dishes.
- 2) Another bottle of LB broth is melted and 2mls of broth is replaced with 2mls of ampicillin before pouring the plates.
- 3) Using some of the prepared "LB only" plates, E.coli is applied with an inoculation loop in a manner to produce single

colonies and incubated for 12-20 hours at 37 degrees. These plates are referred to as 'Starter Plates'.

- 4) The plasmid is thawed, centrifuged and kept on ice.
- 5) Two transformation tubes containing CaCl₂ are prepared. One +plasmid, the other -plasmid. In both cases, a single colony of E.coli from the starter plate is added. 10 microlitres of plasmid is also added to the +plasmid tube.
- 6) 4 LB plates are labelled as follows:
 - LB +plasmid
 - LB -plasmid
 - LB/ampicillin +plasmid
 - LB/ampicillin -plasmid
- 7) The two transformation tubes are removed from ice and "heat shocked" by placing them in warm water for 90 sec.
- 8) After a recovery period, 100µl from the +plasmid tube is plated and spread onto an LB plate and another 100 µl onto an LB/Ampicillin plate
- 9) Similarly, 100 µl from -plasmid is plated and spread onto an LB plate and another 100 µl onto an LB/ampicillin plate
- 10) After resting plates for 5 minutes they are taped and incubated for 24-36 hours

Results:

-Plasmid on LB AGAR E.coli lawn

No glowing as no plasmid is present

+Plasmid on LB AGAR E.coli lawn

No glowing as non-transformed E.coli is predominant

-plasmid on LB ampicillin no growth

No glowing as no plasmid is present

+Plasmid on LB ampicillin single colonies of E.coli

Single colonies of transformed E.coli will be seen to glow using a UV light because the ampicillin kills off the non-transformed E.coli



Photo: Peter Ball (left) and Matt Kopp (right)



Photo: Attendees participating in the bacterial transformation

Thank you to Maeve for hosting this meeting. It was great to hear the lively chatter around the room and the enjoyment of being together in this rich learning environment. We all enjoyed seeing Peter and also meeting Matt.



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List Laughs and Life Hacks

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Sender: Russell, William W
Subject: 'Please, Sir, I want some more'
Attachments: Spirometer.jpg

Greeting Earthlings.

I am sure we are all rejoicing that the Avengers were finally able to reverse Thanos's snap and that good overcame evil.

It was to my shock tho', that when Iron Man made the ultimate sacrifice to rid the Universe of him and his hoards, he did not also ask the power stones to give Melton Secondary College some extra Spirometers (as attached) to go with the one that we already have for an upcoming practical class.

So therefore, I ask if any nearby school would have some we could borrow?

I have made some tank style ones myself, from Uru on Nidavellir, that they are happy to use if we cannot get any.

I will be putting them down on my wish list for next year. At the moment we have \$3000 to get us through the rest of the year...cross fingers....not snap Gauntlet lol.

On a lighter note, I have been approved for the conference dinner.....I mean Labcon, so hope to see you there.

Cheers

Bill "You dare ask for more" Russell | Laboratory Technician



10 of the Best

1. What is the technical name for the shoulder blade?
2. What type of animal is a Booby?
3. What are the 3 metal ingredients in gun metal?
4. Which famous scientist developed the polio vaccine?
5. What does a light-year measure? Time, distance, sound or brightness?
6. The Asian elephant trunk contains up to how many muscles? 600, 6000 or 60,000?
7. The Palatine Glands are more commonly known as what?
8. True or False? 'For every action, there is an equal and opposite reaction' is Newton's third law of motion.
9. The bending of light through a glass prism is called _____?
10. What do the initials USB stand for in computer science?

(Answers page 26)

Brain Break

Moon Landing Word Search

This word search is in recognition of the 50th anniversary of the moon landing. See if you can find all 23 space related words in the word search below. Diagonal and backwards words are allowed, letters can be used twice. The remaining letters will spell out a celebratory sentence!

S	R	A	W	R	A	T	S	R	A	M	T	H
A	T	E	E	N	C	R	A	T	E	R	I	Y
S	F	S	B	I	A	T	P	T	P	T	B	X
T	A	R	O	R	Y	W	E	S	C	U	R	A
R	R	E	R	D	I	O	N	K	E	A	O	L
O	C	V	P	L	R	R	A	N	C	N	C	A
N	E	I	L	A	R	M	S	T	R	O	N	G
O	C	N	A	Z	C	H	A	E	M	R	R	A
M	A	U	N	Z	W	O	E	E	E	T	K	X
Y	P	U	E	U	A	L	T	D	U	S	T	I
L	S	L	T	B	K	E	R	T	R	A	T	S

DID YOU KNOW?



During the first moon landing, the Eagle lunar lander made it to the surface of the moon with only 23 seconds left of fuel.

10 of the Best Answers

- 1 Scapula 2 A seabird 3 Copper, Tin and Zinc 4 Jonas Salk 5 Distance 6 60,000 7 Tonsils 8 True 9 Refraction 10 Universal Serial Bus



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Laboratory Technicians' Association of Victoria

By Lab Technicians for Lab Technicians
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LTAV PUBLICATIONS 2019

The following laboratory reference manuals and/or CD are available from LTAV:

- BIOLOGY REFERENCE MANUAL, 2013: \$25.00 for CD and black and white hard copy combination.
This REVISED handbook contains information on biological techniques, reagents, stains and culture media commonly used in secondary schools. Dale Carroll, Ritva Fazio, Sarah Daniele and Wendy Hurle have updated the earlier version by Dale Carroll, Ritva Fazio, Jeannene Bradbury and Marg Rubans of the original authors of: Jenny Kopsidas, Rita Poole, Jean Stokes and Maya Wagner.
- PHYSICS REFERENCE MANUAL, 2013: \$25 for CD and black and white hard copy combination.
Svetlana Machouba has made many updates to the earlier version by Sabino Del Balso and Valerie Clements.
- CHEMISTRY: A REFERENCE MANUAL FOR LABORATORY TECHNICIANS, 2008: \$27.50 by Geoff Gleadall, Dip.App.Sci. A comprehensive guide for the beginning and experienced Laboratory Technician in all aspects of the chemistry laboratory.
- LABORATORY MANAGEMENT DATABASES CD, Version 2, 2009 \$33 by Geoff Gleadall, Dip.App.Sci.

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REGISTRATION (first time members) / **DETAILS** (continuing members)
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New members to LTAV must complete an APPLICATION FORM as well (refer to website above)

Technicians employed or formerly employed in educational institutions are eligible for membership of LTAV. Financial members receive Lablines, LABCON 2019 Registration Booklet plus discount and voting rights at the Annual General Meeting at LABCON.

Member name:

Name of School / Institution:

Postal address of School / Institution:

Suburb:

State:

Postcode:

Email address:

Phone number:

Position in organisation:

Temporary or permanent? (circle one)

If temporary please give details of term of employment:

Have you registered at more than one school / Organisation? Yes / No

If yes, please indicate where you would like your Lablines sent:

Region:

Signed:

Date:

PLEASE TICK THIS BOX if you are a new Laboratory Technician or Assistant in your 1st year of employment in education and LTAV will cover the cost of your Membership for this 1st year. ☐

INDIVIDUAL MEMBERSHIP FEE – FULL YEAR (1st Jan 2019 to 31st Dec 2019) \$44.00 (includes GST).

Payment due by 30th April 2019

Send payment to: Laboratory Technicians' Association of Victoria Inc
S3/159 Burwood Road, Suite 150, Hawthorn, Victoria 3122

Please make Cheque or Money Order payable to: Laboratory Technicians Association of Victoria.

This Membership Tax Invoice must be sent with payment.

Direct Banking details: Commonwealth Bank of Australia

BSB: 063 532 Account Number: 1040 1068

Reference payment with SURNAME AND SCHOOL NAME

OFFICE USE ONLY

Tax Receipt No:

Payment date:

Method:

If paying by Direct Credit the Remittance Advice must be posted or can be emailed to: membership@ltav.org.au Please ensure this Membership Form is posted or emailed at the same time. Please note that Memberships cannot be processed if paperwork is incomplete. Tax Receipts will be issued to confirm LTAV Membership.

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Laboratory Technicians' Association of Victoria

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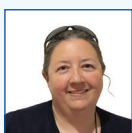
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Please feel free to contact any member of your committee with any queries or concerns.
Members are always welcome at committee meetings. Contact any committee member for more information.

LTAV Committee Meeting Dates 2019.

The Committee meets at CBC St Kilda, 11 Westbury Street, St Kilda East and
St Michael's Grammar School, 25 Chapel Street, St Kilda.

The meetings usually go from 6:30– 9:30 p.m.

All members of LTAV are most welcome to attend. Please be in touch with the LTAV Secretary to confirm the location.

19 February, 7 May, 23 July, 10 September, 22 October, 26 November