

Key Stage 2



# Healthy Transport

## Unit 1

### Air Pollution

# Key Stage 2 Healthy Transport

## INTRODUCTION

The Healthy Transport Teaching Resource is designed to promote the benefits of walking and cycling for the health of people and the planet. The resource will support students to develop an understanding of different types of transport, and the negative impacts of travel, especially regarding air pollution. Students are then able to increase their knowledge of active travel solutions and actively play a role in encouraging healthy transport, through the development of a Walking Bus. The Healthy Transport Teaching Resource supports delivery of the Northern Ireland Primary School curriculum particularly [World Around Us](#) and [Personal Development and Understanding](#). A detailed description of curriculum links and specific themes can be found within the Healthy Transport Teaching Guide.

## PLANNING THE LESSON

The Healthy Transport Teaching Resource can be implemented at any time of year, but it is recommended to be completed at the start of the school year to support the delivery of a Walking Bus project.

### CREATING A LESSON PLAN

- Set aside time to develop your own understanding of topics
- Allow adequate time to ensure the learning activities are covered
- Each unit and corresponding learning activities can be covered across a week or multiple weeks.
- The learning activities can be in partnership with other work, especially within World Around Us and Personal Development and Mutual Understanding. Further details of linking activities with key learning aims and intentions of these areas of the curriculum can be found in the [Healthy Transport Teaching Guide](#).

Key Stage 2	
Units	Learning Activities
Air Pollution	A. Option 1: Pollution Particle Tag Option 2: Source, Solution or Health Effect Game B. DIY Pollution Catcher Optional: A. Smog in a Jar demonstration

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# UNIT 1: AIR POLLUTION

In this unit students will be introduced to the different types of air pollution, causes of air pollution and the effects air pollution can have on health. Students have an opportunity to understand how air pollution impacts the school environment.

## LEARNING INTENTION

Main Curriculum Links: World Around Us (Science) & Physical Education

More detailed curriculum themes outlined in [Healthy Transport Teaching Guide](#)

## CHILDREN WILL LEARN

- Types of air pollution particles
- Sources of air pollution
- Health effects of air pollution
- Ways to reduce air pollution
- What areas of the school could have more air pollution than others

## SUCCESS CRITERIA

At the end of the lessons, children will

- Understand types of air pollution
- Have increased knowledge on the health effects of air pollution
- Be able to identify how the lungs work to filter out air pollution
- Will have increased knowledge of where pollution comes from
- Students will understand how air pollution effects areas around school grounds.

## RESOURCES:

- Key Stage 2 Unit 1 PowerPoint
- Science Experiment Worksheet

## Learning Activity A: Pollution Particle Tag

Time: 40 minutes

### Resources:

- Key Stage 2 Unit 1 PowerPoint
- Scrap paper, coloured paper or newspaper

### Preparation:

- Use scrap paper, coloured paper or newspaper to make paper balls
  - Two sizes: one group of large and one group of very small, at least 10 of each size

### Delivery:

- Use the Key Stage 2 Unit 1 slides (#2-8) to explain to the children the different types of air pollution, and how each type of air pollution can be categorised into different particle sizes
- Use Key Stage 2 Unit 1 slides (#9-13) to explain the anatomy of the lung and respiratory system, making sure children understand that inside the lungs are tiny hairs called cilia that protect and filter particles such as air pollution out of the lungs.
- Take the children outside or into the gym and split them into two groups (cilia and air pollution), explain to the children that the cilia group are acting as the tiny hairs in the lungs trying to stop the air pollution from impacting the lungs.
- The cilia groups need to spread out at least arms width apart. They will stand still and wave their arms, trying to smack down the air pollution (paper balls). The air pollution group will start by throwing the largest size balls of paper into the cilia to try and hit them with the air pollution. Continue this activity for 2-3 minutes or until all the balls of paper have been thrown.
- Repeat the activity for the other smaller sizes of paper balls
  - You can repeat the activity, switching the groups so each child gets a chance to play both parts
  - This activity can be completed a third time, having the children throw both the large and small sizes at the same time
- Ask the children if they thought it was easier or harder to stop the larger or smaller particles.
- Explain to the children that it should have been harder for them to stop the smaller particles. The smaller the air pollution particles the harder it is for the cilia to filter out the pollution from the body, causing health problems such as making it harder to breath and coughing. These particles can then stay in our bodies and have an even worst effect on our health.

## Learning Activity A: Source, Solution and Health Effect Game

### Time:

Part: 40 minutes

### Resources:

- Key Stage 2 Unit 1 PowerPoint slides (#2-24)

### Delivery:

- Use Key Stage 2 Unit 1 PowerPoint slides (#2-24) to give the children a basic understanding of causes of air pollution
- Explain to the children that they will see a series of slides showing a picture, they need to guess if the picture is showing a source (something that causes air pollution), solution (something that can reduce air pollution) or a health effect (how air pollution impacts our health).
- They will do a squat if it is a source, jump if it is a solution and jog on the spot if it is a health effect.
  - Can be adapted (Slides #29-30) based on needs ex: a variation of heads, shoulders, knees, different exercises, or red light green light adaptation with only two options etc.
  - Can also print the pictures onto large cards and take the children outside have them run if it is a source, stop when it's a solution and walk when it's a health effect.
- Use Key Stage 2 Unit 1 PowerPoint slides #15-28 to complete the activity.

## Learning Activity B: DIY Pollution Catcher

### Time:

Part 1: 30 minutes

Part 2: 15 minutes

### Resources:

- Paper plates or small pieces of cardboard (1 for each student)
- String
- Petroleum Jelly (Vaseline)
- Optional: waterproof markers or paint

### Preparation: (1 per student)

- Cut 1-2 holes at the top of the paper plate or cardboard
- Cut string about 25 cm long, to be used to hang the pollution catcher outside.

### Part 1 Delivery:

- Student should first begin to fill out the "Science Experiment Worksheet"
- Have the children thread the string into the holes to allow the paper plate or cardboard to be hung.

**Optional:** Have the children use the waterproof markers or paint to draw a picture of themselves playing outside on their plate or piece of cardboard.

- Have the children take a small portion of the Vaseline and place it anywhere on their paper plate or cardboard.
- Take the children outside or teacher can complete this step another time and tie the pollution catcher to a location that is exposed to air but, if possible, shelter from the rain. The pollution catchers should be in a location where air, dirt, etc. can hit and stick to the catchers. Consider placing the pollution catchers in a few different locations, near school entrance, playground, school garden, car park etc.

### Part 2 Delivery:

- After a few days (3-7 day) retrieve the pollution catchers and return them to the children.
- Have the children fill out the rest of the a "Science Experiment Worksheet".
- Have a classroom discussion

### Talking Points:

- What was found on the pollution catcher?
- Was more dirt found on the pollution catchers in certain areas? Why do you think this is?
- Where do you believe the pollution came from?
- What would you find if you put the pollution catcher in an air pollution heavy area?
- Discuss what can be done to reduce air pollution around the school and consider who is responsible.

## Science Experiment Worksheet

**Name:**

**Title of experiment:**

**Prediction: What do you think will happen?**

**What equipment did you use?**

**Methods: What did you do?**

**Results: What happened?**

## Optional Learning Activity A: Smog in a Jar Demonstration

**Time:** 15 minutes

**Resources:**

- Glass Jar
- Matches or lighter.
- Twisted piece of paper
- (3-4) Ice Cubes
- Piece of aluminium foil to cover the stop of jar.

**Preparation:**

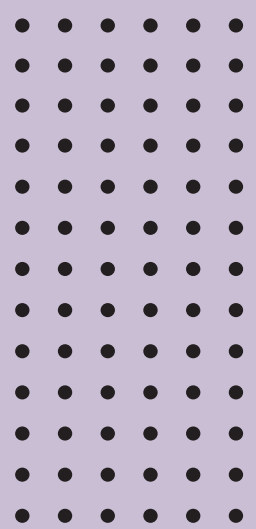
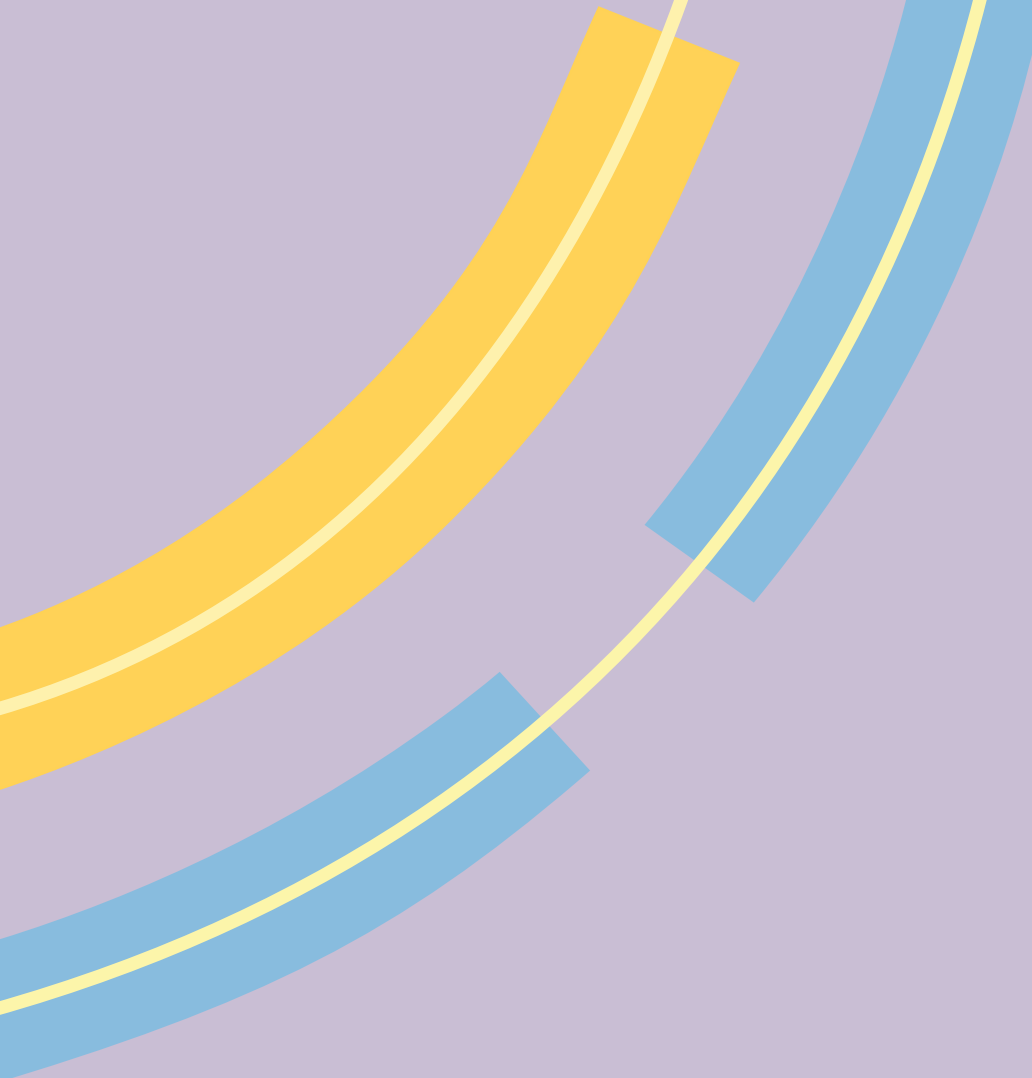
- Put a small amount of water into the glass jar, swish around and empty the water out of the jar.
- Cut a small piece of paper and twist it.
- Create a lid for the jar using a small piece of aluminium foil.
- [Video example demonstrating this activity](#)

**Delivery:**

- Children can observe only or observe and use the "Science Experiment Worksheet".
- Cover the jar with the aluminium foil and place the ice cubes on top for 1-2 minutes prior to starting the experiment.
- While the jar is cooling, explain smog and show children pictures of cities covered in smog. Using slides #6-7 in the Key Stage 2 Unit 1 PowerPoint
- Remove the lid and ice cubes.
- Light the piece of paper on fire and place it inside the jar.
- Cover the jar snugly with the aluminium foil top.
- Place the ice cubes on top of the aluminium foil top.
- Watch as the jar fills with smoke (smog)
- Take care when lifting the jar and releasing the smog, do so outside or near an open window.

**Talking Points:**

- The jar represents your environment, and the smoke represents air pollution.
- When you added the ice cubs to the top of the jar it caused the heat inside the jar to be trapped under a cold atmosphere. Which created smog, a thick layer of air pollution that is trapped at ground level.
- Another way to explain what has happened is that that the ice cubs are cooling the air inside the jar, causing condensation which is mixing with the smoke and forming smog.



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