Lower Key Stage 2 Lesson Plans

Below is a detailed lesson plan, and then further brief lesson plans. These have been designed with key learning objectives and curricular links in mind. The Air Quality Experiments could also be done with Key Stage 2 pupils.

Lower Key Stage 2 Detailed Lesson Plan

Curriculum links:

Science: Undertaking scientific enquiries to answer questions about our world and human behaviour
Science: Exploring the impact of our environment on how our bodies function, including learning how pollutants can be harmful to the human body
Geography: Using fieldwork and observational skills to study the key human and physical features of their school, home and local environment

You Will Need

- Pens or pencils
- Printed copies of worksheets one, two and three
- Whiteboard and marker
- Internet access (for viewing images)

Opener: Great Smog of 1952 (5 mins)

- To start the lesson, display a gallery of images from the Great Smog of 1952. The Guardian has a good collection: www.tinyurl.com/smog1952

- Explain that smog is a kind of dirty fog. In 1952, the weather was very foggy. The fog mixed with lots of dirty smoke from people's coal fires and pollution coming out of power station and factory chimneys.

- This mixture of weather and pollution created a very poisonous blend. The smog was so dirty and thick that it stopped traffic and gave lots of people serious breathing problems. Sadly, the Great Smog of 1952 killed over 4,000 people.

- The terrible conditions and the deaths of people and animals made everyone very angry. The government responded by passing a new law that banned the dirtiest types of smoke and stopped factories and families using coal and smoky wood burners in the city.

Class Activity: Higher or Lower? (10 mins)

- Tell your class that you are going to play a dangerous guessing game. Write "Air Quality" in the middle of your whiteboard with a vertical line and big arrows above it and below it. Using **Teacher notes 1.1: Higher or Lower?** as a guide, ask your class to raise their hands if they think each of the different hazards is more dangerous (higher!) or less dangerous (lower!) than poor air quality or the other hazards already listed.

- Order students' responses on the whiteboard. You may wish to group responses agreed table by table or take a note of the majority's answer. Once you have ordered all eight hazards

you can reveal the real answers.

Group Work: The Air That We Breathe (20 mins)

- Use the results of the previous activity to prompt a short discussion. If necessary, use the following prompts to guide the discussion:
  - Did they get the order right?
  - Were there any surprises?
  - Did your class expect poor air quality to be this dangerous?
  - Does the air your class are breathing now look as polluted as it did in the Great Smog?
  - What do they think modern pollution is?

- Ask your class to take a deep breath and think about what is going into their lungs. Air is a mixture of gases that we breathe in thousands of times a day. The mixture changes depending on where we are and what we (or others) are doing. Can the class think of anything we do that might change the quality of the air around us?

- Hand out Worksheet 1.1: The Air That We Breathe and talk your students through the basic make up of air and the pollution that might be in it. Ask your students to work in pairs or small groups to complete the activity on the worksheet. When encouraging them to imagine the very worst place and the very best place for air quality, encourage them to think both realistically (a bus station) and fantastically (a bus station on top of a volcano).

- Draw a line down the centre of your whiteboard, labelling one half “worst” and one half “best”. Ask each group in turn to describe their worst place from the last activity, noting key attributes on the “worst” half of your whiteboard. If needed, prompt them to provide explanations for their decisions. After each group has described their places, ask the rest of the class if they can think of local places with those key attributes. They may not find any active volcanoes but there may be places with lots of idling traffic, industrial areas or power stations. Add any locations your class think of to your whiteboard.

Worksheet: Routes to School? (10 mins)

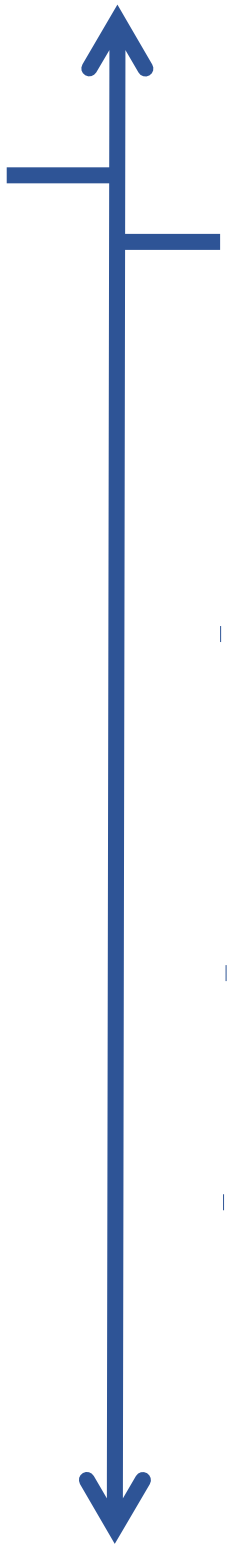
- Hand out Worksheet 1.2: Routes to School and ask each of your pupils to fill in the survey.
- Explain that the answers to this survey will combine with the school’s assembly answers to help them find evidence of people changing their habits in ways that will help improve local air quality. Once your pupils have filled in the survey, collect the sheets and put them away until next lesson, for review with the Air Quality Detective results.

Close: Air Quality Detective (5 mins)

- Tell your class that their homework is to become an “Air Quality Detective”. Each of them will be exploring their school route, investigating the local area and questioning their family. Hand out Worksheet 1.3: Air Quality Detective and walk them through it. Explain that next time you have an air quality lesson they will report back on their investigations!

Teachers Notes 1.1 Higher or Lower?

MOST DANGEROUS



SMOKING
Smoking is responsible for 96,000 deaths a year in the UK, mainly from cancer and heart or lung problems

AIR QUALITY
In the UK, 28-36,000 premature deaths a year are linked to a number of different types of poor indoor or outdoor air quality

OBESITY
In the UK, obesity and complications arising from obesity are responsible for over 30,000 deaths per year

TRAFFIC ACCIDENTS
1,775 people died because of traffic accidents in the UK in 2015

DROWNING
Around 200 people accidentally drown each year in the UK

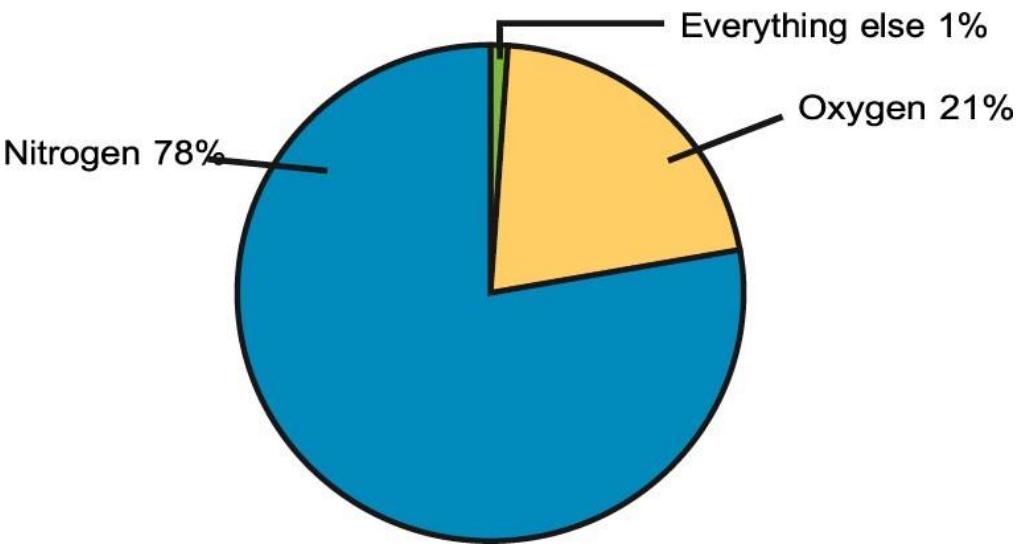
BEE STINGS
Five people a year die because of bee or wasp stings in the UK

LIGHTNING
30 to 60 people are struck by lightning each year in the UK, but less than five die as a result

SELFIES
No deaths in the UK were caused by selfies. However, there were 28 selfie-related deaths worldwide in 2015. That's 20 more than deaths than were shark-related

LEAST DANGEROUS

Worksheet 1.1 The Air That We Breathe



99% of our air is made up of nitrogen and oxygen, gases that are friendly to humans. However, an increasing amount of the remaining 1% of air is made up of harmful substances called pollutants. Too many of these pollutants create poor air quality. Air quality is a measure of the healthiness of our air.

We pollute our air in lots of different ways. When cars, vans or buses burn fuel in their engines, polluting fumes come out of the exhaust pipe. Some houses use coal, wood or gas fires to keep warm or cook, which produces polluting smoke. Half of electricity used is made in power stations that burn coal, oil and gas. These examples are all caused by humans. However, pollution can also come from natural sources, such as volcanoes or pollen.

Read the descriptions of five types of pollution below. The first two types of pollution on the list (nitrogen dioxide and particulates) are the most concerning in Swindon.

- Nitrogen dioxide comes from car exhausts, burning fuel in power plants, cigarettes and thunderstorms. You can find lots of it in cities during rush-hour traffic. It is dangerous for humans, especially people with asthma.
- Particulates aren't gases but lots of bits floating around in our air, including aerosols, smoke, fumes, dust, ash and pollen. Particulates get into our lungs, contributing to heart and lung disease.
- Carbon monoxide comes from burning fossil fuels. You'll find it wherever there are cars, taxis, buses, or fires. It causes headaches, fainting and eventually suffocation.
- Carbon dioxide (CO_2) comes from humans (and other animals) breathing out. At high enough doses it has the same toxic result as carbon monoxide - and it's also very bad for the planet. Increased carbon dioxide is the reason a room filled with people feels stuffy (besides temperature). Other sources of CO_2 are fires, volcanoes, cars and aeroplanes.
- Sulphur dioxide is a smelly but colourless gas that come from power stations and volcanoes. It combines with water in the air to produce acid rain.

Where might you find poor air quality? Imagine the very worst and very best places and describe them here.

Worksheet 1.2 Routes to School

Name:_____ Year: _____

Class:_____ School: _____

Please circle: Girl Boy Age: 5-6 7-8 9-10 11+

What is important to you on your route to school?

Reason	Rank 1 to 6 1 = most 6 = least Use each number once
Being safe	
Being on time	
Being with friends and family	
Good exercise/healthy	
Having fun	
Saving money	

What is worrying about your route to school?

Reason	Rank 1 to 6 1 = most 6 = least Use each number once
Being safe	
Being on time	
Being with friends and family	
Good exercise/healthy	
Having fun	
Saving money	

What do you like about your route to school?

1.

2.

3.

What don't you like about your route to school?

1.

2.

3.

Worksheet 1.2 Routes to School

How do you usually travel to school?

Type of Transport	Count
Walk (including scooter, roller-skates, skateboard etc)	
Cycle	
Car or van to the school entrance (not sharing)	
Car or van to the school entrance (travelling with others)	
Park and walk (not sharing)	
Park and walk (travelling with others)	
Bus	
Rail	
Other	
Total	

How would you most like to travel to school?

Type of Transport	Count
Walk (including scooter, roller-skates, skateboard etc)	
Cycle	
Car or van to the school entrance (not sharing)	
Car or van to the school entrance (travelling with others)	
Park and walk (not sharing)	
Park and walk (travelling with others)	
Bus	
Rail	
Other	
Total	

Thank you very much for completing our survey!

Thank you for taking part in this survey! We will keep your information safe and will not share it with anyone. It will only be used for the purposes of this project.

Worksheet 1.3 Air Quality Detective

Hello! Please help your local air quality detective complete their investigation. The detective's school is working on the "Cleaner Air 4 for Schools" project. We are learning about pollution, measuring local air quality and taking steps to reduce health risks.

Q1. How do you feel about the following statement? Circle one answer.

I know a lot about pollution and air quality in Swindon.

Strongly agree Agree Neither agree nor disagree Disagree Strongly disagree Don't know

Q2. Do you have a bike? Circle one. Yes No

Q3. Do you have a car? Circle one. Yes No

Q4. How often do you leave your engine running for longer than 1 minute while your car is parked?

Always Often Sometimes Infrequently Never No car

Q5. How far do you live from school? Circle one answer.

Within 0.5 miles 0.5-1 miles 1-1.5 miles Over 1.5 miles Don't know

Q6. How do you usually travel to school, to work or in your leisure time? Tick one per column.

Type of Transport	School	Work	Leisure Time
Walk			
Cycle			
Car or van to the school entrance (not sharing)			
Car or van to the school entrance (travelling with others)			
Park and walk (not sharing)			
Park and walk (travelling with others)			
Bus			
Rail			
Other			

Q7. Why do you travel to school using the type of transport above?

Q8. What is most important to you when travelling to school? (Rank 1-6, 1 being most important)

Being Safe	Being on Time	Money	Being Healthy	Family Time

Q9. What are you most concerned about when travelling to school? (Rank 1-6, 1 being most important)

Being Safe	Being on Time	Money	Being Healthy	Family Time

Q10. How would you prefer to travel to school, to work or in your leisure time? Tick one per column

Type of Transport	School	Work	Leisure Time
Walk			
Cycle			
Car or van to the school entrance (not sharing)			
Car or van to the school entrance (travelling with others)			
Park and walk (not sharing)			
Park and walk (travelling with others)			
Bus			
Rail			
Other			

Q11. Why would you prefer to travel using the types of transport above? What is stopping you?

Q12. What is your role in the school? Circle all that apply

Parent or carer Educator Non-teaching staff School governor

Q13. Which year groups do you have children in? Circle all that apply

Reception Year 1 Year 2 Year 3 Year 4 Year 5 Year 6

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Lower Key Stage 2 Brief Lesson Plans

Subject Area and Theme	National Curriculum Links	Activity	Resources
Geography **Mapping the journey to school**	Pupils should be taught to: use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied.	• Ask children to use the maps of the local area to locate their home and their school. Can the children see their route from home to school? • Show children the maps of Swindon on paper or a search engine. Encourage the children to look at routes by car or by bike to identify any special features for cyclists, such as cycle lanes, and differences in the routes. • Children to create their own map showing their route from home to school, creating a key to show the different parts of the journey. Ask children to include any features that might encourage them to walk, cycle or scoot to school instead of using a car, such as pedestrian crossings, cycle lanes or a lollypop man/woman.	Maps of local area Ipads
Mathematics & Computing **Who uses our roads?**	Pupils should be taught to: interpret and present data using bar charts, pictograms and tables	• Explain to the children that we want to find out more about the different types of vehicles that travel on the roads around school. • Children to carry out a traffic survey, using tally marks to record the different forms of transport observed. This could be done as part of a field trip or from within the school grounds if there is a suitable vantage point. [Teachers to ensure that appropriate risk assessments have been conducted before beginning this task]. • Children to use an appropriate software program to enter their data and use it to create a chart to represent their findings.	Traffic survey tally chart Ipads/computers
English **Let's tackle air pollution**	Pupils should be taught to: participate in discussions, presentations, performances, role play/improvisations and debates.	• Show children the Air Pollution cartoon on Youtube and discuss some of the main ways that air pollution can be tackled. • Split children into groups and ask them to devise a campaign to encourage people to make changes to improve air pollution. The children might choose to present some facts about air pollution or create a short piece of drama to illustrate the effects of air pollution. This could be recorded on an ipad or performed as part of an assembly.	Air pollution cartoon Ipads

DT **Be a town planner**	Pupils should be taught to: use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design	• Explain to the children that they are going to design a town of the future that is better set up to tackle air pollution. Discuss how a town could be designed in order to reduce the amount of air pollution and its effects e.g. cycle lanes, play areas located away from roads, tree lined streets, plenty of public transport. • Ask children to plan their design by creating a large scale aerial map of their town. Encourage them to carefully consider the layout of their town, using labels to explain their design choices. Teachers may wish children to work in pairs or small groups for this task. • Children to create a model of their design, then reflect on their work using the evaluation sheet.	Large paper Variety of junk and other model making materials Evaluation sheet