

Mask It

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# **Scientific Question**

Which masks if any of the masks that I have at my house protect you most of the time from others air, or respiratory droplets?

# Hypothesis

I think the N95 mask will protect others from my respiratory droplets the best because these masks are used by medical professionals, carpenters, and painters all over the world to protect themselves from small germs and particles.

# Materials

- SA Fishing Neck Gaiter
- Homemade T-shirt mask
- Blue surgical mask
- N-95 mask
- Flamingo mask with no filter
- Blue/purple mask with filter
- Bandanna
- 1 to 2 candles
- Matches/lighter
- Water
- Spray bottle
- 5 to 10 sheets of yellow construction paper

# Procedure

- Gather all of your masks, candles, matches or lighter, water, spray bottle, and construction paper together at a table.
- Set your water bottle, water, and construction paper off to the side you'll need these later.
- 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.
- Put on your first mask and blow and even slow breath, try this with each mask on 2 to 3 times. This is important to make sure you get the most accurate results.
- Document the data, were you able to blow out the candle with each mask on?
- You can now put away your candle and matches or lighter, you won't need for anything else.

- Then fill your water bottle all the way full so you will have enough water for all of the next tests.
- Next you will need to set up your pieces of construction paper. Place one piece of construction paper standing up vertically in front of the mask about 6 inches away, put another piece of paper on the table underneath the mask, you may also want to put one on the side.
- Holding the mask out like it is over your face spray the water bottle at the center of the mask to symbolize someone sneezing, you can put the nozzle of the spray bottle right up against the mask. Try this with each of your masks 2 to 3 times.
- Record whether any water came through the mask or not, you can also take pictures of the pieces of construction paper to see how much water came through.

### **Analyzing Your Data**

- Now look at your data and see if there was one mask that prevented both blowing out the candle and containing all of the water, this should determine which mask works the best.

# Variables

- **Independent Variable** - The different types of masks
- **Dependent Variable** - Was I able to blow out the candle/Did any water come through the mask?
- **Control**- Same amount of water/ Same spot for candle-same candle/

# Data Tables

## 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						
Home-made T-shirt mask						
Blue Surgical Mask						
N-95 mask						
Flamingo Mask /No Filter						
Blue/Purple Mask/ with Filter						
Bandana						
Control						

## Mask Information

<b>Kind Of Mask</b>	<b>Amount of Layers</b>	<b>Material Mask is Made of</b>
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

# Conclusion

## 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 gaiter 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 then 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.

**\*Press your space bar to play the video\***

# **Visual Test Data**