

September 2019

# GEORGIA PATHWAYS

M A G A Z I N E



## Swimming In a Sea of STEAM Part 3

Investigating **FIRE** Prevention

The Space Elevator  
Things are looking up

Project Based Learning







## Investigating Fire as Fire Prevention:

How One STEM Resource Promotes Fire Safety Through Interactive Learning

By Dr. Kelly Keena

The fire safety community continually aims to reduce fire injuries and deaths. Fire Prevention Week, which is observed annually in the United States and Canada during the week of October 9, is one week out of the year when the effort gets amplified. This campaign was launched by the National Fire Prevention Association (NFPA) and became a national observance in 1925 to educate the public about deterring fires.

And now fire safety is more important than ever. Forty years ago, people had 17 minutes to escape their home in the event of a fire. Today, fire is faster due to synthetic fabrics in furniture, lighter construction materials and open floor plans, leaving people with three minutes or less to escape.

This year's Fire Prevention Week theme is "Not Every Hero Wears a Cape," which refers to incredible fire service professionals and the heroic actions civilians can take every day.

One of these daily heroic actions is education. Sean Grey, Fire Captain in Cobb County, Georgia, emphasizes an understanding of fire science as a tactic to avoid human-caused fires. Gray is part of a unique collaboration between Cobb



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County Schools, Cobb County Fire and Emergency Services and global safety science organization Underwriters Laboratories (UL) Education and Outreach team.

Middle school educators train alongside firefighters and investigators on the UL Xplorlabs Fire Forensics education resource, an online educational platform designed to encourage students to solve through science. It is especially focused on engaging middle-school students during a time in their educational lives when interest in science is shown to decrease dramatically.

The module was developed with the UL Firefighter Safety Research Institute

(FSRI), an applied research organization that advances knowledge of fire dynamics and develops cutting edge, practical fire service education aimed at helping firefighters stay safe while more effectively protecting people and property. Working in partnership with the fire service, research departments, and agencies, UL FSRI executes firefighter research and makes the results widely available to the global fire community. The Fire Forensics module content is based on UL FSRI's research exploring the effects of open and closed doors on ventilation and fire behavior.

In UL Xplorlabs Fire Forensics, students become fire training cadets and explore the science of fire and concepts such as pyrolysis, the chemical reaction where heat breaks down solids into fuel gases which mix with oxygen in the air to ignite in the chemical reaction we know as fire. They then use that acquired knowledge to solve a burn scene; students investigate the source and the cause of the fire. Using the Claims, Evidence, and Reasoning (CER) framework, students must use evidence they collect in the burned kitchen to support how they solved the case. The module fortifies STEM educational concepts based on students' acquired knowledge and understanding of fire science.

The partnership between Cobb County Schools, Cobb Fire and UL extends to teachers' classrooms; when the students do the hands-on investigations with candles and open flames, fire fighters co-teach the lessons with the teachers.

The partnership has the added benefit of introducing students to various vocational opportunities. The firefighters' role in this partnership is twofold – they serve as content experts working with the students on the experiments, and they also share various STEM career paths in the fire service field with the students. In working with these experts, the program supports student investigations that drive engagement and offer access to potential careers.

This approach helps create relevant and meaningful experiences in STEM and provides students with some of the faces and voices behind the work in various fields. In doing so, students can learn critical skills and problem-solving for all occupations and learn how their passion can lead to careers that address the world's safety challenges.

In addition to the Cobb County partnership, Xplorlabs' Fire Forensics module has also been incorporated in Camp Fury Delaware and the Kids Summer Fire Academy camp in Apopka, Florida.

Camp Fury Delaware is a female-led summer camp at the Delaware State Fire School designed to introduce young women between 13 and 17 years old to the emergency services field. 60 girls who attend the camp spend their days preparing to fight fires and protect their communities. Elizabeth Schew, Assistant Chief fire Marshal of Chester County Pennsylvania Department of Emergency Services, is one of the camp counselors

and has adapted the classroom program to her campers' needs to teach the girls about fire behavior. Specifically, she uses the resource to highlight the fire triangle – a model for understanding the necessary ingredients for most fires and how to extinguish fires by eliminating certain components.

The module also has been used effectively at the Kids Summer Fire Academy camp in Apopka, Florida. Here, students in elementary, middle and high school experience hands-on activities and exercises designed to take them up close and personal into the world of fire safety and science through one- and two-week courses. Jerry Maynard, the Apopka County Fire Department's public educator, uses the fire forensics resource to demonstrate real-life applications of the fire triangle and tie learnings to his demonstrations.

UL Xplorlabs Fire Forensics uses a framework of safety science to bolster STEM curriculum. Because of its structure, teachers have significant flexibility in how and when they implement the program. While fire safety is always relevant, these qualities make the program especially pertinent during Fire Prevention Week.

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