

1 Problem

What	Problem(s)	6 injured, fire at high school
When	Date	October 30, 2015
	Time	~9:40 a.m.
	Different, unusual, unique	?
Where	Facility, site	W.T. Woodson High School in Fairfax county, VA
	Unit, area, equipment	Classroom
	Task being performed	Chemistry demonstration to show how chemicals can change the color of a flame

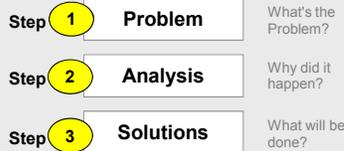
Impact to the Goals

Safety	6 injured, 2 seriously
Regulatory	School district banned open flame experiments
Production/ Schedule	School evacuated
Property/ Equipment	Classroom damaged
Labor/ Time	Emergency response required

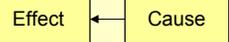
Cause Mapping is a Root Cause Analysis method that captures basic cause-and-effect relationships supported with evidence.

CAUSE MAPPING

Problem Solving • Incident Investigation • Root Cause Analysis



Why?



NOTE: Read the Cause Map from left to right with the phrase "Was Caused By" in place of each arrow.

3 Solutions

Key lessons listed from a CSB safety bulletin that should be considered when planning open flame experiments are as follows:

- Do not use bulk containers of flammable chemicals in educational demonstrations when small quantities are sufficient.
- Implement strict safety controls when demonstrations necessitate handling hazardous chemicals – including written procedures, effective training, and the required use of appropriate personal protective equipment for all participants.
- Conduct a comprehensive hazard review prior to performing any educational demonstration.
- Provide a safety barrier between the demonstration and audience.

6 BURNED AT HIGH SCHOOL

Cause Map

Open Flame Chemistry Demonstration Ends in Injuries

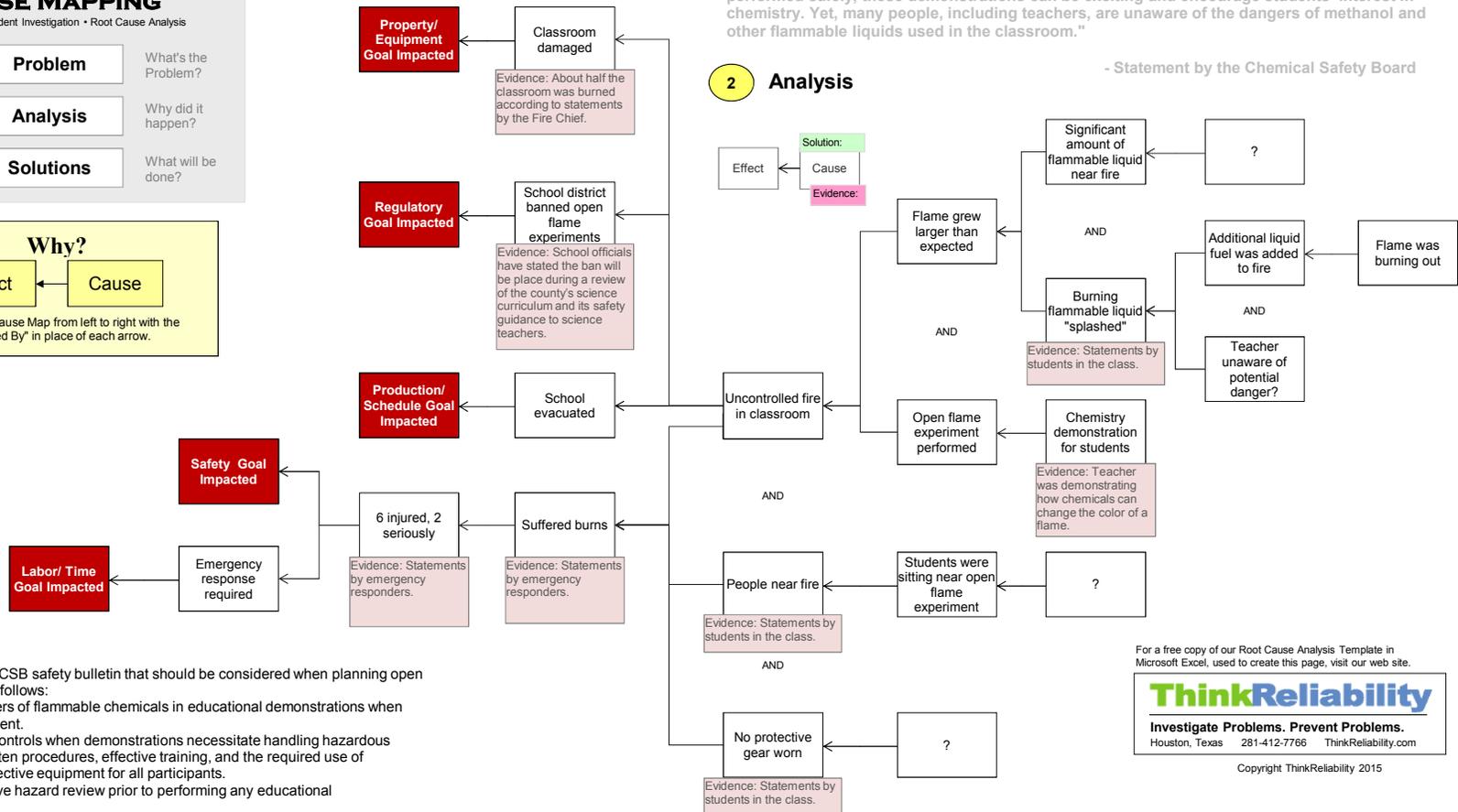
Six were injured, two seriously, in an accident involving an open flame chemistry demonstration at a high school in Fairfax County, Virginia on October 31, 2015. At the time of the incident, the teacher was performing a well-known experiment to show the students how different chemical elements can change the color of a flame. According to students present in the classroom, the teacher was in the process of adding more flammable liquid to the experiment when a splash of fire hit students and the teacher.

"Unfortunately, the accident at Woodson is one of many to occur around the country during lab or classroom demonstrations where methanol or other flammable liquids are used as a fuel for combustion...."

Similar to what we have learned so far about the recent accident at Woodson, all of the previous incidents CSB investigated involved demonstrations of flames produced by burning a flammable liquid, usually methanol. In all three previous cases, there was a flashback to the methanol bulk containers, and the fire engulfed members of the viewing audience. When performed safely, these demonstrations can be exciting and encourage students' interest in chemistry. Yet, many people, including teachers, are unaware of the dangers of methanol and other flammable liquids used in the classroom."

- Statement by the Chemical Safety Board

2 Analysis



For a free copy of our Root Cause Analysis Template in Microsoft Excel, used to create this page, visit our web site.

ThinkReliability

Investigate Problems. Prevent Problems.
Houston, Texas 281-412-7766 ThinkReliability.com

Copyright ThinkReliability 2015