

The Science behind CSI

INTRODUCTION:

Welcome to Salem Stories – a podcast by the Salem School District discussing topics of interest to parents, students, and the Salem community.

I'm your host – David Halpin – and this is Episode 6 – The Science behind the CSI.

Today we're at the Salem High School to investigate what's behind the growing popularity of an elective science course. It's mid-semester, and Aurora Merry's Forensic Science course is in the middle of a unit on DNA analysis.

AURORA CLASSROOM INTRO:

So...the goal today is to begin our actual lab doing the research and digest and gel electrophoresis we have prepared for...if you look behind me we have posed for us suspects who were at a crime scene...there was a bloody knife found there...and two suspects are pictured there...our goal is to perform gel electrophoresis on a variety of DNA samples that are simulating...

NARRATOR:

Most of us get our understanding of Forensic Science from television dramas where crime scene investigators are portrayed closer to super heroes than scientists. They are more likely to be interrogating suspects and kicking down doors than peering into microscopes to analyze the contents of a Petri dish.

But students in Aurora Merry's Forensic Science class know better.

AMBER:

Forensic science is a lot more than the police work you see on TV...it's a lot more about working in a lab, it's a lot more about running the tests and it's a lot less about putting the bad guys away.

NARRATOR:

That was Amber, a junior at Salem High School. She's not sure science is in her future, but she found the real-world applications in Mrs. Merry's class helped her better understand what's involved.

AMBER:

So even though I might not be pursuing a career in forensics, it just makes the topics that are involved in the class interesting...because you can take a chemistry class, you can take a biology class and hate it, but forensics will make it interesting because it can relate it back to something you know about like crime for example.

NARRATOR:

As an instructor, Merry tries to create real-world scenarios to engage students and connect the science to the solutions.

AURORA:

I think students tend to enjoy the class because it's a different type of course than they're used to. There are a lot of different skills they are using in addition to science skills again the communication skills the observation skills, teamwork... the broad range of topics that are covered give a lot of diversity to the content so students will hopefully find one or more of the units something they are excited to learn about.

CLASSROOM ACTIVITY:

How are we doing? Good...we need crime scene and suspect 3. Oh is that the restriction enzyme mix. It says here water bath, dry bath...

NARRATOR:

We're back in the Forensic Science classroom and students are working in groups to identify and sort DNA samples gathered from a fictitious crime scene and compare those to a number of suspects.

CLASSROOM ACTIVITY:

...we're doing the incubator...the dry bath is when it would be basically an incubator but a different shape apparatus...it would heat it without using water.

NARRATOR:

Following the NextGen Science Standards, Merry applies the fundamentals of chemistry, physics, and biology to real-world scenarios that engage students and sharpen problem-solving skills.

AURORA:

In addition to science content learned in the course, students also use a variety of real world skills...they work on and sharpen their problem solving, their analytical skills, their observation...there's a large emphasis on teamwork, cooperation and communication -- all of these skills are useful even if students don't end up pursuing a career in forensic science.

NARRATOR:

The one-credit, elective Forensic Science course includes a series of units designed to introduce students to forensic crime activities such as observational skills and evidence collection techniques, fingerprinting, hair and fiber analysis.

AURORA:

With each of the units in class I like to have the students learn about real case studies that have happened in history and relate those to the content we're going to be learning in that particular unit.

For example, to introduce the unit on DNA profiling...we learn about the Innocence Project and learn about some cases where individuals were exonerated based upon DNA evidence that was later reanalyzed.

NARRATOR:

One of the foundations of the course is building effective observational skills, according to Merry. To get students thinking about this, she shows the class a video clip that serves as a selective attention test.

AURORA:

This video shows individuals in different color t-shirts passing a basketball back and forth, in the middle of the video there's a gorilla that walks out...while students are viewing the video they are asked to focus on how many times the individuals in a white colored t-shirt pass the basketball back and forth...when it's over most of the class has an accurate count of the number of passes...however, most of the class --- about $\frac{2}{3}$ or so -- has completely missed the gorilla that came out in the middle of the video because they are focused on the passes.

NARRATOR:

This is a fun example to get the students to turn off their filters when observing a scene. Merry wants them to take in ALL the information without determining whether or not it's relevant. This ability is essential in evidence collection and classification.

Hair and fiber analysis – another unit in the course – builds on the concepts learned through evidence classification. Again, Merry turned to the study of an actual case to engage her students.

AURORA:

To introduce this unit we reviewed a case where dog hair was used to catch a killer. In reviewing the case, the students had a lot of questions about how the investigators were able to make an association between the victim and a suspect using pet hair.

NARRATOR:

The discussion was followed by an in-depth review of the characteristics of hair and fibers and hands-on microscope analysis.

AURORA:

I really enjoy watching students learn...watching them... their faces light up when they are able to piece together different parts of the picture and then come to a conclusion on their own versus being told and answer or having them look it up in a text book... just their pure excitement when they figure something out and they can take the ownership to it is really exciting to see.

NARRATOR:

One of those students is Darci. She's a junior at the Salem High School and has recently been researching colleges with forensic science programs. She credits Merry and her approach for sparking her interest in pursuing science as a career.

DARCI:

One of the best things about taking this course is having Ms. Merry as a teacher. she makes it very interesting and fun and is very passionate about her work she definitely touches the lives of all her students and has inspired me personally to go pursue forensics in college.

NARRATOR:

For Salem High School students looking to sharpen their investigative skills – Aurora Merry’s Forensic Science course will introduce them to the science behind today’s complicated criminal and civil cases.

They’ll learn the proper way to collect and classify evidence. They’ll analyze hair and fiber, fingerprint patterns, and DNA profiles to help identify or exclude suspects. And they’ll explore the physics of blood spatter patterns to recreate the circumstances of a crime scene.

And – even if solving crimes isn’t in their future – students gain valuable science and analytical skills they’ll use throughout their careers.

Thank you for listening to this edition of Salem Stories – The Science behind CSI.

We’ve been discussing Aurora Merry’s science class and how the Forensic Science program is inspiring the next generation of scientists.

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