

## Sustainable Travel Climate Change Pack

### **Aims:**

- To make pupils more aware of the influence that travel habits have on climate change.
- To develop a better understanding of the issues and terminology surrounding climate change.
- To increase the proportion of pupils travelling to school by sustainable means, leading to environmental benefits.

### **Reasons for doing a climate change activity in school:**

- Climate change stories feature daily in the media and pupils need to be fully informed of the facts.
- Schools can develop positive activities to help combat climate change.
- There is plenty of resource material available.

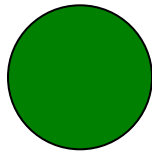
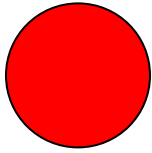
### **Activities:**

- Finding out what pupils already know
- Finding out the facts.
- Using websites, DVDs, information sheets, calculating a global footprint.
- Finding out how using a car affects climate change.



## Climate change- what do you know?

- Read out some of the words associated with climate change. Ask the children if they know what they mean? Get them to hold up a green circle if they can explain the meaning or a red circle if they don't know.



Or

- Matching exercise

Give out definitions of the main terms and match them up to the correct words

Or

- Give out a list of the main terms and ask the children to write down what they mean.

Or

- Get the children to make a poster or scene showing what they understand about climate change and global warming

## Climate change-finding out the facts

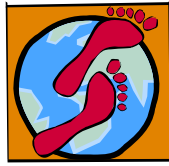
- Do the global footprint exercise enclosed in this pack
- Watch a DVD on climate change (Defra DVD on Climate challenge website)
- Log on to Carbon Detectives website to find out more and register your school to work out the carbon footprint.
- Look up books and other websites to find out more information

## Climate change-How does using a car affect climate change?

- Look at the fact sheet for teachers and pupils in this pack
- Try some of the suggested activities

## Climate Change Glossary

CO <sub>2</sub>	This is a gas called carbon dioxide. Carbon dioxide is a gas that is found in our atmosphere. Burning fossil fuels makes extra CO <sub>2</sub> in the atmosphere.
Fossil fuels	Coal, gas and oil are known as fossil fuels. They occur naturally on the earth from the decomposition of animal and plant remains. They produce carbon dioxide when they are burnt.
Greenhouse gases	The earth is getting warmer because of a build up of greenhouse gases in the atmosphere. These gases trap heat from the sun. The most important greenhouse gas is carbon dioxide.
Carbon footprint	The words 'carbon footprint' is used to describe the amount of CO <sub>2</sub> you produce and its impact on the environment. To measure your carbon footprint, you need information about what you use (water, energy, food, etc) and the waste you produce. Everyone has a carbon footprint - it's your own personal measure of how much carbon dioxide you create and how much you contribute to climate change.
Global warming	<p>Global warming is a gradual rise in temperature all over the earth's surface.</p> <p>The earth is getting warmer because of a build up of greenhouse gases in the atmosphere. These gases trap heat from the sun.</p> <p>Global warming refers to an average increase in the Earth's temperature, which in turn causes changes in climate. A warmer Earth may lead to changes in rainfall patterns, a rise in sea level, and a wide range of impacts on plants, wildlife, and humans. When scientists talk about the issue of climate change, their concern is about global warming caused by human activities.</p>
Climate	Typical weather. The term 'climate' normally describes the average weather we get over a long period of time. When our climate changes, the weather we experience locally day to day can also change.
Atmosphere	<p>It is like an invisible blanket that keeps the earth warm by trapping heat from the sun.</p> <p>The atmosphere is the mixture of gases surrounding the Earth. The Earth's atmosphere consists of about 79. % nitrogen 20.9% oxygen, 0.036% carbon dioxide and trace amounts of other gases. The atmosphere can be divided into a number of layers according to its mixing or chemical characteristics,</p>
Ozone layer	A layer in the earth's atmosphere. The ozone layer protects the earth from the sun's harmful rays.
Climate change	<p>Climate change has happened naturally many times before. The difference now is that the change is happening quickly and humans are speeding it up. A gradual change in the climate we experience.</p> <p>Climate Change is one of the most important issues facing the world today. There is strong evidence that human emissions of greenhouse gases are changing the world's climate.</p>
Emissions	When the car drives it burns fuel and emits fumes that contain the gas carbon dioxide.
Sustainable	Something is sustainable when it can continue to be used in the future.



## Global Footprint Activity

### Aims:

- To introduce the concept of Global footprint
- To calculate individual footprints
- To begin thinking about ways that the global footprint can be reduce

### Introduction

What do global and footprint mean?

What is a global footprint?

*A footprint means pressing down and global means world, so 'global footprint' means pressing down on the world and we don't want to press too hard'*

*(Child's definition of a Global footprint).*

We all make an Ecological footprint (or Global footprint). Show a picture of planet Earth or a globe. Ask if they know what the world population is? Answer six billion. Explain that if we share out the area of productive land and sea by the global population of six billion people then we each have around 2 hectares of land for to supply all our needs.



An Ecological footprint (EF) is the area of land and water that is needed for a person to sustain their particular standard of living. Each person has an allocation of 2 hectares.

Take an apple to represent the world. Cut it into quarters vertically. Put 3 aside, they represent the earth's surface covered by water. Slice the remaining quarter into 8 slithers and discard 7- these represent mountains, deserts etc Peel the remaining slither- the peel represents the earth's surface on which we depend upon for our food for survival. This show's that food production is a key component of the Global footprint.

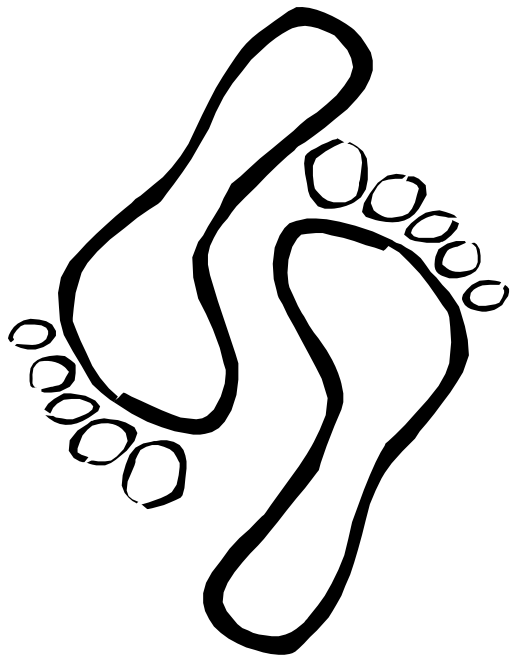
What are the other components?

Paper 2%, water 1%, heating 10%, holiday 14%, waste 22%, transport 17%, food 22%, electricity 11% for an unsustainable lifestyle.

Paper 5%, water 1%, heating 10%, holiday 10%, waste 30%, transport 10%, food 32%, electricity 2% for a more sustainable lifestyle.

## Activity:

Calculate your global footprint using the guideline sheets.



### Feedback scores

Dividing the total by 50 gives the approximate number of hectares needed to support that lifestyle.

(1 hectare is approximately 1 football pitch.)

In this country the average EF is 5 hectares.

In Africa and Asia it is only 1.5 hectares.

In USA it is 10 hectares.

Are we sharing out the earth's resources fairly?

Why do we have an EF of 5 hectares when each person's allocation is 2 hectares?

**What can you do?**



## Global Footprints

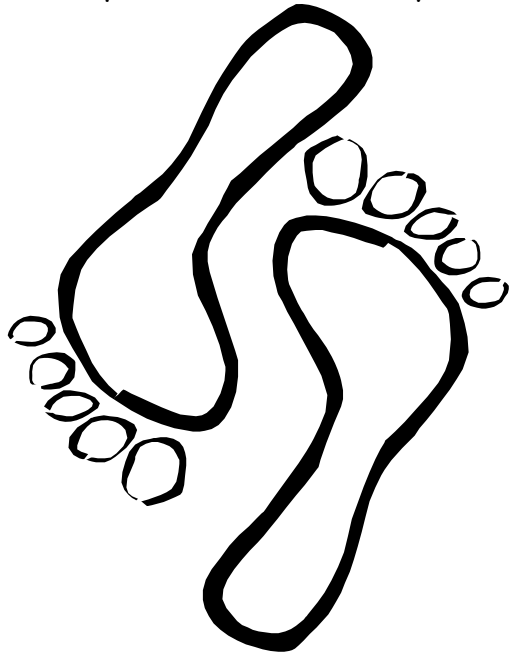
Item	Score range	Guidelines:
Paper	5-10	I use a small amount of paper each day. I use an average amount of paper each day. I use a large amount of paper each day.
Water	1-5	I do not use a washing machine or dishwasher daily. I shower instead of bath. I regularly use a dishwasher and washing machine. I bath daily.
Heating	10-45	I share a medium sized house with my family and the heating bills are average. I live in a large house, by myself and the heating bills are high.
Holiday	10-65	I usually holiday close to home. I usually holiday in Europe and sometimes fly. I usually holiday further a field and travel by plane.
Waste	30-100	I produce a below average amount of domestic waste which is recycled. I produce a large amount of domestic waste which is not recycled.
Transport	10-75	I usually walk or cycle. I travel mostly by bus or train. I travel mostly by car.
Food	32-100	I am a vegetarian and buy fresh locally grown produce. I am an occasional meat eater and eat mix of fresh and convenience food. I am a regular meat eater and eat a lot of convenience food.
Electricity	2-50	I tend to conserve energy and buy electricity from a renewable source. I tend not to conserve electricity and buy electricity from a non renewable source.
	Total	

	<b>Global Footprints</b>			<b>Global Footprints</b>		
Item	Score range	Your Score	Item	Score range	Your Score	
Paper	5-10		Paper	5-10		
Water	1-5		Water	1-5		
Heating	10-45		Heating	10-45		
Holiday	10-65		Holiday	10-65		
Waste	30-100		Waste	30-100		
Transport	10-75		Transport	10-75		
Food	32-100		Food	32-100		
Electricity	2-50		Electricity	2-50		
	Total			Total		

## Global footprint-extension ideas

Draw a footprint on plain paper.

Divide into sections and decorate to show each aspect of the footprint: water, heating, paper, holiday, waste, transport, food, electricity.



Draw a footprint on plain paper.

Divide into sections and decorate to show how you could reduce each aspect of your footprint e.g. water- turn the tap off when you brush your teeth, heating- turn the thermostat down, etc

Calculate % for each item.

E.g. Paper score/ Total x 100%

Which aspect of your Global footprint accounts for the greatest percentage of your score?

Why is this?

What can you do about it?

## TEACHER'S FACT SHEET

### How does using a car affect climate change?

Climate change has happened naturally many times before. The difference now is that the change is happening quickly and humans are speeding it up.

Climate change is one of the biggest threats to our environment. It will have a massive effect on how we live.

The earth is getting warmer because of a build up of greenhouse gases in the atmosphere. These gases trap heat from the sun. The most important greenhouse gas is carbon dioxide.

The symbol for carbon dioxide is  $CO_2$ . The words 'carbon footprint' is used to describe the amount of  $CO_2$  you produce and its impact on the environment. To measure your carbon footprint, you will need information about what you use (water, energy, food, etc) and the waste you produce.

Each thing you do produces different amounts of  $CO_2$ . These measurements are used to calculate your carbon footprint.

In an increasingly car dependent culture it is easy to become relaxed about using our own private vehicles for any and every journey. This is compounded when there are localised problems of inadequate public transport and concerns over cyclist or pedestrian safety. Travel to and from school currently makes up a significant part of a school's carbon footprint. This is made worse when congestion lengthens journeys and increases fuel consumption. Nationally, transport now accounts for 26% of emissions in the UK and is the fastest growing source of climate change gases.

Reducing carbon dioxide emissions from journeys associated with schools can be tackled in a number of ways. New green fuels such as biofuels (based on agricultural crops such as soybeans and rapeseed) and initiatives in vehicle design such as the G-Wiz (an electric car with no emissions) may offer part of the solution in the longer term. In the meantime the more that can be done to reduce individual car journeys the better. Using buses reduces the overall amount of  $CO_2$  released, and both walking and cycling are emission free.

A large car produces 0.10 kg  $CO_2$  per passenger km, whereas a bus produces 0.05 kg  $CO_2$  per passenger km. Using this information the total  $CO_2$  emissions for travel in a school are calculated.

Scientists have calculated that for temperature increases to be held to a maximum of 2 degrees by 2050, the average global emissions per person should be 2 tons. Currently the global average is around 4 tons per person. Climate change is not a small challenge. Big reductions are needed and schools have to play a part in this.

## **Travel facts and figures**

- Transport accounts for 20% of the average school's carbon footprint.
- Between 1992 and 2004 the number of journeys made to school by car rose by 31% and the average journey length increased.
- Between 8am and 9am 18% of cars on the road in urban areas in term time are on the school run.
- Public transport uses as much as 50% less fuel per passenger than a private car.

## **What individual pupils can do**

- Walk or cycle to school whenever possible.
- Use public transport / school bus services rather than traveling by car.
- Arrange to share lifts to cut down on the number of individual cars making the same journey.
- Be aware of the new, more environmentally friendly cars and discuss them as options with their family.

## **What a school community can do**

- Develop a School Travel Plan to change the way the whole school travels.
- Encourage cycling to school by providing safe and plentiful bike sheds and lockers.
- Organise and promote cycling proficiency courses, helping to encourage more pupils to enjoy and feel safe using a bike. This may also help to ease parental concerns about safety issues.
- Organise safe walk-to-school alternatives such as 'walking buses' which will have added social and health benefits.
- Consider providing a breakfast club selling healthy food to replenish the energy used by pupils cycling or walking.
- Use biofuels in minibuses and consider transport emissions when planning school trips.

## **To influence Government thinking and policy-making, pupils can:**

- Write to their MP/MEP asking them to improve public transport provision in their area. This may also mean challenging them concerning cost, especially in rural areas where buses are often expensive to use even for short journeys.
- Support wider initiatives such as International Walk to School Week ([www.iwalktoschool.org](http://www.iwalktoschool.org)) to demonstrate the desire for change. This may include the need to target related issues such as ensuring streets are safe for pupils to walk along.

## PUPIL'S FACT SHEET

### How does using a car affect climate change?

Most cars use petrol to make the engine drive the car.

When the car drives it burns fuel and emits fumes that contain the gas carbon dioxide ( $CO_2$ ).

Added together with  $CO_2$  from other cars, it has a major effect on the amount of  $CO_2$  in the atmosphere.

Carbon dioxide is a gas that is found in our atmosphere. It is like an invisible blanket that keeps the earth warm by trapping heat from the sun.

We make extra  $CO_2$ , which makes the blanket strong. This extra heat warms the Earth. It can also cause changes in the weather. This is known as causing climate change.

A large car produces 0.10 kg  $CO_2$  per passenger km, whereas a bus produces 0.05 kg  $CO_2$  per passenger km. Using this information the total  $CO_2$  emissions for travel in a school are calculated.

Scientists have calculated that for temperature increases to be held to a maximum of 2 degrees by 2050 the average global emissions per person should be 2 tons. Currently the global average is around 4 tons per person. Climate change is not a small challenge. Big reductions are needed and schools have to play a part in this.

### What individual pupils can do

- Walk or cycle to school whenever possible.
- Use public transport / school bus services rather than traveling by car.
- Arrange to share lifts to cut down on the number of individual cars making the same journey.
- Be aware of the new, more environmentally friendly cars and discuss them as options with their family.

For further information and data

[www.carbondetectives.org.uk](http://www.carbondetectives.org.uk)

# Climate Change Activities

- How can I make the biggest difference?

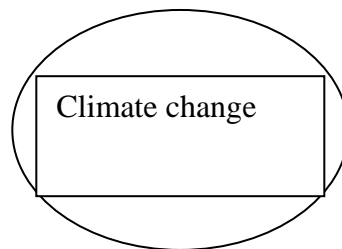
Think about journeys that you and your family make each week.

Look at the grid and fill in what you could do to use your car less and reduce the amount of CO<sub>2</sub> in the atmosphere.

	Easy to do	Hard to do	Very hard to do
Makes a bit of difference			
Makes a lot of difference			
Makes a really big difference			

- Mind maps

Put Climate change in the middle, place words and phrases on the branches. Place similar words or phrases on the same branch. Use lots of colour, symbols and drawings. Remember to include ideas for reducing your car use and cutting emissions.



- Word pictures

Draw a scene featuring the words you know to do with Climate Change. Label it with words and phrases. Use lots of colour and memorable pictures.



- Devise a 3-minute advert to persuade other people to use their cars less. You may use slogans, jingles, drama. Try to include some of the new terms you have learnt.
- Prepare a 5-minute presentation on the influence travel has on climate change. You may want to use drama or make posters. You could do this for the rest of your school.

How can I make the biggest difference?

	Easy to do	Hard to do	Very hard to do
Makes a bit of difference			
Makes a lot of difference			
Makes a really big difference			

## Climate Change Activities-Websites and Resources

<http://www.carbondetectives.org.uk/content/home/toolkit/traveltraffic>

All the facts you need for your lesson and more!

The website starts with a short animation which highlights for Key Stage 2 and 3 pupils the environmental state of the planet and the fact that schools contribute to climate change through their carbon emissions.

The animation aims to stimulate your pupils to use the Carbon Detectives' Kit to find out the carbon footprint of their school and work towards reducing it. Ideally they would be in charge of as much of the data collection and decision-making as possible but help from you and other staff in the school will be vital.

The carbon footprint calculator works by measuring components of the five DCSF Sustainable School Doorways in your school responsible for CO<sub>2</sub> emissions. Data about these Doorways is collected and entered onto the website and a school carbon footprint is calculated. On the website the Doorways are referred to as Assignments. The six assignments for the Carbon Detectives Team are:

- **Energy and water** - pupils discover how much water, electricity, gas and other energy the school uses in a year.
- **Food** - pupils find out about the food eaten in the school including school meals, packed lunches and snacks, plus drinks.
- **Waste and recycling** - pupils measure certain items of waste and how it is disposed.
- **Travel** - pupils investigate how people travel to and from school and the trips the school makes.
- **Purchasing** - pupils find out how much paper is used, and how many of certain items of equipment the school has and purchases each year.
- **Buildings and grounds** - pupils find out about the area of the school and the number of new trees planted each year.

[www.climatechallenge.gov.uk](http://www.climatechallenge.gov.uk)

Tomorrow's Climate today's challenge

Defra climate change short film. This short film illustrates why climate change is happening, what it will mean and how we can all be part of the solution.

Climate change animation to aid children in learning about climate change we have developed a simple animation to explain the basics.

Lots of facts and explanations about climate change. Good sections on Understanding climate change and Communicating Climate Change

[www.managenergy.net-kidscorner](http://www.managenergy.net-kidscorner)

European website has good resources for transport and climate change.

Downloadable pictures

WWF

[www.wwf.org.uk](http://www.wwf.org.uk)

[www.wwflearning.co.uk](http://www.wwflearning.co.uk) Dedicated teacher website

Climate Chaos information for teachers. Learning for Sustainability. An excellent booklet with explanations and activities. Has Curriculum links for KS2 and 3

The Best Eco Book Ever isbn0955311101

Film-An Inconvenient Truth by Al Gore

Sent to all secondary schools with Teacher Guidance Pack.

[www.teachernet.gov.uk/sustainable-schools](http://www.teachernet.gov.uk/sustainable-schools)

Children's Minister Kevin Brennan said: "The judge's decision is clear that schools can continue to use An Inconvenient Truth as part of their teaching on climate change in accordance with the amended guidance

"Climate change is the greatest environmental challenge facing the world today. Schools have a special role to play in helping pupils understand its causes and in exploring if and how we should respond."

*Climate Change film pack - Guidance for teachers*

Submitted by: [Department for Children, Schools and Families](#)

This guidance accompanies the Climate Change Film Pack sent to all secondary schools in England including Al Gore's film, An Inconvenient Truth and a series of short films from Defra. The guidance is aimed at Key Stage 3 and 4 science, geography and citizenship teachers as an aid to teaching about climate change and includes:

- How scenes from the film, An Inconvenient Truth link to the science, geography and citizenship curriculum at Key Stages 3, 4 and A Level.
- Lesson ideas on teaching climate change in science and geography.
- Climate change debate topics for citizenship lessons.
- How to plan a whole day citizenship event on climate change.
- FAQs and further resources.

Film packs have been issued to secondary schools in England only.