

Welcome to Xplorlabs: The Science of Fire Forensics, Claims, Evidence and Reasoning

There's been a fire! It is the students' job to figure out where the fire started and how. The Science of Fire Forensics pathway provides an opportunity for students to explore scientific concepts related to the natural phenomenon of fire and make sense of how they relate to a career in fire investigation. At the conclusion of the pathway, students will virtually analyze a real burn scene to solve the case of the kitchen fire's origin and cause using a claims, evidence and reasoning (C.E.R.) format.

	Engage	Explore/Explain	Explain	Evaluate		
Part of the Pathway	 <p><i>There's been a fire!</i></p>	 <p><i>The Investigators Academy</i></p>  <p><i>What is fire?</i></p>  <p><i>How does fire develop?</i></p>  <p><i>How does fire behave?</i></p>	 <p><i>Guided Investigation</i></p>	 <p><i>Solve the Case</i></p>		
NGSS	MS-PS1-1 Matter and its Interactions / HS-PS1 Matter and Its Interactions and MS-PS3 Energy / HS-PS3 Energy					
Time	1 Class Period	1-4 Class Periods (each investigation likely takes 1 class period)	1 Class Period	1-2 Class Periods		
Overview	<p>A kitchen fire has occurred. Students walk in after the fire to identify potential evidence that might help them understand the origin. Just like real fire investigators, students will ask questions about the burn scene, develop models to better understand the system of fire, and eventually construct explanations for the origin and cause of the fire.</p>	<p>Using interactives from the pathway to explore fire at different scales, students come to understand the changes (PS1.A) that occur for the chemical reaction (PS1.B) known as fire to occur. Students also plan and carry out an investigation to understand that fire requires certain components in its system to ignite and burn.</p>	<p>Students first explore how thermal energy transfer (PS3.A, B) contributes to fire growth through interactives on the pathway. Then students plan and carry out an investigation to specifically observe for the effects of a candle flame on materials of different shape, size, and density (PS1.A) at different locations (PS3.B) relative to the flame.</p>	<p>Students use the pathway interactives to further make sense of how different types of matter in a fire interact with thermal energy (PS1.A). Students also plan and carry out an investigation to make direct observations of how properties (PS1.A) affect the amount of energy released (PS3.A, B) during combustion.</p>	<p>Using an actual burn scene from a lab, students begin to construct explanations for how ventilation affects a fire. Students obtain information from a real investigator about how to analyze a burn scene for evidence and apply scientific reasoning using knowledge of energy and matter.</p>	<p>The time has arrived for students to demonstrate everything they have learned by gathering evidence from a 360° virtual burn scene. They will construct an argument for how interactions of energy and matter leave behind evidence that supports a claim about the origin of the fire. Students use a claims, evidence, and reasoning (C.E.R.) format to organize their thinking in their final investigation reports.</p>
Supporting Documents	Fire Forensics Student Pathway Guide					
		The Fire Triangle Investigation	Heat Transfer and Ignition Investigation	Energy and Combustion Investigation	Fire Lab Data Analysis	Solve the Case