

Research Question

I wanted to investigate the combustibility of different types of paper. I wanted to experiment on whether changing the type of paper between computer paper, construction paper, and newspaper affects the time it took the material to burn. I researched this because I have campfires often in the summer and fall. I wanted to see which type of paper was the most or least combustible for the campfires.



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Hypothesis

I predict that if I change the type of paper every trial, construction paper will be the slowest to turn to ash. Construction paper is stiffer and rougher than computer paper and newspaper. It is made for crafts and is meant to last, unlike newspaper. Since construction paper is firmer and slightly thicker, I predict that construction paper will last the longest.

Variables

Independent variable = The types of paper

Dependent variable = The time it takes for the independent variable to burn

Controlled variables	Why it needs to be controlled	How to control it
The size of the paper	If each type of paper is a different size it will make the data inaccurate.	Cut each type of paper to the exact same size.
Temperature	Could affect how the speed the paper burns.	Do the trials the same day and time to keep the same temperature.
The amount of wind	The paper won't be able to burn as fast.	Do the trials relatively at the same time.
Person who holds the tongs	Different people could hold the tongs differently	The same person holds the tongs for each trial.
Person who manages the stopwatch	To make the experiment the most accurate possible.	Same person starts and stops the stopwatch.
The type of tongs	Different tongs could affect the data.	Use the same tongs for each trial.
Where the paper is placed on the burner	Depending on where you put the paper affects how fast the paper burns.	When holding the pieces of paper over the fire put them in the same place for each trial.

Materials

- 1 3x3 in. piece of Construction paper
- 1 3x3 in. piece of Tissue paper
- 1 3x3 in. piece of Newspaper
- 1 Stopwatch
- 1 pair of tongs
- Burner or open flame
- 1 Bowl of water
- Partner/adult

Photo: Sabrina Shields



Photo: Sabrina Shields



Set Up / Labelled Diagram

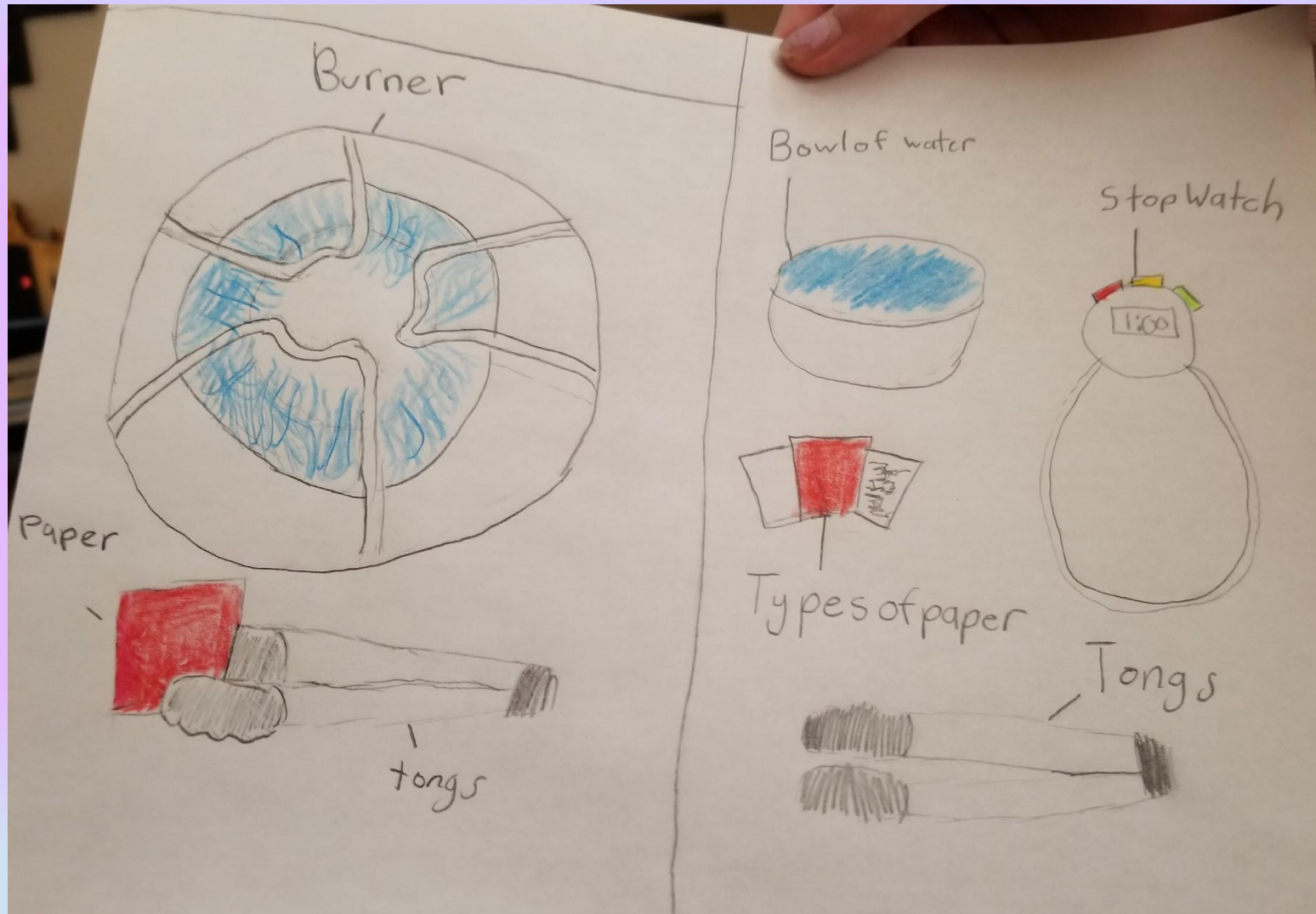


Photo: Sabrina Shields

Procedures

1. Gather all of the materials.
2. Take the 3x3 inch piece of construction paper outside and place it in between the tongs
3. Hold the paper at the very corner and edge of it.
4. Make sure that the paper will stay there and not blow away.
5. One person grabs the end of the tongs (not the part holding the paper) and the other person takes the stopwatch.
6. 1st person puts the part of the tongs that is carrying the paper over the fire/burner.
7. Once the paper has started burning the second person immediately starts the stopwatch
8. Make sure to keep the paper in the fire.
9. Once the paper has fully burned stop the stopwatch and let go of the part of the paper that the tongs were holding.
10. Douse the ashes or tiny pieces of paper with water.
11. Record your observations and the time it took the paper to fully burn.
12. Repeat steps 2-7 two more times with the other types of paper.
13. Write down the conclusion and results to the experiment.

Safety Precautions

1. Do this experiment under adult supervision.
2. Keep a bowl of water near you at all times.
3. The adult should be the only one turning on or off the burner.
4. After putting the tongs in the fire, place them in cold water.

Photo: Sabrina Shields

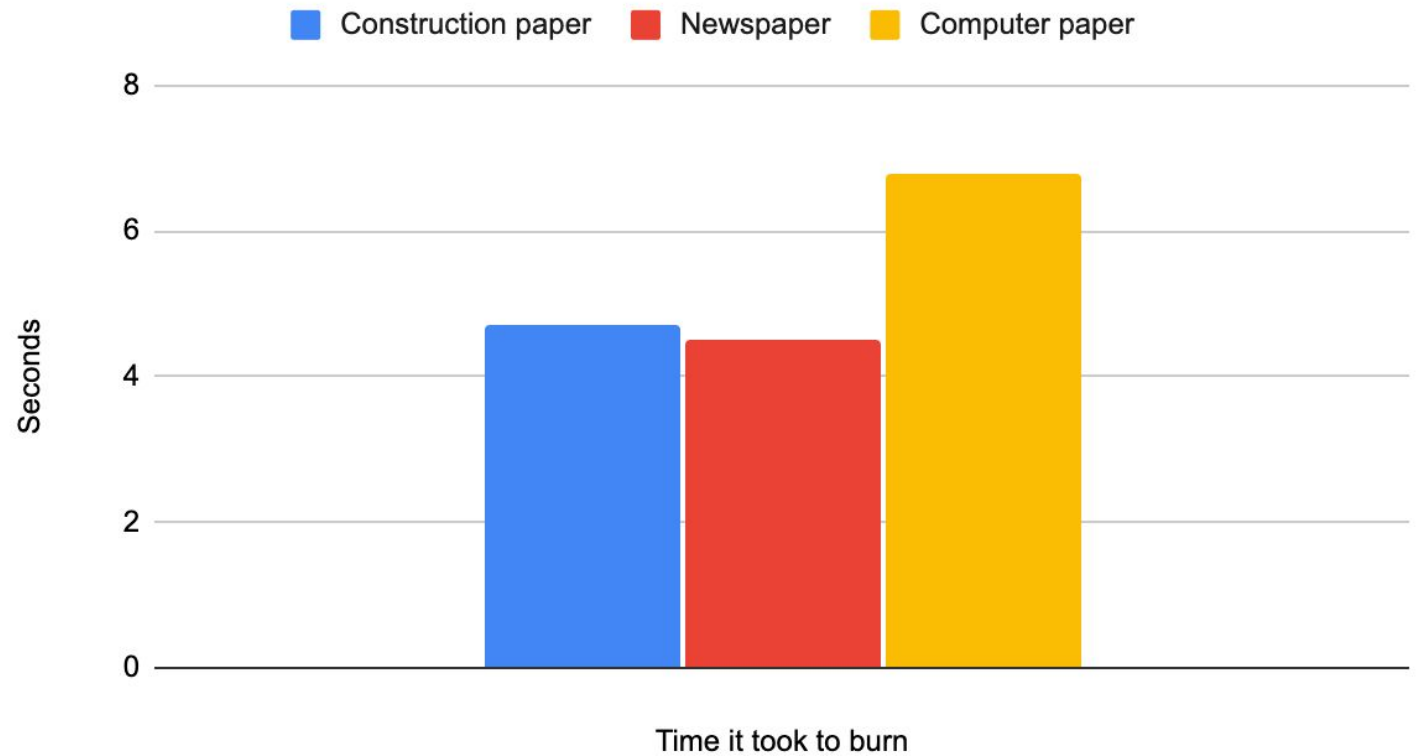


Data and Results

Credit: Sabrina Shields

	<i>Construction paper</i>	<i>Newspaper</i>	<i>Computer</i>
<i>Time it took the paper to fully burn in seconds</i>	4.7	4.5	6.8

The Time the Types of Paper Took to Burn



Analysis

My hypothesis was I predict that construction paper will take the longest time to burn. The data in the graph and table do not support my hypothesis because the Newspaper lasted the shortest and only for 4.5 seconds, then construction paper with 4.7 seconds, and finally, computer paper which lasted 6.8 seconds. This method is reliable because the independent variable was the only variable that changed. I collected enough data to make an accurate claim.

Summary/Conclusion

In conclusion, my data did not support my hypothesis. My hypothesis was if I change the type of paper every trial, construction paper would take the longest time to burn. Instead, computer paper lasted the longest for 6.8 seconds, then construction paper lasted for 4.7 seconds, and lastly, newspaper for 4.5 seconds. A possible explanation of these results is that computer paper is used and made to hold ink. This might have helped make it sturdier and less combustible.

Questions/Ideas

This investigation has made me think of a more ideas and questions. One of these ideas is what is the combustibility of tissue paper and wrapping paper? If I change the size of the paper to 9 by 9 will I get different results? I could test this by following my method but, changing the size of the pieces of paper. I would like to find out more about what paper is made of and how paper is made. This is because after doing this experiment I got different results for computer paper and construction paper even though they are both made out of wood.

Errors/Improvements

There are a few improvements that I could make to this method. One way I could improve the method would be adding more trials for each type of paper. I would make this improvement because then I would have more data and be able to see if my data is accurate. I would know the average of the trials and have more information. When only using 1 trial for each type of paper you might not get the same data for the same type of paper. Another extension that I might add to this method is changing the size of the paper to 4in by 4in. Making the paper bigger will allow the person doing the experiment to gather qualitative data because each trial would last longer.

Photo: Kristoffer Shields



Construction

Photo: Kristoffer Shields



Computer

Photo: Kristoffer Shields



Newspaper