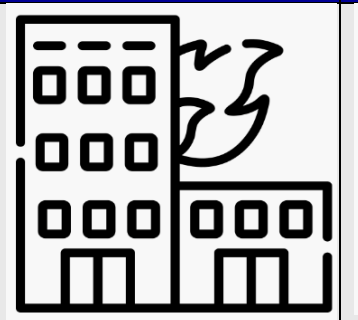
Instructional phases	**Engage**	**Explore**	**Explore/Explain**	**Explain/ Evaluate**	**Extension**
Visual storyline					
Standards	**High School Science (PA STEELS):** • SEP4: Analyzing and Interpreting Data • SEP7: Engaging in Argument from Evidence • SEP8: Obtaining, Evaluating, and Communicating Information **High School Statistics (Common Core/PA Core):** • HSS-IC.B.6: Evaluate reports based on data. • HSS-IC.A.1: Understand statistics as a process for making inferences about population parameters based on a random sample from that population.	**High School Science (PA STEELS):** • SEP2: Developing and Using Models • SEP3: Planning and Carrying Out Investigations • SEP4: Analyzing and Interpreting Data • SEP6: Constructing Explanations[1] (for science) and Designing Solutions (for engineering) **High School Statistics (Common Core/PA Core):** • HSS-ID.A.1: Summarize, represent, and interpret data on a single count or measurement variable. • HSS-ID.B.5: Summarize categorical data for two categories in two-way frequency tables, interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies).	**High School Science (PA STEELS):** • SEP6: Constructing Explanations (for science) and Designing Solutions (for engineering) • SEP7: Engaging in Argument from Evidence • SEP8: Obtaining, Evaluating, and Communicating Information **High School Statistics (Common Core/PA Core):** • HSS-IC.A.1: Understand statistics as a process for making inferences about population parameters based on a random sample from that population. • MP4: Model with mathematics	**High School Science (PA STEELS):** • SEP4: Analyzing and Interpreting Data • SEP8: Obtaining, Evaluating, and Communicating Information **High School Statistics (Common Core/PA Core):** • HSS-ID.A.1: Summarize, represent, and interpret data on a single count or measurement variable. • HSS-ID.B.5: Summarize categorical data for two categories in two-way frequency tables, interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies).	**High School Science (PA STEELS):** • SEP7: Engaging in Argument from Evidence • SEP8: Obtaining, Evaluating, and Communicating Information **High School Statistics (Common Core/PA Core):** • HSS-IC.B.6: Evaluate reports based on data. • MP3: Construct viable arguments and critique the reasoning of others.
Timing	45 minutes	90 minutes	90 minutes	90 minutes	90 minutes
Objective	By the end of this lesson, students will be able to identify and analyze a real-world fire safety problem, and explain how data can inform potential solutions, as demonstrated by their active participation in a class discussion.	By the end of this lesson, through participation in hands-on and virtual experiences, students will learn about fundamental fire science and gain a foundational understanding of basic fire sprinkler system principles.	By the end of this lesson, students will analyze and interpret data from a sprinkler infographic, demonstrating how mathematical and scientific principles inform real-world solutions. This analysis will serve as an introduction to the impact of data-driven policymaking in public safety	By the end of this lesson, students will analyze data and evaluate sources using the CRAAP method to prepare for a sprinkler mandate role-playing activity, demonstrating their ability to identify a real-world fire safety problem and explain data-driven solutions through active participation.	By the end of this lesson, students will demonstrate their understanding of fire safety science, data display and analysis, and source evaluation by effectively engaging in a role-playing scenario and constructing policy arguments relevant to a real-world context.

Overview	**Activity: Fire Scenario Challenge** Students will be presented with the scenario of a recent high-rise fire in Philadelphia and the subsequent debate surrounding a mandatory sprinkler ordinance. Following this, they will **discuss** the scenario, **identify** key stakeholders, and, through guided discussion, **delve into** the crucial role of evidence-based decision-making. Students will then be introduced to the driving question for the unit, *How can data and scientific evidence inform decisions about fire safety policies in high-rise buildings?,*	**Activity 1: The Science of Fire** Students will actively engage with Xplorlabs' Fire Science Exploration (pgs 2-6) to investigate fire science concepts. They will **manipulate** fuel, heat, and oxygen within simulations to **investigate** combustion and the fire triangle. Students will **record** observations while **experimenting** with variables and then **discuss.** **Activity 2: Fire Sprinkler Systems** Students will view Xplorlabs' Side by Side Burn video, and **provide** observations of temperature and time to **analyze** sprinkler safety. Students will then **explore** Xplorlabs' How Do Sprinklers Keep Us Safe? interactive to **examine** sprinkler components and activation mechanisms.	**Activity 1: First Look at Some Sprinkler Data** Students will **analyze** real-world data in the Xplorlabs' Fire Sprinkler Use and Efficiency Data activity. **Activity 2: Exploring Data-Driven Policy** Students will **revisit** the fire scenario and **learn** it's based on a real event. We will **introduce** Philadelphia's proposed sprinkler mandate for high-rise buildings using an Inquirer article. Students will **discuss** the proposed policy, **explain** its justification based on the fire triangle, **consider** the reasons behind it, **brainstorm** relevant data for city officials, and **reflect** on human and equity considerations.	**Activity 1: Evaluating Sources with CRAAP** Students will **learn** the CRAAP method to determine if information is trustworthy. We will **define** Currency, Reliability, Authority, Accuracy, and Purpose. You will then **apply** this method to different examples of fire safety sources like government reports, news articles, and company websites to **judge** their credibility. **Activity 2: Analyzing Fire Safety Data** Students will **research** fire safety data, including information on incidents, injuries, and costs from sources like NFIRS and fire installation companies. You will **interpret** this data and **create** charts or graphs to visualize important trends and comparisons.	**Activity: Data-Driven Policy Role-Play: The Sprinkler Mandate Debate** Students will be divided into groups representing different stakeholders in the Philadelphia sprinkler mandate debate (e.g., city officials, property owners, fire safety advocates, insurance companies). Each group of students will **research** their position using provided resources and potentially **conduct research**, **preparing** arguments based on analyzed data and credible sources (applying the CRAAP method). Then they will **present** their data-backed arguments for or against the sprinkler mandate. Students will **ask** critical questions of other groups, focusing on the evidence and the reliability of their sources.
Supporting Documents	• Fire Scenario Challenge - Student Guide	• Xplorlabs' Side by Side Burn video • Xplorlabs' How Do Sprinklers Keep Us Safe? interactive	• Xplorlabs' Fire Sprinkler Use and Efficiency Data activity • Philadelphia Inquirer Article: A Battle is Brewing • Article Guide	• CRAAP Method for Evaluating Fire Safety Sources • CRAAP PowerPoint	• The Sprinkler Mandate Debate • Role Play Cards
Additional Resouces	• WHYY Article: Philly property owners push City Council to kill sprinkler bill for high-rise buildings • Fox 29 News Clip: Philadelphia City Council considers ordinance that would require sprinklers in high-rises • 6ABC Action News Report: 'I need a place to live': Over 100 residents displaced after fire at Philadelphia apartment complex • NFSA Article:Retrofitting Sprinklers in High-Rise Buildings: Concerns and Solutions • WHYY Article: What to know about fire safety rules for your Philadelphia home or apartment • Stu Bykofsky – Journalist Blog: https://www.stubykofsky.com/fire-sprinkler-retrofit-is-high-cost-low-benefit/				