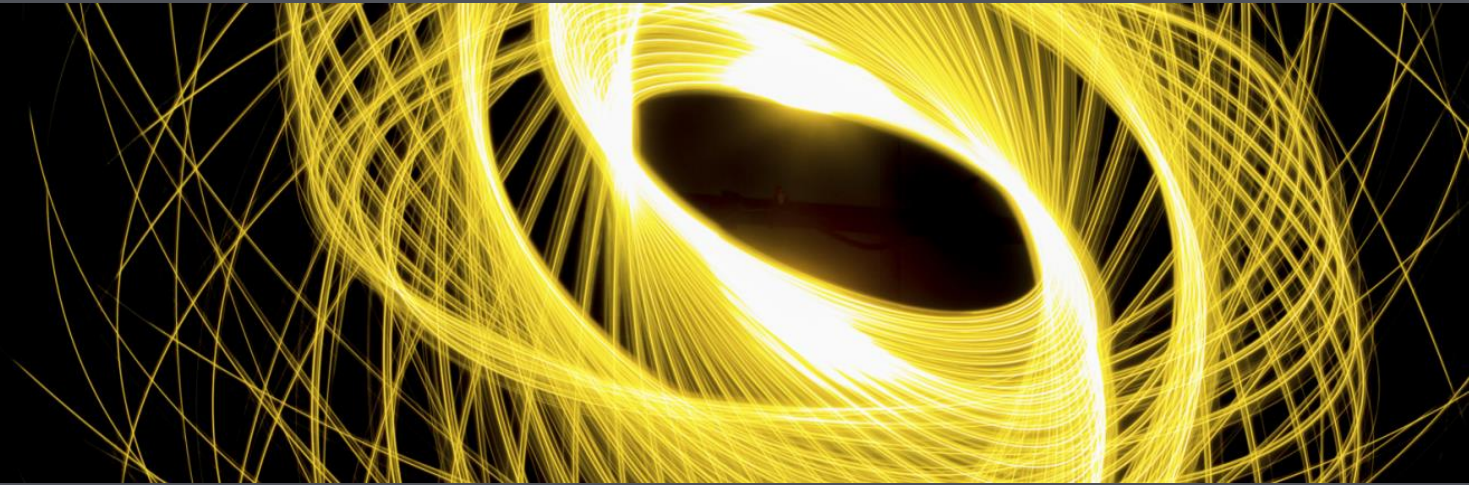


# High-frequency air quality measurements at school gates during the morning drop off and air quality education



**Marta O'Brien**

Research Scientist

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)

**John Sykes**  
foundation

# What do we know already?

- Not known safe levels of air pollution
- UK guidelines are above World Health Organization 2021 recommended levels
- Air pollution hot spots are not monitored at sensitive locations



Exbourne Road Reading

# What do we know already?

- Short and long-term exposure to air pollution has an impact on the health of children
- Children are more vulnerable to air pollution
- Levels of PM<sub>2.5</sub> are not measured

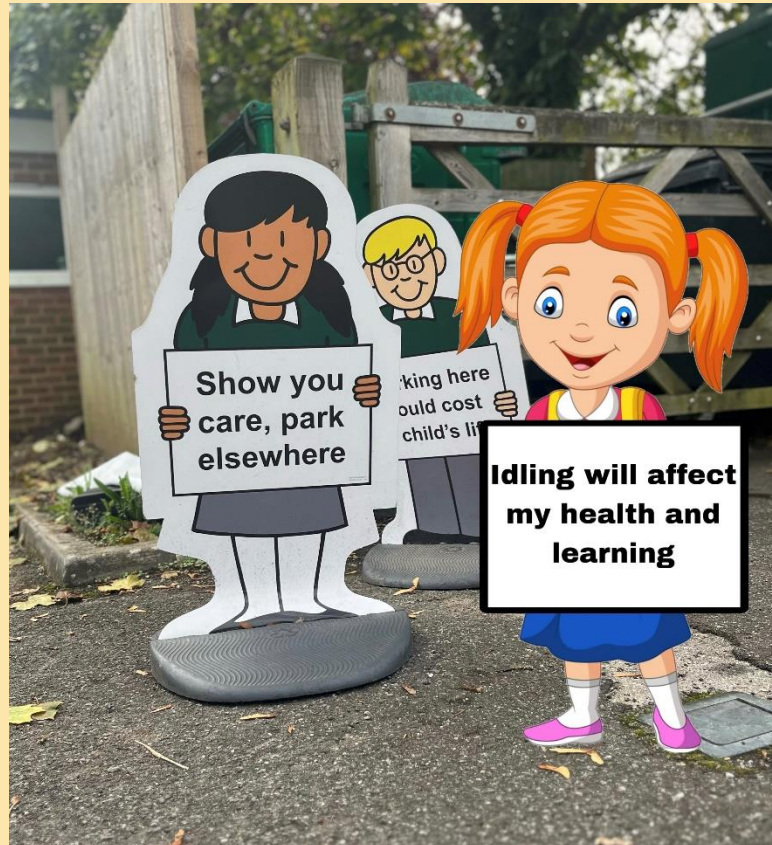


Exbourne Road Reading

# What don't we know?

## PM<sub>2.5</sub>:

- Inhaled PM accumulates in the lungs
- Fine PM enter the blood circulation and affect the whole organism



Ashampstead Road Reading

# What don't we know?

## NO<sub>2</sub>:

- High concentration of NO<sub>2</sub> irritate airways
- Longer exposures contribute to the development of asthma and increase susceptibility to respiratory infections



Oxford Road Reading

# What don't we know?

- What is the impact of localised air pollution?
- Is there a 'safe level' of air pollution?
- Are we involuntarily exposing our children to air pollution every day when taking them to school?



Exbourne Road Reading

# Study area

Reading is a large town in Berkshire, England, with a population of around 230,000 people.

Reading Borough Council:

- 52 primary schools
- 22 secondary schools
- 14% of Reading's schools are private schools.
- Number of pupils: 41 580



Schools in Reading UK

# Methods

One-minute measurements using Airly air quality sensors installed at three locations at school gates.

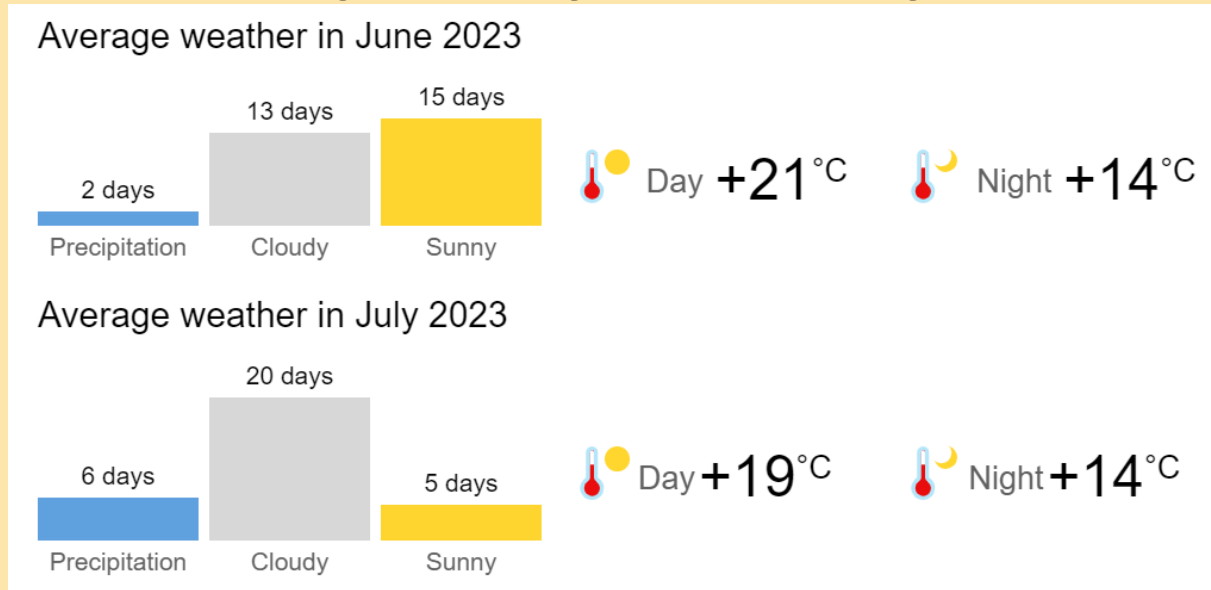


Oxford Road Reading

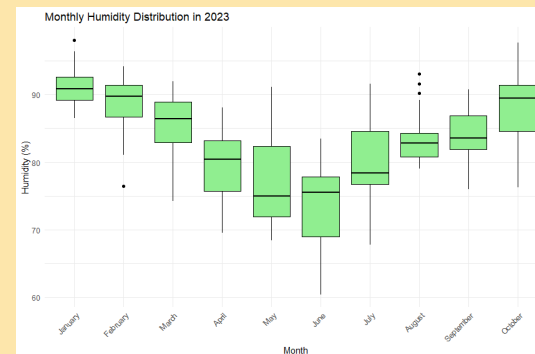
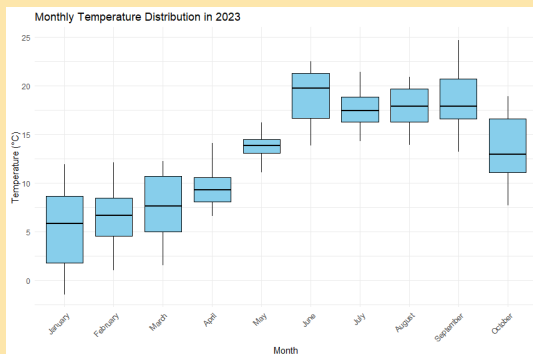


# Sampling period

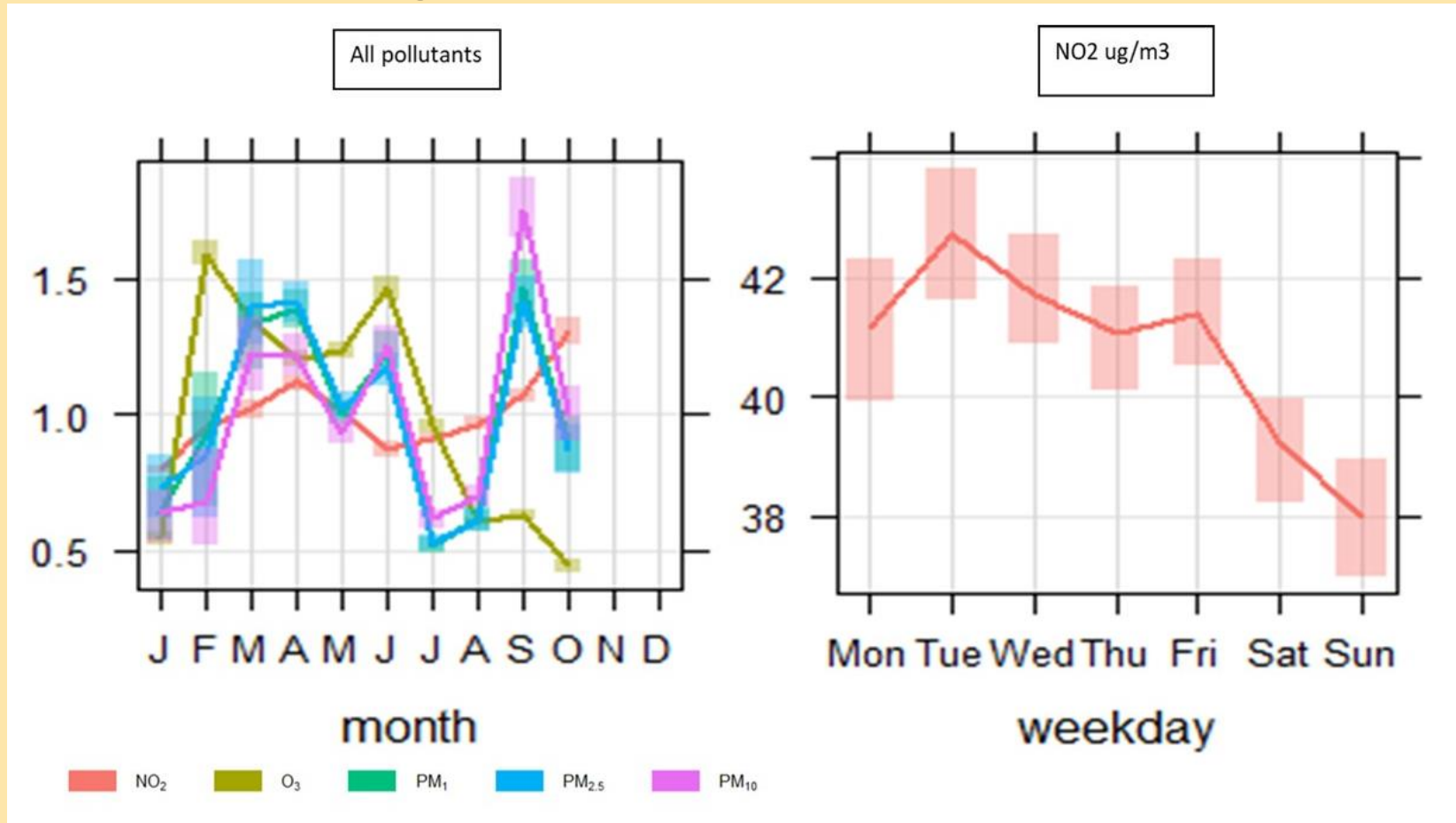
- Least polluted period for school year (June and July 2023)
- Weather supporting walking and cycling



[world-weather.info](http://world-weather.info)



# Air quality measurements:



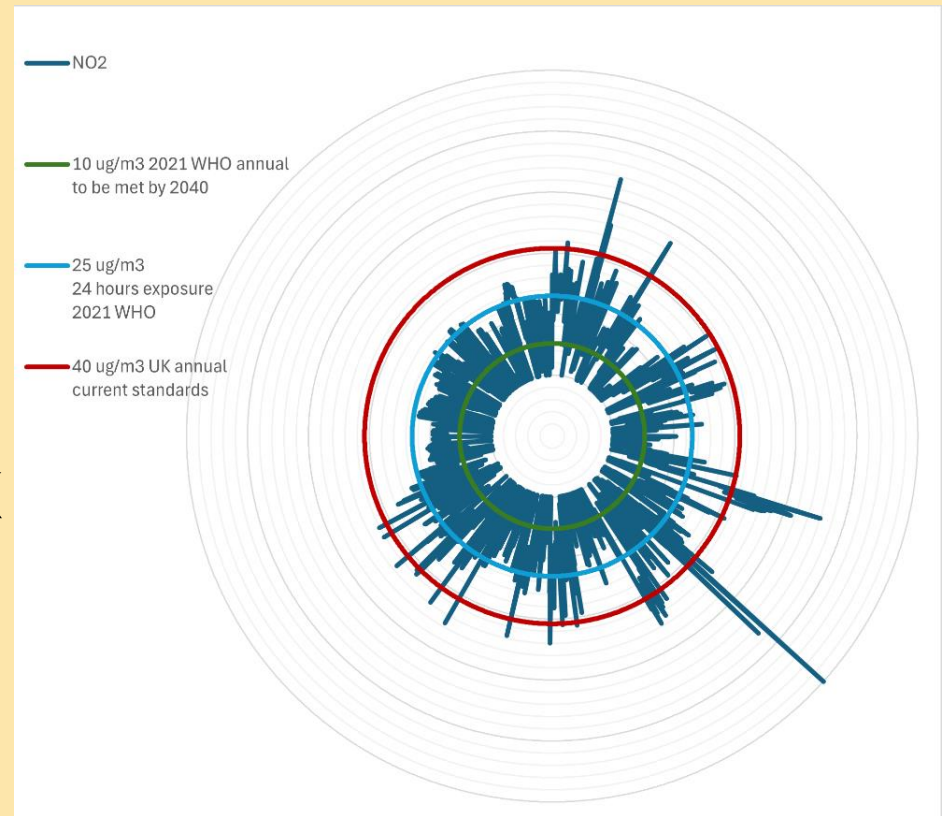
Measurements for the location in the West of town.

*O'Brien et al. High-frequency air quality measurements: school gates practices and children exposure to ambient air pollution during the morning drop off*



# NO<sub>2</sub> measurements:

- in June and July 2023 exceedance of 10 $\mu\text{g}/\text{m}^3$  for over 60% of the recorded measurements (guidance value to be met by 2040)
- Current standard for the annual mean limit in the UK is 40 $\mu\text{g}/\text{m}^3$



Standardised values for all three locations

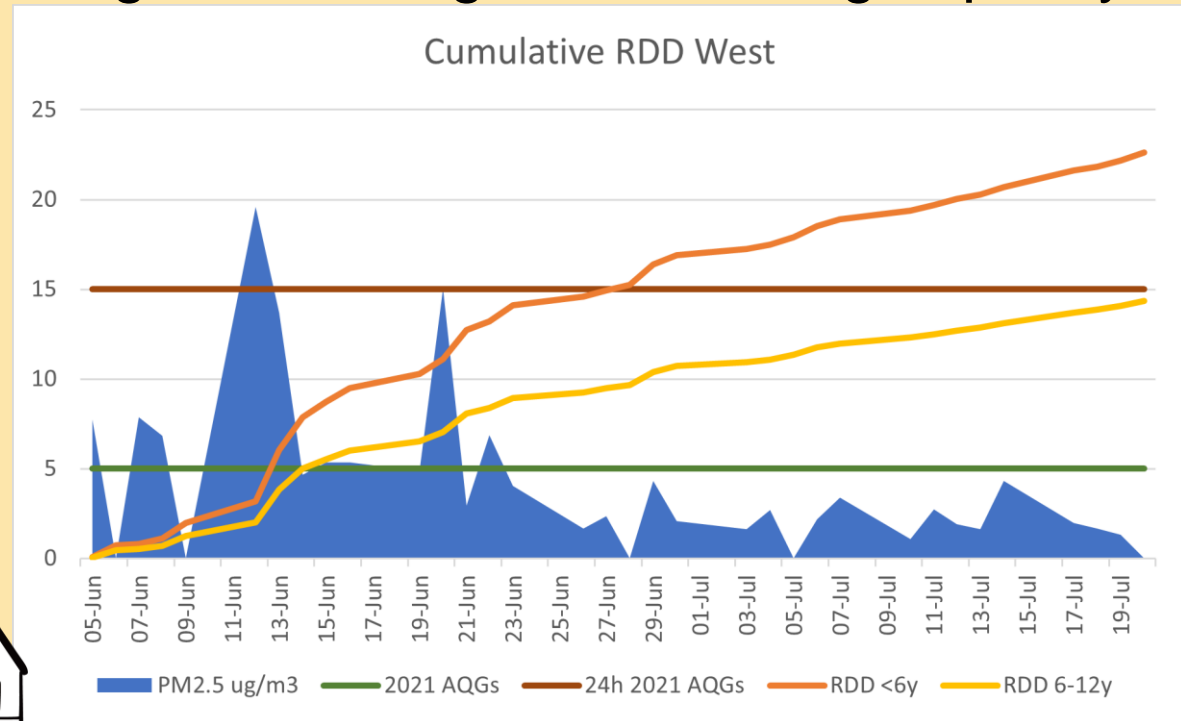
*O'Brien et al. High-frequency air quality measurements: school gates practices and children exposure to ambient air pollution during the morning drop off*

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)

# Cumulative Respiratory

## Deposition Dose measurements for PM<sub>2.5</sub>:

- Inhaled particles deposit inside the body and pose risk to human's health
- RDD depends on age, breathing rate and lung capacity



*O'Brien et al. High-frequency air quality measurements: school gates practices and children exposure to ambient air pollution during the morning drop off*

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)

# What are we doing about this?

- School streets at 6 locations covering 10 schools



Wokingham Road Reading

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)

# What are we doing about this?

- Reading Borough Council expanding Smoke Control Area expanding to cover the whole town (from 62% of the area)



Reading Borough Council

- Smoke control area extends on 1st December 2024
- Noncompliance fines will range from £175 to £300
- Burn wood with under 20% moisture content
- Log burner installation must be a DEFRA Approved wood burning stove

# What are we doing about this?



Collaborative group delivering educational sessions on air quality for Reading Borough Council DEFRA funded project (2023):

- invaluable support to local schools and communities
- increasing air quality knowledge
- inviting behavioural change



# Future plans

- continue educating schools and communities on air quality subject
- support behavioural change
- provide recommendations to schools regarding gates practices
- share evidence supporting policy change
- seek further collaborations and funding to expand this work
- add air quality education to the curriculum



Outdoor air monitoring Clean Air Day June 2024

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)



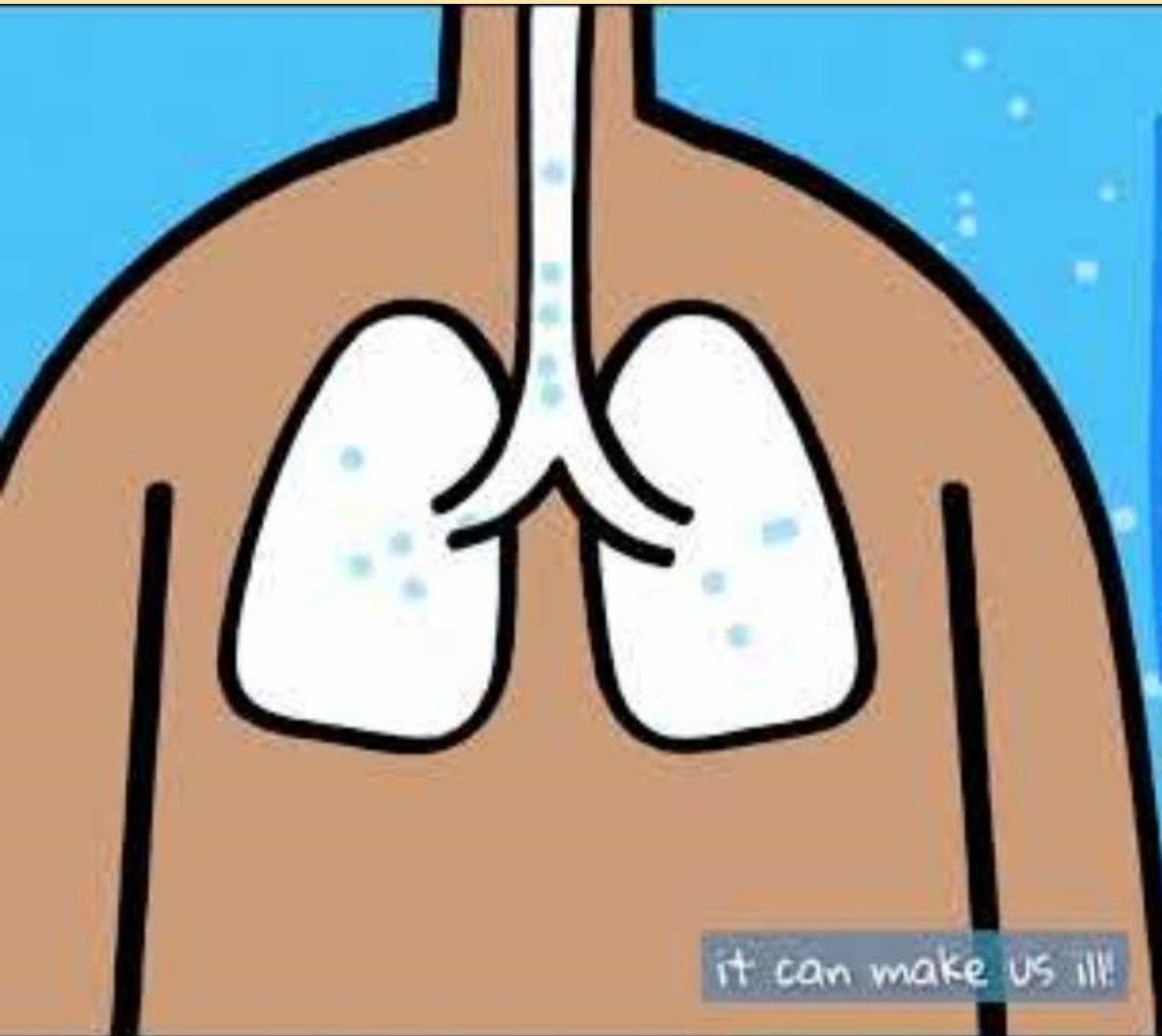
School assembly July 2024





# CALM animation





# Thank you for listening. Any questions?

Marta O'Brien

[marta.obrien@reading.ac.uk](mailto:marta.obrien@reading.ac.uk)

