

Fire Forensics Investigation Day 3

October is Fire Prevention Month!
Learn how fires start and spread through
an interactive investigation this week!



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_Investigators Academy

INVESTIGATORS ACADEMY



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How Does Fire Behave Interactive

How does fire behave?

Scroll to the interactive where there is a **bed on fire**. Gather and communicate information from the interactive about how a fire behaves and interacts with matter.

- Record your understanding of how fire behaves in the chart below.

1	CLICK ON HOTSPOT 1	What causes particles to move?	
2	CLICK ON HOTSPOT 2	How does a change in temperature affect other properties of matter?	
3	CLICK ON HOTSPOT 3	How does density affect the motion of gases in the room?	
4	CLICK ON HOTSPOT 4	What happened to the smoke once it reached the wall?	
5	CLICK ON HOTSPOT 5	What occurred once the oxygen in the room was used by the fire?	
6	CLICK ON HOTSPOT 6	How did the fire eventually extinguish?	

- What is something new you learned about fire from the interactive?



During a fire, changes in temperature affect the pressure and volume of gases in the room. These changes cause fire to behave in predictable ways.

Scroll to the **red language accordion** to better understand the stages of fire development.

3. Using information from the accordion, identify the best explanations for each term or core idea.

- | | |
|-------------------|---|
| _____ Temperature | a. force exerted on walls of a container |
| _____ Pressure | b. amount of space consumed by an object |
| _____ Volume | c. measurement of total kinetic energy of an object |



How Does Ventilation Affect Fire Interactive

Scroll to the interactive where a **bed is on fire**. Gather and communicate information from the interactive about how ventilation affects fire interactions with matter.

4. Record your understanding of how ventilation affects fire in the chart below.

<div>1</div> <div>2</div> <div>3</div>	CLICK ON HOTSPOT 1	Make a prediction. How do you think the fire would behave if the window was open? Would it go out, or would it grow bigger?	
	CLICK ON HOTSPOT 2	How did the open window first affect the fire?	
		How does the interactive represent hot smoke and cooler air?	
	CLICK ON HOTSPOT 3	After some time passes, how does the open window continue to affect the fire?	

5. What is something new you learned about fire from the interactive?



Ventilation is the exchange of hot, oxygen-depleted gases, with cool, oxygen-rich air.

Scroll to the **red language accordion** to better understand the stages of fire development.

6. Using information from the accordion, identify the best explanations for each term or core idea.

- | | |
|--------------------------------|--|
| _____ Exchange | a. fills lower pressure area |
| _____ Hot, oxygen depleted gas | b. unequal pressure of inside hot air and outside cold air that creates a circulation of air |
| _____ Cool, oxygen rich gas | c. flows outside the room |



Real Lab Footage: Fuels

Scroll to the real lab footage of **organic versus synthetic fuels**. Gather information as you observe the video.

7. In the space below, record your observations about organic and synthetic fuels.

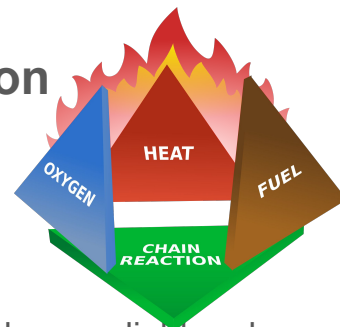
ORGANIC FUELS

SYNTHETIC FUELS

Candle and Marshmallow Investigation:

How could we apply what we learned about particle movement, ventilation, and fuel types to our candle and marshmallow investigation. Draw a picture below.

Candle and Marshmallow Investigation



1. Observe your candle.
 - a. List the parts of the candle.
2. Light your candle. Observe closely. Use the screen to help block some light and visualize the structure of the flame and the wick of the candle.
 - a. Can you see space around the wick?
 - b. What is the fuel source for the flame since the solid wick isn't on fire? Blow your candle out and relight the fuel in the air to support this claim.
 - c. What happens when you put a piece of foil between the wick and the flame?
 - d. If you remove the fuel source, what happens to the fire?
3. Place the clear glass pyrex pan over the candle to test your predictions about how airflow or amount of oxygen affects fire behavior.
 - a. What happens to the fire if oxygen is depleted?
4. See if you can use ice in a beaker to “suck” the heat away from the reaction and put the fire out.
 - a. What happens to the fire if heat is removed?
5. Using the candle and the marshmallow on a toothpick explore the different types of heat transfer. Use a different marshmallow for each investigation.
 - a. Record your observations below

Conduction: heat transfer through touch or direct contact.	Convection: the transfer of heat from one place to another through the movement of a fluid or gas. (hot molecules rise and then fall through convection currents)	Radiation: the process of heat energy being transferred through space via electromagnetic waves.
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