Experiment 1 – Stopping sneezes

Summary

When you sneeze droplets containing microbes come out of your nose and mouth. These droplets travel very fast and can go a long way. Many infectious diseases can be spread by coughs and sneezes. Some examples include: microbes causing coughs, colds and flu, COVID-19, Measles, Meningitis and Tuberculosis. Although a cough or cold might make you feel unwell for just a few days some infections spread by droplets from your nose and mouth can make you, or other people, very seriously ill or even kill. This is why it is so important to cover you mouth and nose when you cough or sneeze and try to stop as many droplets as possible from travelling through the air and landing on surfaces, or other people.

Learning objectives

1. Use basic techniques to how far droplets from a sneeze could travel.
2. Test some simple mechanisms to help stop droplets and discover which are most effective.

Materials

This experiment can be carried out using materials already available in the classroom or easily purchasable from supermarkets. The experiment can be quite messy and requires at least 3 meters of space. If the weather is good, I would suggest working outdoors. If this is not possible then move away from carpeted areas and check that the surfaces you use can be wiped clean afterwards. A corridor or school hall would work very well (or a classroom with tables and chairs pushed to one side to make a large space).

You will need:

- A tape measure or multiple rulers (Un mètre ruban)
- White paper in either sheets or a roll (if the floor surface you are working on is dark coloured this will help you see the droplets more easily) (Feuilles de papier blanc)
- Acrylic paint (multiple colours if possible) (Peinture acrylique (plusieurs teintes))
- A spray bottle (such as you would use to mist plants or contain cleaning products) (Un vaporisateur)
- Water (Eau)
- Jug and stirrer to mix water and paint in (Récipient et ustensile pour mélanger l'eau et la peinture)

Method :

1. Create a results table (example at end) with the students.
    a. Discuss and decide on the methods you will test.
    b. Decide on the methodology you will use. Examples include: will the spray bottle always be held at the same height? How many squirts of the bottle will be used for each test? Where will the person stand when performing the tests? Keeping things like this the same will help make the results more accurate.
2. Lay out the tape measure/rulers and paper on the floor and ensure it is secure
3. Mix a small amount of paint into the water and pour into the bottle
4. Secure the top of the bottle and check that the nozzle will give a fine mist of droplets when sprayed.
5. Stand on the "starting mark", hold the bottle directly in front of you and spray multiple times (I would recommend five squirts per test)
6. Measure how far the droplets have travelled and record this in the table.
    a. You could also assess the furthest the droplets travelled and where the majority fell if you wanted to introduce more mathematics and statistics into the experiment
7. Repeat steps 3 to 6 using the other methods
    a. Hold the item (facemask, tissue, hand, etc) in front of the nozzle when testing
    b. If using the same paper or surface it might help to use a different coloured paint mix for each test.

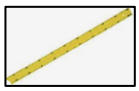
Example results table

Test	Predicted distance droplets will travel	Actual distance droplets travelled
No stopping method	2.5 m	2 m
Facemask	0.5 m	0.1 m
Tissue	1 m	0.25 m
Hand in front of face	2 m	1.5 m
Elbow	1.5 m	0.5 m
Hand tightly covering face	0.25 m	0.1 m

Student's paper

Materials

I will need:

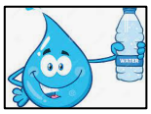



- A tape measure or multiple rulers
- White paper in either sheets or a roll (if the floor surface you are working on is dark coloured this will help you see the droplets more easily)

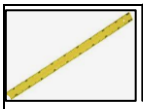
- Acrylic paint (multiple colours if possible)

- A spray bottle (such as you would use to mist plants or contain cleaning products)

- Water



- Jug and stirrer to mix water and paint in

	……
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Method

1. Mix a small amount of paint into the water and pour into the bottle.

2. Secure the top of the bottle and check that the nozzle will give a fine mist of droplets when sprayed.

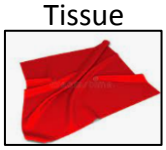
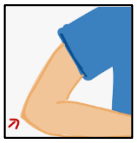
3. Stand on the "starting mark", hold the bottle directly in front of you and spray multiple times (I would recommend five squirts per test)

4. Measure how far the droplets have travelled and record this in the table.

5. Repeat steps 3 to 6 using the other methods (facemask, tissue, hand, etc) in front of the nozzle when testing.




My results :

Test	Predicted distance droplets will travel	Actual distance droplets travelled
No stopping method		
Facemask 		
Tissue 		
Elbow 		
Hand in front of face 		
Hand tightly covering face		