

LAB LINES

OFFICIAL PUBLICATION OF THE LABORATORY TECHNICIANS' ASSOCIATION OF VICTORIA

Editor: Jenny Emery

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Piglet Dissection!

- ▣ **Brains with Integrity**
- ▣ **Testing for E. Coli**
- ▣ **Bottle Rockets**
- ▣ **Flame Test**
- ▣ **Helpful Hacks**

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PRINTING ERROR VOLUME 43 ISSUE 3 December 2023

Due to a printing error, a photo on page 20 was missing from the top left corner.

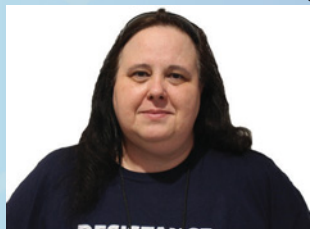
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FROM THE PRESIDENT

Mary L. Jones



Welcome to Term 2!

As we move forward, preparations for LABCON 2024 are in full swing. This year, we've chosen Pullman Melbourne Albert Park as our conference venue on Thursday, November 14th, and Friday, November 15th. In an exciting change, delegates can now select four sessions per day, resulting in slightly shorter sessions compared to previous years. We value feedback from attendees after each LABCON, as it helps us improve for the next year.

I would like to encourage our members to be more active in the association. There are a variety of ways to participate:

LTAV List: If you're a silent member, consider sharing your knowledge on the LTAV List (our email group). Sometimes, we all have those little gems of ideas that have helped us tremendously. By sharing them, you can make things easier for others. So, don't hesitate—let your insights shine!

Regional Participation: Are you near Kew, Ballarat, or the Otways? These regions currently lack a regional representative. If you're part of a school in any of these areas, think about stepping up to be the regional representative. Our liaison officers, Deborah Sun (metro) and Jodie Pignataro (country), will guide you through the process. They're experts at what they do and are there to support you.

Presentations: Have you ever considered giving a presentation? Whether it's at regional meetings or LABCON, sharing your expertise can be incredibly rewarding. Yes, stage nerves might kick in, but remember that you're not alone. Even experienced speakers sometimes feel nervous. The desire to help others can override those jitters. So, keep an eye out for opportunities—maybe not for 2024 (since the call for LABCON sessions has ended), but definitely consider it for 2025. You've got valuable insights to share, and the audience will appreciate it.

When preparing a presentation, consider breaking down the bigger picture into smaller components.

Remember that you're addressing individuals in your field who understand where you're coming from. Embrace opportunities to gain experience and improve your skills. Be sure to choose a topic that aligns with your niche—something you feel most comfortable discussing. Once you've got that, you're already on the right track. Presenting frequently will build your confidence over time, allowing you to discuss topics beyond your niche. Even if you're a novice in a particular area (like physics), don't shy away from it. I've done this myself. Despite my background in biological sciences, I took on physics sessions at LABCON based on attendee feedback. By brushing up on my knowledge, I was able to contribute effectively. Remember, it's all about growth and sharing knowledge.

I also urge you to consider becoming a member of our association's committee. While I may not know all the committee's views, I do know that they're eager for new individuals to step up and fill roles.

Personally, I'm committed to seeing our profession grow and gain the recognition it deserves—two reasons why I joined the committee this year.

Our committee's work isn't always publicised, but it's essential. LABCON organisation, managing the LTAV List, publications, and Lablines are just a few of our tasks. Prior to Covid in 2020, we met with the Department of Education to review chemical management. Although the collaboration was interrupted by the pandemic, the department did incorporate suggestions from our initial meeting into their new documentation.

Lastly, did you know that we introduced a mentoring program for new laboratory technicians? Geoff Gleadall leads this initiative, and the committee assists him in supporting technicians who seek guidance.

We're dedicated to expanding our support for members. If you have ideas or want to contribute, consider joining the committee. Let's elevate our association to new heights.

Please feel free to reach out to me for more information.

Sincerely,
Mary L. Jones

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HINTS & HACKS LAB

BRAINS (WITH INTEGRITY!)

- Submitted by: Patrick Hull, Traralgon College

'Tis that time of the year when I share my recipe for brains, making the ideal on the go snack or conversation piece. I have samples from two years ago and they are still firm and pliable.

The integrity is such you can balance a 2kg weight on them and they bounce when dropped!

First prepare an 80% v/v ethanol solution: for 100 mL, measure 84 mL ethanol (95%) and make up to 100 mL with distilled water.

For 100 mL glycerol/ethanol solution, measure 25 mL glycerol and make up to 100 mL with the 80% ethanol solution (or combine 1 part glycerol with 3 parts ethanol (80%)). You may require a couple of litres- I generally do batches of about 30 so adjust measurements accordingly rather than doing one at a time!



Using a 10 mL syringe and 21 g x 38 mm needle, inject the solution into the brain tissue in several places-in both the left and right cerebral hemispheres. Injection of the brain helps penetrate the inner tissues before immersion in the preservative solution.

Immerse the brain in the solution for storage in a clean glass container that has a tight-fitting lid to prevent any evaporation.

The use of Parafilm or some silicone sealant can be used to provide a good seal.

Store under conditions to prevent any deterioration i.e. a cool dry place with low-light levels and out of direct sunlight. As the solution is flammable, it should be stored in the flammable liquids cabinet.

Leave for 2-3 days to fix the tissue.

After 3 days, pour off the solution and refresh with a new batch.

It is beneficial to use at least 2-3 fresh changes of the solution. The more changes the better for fixing (retaining colour) and rendering the tissue firm and rubbery for dissection purposes.

Using the ratio of 25% glycerol in 80% ethanol has the benefit of no real shrinkage; the glycerol makes the brain tissue pliable and it is relatively safe to use. Glycerol has low toxicity and helps in preserving colour, 'though they will have a yellowish tinge.

Large jars of pickled brains also add that oh so necessary mad scientist touch to any laboratory.



HINTS & HACKS LAB

IT'S THE LITTLE THINGS

- Submitted by: Miranda Ford, Frensham School, NSW

My predecessor had made all sorts of simple yet extremely effective things around the prep room that I'd never thought of before but have proven to be amazing, such as:

Making agar plates- cut out old plastic containers to put conical flasks in to sterilise agar in the pressure cooker so they don't clink together or move around. Plastic beakers on top to stop foil popping off.



A simple storage solution for bulb pipettes. Spongy stuff in the bottom to stop them moving around:



Instead of storing pH electrodes in individual bottles and trying to stand them up, he made holes in a plastic container and filled it with the storage liquid and we can store them all together standing up. Simple and brilliant I think!



A4 lids for individual SRP experiments.



REACH FOR THE STARS at Horsham College

- Article by: Jodie Pignataro, Science Laboratory Manager, Horsham College

On 8/5/2024, Alan and Tom from VSSEC visited Horsham College. This was their first visit, but certainly not VSSEC's. They came to deliver VSSEC's Reach for the Stars program as an outreach initiative. As a rural government school, we were entitled to a subsidy, which made the program free for all our year 7 students.



In the Reach for the Stars program, students build and launch water rockets. These rockets are simple, cheap, safe, guaranteed to fly, and can be launched repeatedly. It was a fantastic way to introduce the concept of forces to our students, especially since it's the next topic the year 7s are starting next week. Talk about perfect timing!

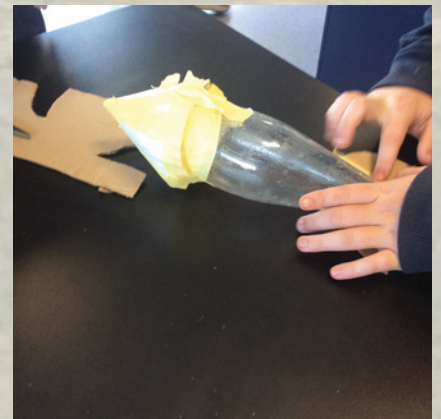
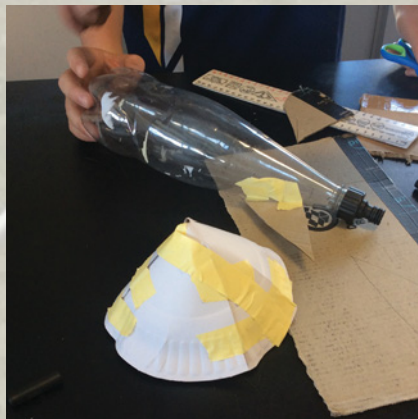
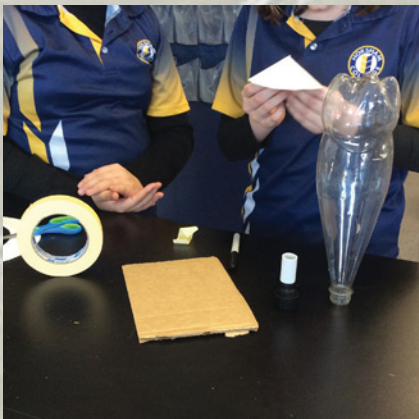
Alan and Tom began the lesson with information about forces and energy. The students then moved to the practical benches to start constructing their rockets. Alan and Tom walked around, chatting with the students about aerodynamics and discussing the possible need for fins, nose cones, and whether a bit of extra weight in the nose cone would be beneficial.

Both presenters engaged the students while seamlessly incorporating relevant information. Due to timetabling constraints, only one session had a Science teacher attend with their students. All other sessions were attended by teachers from Maths, English, Humanities, Systems, Drama, and CRTs. All the teachers were very impressed with the students' engagement, teamwork, and behavior. A few even mentioned that they are considering moving to Science because it seems much more fun than their subjects.

Then it was time to move outside and see the rockets fly. Again, Alan and Tom were very engaging while ensuring the students understood the safety requirements. They discussed the rocket fuel, which consisted of water and pressure. The students were encouraged to try different combinations and compare results, leading to great teamwork and even some new friendships.

I even managed to capture a couple of action shots. As mentioned earlier, this isn't the first time VSSEC has visited Horsham College. Looking back at some photos, it was interesting to see how the launchers have evolved. However, the students' enjoyment certainly hasn't diminished. I highly recommend VSSEC for a visit to your school. They offer many different programs, and I suggest checking out their website:

<https://www.vssec.vic.edu.au>

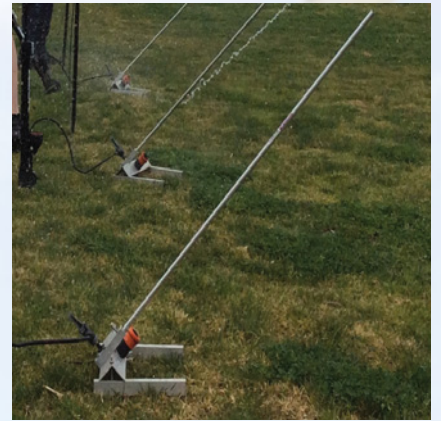




2015 LAUNCHER



2018 LAUNCHER



2024 LAUNCHER



2015 LAUNCH



2015 LAUNCH



2022 LAUNCH



2022 LAUNCH



2024 LAUNCH



2024 LAUNCH



2024 LAUNCH

Native Antibacterials

(Methanolic Extraction and Testing of Essential Oils from Australian Native plants)

- Article by: Sulo Disanayake, Senior Science Technician, Methodist Ladies College

Six different Australian plant leaves were collected, dried, and powdered, and then essential oils were extracted using methanol. Six different test materials were soaked into pre-cut filter paper discs and tested on *Staphylococcus epidermidis* and *Escherichia coli*. This method details how I extracted essential oils for testing and provides the initial results from my investigation. This practical was conducted in 2022 with Year 12 students, and the results were reproducible.

The plants chosen for this experiment were sourced locally (Melbourne).

Despite some imperfections in my bacterial cultures, the crucial observation is the significant inhibition caused by our test materials.

Equipment:

- Small grinder (coffee grinder or some blenders would also work)
- 6 x 25 ml volumetric flasks with lids (or any small glass container with a tight lid)
- 100 x small pre-cut filter paper discs
- 6 x petri dishes
- 6x plastic Pasteur pipettes
- Airtight containers or sealable bags to store dried testing material

Materials:

- 100% methanol
- Lemon Scented Tea Tree *Leptospermum petersonii* (Image 1)
- Lilly Pilly *Syzygium australe* (Image 2)
- Bottle Brush *Callistemon citrinus* (Image 3)
- Ivory Curl *Buckinghamia celsissima* (Image 4)
- Blue Gum *Eucalyptus globulus* (Image 5)
- Lemon Myrtle *Backhousia citriodora* (Image 6)



Image 1



Image 2



Image 3



Method for preparing the plant extracts:

1. Leaves were picked and then air-dried until dehydrated enough to grind (crumble easily).
2. Used a grinder to powder each variety, washing and drying the grinder container between uses. Image 7 shows the powdered samples.
3. Mixed a 1:2 ratio of plant matter to methanol in each volumetric flask, then closed the lid, and left it in the fridge over the weekend. (If you have a shaker, mixing over four hours should be sufficient.)
4. Labelled 6 clean petri dishes with plant names and placed 15x pre-cut discs in each.
5. Extracted the supernatant (methanol + plant extract) using a pipette and wetted the pre-cut filter paper discs with the corresponding plant extract. Let the discs completely dry before wetting them again. On average, three to four drops of supernatant were absorbed into each disc (Image 8.)
6. Completely dried the discs and stored them in airtight containers in the fridge until use.



Method for testing the plant extracts:

1. Prepare nutrient agar plates (4 should be enough for testing on two bacterial strains).
2. Spread 200 μL of the appropriate bacterium onto each plate using a sterile glass spreader.
3. Allow 20 minutes for the plates to dry.
4. Get 6 clean watch glasses. Place a disc from each plant extract into each watch glass (I cut one disc in half to be placed in two different bacterial plates). Wet each disc with a drop of sterile water and remove excess water before placing it on the agar plate.
5. Use Tea Tree oil (commercial) and Eucalyptus oil (commercial) for comparison.
6. Incubate the plates for 48 hours at 35°C.

Results:

Plate results for *S. epidermidis* (Image 9) and *E. Coli* (Image 10) appear below.

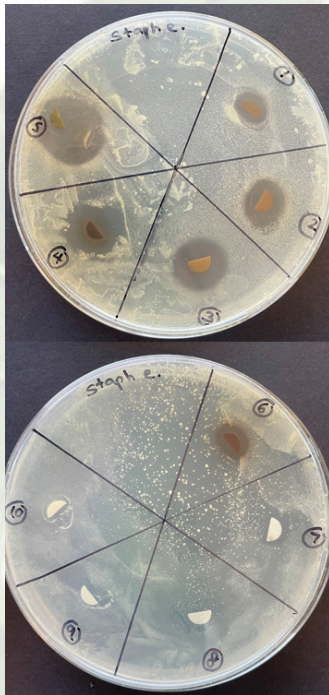


Image 9

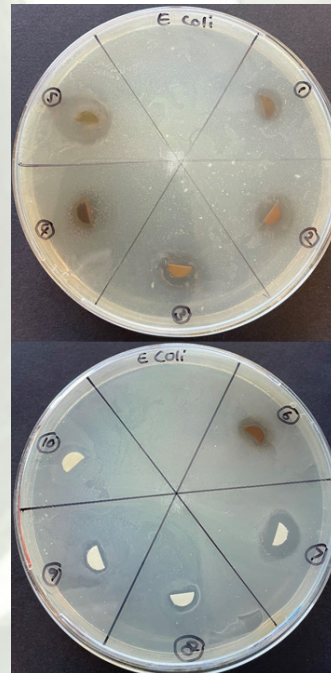


Image 10

Plate Key: 1. Lemon scented tea tree 2. Lilly pilly 3. Bottle brush 4. Ivory curl 5. Blue gum 6. Lemon myrtle 7. Tea tree oil (commercial) 8. Eucalyptus oil (commercial) 9. Water 10. Methanol

Acknowledgements:

I would like to thank Karen Lucas (VCE Biology teacher) for sparking the idea to conduct this investigation.

References:

Antibacterial Activity of Selected Australian Native Plant Extracts:

www.researchgate.net/publication/29467832_Antibacterial_Activity_of_Selected_Australian_Native_Plant_Extracts

Image Credits:

Background Image: Blue Gum by Franz Eugen Köhler, Köhler's Medizinal-Pflanzen - List of Koehler Images CC PDM-1.0 / Wikimedia Commons / Public Domain. Image enhanced by upscalemedia.com

Image 1 - Lemon Scented tea tree (Leptospermum petsonii), by The Fun Chronicles CC0-1.0* / Wikimedia Commons / Public Domain

Image 2 - Lilly pilly (Syzygium australe) - by Pseudopanax CC0-1.0* / Wikimedia Commons / Public Domain

Image 3 - Bottle brush (Callistemon citrinus) – by JJ Harrison CC BY-SA-3.0* / Wikimedia Commons / Public Domain

Image 4 - Ivory curl (Spotted Silky Oak) (Buckinghamia celsissima) by John Robert McPherson CC BY-SA 4.0 / Wikimedia Commons / Public Domain

Image 5 - Blue gum (Eucalyptus globulus) by Forest & Kim Starr CC BY 3.0* / Wikimedia Commons / Public Domain

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Images 7 to 10 - by the author, Sulo Disanayake

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FROM THE EDITOR

Jenny Emery



How Do!?

It seems that as soon as I get an issue of LabLines finalised, I have a small speck of breathing space before finding myself frantically planning for the next issue. Can you believe Term 2 is nearly done and dusted already? Indeed, by the time you get this issue of LabLines, we will have started Term 3.

Speaking of which, I find Term 3 to be the most challenging term of the school year, especially here in Melbourne. The demand for pracs is at its highest for the year, the days are shorter, darker, and colder, and often the commute to or from work is more stressful, made more dangerous by wet roads, squalls, or significant downpours of rain. On top of this, my opportunities for soaking up sunshine to allow my body to produce the Happy Vitamin, VitD, are limited, increasing my risk of SAD (Seasonal Affective Disorder) to set in. Having a prep room/office on the south side of a building doesn't help matters either.

This year I truly need to take the time to make sure I prioritise taking care of myself mentally. Whether it's carving out moments for a hot cup of tea, a brisk walk during a rare sunny spell, diving into my hobbies in my down-time, or simply pausing to take a deep breath, these small acts of self-care are essential to my wellbeing.

Remember, while our work is important, our well-being is paramount. Let's face Term 3 together, supporting each other and finding light in the midst of the winter gloom. While it's ok to not be ok, please remember that a friendly catch-up or quick chat with a fellow Techie for general support is always a phone call or email away.

- Jen -



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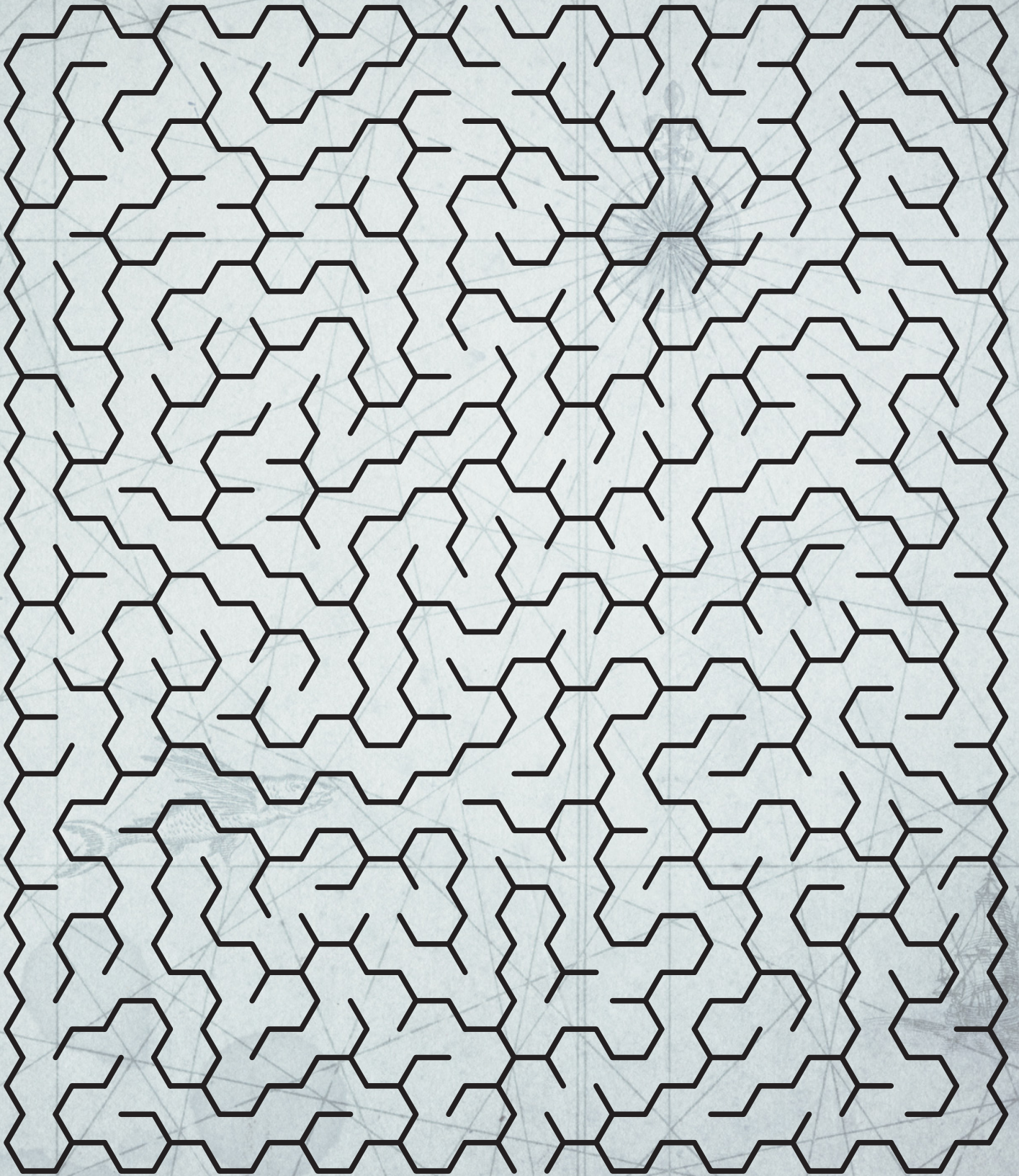
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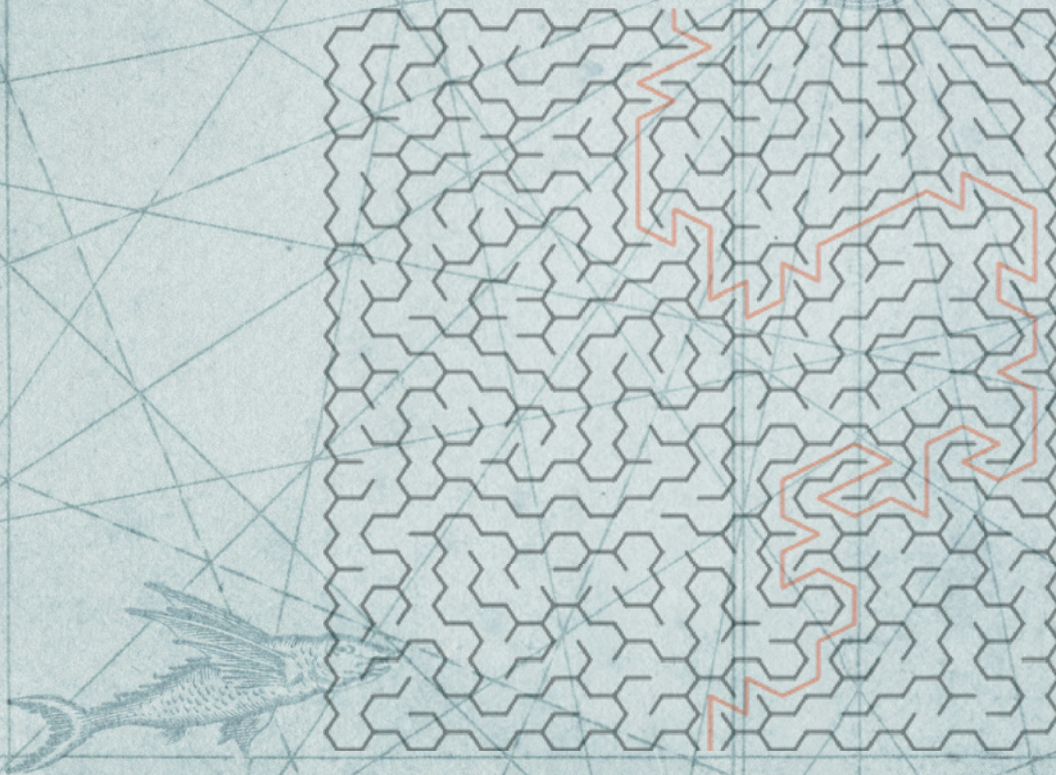
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LABYRINTH MINDFUL MOMENT MAZE

Start



End



RIDDLE-ME-THIS

1. I am not alive, but I can grow; I don't have lungs, but I need air; I don't have a mouth, but water kills me.

What am I?

2. I have many keys, yet I can't open locks.

What am I?



DETECTION of E. Coli IN POLLUTED WATER

- Article by: Ellen Ho, Brentwood SC

Background:

Sewage can contaminate waterways with various bacteria. One of them, Escherichia coli (*E. coli*), is a resident in the human intestine and its presence is an indication of sewage pollution.

Introduction:

This year 12 environmental science practical uses Petrifilm E.coli/Coliform count plates instead of nutrient agar plates.

When the environmental science teacher took leave, the relief teacher used Petrifilm count plates instead of traditional aseptic techniques. Cleaning benches with ethanol sufficed. The plates were convenient in a lab without a gas supply and specifically identified *E. coli*.

Aim:

To observe the presence of *E. coli* on an agar plate.

Equipment:

4 x sterile Petrifilm E.coli/Coliform count plates

3 x polluted water samples:

- tap water, creek water, *E. coli* broth

Distilled water

Sterilise disposable pipettes

Procedure:

1. Each group collects 4x Petrifilm Coliform Count Plates.
2. Observe how to use the Petrifilm count plates:
<https://www.youtube.com/watch?v=23tkG4pp-vc>
3. Pipette 1 ml of tap water onto the Petrifilm count plate 1 as demonstrated in the video.
4. Pipette 1 ml of distilled water onto the Petrifilm count plate 2 as demonstrated in the video.
5. Pipette 1 ml of creek water onto the Petrifilm count plate 3 as demonstrated in the video.
6. Pipette 1 ml of *E. coli* broth onto the Petrifilm count plate 4 as demonstrated in the video.
7. Replace the lids on the plates immediately after streaking.
8. Incubate the plates for 24 hours at 32°C.
9. Inspect the plates and record the number of colonies observed.
10. Incubate for another 24 hours and again record the number of colonies.
11. Enter observations and data into logbook.

Discussion:

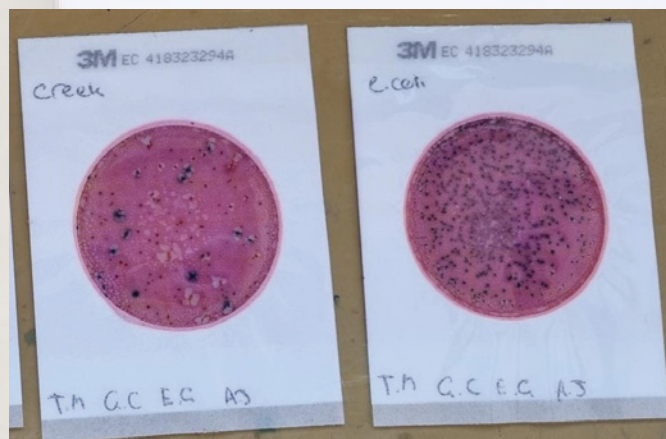
In this practical, distilled water was used as a negative control and *E. coli* broth was used as a positive control.

Two creek water samples were collected: Scotchman Creek, Mount Waverley; and Lakewood Reserve, Knoxfield.

Better results were achieved after 72 hours incubation, rather than 48 hours

Both the creek water samples had *E. coli* detected.

Fortunately, our tap water didn't have any!



FLAME TESTS

- Article by: William Hardman, Newstead College, TAS

At the school we know and love so well somewhere in Australia, it's all go in the Grade 8 science laboratory.

Dumper and Tschinta (remember them?) were found having congress in and about their locker. They have both been suspended. Teacher has seized upon this trouble-free window of opportunity to deliver some meaningful practical experiences to the class.

Reactions of some of metals with acid have been successfully done. Demonstration of the reactivity of the alkali metals (Li, Na, K) passed without incident. The students really liked that one. Teacher has decided that the class will investigate and identify some ionic compounds. They will use the flame test to identify cations (which are the metallic (+) part of these compounds).

Each group of students clamps onto a retort stand a Bunsen burner with its barrel angled at 45°. A mat is put on the bench underneath. They are given an indented tile containing small amounts of solid compounds of Ca, K, Na, Li, Ba, Cu, and Sr. Perhaps they will be given a couple of "unknown" compounds as well. The group also gets a supply of damp cotton buds.

Lit Bunsens are set to give a hot blue flame. Small amounts of solid are picked up on a damp cotton bud that is then held to the edge of the outer blue cone, resulting in a burst of characteristic colour. Students observe and record. Used buds are placed on the mat. A fresh bud is used for each compound.

When everyone is finished, and Bunsens are turned off, mats are shaken over a bin. They are rinsed off with cold water and stood on a draining rack. Teacher is impressed by how well Grade 8 has worked to complete the task of identifying cations (+) and decides that in their next practical they will learn ways to identify the negative (anion) part of a compound.



PIGLET DISSECTION

- Article by: Jodie Pignataro, Science Laboratory Manager, Horsham College

So, I am probably going to stir up a few differing opinions here. What dissections should schools be doing, and which ones should they avoid?

Everyone seems to agree on dissecting brains, eyes, hearts, kidneys, and plucks. There doesn't seem to be any issues with dissecting fish, prawns, rats, squid, or toads. However, when we replaced the rat dissections with piglets, it seemed to raise some strong opinions and ideas. I am open to listening to everyone's concerns—students, teachers, and others—as long as people are willing to hear me address those concerns.

Horsham College has elected to use piglet dissections instead of rats for several reasons:

1. The piglets we use are ethically sourced. Unlike rats, they are not bred specifically to be euthanised for dissection. These piglets come from pig farmers and abattoirs and would otherwise be discarded.
2. Piglets are anatomically closer to humans than rats. This similarity allows students to better understand human body systems.
3. Piglets are larger than rats, which gives students who do not want to participate in the actual dissection a better visual experience.

We trialled piglet dissections in 2019. All classes were informed about what they would be dissecting, and we emphasised that regardless of the animal used, the number one rule was to respect the specimens. The teachers were very impressed with how the students engaged with the piglets.

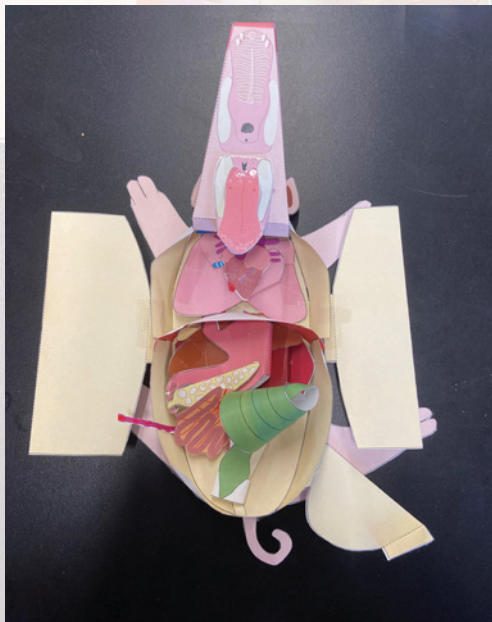
Older students were particularly fascinated by the amount of detail they could observe.

Some teachers and students prefer to cover the piglets' faces during dissections, though not everyone does.

Recently, our Year 11 Biology class conducted a piglet dissection, with 15 piglets shared between two classes. We had one defrosted piglet left, and since it couldn't be refrozen, our Year 9 CSI and Year 8 Body Detectives classes were able to observe a demonstration. It was a great way to finish off the week.

On a side note, we also give students the option of constructing a paper model of the Piglet Dissection (see below) using the "origami" template available for purchase from SSA.

Please note that pages 20-21 of this article contain graphic instructions and photographs of actual piglet dissections. Please skip the next 2 pages if you believe they will cause you distress.



PIGLET DISSECTION INSTRUCTIONS

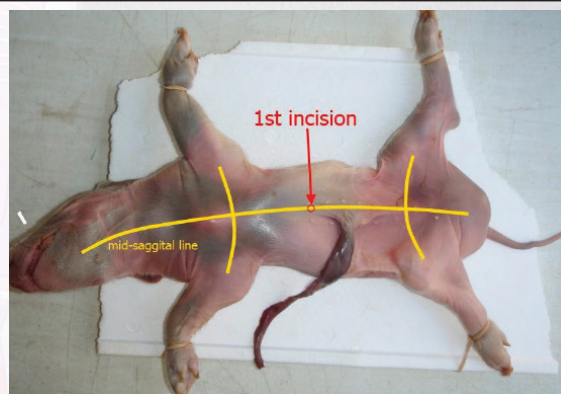
Mount piglet to the dissecting board to ensure the piglet stays in place.

Make first **light** incision from the bottom of the umbilical cord to the rectum.

Make the second **light** incision from the top of the umbilical cord to the top of the sternum.

From the bottom of the sternum make a **light** incision out to the first joint of the front legs.

From halfway between the umbilical cord and the rectum make a **light** incision out to the first joint of the hind legs.



Separate the skin from the muscular tissue using the scissors to bluntly tear through connective tissue.

Please watch the video for demonstration of technique to do so.

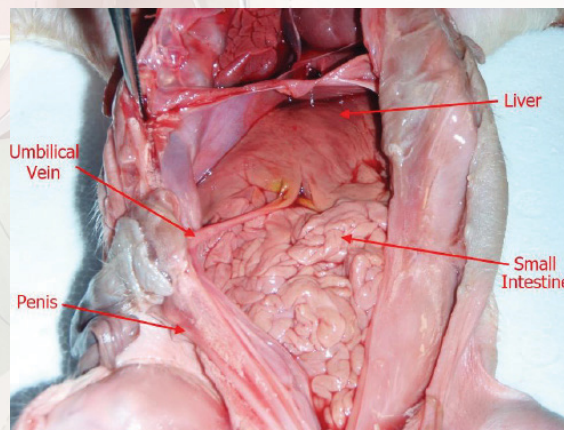


Make a **light** incision through the muscle tissue of the abdomen (you may have some guiding cuts from your initial incision). **BE CAREFUL** not to cut the peritoneal sac (containing the organs of the gut). You should be able to differentiate between muscle and peritoneal sac.

Gently lift the peritoneal sac with forceps and cut open with scissors. **BE CAREFUL**, when you lift the sac tissue that you have not lifted intestines as well.

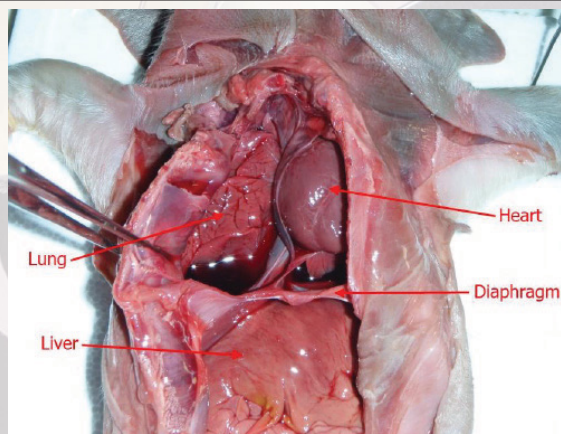
Cut the sac all the way up to the ribs and down the rectum.

You should now be able to view the organs of the abdominal region.



Using scissors, cut upwards through the sternum, to open the rib cage.

You should now be able to view the thoracic region organs.

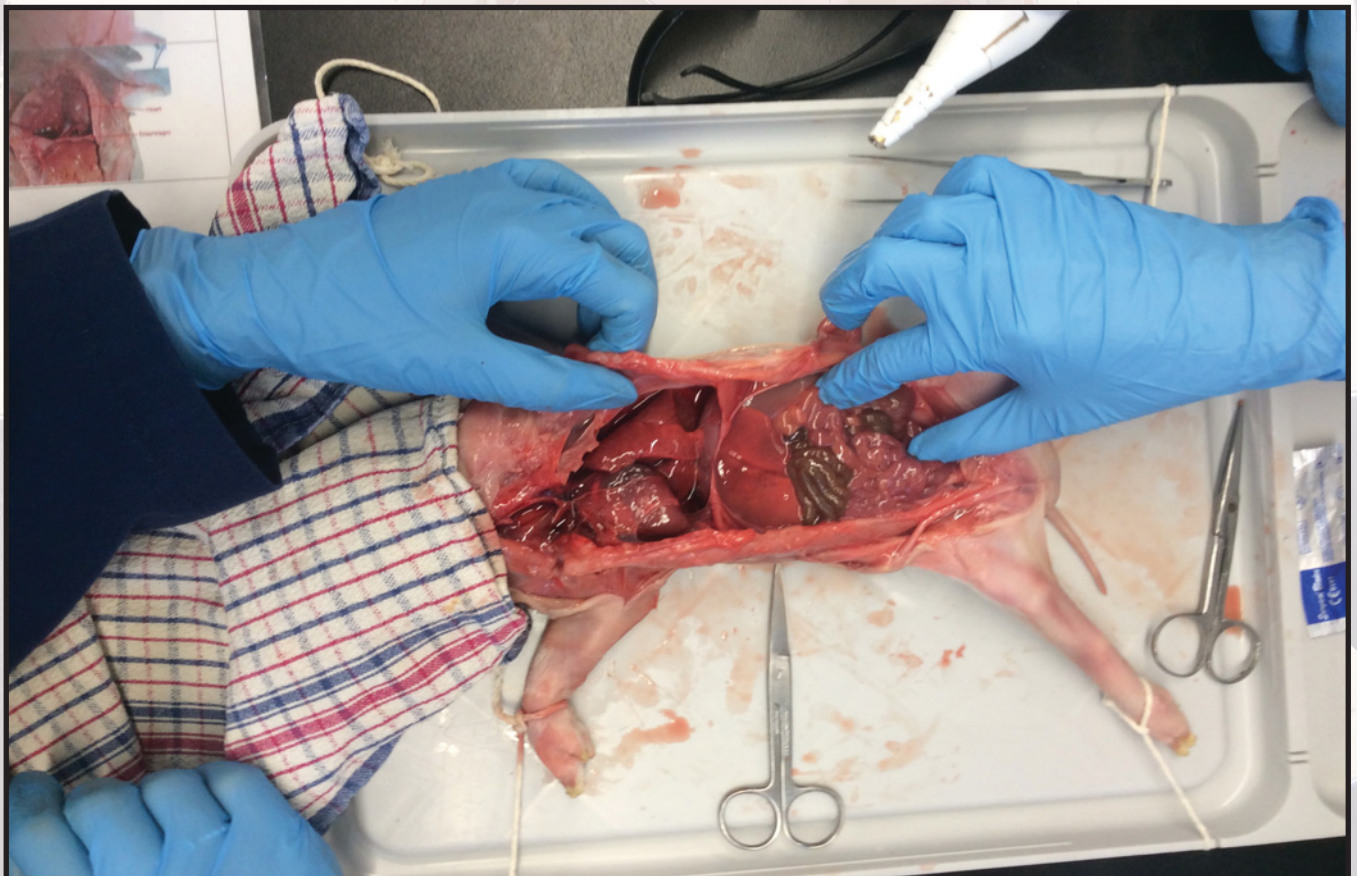
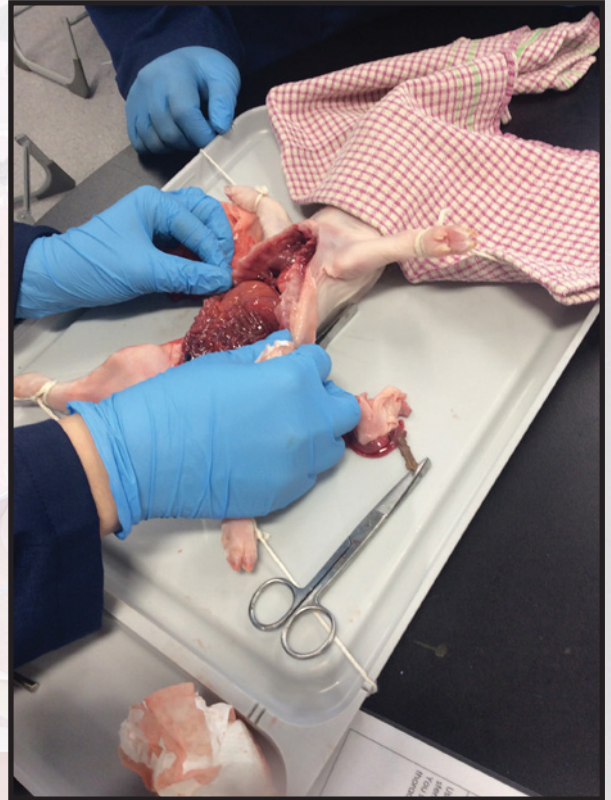


PIGLET DISSECTION

...continued

Our teachers have reported that students, including some of the reluctant ones, get really engaged once a staff member helps them get started. They can get so involved with it, that we run out of time.

Students are always told to treat any dissections with respect and disrespectful behaviour is not tolerated.





MEMBERSHIP APPLICATION



2024 LTAV Membership is now OVERDUE.

To renew your membership online, scan the QR Code, or visit ltav.org.au
Any questions, please email the Membership Officer, Simone:
membership@ltav.org.au

Membership is open to laboratory technical staff (including retired technicians) in all levels of educational institutions in Victoria.
Membership is a calendar year – January 1st to December 31st regardless of when the membership fee is paid.

LABCON SCHOLARSHIP



2024 LTAV Peter Ellis Scholarship

The Peter Ellis Scholarship pays for the costs for a chosen members of the Association to attend LABCON. For information on criteria and how to apply, please visit the scholarship page on the the LTAV website.

ltav.org.au/wp-content/uploads/2023/11/Peter-Ellis-Scholarship-policy-2015_2023v1.pdf

SUSANNAH LARRATT AWARD



2024 Susannah Larratt Award

This award is named for the late Suzannah Larratt and is intended to recognise significant services to the profession which might not otherwise be recognised. For more information on criteria and how to apply, please visit the Award page on the LTAV website.

ltav.org.au/wp-content/uploads/2023/11/The-Suzannah-Larrat-Award-policy-2006_2023v1-1.pdf

LTAV PUBLICATIONS



LTAV SHOP

Three laboratory reference manuals and a conference USB are available for purchase from LTAV:

1. Chemistry Reference Manual + USB, 2008.
2. Biology Reference Manual + USB, 2013.
3. Physics Reference Manual + USB, 2013.
4. Laboratory Management Databases Conference USB, V2, 2009, by L.Geoff Gleadall, Dip.App.Sci.

ltav.org.au/shop/

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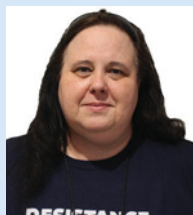
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Riddle Me This Answers: 1. Fire | 2. A Piano

Thanks for playing! If you have a riddle or puzzle or an original joke you'd like to share in LabLines, please email it to The Editor - jennifer.emery@education.vic.gov.au

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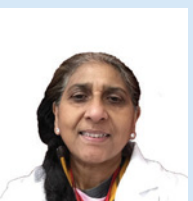
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Please feel free to contact any member of your committee with any queries or concerns. Members are always welcome at committee meetings. Please contact the Secretary to confirm time and location of next meeting if you wish to attend. 2024 MEETING DATES (TBC): 13/08; 22/10; 14/11; 6/12 or 13/12