

Mask It

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Mask It

Abstract

With COVID-19 going on around the world all of us have been asked to wear a mask when we go out in public, or when we are around others. Have you ever wondered though if masks are really protecting us or are we just wearing them for nothing. In my project I am going to test 7 different masks that I have laying around my house. I will test these masks to see if they protect others from my respiratory droplets so in other words what comes out of my mouth or nose when I sneeze or cough. This project interests me because I do not enjoy having to wear a mask, but if it is protecting me from something, that could possible make me very ill, I will stop thinking that they are useless. I think that the N-95 mask will be the mask that is most protective because it has 5 layers that protect you from all sorts of different things. After conduction my experiment I discovered that the N-95 mask was the only mask that passed both test. In the N-95 mask I was unable to blow out the candle, and no water came through the mask.

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Introduction

Covid 19 has affected everyone world wide. Safety measures have been implemented like wearing a mask, so I figured why not test different types of masks and see if they really work. In my project I am going to test and see which mask if any of the masks that I own protect you and others most of the time from my respiratory droplets. Now to test this I will have 7 different mask the I will test by seeing if I can blow out a candle to symbolize if I would sneeze, and taking a spray bottle and spraying it through the mask to see if respiratory droplets would come trough the mask if I would cough or sneeze. I believe that the N-95 mask will be the best mask because it is used by medical professionals, painters, and carpenters all over the world to protect themselves from small particles.

Literature Review

Mayo Clinic-COVID-19: How much protection do face masks offer?
<https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-mask/art-20485449>

In this article personnel at Mayo Clinic discuss the benefits of wearing masks and what types of masks should be used by the general public, versus what medical professionals should use in their line of work. It also explains how you should wear a mask properly.

Nina Bai-Still Confused About Masks? Here's the Science Behind How Face Masks Prevent Coronavirus. <https://www.ucsf.edu/news/2020/06/417906/still-confused-about-masks-heres-science-behind-how-face-masks-prevent>

In this article Nina Bai answers questions like do masks protect the people wearing them or the people around them? What evidence do we have that wearing a mask is effective in preventing COVID-19? If we're practicing social distancing, do we still need to wear masks, and many more questions to help us understand COVID-19.

Centers for Disease Control and Prevention-How to Prevent the Spread of Respiratory Illnesses in Disaster Evacuation Centers
<https://www.cdc.gov/disasters/disease/respiratoryic.html>

In this article the Centers for Disease Control and Prevention (CDC) explains the importance of not spreading respiratory droplets especially during times when like COVID-19 when respiratory droplets are the things that transmit deadly viruses and bacterias.

Mask Information

Kind Of Mask	Amount of Layers	Material Mask is Made of
Neck Gaiter	1 layer	Breathable UPF 30 Microfiber/ cotton
Home-made T-shirt mask	2 layers	Cotton
Blue Surgical Mask	3 layers	non-woven polypropylene fabric
N-95 mask	5 layers	non-woven polypropylene fabric
Flamingo Mask /No Filter	2 layers	Polyester Fabric
Blue/Purple Mask/ with Filter	3 layers	Polyester Fabric
Bandana	1 layer	lightweight woven cotton

Materials List

- SA fishing Neck Gaiter
- Homemade T-shirt mask
- Blue Surgical mask
- N-95 mask
- Flamingo mask no filter
- Blue/Purple mask with filter
- Bandana
- Candles
- Matches/ Lighter
- Water
- Spray Bottle
- Yellow Construction Paper

Procedure

1. Gather all of your masks, candles, matches or lighter, water, spray bottle, and construction paper together at a table.
2. Set the water bottle, water, and construction paper off to the side, you will need these later.
3. Take your matches or lighter and light your candle, it is important that you are in an area with no breeze from a window or ceiling fan so it will not affect the flame of the candle .
4. Put on your first mask and blow an even slow breathe, try this with each mask on.
5. Document the data, whether you were able to blow out the candle with each of the masks on or not.
6. You can now put away your candle, and matches or lighter, you won't need it for anything else.
7. Then fill your water bottle all the way full so you will have enough water for all of the next tests.
8. Next you will need to setup your pieces of construction paper. Place one piece of construction paper standing up vertically in-front of the mask about 6 inches away. Lay another piece of paper on the table underneath the mask.
9. Then holding the mask out like it is over your face, spray the water bottle at the center of the mask to symbolize someone sneezing. Try this with each of your masks.
10. Record whether any water came through the mask or not.

Remove this sheet.

Testing Data

Was I able to blow the candle out ?

Did any water come through ?

Kind of Mask	Test 1	Test 2	Test 3	Test 1	Test 2	Test 3
Neck Gaiter	Flicker/ almost went out	Flicker/ almost went out	Flicker/ almost went out	Yes	Yes	Yes
Home-made T-shirt mask	Flicker/ almost went out	Flicker/ almost went out	Flicker/ almost went out	No water came through, but was absorbed	No water came through, but was absorbed	No water came through, but was absorbed
Blue Surgical Mask	No	No	Flicker	Water was deflected to the inside but none came through	Water was deflected to the inside but none came through	Water was deflected to the inside but none came through
N-95 mask	No	No	No	No	No	No
Flamingo Mask /No Filter	Flicker	No	Flicker	No water came through, but was absorbed	No water came through, but was absorbed	No water came through, but was absorbed
Blue/Purple Mask/ with Filter	No	No	No	No water came through, but was absorbed	No water came through, but was absorbed	No water came through, but was absorbed
Bandana	Flicker/ almost went out	Flicker/ almost went out	Flicker/ almost went out	Part of the water was absorbed, then half came through	Part of the water was absorbed, then half came through	Part of the water was absorbed, then half came through
Control	Yes	Yes	Yes	Yes	Yes	Yes

Data Analysis

In test number one which was seeing if I could blow out the candle the neck gaiter, bandanna, and the home made T-shirt mask had very similar results. All three of these masks allowed me to make the candle flicker or almost go out which is not good. The flamingo mask with no filter flickered but did not go out which is an okay result. The blue surgical mask, N-95 mask, and the purple and blue mask with filter all had the same results too. With these masks on I was unable to make the candle flicker or go out, which is a great result. In test number two which I tested to see if any water would come through the homemade T-shirt mask, flamingo mask with no filter, and the blue purple mask with filter didn't allow water to come through, but it absorbed it. Neck gator allowed almost 100% of the water to come through

the mask. The blue surgical mask deflected the water to the inside, which is not necessarily a good thing meaning that you were than inhaling your own germs back in again. In the bandanna the water was partially absorbed and part of it came through the mask. The N-95 mask was the only mask that did not allow any water to come through.

Conclusion

The hypothesis for this project was supported. The hypothesis stated that when the N95 mask was compared to other types of masks, it would protect others from human respiratory droplets the best because N95 masks are used by medical professionals, carpenters, and painters all over the world to protect from small germs and particles. The data shows the N-95 mask was the only mask that did not allow the candle to be blown out, as well as allowing no water through the mask. Something important to remember when doing the project is to keep the distances from the candle and construction paper the same for each test to insure a smaller margin of error. People must understand the results of this project to make better choices when selecting the right mask for the situation.

Acknowledgements

I would like to thank my teachers for helping me even during the hard times of virtual school in assisting me with my project and meeting with me in their off time. I would also like to thank my parents for allowing me and helping me set up for my project.

Bibliography

COVID-19: How much protection do face masks offer?

By: Mayo Clinic Staff Posted by Mayo Clinic

<https://www.mayoclinic.org/diseases-conditions/coronavirus/in-depth/coronavirus-mask/art-20485449>

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Still Confused About Masks? Here's the Science Behind How Face Masks Prevent Coronavirus

By: Nina Bai

Posted by the University of California San Francisco

<https://www.ucsf.edu/news/2020/06/417906/still-confused-about-masks-heres-science-behind-how-face-masks-prevent>

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How to Prevent the Spread of Respiratory Illnesses in Disaster Evacuation Centers

By: Centers for Disease Control and Prevention

Posted by Centers for Disease Control and Prevention

<https://www.cdc.gov/disasters/disease/respiratoryic.html>

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How Far do Sneezes and Vomit Travel?

By: Nova from Gross Science

Posted by Gross Science on Youtube

<https://www.youtube.com/watch?v=nwh6VPBsf2E>

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