

FIRE Unit Master Document



Objective 1: What makes a fire start and go out?

Objective 2: Wick or wax, what is burning?

Objective 3: How do we talk about matter?

Objective 4: How does heat transfer through materials?

Objective 5: How can you share this newly learned information with a larger audience and share the knowledge of Safety Science?

Objective 1: What makes a fire start and go out?

Introduction

1. Intro Slides (included in supporting docs)
 - a. Cultural Connections
 - b. Fire History- mythology, Indigenous, Chicago, Evanston
 - c. Personal Connection to Wildfire- Dixie Fire in CA
 - d. Watch the Xplorlabs [Kitchen Fire Video](#) - Use the notice and wonder protocol

Lab Experience

2. Students complete the Candle Lab (Xplorlabs inspired, included in supporting docs)
 - a. Individual intro model of a candle
 - b. Group intro model
 - c. Students explore the - Xplorlabs: [What is Fire? Interactive](#)
 - d. Lab Testable Questions:
 - i. **Testable Question 1:** What is the effect of reducing the flame's access to the surrounding air on the reaction?
 - ii. **Testable Question 2:** What happens to the flame when we limit the fuel?
 - iii. **Testable Question 3:** What happens to the flame if heat is removed?
 - e. Exit Ticket Candle Warmer Application



Objective 2: Wick or wax, what is burning?

Lab Experience

1. Wick Lab (Xplorlabs inspired, included in supporting docs)
 - a. Lab Testable Questions:
 - i. **Testable Question 4:** What is the effect of removing the wax from the candle on the candle's ability to burn?
 - ii. **Testable question 5:** What is the impact of using different materials for the wick on the fire?
 - iii. **Testable Question 6a:** What is combustion? (use screen)
 - iv. **Testable Question 6b:** What are the contents of the smoke?
 - v. **Testable Question 6c:** Can a candle burn upside down?
 - vi. **Testable question 7:** What is the impact on the fire if we change the surrounding air?



Students build meaning using these experiences and their Combustion Reaction Notes. They will update their initial model of a candle

Objective 3: How do we talk about matter?

This segment of instruction was a detour to discuss matter- elements, mixtures, compounds, chemical reactions, physical changes and chemical changes. Examples were connected back to fires and candles. Students also worked on expectations of Macroscopic and particulate models of matter given a symbolic model. Most reactions were connected to various combustion reactions.

Lab Experience

1. Reaction in a Bag Lab- intro, writing testable questions, intro to experimental design
 2. Whoosh Bottle Demonstration
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Objective 4: How does heat transfer through materials?

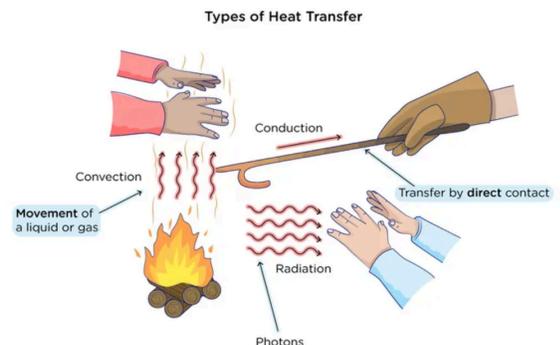
Independent Notes- Students worked on NGSS skills of creating testable questions, writing procedures, and CER as they explored heat transfer through different materials. Students were given materials (marshmallows, iron, copper and wooden sticks, and a heat source) to determine which material was best at transferring energy. Students also worked in teams to transfer energy using a bow drill.

Lab Experience

1. Thermal Energy Transfer Lab (Xplorlabs inspired, included in supporting docs)
2. Bow Drill Lab (included in supporting docs)

Students build meaning on these experiences by exploring the following resources:

1. [Xplorlabs: How does a fire Develop?](#)
2. [Xplorlabs: How does a fire Behave?](#)
3. [Songs](#) about fire - not vetted for lyrics
4. Videos of Indigenous peoples using a bow drill



Objective 5: How can you share this newly learned information with a larger audience and share the knowledge of Safety Science

Students demonstrated their learning through a choice project. They had to choose a role, audience, format, and topic (RAFT). This allowed for students to explore an area in more depth and produce a project that would include a slogan/ motto specific to their audience. It allowed for creativity and demonstration of knowledge in various ways.

Students Explain their understandings about fire and apply them to a situation of interest

1. Fire Action Project (included in supporting documents)
2. Sample projects included in supporting documents