

nustem



What is air made of?



The atmosphere

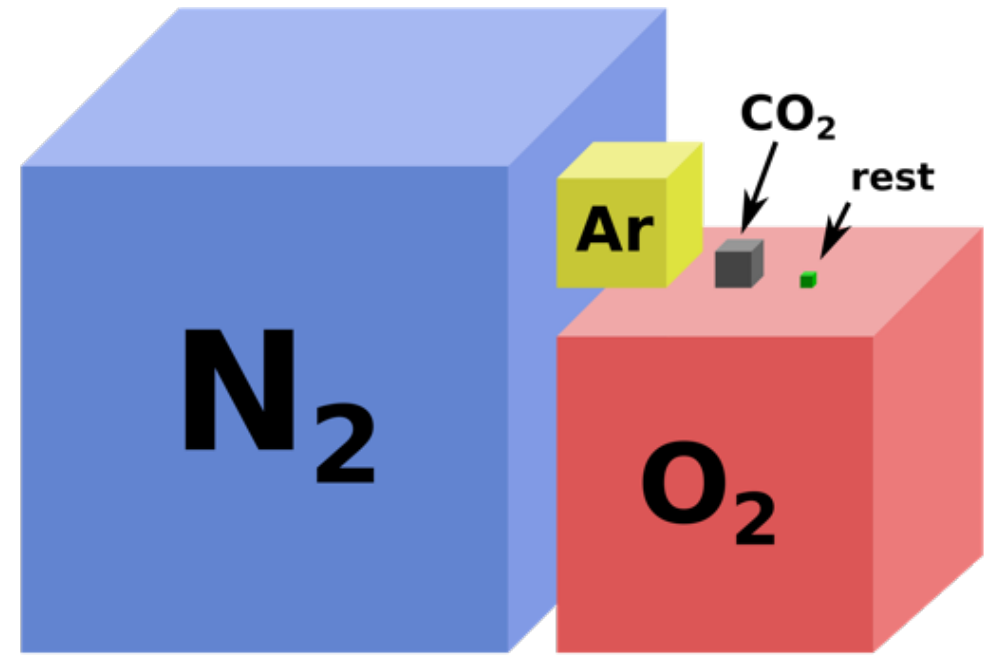
Nitrogen (N_2) – 78%

Oxygen (O_2) – 21%

Argon (Ar) – 0.93%

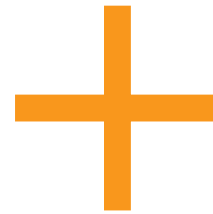
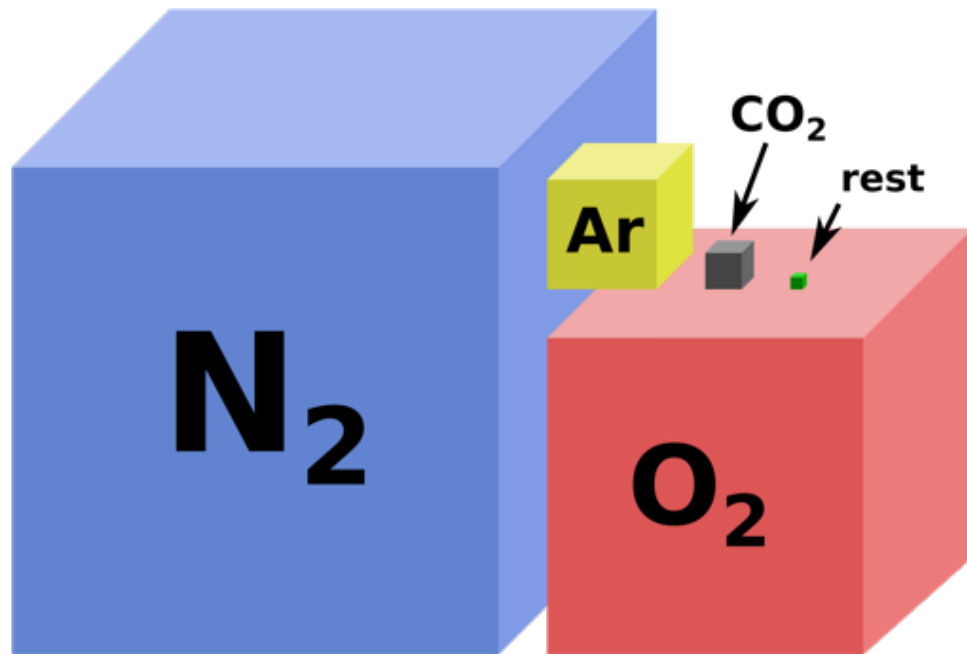
Carbon dioxide (CO_2) – 0.04%

Rest – 0.03%



Adapted from: <https://earthhow.com/earth-atmosphere-composition/>

The atmosphere



Water vapour
Air pollutants

Adapted from: <https://earthhow.com/earth-atmosphere-composition/>

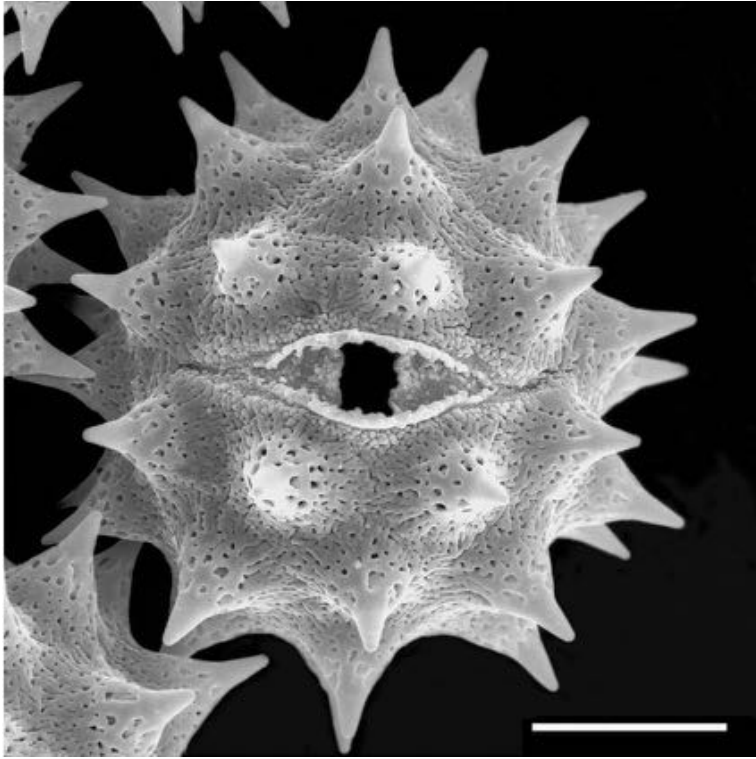
What are air pollutants ?



Air pollutants

Any solid, liquid (and some gas) particles which are suspended in air.





Natural origin

Pollen



Human activity origin

Nitrogen Dioxide (NO₂)

Air pollutants

ASBESTOS

BLACK CARBON

CARBON MONOXIDE (CO)

OZONE (O₃)

POLLEN

SULPHUR DIOXIDE (SO₂)

LEAD (Pb)

SOIL

AMONIA (NH₃)

VOLCANIC DUST

SULPHURIC ACID (H₂SO₄)

SEA SALT

CADMIUM (Cd)

NITROGEN DIOXIDE (NO₂)

MICROBES & VIRUSES

CARBON DIOXIDE (CO₂)

SOOT

NITRIC ACID (HNO₃)

VOLATILE ORGANIC COMPOUNDS



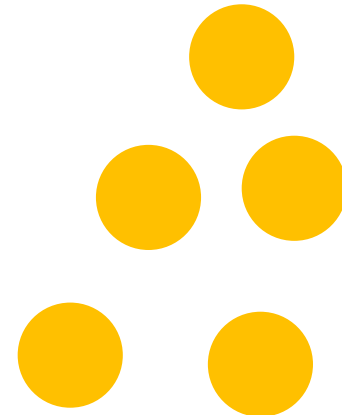
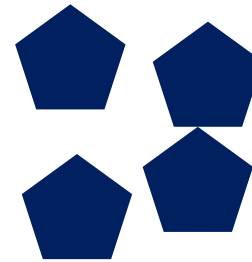
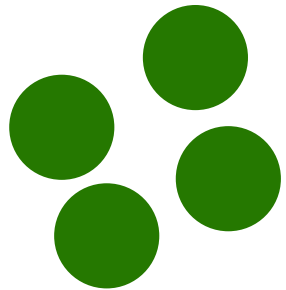
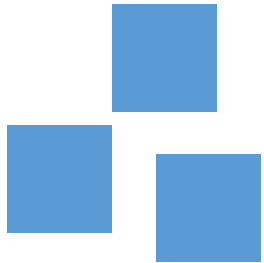
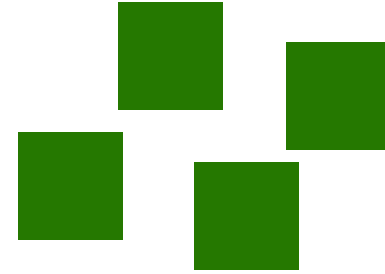
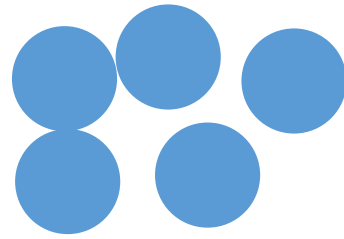
STEM PERSON
OF THE
WEEK

Jane Entwistle
Environmental Geochemist

Jane explores how people come into contact with air pollutants and how these are absorbed by the human body.

Air pollutants

A collection of six identical red triangles arranged in a hexagonal pattern. Three triangles point upwards and three point downwards, forming a larger hexagonal shape.



THINGS IN AIR

**How to classify
air pollutants?**

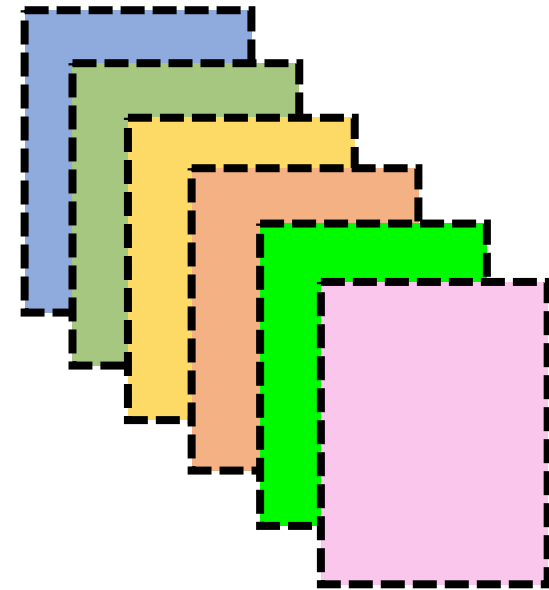


Classifying air pollutants

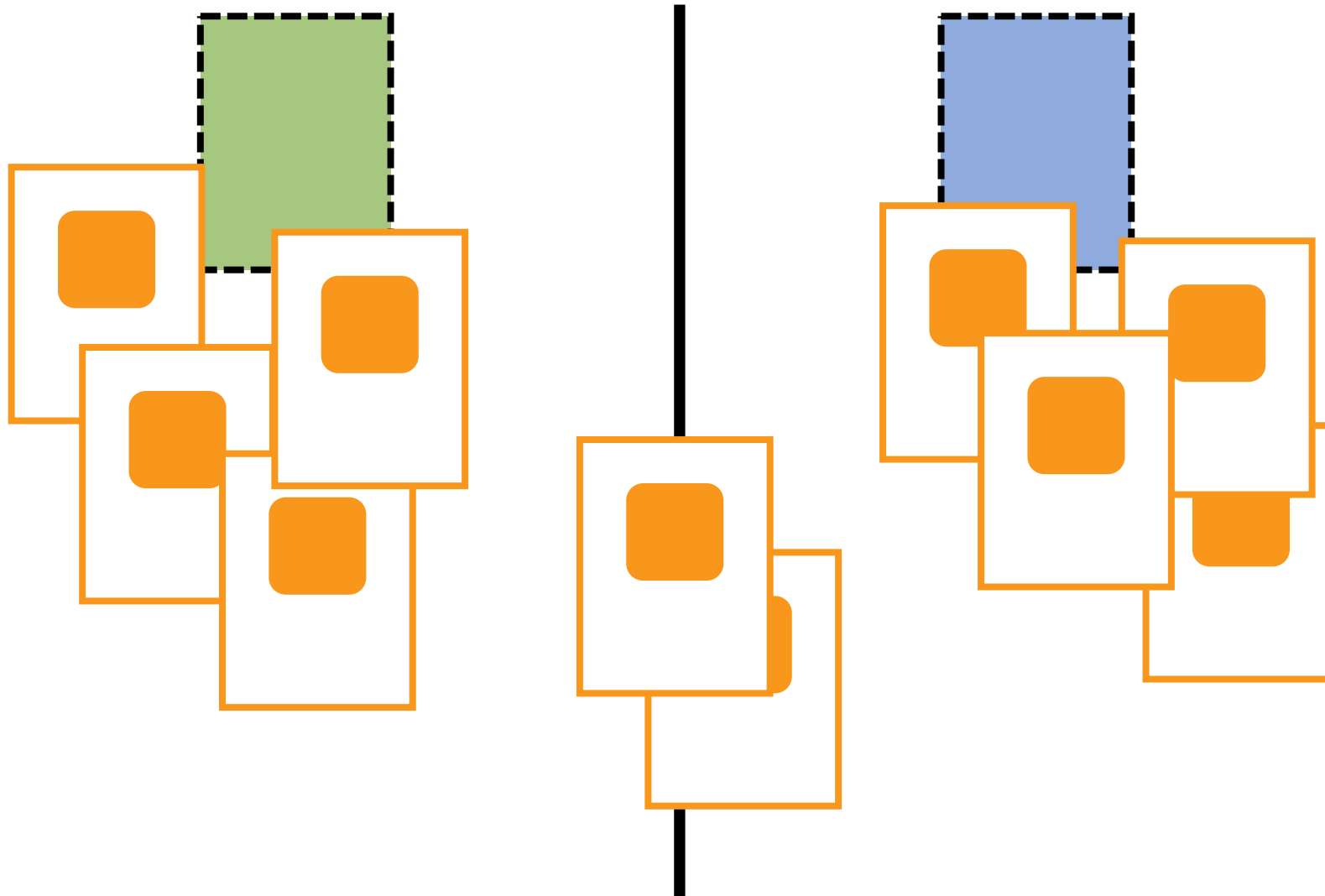
**10 air
pollutants**



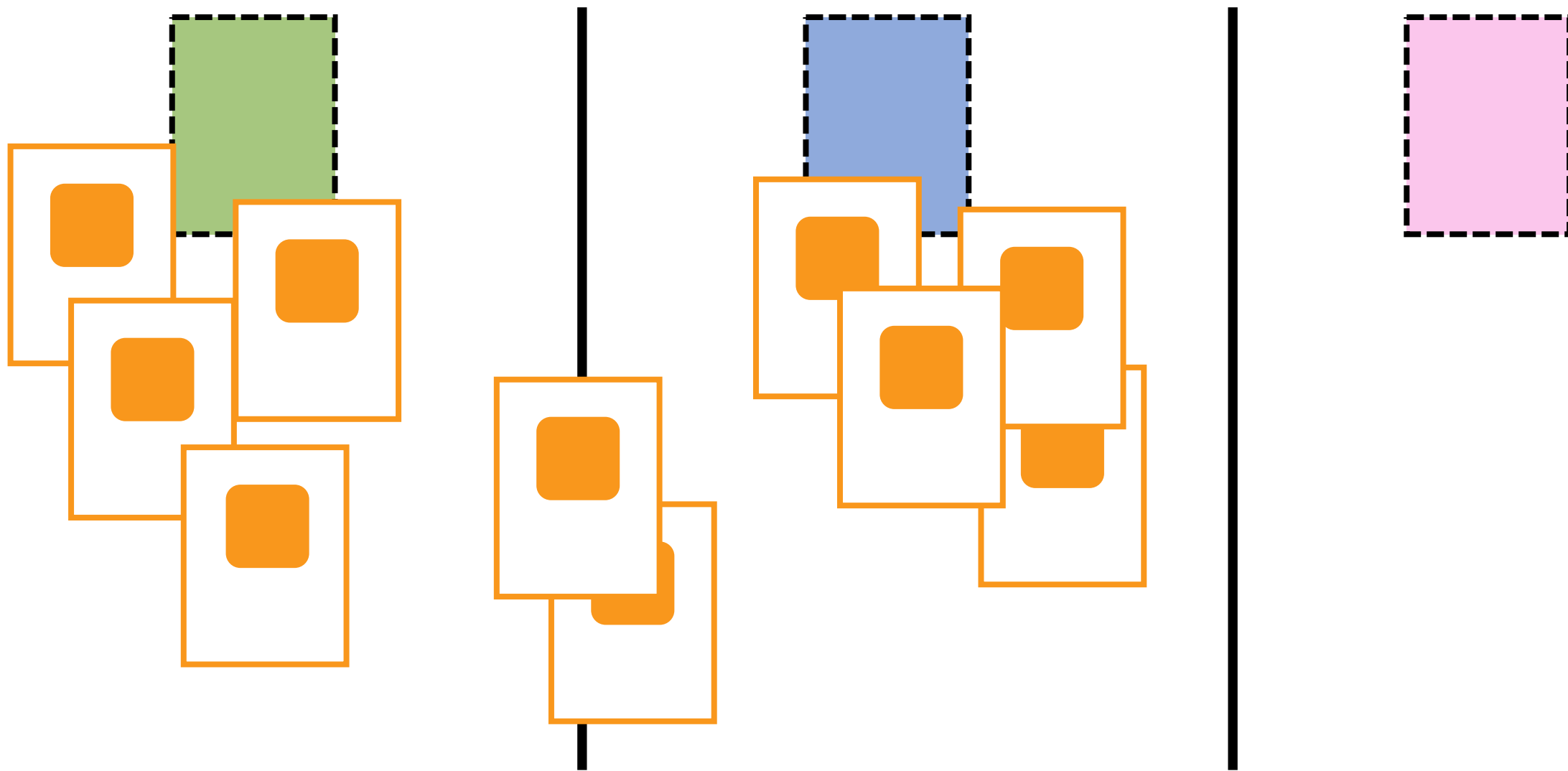
6 categories



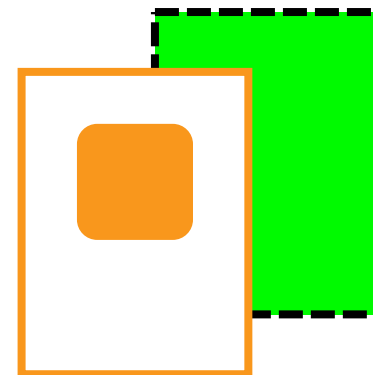
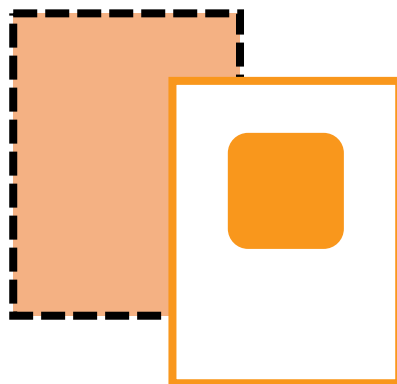
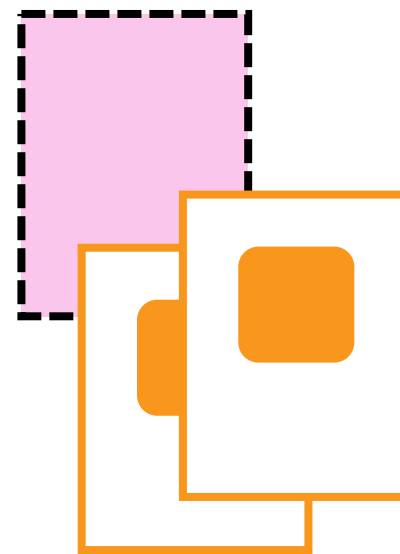
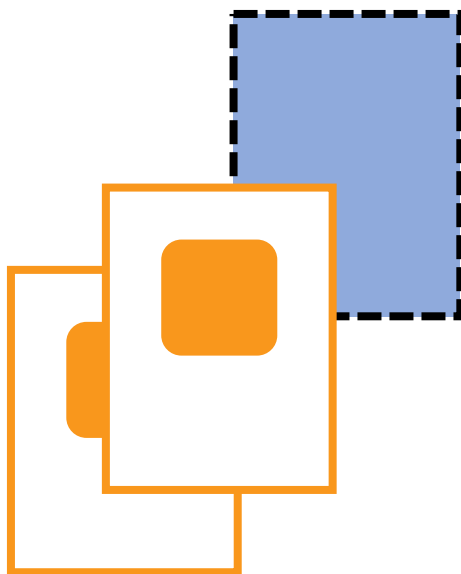
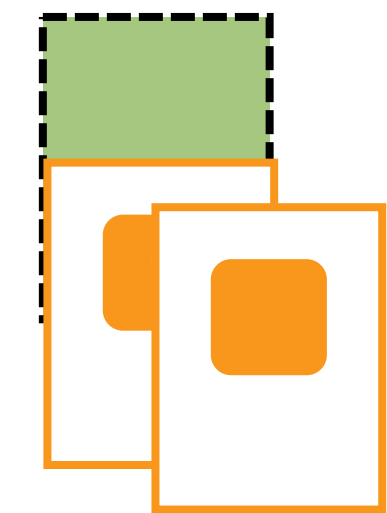
First round: 2 random categories



Second round: + 1 random categories



Third round: all 6 categories

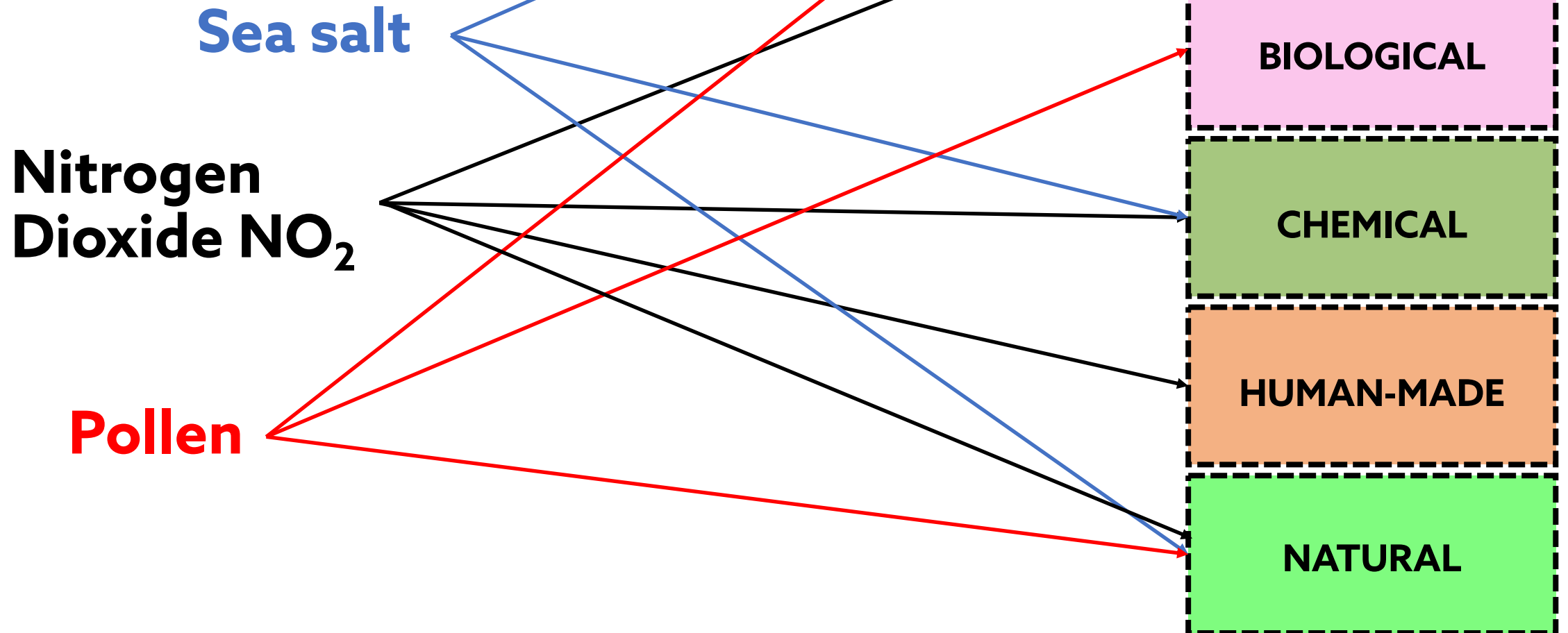


Classifying air pollutants

It's a complex task



Classifying air pollutants



Ways of classifying air pollutants

- It depends on the aim of your study
- There are at least 5 different classification systems

Ways of classifying air pollutants

COMPOSITION

Biological
Chemical
Physical

ORIGIN

Natural
Human-made

STATE

Gas
Liquid
Solid

PRIMARY OR SECONDARY

Primary
Secondary

LEGISLATION

Yes
No

Some SOURCES of air pollution



Volcanic
eruptions
Pollen
season

Natural



Incinerating
waste



Industry
by-
products



Burning
fossil
fuels



Agricultural
practices

Human activity

Air pollution IS EVERYWHERE



Urban areas



Rural areas

Even AT HOME

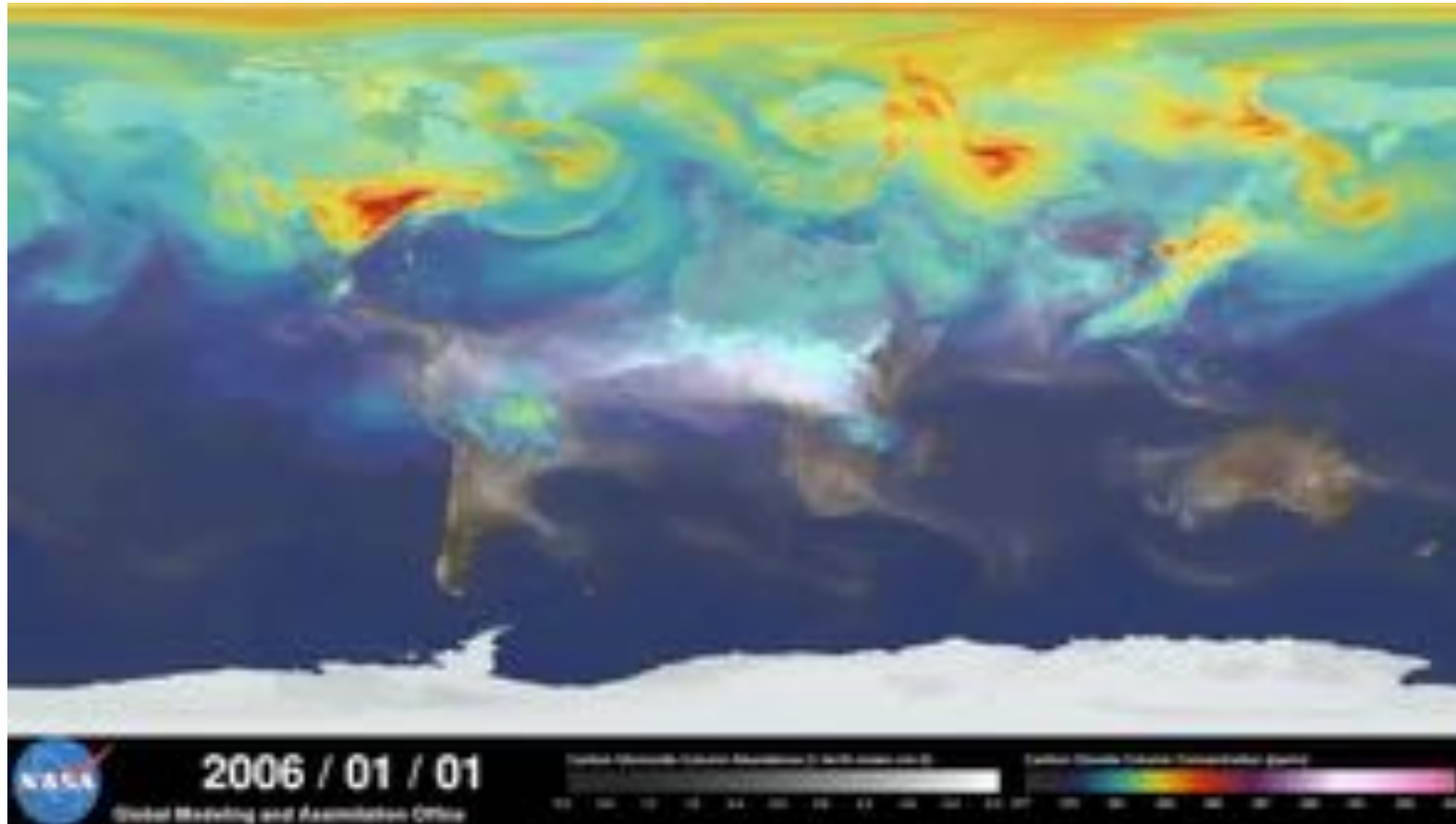


Dust is an example of an indoor air pollutant



Ways of cooking can raise indoors air pollution

Air pollution **TRAVELS** everywhere



Weather patterns and ocean currents

Click on image or visit <https://youtu.be/x1SgmFa0r04>

Air pollution is a **GLOBAL PROBLEM**



9 out of 10 people

breathe
polluted air

7 000 000

Deaths in 2016

related to
air pollution

Particulate Matter PM

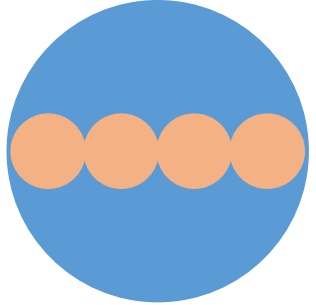
Particulate Matter or **PM** affects more people than any other air pollutant.

PM is named after its size



Particulate Matter PM

- **PM₁** – 1 microns or less
- **PM_{2.5}** – 2.5 microns or less



PM₁₀ – 10 microns or less

**1 micron
=**

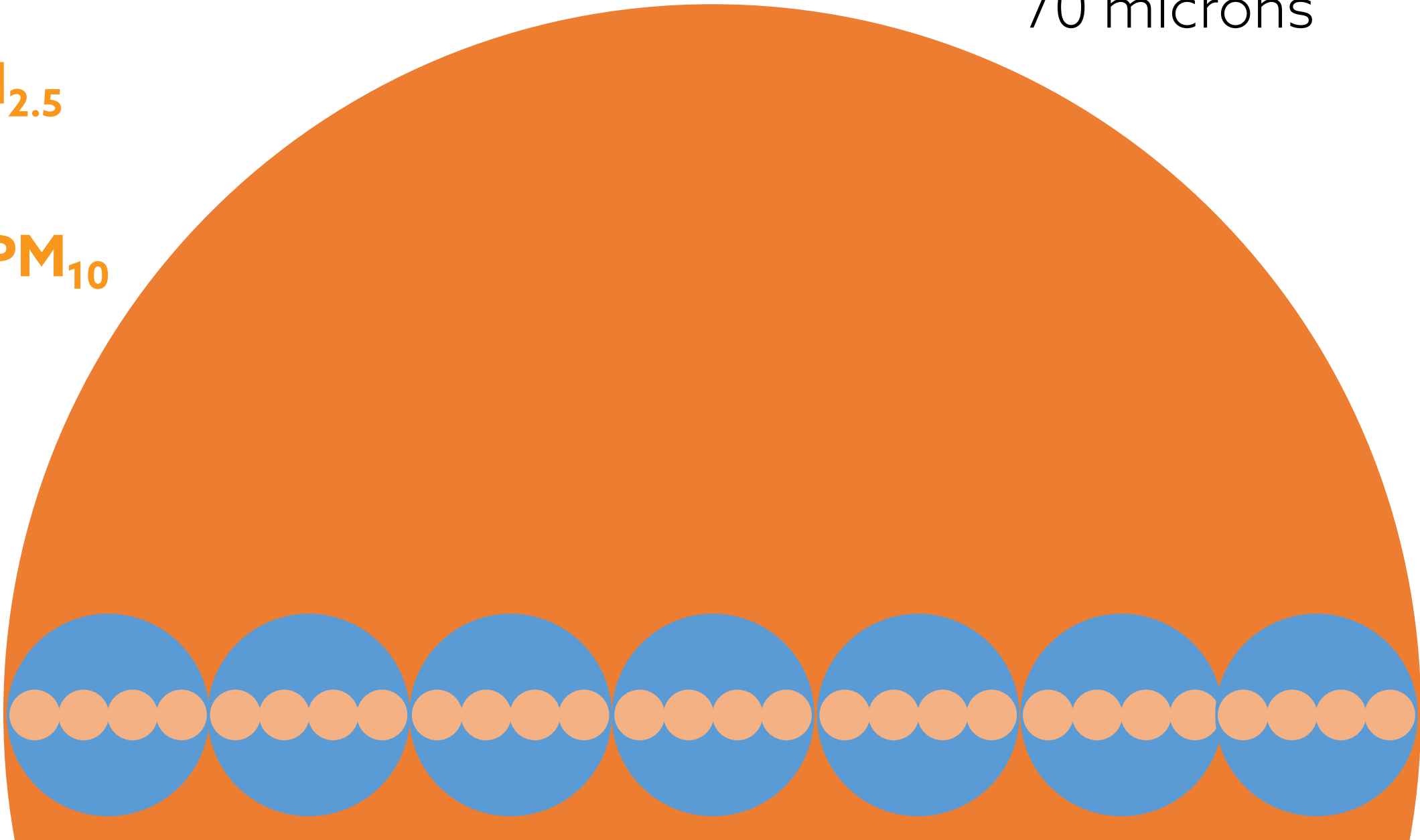
0.000001 metre

Human hair
70 microns

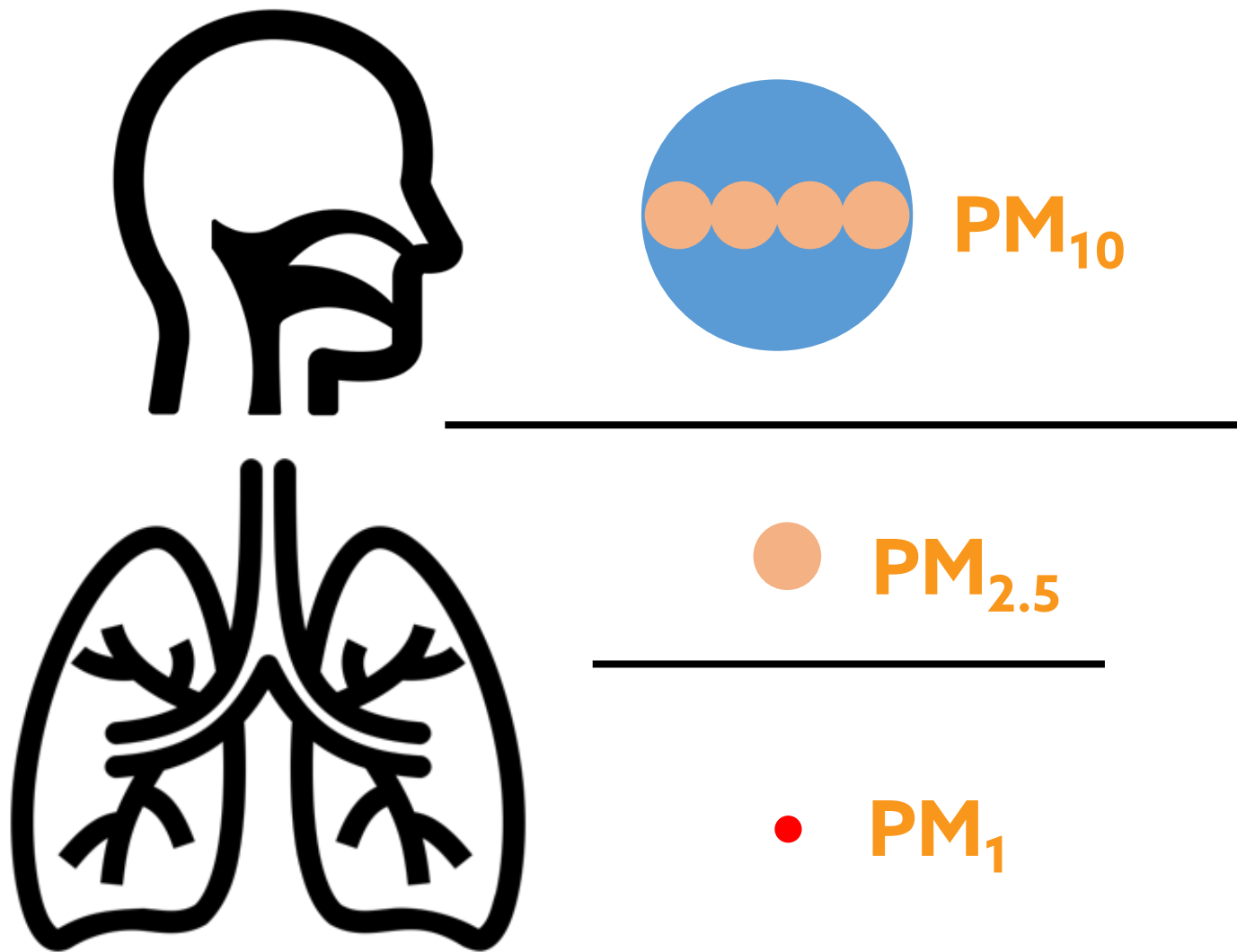
• **PM₁**

● **PM_{2.5}**

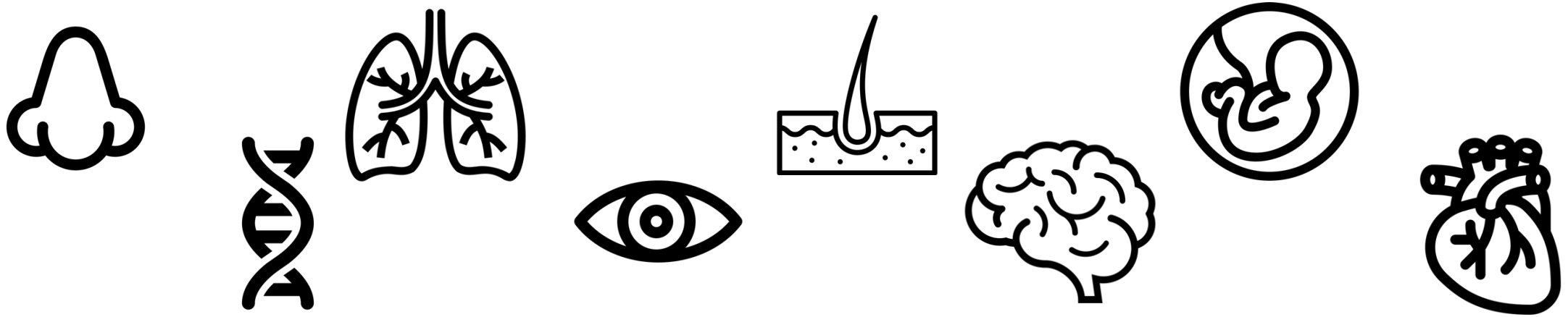
● **PM₁₀**



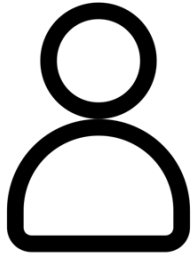
Size of particles



Air pollution **IMPACTS OUR HEALTH**



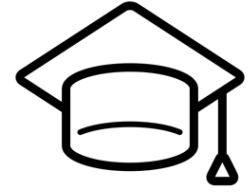
Being exposed to an excess of air pollutants, even during short periods of time can affect our health.



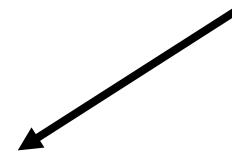
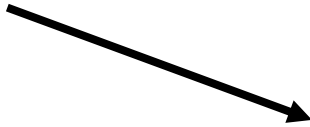
You



Family & friends



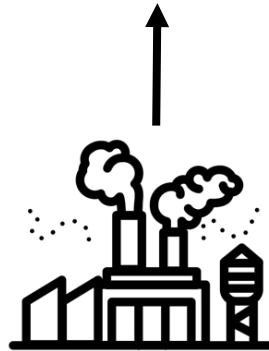
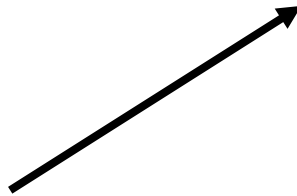
School



EVERYONE IS RESPONSIBLE



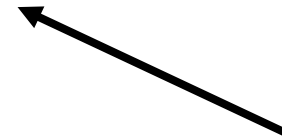
Government

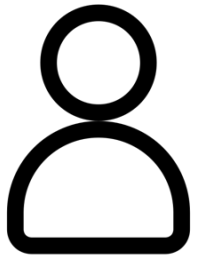


Business
& industry



Local
community

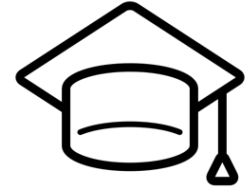




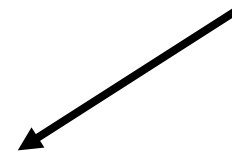
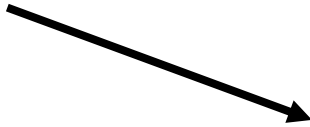
You



Family & friends



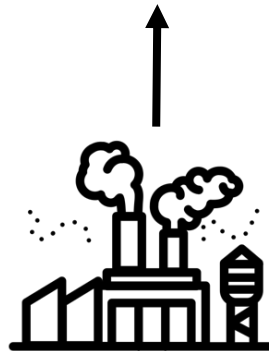
School



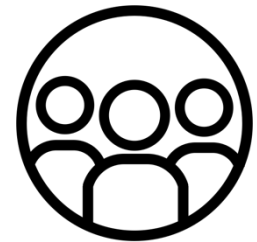
EVERYONE CAN HELP



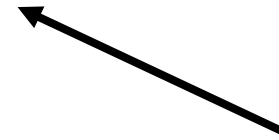
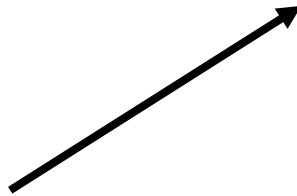
Government



Business
& industry



Local
community



CLEAN AIR FOR ALL

SUSTAINABLE DEVELOPMENT GOALS



Home dust

Home dust contains a variable mixture of pollutants from both inside and outside the home

Curious to find out what is in your home dust?

Send us a sample!



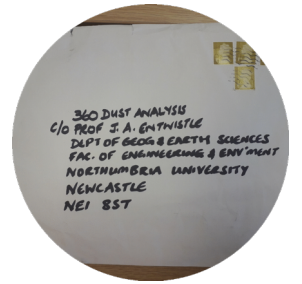
1

Register at **MapMyEnvironment**

<https://www.mapmyenvironment.com/homebiome/>

and complete the questionnaire

2



Vacuum

Collect

Package

Post!

3

Receive a personal report for your home dust

Pollution catchers

Pollution catchers can be created with inexpensive everyday materials such as paper plates, string and any kind of petroleum jelly based products.

Here is an example of how to:

<https://youtu.be/x-61Z50WTFY>

Suggestion: make two. Leave one indoors and another outdoors. After a few days what differences can you see?