

Tricia Jones

University of Delaware



Florence Malinowski, MS

St. Georges High School

Funded by National Science Foundation Graduate Teaching
Fellows in K-12 Education (GK-12) DGE 0538555

Biotechnology at St. Georges

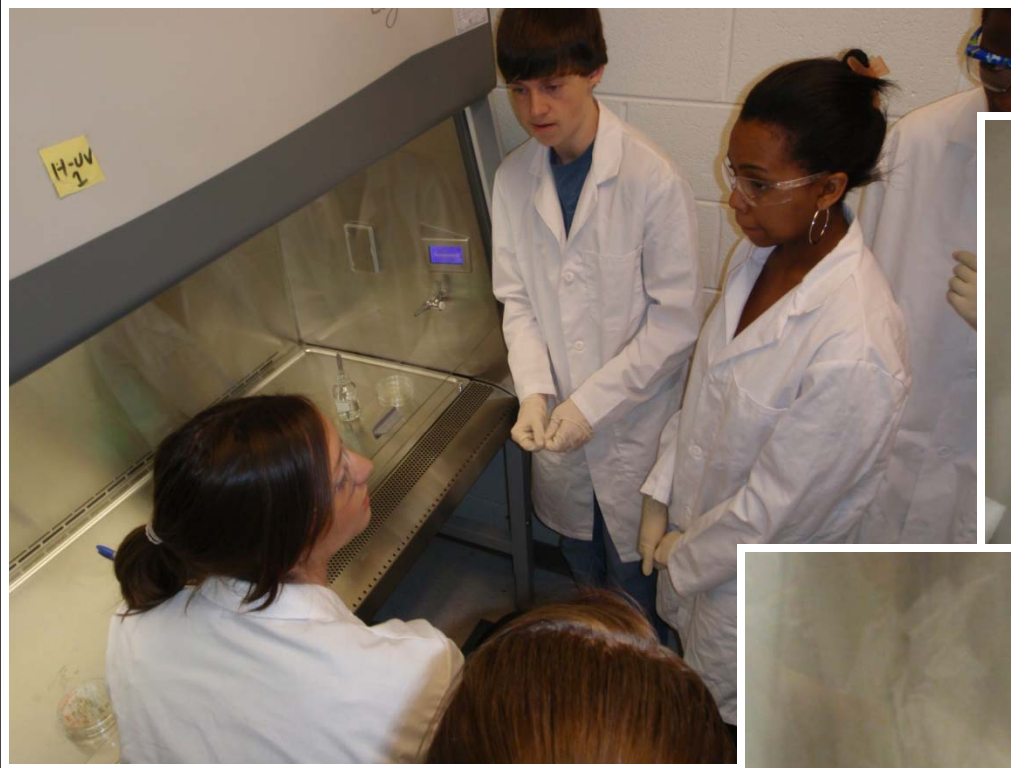
Mission: To enlighten the minds of young scientists today, to ensure the miracles of tomorrow.

Students are trained in:

- Laboratory Safety
- Solution Preparation
- Inventory
- General Laboratory Maintenance
- Standard Biological



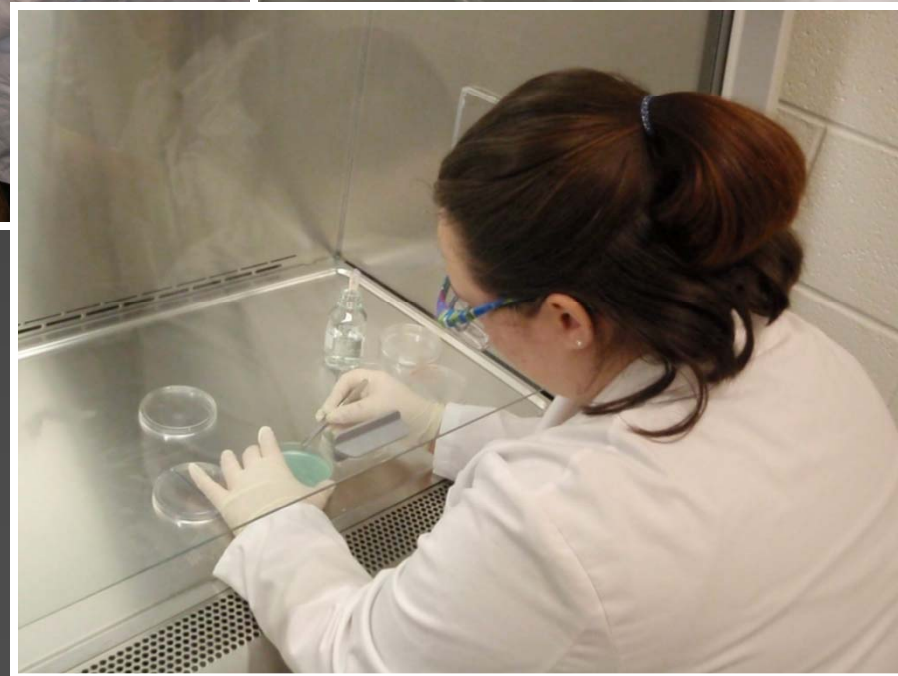
So how can I help?



Plant Tissue Culture



Proficiency in aseptic techniques is essential for avoiding contamination in the laboratory



Teaching and Assessment of Aseptic Techniques

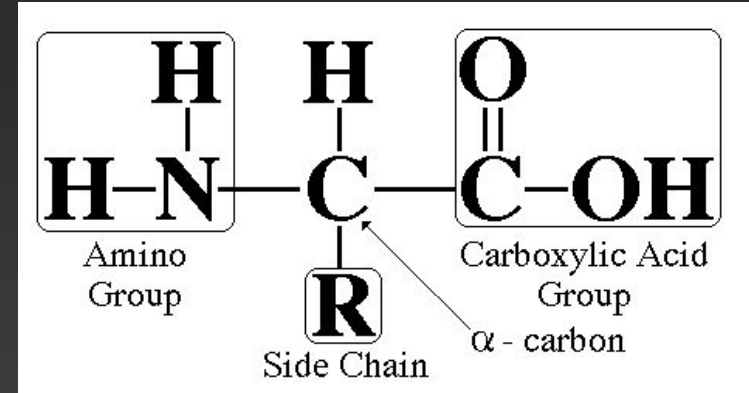
- Initial instruction
- Self-assessment (developed by Mary Boggs)
- Address problem areas
- PRACTICE!
- Lab practical
- Assess remaining problem areas and re-teach



Rubric for assessing sterile technique

	Poor = 0	Fair = 1	Good = 2	Excellent = 3	Score
Safety Equipment	Student is not wearing lab coat or safety glasses. Gloves are not worn in the hood, jewelry is left on.	Gloves are worn, but other safety equipment (lab coat and safety glasses) are not.	Most safety equipment is worn, with one minor exception (i.e. bracelets, watches not removed before working in the hood).	Student is wearing gloves, safety glasses, and lab coat. All jewelry (watches, bracelets) is removed from arms.	
Prep / Clean-up of hood	Student does not spray the hood with ethanol before use and does not turn on the UV light after use. Blower is not used.	Student attempts to properly prepare and clean up the hood but forgets important details (such as: use of the blower)	Prep / clean-up of the hood are done properly with only minor exceptions.	Hood sprayed liberally with 70% ethanol and wiped down before and after usage. Blower is on during hood use. UV light is turned on when finished.	
Pipet technique	Student does not demonstrate knowledge of proper pipet technique.	Student demonstrates weak knowledge of pipet technique, does not change tip between solutions.	Student demonstrates good knowledge of pipet technique, with only few minor mistakes.	Student uses proper pipetting technique and changes pipet tip whenever using a new solution.	
Sterile techniques	Student does not demonstrate knowledge of aseptic techniques. Student is unable to maintain sterility of materials inside the hood.	Student demonstrates familiarity with sterile technique but makes many mistakes, such as forgetting to spray hands with 70% EtOH when they are removed from the hood or working too closely to the front of the hood.	Student demonstrates good knowledge of aseptic techniques, with only few minor mistakes (such as leaving a cap face up in the hood)	Hands are sprayed with 70% EtOH whenever they leave the hood; caps face down in hood; pipets are discarded if there is a chance of contamination; sterile work is not done too closely to the front of the hood.	
Procedure	Student does not follow the procedure closely and makes many mistakes. There is a great likelihood of contamination.	Student attempts to follow the procedure but makes many critical mistakes (such as pipetting into the wrong beaker, etc.)	The lab procedure was followed closely with only minor problems that would not significantly affect the outcome of the experiment.	The lab procedure was followed without mistakes and there is little likelihood of contamination. All materials are carefully labeled.	

Learning about proteins: Constructing a polypeptide



Gly - Leu - Val -
Ser

How I've benefited from the GK-12 program:

I've learned to...

- Communicate complex science principles to the appropriate grade level
- Develop classroom materials to enhance student learning
- Assess student learning using formative assessment techniques

I've enjoyed...

- Working as a team with Florence to establish and enhance the biotechnology curriculum
- Interacting with the students



Acknowledgments

- Florence Malinowski,
MS
- Dr. Randy Duncan
- GK-12 project
leaders, teachers,
and fellows
- St. Georges
Technical High
School
- NSF

