

KS2 LESSON PLAN

Living things in their environments

Introduction:

This lesson will provide children the opportunity to develop a greater understanding of living things, personal health and the health of the environment. The children will be encouraged to consider the positive and negative effects of manmade pollutants on their environment through investigation and by improving their knowledge and understanding via classroom teaching and participation. This document supports the Every Child Matters document and the National Curriculum.

Learning objectives:

- Understand the need for protection of living things
- Understand the need for protection of the environment
- To develop an understanding of health issues relating to environmental pollution
- Learn about habitats and how pollution affects other species

National Curriculum links:

Sc2 Life process and living things (5a)

- ways in which living things and the environment need protection

Sc2 Life process and living things (5b)

- different plants and animals found in different habitats

Differentiation:

- All children will understand that pollution is manmade and affects our environments and health
- Most children will be able to identify the sources of pollution and how they can be avoided or reduced
- Some children will understand how our health and environment is impacted by chemical pollutants

Resources:

- Air Quality Fact Sheets
- Air Quality Quiz Sheet
- Air Quality Picture Sheet

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Key vocabulary:

Environment	Poison	Particulates
Pollution	Transport	Greenhouse gas
Emissions	Carbon Monoxide	Recycled
Industrial revolution	Sulphur Dioxide	Travel plan
Smog	Nitrogen Dioxide	Fossil fuel

Lesson plan:

- 1 Before the lesson starts, ask the children what they know about pollution and transport/travel issues, while recording on a board any information that they give for both differences and similarities.
- 2 Using the information sheets provided, explain the historical emphasis of pollution in the UK and how the Industrial Revolution and London smogs forced the government to respond to the increasing levels of air pollution.
- 3 Progress to discuss the concerns from traffic pollution and how the choices they make when travelling to and from school affect local air quality.
- 4 Take the class to the local road where cars normally drop children off for school. Conduct a traffic count over a period of time and allow each child to record the number and type of vehicles that use the route. Secondly ask the class to observe and identify any plants or animals they think may be living in the area.

Extension activity:

- 1 Count the traffic at different times of the day (include the busiest time, e.g. either the start of the day or at home time). Work out an average of how much traffic passes the school each day.
- 2 Returning to the classroom, ask the children to create pictographs or similar charts to express their findings.
- 3 Discuss with the class how their health and the environment is affected by traffic pollution and how cutting the number of vehicles on the road will help to improve the situation. Finish by asking the class to consider how **they** can help the situation by changing their transport choices.
- 4 Allow the class to complete the word search and their poster competition entries.

N.B. Risk assess the class participation close to a busy road!

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We all need to breathe to stay alive but how clean is the air we breathe?

If you breathe in dirty air you are more likely to develop health problems and become ill. Plants and animals need clean air too. A lot of the things that make our lives more comfortable such as cars, electricity and heating create bad gases and make the air dirty. 'Air pollution' is what we call all bad gases in the air that we breathe and that are harmful to us.

Take a few deep breaths and you will feel your rib cage moving in and out, this opens up your lungs so that air is sucked in. In the lungs, a gas called oxygen passes from the air into your blood. The oxygen is carried in the blood all round your body. You need oxygen for everything you do and it is the oxygen in the air that keeps you alive.

500 years ago in Britain, the burning of **coal** was increasing in London. Coal was used in factories and also used to heat homes. When coal is burnt it makes a lot of smoke, which makes the air very dirty.

Around 200 years ago the **Industrial Revolution** began in Britain. Factories were built, and increasing amounts of coal was burnt. Air pollution was becoming a massive problem, especially when the weather was foggy. In foggy conditions and light winds the smoke or air pollution covered the whole city, and would not move. Smoke and fog together is called **smog**.

Smog was a big problem in the winter when the cold weather, fog and more coal being burnt to warm houses all made the air quality very poor. When smog was stuck over the city, it became really hard to breathe and see clearly. In 1952, the **Great London Smog** occurred and more than 4,000 people died!

New laws were created after this catastrophe in 1956 and 1968, so that it would not happen again. These laws were called the **Clean Air Acts**. These laws were made so that air would become cleaner. The laws encouraged people to use less coal or use cleaner coal in their homes and switch to other fuels such as gas. Factories started using tall chimneys so that the smoke would go high up in the sky and no longer were cover cities, and most new factories were built in the countryside. Smog occurred less often and the air became cleaner.

HISTORY!

Cross curricular opportunity:
Produce a timeline.

KS2 History

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Today, when we think of air pollution, we should think of transport, especially cars

Today there are about 23 million vehicles on the road in Britain, and 20 million of them are cars! The fuels they use release a lot of pollution into the air and once again are polluting our cities.

The problem starts when the car exhausts bad gases, which create air pollution. These gases can be very dangerous for children. Although the fuels are becoming cleaner, air quality is still affected as more and more cars are used.

Transport is not the only reason why we have air pollution. Factories also release bad gases into the air, even with the 'Clean Air Acts'; it still causes a lot of air pollution. There is of course less pollution from coal today but across the world air pollution has not really fallen, because of new bad gases which are released into the air from other sources.

The gases which are a problem are:

- **Carbon monoxide** - a gas that pollutes the air, and is mainly released by cars and other vehicles. It has no colour or smell.
- **Nitrogen oxides** - emitted from vehicles, like cars and trucks. During rush hour periods, a lot more is released into the air. Nitrogen oxides are also emitted from power stations. These gases also make acid rain.
- **Hydrocarbons** - produced when fuel is not fully burnt. They are one of the causes of modern-day smog.
- **Particulates** - very small particles, like soot, dust and fumes that are released into the air. They are caused by vehicles, factories and smoke from homes burning coal for heating.
- **Sulphur dioxide** - has no colour and most of it is released by power stations. It causes acid rain when mixed with water in the air.

SCIENCE!

Cross curricular opportunity:
Egg in bottle experiment as attached.
KS2 Science

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There are many things we can do to help reduce air pollution and global warming

Use **buses and trains** instead of cars, as they can carry a lot more people in one journey. This cuts down the amount of pollution produced.

Walking or cycling whenever you can is even better, as it does not create any pollution. It will also be good for your body, as regular exercise will keep you fit and healthy.

If your parents must use the car, ask them to avoid using it for very short journeys if possible, as this creates unnecessary pollution. Try to encourage them to **share their journeys** with other people, for example when they go to work or go shopping. Also encourage them to **drive more slowly** as this produces less pollution and less carbon dioxide.

Energy is produced to generate electricity and to keep us warm

Most energy is produced by the burning of fossil fuels, like coal, oil and gas, which release carbon dioxide, a **greenhouse gas**. Fuel burnt in our cars also releases carbon dioxide. As a child, you do not have a lot of control on how your energy is produced. However, you can control the way in which you use that energy. Using less energy means less of it needs to be produced. So less carbon dioxide is released into the atmosphere.

We can also help prevent pollution from our own homes which may contribute to acid rain and poor air quality, and increases emissions of carbon dioxide in the atmosphere. **Turning off lights** when they are not needed and **not wasting electricity** will reduce the demand for energy. Less electricity will need to be produced and so less coal, oil and gas will have to be burnt in power stations, which means less air pollution and less carbon dioxide!

Most of the rubbish we throw away can be **recycled**, such as glass bottles and jars, steel and aluminium cans, plastic bottles and waste paper. Recycling used materials uses less energy than making new ones.

Composting fruit and vegetable waste reduces the amount of rubbish buried at rubbish dumps.

POLLUTION WORD SEARCH

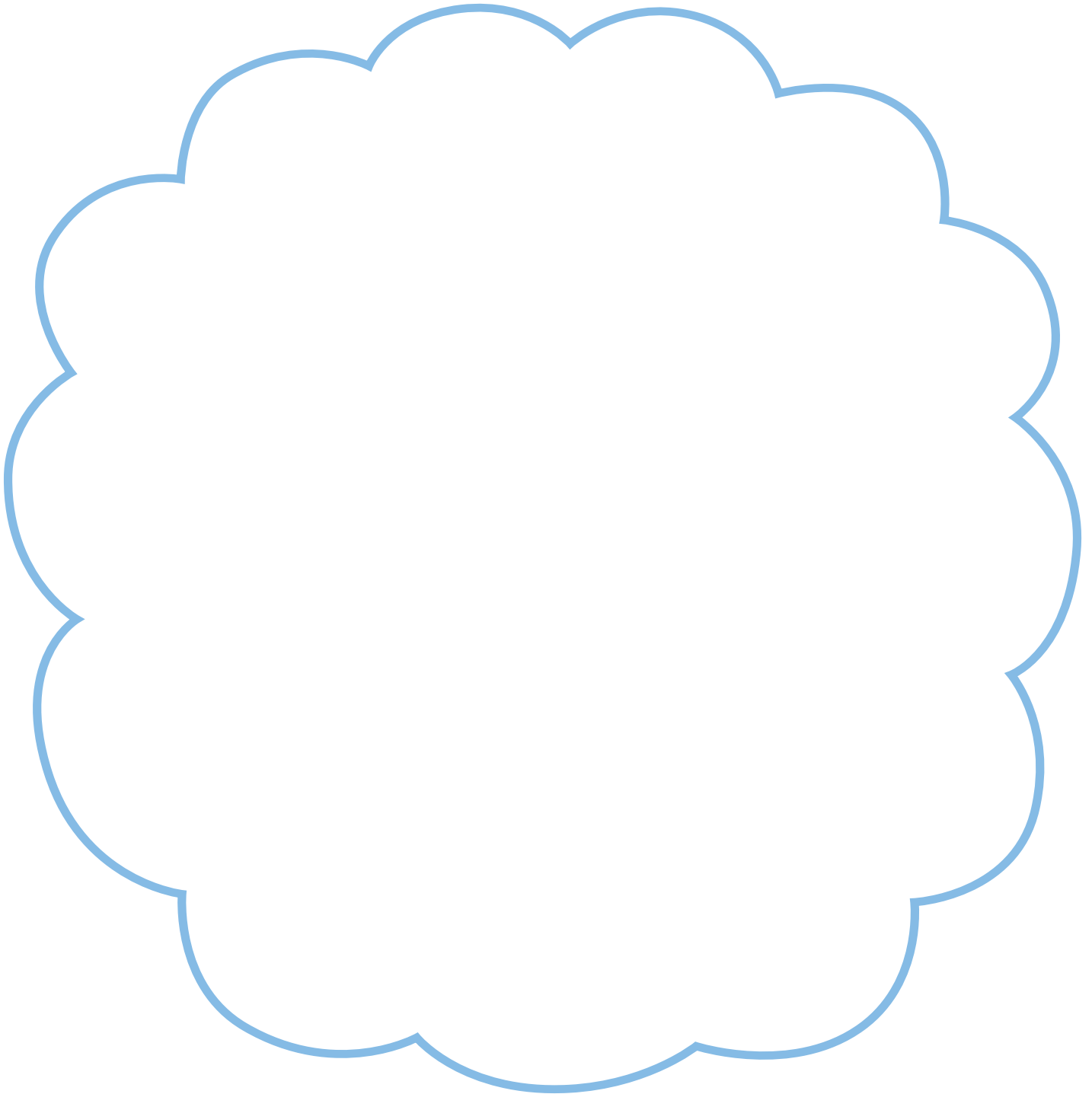
Can you find the hidden environmental words in only ten minutes?

- Greenhouse
- Transport
- Emissions
- Energy
- Recycled
- Pollution
- Smog
- Environment
- Industrial
- Poison

E	R	T	F	G	D	D	Y	L	P	O	I	S	O	N	G	E	O	P	X
N	N	S	K	L	G	H	H	E	T	Y	U	M	S	D	O	H	R	T	N
V	D	E	G	Y	C	W	C	O	D	I	N	D	U	S	T	R	I	A	L
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N	B	M	K	K	E	H	K	F	K	K	L	G	E	T	V	C	N	Y	N
M	C	L	E	X	J	G	G	J	A	E	K	E	C	K	H	R	B	B	O
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N	F	J	K	G	R	E	E	N	H	O	U	S	E	F	H	G	H	T	P

PICTURE PAGE

Draw a picture below which shows how to stop traffic pollution!



Sheet 7