



This document is one of a suite of Factsheets that are part of the support offered to schools and teachers. The Factsheets provide guidance, ideas and link to resources to support your Citizen Science activities. They also contain suggestions for extended learning relating to problem solving, numeracy, geography and social studies. We hope they will provide all the guidance you need to develop lessons to fit with your own curriculum plans. For general enquiries contact – Amanda Malcolm, Citizen Science Coordinator, [citizenscience-scotland@tcv.org.uk](mailto:citizenscience-scotland@tcv.org.uk), 0141 552 5294.

## Global Footprint Factsheet

### Introduction

Each of us takes up space and resources on our planet. This is space that was once filled by wildlife, trees plants and animals. If you look back in time, where you live was probably open fields just 50 years ago and 1000 years ago was probably wild woodland or open moorland. These changes have come about because of 2 things; more people and bigger houses.

When our parents or grandparents were young, it is likely they shared rooms with their brothers and sisters, whereas today most of us now have our own bedrooms. 100 years ago, whole families may have shared 1 room as a bedroom and shared an outside toilet with neighbours. Things certainly are more comfortable for us now, but it does mean we all have bigger houses and that takes up more room.

**Suggested Activity** - Activity – See where you are in the world's population. Enter your date of birth or that of your parents and grandparents  
<http://www.7billionandme.org/about-you.php> -  
<http://www.bbc.co.uk/news/world-15391515>

There are a lot more people today as well. Although Scotland is quite a small country it has 5.3 million people, mostly living in or near the big cities of Glasgow and Edinburgh in Central Scotland or Aberdeen. But that is quite low density compared to the rest of the UK. England and Wales together are only twice the size of Scotland but there are more than 10 times as many people, over 56 million people live there. This has risen from around 6 million people in the early 1700's.

Across the world the population is rising fast, doubling in just the last 40 years to over 7 billion (7,000,000,000), with 3 more people being born every second. It is estimated by 2050 there may be over 10 billion (10,000,000,000) people on the planet.

All these people need somewhere to live, work, sleep, water to drink and food to eat. They need clothes to wear and want the best out of life for them and their families. This means using the world's natural resources in a way that nature did not intend. Forests are cleared for timber and moorland drained to make way for farming and houses, factories and roads. Minerals such as iron ore and coal are mined and quarried leaving large scars on the landscape. This has been going on in Scotland for centuries and the open countryside we see today is very much reduced and very different to when modern humans first settled here over 9000 years ago.

## Food Miles

To feed the world's ever increasing population, modern farming techniques mass produce food all over the world. Farmers grow food here in Scotland and export it to other countries while at the same time we import food from farmers far away.

Transporting all this food back and forward requires large amounts of fuel, which costs a lot of money and causes pollution to refine and when it is burnt in the engines of ships, planes and lorries that deliver it.

**Suggested Activity** – Think about what you are having for lunch today and find out the Food Miles your food creates, see what you could eat instead to reduce them -

<http://www.climatechoices.org.uk/pages/food3.htm>

## Carbon Footprint

The fuel costs added to food make it more expensive than locally grow and distributed food. But it also burns oil, diesel and petrol created from fossil fuels which is a finite natural resource and is a major contributing factor to climate change as they produce Carbon Dioxide as an exhaust waste. Each of us has a Carbon Footprint we create from the production and delivery of the food we eat, the goods we buy, the cars we drive and the light

and heat we use in our houses, schools, factories and offices. We can reduce the Carbon Footprint we create by buying local produce, using public transport and cutting back on unnecessary electricity, heat and water we use.

**Suggested Activity** – measure your family's Carbon Footprint and think of ways you can reduce it -

<http://www.carbonindependent.org/>

## Waste

Once we have finished with our food we need to wash the dishes and pots, get rid of any leftover food and dispose of the packaging. All these create waste which has to be treated and disposed of. The best thing to do is to reduce the amount of waste we create in the first place. Supermarkets and manufacturers are controlled by law to reduce the amount of waste they produce in preparing food and goods and also in the amount of packaging finished goods are wrapped in. We then need to recycle as much as we can back into useful products. For example, waste paper and cardboard can be shredded and made back into new paper packaging products. This not only saves on raw materials needed (trees in the case of paper) but the energy needed to create these products. For example, recycling aluminium drinks can saves 95% of the energy needed to remake a new can from raw material.

## Water Use

Water is also a natural raw resource. It takes lots of energy to clean and pump water to the tap at home. Scottish Water, which delivers most of the clean drinking water to homes in Scotland, is therefore one of Scotland's biggest energy users. The waste water has to go somewhere too. Sewers take away water from toilets to be treated and rainwater runs from roofs and roads into drains. These drains can sometimes lead straight into rivers which can cause pollution problems if the wrong things are poured down the wrong drains. Polluted water in rivers kill the fish and animals that rely on clean water.

We can all do things to reduce our Global Footprint but many animals and plants are already suffering from the development we have already done. We can help by recreating wild places, even if we live in towns and cities. Even a small corner of a playground or garden can be transformed into a wild place with the right plants attracting insects and birds to live and feed there. Ponds to cam attract lots of different animals, even very small ones.

**Suggested Activity** – Activity – Look at the Yellowfish project to ensure your school uses the right drains for disposing of water -

<https://www.gov.uk/government/publications/avoiding-pollution-yellow-fish-scheme>

**Suggested Activity** – Activity – contact your local wildlife centre or TCV Scotland for advice on how you can set up a biodiversity garden in your school grounds. [j.grant@tcv.org.uk](mailto:j.grant@tcv.org.uk)

| Outcome statement   | Curriculum area  |
|---|--|
| I have used a range of ways to collect information and can sort it in a logical, organised and imaginative way using my own and others' criteria.<br><br>MNU 1-20b * Responsibility of all  | Numeracy > Information handling > Data and analysis        |
| I have carried out investigations and surveys, devising and using a variety of methods to gather information and have worked with others to collate, organise and communicate the results in an appropriate way.<br><br>MNU 2-20b * Responsibility of all | Numeracy > Information handling > Data and analysis        |
| I can explore examples of food chains and show an appreciation of how animals and plants depend on each other for food.<br><br>SCN 1-02a  | Sciences > Planet Earth > Biodiversity and interdependence |
| Having taken part in practical activities to compare the properties of acids and bases, I have demonstrated ways of measuring and adjusting pH and can describe the significance of pH in everyday life.<br><br>SCN 3-18a                                 | Sciences > Materials > Chemical changes                    |
| I understand how animal and plant species depend on each other and how living things are adapted for survival. I can predict the impact of population growth and natural hazards on biodiversity.<br><br>SCN 4-01a  | Sciences > Planet Earth > Biodiversity and interdependence |