

A hand holding a lightbulb against a sunset background. The hand is positioned on the right side of the frame, holding the base of a standard incandescent lightbulb. The background is a soft gradient of orange, pink, and blue, suggesting a sunset or sunrise. The lightbulb is unlit, and its filament is visible.

Classroom Technologies

Florida Pathways – April 12, 2022

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Online, remote, in-person:
what's in your technology backpack?



SPC Virtual Labs Strategies

Online transitions were decentralized, leading to various solutions:

- ▶ Video demonstration - Ceramics <https://youtu.be/v9s51LIGy5Q>
- ▶ FALSC resources - Jove for Biology <https://www-jove-com.db24.linccweb.org/science-education/basicbio>
- ▶ Microbiology – home lab kits
- ▶ Simulations - A&P Lab – in-house simulations
- ▶ [Live online guided dissection](#)



“Staining Guides”

- Students couldn't do the staining procedures in lab, so they were directed to read the text book, watch a demo and then create a “Staining Guide”

This week we will be learning about a variety of staining techniques commonly used in microbiology laboratories.

So, STAINING is this week's Activity assignment! CHOOSE ONE OF THE STAINING PROCEDURES (e.g. Gram stain, Capsule stain, etc.). You will then need to create a FLYER or VIDEO on your chosen staining technique. Your target audience is a fellow classmate who is struggling to remember the details of the procedure.

If you choose to create a flyer you can either:

- Draw something, take a picture of it and upload it to the associated Dropbox.
- Create a flyer in Word or PowerPoint (you can use any program you'd like but I can only open .doc, .docx, .ppt, .pptx, or .pdf files---so make sure it's in one of those formats) and upload it to the associated Dropbox.

If you choose to create a video:

- Please be sure to upload it to YouTube and provide me with a Public or Unlisted link (if you make it Private I won't be able to view it).
- Keep the video length to less than 4 minutes.

Keep all materials appropriate (no nudity, violence, cussing, etc.), but feel free to use props and/or ask family or friends to be a part of it.

NOTE: The information shared in the flyer or video should be based on textbook guidelines and **MUST BE YOUR ORIGINAL WORK**. If you upload work that is not original you will not receive credit for the assignment and will be report to the Academic Integrity Council.

Examples of Students' Work:

GRAM STAINS

POSITIVE
•
NEGATIVE

1

2

3

4

Slides 1-4

1. Crystal Violet
2. IODINE
3. ALCOHOL
4. SAFRANIN

WHY USE GRAM STAIN METHOD?

- Gram staining is a method to determine a bacteria type into two groups, Gram-positive and Gram-negative.
- Gram Positive stains show bacteria with thicker cell walls and less lipids allowing these to stain purple.
- Gram Negative stains show bacteria with thinner cell walls and more lipids allowing these to turn red.

STEPS FOR DETERMINING POSITIVE AND NEGATIVE STAINS:

- Using an inoculate loop, smear a bacteria sample from the tube onto slide. Make sure to air dry and heat fix sample after.
- Add 5 drops of crystal violet to slide for about one minute then wash off with water.
- Next, add 5 drops of iodine to slide for about 30 seconds and then wash off with water.
- Add alcohol solution for around 5 seconds and wash off fast with water.
- Add 5 drops of safranin to slide for about one minute then wash off with water.
- Lastly, observe bacteria under microscope and determine which of the two-strands it is.

NEGATIVE STAIN PROCEDURE

1.

OBTAIN A GLASS SLIDE AND PASS IT THROUGH A FLAME TO STERILIZE

2.

AT ONE END OF THE SLIDE ASEPTICALLY TRANSFER A SMALL DROP OF 10% NIGROSIIN

3.

WITH A STERILE INOCULATING LOOP, TRANSFER A SMALL AMOUNT OF THE BACTERIA TO THE SLIDE AND MIX WITH THE DROP OF 10% NIGROSIIN

4.

USING A SECOND STERILE SLIDE, AT A 45° ANGLE GENTLY SPREAD THE DROP CONTAINING THE BACTERIA ACROSS THE SLIDE CREATING A THIN FILM

5.

ALLOW THE SMEAR TO AIR DRY

6.

EXAMINE UNDER OIL IMMERSION

“DNA Extraction”

Examples of student work



OBSERVING DNA IN FOOD

All living things have DNA: the chemical instructions on how to make a living thing. It can easily be seen with the naked eye when collected from thousands of cells. This simple method allows you to extract DNA from a food and view it.

A quick overview of the process...

You will be crushing your food sample in a Ziploc bag to manually start breaking open the cells. You will then add a soap and salt mixture to your sample. The detergent disrupts the phospholipid plasma membrane and the nucleus of the cells. This allows for the release of the DNA from the cell. You will then add alcohol to the sample. The alcohol causes the DNA to precipitate in the solution and you will see the DNA form a stringy white substance.

Materials Needed

Food (a strawberry OR a 2 inch piece of banana OR 10 peas OR a piece of fresh fruit)
Sandwich-size Ziploc bag
Cup
Dawn detergent (or another brand of dish soap)
Salt
Water
Clear cup
COLD rubbing alcohol

Procedure

1. First, prepare your DNA extracting solution:
 - In a cup, mix 2 teaspoons of dish soap, 1 teaspoon of salt and $\frac{1}{2}$ cup of water.
 - Set aside until needed.
2. Place your food sample in a zip-closure sandwich bag and remove most of the air before you seal the bag.
3. Mash your food sample through the bag in your hand; add the DNA extracting solution and continue mixing.
4. Carefully pour the mixture into a clear cup.
5. Add an equal amount of rubbing alcohol to the cup. Take care not to tilt or tip the cup; do not mix the two liquids.
6. Observe the line between the food mixture and the alcohol. You will notice a white thread-like cloud appearing at this line. This is DNA! The DNA will clump together and float to the top of the alcohol layer.
7. You can “pull” your DNA sample out of the cup using a Q-tip.
8. Take a picture of your sample and upload it to the associated Discussion Board for this week’s activity post.

“Microbes Are Everywhere” with student sample

MICROBES ARE EVERYWHERE

"YOU are NOT alone..."

You will learn in lecture that our bodies are home to billions of microbes called "normal microbiota". There is a diverse community associated with these microbes and it has been found that certain genera and/or species of microbes are well suited to live on specific areas of the body (e.g. skin, mouth, vagina, etc.). In general, microbes that commonly inhabit the intestines will not also inhabit the skin (and vice versa). Our normal microbiota can live with us peacefully, but sometimes opportunities arise for these organisms to infect our bodies which can lead to disease. Disease can also arise when **pathogenic** microbes are introduced on or in our bodies.

NOTE: You should receive your lab kit this week. You will need your lab kit to perform some of this week's activities. IF YOU DO NOT RECEIVE YOUR KIT SEE THE APPENDIX AT THE END OF THIS DOCUMENT.

ASSIGNMENTS:

- Sign the Lab Safety Agreement and upload it to the associated **DropBox**
- Read pg. 13 (Possible Contamination from the Air) in Microbiology Laboratory Theory & Application
- Read pg. 17 (Ubiquity of Microbes) in Microbiology Laboratory Theory & Application
- WATCH – How to Melt and Pour Agar Plates:
<https://www.carolina.com/teacher-resources/Video/how-to-melt-and-pour-agar-plates-video/tr11194.tr>

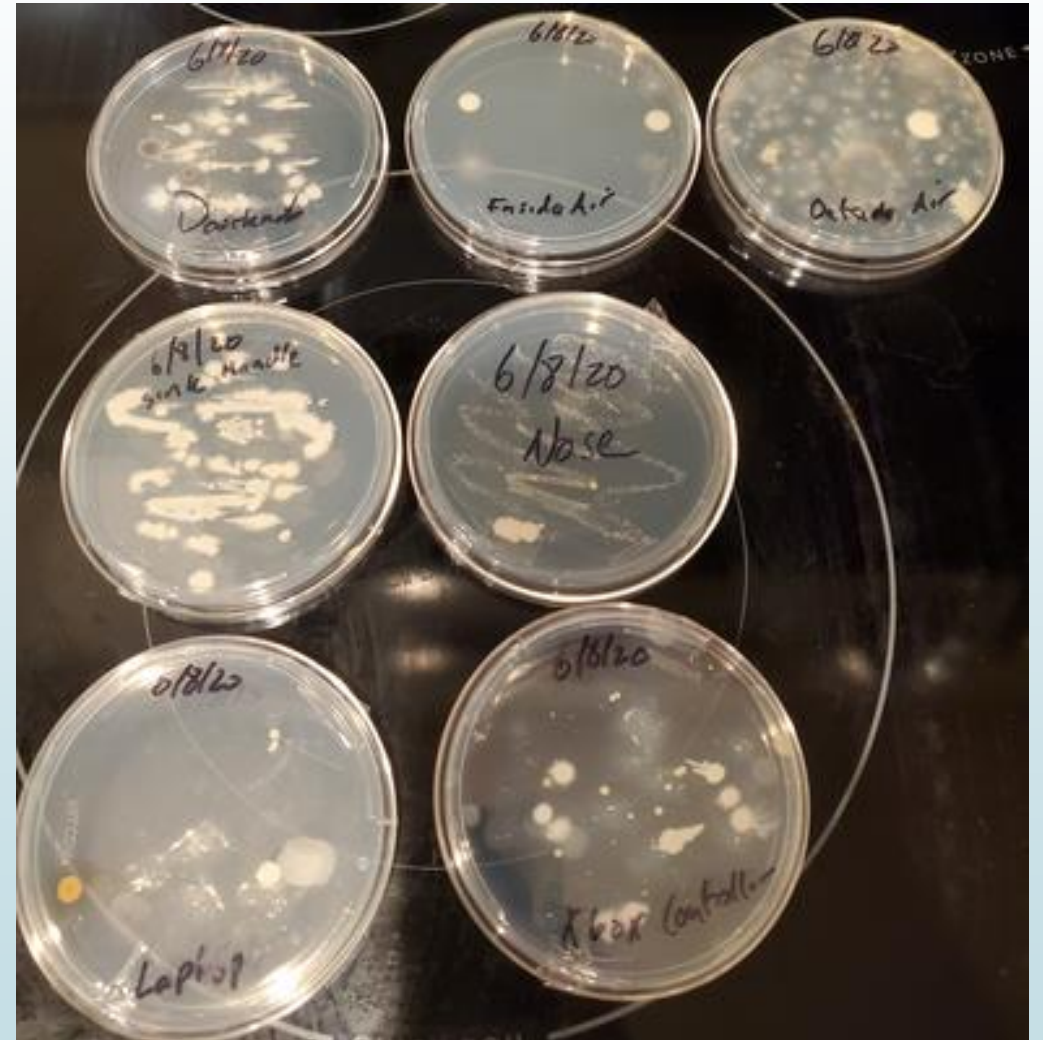
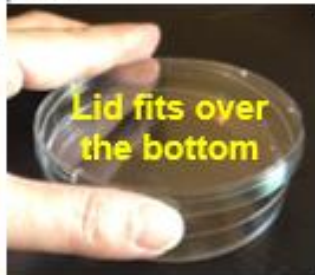
The lab kit you received contains:

Component	Qty
Reinment Agar	2
Sterile Petri Dishes	20
Sterile Agglutinator Media	50
Aluminum Foil	10
Autoclavable Disposal Bag	1

This week you will prepare 1 of the bottles of agar. This should yield ~5 Petri dishes.

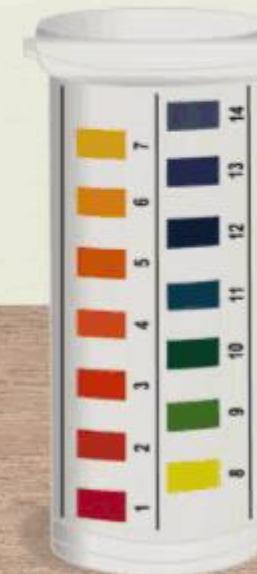
Petri Dish Explained

The Petri dish has 2 parts: the lid and the bottom. The lid is the larger half that closes over the bottom half. The bottom half is where the agar will be poured.



pH Determination

Click start to open the pH bottle.



START

Biology II Labs

Lab compilation videos from Dr. Teresa Gaskill's classes

<https://spcollege.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=d4e2a5b5-0fe7-435d-904a-ae60012566c0>



SPC LiveOnline and Remote Classrooms

- SPC LiveOnline synchronous virtual classroom - Zoom
 - Online self-paced training “Teaching Live Online”
- Remote Classrooms
 - Polycom Studio cameras, speakers, Elmos, dual projectors
 - <https://spcollege.ensemblevideo.com/Watch/b8AKr4f3>



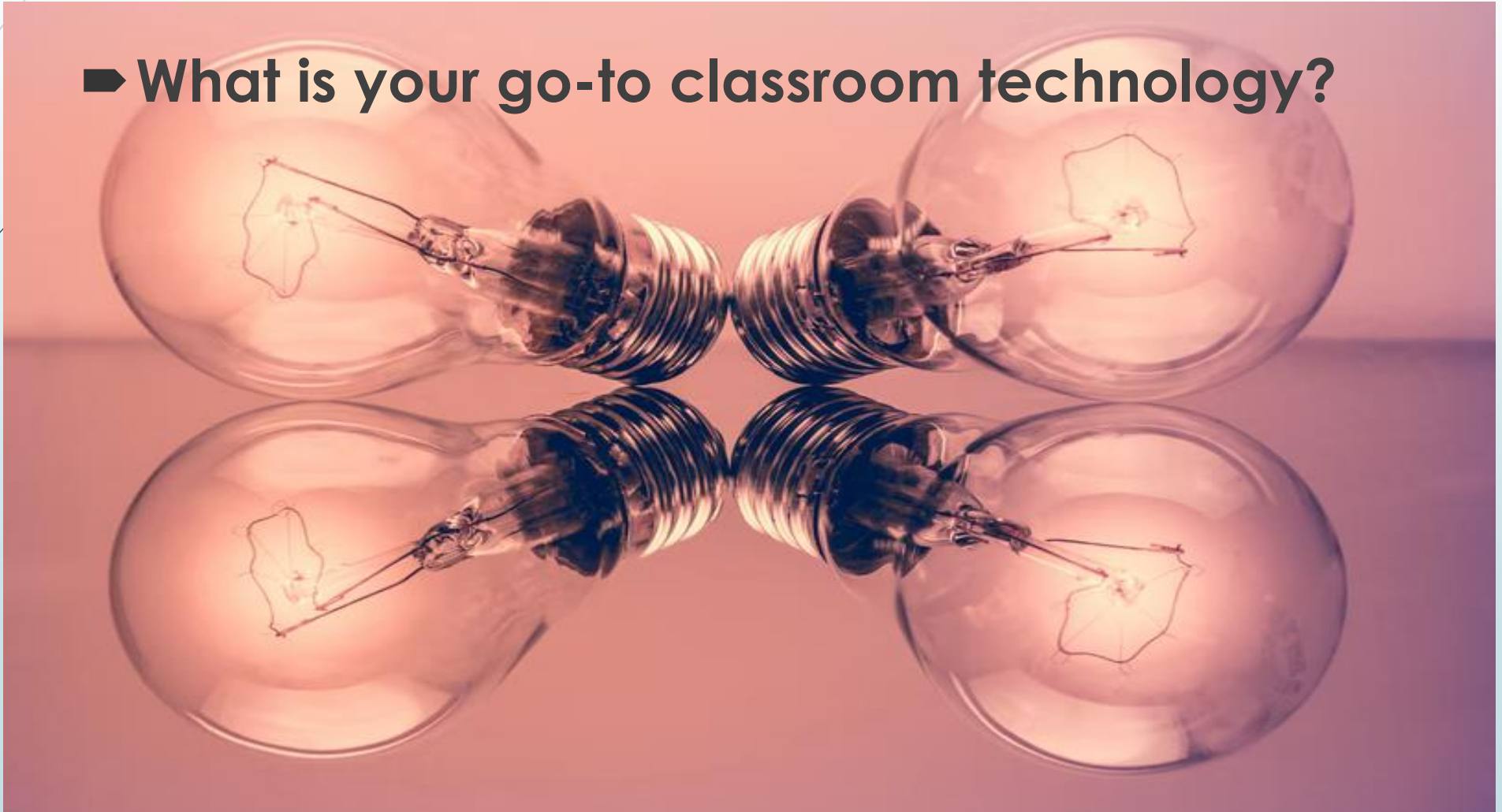
Resources for Faculty

- Zoom & Snagit
- VIBE Smartboard <https://www.youtube.com/watch?v=Ccd4cVrtHTk>
- Video Studios
 - Green screens
 - Lightboard
<https://spcollege.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=78d58ee2-72cc-45fb-9d98-adac010136b8&start=353>



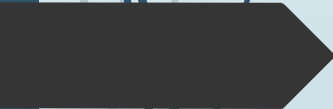
[Your great questions/ideas here]

► What is your go-to classroom technology?





Thank you
for
participating!



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