

Which Fabric can withstand Fire the longest?

Aim: To determine which fabric can withstand fire the longest between Cotton, Wool and polyester and can be suitable to stand in a real fire incident .

Hypothesis: The hypothesis is that wool will be the most flammable of the other 2 fabrics and cotton will be the least flammable.

Apparatus:

- Firelighter or Match bought from any store.
- Protective clothing or clothing that aren't flammable.
- Safety Goggles
- Scissors
- Ruler (To measure the fabric)
- Pen (to write down Results)
- Water Fire Extinguisher Suitable for Class A Fires (ordinary combustibles/Flammable Material) If no Fire Extinguisher is available use a bucket of water (and use the fire extinguisher if fire get out of hand.
- An Adult/Parent or Guardian
- A fire blanket if you catch on fire.
- Stop Watch from your phone or a bought stopwatch
- Fire protective gloves(if unable to get this type of glove make sure you are careful when igniting the fire)
- An open area with a concrete floor and with no flammable material (combustibles) nearby.
- A results table:

Fabrics	The time that with stand fire
Wool Test 1	...
Wool test 2	...
Wool test 3	...

- Note Table may be done on a computer or a sheet of paper
- 20cm by 20cm of These Fabrics (Note: The fabric can be bought from any store and has to have no decal just blank and can be any colour):

Wool, Cotton, Polyester

In an investigation such as this it is better to formulate a clear statement describing the purpose addressed by the investigation, rather than an aim.

The apparatus list shows an understanding of variables and the risks associated with this procedure.

Risk	Prevention
Fire spreading due to nearby combustibles (Flammable Materials/Items)	Having a water Fire Extinguisher (if no fire extinguisher is available use a bucket) If fire goes out of control call the Fire Brigade
Fire spreading on your clothing.	To prevent this make sure you have no sleeves hanging out pull them up to your shoulder. If caught fire Stop Drop Roll and
Fire Fumes (smoke) getting into your eyes.	To prevent fumes going into your eye wear safety goggles to prevent this.
Your skin gets burnt.	To prevent this be careful igniting the fire and be cautious for any combustibles around. Make sure you wear no long sleeve and if you get a minor burn on your skin cool the burn under cool running water then cover the burn with a bandage. If you get a 1 st or 2 nd degree burn seek medical attention immediately .
Fire could blast due to combustible such as flammable liquid, oil, flammable paint and	To prevent make such no flammable liquid is near when you ignite the fabric.

Risk assessment has been thoroughly considered.

Risk Assessment

Method

1. Get a large piece of the three type of fabric (wool, Cotton and polyester) from your local stores or get the fabric from old clothing.
2. Cut up each of the three fabrics with scissors to 20 by 20cm pieces make sure you have three pieces.
3. Prepare your safety equipment Safety Goggles, Protective Clothing, Fire Extinguisher, fire blanket, a bucket of water and protective clothing
4. Set up your results table.
5. Go to an open area with concrete and no flammable material nearby Note. When doing the experiment make sure it is a cloudy day, not windy and the concrete is not wet.
6. Place one of fabric in the middle of the open area.
7. Fill a bucket of water just to be cautious if fire gets out of control
8. Ignite the fabric from a corner and immediately start the stopwatch.
9. When the fire goes out stop the time watch write down the result in the table.
10. After the test clean up any burnt fabric for the next fabric
11. Place the burnt up fabric in a safe place and pour over it with some water.
12. Repeat the test three times for each fabric.
13. When you done the entire test compare all the fabric from the results and find out which fabric can withstand fire the longest.

The method is clearly stated and ordered in a way that the procedure can be reliably repeated.

Independent	Dependent	Control
Type of fabric	How long it burns for	Heat
		Size of the fabric, shape

Correct variables has been explicitly stated.

Independent Variable	Dependent Variable	Control Variable
Type of fabric	How long it burns for	Heat
-----	Size of fabric	Size of the fabric and the shape

Results

Wool Results

Wool Tests	Time
Test 1	5min 48 Sec
Test 2	5Min 50 Sec
Test 3	4Min 55 Sec



Wool Experiment Photos

Inclusion of a bar graph using the averaged times for each sample would clearly demonstrate the differences between the samples.

Polyester Results

Polyester Test	Time
Test 1	3Mins 56 Sec
Test 2	3Mins 59
Test 3	4Min



Polyester Experiment Photos

Cotton Results

Cotton Test	Time
Test 1	2M9ins 36Sec
Test 2	2Mins 30 Sec
Test 3	2Mins 35Sec



Discussion

The results of this experiment shows that cotton did not withstand fire the longest by the time of 2 minute's and 36 seconds, which was unexpected for me. The Polyesters time was 3 minutes and 59 seconds, which is a good time. Leaving with the wool it withstand fire the longest with the time of 5minutes and 55 second, which was impressive. The hypothesis that was made was disproved as the hypothesis said that polyester would be the fabric that would withstand the fire the longest but it was disproved by wool. The experiment would be improved by using more different types of fabric and the size of the fabric. Some errors that

The discussion links to the hypothesis; however, suggestions of further investigations would enhance the report.

could have made is that the fabric would never light up, wind could blow away the fabric that was lit causing a fire and there could be flammable liquid on the ground causing a blast of fire burning things in the fire's path. The science that is involved in this experiment is that which fabric can withstand fire between Wool, cotton and polyester. These findings of this experiment will benefit society by wear wool clothing it will withstand fire for a limited amount of time until the fire reached your skin to go to safety and extinguish the fire.

Conclusion

The fabric that can withstand fire the longest is wool with the time of 5 minutes and 55 seconds. The result that was recorded reject the hypothesis that was made as the hypothesis said that the polyester would withstand fire but the result proved wrong as polyester came with the time of 3 minutes and 59 seconds. Cotton was the most flammable, as it didn't take that long for it to burn up with the time of 2 minutes and 36 seconds. Wool is the fabric that can withstand fire the longest and would be suitable in a real fire incident.

Bibliography

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The conclusion should be a simple statement, based on the evidence collected, that reflects the purpose of the investigation. The application to a real-world situation enhances the report but would be better included in the discussion.

Grade Commentary

Frances has demonstrated a thorough knowledge and understanding of planning and safely conducting a scientific investigation. Frances has gathered and recorded quantitative data in an appropriate format and correctly applied results with a high level of competence. However, greater use of scientific language to communicate finding, conclusions and applications would improve this report. This work sample demonstrates characteristics of work typically produced by a student performing at grade B standard.