

EduTrend Contents

W4C · ENVIRONMENTAL SCIENCE · MIDDLE SCHOOL

Air Quality Detectives

Where is the air cleanest around our school?

Ages 11–14 | **Level: Intermediate** | **60 minutes + 1 week** | **Groups of 3 · up to 30** | **Activity 03**

Inside: activity at a glance · step-by-step session plan · facilitator notes · 3 student worksheets · assessment checklist

ACTIVITY 03 · AT A GLANCE

Air Quality Detectives

Students investigate air quality around the school. They make sticky particle traps, place them at sites near roads, car parks and green spaces, and after a week count particles under a hand lens or microscope. They analyse the results, link them to sources of pollution and propose actions.

Learning outcomes

By the end of the session students can:

- design a fair sampling method across sites;
- count and compare particulate deposition;
- relate results to pollution sources;
- evaluate the method and suggest improvements.

KEY WORDS

air quality · particulate · pollution · sample · site · traffic · vegetation

CURRICULUM LINKS

Science: the atmosphere, pollution, human impact. Maths: means and bar charts. Geography: urban environments.

1	2	3	4	5	6
QUESTION	**INVESTIGATE**	**MEASURE**	**ANALYSE**	**ACT**	**REVIEW**
What is the issue?	Collect evidence	Count and record	Find patterns	Plan a solution	Did it work?

Materials (per group)

- White card squares and clear sticky tape or petroleum jelly
- Hand lens or microscope, grid overlay (1 cm squares)
- String, pegs, labels
- Site map
- Worksheets 1, 2 and 3

Before the session

- Choose 5–6 sites: road edge, car park, playground, near trees, indoors.
- Get permission for trap placement.
- Prepare grid overlays.
- Check weather: avoid heavy rain week.

SAFETY

Staff place any traps near roads. Wash hands after handling petroleum jelly.

ACTIVITY 03 · SESSION PLAN

Step by step

Session 1 (60 minutes) sets up traps. Session 2 (60 minutes), one week later, counts and analyses.

Time	What happens	Say or ask
0–10 min Hook	Show a white tissue wiped along a windowsill near a road. What is this?	*"Where does it come from?"*
10–20 min Plan	Groups predict which sites will have most particles and design a fair method.	*"What must be the same at every site?"*
20–40 min Place traps	Groups make and place traps at the same height, recording site features.	*"What is near your site?"*
Week 2: 0–25 min Count	Collect traps and count particles in five random grid squares.	*"Why count random squares?"*
25–40 min Analyse	Calculate means and draw a bar chart.	*"Which site was worst?"*
40–60 min Explain and act	Link to traffic and trees; propose actions such as planting or no-idling signs.	*"Which action would help most?"*

CHALLENGE CARD (print or copy onto the board)

Rank the sites from cleanest to most polluted, explain the pattern using site features, and recommend one action for the school.

ACTIVITY 03 · FACILITATOR NOTES

The science in brief

Particulate matter is made of tiny solid and liquid particles in the air, from vehicle exhausts, brakes and tyres, construction dust, burning and natural sources such as pollen. The smallest particles can travel deep into the lungs and are linked to health problems.

Particulate levels are usually higher near busy roads and lower near vegetation, which can trap some particles on leaves. Simple sticky traps measure deposition of larger particles only; official monitors measure fine particles such as PM2.5 with instruments.

Common ideas to listen for

- “Clean-looking air has no pollution.” Many particles are too small to see.
- “Trees remove all pollution.” They help a little but reducing sources matters most.
- “Indoor air is always clean.” Indoor sources such as cooking also add particles.

Adapting the activity

Support

Use three sites and count particles in one square only.

Stretch

Compare the results with official local air quality data and discuss why the methods differ.

WORKSHEET 1

Sampling plan

Name: _____ Class: _____ Date: _____

Describe each site.

Sites

Site	Location	Features nearby	Prediction
1			
2			
3			
4			
5			
6			

How we kept it fair

Tick:

- ☐ same trap size
- ☐ same height
- ☐ same length of time

WORKSHEET 2

Particle counts

Count particles in five random 1 cm squares.

Counts

Site	Sq 1	Sq 2	Sq 3	Sq 4	Sq 5	Mean
1						
2						
3						
4						
5						
6						

Bar chart



y-axis: mean particles per cm²

x-axis: site

WORKSHEET 3

Conclusions

Explain your results.

Pattern and explanation

Our recommendation and one improvement to the method

FOR THE TEACHER

Assessment checklist

Use during the session. One sheet covers up to eight students; copy as needed.

Student	Samples fairly	Analyses data correctly	Links results to sources

Suggested codes: W = working towards · E = expected · G = greater depth

ABOUT THIS ACTIVITY

Air Quality Detectives is a sample activity from the EduTrend Contents W4C Environmental Science programme (middle school, level: intermediate). Every activity in the programme follows the same format: a practical challenge, a clear session plan, facilitator notes and ready-to-print worksheets, so that teachers, club leaders and parents can run it without extra preparation.

Full 15-, 20- and 32-week programmes are available from EduStore at edutrend.org.

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