

# Schools Global Footprint



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This second edition has been produced as part of the Local Footprints Project. Local Footprints is a joint project between WWF Scotland and the Sustainable Scotland Network (SSN) with funding and support from Eco-Schools Scotland, the Improvement Service, the Scottish Government and ScottishPower.

The purpose of the Local Footprints Project is to help local authorities and schools make an effective contribution to reducing Scotland's global footprint through the use of footprint analysis to inform policy and practice, to raise awareness, and to change behaviour.

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**With grateful thanks to the former *Schools Global Footprint* Steering Group members and the pilot schools in Aberdeen City, Aberdeenshire and North Lanarkshire:**

#### **North Lanarkshire**

Clarkston Primary School, Greenfaulds High School, Keir Hardie Primary School, Langloan Primary School, Overtown Primary School, Our Lady's High School and St Patrick's High School.

#### **Aberdeen City and Aberdeenshire**

Craigievar Primary, Cults Primary, Fishermoss Primary, Harlaw Academy, Keithhall Primary, Mill O' Forest Primary, St Peters RC Primary and Turriff Academy.

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**Part 1**  
**Footnotes –**  
**Introducing *Schools***  
***Global Footprint***



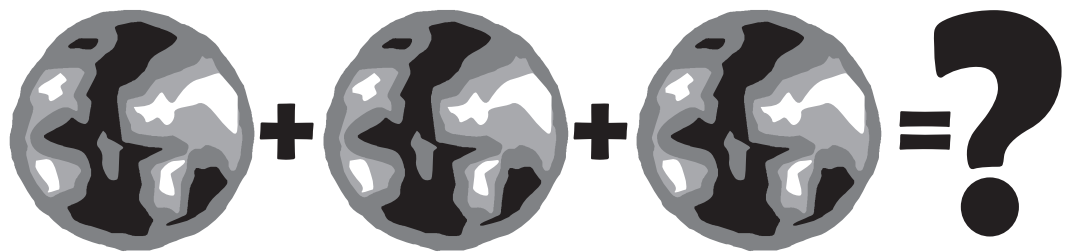
# Introduction

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Welcome to the *Schools Global Footprint* teaching resource. The overall aim of *Schools Global Footprint* is to help your learners learn about examining, measuring and reducing your school's Ecological Footprint. It also allows you to measure your school's Carbon Footprint (see page 12 for an explanation of the difference between an Ecological Footprint and a Carbon Footprint).

*Schools Global Footprint* is made up of two main teaching tools which work hand in hand: this handbook for teachers and an online footprint calculator for learners, both found at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)

*Schools Global Footprint* offers a comprehensive approach to sustainable development education (SDE), primarily for learners at second and third levels (P6 – S3) although it could be used with younger or older learners. It is fully aligned with the principles of Curriculum for Excellence and allows for creative and practical learning across all areas of the curriculum.



## Curriculum for Excellence

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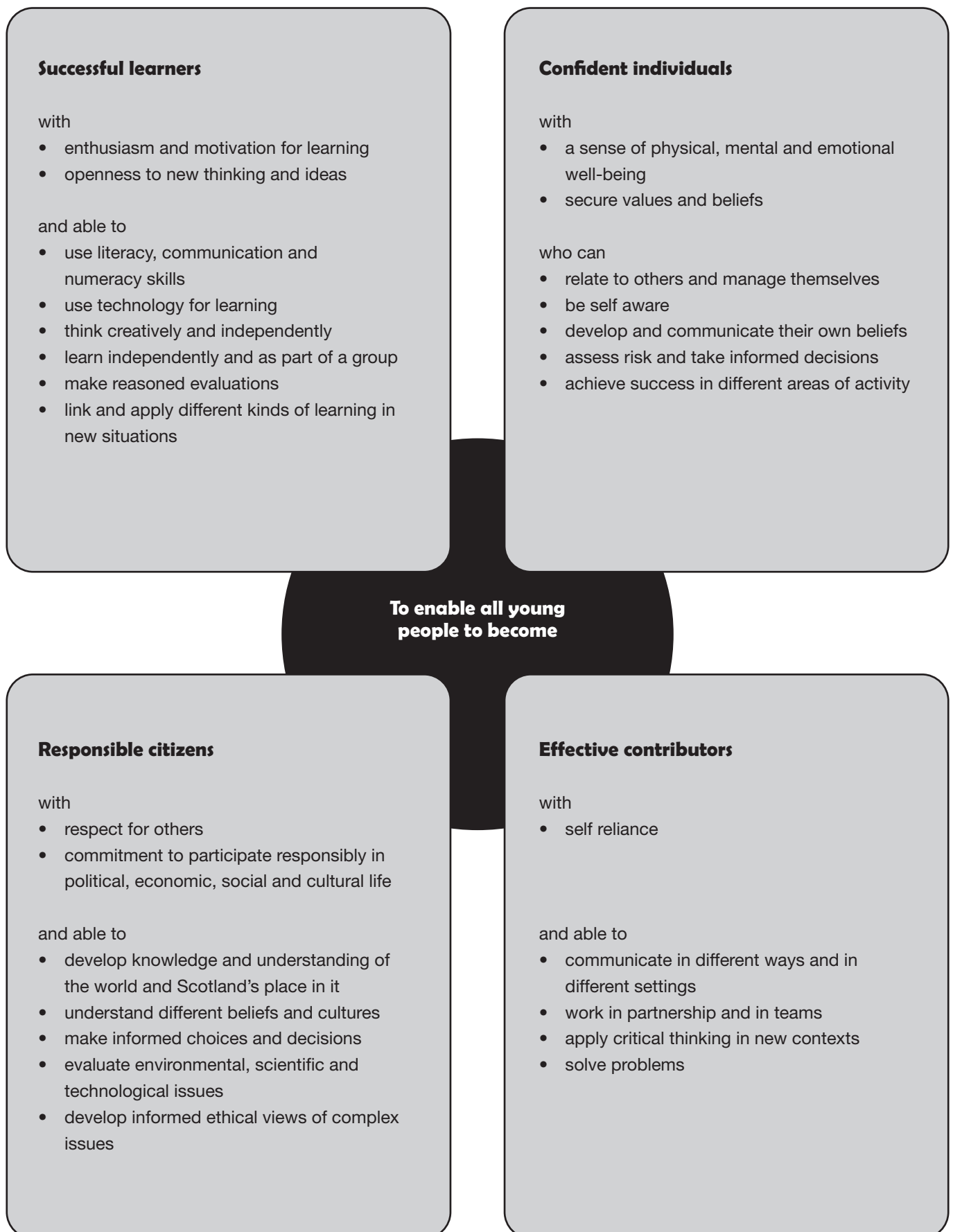
With the movement to Curriculum for Excellence (CfE), the curriculum is less prescriptive, more open to professional judgement and reflection, and involves more interdisciplinary and cross-curricular working, providing learners and staff with 'live' experiences. *Schools Global Footprint* helps achieve all of this.

*Schools Global Footprint* work aligns well with the Purposes of the Curriculum 3-18 as detailed in *A Curriculum for Excellence* (Scottish Executive, 2004). It holds relevance with every aspect of the Purposes 'responsible citizens', 'successful learners', 'confidence individuals' and 'effective contributors' as set out in Diagram 1 (opposite).

"It is one of the prime purposes of education to make our young people aware of the values on which Scottish society is based and so help them to establish their own stances on matters of social justice and personal and collective responsibility. Young people therefore need to learn about and develop these values. The curriculum is an important means through which this personal development should be encouraged." The Curriculum Review Group Report, November 2004, Scottish Executive.

Teachers and learners can reflect on the knowledge, understanding, skills, values and attitudes gained from engaging in *Schools Global Footprint* and will be able to achieve the breadth of coverage necessary for CfE.

**Diagram 1:** How *Schools Global Footprint* work contributes to developing the following capacities in young people



**Diagram 2:** How *Schools Global Footprint* work contributes to the Curriculum for Excellence principles for curriculum design

<b>Challenge and enjoyment</b>	<p><i>Schools Global Footprint:</i></p> <ul style="list-style-type: none"> <li>• addresses real world issues. It focuses on the local but with links to important national and international issues;</li> <li>• provides opportunities for positive action by individuals, groups, whole schools and school clusters;</li> <li>• incorporates experiential learning and requires links to wider communities.</li> </ul>
<b>Breadth</b>	<p><i>Schools Global Footprint:</i></p> <ul style="list-style-type: none"> <li>• lends itself to cross-curricular engagement and interdisciplinary working;</li> <li>• enables young people to make comparisons with other people and places across the globe; as well as through time - past, present and future.</li> </ul>
<b>Progression</b>	<p>Whilst primarily pitched at second and third levels it has meaning for all levels of formal education and beyond, through tertiary and into lifelong learning.</p>
<b>Depth</b>	<p><i>Schools Global Footprint:</i></p> <ul style="list-style-type: none"> <li>• provides opportunities for individual and group exploration of ideas and issues.</li> </ul>
<b>Personalisation and choice</b>	<p><i>Schools Global Footprint:</i></p> <ul style="list-style-type: none"> <li>• provides opportunities for meaningful learner decision-making;</li> <li>• incorporates critical thinking about the place and society in which learners live;</li> <li>• enables them to think about the choices they make and the consequences for the environment and other people.</li> </ul>
<b>Coherence</b>	<p><i>School Globals Footprint:</i> is integrative, involving learning across a number of subjects.</p>
<b>Relevance</b>	<p><i>Schools Global Footprint is:</i></p> <ul style="list-style-type: none"> <li>• relevant to all individuals, now and in the future;</li> <li>• relevant both locally and globally, enabling young people to visualise what this means for the future.</li> </ul>



## Wider links

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Local authorities in Scotland are using Ecological Footprint analysis to inform their policies and practice, aiming to transform the way that people live and work to reduce their environmental impact. (Visit [www.localfootprints.org](http://www.localfootprints.org) for more about this work).

*Schools Global Footprint* complements this process, helping schools to extend their understanding of sustainable development and citizenship, both locally and globally, and helping them to adopt more sustainable practices.

*Schools Global Footprint* work is compatible with work on many other sustainable development education initiatives, including Eco-Schools (see page 11 for more on how it links with Eco-Schools), and with work you may be doing with other sustainability organisations in your area.

## What is *Schools Global Footprint*?

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*Schools Global Footprint* is a resource designed to help your learners examine, measure and reduce their school's Ecological Footprint. It is made up of two main teaching and learning tools which work hand in hand: this handbook for teachers and an online footprint calculator for learners, both found at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)

**For learners:** the online footprint calculator introduces and enables the calculation of their school's Ecological Footprint and Carbon Footprint. The calculator is divided into the six components of an Ecological Footprint; Buildings, Energy, Food, Transport, Waste and Water.

**For teachers:** this handbook of practical teaching and learning ideas and materials; set in a broad global context, introducing and investigating each of the six components that make up an Ecological Footprint, and exploring their interconnections. The understanding of this global interconnectedness lies at the root of sustainable development education – hence the title of this resource being *Schools Global Footprint*.

It is intended that by using this handbook, and the online footprint calculator, your school will be able to draw up an Action Programme which contains actions designed to reduce the size of your school's Ecological Footprint.

# How do I use *Schools Global Footprint*?

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The teaching materials are not prescriptive and there is no linear progression between themes or activities. They provide a selection of ideas to enhance your normal teaching about the themes covered and can be adapted or extended to meet your own particular needs. Several are generic activities that may be transferred across the units.

## **Online Footprint Calculator**

The size of an Ecological Footprint is determined by the amount of resources used and the amount of waste produced. The size of a Carbon Footprint is determined by the amount of carbon dioxide produced. The online footprint calculator measures both.

The online footprint calculator, which is found at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) helps your school to measure its resource use and production of waste for each of the six components of an Ecological Footprint, namely; Buildings, Energy, Food, Transport, Waste and Water.

It does this by:

- encouraging your pupils to explore the resources used by the school and to collect information on the amounts being used per person. Simple calculations are provided to help with gathering this information.
- calculating the size of your school's Ecological Footprint for each component, once the information has been entered.
- calculating the size of your school's Carbon Footprint for each component, once the information has been entered.

You can work on just one of the components at a time, or more than one if you choose.

Once you have the results there are online hints and tips on preparing an Action Plan that will help reduce the size of that component of your Ecological Footprint. It is recommended to use the calculator on a regular basis (at least once per year) to monitor your progress and identify future targets.

## **Teachers' Handbook**

This handbook is divided into three parts.

**Part 1** (the part you are reading now) provides background information on how to use the resources.

**Part 2** comprises seven units, each providing key ideas, background information, activities to support the work of understanding and calculating your school's Ecological Footprint, supporting materials, useful resources and ideas for evaluation.

- The first of these seven units, 'Making Connections', introduces footprinting and emphasises the need to examine the 'big picture' – locally and globally, and to make connections between the six components of an Ecological Footprint.
- The six units that follow explore each of the six components individually.

**Part 3** introduces Action Plans and the Action Programme. By measuring your school's Ecological Footprint you will be in a more informed position to draw the whole school into considering Actions Plans to address one or more of the footprint components, and developing a long term Action Programme to reduce the school's overall Ecological Footprint.

# How does Footprinting relate to Eco-Schools?

*Schools Global Footprint* has been developed in cooperation with Eco-Schools Scotland.

Using the online footprint calculator is a very reliable way of keeping tabs on how well your Eco-Schools work is going. Environmental Review, Action Planning and Monitoring and Evaluation are three of the seven key elements of the Eco-Schools process that measuring your Ecological Footprint can help with.

Footprinting provides you with data regarding your school's impact on the planet that can be incorporated into the Environmental Review process and used when discussing your Action Plan. Your Ecological Footprint can be measured again as part of your Monitoring and Evaluation to see if your actions have succeeded in reducing its size.



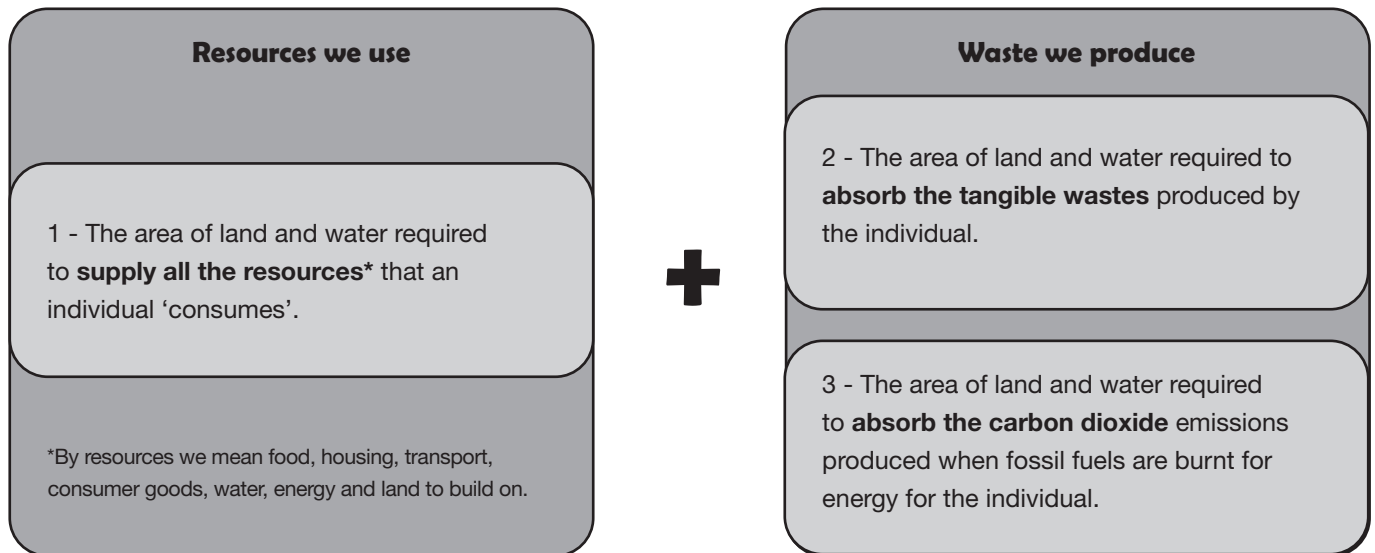
# Ecological Footprint or Carbon Footprint?

Before you begin teaching with *Schools Global Footprint* it is very important that you are clear on the definitions of the different footprint terms you will come across in the resource.

**Schools Global Footprint** – this is the title of the teaching resource. It is not a type of footprint. Issues you will explore by using this resource are global in nature, hence the title *Schools Global Footprint*.

**Ecological Footprint** – this is a type of footprint and it can be measured using the *Schools Global Footprint* online footprint calculator. It tells us how much land and sea our lifestyles depend upon.

The size of an Ecological Footprint is calculated by measuring, per person:



The size of an Ecological Footprint is given in hectares (ha). However, we actually call them global hectares (gha), to reflect the fact that our resources are drawn from land around the world (rice grown in China, beef farmed in Chile, wood from Swedish forests etc.) and that our waste products, particularly carbon dioxide, don't observe national boundaries – i.e. our waste impacts on other parts of the world.

**Carbon Footprint** – this is a type of footprint and it can be measured using the *Schools Global Footprint* online footprint calculator. It is measured in tonnes (or kilogrammes) of carbon dioxide per person. It tells us how much carbon dioxide is released by the fossil fuels that are burnt to give us energy (providing transport, heat and electricity to us directly, but also to make, transport and dispose of all the goods we consume).

The amount of carbon dioxide that we cause to be released has a direct effect on the size of our Ecological Footprint. As shown in box 3 above, carbon dioxide counts as a waste product - the more we produce the more land and sea are needed to reabsorb it. So it

follows that *the bigger our Carbon Footprint, the bigger our Ecological Footprint*. Globally our current carbon dioxide emissions are more than the land and sea can absorb; this is the fundamental reason that more and more of it is building up in the atmosphere and causing the planet to warm up.

By using *Schools Global Footprint* pupils will develop an understanding of the global impact of their consumption and they will gain knowledge of how they can reduce this impact by reducing their consumption.

## Teaching and learning

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The resources bring with them a number of opportunities, possibilities, dilemmas and challenges to teachers. Much of what is presented deals with thinking skills and the developing of informed values and attitudes - dispositions to change, rather than any facts or certainties. This emphasises that the approach, the 'how' it is presented, is as important as the content, or 'what' is being taught, requiring us as teachers to:

- examine our own understandings and values of the world around us, and the issues raised;
- explore our willingness to be participants and learners with the children;
- think about our role as role model, facilitator, questioner and enabler;
- think about the school as role model, and the different management strategies enabling the integration of learning – e.g. work on Eco-Schools and school grounds, School/Learner Council and other school policies e.g. Health Promotion, Energy, Waste, Transport etc;
- examine our own attitudes to change and our willingness to look for alternative solutions, and to address the challenges these may bring.

## Global linking

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*Schools Global Footprint* provides an opportunity for learners to understand and identify with the notion of global equity and the distribution and more even sharing of the planet's natural resources.

The approach to using the online footprint calculator and the supporting materials will be enriched by linking schools together, both within Scotland (urban and rural, east and west, north and south), and with other countries - both in Europe, and across the world.

There are several ways to make the links:

- **Scotland** – school links may be explored through personal connections, through various providers – local Development Education Centres ([www.ideas-forum.org.uk](http://www.ideas-forum.org.uk)), Eco-Schools ([www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org)), environmental organisations with links across Scotland etc, or through approaching different local authority education departments;
- **Europe** – school links may be explored as a member of Eco-Schools ([www.Eco-schools.org](http://www.Eco-schools.org)), which is an international initiative with strong European presence, or through various EU Education initiatives e.g. Comenius ([www.britishcouncil.org/comenius.htm](http://www.britishcouncil.org/comenius.htm));

- **Global** – there may be family links within the school that may provide school connections abroad. Links within the Commonwealth are advantageous, since English is widely spoken and often the official language used for education. Obtaining contacts for link schools can be obtained through The British Council – visit this website and go to Teaching and School Links ([www.britishcouncil.org/learning.htm](http://www.britishcouncil.org/learning.htm)). Funding for links, enabling teachers to visit, may be available. e.g. the League for the Exchange of Commonwealth Teachers ([www.lect.org.uk](http://www.lect.org.uk)) has some funding available. Also look at the Global Gateway website ([www.globalgateway.org.uk](http://www.globalgateway.org.uk)).

## Fieldwork and first hand experience

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There is no substitute for learners experiencing the world around them first hand. There are many opportunities for experiencing the world locally – study visits to the supermarket, landfill site or power station, and for field survey and research – school grounds, land use and habitat, questionnaires – applying the theory and practice learnt in the classroom to the real world, and seeing how it fits.

## Terminology

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There are many ways of ‘dividing up’ the globe. Each set of terms reflects certain values and assumptions. In this resource we have adopted the terms North and South that came into more widespread use in the 1980s. This was as a reaction to the terms ‘developed/ developing/ less developed’ where the latter two descriptions were considered offensive, in contrast to developed – which was associated with positive qualities like advanced, civilised and maturity. First (Western industrialised), Second (Communist) and Third (the rest) World are terms used since the 1950s, but Third’ in this case became associated with third rate and inferior, rather than the initial understanding which was seeking a ‘third way’. The debate continues and ‘majority world’ is another term gaining currency – emphasising the greater area and population of Africa, Asia and South America. It is your choice which terminology you wish to adopt.

## Acknowledgements

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The activities have drawn from a wide variety of existing materials from a similarly broad range of providers, and we acknowledge the goodwill of these providers in allowing the ideas to be adapted and/or aired in a different context.

# Curriculum links

## Unit 1 – Making Connections

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity one: Treading lightly on the planet

Planet Earth is a finite resource and human consumption in the industrialised world, at present rates, is not sustainable.

Humans are part of global, natural ecosystems, not apart from them.

Many everyday actions have impacts on people in other places around the world.

The Ecological Footprint is a tool that answers the most basic question for sustainable development 'How much nature do we have, compared with how much we use?', but it cannot tell us what to do.

Sharing circle – imagine a glass dome coming down over the school – how long would we survive?

Brainstorm what they use, and how they impact on natural world. Create footprints and record.

Introduce concept of Ecological Footprint.

Consider those people with larger/smaller Ecological Footprints around the world – record countries on large/small footprints.

Investigate the benefits & footprints of native animals in Scotland and impacts of humans on natural heritage.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Social Studies** – *People in society, economy and business* – SOC 19 compare countries, interdependence.

**Sciences** – *Planet Earth* SCN 01 Biodiversity and Interdependence – habitats and species, human impacts.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**RME** – *Development of Beliefs and Values* RME 08 awareness and understanding of own beliefs and values.

**Responsible citizens**

Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

**Effective contributors**

Communicate in different ways.

**Confident individuals**

**Successful learners**

Use literacy, communication and numeracy skills.

Citizenship.

Sustainable Development.

### Activity two: Footprints across the planet

There are global inequalities and injustices in the sharing and use of natural resources.

Individuals have choices, influences and powers to bring about change at local, national and global levels; not everyone has this opportunity.

The Ecological Footprint provides accurate information allowing us to make informed lifestyle choices; improve as local and global citizens and monitor our progress.

Read what an Ecological Footprint is on the website.

Look at Scotland's residents' Ecological Footprint and its components.

Measure out 100m x 100m square – 1 hectare – imagine area 5 x size and how it would look.

Consider how it compares with our 'Fair share'. What that means for the planet.

Look at footprints from different countries, find them on an atlas map – draw graphs – compare, analyse and interpret.

Consider how we can reduce our footprint.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data *Number Money and Measure* MNU 11 Measurement – using measuring wheels/tapes.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources; SOC 13 Compare local area with a contrasting area; SOC 14 Use a range of maps.

**Health and Wellbeing** *Social Wellbeing* Self Awareness Interdependence.

**Responsible citizens**

Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**

Solve problems.

**Confident individuals**

**Successful learners**

Use technology for learning Learn independently and as part of a group.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 1 – Making Connections *continued*

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity three: Consuming passions

Planet Earth is a finite resource and human consumption in the industrialised world, at present rates, is not sustainable.

Individuals have choices, influences and powers to bring about change at local, national and global levels; not everyone has this opportunity.

Keep a record of what 'needs' have been flagged up at home. Compare.

Read out statement on consumerism. What do they think.

Give out envelopes with statement cards mixed up. Complete activity sheet. Consider class results.

Consider the meaning for the way we consume things and for the natural environment.

**Social Studies** – *People in Society, economy and business* SOC 16 needs and wants, inequality; SOC 17 rights and responsibilities; SOC 19 interdependence of countries.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**RME** – *World Religions Selected* – RME 05 share views, understanding of moral values, consider moral dilemmas *Development of Beliefs and Values* RME 08 awareness and understanding of own beliefs.

**Health and Wellbeing**  
*Social Wellbeing* Self Awareness Interdependence.

**Responsible citizens**

Make informed choices and decisions  
Develop informed ethical views of complex issues.

**Effective contributors**  
Apply critical thinking in new contexts.

**Confident individuals**

**Successful learners**  
Make reasoned evaluations.

Citizenship.

Sustainable Development.

### Activity four: Connection inspection

The Ecological Footprint is a tool that answers the most basic question for sustainable development 'How much nature do we have, compared with how much we use?', but it cannot tell us what to do.

The Ecological Footprint provides accurate information allowing us to make informed lifestyle choices; improve as local and global citizens, and monitor our progress.

Sharing circle – consider connections between any footprint component and other components.

Complete Activity Sheet.

Reflect on what this means in terms of individual choices and societal choices to reduce footprints.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**Health and Wellbeing** – *Social Wellbeing* – HW09 Rights and responsibilities.

**Social Studies** – *People in society, economy and business* – SOC 15 Use and interpret evidence, present an informed view; *People, Place and environment* SOC 09 impacts of transport, agriculture on sustainable systems.

**Sciences** – *Planet Earth* SCN 01 Biodiversity and Interdependence – habitats and species, human impacts; Energy sources and sustainability SCN04.

**Responsible citizens**

Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Apply critical thinking in new contexts.

Solve problems.

**Confident individuals**

Take informed decisions.

**Successful learners**  
Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development.

### Activity five: Making connections

There are global inequalities and injustices in the sharing and use of natural resources.

Individuals have choices, influences and powers to bring about change at local, national and global levels; not everyone has this opportunity.

Explain Routefinder as a tool.

In groups chose a development/global issue of concern and analyse using the Routefinder.

Sharing Circle – reflect on what learners have learnt about interdependence and issues.

As a class select one issue. Give out cards/pair and ask to look at issue from perspective given on card.

Sharing circle – each pair give 2 reasons for their perspective. How does this reflect on the issue? What have they learnt, further comments/ideas.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact (implications for humans).

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Health and Wellbeing** – *Social Wellbeing* – HW09 Rights and responsibilities.

**Social Studies** – *People in society, economy and business* – SOC 19 compare countries, interdependence, power.

**Responsible citizens**

Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Apply critical thinking in new contexts. Work in partnership and in teams.

**Confident individuals**  
Develop and communicate their own beliefs.

**Successful learners**  
Make reasoned evaluations.

Citizenship.

Sustainable Development.



# Curriculum links

## Unit 1 – Making Connections *continued*

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity six: What makes a good global citizen

There are increasing efforts by people around the world working towards more equitable and sustainable development.

Responsible citizens learn from and work with others to improve things at a local/global level.

Brainstorm characteristics of a good local citizen, and then a global citizen.

Use questionnaire to find out how they feel about themselves.

**Social Studies** – *People in Society, economy and business* SOC 15 present an informed view, SOC 16 needs and wants, inequality; SOC 17 rights and responsibilities; SOC 19 interdependence of countries.

**RME** – *Development of Beliefs and Values* RME 08 awareness and understanding of own beliefs.

**Responsible citizens**

Commitment to participate responsibly in political, economic, social and cultural life.

**Effective contributors**

**Confident individuals**

Develop and communicate their own beliefs.

**Successful learners**

Think creatively and independently.

Citizenship.

Sustainable Development.

### Activity seven: Futures

Planet Earth is a finite resource and human consumption in the industrialised world, at present rates, is not sustainable.

There are increasing efforts by people around the world working towards more equitable and sustainable development.

Responsible citizens learn from and work with others to improve things at a local/global level.

Brainstorm some examples of how they feel about the school buildings and grounds now, what changes they might like and why; what is likely to happen.

Complete Futures Survey activity sheet.

Sharing circle – what they have written down and learnt, consider what can be their contribution, and the barriers to change and better futures.

**Social Studies** – *People Place and Environment* SOC 08 impact of human activity, informed suggestions, sustainability. *People in Society, economy and business* SOC 15, use evidence, present an informed view SOC 16 needs and wants, inequality SOC 17 rights and responsibilities, choices SOC 19 interdependence of countries.

**Sciences** – *Planet Earth* SC 01 Biodiversity and Interdependence understanding positive and negative effects of humans on environment.

**Literacy and English** – *Listening and Talking, Writing.*

**Responsible citizens**

Make informed choices and decisions.

Evaluate environmental, scientific and technological issues.

**Effective contributors**

Solve problems.

**Confident individuals**

Develop and communicate their own beliefs.

**Successful learners**

Learn independently and as part of a group.

Make reasoned evaluations.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 2 – Buildings and place

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's buildings footprint

Technology can provide solutions in reducing the impact on the environment of our buildings – their construction and maintenance – if appropriate materials and designs are used.

Brainstorm how the use of materials in the Schools buildings and grounds affects its global footprint.

Use plans to work out the amount of floor space (m<sup>2</sup>) taken up by the school.

Enter the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the buildings footprint.

Develop an Action Plan to improve the Buildings and Grounds.

**Social Studies** – *People, Place and Environment SOC 08* environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Technologies** – *ICT to enhance learning TCH 04*.

**Numeracy and Mathematics** – *Information handling MNU 20* Data and Analysis, evaluate and interpret data; *MNU 21* display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Building sense

A sense of place contributes to a sense of belonging to a place or community.

Buildings and landscapes provide local distinctiveness and project messages about the people who live in, work in or design them.

Technology can provide solutions in reducing the impact on the environment of our buildings – their construction and maintenance – if appropriate materials and designs are used.

Brainstorm what might contribute to the buildings component of the school's Footprint. Look at the calculator ([www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)) for information about the embodied energy represented by different building materials and designs.

Introduce the two stories in the *Wall to Wall* design pack

- the Maasai
- the Hockerton community

Comparing needs, design and structures, materials, fitness for purpose, impacts and sustainability.

In small groups, set task of developing plan/model design for a new build School with a small global footprint.

**Social Studies** – *People, Place and Environment SOC 08* environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Technologies** – *Technological developments in society TCH 01* link between scientific and technological developments; *TCH 02* how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment.

*Contexts for developing technological skills and knowledge TCH 13* Plan, develop, organise production of items. *ICT to enhance learning TCH 04*.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information

**Numeracy and Mathematics** – *Information handling MNU 20* Data and Analysis, evaluate and interpret data; *MNU 21* display data.

**Expressive Arts** – *Art and Design EXA 06* solution to a design problem.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

Understand different beliefs and cultures.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**  
Assess risk and take informed decisions.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Think creatively and independently.

Sustainable Development.

Citizenship.

Enterprise.

Creativity.

International Education.

# Curriculum links

## Unit 2 – Buildings and place continued

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity three: Special places

A sense of place contributes to a sense of belonging to a place or community.

Buildings and landscapes project messages about the people who live in, work in or design them.

Ask whether they have special places, and what's special about them, how they make them feel. Draw their special place. Go outdoors and share what they put in and left out. Work on a mental map in and around school grounds – focus on landmarks, areas & paths. Share maps and explanations.

Options to look back to past, or to look at the impact of choices made on footprint, before calculation.

**Expressive Arts – Art & Design**  
EX 05 – Express and communicate ideas, thoughts and feelings through art and design.

**Responsible citizens**  
Develop informed ethical views of complex issues.

**Effective contributors**  
Solve problems.

Communicate in different ways and in different settings.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Think creatively and independently.

Creativity.

Sustainable Development.

Citizenship.

### Activity four: Sense of place

A sense of place contributes to a sense of belonging to a place or community.

Buildings and landscapes project messages about the people who live in, work in, or design them.

Relaxation activity to encourage later focus.

Sensory walk, like an Earth Walk, and sharing circle exploring feelings and what gives sense of place.

OR

Circle time exploring feelings about school environment – silent changing places; sentence completion; open discussion; look to the future – identify some changes.

**Social Studies – People, Place and Environment** SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Technologies – Technological developments in society** TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment.

**Literacy and English – Listening and Talking.**

**Health and Wellbeing** *Mental, emotional, social and physical wellbeing* HWB01, HWB06, HWB 13.

**Responsible citizens**  
Develop knowledge and understanding of the world and Scotland's place in it.

**Effective contributors**  
Communicate in different ways and in different settings.

**Confident individuals**  
A sense of physical, mental and emotional well-being.

**Successful learners**  
Use literacy, communication and numeracy skills.

Think creatively and independently.

Creativity.

Sustainable Development.

Citizenship.

### Activity five: Sharing our space

The way our school buildings and grounds are managed and used reflects the ethos of the whole school, and promotes active learning and positive behaviour.

Developing school grounds are a valuable means of practising skills in sustainable living, and raising both the biodiversity value and bio-capacity of our local environment.

Ask – who else shares this space with us? Carry out an ecological survey of the school grounds – identify habitats and species. Report back and establish database, for updating annually.

Consider ways of improving biodiversity and bio-capacity of the school grounds. Explore how people feel about conservation – ranking exercise.

Explain links to ideas of sustainable living and foot-printing. If thought a good idea - invite others to provide ideas and advice – look at the local area and/or school grounds; find out about Local Biodiversity Action Plans and present posters on local habitat/species conservation.

**Sciences – Planet Earth** SCN 01 Biodiversity and Interdependence – habitats and species, human impacts SCN 02 interactions between plants and animals.

**Social Studies – People, Place and Environment** SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans .

**Literacy and English – Listening and Talking.** Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Responsible citizens**  
Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Communicate in different ways.

Work in partnership and in teams

**Confident individuals**  
Develop and communicate their own beliefs.

**Successful learners**  
Use literacy, communication and numeracy skills.

Citizenship.

Sustainable Development.

Enterprise.

# Curriculum links

## Unit 3 – Energy

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's energy footprint

The choices we make to support our lifestyle - consume heat, light and power, the efficiency of the appliances we use, and to insulate our buildings -make a difference to the size of our Ecological Footprint.

Brainstorm how the school's energy use affects its global footprint.

Find out what types of energy the school uses. Find the kilowatt hours (kWh) used from the school's last four energy bills. Calculate how much of each energy type is used per learner in a school year.

Put the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the energy footprint.

Develop an Action Plan to reduce the school's energy footprint. Measure the energy footprint again when actions have been completed.

**Sciences** – *Planet Earth Energy sources and sustainability* SCN 04 energy resources renewable/non-renewable.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Home truths

The choices we make to support our lifestyle - consume heat, light and power, the efficiency of the appliances we use, and to insulate our buildings -make a difference to the size of our Ecological Footprint.

Energy is easily wasted but also conserved.

Brainstorm what things we use most energy for in Council area/Scotland. Look at footprint data and compare with what they thought. Demonstrate an area of 1 hectare.

Look at school's energy footprint and ways to reduce it. Carry out a home survey and look at measures for energy conservation at home/school. Design an Energy Efficient house.

Reflect on how their lifestyles depend on 'flicking a switch'; write an account of a day/week in my life with a power cut. Adopt an energy conservation habit.

Research ways people without reliable electricity adapt their lifestyles – link school.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage, implications for humans.

**Sciences** – *Planet Earth Energy sources and sustainability* SCN 04 energy resources renewable/non-renewable.

**Technologies** – *Technological developments in society* TCH 02 renewable and sustainable energy *Contexts for developing technological skills and knowledge* TCH 13 Plan, develop, organise production of items *ICT to enhance learning* TCH 04.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Expressive Arts** – *Art and Design* EXA 06 solution to a design problem.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Health and Wellbeing** – *Mental, emotional, social and physical wellbeing* HWB01, HWB06, HWB 13.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

Develop informed ethical views of complex issues.

**Effective contributors**  
Work in partnership and in teams.

Solve problems.

**Confident individuals**  
Assess risk and take informed decisions.

Develop and communicate their own beliefs.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Make reasoned evaluations.

Citizenship.

Sustainable Development.

Creativity.

# Curriculum links

## Unit 3 – Energy continued

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity three: Chain reaction

Few problems can be described in terms of a simple, linear cause and effect model. Most problems are complex webs.

People have different ideas about problems and how to solve them; such diversity should be acknowledged and may be useful in coming to realistic and informed decisions/solutions.

Select an issue/problem related to energy at home/school.

Demonstrate simple linear cause and effect analysis diagram, then work in small groups to expand, into complex web.

Draw out key learning points.

**Sciences** – *Planet Earth Energy sources and sustainability* SCN 04 energy resources renewable/non-renewable.

**Technologies** – *Contexts for developing technological skills and knowledge* TCH 13 Plan, develop, organise production of items.

**Expressive Arts** – *Art & Design* EX 05 – Express and communicate ideas, thoughts and feelings through art and design.

**Responsible citizens**  
Develop informed ethical views of complex issues.

**Effective contributors**  
Solve problems.

Communicate in different ways and in different settings.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Think creatively and independently.

Citizenship.

Sustainable Development.

Creativity.

### Activity four: Alternative choices

Energy production and consumption embraces many environmental, economic and social issues, from the local to the global; no source of energy can provide electricity without having an environmental impact.

Technology, wise decision-making by government and business can lessen our global footprint.

Organise, plan, carry out and report on a research findings, investigating alternative sources of energy, their advantages and disadvantages; forces affecting adoption and impact on global footprint.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage, implications for humans.

**Sciences** – *Planet Earth Energy sources and sustainability* SCN 04 energy resources renewable/non-renewable.

**Technologies** – *Technological developments in society* TCH 02 renewable and sustainable energy *Contexts for developing technological skills and knowledge* TCH 13 Plan, develop, organise production of items *ICT to enhance learning* TCH 04.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

Develop informed ethical views of complex issues.

**Effective contributors**  
Solve problems.

Apply critical thinking in new contexts.

**Confident individuals**  
Develop and communicate their own beliefs

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Make reasoned evaluations.

Use literacy, communication and numeracy skills.

Citizenship.

Sustainable Development.

Enterprise.

# Curriculum links

## Unit 4 – Food

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's food footprint

Food costs are found along the chain from 'cradle to grave' – these may have environmental, social and/or economic impacts, at local and global levels.

Brainstorm the ways that the school's consumption of food affects its global footprint.

Work with the school canteen or your local Council to find out the amount and type of food eaten in the school canteen in one week. Calculate what this means for each food type per learner in a school year. Enter the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the school's food footprint.

Develop an Action Plan to reduce the school's food footprint. Measure the footprint again when actions have been completed.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Health and Wellbeing** – *Food and health* HWB 35 journeys foods make from source to consumer.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Food footprints

Food costs are found along the chain from 'cradle to grave' – these may have environmental, social and/or economic impacts, at local and global levels.

Our purchasing preferences can make an impact locally and globally – on the health and well-being of people and the natural heritage.

Look at Activity Sheet to see how much the food footprint contributes to the total.

In groups, analyse school dinners – raw materials, processing, transport from source to waste. Design and /or complete summary chart.

Investigate options for reducing food footprint using [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)

Sharing circle – what they have found out, what links between food footprint and other global footprint components.

Investigate associated issues - fair trade/equity – using 'Picking Fruit' activity/Global Express Issue 38 look at the story of the Bacon, Lettuce and Tomato sandwich, have a debate.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans, SOC 09 agriculture and sustainability, SOC 11 natural resources and international power;

**Social Studies** – *People in Society, economy and business* SOC 16 needs and wants, inequality; SOC 20 ethical trading, globalisation.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Health and Wellbeing** – *Food and health* HWB 30, HWB 31, HWB 34, HWB 35, HWB 36, HWB 37.

**Responsible citizens**  
Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Solve problems.

Apply critical thinking.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Citizenship.

International Education.

Sustainable Development.

# Curriculum links

## Unit 4 – Food continued

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity three: All in a cup of coffee

Food (energy and materials) costs are found along the chain from 'cradle to grave' – these may have social, environmental, and /or economic impacts, at local and global levels.

Our purchasing preferences continually impact, locally and globally – on the health and well-being of people and the natural heritage.

How major issues such as poverty, consumption, development, health and loss of species are inter-related.

Question: What has to happen to make a cup of coffee? List actions. Give cards out.

Ask 4 with expected actions to place their cards down. Ask the rest to place theirs in relevant places. Explain as necessary.

Ask what's missing – prompt as necessary – place down Coffee Sales card and discuss.

What if you add milk? Place milk card down and discuss.

Look at pattern of cards – linear/cluster – link to joined up thinking in problem solving. Introduce idea of systems – inputs, throughputs & outputs (optional).

Circle time – what have they learnt, how does this reflect on Ecological Footprints, ways of thinking and informed decision-making, anything else they wish to raise.

**Literacy and English** – *Listening and Talking*.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans, SOC 09 agriculture and sustainability, SOC 11 natural resources and international power.

**Social Studies** – *People in Society, economy and business* SOC 16 needs and wants, inequality;

**Health and Wellbeing** – *Food and health* HWB 35 journeys foods make from source to consumer.

**Sciences** – *Planet Earth* SCN 01 Biodiversity and Interdependence – habitats and species, human impacts.

**Responsible citizens**

Make informed choices and decisions.

Develop informed ethical views of complex issues.

**Effective contributors**

Solve problems.

Work in partnership and in teams.

**Confident individuals**

Relate to others and manage themselves.

**Successful learners**

Make reasoned evaluations.

Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development.

Enterprise.

### Activity four: Food chains

Energy is lost as it passes through each level of the food chain/pyramid.

It is healthier for planet Earth that we eat lower down the food pyramid/chain; we all have a share in being responsible for the health of the planet Earth.

We are what we eat, and only we are responsible for our own health, by choosing what we eat.

Brainstorm any food not originating from the sun.

Read the statement on Activity Sheet. Introduce the Food Chain relay race. Volunteer – sun, plants, cow, judges. Explain rules.

Set race off, watch progress, stop race look at what's happening with everyone. Complete race. Complete Activity Sheets. Share examples.

**Sciences** – *Planet Earth* SCN 01 Biodiversity and Interdependence – habitats and species, human impacts SCN 02 food chains and webs, why plants are vital to sustain life on Earth.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources ways to manage impact, implications for humans.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Expressive Arts** – *Art and design* EXA 02 experiment with a range of media and technologies.

**Health and Wellbeing** – *Food and health* HWB 34 issues that affect food choice.

**Responsible citizens**

Develop knowledge and understanding of the world and Scotland's place in it.

Make informed choices and decisions.

**Effective contributors**

Work in partnership and in teams.

**Confident individuals**

Relate to others and manage themselves.

**Successful learners**

Use literacy, communication and numeracy skills.

Citizenship.

Sustainable Development.

Creativity.

# Curriculum links

## Unit 5 – Transport

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's transport footprint

Transport and travel represent a large proportion of our Ecological Footprint today.

Brainstorm how the ways that people travel to school affects the *Schools Global Footprint*.

Ask learners (and staff) to keep a travel-to-school diary for a week with the distance in kilometres between their home and the school and how they travelled each day. Calculate what this means for each transport type per learner/person in a school year.

Enter the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the transport footprint.

Develop an Action Plan to reduce the school's transport footprint. Measure the transport footprint again when actions have been completed.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity, SOC 09 Transport.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Cars are cool

Transport and travel represent a large proportion of our Ecological Footprint today.

There are lots of other ways to get around – each one with differing environmental, economic and social costs, local and global?

Car companies, advertisers and the media play an important role in shaping public opinion and influencing people's behaviour.

Who thinks cars are cool? Which cars and why? Make a survey of family car and bike ownership in class, look at individual school transport footprint diary scores. Draw class graph and interpret.

Use 'car jigsaws' to split into small groups. Look at adverts and identify image being promoted – match prompt cards; open and hidden messages of people/environment.

Share opinions within & between groups – effect on people's attitudes, values & behaviour.

Circle time – share what they have learnt, how they feel about transport now; where are the links with other components of footprint.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**Technologies** – *Technological developments in society* TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment  
*ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data  
*People, Place and Environment* SOC 08 environmental impact of human activity SOC 09 advantages and disadvantages of transport forms, sustainable transport systems.

**Social Studies** – *People in society, economy and business* - SOC 15 interpret evidence, present informed view, SOC 17. Choices and decisions, role of media.

**Responsible citizens**  
Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Solve problems.

Communicate in different ways and in different settings.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Learn independently and as part of a group.

Think creatively and independently.

Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development.



# Curriculum links

## Unit 5 – Transport continued

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity three: Planning for real: Chewburgh

There are lots of other ways to get around – each one with differing environmental, economic and social costs, local and global.

Supporting sustainable transport means taking informed, realistic choices now, and getting involved in raising awareness of the actions required for the future.

In teams of 4, give out the Traffic Game Team Booklets. Complete a study, or the worksheet, on traffic near the school.

In teams, co-operatively construct road layout and 3D models of buildings from the nets supplied.

Read/Listen to the info. about Chewburgh from the Traffic Game team booklet.

Allow 20 minutes to design and layout Chewburgh – Route Planning and Traffic Problems.

Share designs and introduce other issues; make minor changes to design.

Colour and stick buildings down as final design for display.

Circle time – share what they have learnt, how they feel about town planning.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**Numeracy and Mathematics** – *Shape, position and movement* MTH 16, MTH 17.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity, SOC 09 Transport, SOC 10 interactions between humans and environment SOC 13 landscapes and human activity.

**Social Studies** – *People in Society, economy and business* SOC 16 needs and wants, inequality, SOC 17 rights and responsibilities.

**Technologies** – *Technological developments in society* TCH 01 link between scientific and technological developments; TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment *Contexts for developing technological skills and knowledge* TCH 14 construct models.

**Responsible citizens**  
Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Apply critical thinking in new contexts.

Solve problems.

**Confident individuals**  
Take informed decisions.

**Successful learners**  
Use literacy, communication and numeracy skills.

Link and apply different kinds of learning in new situations.

Use technology for learning.

Make reasoned evaluations.

Citizenship.

Sustainable Development.

Creativity.

### Activity four: Buying a car

The car is the most convenient form of transport for most people, and there are many pressures on us to buy one.

The car as a status symbol, reflecting an individual's success and standard of living, does not necessarily also reflect their quality of life.

Supporting sustainable transport means taking informed, realistic choices now, and getting involved in raising awareness of the actions required for the future.

Groups discuss what influences choices when buying a car.

Groups develop spider diagrams of environmental (& social/economic) impacts of cars.

Groups select a role character card – mime/create cardboard cut outs to get into character. List factors/characters of the people influencing new car they might buy.

Highlight factors with direct/indirect ecological impact.

Use information from software to design a spreadsheet/database – summarise and compare footprint of selection of cars.

Compare footprint value of different models given.

Compare values of all models chosen – analyse and discuss.

What are the alternatives for reducing the environmental effects of cars – explore ways by schools/government/cities.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**Expressive Arts** – *Drama* EXA 12 create character through voice, movement, language.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Health and Wellbeing** – *Mental and emotional wellbeing* HWB 01 *Social Wellbeing* rights and responsibilities, positive change.

**Responsible citizens**  
Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Apply critical thinking in new contexts.

Solve problems.

**Confident individuals**  
Take informed decisions.

**Successful learners**  
Use literacy, communication and numeracy skills.

Use technology for learning.

Make reasoned evaluations.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 5 – Transport continued

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity five: Alternative choices

Transport and travel represent a large proportion of our Ecological Footprint today.

There are lots of ways to get around – each one with differing environmental, economic and social costs, local and global.

Supporting sustainable transport means taking informed, realistic choices now, and getting involved in raising awareness of the actions required for the future.

Look at Activity Sheet MC3 chart of Scottish residents' Ecological Footprint – analyse & interpret.

Look at the table in [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) that compares the Ecological Footprint, and costs for different transport modes, over 10km distance. Select most sustainable transport mode over different distances 1-500 km.

Brainstorm what other factors affect people making a sustainable choice about the transport they use.

In small groups, use the *Issues Wheel*, or *Local/global question time (Get Global! pp 25-27)* to investigate and identify how transport footprint (or car use) is connected to sustainable development and/or the global transport footprint.

Share their charts and findings and discuss. Could lead on to developing spider diagrams/mind maps making the connections e.g. Activity Sheets GP1 and GP2.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity, SOC 09 Transport, SOC 10 interactions between humans and environment SOC 13 landscapes and human activity.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, *Reading and Writing*, organising and using information.

**Numeracy and Mathematics** – *Number* MNU 07 % values *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Technologies** – *ICT to enhance learning* TCH 04.

**Health and Wellbeing** – *Mental, emotional, social and physical wellbeing* HWB01, HWB06, HWB 13.

**Responsible citizens**

Develop informed ethical views of complex issues.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

Understand different beliefs and cultures.

**Effective contributors**

Apply critical thinking in new contexts.

Solve problems.

Communicate in different ways and in different settings.

Work in partnership and in teams.

**Confident individuals**

Take informed decisions

**Successful learners**

Use literacy, communication and numeracy skills.

Use technology for learning.

Make reasoned evaluations.

Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 6 – Waste

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's waste footprint

Materials and waste make up a large component of the Scottish resident's footprint.

There is a limit to how much we can use the planet Earth as a waste disposal unit at current rates – it is a closed system.

Brainstorm the ways that the school's production of waste affects its global footprint.

Find out the amount of waste the school (or class) produces in one day or week and how it is disposed of. Calculate what this means for each type of waste per learner in a school year.

Put the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the waste footprint.

Develop an Action Plan to reduce the school's waste footprint. Measure the waste footprint again when actions have been completed.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Waste around the world

Materials and waste make up a large component of the Scottish resident's footprint.

There is a limit to how much we can use the planet Earth as a waste disposal unit at current rates – it is a closed system.

Whether something represents waste or riches depends on our cultural and social values and attitudes and economic situation; often as a consequence of whether you live in a Northern or Southern country.

Look at Activity Sheet with variety of data on waste footprints.

Discuss ways in which data may be presented as a graph. Advantages of graphs and different types – bar, pie, line. Construct graphs by hand/ on computer. Analyse and interpret issues they raise. Present display.

Consider differences between Northern and Southern countries and why this may be. Consider stereotype images and sources. Look at case studies related to waste issues in other parts of the world – link school, resource packs, other sources.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity.

*People in Society, economy and business* SOC 15, use evidence, present an informed view SOC 16 needs and wants, inequality SOC 17 rights and responsibilities, choices SOC 19 interdependence of countries.

**Technologies** – *Technological developments in society* TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

Understand different beliefs and cultures.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

Apply critical thinking in new contexts.

**Confident individuals**  
Assess risk and take informed decisions.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Think creatively and independently.

Sustainable Development.

Citizenship.

International Education.

# Curriculum links

## Unit 6 – Waste continued

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity three: Takeaway, throwaway

The true cost of a product and the packaging should be calculated from 'cradle to grave' – the 'hidden costs' revealed may be environmental, social and/or economic, and impact at local and global levels.

Reducing our consumption, and the amount of waste we produce, is the most effective and efficient way to achieve a sustainable lifestyle, but difficult to achieve on a national scale.

How increasing efforts by people around the world are working towards more sustainable development – governments, business, industry, communities and individuals – and reducing their waste footprints.

Each group given carrier bag full of items and measuring scales to investigate packaging and its hidden costs. Discuss meaning and examples of 'hidden costs'.

Use Activity Sheets for recording and Energy Costs Table. Weigh items with and without packaging. Record weights and make calculations. Rank items with largest/smallest footprints.

Make a list of 10 newest purchases at home and their packaging. Collect and discuss adverts/products promoting over packaging.

Look at school's Ecological Footprint in relation to waste. Use information on [www.LTScotland.schoolsglobalfootprint](http://www.LTScotland.schoolsglobalfootprint) to explore effects of different purchasing choices to reduce amount of packaging.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity.

**Technologies** – *Technological developments in society* TCH 01 link between scientific and technological developments; TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment. *Contexts for developing technological skills and knowledge* TCH 13 Plan, develop, organise production of items.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Technologies** – TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment. *ICT to enhance learning* TCH 04

**Health and Wellbeing** – *Food and health* HWB 34 issues that affect food choice HWB 35 food sustainability.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Think creatively and independently.

Make reasoned evaluations.

Use literacy, communication and numeracy skills.

Sustainable Development.

Citizenship.

International Education.

### Activity four: Throwaway world

There is a limit to how much we can use the planet Earth as a waste disposal unit at current rates – it is a closed system.

Reducing our consumption, and the amount of waste we produce, is the most effective and efficient way to achieve a sustainable lifestyle, but difficult to achieve on a national scale.

How increasing efforts by people around the world are working towards more sustainable development – governments, business, industry, communities and individuals – and reducing their waste footprints.

Arrival of letter with a number of full rubbish bags. Read letter out – invited to solve riddle to reveal a lost truth.

Items with tasks – find out energy wasted in production; envelope with plant/animal pictures with task - find out habitats needed and problems human waste has caused them. Share findings.

What can we do about it? Discuss 3/5Rs and carry out a ranking exercise, using Activity Sheet and statement cards.

Answer to the riddle – the planet EARTH is in trouble, people have forgotten it is not inexhaustible. Hold up globe to reinforce message.

Draw a cartoon/poster, or write a poem to reflect how planet Earth has been treated and what we can do about it.

Lead on to calculate the *Schools Global Footprint* for waste and trying to reduce it.

**Sciences** – *Planet Earth* SCN 01 Biodiversity and Interdependence – habitats and species, human impacts SCN 02 food chains and webs, why plants are vital to sustain life on Earth.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Expressive Arts** – *Art and design* EXA 02 experiment with a range of media and technologies.

**Technologies** – TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment. *ICT to enhance learning* TCH 04

**Responsible citizens**  
Make informed choices and decisions.

Develop informed ethical views of complex issues.

Develop knowledge and understanding of the world and Scotland's place in it.

**Effective contributors**  
Apply critical thinking in new contexts.

Communicate in different ways and in different settings.

Work in partnership and in teams.

Solve problems.

**Confident individuals**  
Be self aware.

Develop and communicate their own beliefs.

**Successful learners**  
Make reasoned evaluations.

Use literacy, communication and numeracy skills.

Use technology for learning.

Sustainable Development.

Citizenship.

Creativity.

# Curriculum links

## Unit 6 – Waste continued

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity five: Alternative choices

Whether something represents waste or riches depends on our cultural and social values and attitudes and economic situation.

Reducing our consumption, and the amount of waste we produce, is the most effective and efficient way to achieve a sustainable lifestyle, but difficult to achieve on a national scale.

How increasing efforts by people around the world are working towards more sustainable development – governments, business, industry, communities and individuals – and reducing their waste footprints.

A choice of 3 different types of investigation leading towards an Action Programme.

What does school's Ecological Waste footprint look like – analyse school's consumption and waste and identify ways to reduce and encourage others to help.

Who does what with waste – investigate all the local/government players concerned by/with consumption, waste minimisation & disposal.

What are the alternative technologies and benefits/costs to implement against landfill – use internet/resources/local contacts to investigate/visit the alternatives.

**Social Studies** – *People in Society, economy and business* SOC 15, use evidence, present an informed view SOC 16 needs and wants, inequality SOC 17 rights and responsibilities, choices SOC 19 interdependence of countries.

**Technologies** – *Technological developments in society* TCH 01 link between scientific and technological developments; TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment. *Contexts for developing technological skills and knowledge* TCH 13 Plan, develop, organise production of items *ICT to enhance learning* TCH 04.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Responsible citizens**

Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**

Apply critical thinking in new contexts.

Work in partnership and in teams.

**Confident individuals**

Develop and communicate their own beliefs.

**Successful learners**

Make reasoned evaluations.

Sustainable Development.

Citizenship.

# Curriculum links

## Unit 7 – Water

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity one: Calculating your school's water footprint

Choosing responsible and sustainable ways of using and disposing of water means taking informed, realistic choices/actions now.

Brainstorm the ways that the school's use of water affects its global footprint.

Find the amount of water the school uses in one year from the Council or the school's water meter. Calculate what this means for the school's water use in litres for each learner per year.

Enter the results into the calculator [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to find the water footprint.

Develop an Action Plan to reduce the school's water footprint. Measure the water footprint again when actions have been completed.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity, SOC 09 Transport.

**Technologies** – *ICT to enhance learning* TCH 04.

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Responsible citizens**  
Evaluate environmental, scientific and technological issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**

**Successful learners**  
Use technology for learning.

Sustainable Development.

Citizenship.

### Activity two: Taken for granted

Water is a unique natural resource, essential for life and all living things;

Water is a finite resource and humans compete with other living things, as well as other humans;

Water is easily wasted, but also conserved.

Water shortage is not restricted to countries of the South.

Freshwater habitats support a rich diversity of plant and animal species and in turn enrich local landscapes; there are negative consequences from careless water abstraction and pollution.

Home research of the ways water is used at home and gathering data to assess amounts used.

Exploring and making decisions about what realistic water savings can be made in a simulated drought situation to meet a target set by government.

Using hard copy or computerised tables to enter and analyse data.

Discussion/research of the effects of drought on the natural heritage, local community and economy.

Circle time – reflection on learning and resulting personal actions.

**Social Studies** – *People, Place and Environment* SOC 08 environmental impact of human activity – sustainability of natural resources; SOC 13 Compare local area with a contrasting area; SOC 14 Use a range of maps.

**Sciences** – *Planet Earth* SCN 05 Processes of the planet, water cycle, climate change.

**Technologies** – *Technological developments in society* TCH 01 link between scientific and technological developments; TCH 02 how lifestyle can impact on the Earth's resources, ethical issues, lifetime cost to the environment. *ICT to enhance learning* TCH 04

**Numeracy and Mathematics** – *Information handling* MNU 20 Data and Analysis, evaluate and interpret data; MNU 21 display data.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Responsible citizens**  
Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**  
Solve problems.

Apply critical thinking.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Use technology for learning.

Learn independently and as part of a group.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 7 – Water continued

Topic development and key ideas

Learning and teaching activities

Curriculum areas and subjects experiences and outcomes

Links to the capacities

Interdisciplinary themes

### Activity three: Water worldwide

Water shortage is not restricted to the South; but where poverty exists, it is more difficult.

Technology can help, both at simple and hi-tech levels; Getting involved in acting for or raising awareness of the actions required for the future requires personal commitment and effort.

Communicating with learners from a school in a Southern country with water shortages.

Discussion of ways in which climate and access to water affects way of life and values/attitudes to natural resources.

Looking at ways technology can help find/abstract water.

Using search engine to find websites telling Ryan's Well story; possible communication with Ryan.

Discussion of stimuli and human characteristics that lead to motivation and success.

Selection of material and preparation/presentation of wall display/assembly/written piece.

Circle time – reflection on what everyone has learnt and what affect it has had on them.

**Sciences** – *Planet Earth* SCN 05 Processes of the planet, water cycle, climate change.

**Social Studies** – *People, Place and environment* SOC 12 climate and weather impact on ways of life; SOC 08 environmental impact of human activity – sustainability of natural resources; SOC 11 more and less economically developed countries, distribution of resources.

**Social Studies** – *People in Society, economy and business* SOC 16 needs and wants, inequality.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Technologies** – *ICT to enhance learning* TCH 04.

**Expressive Arts** – *Drama* EXA 12 create character through voice, movement, language.

**Responsible citizens**  
Make informed choices and decisions.

Develop informed ethical views of complex issues.

**Effective contributors**  
Solve problems.

Work in partnership and in teams.

**Confident individuals**  
Relate to others and manage themselves.

**Successful learners**  
Make reasoned evaluations.

Link and apply different kinds of learning in new situations.

Use literacy, communication and numeracy skills.

Citizenship.

International Education.

Sustainable Development.

Creativity.

### Activity four: Bottled up

Choosing responsible and sustainable ways of using and disposing of water means taking informed, realistic choices/actions now.

Water is easily wasted, but also conserved.

Water is a unique natural resource, essential for life and all living things;

Water is a finite resource at any given time and humans compete with other living things for this supply, as well as other humans.

In small groups, consider the scenario provided – identify problem, solution and end story.

As class, construct linear diagram.

Discussion on the other elements of the scenario and alternative solutions.

In small groups, decide on the most sustainable solution.

Select group representative to give short summary; present short summary; agree as class most sustainable solution.

As class, construct more complex diagram; summarise problem solving process.

Express personal opinion on drinking bottled water.

In small groups look at bottled water adverts and identify hidden and explicit messages.

Consider information on water quality of bottled water – given or from website.

Circle Time – reflection on learning and personal actions.

**Social Studies** – *People, Place and environment* SOC 08 environmental impact of human activity – sustainability of natural resources.

**Sciences** – *Planet Earth* SCN 05 Processes of the planet, water cycle, climate change.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Expressive Arts** – *Art and design* EXA 02 experiment with a range of media and technologies.

**Technologies** – *ICT to enhance learning* TCH 04.

**Health and Well Being** – *Food and Health* HWB 30/31 nutrition and health; HWH 37 advertising and the media, influences on the consumer.

**Responsible citizens**  
Make informed choices and decisions.

Evaluate environmental, scientific and technological issues.

Understand different beliefs and cultures.

**Effective contributors**  
Solve problems.

Apply critical thinking in new contexts.

Communicate in different ways and in different settings.

**Confident individuals**  
Develop and communicate their own beliefs take informed decisions.

**Successful learners**  
Learn independently and as part of a group.

Make reasoned evaluations.

Use literacy, communication and numeracy skills.

Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development.

# Curriculum links

## Unit 7 – Water continued

**Topic development and key ideas**

**Learning and teaching activities**

**Curriculum areas and subjects experiences and outcomes**

**Links to the capacities**

**Interdisciplinary themes**

### Activity five: Alternative choices

Water is a finite resource at any given time and humans compete with other living things for this supply, as well as other humans.

Water is easily wasted, but also conserved.

Technology can help, both at simple and hi-tech levels.

Choosing responsible and sustainable ways of using and disposing of water means taking informed, realistic choices/actions now.

Facilitate groups of learners in choice of theme – from a list, or water related issue.

Plan research to focus on environmental/natural heritage benefits.

Carry out research using ICT – search engine/internet – and other sources of information.

Analyse information, reflect and draw conclusions.

Review material and select key points and illustrative material.

Prepare and deliver presentation – ICT/powerpoint or a poster.

Plan and carry out a field visit to relevant site Reflect on learning and links with taking action in school to reduce water and global footprint.

**Social Studies** – *People, Place and environment SOC 08* environmental impact of human activity – sustainability of natural resources.

**Sciences** – *Planet Earth SCN 05* Processes of the planet, water cycle, climate change.

**Literacy and English** – *Listening and Talking*, Understanding, analysing and evaluating, and *Writing*, organising and using information.

**Expressive Arts** – *Art and design EXA 02* experiment with a range of media and technologies.

**Technologies** – *ICT to enhance learning TCH 04*.

**Responsible citizens**

Develop knowledge and understanding of the world and Scotland's place in it.

Evaluate environmental, scientific and technological issues.

Make informed choices and decisions.

**Effective contributors**

Solve problems.

Communicate in different ways and in different settings.

**Confident individuals**

Relate to others and manage themselves.

**Successful learners**

Learn independently and as part of a group.

Think creatively and independently.

Link and apply different kinds of learning in new situations.

Citizenship.

Sustainable Development





## Part 2

# Unit 1: Making connections

### Key ideas

- Planet Earth is a finite resource and human consumption in the industrialised world, at present rates, is not sustainable. (*Treading lightly, Consuming passions, Futures*)
- Many everyday actions have impacts on natural ecosystems and people in other places around the world. (*Treading lightly*)
- There are global inequalities and injustices in the sharing and use of natural resources. (*Treading lightly, Footprints across the planet*)
- The Ecological Footprint is a tool asking us “How much nature do we have, compared with how much we use?” It cannot tell us what to do but allows us to make informed decisions. (*Treading lightly, Footprints across the planet, Connection inspection*)
- Individuals have choices, influences and powers to bring about change at local, national and global levels; not everyone has this opportunity. (*Consuming passions, Making connections*)
- There are complex and inter-dependent social, economic and environmental aspects to any issue, which require balancing to reach sustainable solutions. (*Making connections*)
- There are increasing efforts by people around the world working towards more equitable and sustainable development. (*Connection inspection, What makes a good global citizen, Futures*)
- Responsible citizens learn from and work with others to improve things at a local/global level. (*What makes a good global citizen, Futures*).

# Background notes



**“The problem with land is that they stopped making it some time ago.” Mark Twain**

Our Ecological Footprint is, quite simply, the area of land and sea that is required to support our current lifestyles; through providing the resources we use (food, housing, transport, consumer goods, water, energy and land to build on) and absorbing the waste we produce (tangible wastes and carbon dioxide emissions). The surface of planet Earth covers 51 billion hectares (ha), however we only have 13.6 billion ha of usable (biologically productive) land; the rest is ocean, ice cap, desert, mountains, or urban tarmac, concrete and buildings. The human population is 6.9 billion and climbing rapidly. If we looked at the equitable distribution of usable land across the planet, the average ‘Earth share’ per person would be about 2.1 ha (allowing a 12% provision for other species). In contrast, a typical city imposes a giant ‘footprint’ of resource demands and waste assimilation over a large area; it may need an area of land over 20 times its size to sustain it. The footprint of London (2002), for example, is 125 times its geographical area, the size of the UK itself. ([www.citylimitslondon.com](http://www.citylimitslondon.com)).

At present, in Scotland, it has been calculated that a person, on average, requires 5.4 global hectares (gha) to support their lifestyle; in the USA it is 9.4 gha (WWF Living Planet Report 2008). Current estimates suggest we have overshoot our ‘global carrying capacity’ by over 30%. In other words, in Scotland, if we continue to demand resources at our present rate we need almost two more planet Earths to support us. (Look at <http://resource-accounting.org.uk/downloads/scotland/> for the Ecological Footprint of Scotland’s residents in 2004). As people all over the world seek to raise their standard of living, and by definition their consumption of resources, the consequences are obvious. Humanity is effectively destroying our life-support systems all over planet Earth. Population growth is a key issue in addressing our capacity to achieve sustainable development, but one people prefer to avoid.

The Scottish Government’s overall stated purpose (from 2007), ‘to focus government and public services on creating a more successful country, with opportunities for all of Scotland to flourish, through increasing sustainable economic growth’, reflects a commitment to sustainable development. ‘A Greener Scotland’ is one of the five strategic objectives of the Scottish Government, one of the 15 national outcomes is ‘to reduce the local and global environmental impact of our consumption and production’ and ‘to reduce Scotland’s overall Ecological Footprint’ is an indicator for the country. (<http://www.scotland.gov.uk/Topics/SustainableDevelopment>).

This unit looks at some of these issues, and their connection with sustainable development as a whole. Learning about our Ecological Footprint sets the local use of resources in a global context, hence this teaching resource is called *Schools Global Footprint*.

Active global citizenship is about enabling learners to participate fully in a global society – its political, economic, social and cultural life. The introduction of citizenship, sustainable development and international education as opportunities for interdisciplinary learning in schools has huge potential in motivating young people about citizenship: first, to investigate what it means, and requires, to be active and responsible members of their communities – local, national and global, both individually and collectively; then to practise the relevant skills they have acquired in the relative safety of the school environment.

Citizenship involves enjoying rights and exercising responsibilities in the various types of community to which we belong. Citizenship is about making informed choices and decisions, and about taking action, individually and as part of collective processes. The rights and responsibilities of citizens are reciprocal in most respects: if we have a right to be respected, then we must treat others with respect; if we have a right to an opinion, we have a responsibility to consider the opinions of others. Often 'different' communities have differing perspectives that may arise in conflict. Developing strategies to deal with controversy is another aspect of citizenship, including the need to oppose strongly the views of those promoting racism, sectarianism and related ideals.

Understanding of our own basic needs, and the implications for the needs of future generations of actions taken today, is fundamental to our ability to have a vision for the future. Equally, acknowledging that global equity and justice are essential elements of sustainability, and that some basic needs are still to be met universally, are essential messages to be relayed.

#### **Two definitions of sustainable development**

**“(Sustainable development is) development that meets the needs of the present without compromising the ability of future generations to meet their own needs.”**

*Gro Harlem Brundtland, 1987*

**“Each generation is entitled to the interest on the natural capital, but the principal (capital sum) should be handed on unimpaired.”**

*Canadian Conservation Commission, 1915*

Ecological Footprinting is an important way of putting sustainable development into more real and understandable contexts for us all. It simply and clearly conveys two ideas central to sustainable development: environmental limits and the inequity of current consumption patterns. We can see the mark our lifestyle and consumer choices make on the natural world.

Matched to concerns about access to/use of energy and other natural resources on which we depend, and the burden of our waste production, are concerns for biodiversity – our responsibility for all living things and the places they rely on for survival, not just our own survival as a species!

Industrialised countries in particular have a responsibility to reduce their consumption rates, but the impact of economic globalisation on the world's ecosystems has made any solutions highly complex. In economic terms, we can understand the Ecological Footprint as a measure of our demand upon natural resources, and the available biocapacity (both locally and globally) as an indicator of our available supply of natural resources.

Footprinting is underway in Scotland – nationally, regionally and locally with the support of the Scottish Government through the Local Footprints project ([www.localfootprints.org](http://www.localfootprints.org)). We have a choice to continue as part of the problem or to become part of the solution. Where to start? How about with ourselves and our schools.

# Objectives and outcomes

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Young people should learn:

## Knowledge

- To describe what an 'Ecological Footprint' is, and how it is used as a tool to help individuals, schools or communities find more sustainable lifestyles and management strategies. (*Treading lightly, Connection inspection*)
- To describe how the Earth's resources are finite, and that there are global inequalities and injustices in the sharing and use of natural resources. (*Treading lightly, Footprints across the planet*)
- To describe the differences between, and give examples of, needs and wants and explain why human consumption in the industrialised world is not sustainable at present rates. (*Consuming passions*)
- To describe the connection between personal values and beliefs and behaviour. (*Consuming passions, What makes a good global citizen*)
- To describe how economy, society and the environment are mutually affecting and interdependent, and absorb many other 'dimensions'. (*Making connections*)
- To give examples of how their choices make a difference, to our natural heritage, the wider environment and other people – now and for the future. (*Futures*)

## Skills

- To think critically about the different ways levels of government, the media and advertising, our family and peers, and others influence our 'wants' and choices. (*Consuming passions*)
- To express quality of life in personal terms beyond consumption; be able to assess the sustainability of their own lifestyle. (*Consuming passions*)
- To demonstrate an ability to use the information available to make informed, balanced choices leading to more sustainable outcomes. (*Connection inspection, Making connections, Futures*)
- To engage in learning about taking action and managing change at individual and school/community levels. (*Futures*)
- To imagine and distinguish between probable and possible futures. (*Futures*)

## Values and dispositions

- To appreciate how lifestyle choices, global citizenship, biodiversity/bio-capacity and intergenerational responsibilities they study are connected and interdependent. (*Treading lightly, Futures, What makes a good global citizen*)
- To appreciate that the quality of life of future generations is endangered or enhanced by actions we take now. (*Futures, Connection inspection*)
- To appreciate why equity and justice are necessary, locally and globally, to a sustainable society, now and for the future. (*What make a good global citizen*)
- To have a sense of responsibility for, and be willing to act as a responsible citizen, learning from and working with others to improve situations with respect to sustainability. (*Futures, Connection inspection, Making connections*)

# Activity one: Treading lightly on the planet

Adapted from 'How Big is your Footprint' in *Second Nature*, RSPB

## You will need

- a space (inside/outside) large enough for everyone to sit in a circle
- a flipchart, sugar paper/card, scissors, pens
- a set of laminated animal silhouette and footprint cards – see Activity sheet MC1 – and a cloth bag
- copies of Activity sheet MC2.



**Time**  
**Allow for**  
**classwork/research 1.5**  
**hours; fieldwork open**

## What to do

Circle up somewhere comfortable and ask the learners to imagine that one day they come out of school to find a glass dome has come down on top of their school covering an area of 10 ha (1 ha = 100 m x 100 m) around it. The dome extends down into the soil, so that only light and heat can enter or escape. No air, water, food or other resources can get in; and no sewage, rubbish or other waste can get out. How long do they think they would survive? Why?

Build on their responses to reinforce that we take for granted that our local environment can interact with the rest of the world, e.g. we can transport our rubbish somewhere else to dump it, we can bring in food and building materials, our air and water will be replenished by the clouds and rain and the wind. Most of us are completely reliant on faraway sources for even our most basic needs.

Give everyone a piece of card/sugar paper and a pen. Ask them to carefully draw round their feet. You do it too! Cut out the footprint outlines. Ask for examples of how their lifestyles depend on the natural environment – living processes, resources to make energy, use of land, water and other natural resources to make other things and for enjoyment, disposal of waste.

Ask learners to take one of their outlines and record, using summary words, all the things we get from the natural world to support our lifestyles – plants, animals, water, clean air, rocks and minerals, waste disposal, inspiration, peace and quiet. Now ask for examples of how their lifestyles impact on the natural environment. On the other outline, they should record all the ways their lifestyle impacts on the natural world. Explain in essence that what we get/what impact we have is how we try to measure the size of our Ecological Footprint: it's a tool to help us to measure and understand the connection between how much of nature we use and how much nature there is. If we understand the connections, we can then reduce our use and impacts. Make a display of the 'footprints'.

## Extension 1 – Bigfoot or Lightfoot

Ask whether they think the size of people's Ecological Footprint will be the same all over the world. Why do they think that? How do they think the size might differ? Have some small and large footprint outlines, enough for one each, cut out ready (on a different colour paper). Ask them to suggest countries which may have small size Ecological Footprints, and which may have large size footprints and why. Can they think why there might be a problem with this. What about outsize footprints, and how might those with the smallest footprints feel? Record inside their outline those countries relevant to the size of footprint they have been given. Make a display.

What about other living things on planet Earth? There is a lot of talk about conserving the biodiversity (biological diversity) of our natural world, both locally and globally. Why is this? What benefits can they think of that our native plants and animals bring us? Brainstorm and record on a flipchart.

### Extension 2

In a cloth bag, first put the set of animal silhouette cards, then the 'footprint' cards from Activity sheet MC1. Each pair/group dips in and then researches the species and its 'footprint' on the natural world; what kind of living thing it is, its habitat and all the impacts they have identified – living processes (feeding/drinking, breathing, reproducing), waste disposal, housing, travel, etc. Each pair/group shares its findings. Which do they think has the lightest footprint?

Ask them to make two large copies of their animal outline and write inside one outline the name, the habitat and all the impacts they have. Inside the other they should record all the possible benefits it provides for people. Make a display with the footprints. Complete Activity Sheet MC2 as an assessment activity.

Tell them about *Schools Global Footprint*. Will they enjoy getting involved with measuring their school's Ecological Footprint? Reinforce that measuring our Ecological Footprint can only tell us what is happening, not what we should do to minimise our impact on the natural world.

## Activity two: Footprints across the planet

### You will need

- copies of Activity sheet MC3 – 1 each/pair
- copies of the Activity sheets MC4 (For Second Level – selection of 12) or MC5 (For Third Level – selection of 30) – 1 each/per pair
- internet access to [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- 30 m measuring tape.



**Time**  
**Allow anything from**  
**1.5 – 5 hours**

### What to do

Make sure everyone has read the online information explaining what the Ecological Footprint is about ([www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)). In Scotland, it has been calculated from our average footprint that we each need circa 5 ha to survive. What does this look like? Take a measuring tape and go outside and walk a 100 m by 100 m square to show 1 hectare – it's five of those! Useful trivia to impart is that Trafalgar Square in London is exactly 1 hectare in area. Use Activity sheet MC3. What kinds of things are being measured to tell us about what contributes to the footprint? Reinforce that, at the going rate, we need two extra planets to support us! What is our 'Earth share' footprint size (2.1 gha)? What does this mean in everyday terms? (We need to use a lot less). How might we do that?

Look at Activity sheet MC4 (Second Level) or MC5 (Third Level) – tables comparing the Ecological Footprints of different countries. Not everyone has as large a footprint as the UK/Scotland, but a few have larger footprints. Analyse the largest and smallest and where Scotland/UK fits, and why this might be. Make a selection of countries illustrating the range of values – about 10-12 countries. Find out where they are on a world map. Discuss what kind of graph would illustrate the comparison best. Construct bar graphs by using a prepared graph

outline, or using a software package. Discuss the patterns revealed and explore the reasons for similarities and differences. What are the global implications?

If your school has finished calculating each component of its Ecological Footprint, look at the size of the whole footprint and make a comparison with the size of the average Scottish person's Ecological Footprint. This could lead on to asking link schools (especially in Europe and/or a Southern country) to measure their school's Ecological Footprint in the same way (using the online footprint calculator) and to make comparisons (Second Level) and seek explanations for similarities and differences (Third Level).

## Activity three: Consuming passions

Adapted from *Second Nature*, RSPB

### You will need

- copies of Activity sheet MC6 – one each
- copies of the statements on Activity sheet MC7 photocopied onto paper/card, laminated and cut into cards before placing into an envelope with the task written on the outside – one per set/group.



**Time**  
**Allow 1.5 hours**

### What to do

As homework, over a period of a week, ask everyone to note down when they hear someone expressing a 'need' for something – a lift, new clothes, a drink. Share the results and discuss what the word 'need' has come to mean in our society.

Give everyone a copy of Activity sheet MC6 and read out the statement from the Worldwatch Institute: *"Our enormously productive economy... demands that we make consumption our way of life, that we convert the buying and using of products into rituals. We need things consumed, burned up, worn out, replaced and discarded at an ever-increasing rate."*

Check out the vocabulary for everyone; share the meanings of the words 'economy', 'consumption' and 'rituals'. Has shopping become a ritual for some people today? Discuss with the learners if this is how we live in society; do they know of a society that doesn't? (There are very few left today – some tribes in West and East Africa, Brazil and Papua /New Guinea and other remote communities).

What are the implications of the last sentence for scarce natural resources and the environment – if a country wants to keep growing its economy? Do they know what we mean by the words 'sustainable development'?

Hand out an envelope containing the statements from MC7 to each group of learners, and ask them to sort the statements into two piles – what a sustainable society does and what a consuming society does – and then spread them out. The most important aspect of this activity is the participation in dividing the cards: the discussion, decision-making and negotiation within the group. In Scotland, what kind of society do we live in? What does the class as a whole think? What are the consequences? Can we continue to consume at the present rate? They then fill in both sides of Activity sheet MC6 either individually, in pairs or in their group – see completed example of side 1 overleaf.

What are some successful ways of encouraging people to change bad habits? Ask them to select a bad consuming habit they have (e.g. wasting food, leaving lights/the TV on, leaving taps running, buying things they don't use) and how they are going to change it. How will they check progress over the next few months?

What a consuming society does	What a conserving society does
<b>Uses up energy and resources</b> as if an unlimited source, with no worries of their waste or renewal.	<b>Uses only as much energy and resources as it needs to.</b> Always <b>uses renewable sources</b> where possible and minimises waste.
Makes/buys cheap and convenient <b>goods that don't last long.</b>	Tries to make/buy <b>long lasting goods</b> that can be maintained and repaired.
Produces goods in large quantities. Often <b>considers cash cost but not the effects on people (at home or abroad) and the environment.</b>	Carefully <b>considers and balances all costs</b> – people (at home and abroad), environment and cash – involved in making goods.
Concentrates on <b>short-term cash benefits and goals</b> normally.	Tries to show concern for the future, by looking at <b>long-term benefits and goals</b> – cash, people, environment.
<b>Avoids responsibility</b> – often relies on someone else (e.g. Government) paying to develop the technology to clear up the mess.	<b>Takes on responsibility</b> – individuals, communities, businesses and industry as well as government try to save energy and resources, and dispose of their wastes carefully.

## Activity four: Connection inspection

### You will need

- flipchart paper and pen – 1 per group
- copies of Activity sheets MC8 and MC9 – 1 each
- space for circling up.



### Time

**Allow 30 minutes**

### What to do

This is an activity to help the learners make the connections between the different components of an Ecological Footprint. For example, if you are working on the food component of your school's Ecological Footprint you can use the Activity sheet MC8 as an example, to help demonstrate how the food component of an Ecological Footprint is connected to all the others.

Use a sharing circle, ask for examples of how they see the connections, and gradually build up the network – Activity Sheet MC9. Reflect on how the connections make us view the overall footprint and its reduction, as individuals and as a society.

Use this activity as you work on each of the footprint component units (Waste, Food, Energy, Transport, Buildings, Water) and/or as an assessment activity.



# Activity five: Making connections

This activity introduces the use of the 'development compass rose' or 'route finder' (*Get Global!*) and a *WWF LinkingThinking* activity

## You will need

- space for small groups to work and for circling up on chairs
- time to create an interesting way for groups to select their issue – see *Get Global!* for ideas
- flipchart pads and pens – per group
- a laminated copy of Activity sheet MC10\* – 1 per group
- copies of Activity sheet MC11 – 1 each
- copies of the descriptors on Activity sheet MC12, enlarged on the photocopier or stuck onto larger pieces of card and laminated. Select – add or omit – the cards used depending on the issue and/or ability of class
- access to a computer suite, the internet and library resources.

\* A colour poster version is available through Tide~. See the Resources section on page 44 for details.



**Time**  
**Allow 1 – 2 hours**

## What to do

Explain that most sustainable development issues are not black and white and are often very complex to unravel. The 'Route finder' is a tool that can help unravel issues by looking at the economic, social and environmental components.

Ask them to brainstorm a number of global/development issues that they are concerned about, or which they see on TV. Each group selects an issue to investigate using the 'Route finder'.

Give each group a laminated copy of the 'Route finder guide' (Activity sheet MC10), plus a flipchart and pens to record their ideas. Give each learner a copy of the 'Route finder' (Activity sheet MC11) to summarise their group's ideas, adding any significant information.

Use circle time to have an open discussion and reflect on what they have learnt, any comments about the 'Route finder' as a tool, and any further ideas about understanding issues.

## Extension – What's the issue

Select one of the issues to explore further as a class (Third Level) – write it in large letters on a piece of paper/card, place on floor or chair. Working in small groups – the same number as you have descriptor cards for – give each group a card, and ask them to think about how it applies to the chosen issue.

Write the ideas down on a piece of paper and select a spokesperson. Each spokesperson speaks to the whole group, using the wording "[name of issue] is a [name of descriptor] issue because... giving at least two reasons". (Keep this feedback short and snappy!)

As they speak, construct a 'mind map' on a whiteboard/ flipchart/blackboard to illustrate the main points. When each group has had a turn, then ask of the whole group "What sort of issue is this?".

It is likely they will reflect that it is multi-dimensional. Ask the group “Do we miss some of these dimensions when looking at how our lifestyles impact on the world, if we just think environmental, economic and social?”. So what must we do?

Use circle time to have an open discussion and reflect on what they have learnt, any comments about what’s been discussed, any further ideas about the interdependence of factors involved in issues.

## Activity six: What makes a good global citizen

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Adapted from *Get Global!* – ‘Asking questions’

### You will need

- flipchart paper and pen – 1 per group
- copies of Activity sheet MC13 – 1 each.



**Time**  
**Allow 40 minutes**

### What to do

This is a good activity for providing a baseline: measuring and recording learners’ existing understanding, values, dispositions and skills.

Brainstorm the kinds of values, attitudes and actions that they think demonstrate good citizenship in a local context. Draw around a person on a large sheet of paper and write these over the outline – use head, heart and hands. Then ask how might a good global citizen be different? Ask small groups to make themselves an outline and write on anything more they think of. Display the outlines and ask for comments on the ideas.

Give everyone a copy of Activity sheet MC13 and ask them to complete it, or use for quick group work and/or assessment – look for any development.

## Activity seven: Futures

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### You will need

- flipchart paper and pen – 1 per group
- copies of Activity sheet MC14 – 1 each.



**Time**  
**Allow 40 minutes**

### What to do

This is a good activity for providing a baseline: measuring and recording learners’ existing understanding, values, dispositions and skills.

It is difficult to see how we can make a difference to things at a national or global level, but at a home and school level we can make a difference.

Brainstorm some examples of how they feel about the school buildings and grounds (before the *Schools Global Footprint* work), what their hopes are for changes in the future and what

they think will probably happen. What changes have happened in the past? What are the uncertainties for the future? What are the needs and what can be done now?

Give individuals/pairs a copy of Activity Sheet MC14 – a futures survey, and ask everyone to think about it and complete it for his/herself. Allow them to share their concerns and aspirations with others.

To conclude, invite them to take a look at how calculating the school's Ecological Footprint might allow us to make choices on how we can contribute to sustainable development at a very local level. This is then a lead into the footprinting work.

You could use the exercise again after the *Schools Global Footprint* work and look for developments in their thinking. This activity can be adapted for use with any component of your school's Ecological Footprint, for example Waste, Water, Energy, Transport, Buildings, Food.

## Assessment and evaluation

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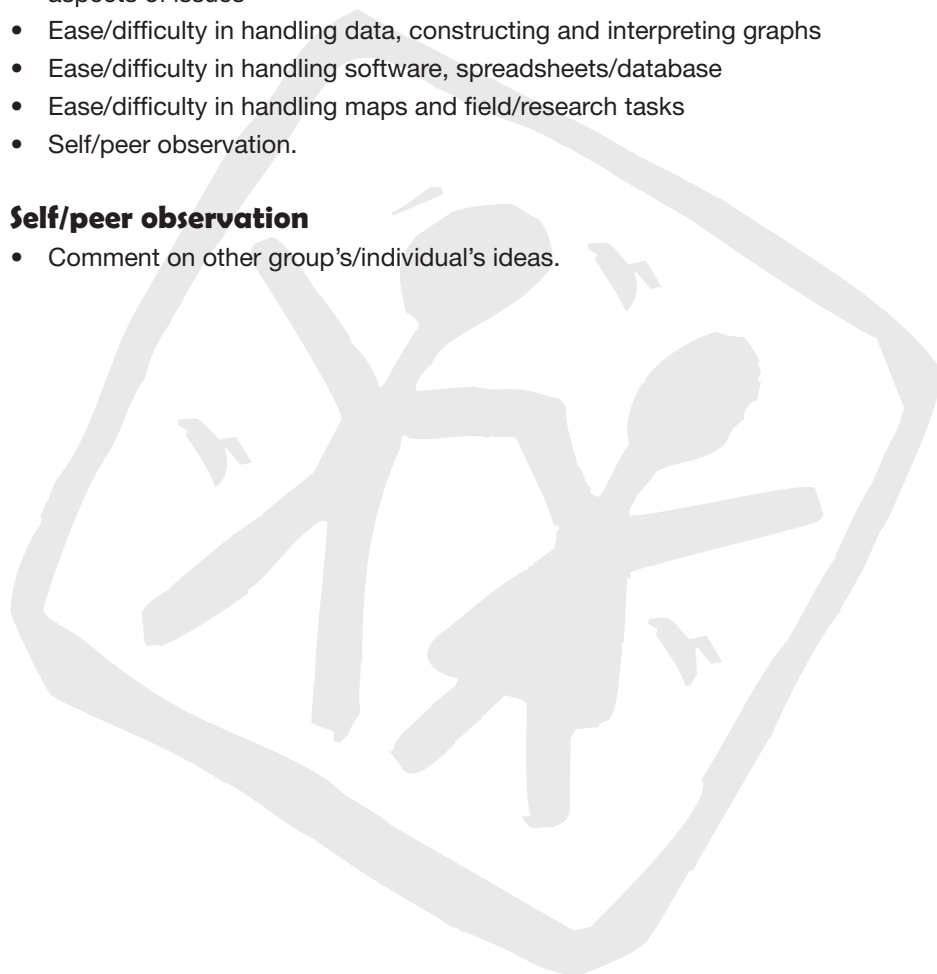


### Teacher observation

- Ease/difficulty of contributing to group investigation
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in making connections between issues, and local and global contexts
- Ease/difficulty in making connections between environmental, social and economic aspects of issues
- Ease/difficulty in handling data, constructing and interpreting graphs
- Ease/difficulty in handling software, spreadsheets/database
- Ease/difficulty in handling maps and field/research tasks
- Self/peer observation.

### Self/peer observation

- Comment on other group's/individual's ideas.





## For teachers

### ***Get Global!***

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities enabling higher order thinking by learners. Route Finder, Chapatti Diagram and Active Global Citizen Survey activities here. ISBN 1 872502 91 1. Available in pdf format on the websites below:

[www.actionaid.org.uk/schools](http://www.actionaid.org.uk/schools)

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### ***Eco-Schools Guide***

Guides can be downloaded from the website. Full of relevant information and practical activities, recently revised for Scottish schools. Good sections on school grounds and sustainable development. Eco-Schools Scotland Website: [www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org)

### ***Development Compass Rose***

A4 book by Tide ~ (Global Learning), 1995. ISBN 0 948838 34 5. Exemplifies the use of the development compass rose in analysing local/global issues, as a means of developing ideas about sustainable development, globalisation, North/South, etc. Available from [www.tidec.org](http://www.tidec.org)

### ***Globalisation - What's it all about?***

A4 book by TIDE ~ Global learning 2001 ISBN 9780948838699 Activities, case studies and information supporting classroom work on globalisation and the many questions it raises. Contact as above.

### ***How big is your footprint?***

Free A4, four-page colour leaflet produced by the Royal Society for the Protection of Birds. Quiz to introduce the concept of a footprint' to primary children. Use to raise awareness of the connections between our lifestyles and environmental change. Available from [www.rspb.org.uk/ourwork/teaching/](http://www.rspb.org.uk/ourwork/teaching/)

### ***Lessons in Sustainability – What on earth is happening? How do we respond?***

A4 book by Tide ~ 2003 ISBN 0 948838 87 6. Shares ideas for teaching about sustainable development issues, as a response to the Johannesburg World Summit. Availability as above.

### ***Second Nature – Society, Science and Technology***

A4 spiral folder by Royal Society for the Protection of Birds (RSPB Scotland). ISBN 1 901930 36 X, 2002. Shares ideas for teaching about sustainable development, biodiversity and responsible citizenship. Includes a section on the importance of reducing

consumption and increasing recycling through understanding the sources and effects of energy. Available from RSPB Scotland, Website: [www.rspb.org.uk/scotland](http://www.rspb.org.uk/scotland)

### **Partners in Rights**

A4 spiral bound resource by Save the Children Fund 2000, for ages 7 – 14, ISBN9781841870274. Creative ideas and activities for exploring rights and citizenship, drawing on children's experiences in the UK, Latin America and the Caribbean. Available from [www.scotdec.org.uk](http://www.scotdec.org.uk), Tel. 0131 226 1499.

### **What Rights**

UNICEF. Leaflet on the Convention of Rights for the Child (12 – 14 year olds) [www.unicef.org.uk/resources/index.asp](http://www.unicef.org.uk/resources/index.asp)  
[www.unhchr.ch/udhr/lang/eng.htm](http://www.unhchr.ch/udhr/lang/eng.htm) – Universal Declaration of Human Rights

### **Values and Visions**

Book from Hodder. Exciting resource for teachers. Shows how personal, social and global issues are interrelated, and how they can be explored in experiential and participatory ways in the classroom. Four key areas explored: sense of self, of community, valuing the Earth and developing openness to suffering and joy. Available from [www.scotdec.org.uk](http://www.scotdec.org.uk)

### **Our World, Our Rights**

Amnesty International UK, ISBN 1873328648. Excellent mix of ideas and practical classroom activities introducing children to issues of human rights and responsibilities. Available from [www.scotdec.org.uk](http://www.scotdec.org.uk)

### **Take Part! Speak Out!**

Handbook for primary schools. Practical activities for a programme on Citizenship, in three sections: Rights and responsibilities; Learning to participate; How democracy works. Available from [www.dep.org.uk](http://www.dep.org.uk)

### **Trading Game and Debt Game**

Simulation games from Christian Aid. Players learn how trade affects the prosperity of a country, and how countries can become trapped in debt. Available online at [www.christianaid.org.uk](http://www.christianaid.org.uk)

### **School Council**

A guide from Save the Children, co-written/artwork by children, £7.50. Includes sections on: what a School Council can do for your school; the election process, fundraising; involving everybody, and more. Available from distributors, Tel: 01752 202301.

[www.scotland.gov.uk/library5/society/rsca.pdf](http://www.scotland.gov.uk/library5/society/rsca.pdf) – Scottish Executive's summary of the Ecological Footprint of Scotland's cities 2003.

[www.localfootprints.org](http://www.localfootprints.org) – footprint information for Scottish local authorities and schools.

[www.scotlandsfootprint.org](http://www.scotlandsfootprint.org) – website for Scotland's Global Footprint with ideas about reducing our impact on the planet.

[www.ecologicalbudget.org.uk](http://www.ecologicalbudget.org.uk) – download ‘Counting Consumption’. Ecological Budget UK 2006, with three pages about Scotland.

[www.panda.org/news](http://www.panda.org/news) – The Living Planet report, WWF’s periodic update on the state of the world’s ecosystems – as measured by the Living Planet Index – and the human pressures on them – as measured by the Ecological Footprint.

### **For teachers and learners**

#### ***Rescue Mission Planet Earth***

Kingfisher Books. Children’s edition of Agenda 21, written designed and illustrated by children. Divided into four parts – the Natural World, the Human World, Making it Happen and the Rights of Young People. Sets out environmental issues in a clear way. ISBN – 10: 1856971759.

Children can share ideas about human rights interactively at:

[www.unicef.org/voy](http://www.unicef.org/voy) – Voice of Youth.

[www.therightssite.org.uk](http://www.therightssite.org.uk) – UNICEF UK’s website for children and young people.

[www.amnesty.org](http://www.amnesty.org) – Amnesty International – the human rights campaigning group.

[www.reflect-action.org](http://www.reflect-action.org) – Reflect is a community development approach used in the developing world (developed by Action Aid in 1993) to encourage communities to make linkages between their local issues and wider forces, so that they can influence change at a national and global level. Stories and information.

[www.worldwatch.org](http://www.worldwatch.org) – Worldwatch Institute website. Full of up to date information on relevant issues and solutions. Press releases and research extracts providing useful stimulus material.

[www.globalfootprints.org](http://www.globalfootprints.org) – A site introducing the concept of global footprints and sustainable development . Includes games, facts, poems, stories and quizzes.

[www.bestfootforward.com](http://www.bestfootforward.com) – Best Foot Forward’s website. Pioneer organisation in promoting and popularising the Ecological Footprint philosophy. Provides associated background information and resources, and activities for exploring related issues.

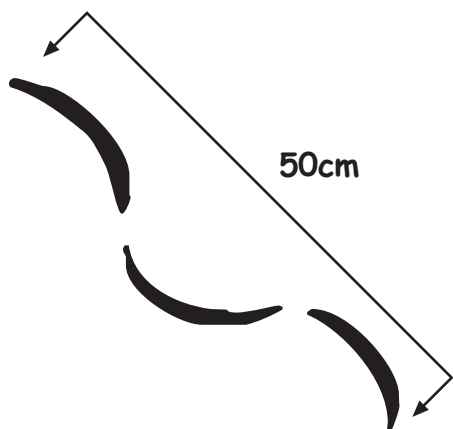
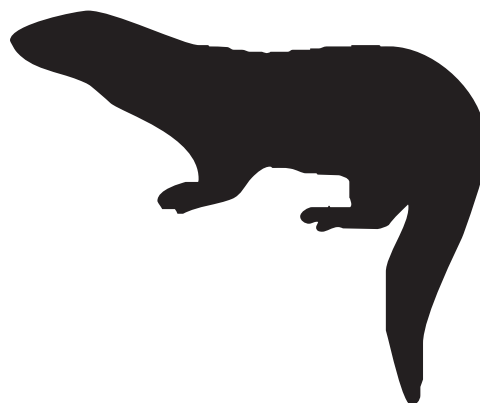
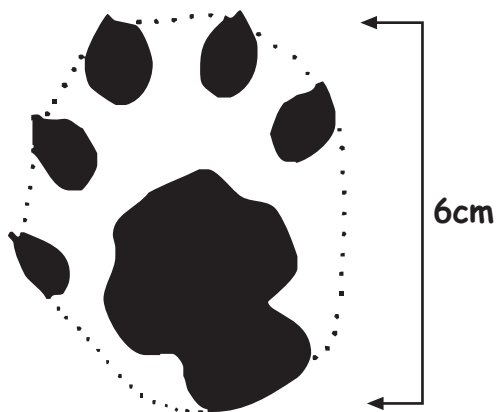
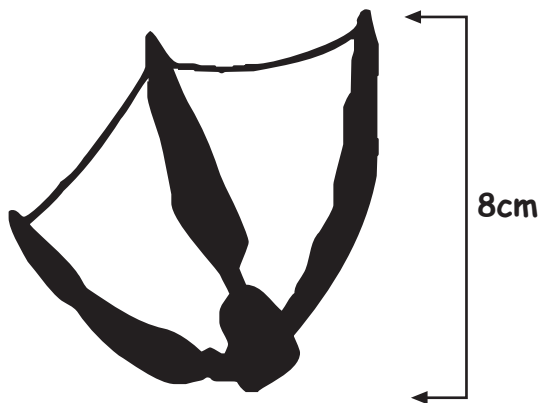
[www.myfootprint.org](http://www.myfootprint.org) – a footprint calculator for individuals. After answering 27 questions you’ll be able to compare your Ecological Footprint with people living at home and in other countries across the world.

<http://footprint.wwf.org.uk/> – a footprint calculator for individuals. After answering 23 questions you are shown which are the main components of your footprint, what your carbon footprint is, and how you can reduce your footprint.

<http://www.storyofstuff.com> – a fun 20-minute fact-filled online video, looking at the impact of our production and consumption patterns and the connections between environmental and social issues.

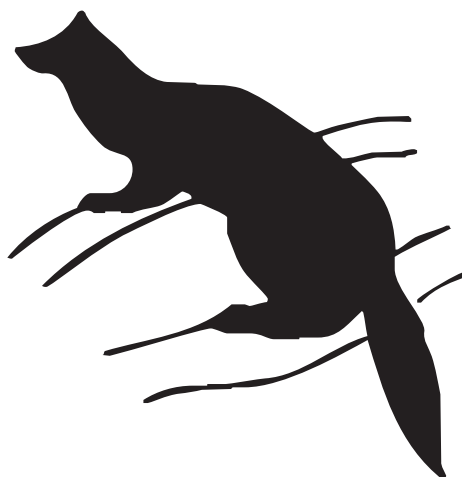
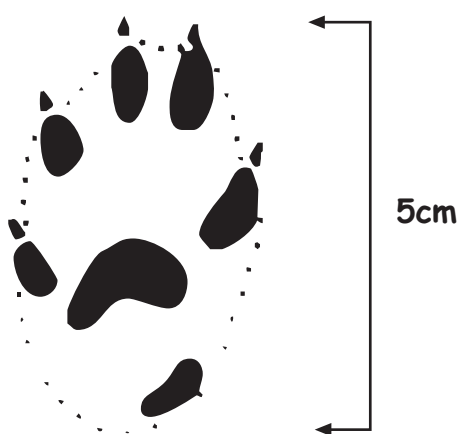
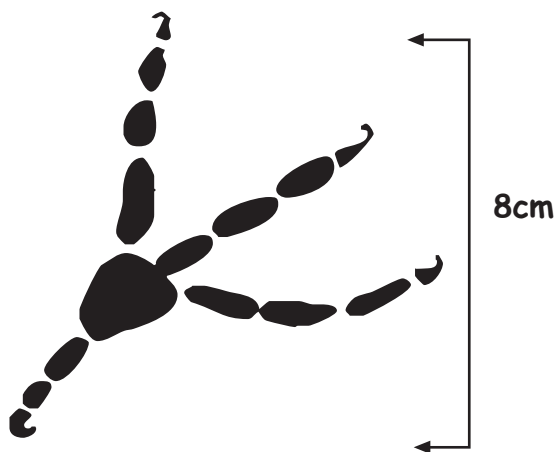
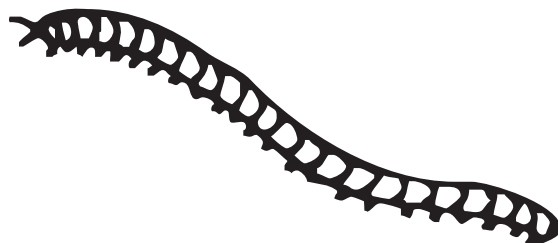
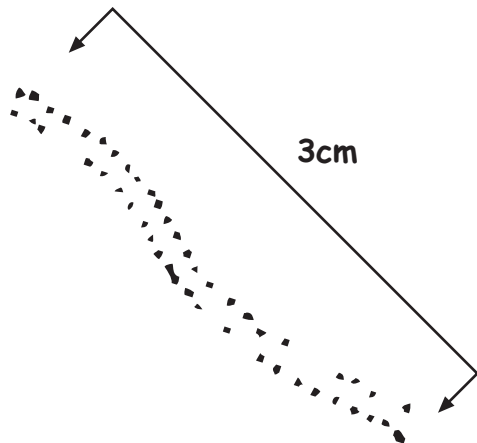


**Activity one: Treading lightly on the planet:**  
**Activity sheet MC1**  
**Plant and animal footprints**





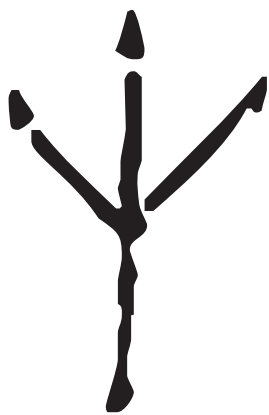
**Activity one: Treading lightly on the planet:**  
**Activity sheet MC1 continued**  
**Plant and animal footprints**



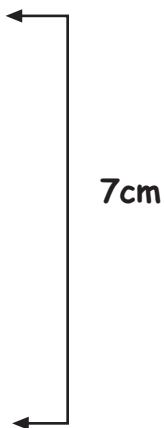
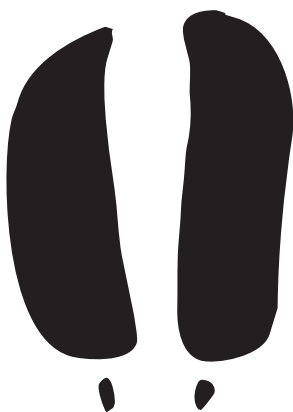




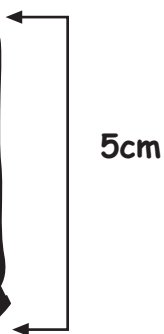
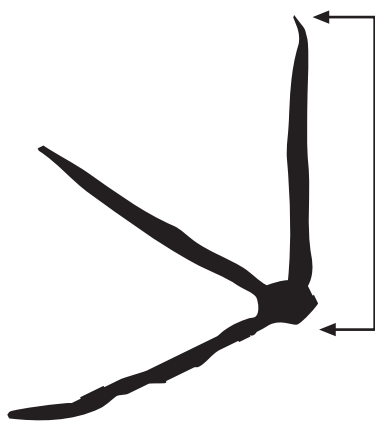
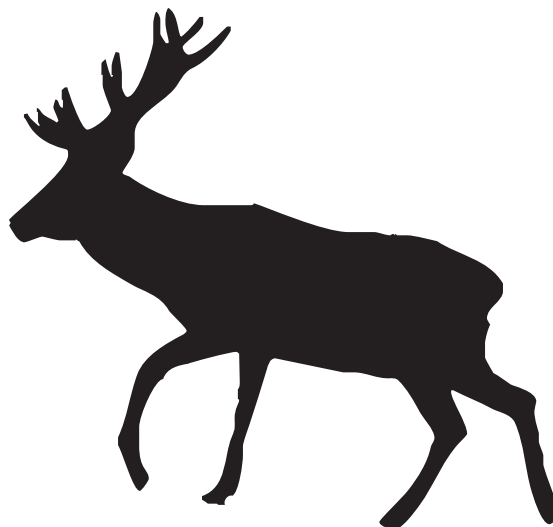
**Activity one: Treading lightly on the planet:**  
**Activity sheet MC1 continued**  
**Plant and animal footprints**



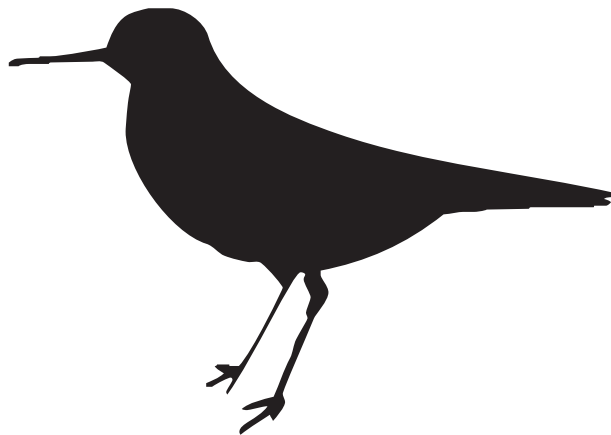
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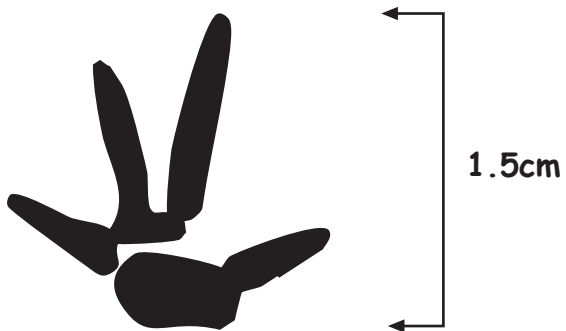
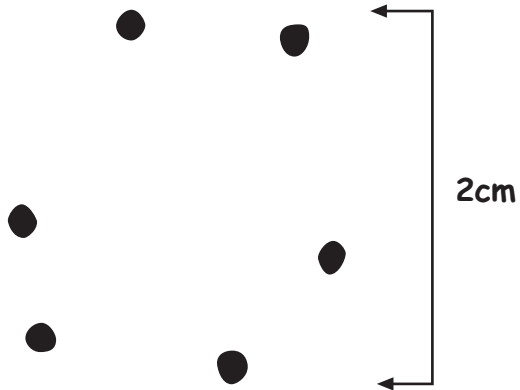
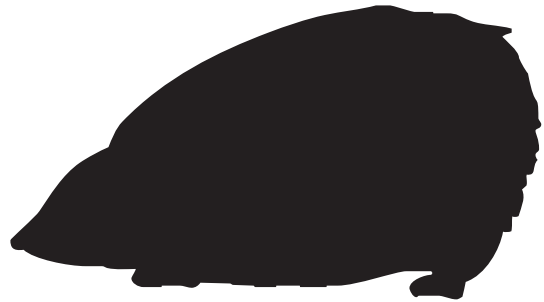
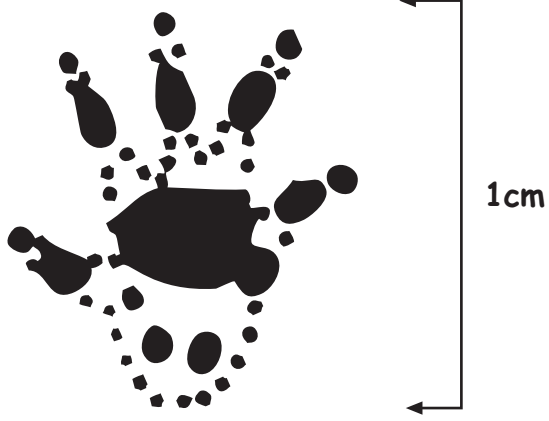


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**Activity one: Treading lightly on the planet:**  
**Activity sheet MC1 continued**  
**Plant and animal footprints**





## Activity one: Treading lightly on the planet: Activity sheet MC2 Plant and animal footprints

"Our Ecological Footprint is a measure of the area of land and sea required to provide the resources consumed by any community and also to assimilate the waste products produced by that community."

Look at my footprint, find out what I am and investigate how heavy I tread.

I am a plant/bird/mammal - which? \_\_\_\_\_

I am a (give my name) \_\_\_\_\_

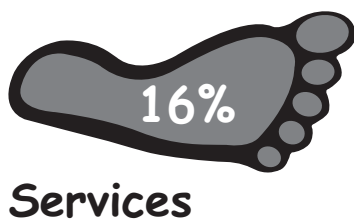
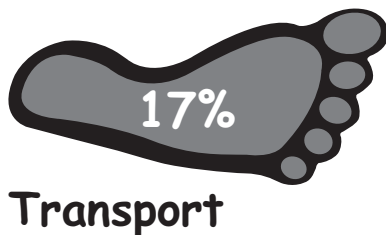
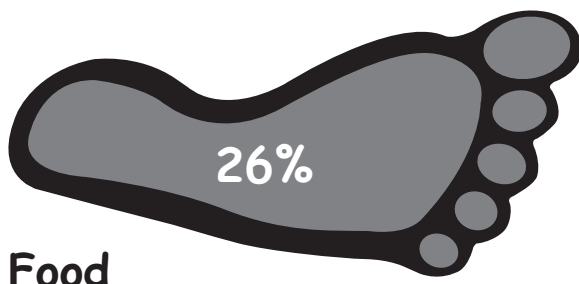
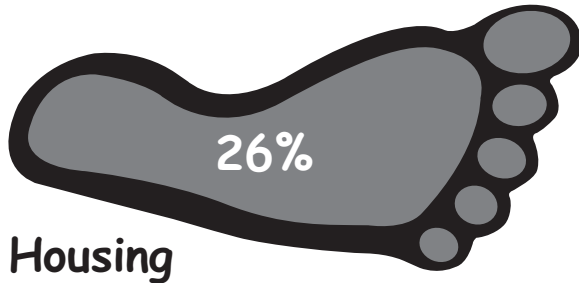
What habitat do I live in and how much space do I need?	
What other groups of living things are members of my community?	
What kinds of things do I consume or use up? Think of gases/liquids/solid matter. Think of living, housing, travel	
What kinds of things do I produce as waste? Think of gases/liquids/solid matter. Think of living, housing, travel	
What happens to the waste?	
Is my footprint heavier or lighter than yours?	
In what ways do humans threaten my survival?	

My footprint is heavier than a \_\_\_\_\_, but lighter than a \_\_\_\_\_

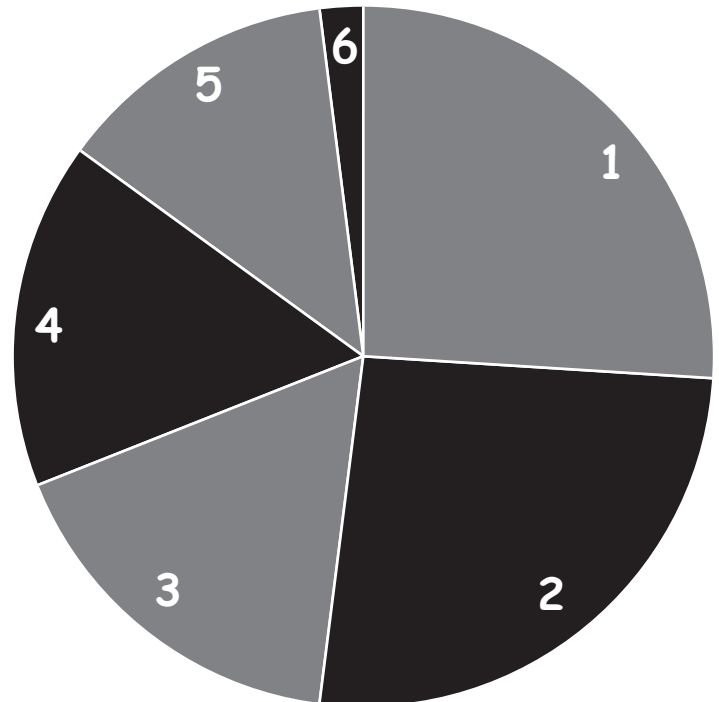


## Activity two: Treading lightly on the planet: Activity sheet MC3 Ecological Footprint of Scotland's residents, 2004

% values for each component of the footprint



A pie chart of the components of the footprint of Scotland's residents, 2004



1. Housing	1.38 gha
2. Food	1.36 gha
3. Transport	0.9 gha
4. Services	0.87 gha
5. Consumer goods	0.7 gha
6. Other	0.13 gha
	<b>5.34 gha</b>

gha = global hectares

On average in 2004, each of Scotland's residents had an Ecological Footprint sized **5.34 gha**. For Scotland, with about five million people, this means its Ecological Footprint was **26,700,000 gha**.

Source: Stockholm Environment Institute. See [www.resource-accounting.org.uk/downloads](http://www.resource-accounting.org.uk/downloads)



**Activity two: Footprints across the planet:**  
**Activity sheet MC4**  
**Ecological Footprints for selected countries of the world**

Country	Ecological Footprint gha/person	Population (millions) 2006
Bangladesh	0.6	142
Cambodia	0.9	14
China	2.1	1323
France	4.9	60.5
India	0.9	1103
Japan	4.9	128
Kuwait	8.9	3
Mozambique	0.9	19
Peru	1.6	28
Sweden	5.1	9
UK	5.3	60
USA	9.4	298

Source: WWF Living Planet Report 2008, WWF, Gland, Switzerland, [www.panda.org](http://www.panda.org)



**Activity two: Footprints across the planet:  
Activity sheet MC5  
Ecological Footprints for selected countries of the world**

Country	Ecological Footprint gha/person	Population (millions) 2006
Australia	7.8	20.2
Bangladesh	0.6	141.8
Bolivia	2.1	9.2
Cambodia	0.9	14.1
Canada	7.1	32.3
Chile	3.0	16.3
China	2.1	1323.3
Cuba	1.8	11.3
Egypt	1.7	74.0
France	4.9	60.5
Greece	5.9	11.1
Holland	4.0	16.3
Honduras	1.8	7.2
Hungary	3.5	10.1
India	0.9	1103.4
Jamaica	1.1	2.7
Japan	4.9	128.1
Kenya	1.1	34.3
Korea Rep (N)	3.7	47.8
Kuwait	8.9	2.7
Mexico	3.4	107.0
Mongolia	3.5	2.6
Mozambique	0.9	19.8
New Zealand	7.7	4.0
Peru	1.6	28.0
S. Africa	2.1	47.4
Spain	5.7	43.1
Sweden	5.1	9.0
Thailand	2.1	64.2
UK	5.3	59.9
USA	9.4	298.2

Source: WWF Living Planet Report 2008, WWF, Gland, Switzerland, [www.panda.org](http://www.panda.org)



**Activity three: Consuming passions:**  
**Activity sheet MC6**  
**Consuming and conserving societies**

"Our enormously productive economy... demands that we make consumption our way of life, that we convert the buying and using of products into rituals. We need things consumed, burned up, worn out, replaced and discarded at an ever-increasing rate."  
The Worldwatch Institute

After you have finished the task, complete the chart below by copying the **key words** (those words in bold on the statement cards)

What a consuming society does	What a conserving (sustainable) society does



**Activity three: Consuming passions:  
Activity sheet MC6 continued  
Consuming and conserving societies**

I think that in Scotland we are, at the moment, a \_\_\_\_\_ society. I would like us to \_\_\_\_\_ a \_\_\_\_\_ society in the future.

Choose from:

consuming

conserving  
(sustainable)

remain

become

I think this, because \_\_\_\_\_

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**Activity three: Consuming passions:  
Activity sheet MC7  
Society characteristics**



Uses up energy and resources as if an unlimited source, with no worries of their waste or renewal.

Uses only as much energy and resources as it needs to. Always uses renewable sources where possible and minimises waste.

Makes/buys cheap and convenient goods that don't last long.

Tries to make/buy long lasting goods that can be maintained and repaired.

Produces goods in large quantities. Often considers cash cost but not the effects on people (at home or abroad) and the environment.

Carefully considers and balances all costs - people (at home and abroad), environment and cash - involved in making goods.

Concentrates on short-term cash benefits and goals normally.

Tries to show concern for the future, by looking at long-term benefits and goals - cash, people, environment.

Avoids responsibility - often relies on someone else (government) paying to develop the technology to clear up the mess.

Takes on responsibility - individuals, communities, businesses and industry as well as government try to save energy and resources, and dispose of their wastes carefully.



**Activity four: Connection inspection:  
Activity sheet MC8  
Making footprint connections**

Food



Energy



Building



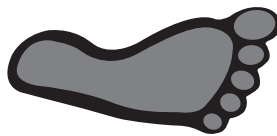
Water



Transport



Waste





**Activity three: Connection inspection:  
Activity sheet MC9  
Making footprint connections**

Example of how to make the connections between 'Food' components and the other components' footprints

**Energy**



cooking  
processing  
producing  
processing waste

**Food**



eating  
cooking  
processing

**Building**



**Water**



growing/tractors  
source - processing  
processing sales  
wholesale - retail

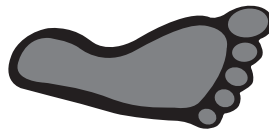
production waste  
processing waste  
after-eating food waste  
transport route  
cooking food

processing water - urine/faeces  
cooking  
processing  
growing

**Transport**



**Waste**





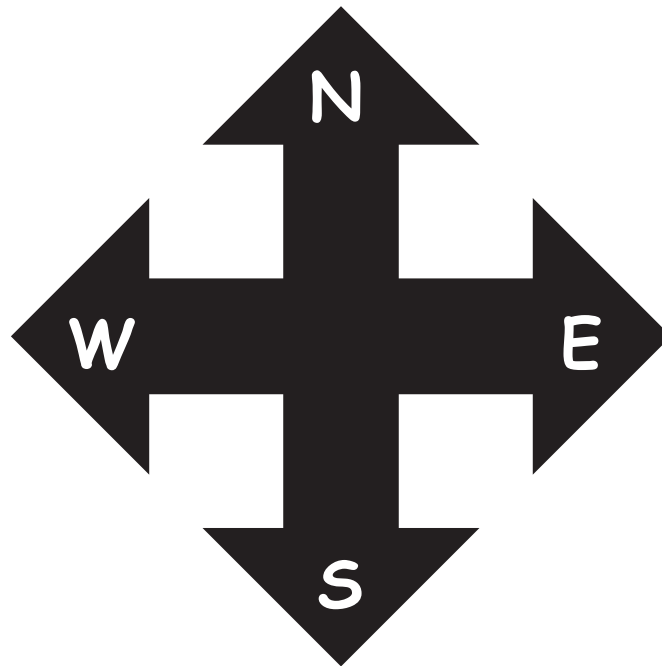
## Activity five: Making connections: Activity sheet MC10 Route finder guide

### Natural environment

These are questions about the natural and built environment  
- energy, air, water, soil, landscapes and habitats, oceans and seas, rocks and minerals, climate, wildlife and their inter-relationships.

### Who decides?

These are questions about power, who makes choices and decides what is to happen. Who benefits and loses as a result, and at what cost.



### Economic

These are questions about money, trading, aid, buying and selling and ownership.

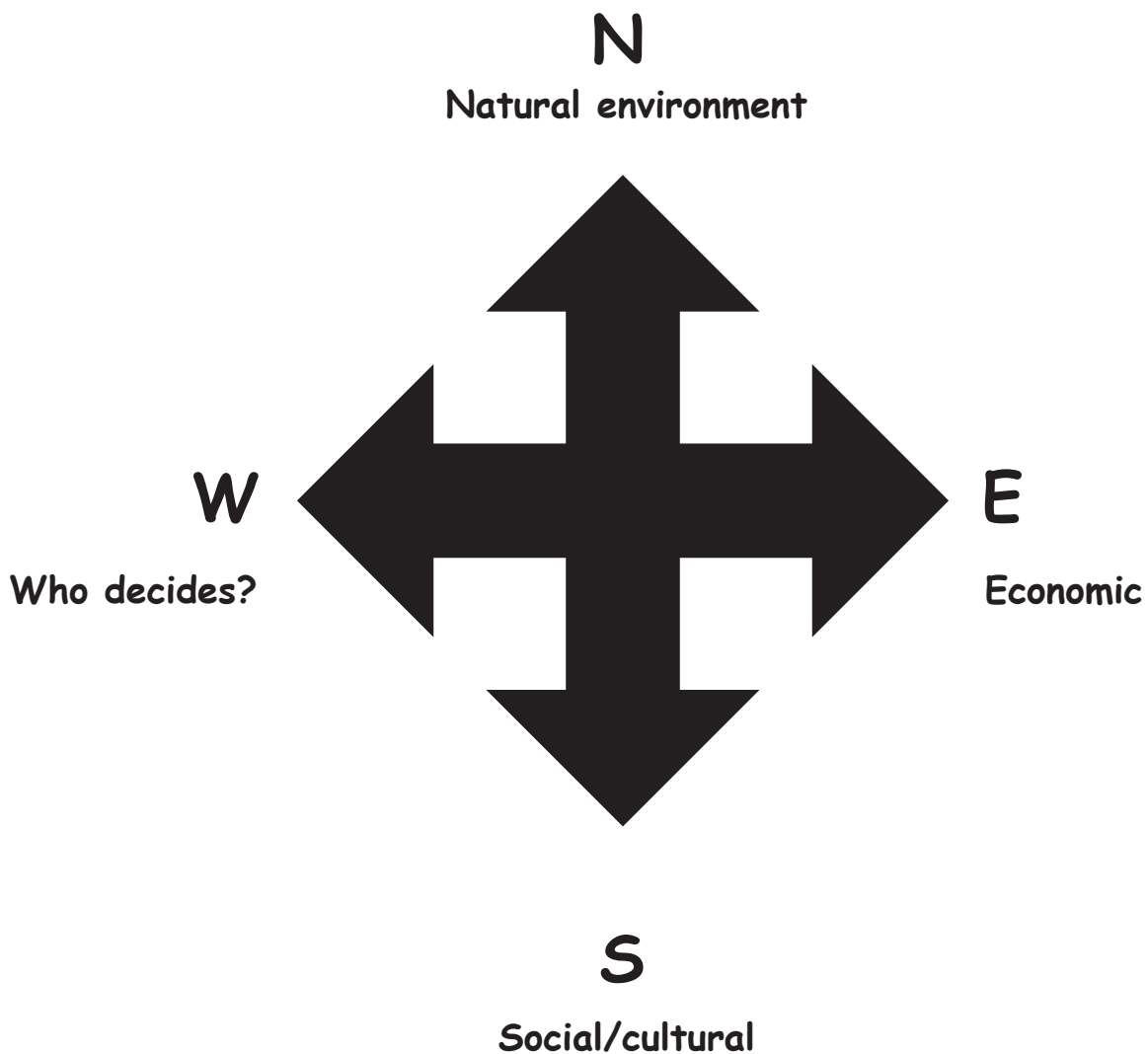
### Social/cultural

These are questions about people, their relationships, their traditions, culture and the way they live. They include questions about how, e.g. gender, race, disability, nationality, class and age, affect social relationships.



**Activity five: Making connections:  
Activity sheet MC11  
Route finder**

Write the issue you are looking at in the middle of the cross. Using the questions on the 'Route finder guide', jot down in pencil your thoughts for each direction, and share these within your group. If you change your mind you can rub things out or add things on!





**Activity five: Making connections:  
Activity sheet MC12  
Descriptor cards**

<b>Economic</b>	<b>Social</b>
<b>Ethical</b>	<b>Political</b>
<b>Environmental</b>	<b>Cultural</b>
<b>Scientific</b>	<b>Technological</b>
<b>Historical</b>	<b>Quality of life</b>
<b>Global equity</b>	<b>Human rights</b>
<b>Ecological</b>	<b>Emotional</b>
<b>Local/national</b>	<b>Global</b>



## Activity six: What makes a good global citizen: Activity sheet MC13 Active global citizenship survey

"An active global citizen is someone who thinks about what is happening across the planet and gets involved to make things better."

Name: \_\_\_\_\_ Date: \_\_\_\_\_

1. Look at the list of skills below. Shade the lines to show how important you think each of the skills is for being an active global citizen. 1 = not important 6 = very important

Skill	1	2	3	4	5	6
Working as part of a team						
Doing everything on your own						
Reading newspapers/internet for news about the planet						
Watching TV						
Taking part in discussions to hear other viewpoints						
Keeping your opinions to yourself						
Challenging other people's ideas						
Taking up opportunities to talk with people from other countries						
Always doing things with the same people						



**Activity six: What makes a good global citizen:  
Activity sheet MC13 continued  
Active global citizenship survey**

2. Read the statements below. Decide whether you agree, disagree, or are not sure, with each statement. Place a dot with the letter for each statement on the scale.

- A - I want to learn more about how to change things I care about.
- B - I cannot help change things happening on the planet.
- C - I am a local citizen and a global citizen.
- D - I have nothing in common with someone living in a poorer part of the world.
- E - The world is like one big global village and all people are connected to each other and to the natural environments we live in.

	Agree strongly	Agree	Not sure	Disagree	Disagree strongly
A					
B					
C					
D					
E					





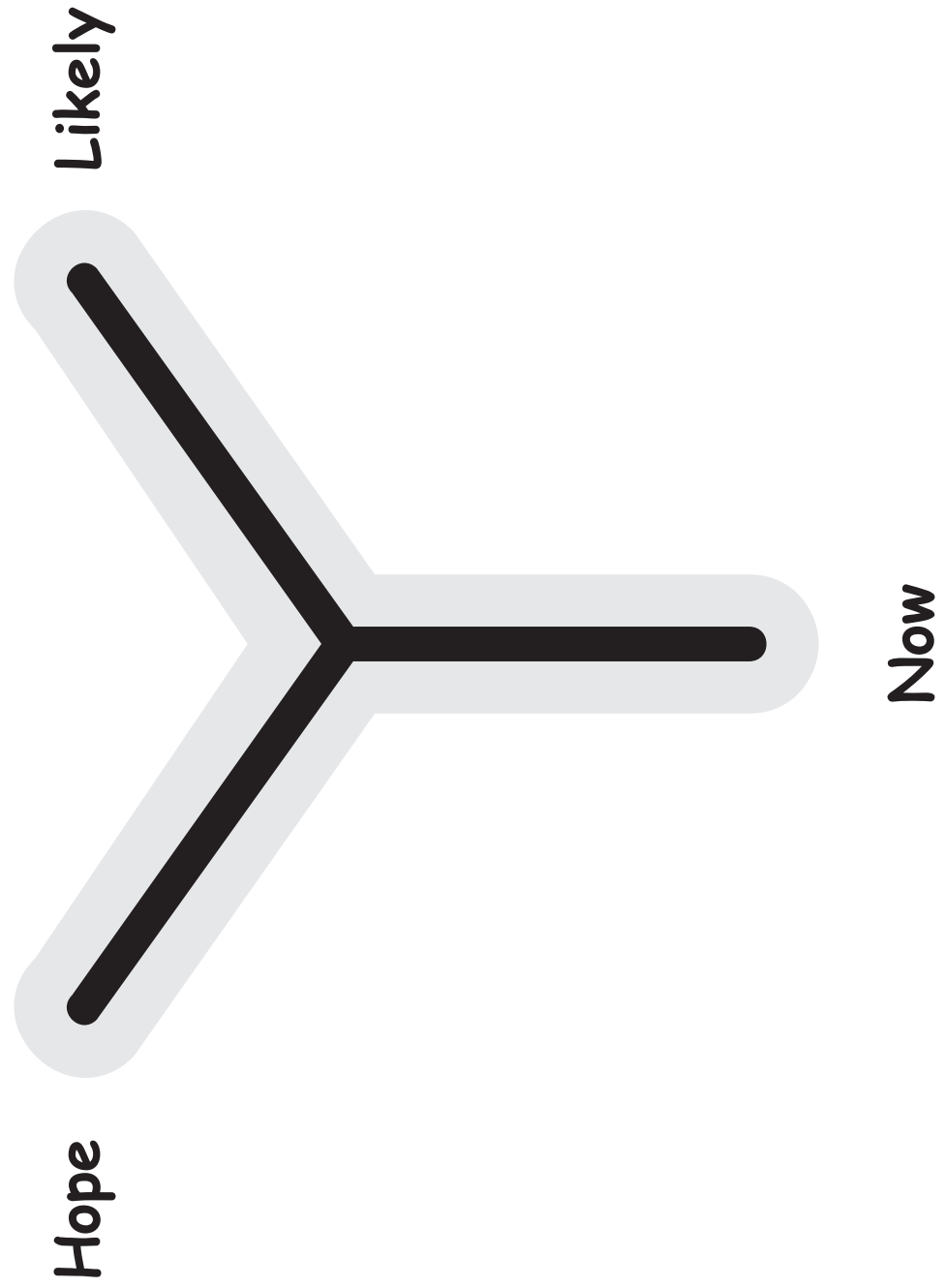
**Activity seven: Futures:  
Activity sheet MC14  
V for vision**

What are the most important things about the school buildings and school grounds that have an impact on you **now**?

What do you **hope** will happen in the future that might make it different for future learners?

What do you think is likely to happen?

You can label and illustrate the timeline below to show your ideas







## Part 2

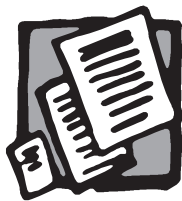
# Unit 2: Buildings and place

### Key ideas

- A sense of place contributes to a sense of belonging to a place or community. (*Special places*)
- Buildings and landscapes provide local distinctiveness, and project messages about the people who live in, work in, or design them. (*Building sense, Special places, Sense of place*)
- Technology can provide solutions in reducing the impact on the environment of our buildings – their construction and maintenance - if appropriate materials and designs are used. (*Building sense, Calculating footprint*)
- The way our school buildings and grounds are managed and used reflects the ethos of the whole school, and promotes active learning and positive behaviour. (*Sense of place, Sharing our space*)
- Developing school grounds is a valuable means of practising skills in sustainable living, and raising both the biodiversity value and biocapacity of our local environment. (*Building sense, Sense of place, Sharing our space*).

# Background notes

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The Buildings and Place component of *Schools Global Footprint* is concerned with emphasising the energy required to supply and build, or refurbish, the school buildings, and demonstrating the energy intensity of different building designs. At a learner level, in real life, such decisions will appear difficult to influence, particularly in the short term, unless a school 'new build' is planned. What they can influence, however, is how their school buildings and grounds are managed and used – developing skills in their care and development with sustainable outcomes in mind. Two organisations providing useful resources and advice in Scotland are Grounds for Learning<sup>1</sup> (the Scottish arm of Learning through Landscapes) based in Alloa and The Lighthouse – Centre for Urban Design and Architecture<sup>2</sup> in Glasgow.

In *Special Places, Special People*, 1994 (now out of print), Wendy Titman describes some revealing research from the early 1990s, looking at children's views about school grounds and how they feel adults value the school environment. Importantly, she found that children view their school (buildings and grounds) as an entity – a whole unit. In addition, where none of the children's needs for play were met in the playground, they believed the adults knew this and by implication didn't care. Thus we may assume that young people interpret from their school buildings and grounds the attitudes and values of those responsible for their design and management. If we are teaching about the importance of sustainable development and sustainable lifestyles in the classroom, our school buildings and grounds need to model management practices demonstrating a commitment to sustainable development and sustainable lifestyles.

Patrick Geddes, born in Perth in 1854, was a Scot well ahead of his time with regard to thinking about sustainable lifestyles and considering 'the whole' rather than 'the parts'. He had the opportunity to experience and explore the countryside as a boy, and develop an interest in landscapes and the natural world. As an assistant in the Botany Department at the University of Edinburgh in the late nineteenth century, he was appalled at the living conditions of people in the city. His vision was to restore harmony to human life, by bringing together the threads of place (environment), work (economy) and folk (community/society). He believed the industrial revolution had been harmful in destroying the links between people and place. He developed an ambitious programme of civic and environmental renewal, creating places where people could enjoy greater personal fulfilment and creative expression – including the restoration of tenements, creation of gardens and improvement of open spaces. He involved local people in the process of rehabilitation within their local community. There are many examples of projects that continue his work, although his name and his work are rarely celebrated in Scotland.

We all have a unique perspective of, and attachment to, the place where we live/play and how we choose to interact with our built, or natural, environment. Whether we feel attached to a place relies more on us than the place. We each come to view our familiar places with a different set of values and emotional attachments. Mental maps can be used as a tool to bring awareness of these differences and to help people express an individual relationship with their neighbourhood. Accuracy, scale and detail are not a priority in this case. We do not use mental maps to navigate; rather as a tool to provide an opportunity to reflect on how we feel about landmarks and places in our local environment. The landmarks chosen by individual children can be surprising, since their perspective is generally different from adults.

1. Grounds for Learning – [www.gflscotland.org.uk](http://www.gflscotland.org.uk), tel: 01259 220887.

2. The Lighthouse – Sustainability and Building Design – [www.thelighthouse.co.uk](http://www.thelighthouse.co.uk), tel: 0141 221 6362.

Today, some children may not have the opportunity to interact with a truly ‘natural’ environment, and particularly not on their own – without an adult close by, and their only place for safe play is in the school grounds. Even so, their school grounds may be a predominantly ‘built’ environment – tarmac, brick, and stone. If we seek to encourage young people to empathise with and care about sustaining either our built or natural heritage, we need to provide experiences of our natural as well as our built heritage; engage their senses and sensibilities, and provoke emotional/spiritual responses to what is around them. Knowledge of and about such places is not enough. There are ideas and activities designed to develop sensory awareness to the natural world, which most local Countryside Ranger services will be able to provide, or which can be found in the publications by Joseph Cornell and Steve Van Matre (see the Resources section on page 77 for details). Similarly, there are resources to help a sensory exploration of our built environment.

Nature conservation is not a new idea and it is a popular topic in schools, now being associated with the concept of biodiversity. The values and attitudes that apply to conserving personal things in our lives also influence the decisions we make as a society about land use and protected areas. It was another uncelebrated Scottish American, John Muir, who first championed the need for protecting areas of wild land from development across the USA – later called National Parks – in the late 1800s. Making choices often involves compromise and foregoing something else. Decision-making is complex. Choices made for one set of circumstances may be completely different under a different set of circumstances. An ability to think critically is vital in developing attitudes and dispositions to conservation and change.

Biodiversity can be measured in different ways: species diversity (the variety of living things), ecosystem diversity (variety of habitats), and genetic diversity (variety within species groups in an area). One of the keys to conserving biodiversity is making sure we maintain healthy ecosystems. One means is to create ‘protected areas’ of special biodiversity or landscape value – of which we have many in Scotland – and lists of ‘endangered species’ with legal protection. More importantly, we now realise that we need to conserve the ‘ordinary and commonplace’, maintaining diversity in all the places not protected. Many local councils in Scotland are working with communities to prepare Local Biodiversity Plans (LBAPs) and there are many ways schools can be involved, both in their school grounds and the wider community. Have a look at the Biodiversity Unit in the Eco-Schools Guide for more ideas ([www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org)).

In looking at the Buildings and Place component of your school’s Ecological Footprint, the positive and negative aspects of the school buildings and school grounds, and their management, can be starting points for developing ideas to enhance their environmental<sup>3</sup> and learning<sup>4</sup> potential. As with all aspects of *Schools Global Footprint* this is a way to meet the four capacities of Curriculum for Excellence, particularly Responsible Citizens.

3. Taken here in its widest sense of stimulus value – visual, emotional, imagination, physical challenge – and wildlife/landscape value.  
4. Includes informal and hidden curriculum as well as formal attainment outcomes.

# Objectives and outcomes

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Young people should learn:

## Knowledge

- To reflect and express their interpretation of and feelings about places they are familiar with; demonstrate their sense of place. (*Special places, Sense of place, Building sense*)
- To describe the main elements of the landscape, and/or a building that make it pleasing, or less so, visually and to our other senses. (*Special places, Sense of place, Building sense*)
- To describe ways in which 'appropriate' technology can improve housing design, bringing benefits to people and the environment – locally and globally, and reduce their footprint. (*Building sense, Calculating footprint*)
- To give examples of ways in which both rare and common living things and their habitats can be conserved. (*Sharing our space*).

## Skills

- To demonstrate an ability to handle information, present data for interpretation and use information to make informed and balanced choices. (*Sharing our space, Calculating footprint*)
- To demonstrate an ability for thinking about alternative possible futures and identifying necessary changes. (*Sense of place*).

## Values and dispositions

- Concern for and appreciation of all living things, their needs and dependencies, and an appreciation of them as a source of inspiration. (*Sharing our space*)
- Respect for and value of human diversity globally, and appreciate that the quality of life for future generations can be enhanced or endangered by actions we take now. (*Building sense, Sense of place*)
- To be willing to act as a responsible citizen, learning from and working with others to improve the buildings and places where we live with respect for sustainability. (*Sharing our space, Sense of place*).

# Activity one: Calculating your school's buildings footprint

## You will need

- plans of the school
- paper, pencils
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



## Time

Allow 30 minutes/open

## What to do

Ask how your school building and grounds affect the buildings component of its Ecological Footprint. Schools take up land space. Materials made from natural resources are used to construct the buildings. Making materials and constructing buildings uses energy. Fossil fuels that provide the energy are non-renewable resources and also release carbon dioxide when burnt.

Calculate the buildings component of your school's Ecological Footprint by working out the amount of floor space taken up by the school. Use plans of the school to work out the floor space area of the school in square metres. Divide the result by the total number of learners (or learners and staff) in the school to find out the number of square metres for each person.

Buildings (m2)	Number of people	Square metres per person

Record and save the results in the buildings tab of the downloaded Excel workbook. Then enter these results into the buildings section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the buildings component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the construction of your school buildings, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

# Activity two: Building sense

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## You will need

- paper and pencils, art materials and ‘tools’
- *Wall to Wall Design Pack* (see Resources section on page 76 for details)
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



## Time

Allow 40 minutes/open

## What to do

If you have already looked at the energy component of your school's Ecological Footprint, learners will have been introduced to some aspects of energy conserving designs, otherwise you may have to do some prompting – construction of building materials/life cycles/energy use.

Brainstorm the ways the school buildings and grounds will contribute to your school's Ecological Footprint. What effect does built land have on the biocapacity of the areas affected? Why do some people get upset by building developments on 'new' land?

Go to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) and calculate the size of the buildings component of your school's Ecological Footprint. How does it look? Use the Action Plan data to compare the use of different building materials and designs to conserve energy. Are there realistic improvements that could be made to reduce the size of the buildings component of your school's Ecological Footprint? Does the design of the school make it locally distinctive in any way? Is there any way to enhance or create its distinctiveness?

Invite the local council architects to visit and describe how they work, and how a new build school is planned and explain key elements of the Scottish Government's policies on sustainable school design.

To make a global comparison, you can use the *Wall to Wall Design Pack* produced by Practical Action which looks at sustainability, design and technology issues relating to Maasai housing in Kenya, and an ecological housing development in Hockerton, Nottinghamshire.

Ask the class, using the knowledge gained, to work in small groups (four to five) as design teams brought in to develop plans for a new build Eco-School, good for the purpose and nice to be in – with as low an Ecological Footprint, for construction and maintenance, as possible. Either choose the existing site, or another known site. Encourage them to organise themselves as a team, plan the project out (what jobs need to be done) and look at the task holistically – the situation (in terms of travelling to school), the site (aspect, slope, grounds development), as well as the actual building design (use by the community). They will present their designs as plans and/or 3D models explaining their choice of design. These can be made to scale depending on ability levels/time available. If you have a link school, you may exchange plans and the principles of their design.

Ask for opinions about the plans presented.



# Activity three: Special places

Activity adapted from *Arts in the School Grounds*, Learning through Landscapes/Southgate Press and *Second Nature – ‘Mental Maps’*, RSPB

## You will need

- clipboards, paper and drawing equipment.



## Time

Allow 1.5 – 2 hours

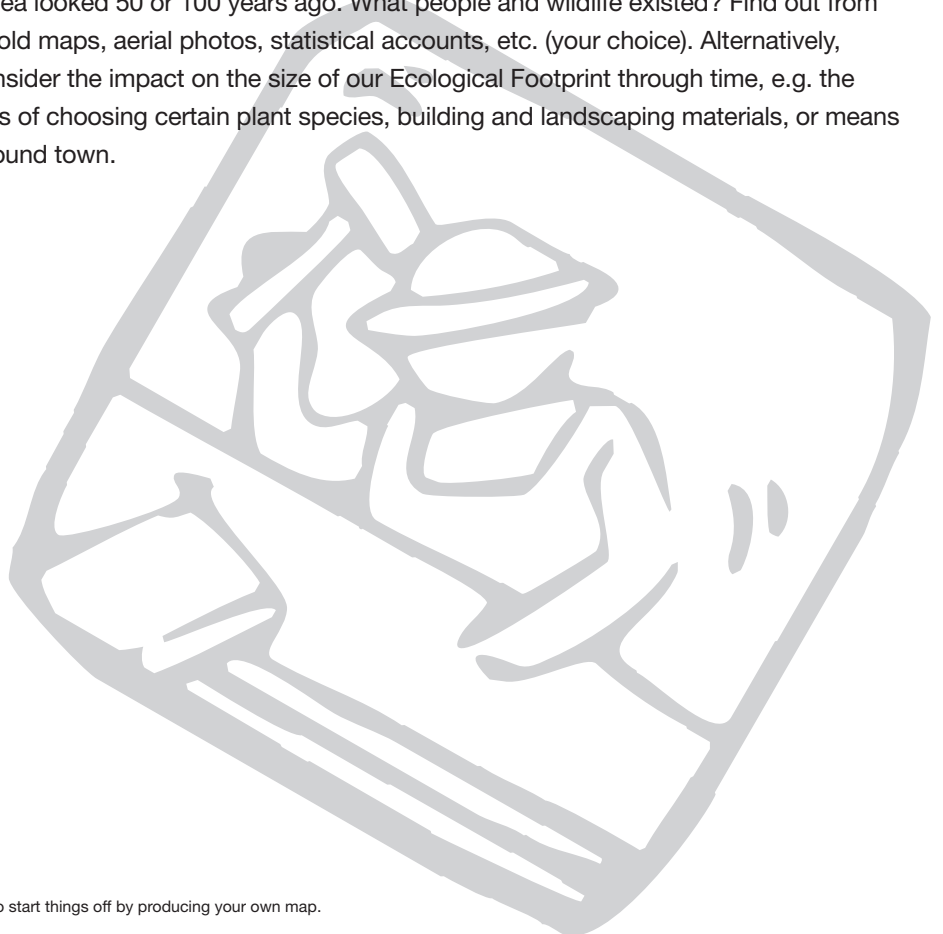
## What to do

Begin by asking the learners about special places in the local area. Discussion may be helped by asking specific questions. Why is one place more important/significant? Do their special places tend to be in a natural/built environment and why? What is it that makes special places so special? Ask them to produce a drawing of their neighbourhood (or school buildings and grounds if they prefer) and its special places for them<sup>5</sup>.

Take the learners outside and compare their drawings with the experience of being outdoors. Discuss what they put in and left out from their drawings and why. Now ask the learners to produce another map, this time working outside, in and around the school grounds. Ask them to focus on three different elements: landmarks (places/points of significance, e.g. trees, buildings, structures); areas (larger areas – woods, playground, grass, parks, shopping precinct); and paths (connecting routes or features between places). Encourage the sharing of their maps, explaining why they feel the areas and landmarks they have chosen are special.

This could lead on to the question: “What about children in the past?”. Follow up with research on how the area looked 50 or 100 years ago. What people and wildlife existed? Find out from local people, old maps, aerial photos, statistical accounts, etc. (your choice). Alternatively, you could consider the impact on the size of our Ecological Footprint through time, e.g. the consequences of choosing certain plant species, building and landscaping materials, or means of travelling round town.

5. You may choose to start things off by producing your own map.



# Activity four: Sense of place

## You will need

- time to 'recce' an appropriate space/route to carry out an Earth Walk, with the necessary props for the four to five activities chosen
- a space where everyone can sit comfortably in a circle on chairs/benches/logs/sit-upons on the ground (outside preferable); they need to be able to make eye contact; time to organise prompt questions
- Activity sheet BP1 – 1 each/pair.



**Time**  
**Allow 2 hours**

## What to do

Use a relaxation activity for the group out of doors ('Waterfall' from *Values and Visions*, [see the Resources section on page 77 for details] or have a look at [www.LTScotland.org.uk/healthpromotingschools](http://www.LTScotland.org.uk/healthpromotingschools)). Then take a sensory walk (ideally an Earth Walk) around the school buildings and grounds. Consider/note sounds, smells, textures and touches, sights and spaces, emotions. Does it have a sense of place? What makes it feel distinctive? In a sharing circle, ask for a single characteristic/feeling about the buildings/grounds for them – then you may explore what gives good or bad feelings about the place?

Or, use circle time to explore learners' feelings about their school environment. Use a silent changing places activity: you make a statement, and if they feel the same, they get up and change places with someone else who has stood up. If no-one else shares the sentiment, they can change places with you, as facilitator. For example, start with some easy ones: if you ate breakfast today, if you walked to school today, if you like pizza. Build up to: if you like your school environment, if you generally feel happy in the school grounds, if you often feel sad, if you have ideas to improve what you can do in the school grounds, if you have ever been consulted about your ideas.

Move on to a sentence completion activity, where they listen to a sentence and then someone completes it, and it goes round in a circle. There are three ground rules: listen to others; no comments; pass if you want to and the facilitator can return to you. Again start with some non-threatening statements such as my favourite food is....; a good thing that happened to me this week was.... Start with the first hand that goes up and work alternately clockwise or anti-clockwise round the circle. Follow on with more thoughtful sentences such as: one thing I like about the school environment is...; then, one thing I don't like...; then, one thing I would change is..., because...'. Finish with an open discussion exploring what they have learnt, any comments about things people said, any further ideas, etc.

It will probably arise that visual impacts are important to us and affect our quality of life. Identify those components of the external visual design of the school and grounds that affect them most. Think about all the 'impacts' the buildings and grounds have on them – remember that this is their environment for 25% of their school day – physically, aesthetically and emotionally. Agree which are more positive/negative? What about the future? What would they like to do? What changes would make a difference? Which are possible? Use Activity sheet BP1 to help organise their ideas individually/in pairs/in small groups. Share their visions.

# Activity five: Sharing our space

## You will need

- a variety of sampling equipment, trays/bugboxes, magnifiers, identification keys (simple branched, for all levels), reference books – per group
- clipboards, Activity sheet BP2, recording sheets – 1 each
- set of cards from Activity sheet BP3 enlarged on a photocopier, cut up into cards and laminated, then placed in an envelope – 1 per group
- Activity sheet BP4 – 1 per group
- invited 'expert/s' from the local community/local council (optional).



**Time**  
**Allow 4 – 7 hours**

## What to do

Carry out a 'space audit': find out what other communities (plant and animal) are sharing the school's space with them – be it in the basement, at ground level, in the upper levels. Emphasise that the greater the number of different species, the higher the biodiversity value of the school grounds. If you want to do this in some detail, discuss different methods of survey for different species groups and demonstrate use of equipment and identification keys. Organise groups to survey different levels/areas of the grounds: provide them with clipboards, collecting equipment and identification keys. Identify tasks and design recording sheets (see Activity sheet BP2). Encourage them to look carefully, in the least expected places<sup>6</sup>, but always place the animals back where they found them and leave things as they found them. Present their findings to the rest of the class. Collate the results and set up a database to update annually.

Working in small groups of three to four, give each a set of activity cards from BP3 – 'To conserve or not' ('Wildlife versus people' in *Second Nature*, see the Resources section on page 77 for details) and ask them to rank them using Activity sheet BP4. Remember to stress that there are no right answers, but they need to have reasons to back up their choices. Ask them to share their ranking with another group. What are the similarities and differences? How did their ranking justifications differ?

What are the needs of plants and animals for healthy living space? By improving their living conditions and the variety of homes, greater numbers of species may be attracted to move in, increasing the biodiversity of an area. How do we do this in the school grounds, and/or the local community? How might we raise the biocapacity of the school grounds and/or the local community? If you chose school, use the responses to the above to inform the Action Programme. If looking at the local community and making links, ask along a Countryside Ranger or Local Biodiversity Action Plan/Farming and Wildlife Advisory Group/Scottish Natural Heritage advisers to talk about/demonstrate/take you for a field visit, showing what is being done locally. Take a look at the Biodiversity Unit in the Eco-Schools Handbook. Use the internet to look at biodiversity websites. Prepare posters on different local habitats/species, their importance and their conservation management.

6. Some old pieces of carpet, or a few logs left in less obvious places around the school grounds for a few weeks, will ensure a good variety of new neighbours!

# Assessment and evaluation

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## Teacher observation

- Ease/difficulty in participating in Earth Walk activities and using senses in observing the world from a different perspective
- Ease/difficulty of contributing to sharing circle – observing and listening to others, allowing everyone to have their say
- Ease/difficulty in expressing own viewpoints and accepting others – finding out and acknowledging how others feel
- Ease/difficulty in identifying visual components of their school environment affecting them in various ways
- Ease/difficulty in using imagination to create a realistic future vision of how they might like things to be
- Ease/difficulty in making connections between issues, and changes that could be made to improve things
- Application of knowledge, understanding and skills in planning, carrying out and reporting on a field investigation
- Technical skills – handling field survey equipment and identification keys, information, ICT
- Use Connection inspection – Making footprint connections (Activity sheet MC8).

## Self/peer observation

Use the 'Active Citizenship Skills Chart' from the resource *Get Global!* (see the Resources section on page 77 for details).

# Resources

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## For teachers

### *Arts in the School*

A4 book by Brian Keaney, published by Learning through Landscapes/Southgate. Looks at the interaction between children and their school grounds and its impact on the imagination. Includes sections on process, celebration and performance, sustainability, artists in residence and case studies. £9.50. Available from [www.ltl.org.uk](http://www.ltl.org.uk) and [www.gflscotland.org.uk](http://www.gflscotland.org.uk)

### *Building Connections*

Website for teachers and learners with a range of materials, ideas and case studies for teaching and learning across the curriculum. [www.buildingconnections.co.uk](http://www.buildingconnections.co.uk)

### *Wall to Wall Design Pack*

A4 ring binder (2001). A Design and Technology resource pack for S1/S2 learners, produced by Practical Action. Looks at the design and construction of sustainable homes, through two detailed case studies – Maasai in Kenya and a sustainable housing scheme in Nottinghamshire, UK. Available from [www.practicalaction.org](http://www.practicalaction.org)

### **Get Global!**

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities enabling higher order thinking by learners – good for approaches to issues and investigations. ISBN 1 872502 91 1.

Available in pdf format on the websites below:

[www.actionaid.org.uk/schools](http://www.actionaid.org.uk/schools)

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

### **Second Nature – Society, Science and Technology**

A4 spiral bound resource from RSPB Scotland. ISBN 1 901930 36X. Full of imaginative and practical activities. Good section on encouraging a sense of place and conservation/protected places. Available from RSPB Scotland, Dunedin House, 25 Ravelston Terrace, Edinburgh EH4 5TP.

### **Sharing Nature with Children – I and II**

Two collections of stimulating ideas and activities written by Joseph Cornell. Promoting sensory awareness and a sense of relationship with the natural world. Well laid out and easy to follow activity outlines. ISBN 0 905521 36 6 and ISBN 1 883220 87 4.

### **Earth Walks – Snow Walks and Earth Magic** (plus binder)

Two collections of activities that may be selected from and woven into an hour long experience, designed to heighten sensory awareness of the natural wonders of the world, and provide different perspectives. Written by Steve Van Matre. Published by the Institute for Earth Education. Website: [www.earthed.org.uk](http://www.earthed.org.uk)

### **Values and Visions: a handbook for spiritual development and global awareness**

DEP, 1995. Resource for teachers showing how personal, social and global issues are interrelated and how they can be explored in an experiential and participatory way. Four key areas are explored – a sense of self, sense of community, valuing the Earth and developing openness to suffering and joy. Available from Scotdec – [www.scotdec.org.uk](http://www.scotdec.org.uk)

### **For teachers and learners**

[www.biodiversitystories.co.uk](http://www.biodiversitystories.co.uk) – stories about Scottish nature and the way people see it.

[www.thelighthouse.co.uk](http://www.thelighthouse.co.uk) – architecture and design activities.



**Activity four: Sense of place:  
Activity sheet BP1  
V for vision**

**Now**

**Action**

**Future**





**Activity five: Sharing our space:**  
**Activity sheet BP2**  
**School's grounds space audit**

Family	Number of different species/name	What level do they live? e.g. basement, ground, upper	What kind of place/habitat? e.g. grass, soil, rotten wood, damp/dry, dark/light, windy	What are they doing? (if appropriate)
<b>Animals</b>				
Minibeasts/invertebrates				
Amphibians/reptiles				
Mammals				
Birds				
<b>Plants</b>				
Trees				
Shrubs				
Others				



**Activity five: Sharing our space:**  
**Activity sheet BP3**  
**To conserve or not**

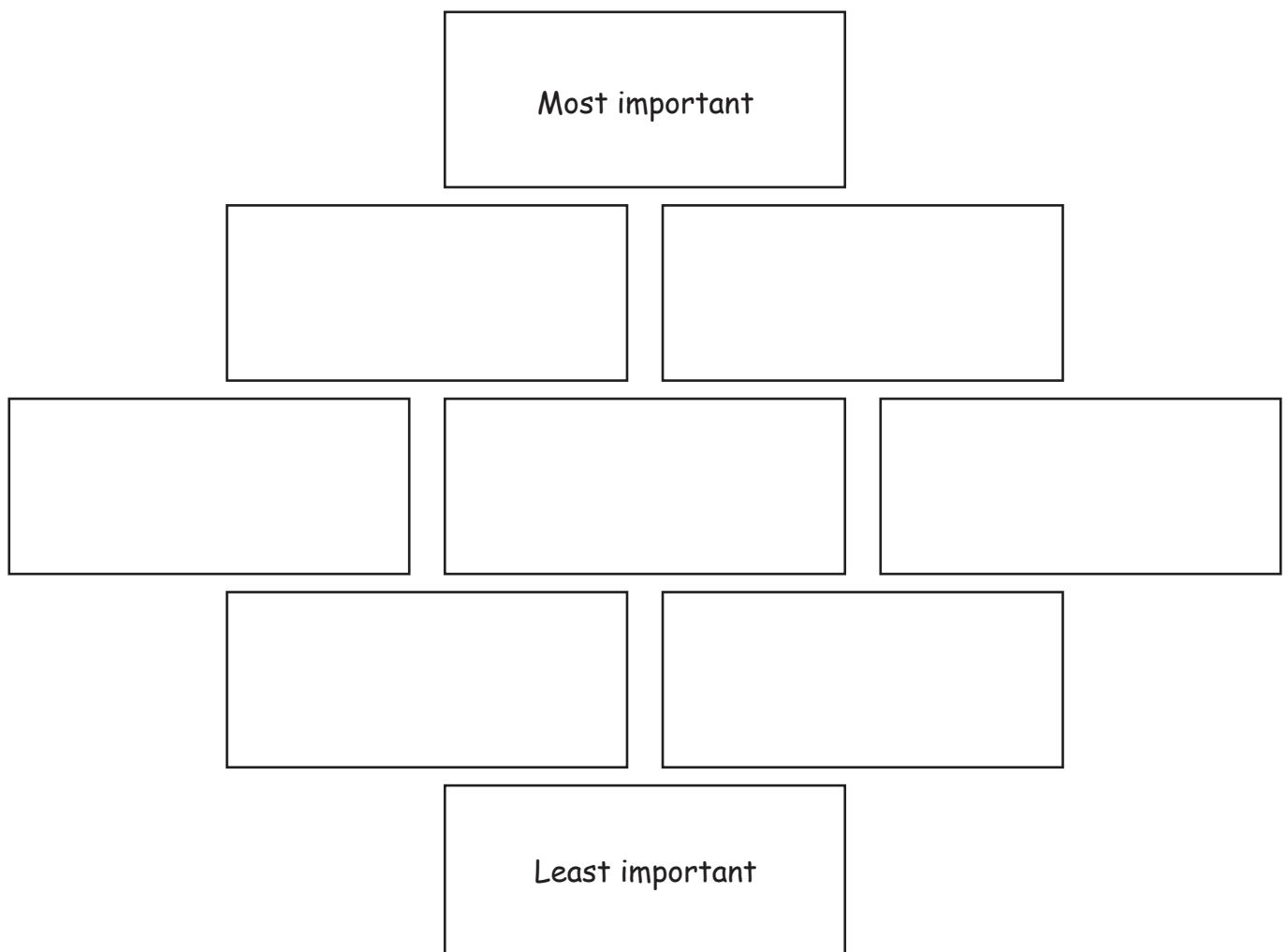
<p>Some animals are dangerous or unpleasant like snakes, mosquitoes and midges. It doesn't matter if they become extinct.</p>	<p>Many wild animals (like wolves and beavers) were wiped out in Scotland years ago. We have no right to tell people in other countries not to let their animals or plants become extinct.</p>
<p>If an animal becomes extinct, it can never live in the world again. This makes me feel sad and worried.</p>	<p>People are more important than animals. We should care more about people than whether animals die out.</p>
<p>All living things, including people, need other living things. They are in balance in an ecosystem. If something becomes extinct, this balance can be affected and can be dangerous for us and the world.</p>	<p>Some animals provide employment for people e.g. farms and parks. People would suffer if animals became extinct.</p>
<p>If an animal is nearly extinct we can keep it in the zoo. We don't need to worry about not being able to see it in the wild any more.</p>	<p>Why should we care if an animal dies out? It won't make a difference to our lives.</p>
<p>Everything in nature is wonderful. We should care for all animals and plants, regardless of whether they are cuddly or useful to humans.</p>	





## Activity five: Sharing our space: Activity sheet BP4 Diamond ranking activity

1. You will be given an envelope with a set of cards, each with a statement. In your group, sit in a circle and place the cards face down in the middle, in a pile. Take it in turns to turn up the cards and discuss each one in term. Ask questions if you don't fully understand what the statement means.
2. Debate and agree an arrangement of the statements, either on your own, with a partner, or in a group. The most important in your opinion is at the top, and the least important at the bottom. Arrange the rest in between, with the more important nearer the top. **Make sure you can explain why you chose the arrangement you have made.**
3. When you have arranged all the statements, see how your arrangement compares with other groups. **There are no correct answers**, but if there are differences try to find out why you had different opinions.







# Part 2

## Unit 3:

# Energy

### Key ideas

- The choices we make to support our lifestyle – e.g. heat, light and power consumption, the efficiency of the appliances we use, and how we insulate our buildings – make a difference to the size of our Ecological Footprint. (*Home truths, Calculating footprint*)
- Energy is easily wasted but also conserved. (*Home truths*)
- Few problems can be described in terms of a simple, linear cause and effect model. Most problems are complex webs. (*Chain reaction*)
- People have different ideas about problems and how to solve them; such diversity should be acknowledged and may be useful in coming to realistic and informed decisions/solutions. (*Chain reaction*)
- Energy production and consumption embraces many environmental, economic and social issues, from the local to the global. No source of energy can provide electricity without having an environmental impact. (*Alternative choices*)
- Technology and wise decision-making by government and business can lessen our Ecological Footprint. (*Home truths, Alternative choices*).

# Background notes

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People depend on the Earth's natural resources for a steady supply of basic requirements for living. Energy is needed for heat, light, transportation, housing, products and services, food and clean water. Our use of energy is fundamental to our daily lifestyle – making toast, driving around, switching on lights, the TV, washing machine or hair dryer, keeping warm or cool; yet because we can't see it, and for most of us its source is remote, we find it a difficult concept to understand, even as an adult. We rarely think about where it comes from, or where it goes, let alone what impact it has directly, or indirectly on the environment or other people. However, understanding about energy is fundamental to appreciating the importance of consuming less and being more efficient in our use of energy and natural resources, and the disposal of any waste products (including heat and light).

Our current lifestyles are not sustainable in terms of our average energy use. There are many factors affecting individual energy use, including income levels, standard of living and quality of life choices, geographical location, age and health dimensions.

There are now a number of energy sources available to governments. Our choices are varied, and the balance of use and popularity constantly changes, depending on current opinion about the potential advantages and risks attached. The choices include:

- non-renewable: fossil (coal, oil, gas) and nuclear (fission or fusion) sources
- renewable: hydro/water, solar, wind, wave, tides, geothermal heat, organic (plants and animals [biogas, methane]) sources.

Looking at environmental and natural heritage impacts, there is no such thing as a totally 'green' source of energy and some difficult trade-offs have to be made. Some energy supply technologies may pose less of a problem for the environment, e.g. in terms of carbon dioxide or sulphur emissions, but any form of energy supply can damage habitats and the wider environment. Our contribution to global pollution problems, such as global warming and climate change, will depend on the mix of energy sources we end up using, and the energy efficiency of our appliances.

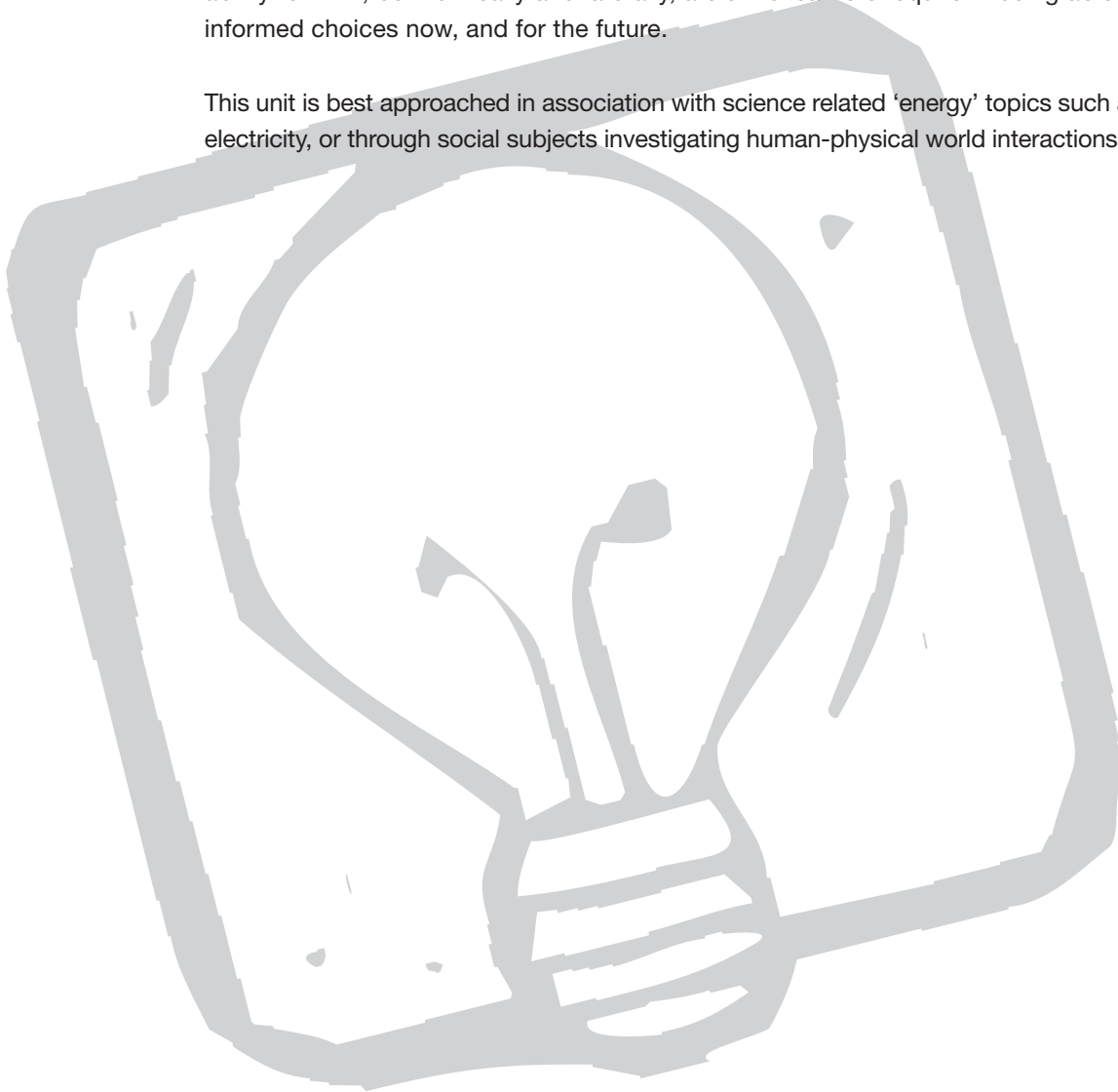
Renewable energy sources are less polluting, but because renewable energy is more diffuse than that found in fossil fuels, or uranium, the facilities needed to capture it tend to be more extensive. Because of this, they are generally located in remoter areas, and can be more visually intrusive. There is some interest in micro-generation using alternatives such as wind power, solar power and incineration at a local, community level – with less impact on the landscape.

It takes between 200-300 wind turbines to produce the same amount of electricity as a nuclear reactor. Natural heritage effects include the visual impact on landscape quality of the turbines and associated infrastructure. Other associated concerns include incidents of bird deaths, e.g. flying into the turbines, pylons and power lines that are sited on migration routes, noise pollution, and the fact that wind is not always reliable, so a back-up source of power is always required, e.g. coal/oil fired power station, which is expensive to maintain.

Given all the complexities of the energy question, the most effective choices a consumer can take to make a difference are in terms of their energy consumption, and the energy efficiency of the appliances they use (lighting, domestic and leisure) and the buildings they live in. We use energy far more efficiently than we used to. However, over the last decade these improvements have been largely outweighed by the growing number of machines used in our homes and schools as standard, e.g. computers, dishwashers and the growing range of household appliances. We can make a difference by choosing these appliances only when they are really needed, and ensuring we adopt energy conservation measures (insulation, draft proofing) in our homes. At a local level, we can campaign on ensuring that alternative energy sources are developed and used, where it is appropriate, and promoting and raising awareness of energy conservation habits and technology.

A sound foundation of understanding about energy production and consumption in Scotland is needed, and the local and global consequences and related issues. Abstracting scientific and factual information from various sources involving promotional 'propaganda' can often be difficult. The presentation of the issues, as over-simplified cause and effect, linear, problems with black and white solutions is also misleading. An ability to think, both critically and laterally, are skills learners require in being able to make informed choices now, and for the future.

This unit is best approached in association with science related 'energy' topics such as electricity, or through social subjects investigating human-physical world interactions.



# Objectives and outcomes

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Young people should learn:

## Knowledge

- To demonstrate understanding of the energy footprint and its component parts; give examples of energy conservation measures. (*Home truths, Calculating footprint*)
- To identify the traditional sources of energy and alternatives, together with their advantages and disadvantages, in relation to the environment. (*Alternative choices*)
- To give an example that demonstrates how we don't always know all the effects of our actions, and be able to explain the idea of the precautionary principle. (*Chain reaction, Alternative choices*)
- To describe how technology has provided the potential for a variety of alternative energy sources; their different environmental impacts, and how politics and economics influence their successful adoption. (*Alternative choices*).

## Skills

- To recognise the complexity of the webs of cause, effect and feedback, and question the notion of a simple chain of cause and effect. (*Chain reaction*)
- To think critically about the different ways multinationals, government, peer pressure, family, and others influence our 'wants' and choices. (*Home truths*)
- To demonstrate skills in planning an investigation, carrying it out and presenting and sharing the results with peers and others. (*Alternative choices, Calculating footprint*)
- To demonstrate an ability to use the information available to make informed and balanced choices. (*Alternative choices*).

## Values and dispositions

- To recognise and respect the different dispositions people hold, and what their own attitudes are. (*All activities*)
- To be willing to act as a responsible citizen, learning from and working with others to improve energy conservation with respect to promoting sustainable lifestyles. (*Home truths*).

# Activity one: Calculating your school's energy footprint

## You will need

- information or bills giving the amount of energy the school has used over the past year
- paper, pencils
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**30 minutes/open**

## What to do

Brainstorm the ways that the school's use of energy affects the size of the energy component of its Ecological Footprint. What does your school use energy for: heating, lighting, cooking, pumping clean water to the toilets, more? Explain that the amount of energy used affects the size of the school's Ecological Footprint. Land is needed to build power stations and to mine fossil fuels, but more significantly large areas of land and sea are needed to reabsorb the carbon dioxide created when we burn fossil fuels – see page 12 for a full explanation of this and an explanation of how a Carbon Footprint contributes to an Ecological Footprint. Energy can be produced from renewable sources that are always available in nature e.g. sun, wind, flowing water and plants; however most of Scotland's energy comes from fossil fuels, non-renewable sources such as coal, gas and oil. Increased use of fossil fuels releases more carbon dioxide, changing the climate across the planet.

Calculate the energy component of the school's Ecological Footprint by finding out what types of energy the school uses: electricity, oil or gas? Look at the school's last four energy bills, each giving the kilowatt hours (kWh) used over three months. Add the four results together and divide the total by the number of learners (or learners and staff) in the school to give the kWh used per person per year.

Type of energy	Energy used (kWh or litres per year)	Number of people	Total (kWh per person per year)
Gas			
Electricity			
Oil			

Record and save the results in the energy tab of the downloaded Excel workbook. Then enter these results into the energy section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the energy component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the energy used, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

Now that the size of the energy component of your school's Ecological Footprint has been calculated, begin to look at ways to reduce it. The Action Programme for Change section of this handbook (starting on page 181) contains information and advice on how to do this. You can repeat the calculations after changes have been made to see how much you have managed to reduce the size of the energy component of your school's Ecological Footprint.

# Activity two: Home truths

This activity provides progression/links up well with the activity 'Building sense' in Unit 2 'Buildings and place'.

## You will need

- outside/inside space to measure areas and circle up as a class/group
- copies of Activity sheet E1
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- email and telephone
- library resources
- a link school in a Southern country
- a house or school 3D diagram and a basic outline for homework activity (see activity sheet E2).



**Time**  
**Allow 1.5 – 5 hours**

## What to do

Ask your learners what things they think most energy is used for in Scotland, e.g.:

- producing and processing food;
- building, maintaining and running homes;
- transporting people and goods;
- making consumer goods, and
- providing services.

Ask them why they gave the answers they did. After learners have shared their opinions, show them Activity sheet E1 – the energy footprint for the average Scottish resident in 2004, ([www.scotlands-footprint.com](http://www.scotlands-footprint.com)). This sheet shows the consumption categories and total land required to support the average Scottish resident's current lifestyle in terms of energy consumption. This area is 0.97 gha, or 9,700 sq m, per person.

As a way of showing how much land that is, take the class into the grounds and measure off a square 10 metres on each side – 100 sq m – it takes 10 of these to make a hectare. How many of these would it take to support a single Scot and their energy consumption? How would they approach the task of marking off that large an area? Is it bigger than the school grounds? ...local shopping mall? ...local playing fields?

After looking at the chart, circle up and ask some of the following: What surprised them most? Where is energy used that they didn't consider? Which has the most visible/hidden energy use? How much land does that suggest their school needs to support their current energy lifestyle? (Multiply the school population figure by average of 0.97 hectares.) How much land does it have? (Look at an OS map.) What influences our current energy lifestyle as individuals/society?

Calculate the size of the energy component of your school's Ecological Footprint using the online footprint calculator. Look at the energy conservation measures for school or home suggested in the energy tab of the downloaded Excel workbook. Look at the range of options presented on the calculator. Carry out a survey and design a recording sheet within class/school. Who has central heating and what is the energy source? Is it renewable/



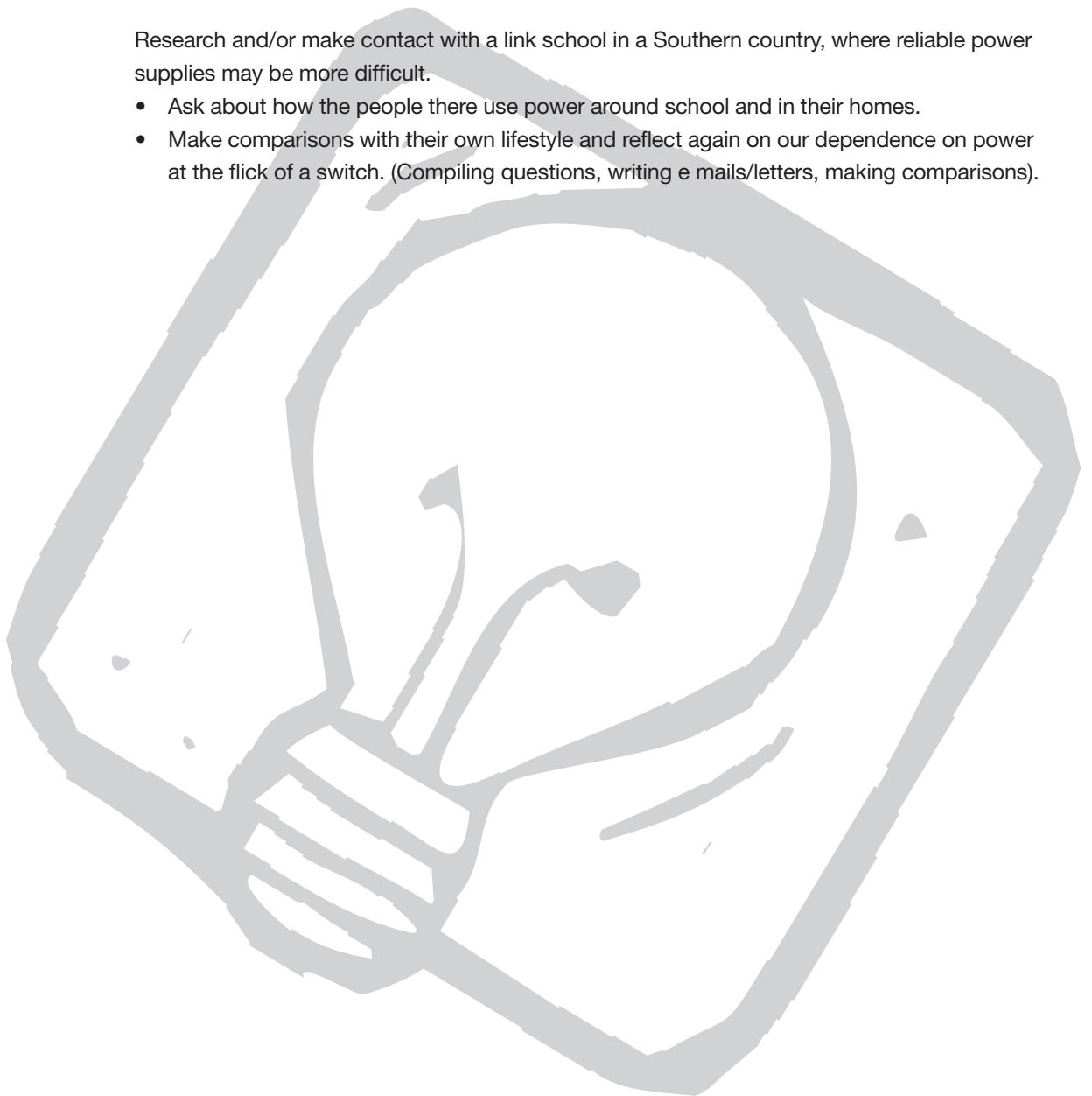
non-renewable? Who has double-glazing and roof/wall insulation? What temperature are thermostats set for? Are they fitted to individual radiators? Do they wear jumpers indoors, or go around in short sleeves? How many appliances do they have in their bedroom/house? Analyse the results. What do they show about our use and conservation of energy at home/school? Ask in a local expert from the local Council/elsewhere (involve the learners in organising this) to talk about the options for and benefits of energy conservation measures. Design an eco house/school for energy conservation. Annotate a 3D drawing with the different design elements.

Reflect on the sorts of things they do at home that depend on flicking a switch for energy.

- Make a list? What influences are there for them to behave in this way?
- Imagine life with a power-cut for a week.
- Write an account of 'A day/week in my life with a power-cut...'. What would they miss most? What would they need to survive? How would they feel?
- Everyone (learners and teacher/s) could adopt one new habit contributing to energy conservation and monitor progress at sticking to it. Use a class chart to map progress.

Research and/or make contact with a link school in a Southern country, where reliable power supplies may be more difficult.

- Ask about how the people there use power around school and in their homes.
- Make comparisons with their own lifestyle and reflect again on our dependence on power at the flick of a switch. (Compiling questions, writing e mails/letters, making comparisons).



# Activity three: Chain reaction

Adapted from *Second Nature*, RSPB

## You will need

- a flipchart pad, pens – 2-3 sheets of paper and pen/group
- space that allows for learners to work at small group tables, in view of a flipchart /screen/ whiteboard.



**Time**  
**Allow 1 hour**

## What to do

Ask the class to select a problem issue/event related to energy around the home/school that they could explore, or use a specific example of your choice. In their small groups, ask them to write down what is the key problem, the main cause and the main effect. Demonstrate on a piece of flipchart paper, how they can analyse the problem using this approach. Start with the problem, e.g. overhot houses, placing it in the centre and circling it. To its left, write the *main cause*, e.g. boiler and radiators on too long/too high, circle it and draw an arrow towards the problem circle. To its right, write the *main effect*, e.g. open windows to let heat escape, circle it and draw an arrow from the problem circle towards it.

Ask each group to copy this diagram (or think of their own problem they wish to analyse) and then expand it by discussing and writing down the other *causes* and *effects* that people came up with.

Now working out towards the edges of the diagram, ask what things may have caused the causes? Use arrows to make connections. Then, what effects are the effects going to have? Are there any loops back to the causes? You should have quite complex diagrams developing.

Then by asking questions, draw out the key learning points:

- differing opinions about the nature of problems are/can be valuable in generating new insights;
- problems are rarely simple or linear in nature or in their solution – they are more web-like;
- causes can be effects and vice versa; influences can be traced backwards or envisioned forwards, they can behave as feedback loops;
- if we focus on one area of a problem map, we need to recognise it's only part of the story;
- intervention should always be taken cautiously – we often don't know the effects of some actions.

# Activity four: Alternative choices

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## You will need

- task cards outlining what the investigation task is, with some starter websites/resources to look at – see the example card on Activity sheet E3
- time to prepare the task cards, view websites, and gather library resources together into themed boxes for the investigation
- time to devise an interesting way to allow self-selection into task groups/pairs – see *Get Global!* (see the Resources section on page 92 for details)
- access to a computer suite, the internet, PowerPoint, and *Schools Global Footprint* website [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint); a printer; library resources; photocopier, art/design materials
- space for presentations and circling up.



**Time**  
**Open, your choice**

## What to do

Set small groups (four to five learners/group) the task of researching into alternative energy sources – how they work and what energy/infrastructure is used in making them work; their potential impacts for the natural heritage and wider environment (landscape value, pollution); and the physical/environmental, political, economic and social controls/drivers influencing their adoption. The groups should use a variety of sources including the computer and the internet.

They could look at:

- biogas/methane
- solar
- wave
- nuclear
- geothermal
- wind
- tidal
- other.

Ask groups to choose how they will present their findings to their peers and/or invited guests – e.g. posters/PowerPoint.

Build in circle time at the end to have an open discussion on what they have learnt from doing the investigation, e.g. about working in groups/pairs, researching skills, presentation skills; any comments about the presentations; any further ideas about the issues raised. You could use a ranking exercise to explore which energy sources they favour and why.

This activity could be extended to compare alternative sources of energy available in Scotland with those in another country, e.g. Kenya.

# Assessment and evaluation

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## Teacher observation

- Ease/difficulty of contributing to group working and discussion
- Ease/difficulty in making accurate/concise notes, presenting and analysing results
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in identifying and applying the range of factors affecting decision-making
- Ease/difficulty in making connections between cause and effect, and local and global
- Application of knowledge, understanding and skills to identifying realistic actions to improve energy conservation in school/home
- Information handling and analysis skills
- Technical skills – ICT – using search engines to find information; drawing/graphicacy skills
- Use Connection inspection – Making footprint connections (Activity sheet MC8).

## Self/peer observation

- 'Participation Chart' from the resource *Get Global!* (see the Resources section below for details)
- 'Active Global Citizenship Chart' from the resource *Get Global!* (see the Resources section below for details)
- Peer comment on presentations.

# Resources

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## For teachers

### *Get Global!*

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities enabling higher order thinking by learners. ISBN 1 872502 91 1. Available in pdf format on the websites below:

[www.actionaid.org.uk/schools](http://www.actionaid.org.uk/schools)

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### *Eco-Schools Guide*

Full of relevant information and practical activities, recently revised for Scottish schools. Good sections on energy in school and sustainable development. Guides can be downloaded from Eco-Schools Scotland website: [www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org) and [www.eco-schools.org](http://www.eco-schools.org) (International Eco Schools).

### **Climate Chaos**

A week of activities about climate change for ages 9 – 11, produced by Oxfam  
[www.oxfam.org.uk/education/resources](http://www.oxfam.org.uk/education/resources)

### **Renewable energy resources (various)**

Wide variety of information sheets, activity/practical ideas, kits, booklets available from the Centre for Alternative Technology. Also Teaching about Energy – practical activities by Clare Eastland/CAT. Available from Education Office, CAT, Machynlleth, Powys SY20 9AZ.  
Website: [www.cat.org.uk](http://www.cat.org.uk)

### **'It's only natural' (renewable energy resources)**

Cross-curricular resources for 5 – 11 years, science resources for 11 – 16 years, geography for 11 – 18 years. Website: [www.berr.gov.uk](http://www.berr.gov.uk)

### **The Energy Files**

Online resources suitable for 13 – 16 year olds providing an overview of renewable/non-renewable forms of energy, and alternative energy sources – oil, gas, coal, nuclear, hydro, wind, biogas, solar, biomass, geothermal, wave and tidal. Available from Energy Networks Association [www.energynetworks.org](http://www.energynetworks.org)

### **Special Energy Investigators**

Four progressive activities for 9 – 14 year olds using school lighting as a source of basic data for numeracy and spreadsheet tasks. Downloadable from CREATE.  
Website: [www.create.org.uk](http://www.create.org.uk)

### **Saving Energy – A Whole School Approach – management guide**

Practical guides for teachers – giving advice and guidance for reducing energy consumption in schools. Ordered by phone/website. New titles added frequently.  
Available from The Carbon Trust. [www.carbontrust.co.uk](http://www.carbontrust.co.uk)

[www.generationgreen.co.uk](http://www.generationgreen.co.uk) – cross-curricular resources for primary and secondary schools.

[www.new.solar-active.com](http://www.new.solar-active.com) – Low priced solar energy educational kits. Solar cells can be hired.

[www.wwf.org.uk/oneplanetschools](http://www.wwf.org.uk/oneplanetschools) – WWF materials including climate change information, assembly ideas.

[www.solarwindapplications.com](http://www.solarwindapplications.com) – Ayrshire-based alternative energy company, which has also designed the 'S-cube' – a solar panel for experimenting with, and that powers other gadgets – for schools investigating alternative energy through science. Tel: 01292 674033.

[www.school4energy.net](http://www.school4energy.net) – opportunity to link up with another school in Europe that works with renewable energy supplies. Also information about educational resources, websites and organisations.

[www.energyzone.net](http://www.energyzone.net) – advice and information about energy for teachers and secondary learners.

[www.howstuffworks.com](http://www.howstuffworks.com) – describes how almost anything you can think of works.

[www.epatrol.org](http://www.epatrol.org) – good information about biodiversity and energy saving.

### **For teachers and learners**

**Killer Energy (Horrible Science)** by Nick Arnold ISBN 0 4399 9257 5. Good read for all ages, bringing together a number of strong science themes.

[www.energychest.net](http://www.energychest.net) – lots of info about energy use in buildings and alternative energy. Activities and worksheets.

[www.LTScotland.org.uk/sustainabledevelopment](http://www.LTScotland.org.uk/sustainabledevelopment) – information, links, games on the causes, effects and what we can do about it for secondary learners.

[www.coolkidsforacoolclimate.com](http://www.coolkidsforacoolclimate.com) – for kids, by kids, on climate change: the causes, effects and what we can do about it.

[www.climatechoices.org.uk](http://www.climatechoices.org.uk) – climate change activities for 9 – 11 year olds from Practical Action.

[www.metoffice.gov.uk](http://www.metoffice.gov.uk) – facts, effects and issues around climate change.

### **Sources of funding**

**Local Council** – contact through Education Services

**Local Energy Saving Scotland Advice Centres** – provide information and advice on energy saving, may provide speakers (or sources of) or sources of funding. Tel: 0800 512012.

**Community and Renewable Energy Scheme** – an exciting project bringing renewable energy sources to communities across Scotland. Offers advice, project support and grants. Website: [www.communityenergyscotland.org.uk/cares.asp](http://www.communityenergyscotland.org.uk/cares.asp)

**Scottish Power Green Energy Trust** – an independent charity set up to encourage new, community renewable energy sources. Offers grants and awards for renewable and educational projects leading to increased use and understanding of renewable energy sources. Tel: 0141 568 3492. [www.scottishpowergreentrust.co.uk](http://www.scottishpowergreentrust.co.uk)

**Climate Challenge Fund** – fund to help communities (including schools) to reduce carbon emissions. [www.infoscotland.com/climatechallengefund](http://www.infoscotland.com/climatechallengefund)

**E.ON SOURCE Fund** – supports community energy projects that result in the production of energy from a sustainable source or reduce the amount of energy used by a community. [www.eon-uk.com](http://www.eon-uk.com)



**Activity two: Home truths:  
Activity sheet E1**

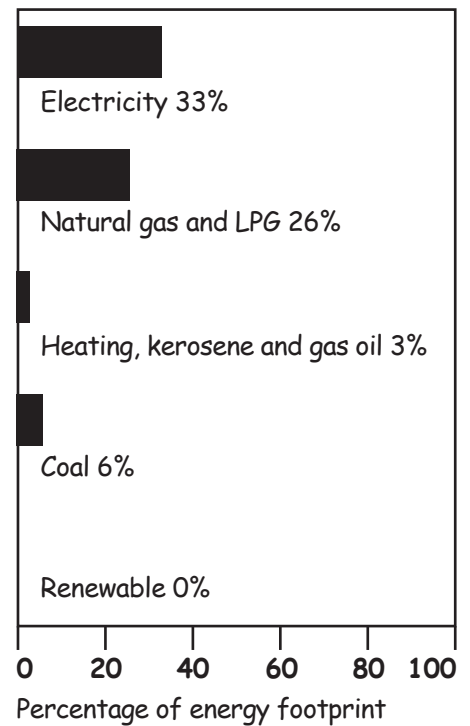
**The energy footprint for the average Scottish resident in 2004**



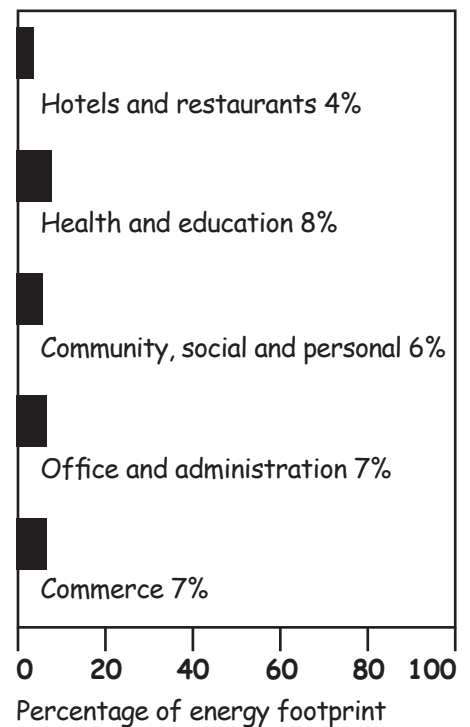
Total area of Scotland = 7,272,200 hectares

Source: Scotland's footprint, [www.scotlands-footprint.com](http://www.scotlands-footprint.com) February 2004

**Domestic energy (total 68%)**

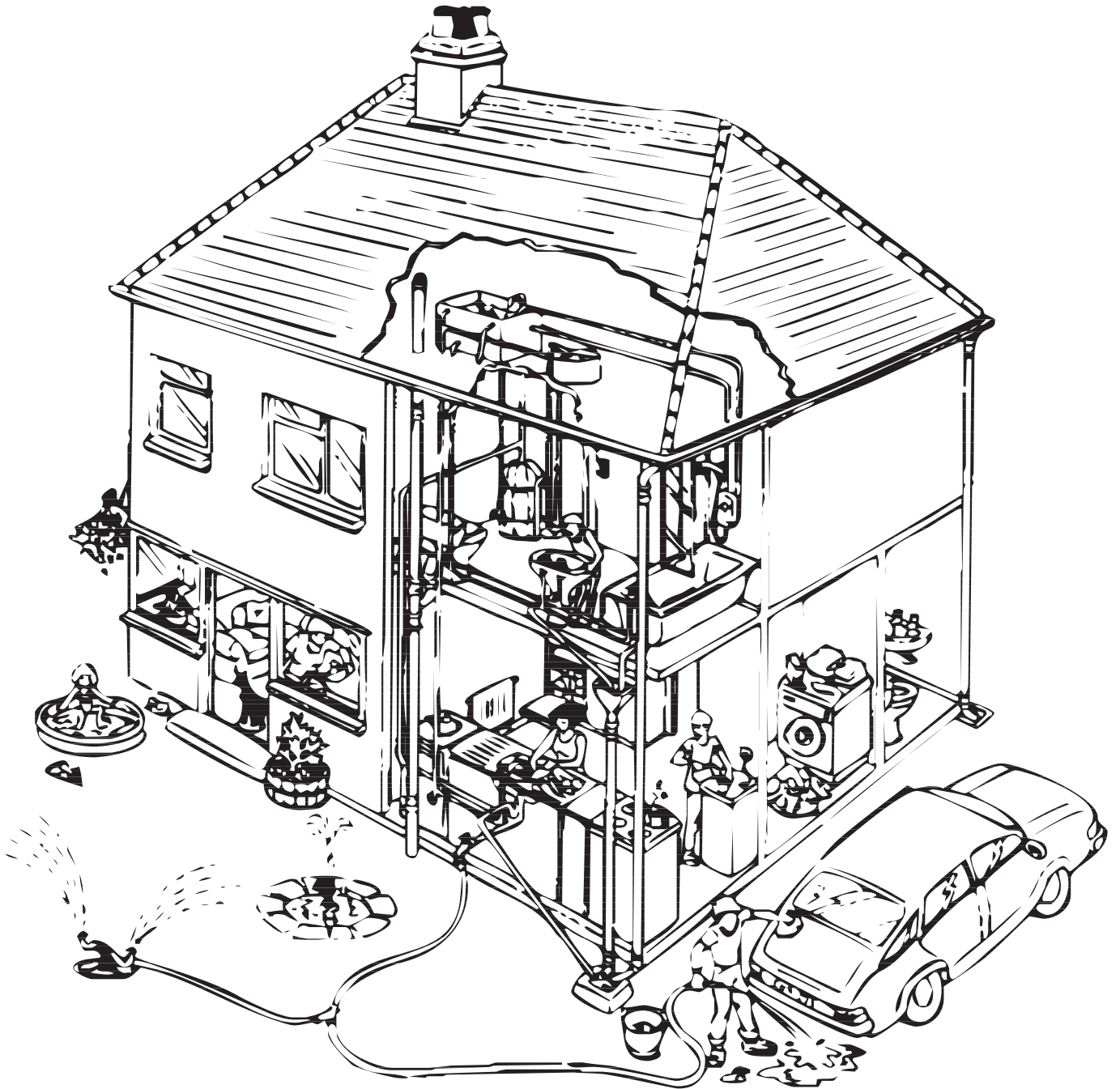


**Services energy (total 32%)**





**Activity two: Home truths:  
Activity sheet E2  
3d house outline**







**Activity four: Alternative choices:  
Activity sheet E3  
Alternative choices task card**

You have chosen/been selected to investigate **SOLAR** power 'as an alternative' source of energy.

**You are asked to research:**

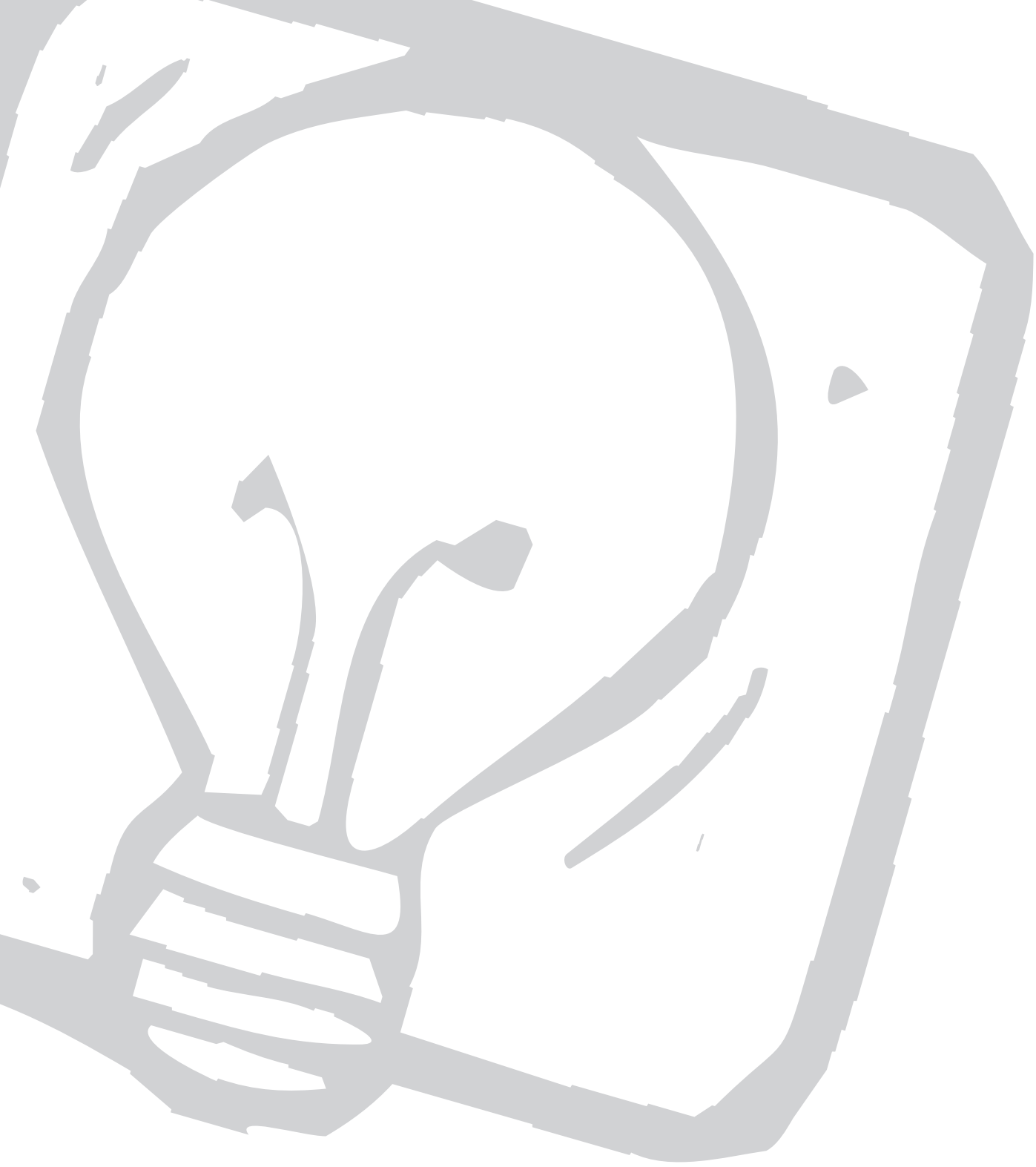
- How it works - how do we capture, store and relay the sun's energy?
- What needs/infrastructure does solar power require for popular use? (machinery, buildings, transport lines, climate)
- What impacts providing solar power has on the natural heritage. (habitats, wildlife, landscapes)
- What are the drivers/controls on people adopting solar energy in Scotland/the UK? (think physical, economic, environmental, social, political, cultural)
- Your decision whether solar power is a real alternative source of energy, which can help reduce our footprint.

**Have a look in:**

- the box file labelled 'Solar Energy'
- library books on Energy Sources - use the index and look for **solar power, solar energy renewable energy**
- internet: have a look at the following websites:
  - [www.scotland.gov.uk/topics](http://www.scotland.gov.uk/topics) Look for energy
  - [www.ourplanet.org.uk/about-solar-energy.asp](http://www.ourplanet.org.uk/about-solar-energy.asp)
  - [www.howstuffworks.com](http://www.howstuffworks.com)

**Use a search engine:** key words - solar, energy, domestic

- Look at the **Renewable Energy** video.





## Part 2

# Unit 4: Food

### Key ideas

- Food (energy and materials) costs are found along the chain from ‘cradle to grave’ – these may have environmental, social and/or economic impacts, at local and global levels. (*Food footprints, All in a cup of coffee, Calculating footprint*)
- Our purchasing preferences continually impact, locally and globally – on the health and well-being of people and the natural heritage. (*Food footprints, All in a cup of coffee*)
- How major issues such as poverty, consumption, development, health and loss of species are inter-related. (*Food footprints, All in a cup of coffee*)
- Energy is lost as it passes through each level of the food chain/pyramid. (*Food chains*)
- It is healthier for planet Earth that we eat lower down the food pyramid/chain; we all have a share in being responsible for the health of the planet Earth. (*Food chains*)
- We are what we eat, and only we are responsible for our own health, by choosing what we eat. (*Food chains, Food footprints*).

# Background notes



**“Before you’ve finished eating your breakfast this morning, you have depended on half the world...”. Martin Luther King**

In Scotland, food was the second largest component of a person’s Ecological Footprint in 2004. The footprint was 1.36 gha per person, representing 26% of their overall Ecological Footprint.

The sun is the source of energy for all living things<sup>7</sup> – but how many of us thinking about food, think this far back? The cow eats grass and we get steak... what could be a better arrangement? Livestock ‘protein factories’ turn humanly unusable substances (like cellulose) into foodstuffs for humans. Grazing livestock on pasture of little agricultural value fulfils this function well, but feeding high quality food sources (that could be fed to humans) to livestock, does not. Similarly, clearing large areas of high production primary tropical forest for the purpose of growing grass to feed livestock for beef production (or cash crops) does not either.

To understand the science behind this, we need to look at the efficiency of livestock in converting their ‘feed’ into protein for humans. A cow must eat 21 tonnes of feed protein to provide 1 tonne of usable protein for us – pigs (8 tonnes), chickens (5.5 tonnes), and fish (5 tonnes) are more efficient. Another way of looking at it is that one hectare of cereals can produce, on average, five times more protein than a hectare devoted to livestock production (legumes 10 times; leafy vegetables 15 times). (Source: *Diet for a Small Planet*, 1974). So eating veggie-burgers makes ecological sense.

What makes economic and social sense? A reduction in livestock numbers would reduce our current levels of protein ‘waste’, freeing up cereals for human consumption: this would easily counter our current world hunger crisis. Ruminant animals do not need to eat protein to produce protein. They can convert nitrogen in the form of urea into protein. However, it is cheaper to obtain cereals (humanly edible) than urea (humanly inedible).

The right to sufficient, healthy food is a basic one, but there are many inequalities globally in achieving it, especially in its growth and distribution. Rich countries gave about US\$54 billion towards development aid in 2001, but paid more than US\$350 billion to their own farmers. A World Bank official summed this up, noting “the average cow is supported by three times the level of income of a poor person in Africa .... “ (*Lessons in Sustainability*, Tide~, 2003).

Fair Trade is gaining far more prominence in our supermarkets and shops today, particularly promoting coffee, tea, cocoa/chocolate and bananas. The purpose is to win equality and justice for the small producers and workers on plantations. Many plantation workers and farmers have traditionally been forced to survive in poor working and living conditions and on low wages, with few chances to improve their situation. Fair Trade is reversing this trend and establishing standards and ensuring traders and consumers pay a fair price for the product. In this way, it provides fairer and better welfare and wages for workers and farmers, and improved, sustainable practices in producing the crops.

7. We accept this is not quite true. There are organisms in the deep ocean trenches that obtain their life-supporting energy through sulphur compounds. For our target age group it is considered an acceptable generalisation to use the word ‘all’.

Plantations have created other issues for those countries involved; for example, the land that grows money can't grow food – a legacy left to many countries by our colonial forbears, for over 200 years. The plantation was a pattern of land use widely introduced to produce wealth for the colonisers, not food or income for local people. 'Cash crops', the name given to the tea, coffee, cocoa, cotton, palm oil and bananas grown is appropriate, and they became established in world trade. Many Southern countries have stayed economically 'hooked' on cash crops after independence, because of world demand – despite the problem of hunger within their own populations, and the plantations taking up land with the best agricultural value. These countries also suffer because of the conditions imposed on them by international bodies such as the International Monetary Fund, in raising revenue to repay debts and loans due to Northern countries.

Intensive farming all over the world has led to environmental degradation – soil erosion, salination of soils, pesticide residues, fertiliser/slurry over-enrichment of water run-off, habitat destruction and plant and animal extinction, as well as 'poisoning' products – BSE, pesticide/fungicide residues, hormone transfer. The Ythan estuary, near Aberdeen, is an area where overuse of fertilisers in the past led to severe over-enriching of waterways and consequent problems for water quality and the survival for freshwater populations of plants and animals. In contrast, the encouragement through subsidies for extensive farming methods, e.g. in Scotland's crofting communities, is leading to the rehabilitation of machair grasslands, hay meadows and the return of the corncrake, as well as increasing organic produce (livestock and crops).

Intensive fishing methods have led to 'overfishing' and the inability of fisheries to sustain themselves naturally, as well as killing unwanted animals as a by-catch (albatross, dolphins, turtles).

For those of us in economies where standards of living are rising, the basic right to food is generally achievable – but here there is a lot of misunderstanding of what healthy food and eating looks like. We enjoy considerable choice as consumers; using the Ecological Footprinting approach helps understanding towards making informed choices. It demonstrates why it makes ecological sense to buy local produce and fruit and vegetables when they are in season, it also brings back enjoyment to eating, with variety each season.

The World Summit on Sustainable Development took place in Johannesburg, South Africa, in 2002 (a ten year follow up to the Earth Summit in Rio de Janeiro, Brazil in 1992). The main focus was on reducing world poverty, but other related issues were covered, including health and the environment. The Summit agreed to:

- halve, by 2015, the proportion of people who suffer from hunger;
- improve productivity and food security by sustainable means, especially in Africa;
- restore fisheries to their maximum sustainable yields by 2015.

The ways we eat today need to change if we are to meet the challenges of sustainable development, and reduce our food footprint:

- The way food (crops and livestock) is grown threatens biodiversity, and causes soil erosion (over grazing/cropping), pollution of waterways and groundwater (over fertilizing and/or pesticide/slurry disposal), and the salination of soils (irrigation in dry climates).
- The processing of food involves significant amounts of 'embodied energy' in its refining, reduces its nutritional value, and involves additives we do not know the long-term results of.

- In the UK, studies have found food consumption comprises a 20-35% share in the total energy use of a household.
- Food transportation over long distances adds to carbon dioxide emissions, which in turn contribute to climate change.
- Millions of people in the South die of malnutrition and associated diseases every year, despite an existing capacity to feed everyone – even without genetic modification (GM) food technology.
- In rich countries, we suffer ill health and obesity through eating too much, and too much of the wrong kinds of foods, especially those over-processed, or high in fat and cholesterol.

It is important that we have a sound foundation of understanding about the food that we eat and the science behind healthy eating. In addition, we need to know the social and economic forces influencing food production and processing, as well as the local and global consequences of providing the food that we eat. In this way, we can make informed choices. We also need to appreciate that the way we look at things can affect the decisions we make, and the impacts of those decisions are felt more widely than we may realise. We need to use 'joined up', systems thinking in seeking sustainable lifestyles.

# Objectives and outcomes

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Young people should learn:

## Knowledge

- To demonstrate an understanding of the elements contributing to the food component of an Ecological Footprint. *(Food footprints, Food chains, Calculating footprint)*
- To make and describe global connections between the food they eat, their well being, and the well-being of those involved in growing/processing it. *(Food footprints, All in a cup of coffee)*
- To describe how few situations are linear, or simple 'black box' systems; more often there are multiple connections between systems, each made up of a complex web of further connections. *(All in a cup of coffee)*
- To demonstrate how science and moral/ethical values and dispositions influence people's decisions and actions in buying food. *(All activities)*
- To make and describe connections between the food they eat and the flow of solar energy through food chains/pyramids, and what it means for their health, and the health of the planet/natural heritage. *(Food chains).*

## Skills

- To demonstrate an ability to use the information available to make informed and balanced choices, reducing the food component of their Ecological Footprint. *(All activities)*
- To be able to express quality of life in personal terms beyond consumption. *(All in a cup of coffee)*
- To develop informed and reasoned opinions and choices about the social, political, economic and environmental issues surrounding food production. *(Food footprints, All in a cup of coffee)*
- To be able to confront views and actions that are harmful to the well-being of others, and respond positively. *(Food footprints, All in a cup of coffee).*

## Values and dispositions

- To discuss and communicate their feelings and opinions about food consumption, and the foods they eat within a group. *(All activities)*
- To show a concern for and appreciation of all people and living things across the world, their needs and interrelationships. *(Food footprints, All in a cup of coffee)*
- To appreciate the quality of life of future generations is enhanced or endangered by actions taken now. *(Food footprints, All in a cup of coffee)*
- To be willing to act as a responsible citizen, learning from and working with others to achieve healthier, sustainable eating habits; improve global equity in the provision of sufficient food for all, within resource and carrying capacity limits. *(Food footprints, All in a cup of coffee).*

# Activity one: Calculating your school's food footprint

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## You will need

- information about the amount and type of food eaten in the school canteen
- paper, pencil
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**Allow 40 minutes**  
**plus follow on**

## What to do

Brainstorm the ways that the school's consumption of food affects the size of its Ecological Footprint. Explain that productive land all over the world is needed for animals to graze on and for growing the fruit and vegetables we eat. Growing and preparing food uses energy: machines (e.g. tractors, irrigation systems), fertilisers and pesticides are needed; the food has to be transported to places where it will be processed, packaged and sold. Therefore the distance the food travels and how it is produced has an impact on its footprint. Most of the energy comes from fossil fuels that are not only non-renewable resources but also release carbon dioxide when burnt.

Calculate the food component of your school's Ecological Footprint by finding out the amount and type of food eaten in the school canteen. Work with the school canteen or with information from your local Council to compile a week's diary of the amount and type of food eaten in school dinners. You will also need to find out what different food is made up of, for example 1 kg of chips is made up of 800g potatoes and 200g vegetable oil.

Multiply each weight by 40 weeks (that's a school year, which doesn't include holidays) to work out the weight in kg per year. Divide each total by the number of learners (or learners and staff) in your school to find out the average amount of each food per person per year.





Type of food	Weight per class/school per week (kg)	Weight per year (40 weeks)	Number of people	Total weight (kg per person per year)	Local (Yes or No?)	Organic (Yes or No?)
Confectionery						
Soft drinks						
Miscellaneous						
Beverages						
Cereal products						
Bread						
Fruit						
Vegetables						
Sugars and preserves						
Fats and oils						
Eggs						
Fish						
Meat						
Cheese						
Milk and cream						

Record and save the results in the food tab of the downloaded Excel workbook. Then enter these results into the food section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the food component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the food consumed, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

Now that the size of the food component of your school's Ecological Footprint has been calculated, begin to look at ways to reduce it. The Action Programme for Change section of this handbook (starting on page 181) contains information and advice on how to do this. You can repeat the calculations after changes have been made to see how much you have managed to reduce the size of the food component of your school's Ecological Footprint.

# Activity two: Food footprints

Activity adapted from *Lessons in Sustainability*, Tide~

## You will need

- copies of Activity sheet MC3 – 1/group
- copies of activity sheets MC8 and MC9 – 1/group
- a typical packed lunch or school dinner; list of contents/group
- copies of Activity sheets F1 and F2 – 1 each
- a set of 'Picking fruit' cards (see *Lessons in Sustainability*, Tide~)
- copies of Activity sheet F3, F4 and F5 – 1 each
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**Allow 1.5 hours**  
**plus follow up**

## What to do

Ask what proportion of the 2004 Scottish residents' Ecological Footprint was made up by food (26%), and how important it was: look at Activity sheet MC3 showing the components of the 2004 footprint (in the 'Making connections' unit). Before calculating the food component of your school's Ecological Footprint, explore some of the issues surrounding what we eat generally, starting with a typical packed/school lunch (e.g. potato crisps, apple, chocolate biscuit, orange drink, corned beef sandwich; tuna salad, chips, chocolate pudding and custard). In small groups, ask learners to research the foods making up this typical packed/ school lunch, from cradle to grave. Ask them to design a chart, or use the one provided on Activity sheet F1, to record their results – learners research each of the components of their lunch: where the foods come from (country and raw material), how they have been processed (refining and packaging), and how they were transported (from source to school). They can highlight the imported foods.

Using an atlas and the map on Activity sheet F2, they can identify where the countries are, and how far the food has come (food miles). Ask "What happens then – to the food we waste, and the food we eat?"

Using the online footprint calculator, groups can then explore a number of options for reducing the food component of their Ecological Footprint, and finding out which is the most effective: eating less meat and more vegetables; buying local food; buying less packaged food; composting food waste. Ask groups to design a poster to promote their findings.

Organise a sharing circle. What have learners learnt about their food and the food component of their Ecological Footprint? What issues have been raised affecting their own food choices (which they might explore later)? How does the food component impact on other components of their Ecological Footprint? Help them complete Activity sheets MC8 and 9. What kinds of choices can they make towards more healthy eating – for themselves and the planet?

This can then lead on to extension work on fair trade, food miles, food mountains (EU and Common Agricultural Policy/World Trade Organisation/globalisation), diet choices (time of year/seasonal availability, meat/vegetable, organic/intensive sources, processed/non-processed food/drink), and comparisons of the food component of their Ecological Footprint with that of link schools in a Southern and/or Northern country.

Take fair trade, for example: lead into Tidec's 'Picking fruit' activity (part of Food and Farming – see Resources section on page 112 for details), or use a debate to research and analyse an issue – 'Should we buy/eat French beans brought from Zimbabwe to the supermarket?'

Circle up, and read out 'The story of the bacon, lettuce and tomato sandwich' on Activity sheet F3, then ask learners to think about what makes a sustainable snack by completing Activity sheet F4. Information on the ingredients can be found in Activity sheet F5. Further information for teachers can be found in the box below.

### Food footprints

- The EU has provided a processing subsidy totalling €372 million (£248 million) per year for the production of tomato concentrate in Southern Europe (Greece, Italy, Spain and Portugal). Tomato concentrate has been exported to West Africa where the processing industries are now in crisis: for example, in Senegal, one of the two tomato canning factories has closed and the other factory now imports cheap tomato concentrate from Italy; farmers in West Africa growing tomatoes have found now that they are unable to sell their tomatoes.
- Hedgerows are valuable for wildlife and the landscape. Between 1984 and 1993 (last survey carried out), 185,600 km of hedgerows, one-third of the total in England and Wales, were lost by removal (15%) or neglect (85%). (Source: Agriculture and the Environment, Environment Agency, 2000)
- English and Welsh agriculture uses between 25,000 and 30,000 tonnes of the active ingredient of pesticides each year. (Agriculture and the Environment, Environment Agency, 2000)
- Payments for claims under the Single Payment Scheme, made in 2006 are expected to total about £2,354 million for the UK. (Source: Department for Environmental Food and Rural Affairs website: [www.defra.gov.uk/farm](http://www.defra.gov.uk/farm))
- Brazil is one country where huge volumes of soya are grown largely for export to Europe. Since the 1960s, soya cultivation has expanded from 200,000 hectares to 13 million hectares. Large mechanised soya estates have caused soil erosion on the Cerrados plateau. This is an ecologically fragile savannah home to many endangered species. (Source: Soya: the ubiquitous bean, SAFE Alliance, 1999)
- The Organisation for Economic Co-operation and Development (OECD) calculated that the Dairy Regime of the Common Agricultural Policy (CAP) provided €16 billion of direct and indirect support in 2001, representing 40% of the value of EU dairy production.
- Since 1995, milk production in Jamaica has dropped by a third – EU milk powder has flooded the local market. Jamaican dairy processors stopped using local milk, preferring to use cheaper milk powder from Europe. Nestle – the major buyer of Jamaican milk – buys a third less from Jamaica than three years ago. As a result, Jamaican farmers are forced to throw away thousands of litres of milk – many have lost their jobs and their livelihoods.
- In Brazil, milk and milk products are the second largest sector of food imports. Since 1993, when the country opened up its markets, the largest source of dairy imports is the EU. Research in the southern state of Mato Grosso do Sul showed the dairy industry going into crisis in 2001 – after the price for their milk fell by a third. Two milk-processing plants went bankrupt, leaving farmers with no outlet for their produce. (Source: The Rough Guide to the CAP, CAFOD)
- CAP Reforms announced in November 2008 have delivered subsidies for food production to Rural Development. Milk quotas will be scrapped in 2015.

# Activity three: All in a cup of coffee

This activity is adapted from an activity first devised by Drennan Watson, and used by the WWF Scotland's *LinkingThinking* project. The 'Chocolate game' is a similar, easier activity, devised for this age group, focusing on the trade issues.

## You will need

- a set of 'Coffee game' cards from Activity sheet F6, enlarged on the photocopier, cut up into cards and laminated (or one small set/group)
- Coffee sales and Adding milk cards from activity sheet F6
- a sheet of reusable paper and pencil/person
- a flipchart and pens – 2-3 sheets of paper and 2 coloured pens/group
- a large open space (indoors/outdoors) to lay out the cards and for everyone to be able to sit in a circle.



**Time**  
**Allow 40 minutes**

## What to do

Looking at plantation, agriculture and/or dairy farming in UK/Scotland may be a good lead in to this activity. Ask the class to think about what has to happen to make a cup of instant black coffee. They should write the actions down on their sheet of reusable paper, in sequence (5 minutes). Give the cards out made up from F6 (22 in all – make some duplicates if your class/group is larger) – ask them not to read or share them for the moment. Make sure you give out and know who has the following:

- Collect mug and put coffee in
- Add boiling water to coffee in mug
- Fill kettle with mug full of water and boil
- Drink the mug of coffee.

Ask the four learners with these cards to put their cards out on the floor/table in a pattern of order they think fits best. Go round the group asking them to place their cards where they think fits best. Discuss as necessary as they get put down.

Ask how many had all these steps when they began – most won't have. Ask how much of the information was new to them – most will say they knew them. Reinforce that learning about sustainability is not about learning new things, but more about integrating our knowledge and skills in new ways. Explain those cards that anyone doesn't understand.

Explain that the picture is incomplete. What's missing? Selling the coffee isn't there, so put the 'Coffee sales' card down and discuss its contents. What if we like milk in our coffee? Put the 'Adding milk' card down and discuss its contents. Point out that each of the cards could have a similar network of inter-relationships.

The whole thing looks more like a web with interconnections. Ask them to look at the way the group has organised the cards. They have probably used a linear arrangement: this is a (managerial) style common in Western societies. They may have used clusters: this allows more 'joined up' thinking. Use the flipchart and clusters to explain about systems (inputs, throughputs, outputs) and explain how they are useful as a way of dealing with complexity (optional). The exercise aims to demonstrate how informed decision-making depends on what an individual knows and understands, and how they feel about it (their values and dispositions), after some 'joined up' thinking.

Finish with circle time. Use a sentence completion activity, e.g. one thing I learnt from this activity was...; or use the time for an open discussion to explore what they have learnt, any comments about things people said, any ideas on the choices we can make for healthy eating and reducing the food component of our Ecological Footprints, e.g. encourage buying Fair Trade coffee, encourage fair prices for milk for dairy farmers, drink less coffee.

Further extension may come from asking how many of them fill and boil a kettle when they only need a mug full of water, or what happens to the coffee once it is drunk. Much research/discussion can then lead from these, e.g. energy (power) wastage, waste water treatment, caffeine addiction, human energy 'kicks and slumps', etc.

## Activity four: Food chains

This activity is adapted from the Institute for Earth Education's *Sunship Earth* programme – the concept activity 'Chain gang'<sup>8</sup>. There are other activities presenting photosynthesis ('Food factory') and food pyramids ('Mr Sun's Restaurant') that would go well with this activity.

### You will need

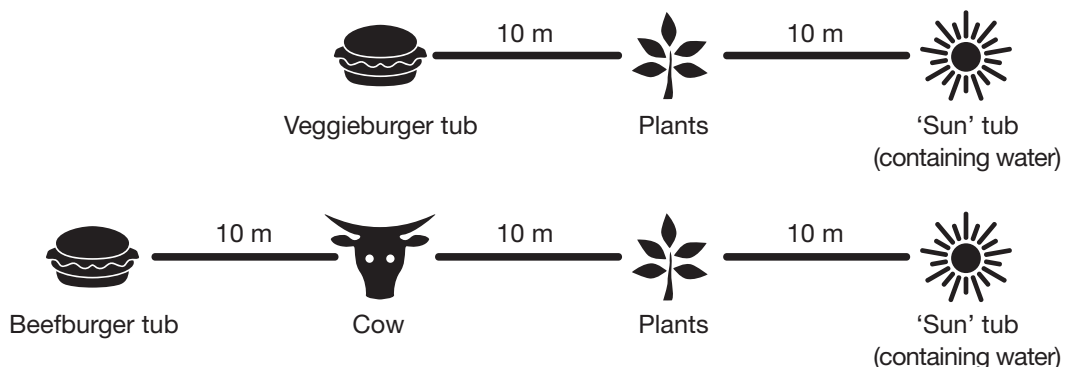
- an outdoor space large enough to set up the 'relay' course
- time to prepare:
  - two large (dust) bins, each with sun symbols, full of water
  - two plastic wastepaper bins, one labelled 'veggieburger' and one labelled 'beefburger'
  - five large plastic plant pots with holes in the bottom (15 – 20cm diameter), two labelled 'sun', two labelled 'plant' and one labelled 'cow'
  - nine name tags on strings, two labelled 'sun', four labelled 'plant', one labelled 'cow' and two labelled 'judges'
- a long piece of rope, or 30 m tape extended
- five bamboos/poles/chairs to mark stations for the sun, plants and cow
- two 1 m rules for judges
- a whistle
- copies of Activity sheets F7 (Second Level) or F8 (Third Level) – 1 each.



**Time**  
**Allow 1 hour**

### What to do

Set up the 'race track' on the school playing field/tarmac in advance. Lay it out as the diagram shows:



Recap or teach a section on photosynthesis/foodchains/webs/ food pyramids.

8. See the Resources section on page 112 for more details.

With the class on the edge of the race track, ask “Where do we get our energy from?”. Brainstorm a food that doesn’t originate from the sun’s energy. There isn’t one, OK! Give everyone a copy of Activity sheets F7 and 8 and read out the statement:

*“The sun gives energy to all living things through the food that they make or eat.”*

As necessary, explain that: *“Plants capture the sun’s energy through their leaves. As this energy then flows from the plants – to the animals eating the plants, and the animals that eat those smaller animals and so on, a lot of energy is lost. Plants use up a lot of energy growing. Animals use up a lot of energy growing and moving. Because of this energy loss, a lot more sun energy is needed to feed a meat-eater than a plant-eater.”*

Explain they are going to take part in a relay race called the ‘Food chain’, after the old prisoner chain gangs: they used to pass rocks, they (learners) are going to pass energy! The chain they will be witnessing in action is the food chain – from the sun to a burger. Move to where everything is set up.

Explain that, since it’s a little difficult to carry energy, they are going to carry something to take its place – water. There are sun tubs for each team. There is also tub for each team at the other end – beef and veggie. The idea is to see which team uses the sun’s energy most efficiently. The water carriers have holes in them representing the energy lost while passing between levels in the food chain in the natural world.

Organise sun people, plant people, and a cow. Ask what is needed between the sun and the burger. Where should they stand? Give out the name-tags for each step of the food chain and position everyone, after asking where they should go.

#### **Explain the process and the rules of the game:**

- The idea is that on the word ‘Go’, the suns fill their buckets with water (energy) and run to the plants; they transfer their water (energy) to their pots, then the plants run either to the veggieburger tub, or the cow and transfer their energy (water); the cow is then left to run up to the beefburger tub. Meanwhile everyone else is running back to their stations to collect the next load of ‘energy’.
- Since they have to play by nature’s rules, they have to accept that energy loss is always happening – so they can’t try to cover the holes in their buckets with their hands! Also, energy only goes one way: from sun-plant-animal – so they can only receive water from the level below/sun.
- They should go as fast as they can and see who fills to their burger-level first. When the whistle is blown, this means “Stop Action” – so they have to stop right where they are.

Set the race in motion. Take a look and watch who’s working hardest. Those watching should also analyse what’s happening:

- the suns are moving fast and furious
- plant and cow people are doing proportionately less work
- the veggieburger tub should be drawing ahead – it should be filling about twice as fast.

Stop once during the action and identify what's happening by asking questions, then continue until the veggieburger tub is filled, or up to the agreed level.

Ask the learners to reflect and report back on what was happening, what this represents in nature, and what it means for us.

Ask them to look at their Activity sheet again and to find a natural example in the school grounds where energy is being lost. They can draw/write an example of a food chain linked to the plant/animal, and explain why it's healthier for the planet to eat lower down the food chain.

## Assessment and evaluation

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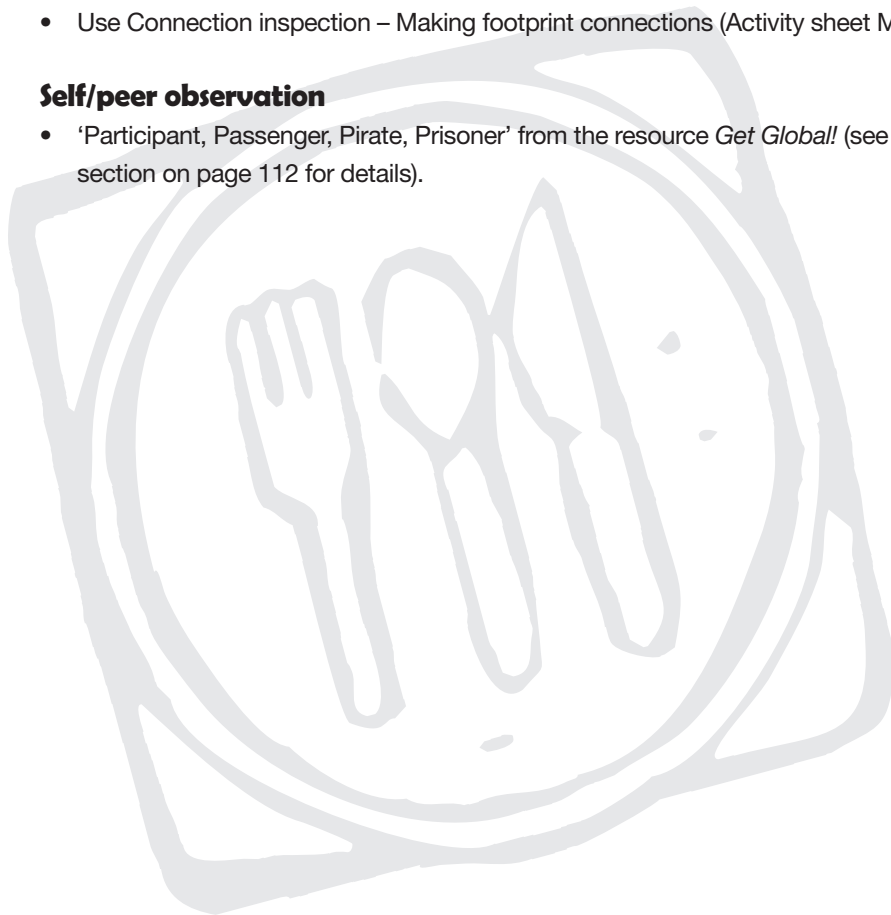


### Teacher observation

- Ease/difficulty of contributing to a group activity
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in identifying and applying the range of factors affecting decision-making
- Ease/difficulty in making connections between issues, and local and global dimensions
- Ability to describe and explain at least three issues relevant to Healthy Eating
- Ability to describe three choices for healthier eating and also reducing the food component of their Ecological Footprint
- Ease/difficulty in completing activity sheets accurately
- Use Connection inspection – Making footprint connections (Activity sheet MC8).

### Self/peer observation

- 'Participant, Passenger, Pirate, Prisoner' from the resource *Get Global!* (see the Resources section on page 112 for details).





## For teachers

### **Get Global!**

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save The Children/DFID. Full of great ideas and activities enabling higher order thinking by learners. 'Route finder' activity here.

Available in pdf format on the websites below:

[www.actionaid.org.uk/schools](http://www.actionaid.org.uk/schools)

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### **Eco-Schools Guide** – Chapter on Health and Well-being

Full of relevant information and practical activities, recently revised for Scottish schools. Good sections on waste, school grounds and sustainable development. Guide can be downloaded from the Eco-Schools Scotland website.

Website: [www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org) or [www.eco-schools.org](http://www.eco-schools.org) (European Eco-Schools).

### **Development Compass Rose**

A4 Book by Tide~ (Global learning), 1995. ISBN 0 948838 34 5. Exemplifies the use of the development compass rose in analysing local/global issues, as a means of developing ideas about sustainable development, globalisation, North/South, etc. Available from [www.tidec.org](http://www.tidec.org)

### **Lessons in Sustainability – What on earth is happening? How do we respond?**

A4 book by Tide~. 2003 ISBN 0 948838 87 6. Shares ideas for teaching about sustainable development issues, as a response to the Johannesburg World Summit. Produced by teachers, with background information, activities, case studies, further ideas and resources. Available as above.

### **Food and farming – local and global**

A recent Tide~ resource. Produced by teachers to help effectively engage learners in the everyday complexity of live issues about food and farming, including sustainable development, interdependence, and questioning. Available as above.

### **All you need for a Fair Trade Assembly**

Plans for three assemblies with minimal preparation and maximum participation, looking at different kinds of trade – chocolate, bananas and fashion. Available for download from [www.risc.org.uk](http://www.risc.org.uk)

### **Sunship Earth**

Spiral-bound programme developed by the Institute for Earth Education [www.earthed.org.uk](http://www.earthed.org.uk)



**Go Bananas!**

Educational resource from Oxfam. Downloadable lessons and photos about the journey of a banana. Aimed at ages 7 – 11 years. Website: [www.oxfam.org.uk/education/resources](http://www.oxfam.org.uk/education/resources)

**Making a meal out of it**

Activities about the origins of food and causes of hunger. Aimed at ages 7 – 11 years. Available from Oxfam as above.

**Best of the Bunch**

A booklet from Banana Link looks at production in the Windward Islands and Fair trade issues. See their website for other teaching resources. Banana Link campaigns for small producers in Africa, Caribbean and Latin America; useful for issues on fair trade and workers' rights. Website: [www.bananalink.org.uk](http://www.bananalink.org.uk)

**The Whole World Cake**

Educational resource from Christian Aid, 1994. Looks at where our food comes from. No longer available for purchase, but may be loaned from all SDEC centres. See IDEAS (International Development Education Association of Scotland) website at [www.ideas-forum.org.uk](http://www.ideas-forum.org.uk) for your local centre contact details.

**Fair Trade School Handbook**

Ideas to help schools teach and implement the values of Fair Trade. Available through [www.scotdec.org.uk](http://www.scotdec.org.uk)

**The Chocolate Trade Game**

A Christian Aid/Comic Relief resource for levels ages 7 – 14 years. Lively game that simulates the experience of all involved in the production of chocolate from cocoa farmers in Ghana to shoppers in the UK. Excellent intro to trade issues.

Website <http://learn.christianaid.org.uk>

[www.newint.org](http://www.newint.org) – The New Internationalist site looking at world poverty and inequality with up-to-date reports on world trade issues.

[www.maketradefair.com](http://www.maketradefair.com) – Oxfam site with lots of accessible information on the issues, and the impact on people's lives.

[www.snh.org.uk](http://www.snh.org.uk) – Scottish Natural Heritage website with information on Scotland's natural heritage and farming.

[www.wwf.org.uk/oneplanetschools](http://www.wwf.org.uk/oneplanetschools) – WWF-UK website – Consumption topic box and other useful teaching resources.

[www.wwfscotland.org.uk](http://www.wwfscotland.org.uk) – WWF Scotland website – Food and Agriculture area with a resource on The Footprint of Scotland's diet.

## Teachers and learners

[www.oxfam.org.uk/coolplanet/milkingit](http://www.oxfam.org.uk/coolplanet/milkingit) – an Oxfam award-winning interactive website for secondary learners (Third level +) and teachers, teaching about the lives of two dairy farmers in Jamaica and Wales. Learn all about milk production, the farmers, the issues involved and how international trade affects them.

[www.soilassociation.org](http://www.soilassociation.org) – information/advice from the soil association – organic growing.

[www.hdra.org.uk/schools](http://www.hdra.org.uk/schools) – Henry Doubleday Research Association's school organic network.

[www.localfood.org.uk](http://www.localfood.org.uk) – local food information.

[www.foe.co.uk/living](http://www.foe.co.uk/living) – Friends of the Earth foodsite, 'Growing concerns'.

[www.fairtrade.org.uk](http://www.fairtrade.org.uk) – Fair Trade Foundation – information and resources – register to become a fair trade school.

[www.peopleandplanet.org](http://www.peopleandplanet.org) – learners campaigning on Fair Trade.

[www.jubileedebtcampaign.org.uk](http://www.jubileedebtcampaign.org.uk) – information on trans-global debt cancellation and ways to take action.

[www.agra-net.com](http://www.agra-net.com) – Agra Europe – info on food imports and exports.

[www.bhf.org.uk](http://www.bhf.org.uk) – information/advice from British Heart Foundation.

[www.bda.uk.com](http://www.bda.uk.com) – information/advice from British Diabetic Association.

[www.crc.org.uk](http://www.crc.org.uk) – information/advice from Cancer Research Campaign.

[www.nutrition.org.uk](http://www.nutrition.org.uk) – information/advice from British Nutrition Foundation.

[www.rhet.org.uk](http://www.rhet.org.uk) – Royal Highland Education Trust has resources, farm visits and classroom speakers.

[www.thinkfoodandfarming.org.uk](http://www.thinkfoodandfarming.org.uk) – Food and Farming schools advice/information.

[www.growingschools.org.uk](http://www.growingschools.org.uk) – support for using the outdoor classroom as a resource across the curriculum.

[www.LTScotland.org.uk/healthpromotingschools](http://www.LTScotland.org.uk/healthpromotingschools) – a whole school approach to health.



## Activity two: Food footprints: Activity sheet F1 What goes into my packed lunch/school lunch

### What goes into my packed lunch/school lunch example

Food	Main raw materials	Country of origin	Km travelled to Scotland/ UK (to nearest 100km)	Processes/fresh
Bacon	Pig meat	Denmark	1,000	Processed (hung, smoked, sliced) and packaged (plastic)
Lettuce	Plant leaves	Scotland	0	Fresh - from the school garden - washed
Bread	Flour (ground grass seeds), yeast, water	Flour - USA Yeast - UK Water - UK	Flour - 9,000	Processed (dried, bleached, ground) and packaged (plastic)
Butter	Cows milk (udder secretion)	England	600	Processed (separated, beaten, shaped, cooled) and packaged (paper)
Apple	Apple tree fruit (swollen seed case)	New Zealand	24,000 (by sea)	Processed (sorted, waxed) and packaged (paper stamps and boxes)



**Activity two: Food footprints:  
Activity sheet F2  
World map**



World map



## Activity two: Food footprints:

### Activity sheet F3

## The story of the bacon, lettuce and tomato (BLT) sandwich

Here is the story of what goes into a BLT: that sweet and lightly salty sandwich, which came over from North America, and which most of us love!

Close your eyes and just imagine making a BLT sandwich for a snack. Try and imagine each of the stages as we do it...

Take the bacon from its packet and put it under the grill. Smell the fat as it burns off, and watch the fat drip off while it cooks! Put it on a plate to cool, avoid any drips of course...

Get out the loaf of bread. Now take out or cut off a couple of slices. Take the butter or margarine from the fridge; get a knife and spread it onto the bread.

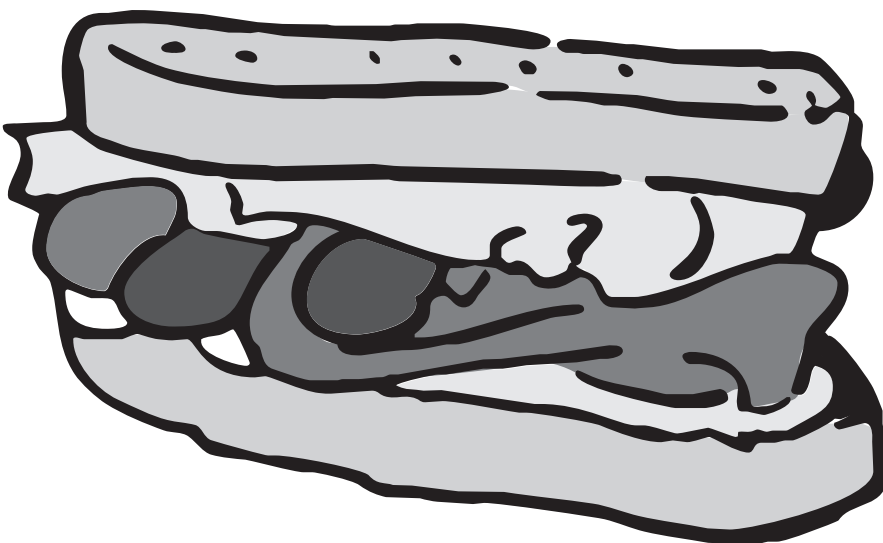
Take out the lettuce and tomato, wash them, drain and dry them and slice them finely with a sharp knife on a chopping board.

Get the mayonnaise out of the fridge, take off the lid and giving it a stir.

Now we're ready.... Put the bacon on the bread with the lettuce and tomato pieces. Spoon on a generous helping of mayonnaise, add the top layer of bread and then lift it all up to your mouth with both hands.

Take a large bite... yum!

Enjoy the crunch and the flavours in your mouth and the drips of mayonnaise down your chin... Smile! Open your eyes!



We are going to look at what lies behind the BLT - something we rarely think about. But this is the reason why it leaves a sour taste in the mouths of many people elsewhere in the world - let's have a look at Activity sheet F5.



**Activity two: Food footprints:  
Activity sheet F4  
The BLT sandwich story: what do you think?**

**Question:** Does a bacon, lettuce and tomato (BLT) sandwich sound like a globally sustainable snack?

- What do you think? Write down your thoughts and reasons.

**I think a BLT sandwich like this sounds/does not sound (cross out the one you don't want) like a sustainable snack, because**

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- What are the key ingredients of a sustainable snack?

**I think the ingredients are**

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- Do government and the food industry take responsibility for caring about other people's livelihoods, and the natural environment, around the world? What do you think - write down your thoughts.

**I think**

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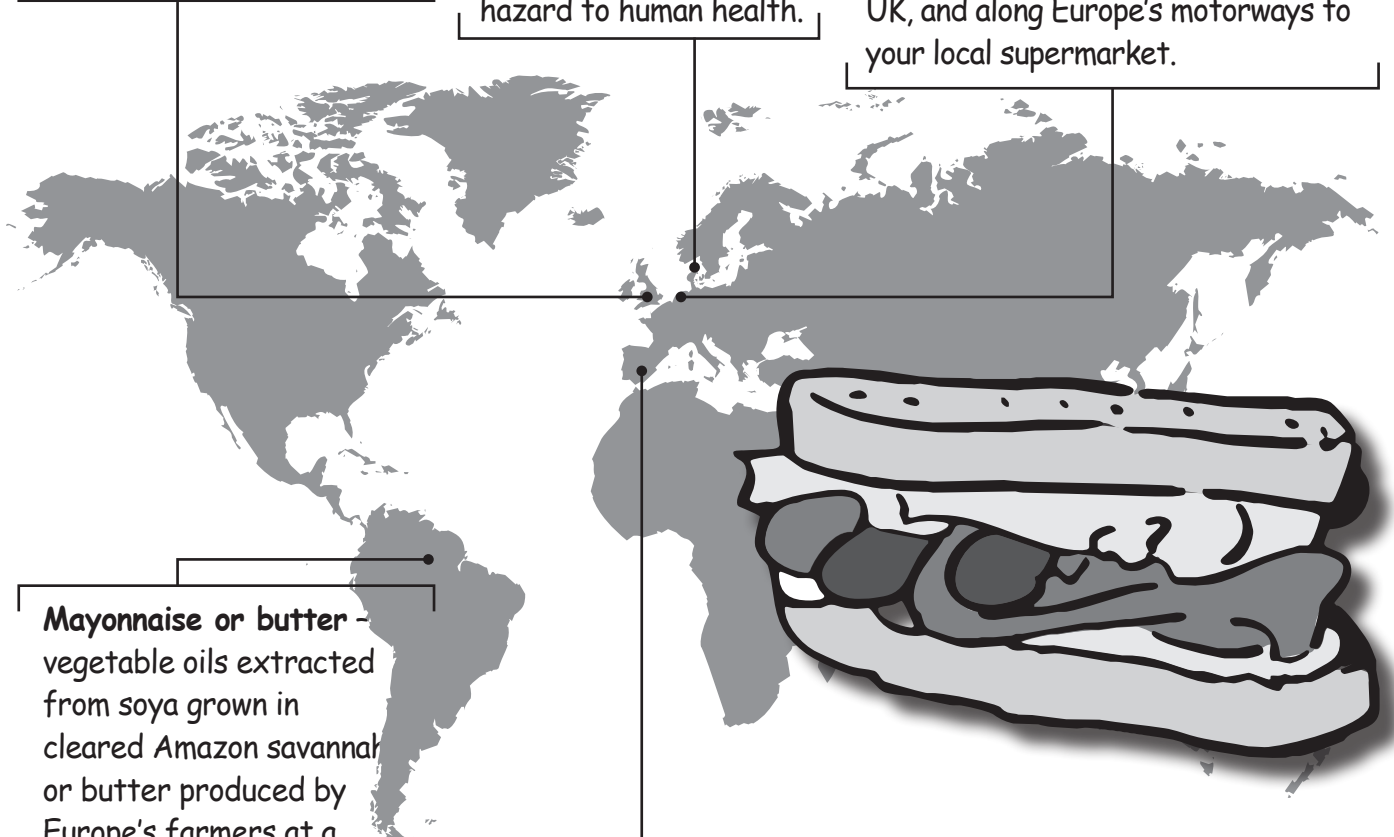
## Activity two: Food footprints: Activity sheet F5 The BLT sandwich unwrapped

Let's take a look at where all the ingredients come from:

**Two slices of bread** - from wheat grain produced on the arable 'prairies' of eastern England - now largely devoid of hedgerows and wildlife sprayed with toxic pesticides and paid for by the tax-payer (in subsidies).

**Two strips of back bacon** - from an industrial piggery in Denmark producing massive quantities of slurry that can cause severe pollution to rivers, estuaries and the open seas and a hazard to human health.

**One to two large crisp Iceberg lettuce leaves** - produced in Dutch greenhouses in the middle of winter, so we can have them all year round. They are sprayed with huge quantities of toxic chemicals and use vast amounts of energy to be grown, stored and shipped across to the UK, and along Europe's motorways to your local supermarket.



**Mayonnaise or butter** - vegetable oils extracted from soya grown in cleared Amazon savannah or butter produced by Europe's farmers at a cost of up to £16 billion a year in subsidies, with buying and selling practices that undermine the dairy industries in Jamaica, Brazil, Kenya and India.

**One medium sized ripe tomato, preferably beefsteak type** - from factory-sized greenhouses in Andalucia, southern Spain that have scarred the landscape, and sucked the rivers dry by being irrigated (Spain has the most irrigated land in W Europe), polluted the air, and indirectly destroyed the livelihoods of farmers in West Africa.

**Servings:** two planets, at least, to sustain a lifestyle like this.

For more background to these explanations, ask your teacher.



**Activity two: Food footprints:**  
**Activity sheet F6**  
**Coffee game cards**



Attract people from local communities to work on the coffee plantations	Fill kettle with mug-full of water and boil it
Make coffee product from beans in a factory	Pour boiling water onto coffee in mug
Transport packaged coffee product from factory to port	Collect mug and put in coffee from jar
Export coffee by ship to London	Build waste water treatment plants to deal with people's urine
Build reservoirs to supply water to your house/school/office	Drink the mug of coffee
Create landfill sites for old crockery, coffee packaging, etc	Make roads and railways to transport the coffee beans from plantation to factory
Make steel to build ships to export the coffee and rails for railway	Quarry rocks for aggregate to make roads/railways to get coffee from factory to port
Build power stations to supply electricity to heat the water	Make mugs/coffee pots from raw materials
Remove local people's land rights to get land for coffee plantations	Sale of coffee beans on the world commodities market
Fell primary tropical rainforest to make coffee plantations	Plant coffee bushes in plantations and manage them to improve growth
Harvest the coffee beans, dry them and put them in sacks	Build factory to make the coffee beans into a coffee product





**Activity two: Food footprints:  
Activity sheet F6 continued  
Coffee sales**

Sale of coffee product to retailer/supermarket chain  
from port of London/warehouse

## COFFEE SALES

(what else is involved?)

Packaging

Transport of coffee product from warehouse to  
retailer or supermarket

Advertising

Getting shoppers to/from the store

Disposal of empty jars and lids





**Activity two: Food footprints:  
Activity sheet F6 continued  
Adding milk**

## MILK

Grazing land/covered barns

Slurry/manure disposal

Cattle cake/Silage

Farming support from government

Collection and transport of milk

Processing, packaging and selling of milk

Farming as a livelihood

Animal welfare





**Activity four: Food chains:  
Activity sheet F7  
Energy flow**

**ENERGY FLOW**

The sun gives energy to all living things through the food that they make or eat.

Energy is passed from the sun to the plants and on to animals, but much of it is lost along the way. Before they are eaten, plants use up sunshine energy in making food and growing. Animals use a lot of energy in growing and moving around looking for food to eat. Because of this energy loss, a lot more of the sun's energy is needed to feed a meat-eater than to feed a plant-eater.

**Write or draw below a natural example of energy being lost that you have found around here.**

My example of energy being lost naturally is \_\_\_\_\_

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**Activity four: Food chains:  
Activity sheet F8  
Energy flow**

**ENERGY FLOW**

The sun gives energy to all living things through the food that they make or eat.

Fill in the gaps - there are more words than gaps!

Energy is passed from the \_\_\_\_\_ to the \_\_\_\_\_ and on to \_\_\_\_\_, but much of it is lost along the way. Before they are eaten, plants use up sunshine energy in growing. Animals use a lot of passed-on energy in growing and moving around looking for food. Because of this energy \_\_\_\_\_, a lot more of the sun's energy is needed to feed a \_\_\_\_\_ than to feed a \_\_\_\_\_.

sun   food   meat-eater   animals   plant-eater   loss   plants   gain

Write or draw below a natural example of energy being lost that you have found around here. Explain why eating a veggieburger is healthier for the planet.

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# Part 2

## Unit 5:

# Transport

### Key ideas

- Transport and travel represent a large proportion of our Ecological Footprint today. (*Cars are cool, Alternative choices, Calculating footprint*)
- There are lots of ways to get around – each one with differing environmental, economic and social costs, local and global. (*Cars are cool, Alternative choices, Planning for real*)
- Car companies, advertisers and the media play an important role in shaping public opinion and influencing people's behaviour. (*Cars are cool*)
- The car is the most convenient form of transport for most people, and there are many pressures on us to buy one. (*Buying a car*)
- The car as a status symbol, reflecting an individual's success and standard of living, does not necessarily also reflect their quality of life. (*Buying a car*)
- Supporting sustainable transport means taking informed, realistic choices now, and getting involved in raising awareness of the actions required for the future. (*Buying a car, Planning for real, Alternative choices, Calculating footprint*).

# Background notes

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In 2004 in Scotland, the transport component of each person's Ecological Footprint was 0.9 gha. This represented 17% of their overall Ecological Footprint.

The car has become the most convenient way to travel, for most people in Scotland. Traffic on the roads in Scotland increased by 25% between 1993 and 2006 (Scottish Environmental Statistics 2008) – a good proportion of this caused by increased car ownership. The Ecological Footprint of a car (or any means of transport) is not just in its use, but also its construction and disposal – from 'cradle to grave'.

The car has become one of our most obvious status symbols. Many young people see achieving a driving licence and owning a car as a natural goal and essential right beyond the age of 17. As adults, after buying a house, buying a car is one of our biggest and most expensive purchasing choices. What facts and influences inform our choices in buying a car, and using it?

Advertisers are particularly adept at raising our level of 'wants' over 'needs'. As a society, in Scotland, we have greater leisure time and disposable income than ever before, and we enjoy going places and buying new things. 'Retail therapy' is now one of our nation's most popular leisure pursuits. How much are our purchasing decisions influenced by the media/advertisers and others, and in what ways?

Recently the 'school run' has been flagged up as the 'villain' of urban congestion and pollution. The online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) can calculate the size of the transport component of our Ecological Footprint, and provides comparative information about walking, cycling and public transport (buses and trains). Schools are achieving changes through commitment to alternatives and having school transport policies and plans.

Energy is a particularly challenging concept to understand, particularly in the context of transport. We rarely think about the means by which we travel, other than in terms of convenience, cost and time – not what raw materials, energy and technology have been used in its design and production, where all this comes from, or where it all goes after we're finished with it, let alone what impact it has – directly or indirectly – on the environment or other people while in use. However, understanding about energy, and the interdependence of the social and cultural, political and economic, and environmental forces affecting the way we travel, is fundamental to appreciating the size of the transport component of our Ecological Footprint, and how to reduce it.

# Objectives and outcomes

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Young people should learn:

## Knowledge

- To describe the travel modes that make up the transport component of their school's Ecological Footprint and how it may be reduced. (*Cars are cool, Alternative choices, Calculating footprint*)
- To give examples of the connection between values and attitudes and behaviour. (*Cars are cool, Buying a car*)
- To describe how school and household travel can be managed more sustainably. (*Cars are cool*)
- How people continually impact on the environment and others, as part of wider society, at local and global levels. (*Alternative choices*)
- To give an example of how quality of life is broader than standard of living. (*Cars are cool, Buying a car*)
- To describe what elements add to the aesthetics of a place to work and live. (*Planning for real*)
- To give examples of ways to reduce the transport component of their own Ecological Footprint. (*Planning for real*).

## Skills

- To think critically about the different ways advertising, the media and our family and peers influence our 'wants' and our choices. (*Cars are cool*)
- To demonstrate an ability to use the information available to make informed and balanced choices. (*Buying a car*)
- To be able to express quality of life in personal terms beyond consumption. (*Cars are cool, Buying a car*)
- To work cooperatively in planning, camping out and reviewing a project. (*Cars are cool, Planning for real, Calculating footprint*).

## Values and dispositions

- To recognise and respect the different dispositions people hold about cars – their value and use, and what their own attitude is. (*Cars are cool, Planning for Real, Buying a car*)
- To discuss and communicate their feelings and opinions about media and peer pressure influences, within groups. (*Cars are cool, Buying a car*)
- To discuss and communicate their feelings and opinions about traffic and their transport choices, within groups. (*Planning for real*)
- To be willing to act as a responsible citizen, learning from and working with others to reduce the transport component of their Ecological Footprint, and choose more sustainable ways to travel to school and at home. (*Cars are cool, Alternative choices*).

# Activity one: Calculating your school's transport footprint

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## You will need

- information about the ways learners and staff travel to school
- paper, pencil
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**Allow 30 minutes**  
**plus follow-up**

## What to do

Brainstorm the ways that people travel to school and how this affects the size of the transport component of the school's Ecological Footprint. Each type of transport needs a different amount of energy to run and therefore has a different Ecological Footprint. Energy from fossil fuels is used to power nearly all transport other than bicycles and walking. Fossil fuels are not only non-renewable resources but also release carbon dioxide when burnt. Most forms of transport take up land space, for example roads, parking spaces, bus-stops, rail tracks, stations, airports and ports.

Ask everyone in your class or school to keep a transport diary for a week. They need to write down the distance in kilometres between their home and the school and how they travelled. Choose from the types of transport listed in the chart opposite.





Type of transport	Distance per class per week (km)	Distance per year (40 weeks)	Number of people	Distance (km per person per year)
Air travel – domestic				
Walking				
Bicycle				
Private hire bus				
Car				
Motorcycle/ moped				
Van/lorry				
Other private (minibus etc)				
Local bus				
Taxi minicab				
Ferry				

Ask each person to add up the distances they have travelled during the week on each type of transport. Then add together all the results for the different types of transport. Multiply each result by 40 weeks (a school year which doesn't include holidays) to find the distance in km travelled per year with each type of transport. Divide the result for each type of transport by the total number of learners (or learners and staff) in the class or school. This will give you the number of kilometres each person travels per year on each type of transport.

Record and save the results in the transport tab of the downloaded Excel workbook. Then enter these results into the transport section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the transport component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the distances travelled by each mode of transport, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

Now that the size of the transport component of your school's Ecological Footprint has been calculated, begin to look at ways to reduce it. The Action Programme for Change section of this handbook (starting on page 181) contains information and advice on how to do this. You can repeat the calculations after changes have been made to see how much you have managed to reduce the size of the transport component of your school's Ecological Footprint.

# Activity two: Cars are cool

## You will need

- time to gather a variety of car adverts from magazines/newspapers (include those with a background of the countryside/wild places) – put them in plastic pockets or laminate to protect; videos of car adverts from TV might also be useful
- folders for each advert – one for each group
- time to prepare prompt cards (optional) for each group featuring the words status symbol, power, freedom, belonging, excitement, image; it would also be useful to have some blank cards. Place them in a folder for each group, with the advert
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- space to allow small group working and circle time.



## Time

**Allow 1 hour**

## What to do

Who thinks cars are cool? What is their favourite car and why? This activity is about analysing the way car advertisers influence our choices – both overtly in the words and images they use, but also through hidden messages absorbed unconsciously through the images – e.g. their use of women/men, backdrops, etc.

Ask learners to make a list of the overt messages and the hidden messages/emotions that adverts promote about cars and the natural environment/countryside, e.g. man's dominance over nature, nature is there to be conquered and used/abused. How might this affect people's values and attitudes to cars and the natural environment?

Or ask learners to design an advert for promoting the use of bicycles to school and/or their town/village.

Carry out a class survey – draw a quick chart with columns – no car, 1 car, 2 cars, 3 cars, more than 3 cars, and ask children to tick the situation for their family. What do they find? Look at the transport to school diaries they completed. How did the car feature in these? Compare the size of each learner's (and your!) transport footprint for the week. Decide on a graph to illustrate the range in sizes of transport footprint and construct it together. Was the car an important factor in raising the footprint's size? How did they manage to reduce their footprint size? Are there any other ways to achieve a reduction?

Use picture pieces to form groups<sup>10</sup>. Give each group a folder and ask them how they feel about their group's car and why. Explain how advertisers appeal to our emotional needs and wants. Brainstorm those associated with cars, or use the cards. Can the learners match these or other descriptions in the adverts? Ask the learners to list what they think are the most persuasive messages in adverts, e.g. gives you speed, makes you look cool, helps boys/girls attract attractive boys/girls.

Use a sharing circle to share what they think they have learnt, comments on what has been said, any other ideas relating to cars, car ownership and/or car advertising. Explore whether they would be willing/not willing to buy smaller cars, with less impact on the environment, and why.

10. Laminated car pictures (20 cm x 15 cm – as many as you have groups – Range Rover, sports car, Skoda, Ford, Volvo, large/small, etc). Cut them into as many pieces as you have people in each group. Mix up in a cloth bag. Learners take 'lucky dip' and find people with other parts of their picture – a fun way of random grouping.

# Activity three: Planing for real – Chewburgh

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## You will need

- a copy of the 'Traffic Game' (2002), loan copies available from SSN on 01786 468 770. This simulation game is part of a larger resource *Traffic First?* Also available from SSN.
- a large table space on which to layout and build Chewburgh
- scissors, glue, card (optional)
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**Your choice**

## What to do

This is a good activity for drawing together a number of issues associated with the transport component of an Ecological Footprint and traffic. Discussion around looking at their footprint for travelling to school, and any traffic problems associated with the school, might lead in to the game by looking at where the school is situated and why. This might include looking at what solutions to traffic problems have been used, and how successful they have been.

The Chewburgh Game comes supplied with photocopiable, paper master copies of the road and building nets with which to construct a 3D model of the town of Chewburgh, leaders' notes, and a team booklet to guide each group of learners participating through the process.

The learners are organised into teams and are given a challenge to design an imaginary town (Chewburgh). They are given information (an excerpt from *The Traveller's Companion on Chewburgh District* and details of the local economy); also roads and buildings to cut out and construct in 3D, in preparation, with help from the Building and Construction Guidelines supplied, and Rules for the Game. The game involves planning where to design the road layout and place all the buildings, in such a way as to facilitate easy and safe movement throughout the area, and be aesthetically pleasing. There are relevant activity sheets helping teams explore the issues. Afterwards teams share and explain their designs and ideas.

The leaders notes' provide Language extension activities involving writing (functional, imaginative and personal) and talking/listening (a debate).

# Activity four: Buying a car

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## You will need

- time to prepare a set of role cards – one for each group – pictures/words describing roles, e.g. single male/female, age 20; factory worker with a family; successful businessman with a family; young professional, conservation conscious couple. On the back of the cards, give prompts as to characteristics if required
- newspapers/magazines with car models and prices (new cars)
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



**Time**  
**Allow 1.5 – 2 hours**

## What to do

Explain that buying a car may be one of the largest purchases they ever make. Discuss what sort of things you need to think about before buying a car; one of these might be the footprint of the car, or its impact on the environment.

Explore the environmental impacts of cars. In small groups, ask them to develop a spider/spoke diagram of the environmental impacts of cars at a local and/or global level. These should include some/all/more of the elements in Activity sheets T2 and T3. Display and share their diagrams and compile composites with all the impacts they have come up with, and those you develop with them.

Allow each group to select a role character card – mime/create cardboard cut outs to get into character.

Ask each group to list all the factors/characteristics of the people that may influence what kind of new car the character might buy. Highlight those factors that will have a direct or indirect ecological impact, e.g. on the natural heritage/wider environment.

Use the CO<sub>2</sub> emissions information from the car adverts to design a spreadsheet/database that summarises and compares the footprint of a selection of cars their characters might choose.

Select a likely car type/model and look at the footprint value.

Compare the footprint values of all the models chosen by the characters. Who chose the car with the lowest and highest values. Was this expected and why? On a similar basis, which car would they themselves select and why? What are the alternatives for reducing the environmental effects of cars?

This could lead on to using the internet to explore ways schools, government, cities are using incentives to reduce car use, or alternative traffic modes, rather than the car.

# Activity five: Alternative choices

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## You will need

- copies of Activity sheet T1
- copies of Activity sheets T2 and T3
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



## Time

Allow 1.5 – 2 hours

## What to do

Look at Activity sheet T1 – a pie chart showing the components of the Scottish residents' Ecological Footprint. What proportion (%) of the whole footprint is transport?

Ask the learners to look at the table in the transport section of the online footprint calculator that compares the Ecological Footprint, and costs for different transport modes, over 20 km distance. Which is the most sustainable transport mode over 20 km? What about 1 km, 100 km or 500 km?

In reality, brainstorm what other factors affect people making a sustainable choice about the transport they use – economic/political, social/cultural, environmental, real or imagined?

Ask small groups to use the 'Issues wheel', or 'Local/global question time' from *Get Global!* (see the Resources section on page 134 for details) to investigate and identify how the transport component of their own Ecological Footprint or car use is connected to sustainable development and/or the transport component of the whole world's Ecological Footprint. Share their findings and discuss. This could lead on to developing spider diagrams making the connections, e.g. Activity sheets T2 and T3.



# Assessment and evaluation

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## Teacher observation

- Ease/difficulty of contributing to group investigation
- Ease/difficulty in making accurate/concise notes, presenting and analysing results
- Ease/difficulty in interpreting adverts and expressing ideas
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in identifying and applying the range of factors affecting decision-making
- Ease/difficulty in making connections between issues, and local and global
- Knowledge and understanding application
- Technical skills – ICT
- Use Connection inspection – Making footprint connections (Activity sheet MC8).

## Self/peer observation

- Group evaluation – use ‘Reflect’ from *Get Global!* (see the Resources section below for details)
- Self evaluation – use the ‘Evaluation wheel’ from *Get Global!* (see the Resources section below for details)
- Peer assessment of other groups’ outputs.

# Resources

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## For teachers

### *Get Global!*

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities enabling higher order thinking by learners. Route Finder, Chapatti Diagram and Active Global Citizen Survey activities here. ISBN 1 872502 91 1. Available in pdf format on the websites below:

[www.actionaid.org.uk/schools](http://www.actionaid.org.uk/schools)

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### *Eco-Schools Guide*

Guides can be downloaded from the website. Full of relevant information and practical activities, recently revised for Scottish schools. Good sections on school grounds and sustainable development. Eco-Schools Scotland website: [www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org)

### *Second Nature – Society, Science and Technology*

A4 spiral folder by Royal Society for the Protection of Birds (RSPB Scotland). ISBN 1 901930 36 X, 2002. Shares ideas for teaching about sustainable development, biodiversity and responsible citizenship. Includes a section on the importance of reducing consumption and increasing recycling through understanding the sources and effects of energy. Available from RSPB Scotland, website: [www.rspb.org.uk/scotland](http://www.rspb.org.uk/scotland)

### **Green2 school**

Travel management software associated with the Safer Routes to School Initiative. Sponsored by DfES. Helps develop walking, bus, cycle club and car share schemes. Demo disk available by e mail from Intrinsic Technology Ltd [green2school@intrinsic.co.uk](mailto:green2school@intrinsic.co.uk)

[www.create.org.uk](http://www.create.org.uk) provides an Energy and Transport education pack with information and activities.

[www.saferoutestoschools.org.uk](http://www.saferoutestoschools.org.uk) provides school travel strategies and plans.

### **For teachers and learners**

[www.transformscotland.org.uk](http://www.transformscotland.org.uk), [www.cuttingyourcaruse.co.uk](http://www.cuttingyourcaruse.co.uk) – Sustainable Transport Campaigns.

[www.globalfootprints.org/issue/transport](http://www.globalfootprints.org/issue/transport) – looks particularly at the social and global dimension.

[www.liftshare.com](http://www.liftshare.com), [www.carcityclub.co.uk](http://www.carcityclub.co.uk), [www.nationalcarshare.co.uk](http://www.nationalcarshare.co.uk), [www.school-run.org](http://www.school-run.org) – information/advice on car sharing.

[www.environmental-protection.org.uk](http://www.environmental-protection.org.uk) – information about vehicle pollution. Travel buster learner quiz and teaching notes.

[www.sustrans.org.uk](http://www.sustrans.org.uk) – information on cycle routes in your area.

[www.rospace.com](http://www.rospace.com) – information/advice on road safety issues.

[www.walkingbus.org](http://www.walkingbus.org) – advice on setting up a walking bus, a list of Local Councils and schools who already have them, and a page for children.

[www.bikeforall.net](http://www.bikeforall.net) – everything about cycling to school.

[www.livingstreets.org.uk](http://www.livingstreets.org.uk) – advice on walk to school days.

[www.walktoschool.org.uk](http://www.walktoschool.org.uk) – advice on green transport weeks and car free days. These are action campaigns coordinated at local, national and European levels. Contact your local Council also.

[www.energysavingtrust.org.uk/scotland](http://www.energysavingtrust.org.uk/scotland) – Eco-driving test online, information on sustainable transport and a grant scheme helping the purchase of new, clean fuel vehicles, or the conversion of vehicles up to a year old, e.g. school minibus.

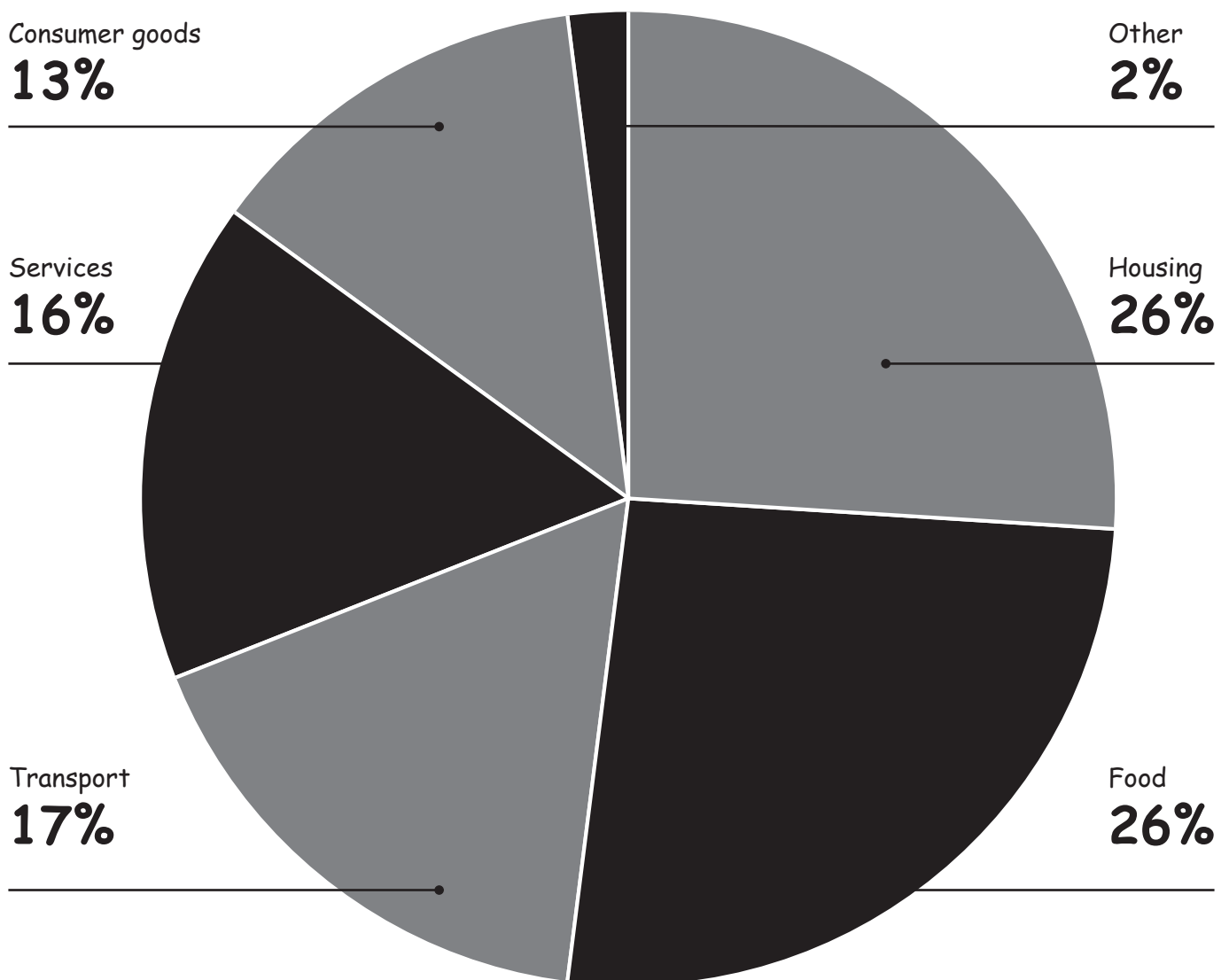
[www.travelwise.org.uk](http://www.travelwise.org.uk) – case studies and project summaries available from the National Travelwise Association.

[www.suschool.org.uk](http://www.suschool.org.uk) – Alternative Technology Centre website, Hebden Bridge, good starter information on transport.



**Activity five: Alternative choices:**  
**Activity sheet T1**  
**Transport footprints**

A pie chart of the components of the footprint of Scotland's residents, 2004







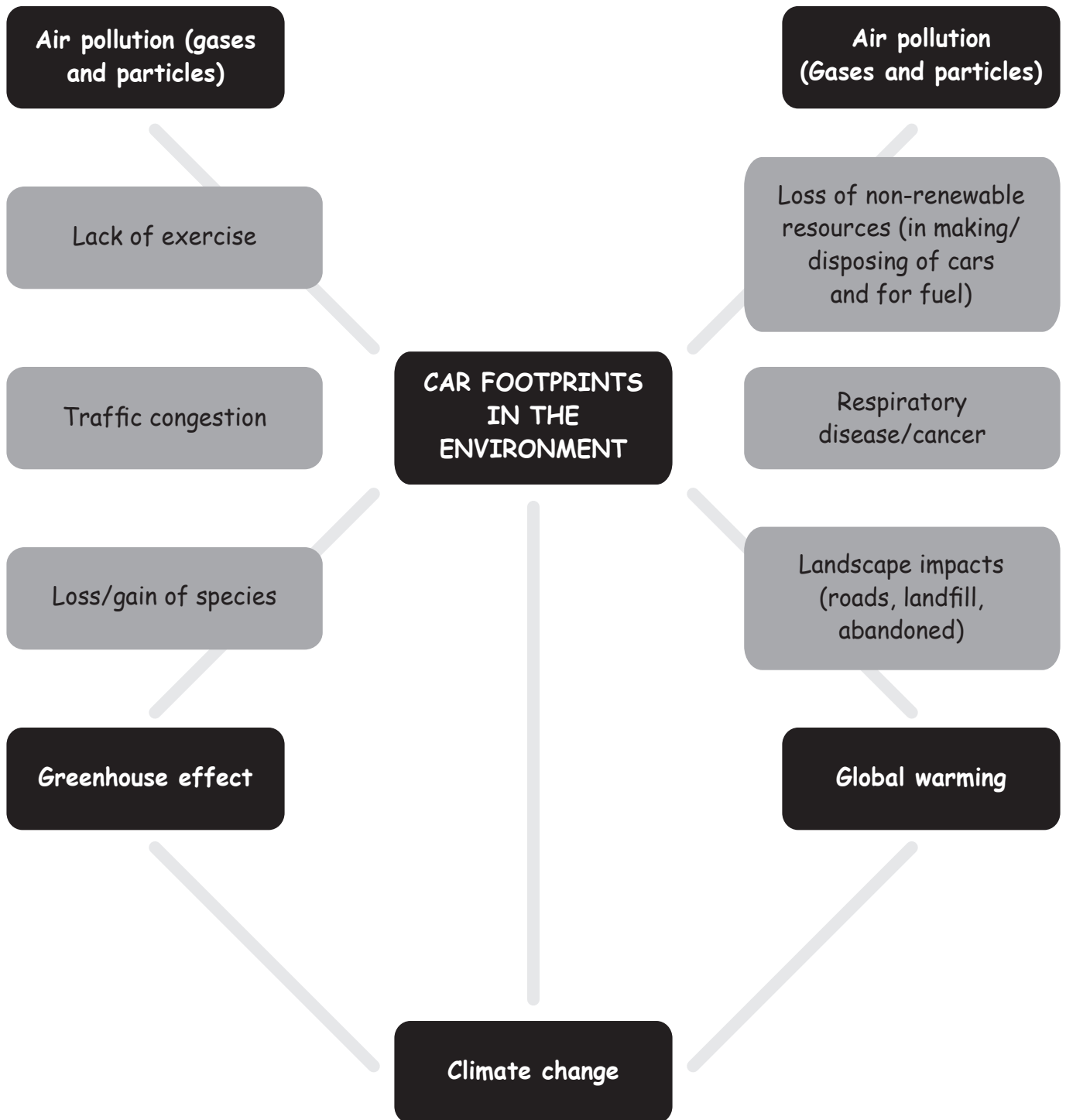
**Activity five: Alternative choices:  
Activity sheet T2  
Transport – making local connections**



Key:  = issues  = connected issues



**Activity five: Alternative choices:**  
**Activity sheet T3**  
**Transport – making global connections**





## Part 2

# Unit 6: Waste

### Key ideas

- Materials and waste make up the largest component of the Scottish residents' footprint. (*Waste around the world, Calculating footprint*)
- There is a limit to how much we can use the planet Earth as a waste disposal unit at current rates – it is a closed system. (*Throwaway world, Waste around the world*)
- The true cost of a product and the packaging should be calculated from 'cradle to grave' – the 'hidden costs' revealed may be environmental, social and/or economic, and impact at local and global levels. (*Takeaway, throwaway*)
- Whether something represents waste or riches depends on our cultural and social values and attitudes and economic situation; often as a consequence of whether you live in a Northern or Southern country. (*Waste around the world, Alternative choices*)
- Reducing our consumption, and the amount of waste we produce, is the most effective and efficient way to achieve a sustainable lifestyle, but difficult to achieve on a national scale. (*Throwaway world, Takeaway throwaway, Alternative choices*)
- How increasing efforts by people around the world are working towards more sustainable development – governments, business, industry, communities and individuals – and reducing their waste footprints. (*All activities*).

# Background notes

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When calculating the waste component of the Ecological Footprint, it is difficult to separate our waste from the goods we consume, therefore waste is a component of every element of Scotland's footprint. The largest contributor to the footprint is the accumulation of embodied<sup>11</sup> energy, built up during the process of converting raw materials into finished products. This shows the importance of reducing consumption, before/as well as promoting waste minimisation initiatives, like Scotland's National Waste Plan<sup>12</sup> and adoption of the Waste Aware Scotland public education and awareness campaign ([www.wasteawarescotland.org.uk](http://www.wasteawarescotland.org.uk)).

Why do we create so much waste today? We have more money, we can buy more than we need, we do not value possessions and we like new things. Also, products are not made to last – that would be poor economics. When we dispose of items it's "out of sight, out of mind", and many more things we buy are disposable. In addition, most products are packaged, often several times or unnecessarily. Fewer people today are in touch with the natural world and many are just not aware of the environmental consequences of their waste or litter.

In other words, our waste crisis is just a symptom of a much bigger crisis, that is over-consumption and our throwaway attitudes. When we are made aware and know the hidden costs, we can make more informed choices as consumers and citizens.

Packaging is a major source of domestic waste and landfill fodder in the UK – it is instant 'waste' once removed from a product. Many of the costs of packaging are hidden. We pay twice: once to buy it, and then to dispose of it, and we suffer the consequences as litter and landfill. Packaging is a relatively new phenomenon. Some 40 years ago, bags, jars and bottles could be refilled – ask some grandparents. Things are beginning to change as consumer pressure and government legislation are beginning to make more manufacturers follow suit – choosing recycled materials, or encouraging refills of their products.

Each year the UK produces around 335 million tonnes (22.58 million tonnes in Scotland 2006/07) of solid waste from a variety of sources – homes, offices, shops and factories, farms, building construction and demolition. Currently in Scotland (2007), around 70% of this is buried in landfill, around 29% recycled and the remainder is sent for incineration, where some of it can be used to produce energy. Many materials buried will take hundreds of years to degrade (e.g. disposable nappies), some will never degrade (e.g. glass, bricks, concrete, some plastics) and all represent wasted natural resources and energy. In some areas we have run out of space for landfill and waste is transported for large distances, using additional energy and creating additional pollution. Improved and appropriate technologies are important in finding solutions for the future.

11. The energy required to produce, harvest and process any product.

12. Scotland's National Waste Plan is a blueprint for the future, providing challenging but realistic objectives for the sustainable management of Scotland's waste. It forms the keystone of the National Waste Strategy: Scotland and is about the real behaviour change required to minimise the waste we generate and the opportunities that will stem from this.

Elsewhere in Europe and in the developing world, landfill is viewed as only one of several solutions, – waste is valued differently. Why is that? There are a number of alternative technologies, beyond those commonly used in the UK, able to minimise the wastage from waste, and to ‘recapture’ its energy value, e.g. incineration and local heating schemes, biogas production and anaerobic digesters.

When we consume and waste less, we reduce the energy, water and matter (raw material) costs to the planet, in making the products and disposing of them at the end of their lives (cradle to grave). The best way to reduce waste, after reducing consumption, is through resource conservation/waste minimisation. At a practical level, this means following the Big 3Rs – reduce, reuse, and recycle, to which now, some also add repair and refill – making the 5Rs.

## Objectives and outcomes

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Young people should learn:

### Knowledge

- To describe the connections between consumption and waste (energy and matter), and what its disposal means for their local natural heritage, and the health of the planet. (*Throwaway world*)
- A variety of economic and political forces determine what and how we consume resources and how their waste is managed. (*Waste around the world*)
- A variety of social and cultural values influence how consumption and waste are viewed. (*Waste around the world*)
- To demonstrate an understanding of the connections between personal values, beliefs and behaviour. (*Takeaway, throwaway*).

### Skills

- To demonstrate an ability to handle information, present data for interpretation and use information to make informed and balanced choices. (*Waste around the world, Alternative choices, Calculating footprint*)
- To demonstrate an ability and determination to make changes to their behaviour (however small) and take action for something positively. (*Takeaway, throwaway*)
- To think critically about the different ways large multi-nationals, government policy and wealth influences our attitudes to consumption and waste, and choices of waste disposal. (*Alternative choices, Waste around the world*).

### Values and dispositions

- To discuss and communicate their feelings and opinions about consumption, and waste issues within a group. (*All activities*)
- To show a concern for and appreciation of all people and living things across the world, their needs and interrelationships. (*Throwaway world*)
- To be willing to act as a responsible citizen, learning from and working with others to improve levels of consumption and waste, with respect to sustainable lifestyles and the reduction of the waste component of our Ecological Footprint. (*Takeaway, throwaway*).

# Activity one: Calculating your school's waste footprint

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## You will need

- information about the amount and type of waste produced in the school/class
- paper, pencil
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



## Time Open

## What to do

Brainstorm the ways that the school's production of waste affects the size of the waste component of its Ecological Footprint. Waste is made up of many different materials (for example paper, aluminium, plastic) made from natural resources. Throwing things away is a waste of the natural resources and energy which have been used to make the product. Most of the energy to make the materials comes from fossil fuels that are not only non-renewable resources but also release carbon dioxide when burnt. Waste has to be put somewhere. Most is sent to landfill sites or incinerated (burnt), using up land and releasing greenhouse gases like methane and carbon dioxide.

Find out the amount of waste your school (or class) produces in one day or week, broken down into the categories given in the table opposite. Find out how you dispose of each type of waste. You do not have to gather data on all the types listed to use the online footprint calculator and may wish to focus on one or two waste types to begin with. One full wheelie bin holds about 41 kg of waste, the average full bin bag contains 10 kg of waste.

Type of waste	Weight per class/school per week (kg)	Weight per year (40 weeks)	Number of people	Total waste (kg per learner per year)
Office paper				
Mixed paper				
Cardboard				
Cans				
Plastic				
Glass				
Aluminium foil				
Organic waste				
Residual waste				
Electronic waste				

On average in Scotland 29% of waste is recycled/composted, 70% is sent to a landfill site and 1% is incinerated (burnt). Learners could research the average proportions in your Council area.

Record and save the results in the waste tab of the downloaded Excel workbook. Then enter these results into the waste section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the waste component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the waste used, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

Now that the size of the waste component of your school's Ecological Footprint has been calculated, begin to look at ways to reduce it. The Action Programme for Change section of this handbook (starting on page 181) contains information and advice on how to do this. You can repeat the calculations after changes have been made to see how much you have managed to reduce the size of the waste component of your school's Ecological Footprint.

# Activity two: Waste around the world

The data/case study and article all come from *Out of the Bin and into the Secondary Curriculum*, Aylesbury DEC – (see the Resources section on page 150 for details).

## You will need

- copies of Activity sheet W1 – 1 per pair
- a link school in a Southern and/or Northern country
- the Ghana case study from *Family Life and the 5Rs* (see the Resources section on page 150 for details)
- the news article 'Let them eat cake' from *Out of the Bin and into the Secondary Curriculum* – 1 per group
- case studies of what other countries have done about waste minimisation from *Out of the Bin and into the Secondary Curriculum* – 1 per group.



**Time**  
**Allow 2 – 3 hours**

## What to do

Look at the data given in Activity sheet W1 – data on the materials and waste Ecological Footprint for Scotland's residents in 2001 and offering a comparison of UK waste in the 1990s and the 1940s. Discuss the different types of graphs possible (bar, divided bar, bar line and pie charts) and how to draw them; how to decide on sensible scales; how to align for comparison, etc. Consider the most appropriate graphs to show the different sets of data given. Differentiation can be built in by allocating the data sets accordingly. Each group/individual should provide a set of graphs drawn by hand, or by using appropriate software and the computer, illustrating the data provided, and prepare to contribute their analysis and interpretation of what graphs show. Create a display of the graphs with their explanations written below, with some of the implications of the waste footprints of UK, Europe and the world for the planet.

What about elsewhere in the world? What do the footprints tell us about Southern versus Northern countries? What images do they have about waste in Southern countries? Could these be described as stereotypes? Where do these images often come from? What 'value' is placed on consumption and waste in other countries and why? What is the real situation? Ask your link school about waste in their country.

## Look at some case studies, for example:

- a story from Ghana where there has been an "insidious erosion of culture and adoption of pseudo – 'superior' Western consumer habits" (in *Family Life and the 5Rs*)
- read the news item 'Let them eat cake' looking at Curitiba in Brazil, and
- examples of what other countries have done for waste minimisation. (in *Out of the Bin and into the Secondary Curriculum*).



# Activity three: Takeaway, throwaway

Adapted from 'Hidden costs' in *Second Nature*, RSPB

## You will need

- metric scales for each group
- a supermarket bag with two fresh potatoes, one can of potatoes (plus a can opener), one bag of crisps, one packet of powdered potato and one bag of frozen chips
- a set of containers to take each product per group (plastic bags, old ice cream/margarine tubs)
- copies of Activity sheet W2 – 1 each
- copies of Activity sheet W3 – 1 per group (W3a is for Third Level and above, W3b is for Second Level)
- a calculator and/or computer software to allow learners to design a recording table for themselves.



## Time

**Allow 2 – 2.5 hours  
plus homework**

## What to do

Provide each group with a carrier bag and scales. Inform them that the clues in the bag will help them investigate some of the 'hidden costs' of packaging. Explain what we mean by a 'hidden cost' – the idea of looking at the cost of a product from cradle to grave, not just as you receive it. Ask learners to give examples of what they think might be a hidden cost of packaging, using prompt questions that could be written on the board: What natural resources does the packaging require for extraction/processing? What waste is produced? How is it disposed of? How does this affect the natural heritage?

Ask them to take out all the things in their carrier bag. They then use the scales to work out the weight of the packaging of each product and compare the energy involved. What do they need to do first? Carry out the measurements, recording and calculations – help them use activity sheet W3 'Energy costs for making packaging materials'. They can go on to find out the total weight of rubbish for 100 or 1,000 products sold. Ask them to rank the products from the lightest to the heaviest Ecological Footprint.

If you are working with learners at Second Level or below, use the term 'units' if you prefer, rather than kilojoules, and round figures to the nearest 10, e.g. 228.6 becomes 230, 47.7 becomes 50, 43.1 becomes 40, 34.7 becomes 30 and 17.6 becomes 20.

Similarly, if you have alternative figures for rotting times, use whichever you feel happiest with – they are unlikely to be significantly different, and it is not an exact science.

Ask the learners for homework to make a note of at least ten (can be food) new items bought in their household and to list the items and the kind of packaging. Also, encourage them to explore the notion that packaging companies convince us, as consumers, that the bigger and glossier, or more layers, of packaging, the better/more hygienic the product. Bring back and share some evidence from magazines/TV/newspaper/supermarkets/products.

Look at the size of the waste component of your school's Ecological Footprint – where does packaging fit in, and what can they do to make a difference? Can the learners suggest alternative ways of selling/packaging the items which are less wasteful of resources and energy? Use the information on [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) to explore some different scenarios demonstrating practical applications of the 5Rs.

# Activity four: Throwaway world

Adapted from an Institute for Earth Education activity 'Throwaway Planet', originally in *Earth Caretakers*

## You will need

- a copy of the letter on Activity sheet W4
- a dustbin/dustbin liner containing a typical mix of waste items made from a variety of materials, with labels attached – see box below for a list of waste items and questions for each label. Attach the letter from Activity sheet W4 to the bin.
- at the bottom of the bin liner, a large envelope containing pictures of native/world wildlife with questions on the back – see box opposite for a list of wildlife and questions for the back of each picture
- an earth in space globe (make one from a paper globe lampshade and papier mache, painted as from space, and varnished) or an image of earth from space, and example cartoons/poems
- a set of cards made up from the statements on Activity sheet W5 – 1 set/group
- copies of Activity sheet W6 – 1 each/per group.

## Bin liner content suggestions and labels

Remember!

Wash bottles/cans/cartons out with boiling water, dry and remove sharp edges (use ring pull variety).

### Waste items

- Crisp packet (plastic/foil)
- drinks carton (cardboard)
- cotton fabric (cotton)
- sealed plastic bag with potato peelings/banana skin/egg shell
- small bottle (glass – with warning)
- drinks can (aluminium)
- yoghurt carton (plastic)
- nylon fabric (nylon)
- battery (mercury/lead)
- soap dispenser (plastic)
- baked bean can (steel)
- drinks/shampoo bottle (plastic)
- newspaper (paper)
- mobile phone card (plastic)

### Questions for the labels attached to the waste items

- What am I the packaging for?
- What raw material am I made from?
- Where is the main source of this raw material?
- In the journey from raw material to product – what will energy be needed for?
- Could another method of packaging (or no packaging) have been used?
- How will energy be used now in getting rid of this 'piece of rubbish'?
- Could I be used for anything else?

## Native/world wildlife

Collect photographs/pictures from magazines/the internet. Stick on to paper or card and write the questions on the back. Laminate. Suggestions:

- killer whale
- yellowhammer
- brown hare
- corncrake
- badger
- Scottish primrose
- Scots Pine tree
- crested newt
- bumblebee
- Scottish midge

(These are all Scottish species. You may wish to make global connections by adding in threatened species worldwide – e.g. tiger, orang utan, etc).

### Questions for the back of the native/world wildlife images

- What am I?
- What group of living things do I belong to?
- Where am I found in/around Scotland/Britain today?
- What do I need for a healthy habitat and community to live in?
- What problems are human activities causing for my survival?
- What conservation actions could help me survive?



#### Time

Allow 2 – 3 hours

### What to do

Explain (excitedly!) that the bins/bags were left at the school with an envelope addressed to the class. Give each group (five to six learners per group) a dustbin liner and ask someone to open the envelope and read out the letter. It looks like they need to look inside the bags. Ask them to dig in and hold up some items and look at the labels attached – read them out. The items in the bin/liner seem to represent different ways that we use and waste natural resources. Is there anything else? Wait for someone to find the large envelope and open it – here are the picture cards of native plants and animals. Prompt learners to look at the backs too – these look like other representatives of living things sharing our world, whose lives are threatened by our waste and carelessness. The tasks need to be completed and this might help solve the riddle on Activity sheet W4.

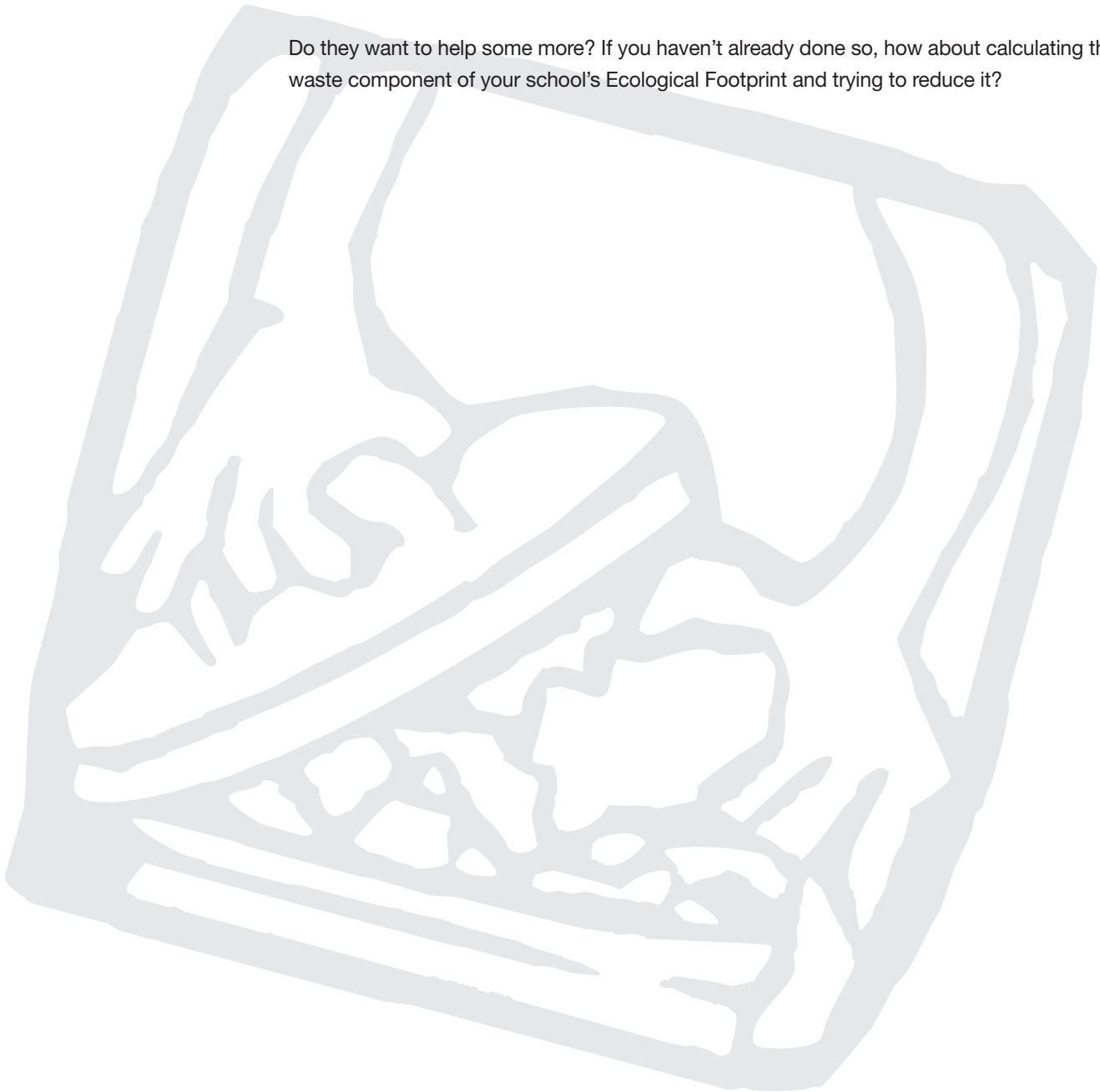
The waste items are shared out first and each/half of the group goes away and investigates the energy and raw materials used to make the products and transport and dispose of them (cradle to grave). Then share out the photos/pictures of native/world wildlife: each/half of the group researches the plants and animals to find out what they need for a healthy life and the ways in which they are badly affected by the energy we use and the rubbish (drop these words in again lightly!) we produce. The results are presented, displayed and shared. Can they answer the riddle yet? Share the actions to solve some of the problems they have uncovered.

Go on to discuss the 5Rs – stress that any one of these will not solve our waste disposal problems; it's their collective power that makes a difference. Carry out the diamond ranking activity and compare between the groups. Remember to stress there are no easy or right answers, but if we understand why it is important, it makes it easier to do something. Reinforce the Big 3 – reduce, reuse, recycle – ask whether the order is important.

Have they answered the riddle yet? The answer is: EARTH – energy, action, any of the 5Rs, time, rubbish.

When they have got the answer, hold up a globe or a photograph/poster of the Earth as seen from space to reinforce the message that waste is a global issue and the planet Earth is in trouble. Reinforce that we still have time and can take action to change things. Draw a cartoon or poster, or write a poem, to reflect on how some people treat the planet badly, without thinking, and how we can do something about it. Look at *Second Nature* for some poems – 'Who Made a Mess', 'If the Earth...' (see the Resources section on page 150 for details).

Do they want to help some more? If you haven't already done so, how about calculating the waste component of your school's Ecological Footprint and trying to reduce it?



# Activity five: Alternative choices

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## You will need

- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- phone lines with list of local contacts
- library resources.



## Time

### Open, your choice

## What to do

It's important that learners understand the different kinds of waste we produce – not just 'rubbish' – and what different groups are doing about it, their own roles, and the alternatives.

- What does the waste component of school's Ecological Footprint look like? What does it say about the school's consumption and waste of resources – go and look at how it's collected; analyse and interpret the data. Collect ideas for reducing the size of the waste component of the school's Ecological Footprint.
- Who does what? Consider the role of local Councils (Council Tax – sewerage, waste collection, waste campaigns – Waste Aware Scotland, Edinburgh Furniture Initiative) and national government and agencies, e.g. Scottish Water, SEPA, SNH; the police (wildlife crime); NGOs – voluntary sector/charities (helping others locally/globally, e.g. RSPB, SSPCA, Keep Scotland Beautiful, Tools for Self Reliance); and commercial companies (e.g. B&Q, supermarkets, Scottish Power). This provides opportunities for visiting speakers to explain how they are reducing waste/environmental impacts, and/or site visits.
- What are the alternatives and their benefits/costs to implement? Use the search engines and resources to find out about other alternative technologies – incineration and local heating schemes, biogas production, anaerobic digesters, composting; what is being used elsewhere in the world (link with Eco-Schools across Europe). These investigations also provide opportunities for visiting speakers to explain how they are reducing waste and environmental impacts, and/or to take you on site visits.

# Assessment and evaluation

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## Teacher observation

- Ease/difficulty of contributing to group investigation
- Ease/difficulty in making accurate/concise notes, presenting and analysing results
- Ease/difficulty in planning, carrying out and presenting an investigation
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in identifying and applying the range of factors affecting decision-making
- Ease/difficulty in making connections between issues, and local and global
- Application of knowledge and understanding
- Technical skills – handling information, ICT
- Use Connection inspection – Making footprint connections (Activity sheet MC8).

## Self/peer observation

- Peer group evaluation of findings and presentations.



## **For teachers**

### ***Get Global!***

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities, enabling higher order thinking by learners – good for approaches to issues and investigations. ISBN 1 872502 91 1.

Available in pdf format on the websites below:

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

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### ***Eco-Schools Guide – Chapter on Waste***

Full of relevant information and practical activities, recently revised for Scottish schools. Good sections on waste, school grounds and sustainable development. Download from Eco-Schools Scotland website: [www.ecoschoolsscotland.org.uk](http://www.ecoschoolsscotland.org.uk) or [www.eco-schools.org](http://www.eco-schools.org) (International website)

### ***Second Nature – Society, Science and Technology***

A4 spiral bound resource from RSPB Scotland. ISBN 1 901930 36X. Full of imaginative and practical activities, covering Environmental Studies 5 –14 outcomes at levels C/D.

Good section on energy and over-consumption issues. Available from RSPB Scotland, Dunedin House, 25 Ravelston Terrace, Edinburgh EH4 5TP.

### ***Out of the Bin and into the Secondary Curriculum***

Produced by Aylesbury Development Education Centre. Aimed at the English National Curriculum, Key Stage 3, but lots of useful information and ideas. Good section on landfill, hazardous waste and how to make a methane digester. Available for download from website [www.adec.nildram.co.uk](http://www.adec.nildram.co.uk)

### ***Family Life and the 5Rs***

A4 folder with a set of slides, comparing within two countries, the UK and Ghana, how local families in Milton Keynes and Kumasi live and the waste they produce. It aims to break down some stereotypes of life in Southern countries. It also explores waste issues – what it is, how the 5Rs are applied, what sustainable living means in a day-to-day context. Available from Global Education, Milton Keynes Tel: 01908 310951.

E mail: [info@gemk.org.uk](mailto:info@gemk.org.uk)

### ***Rangers of the Earth***

Spiral-bound programme developed by the Institute for Earth Education.

Website: [www.earthed.org.uk](http://www.earthed.org.uk)

### **Thin black lines**

A collection of black and white cartoons illustrating a variety of environmental and development issues. 1994. Produced by Tidec~, Birmingham. Website: [www.tidec.org](http://www.tidec.org)

[www.wastewatch.org.uk](http://www.wastewatch.org.uk) – WasteWatch website with resources e.g. Rubbish Challenge game, paper-making kit, to hire or buy.

[www.wasteonline.org.uk](http://www.wasteonline.org.uk) – great source of information on every aspect of waste and waste minimisation; including information sheets and education materials/activity sheets, etc

[www.recyclenow.com](http://www.recyclenow.com) – Waste and Resources Action Programme (WRAP) information on waste minimisation and recycling.

### **For teachers and learners**

[www.wascot.org.uk](http://www.wascot.org.uk) – Waste Aware Scotland website with local information to help you Reduce, Reuse and Recycle. Also see WasteWatch (England and Wales equivalent)

[www.changeworks.org.uk/education\\_minisite](http://www.changeworks.org.uk/education_minisite) – useful education resources on waste for schools

[www.epa.gov/kids/garbage.htm](http://www.epa.gov/kids/garbage.htm) – US Environmental Protection Agency – waste education resources including ‘Recycle city’ exploring how Dumptown has restored itself to ‘Recycle city’

[www.urbanext.illinois.edu/worms](http://www.urbanext.illinois.edu/worms) – an American site all about Squirmin’ Herman the Worm

[www.recyclezone.org.uk](http://www.recyclezone.org.uk) – information, games, activities for learners and ideas for teachers, from WasteWatch

[www.mansfieldct.org/Schools/MMS/compost](http://www.mansfieldct.org/Schools/MMS/compost) – an American Schools website describing their composting system – could your school do something similar?

[www.diy.com](http://www.diy.com) – B&Q website advertising as a sustainable retailer, One Planet Home

[www.wastetraders.com](http://www.wastetraders.com) – online waste exchange

[www.incpen.org](http://www.incpen.org) – Industry Council for Packaging and the Environment website

[www.recoup.org](http://www.recoup.org) – everything you want to know about recycling plastics

[www.earthwire.org/uk/](http://www.earthwire.org/uk/) – an environmental news portal (global news)

[www.europa.eu.int/comm/environment/youth/index\\_en.html](http://www.europa.eu.int/comm/environment/youth/index_en.html) – EC site for younger people.



**Activity two: Waste around the world:**  
**Activity sheet W1**  
**Waste footprints**

**Scotland's materials and waste footprint (2001)**

(Adapted from Scotland's Footprint: A resource flow and Ecological Footprint analysis of Scotland, [www.scotlands-footprint.com](http://www.scotlands-footprint.com), by Best Foot Forward)

Category	% of footprint
Construction and demolition	40
Commercial and industrial	19
Putrescibles (items that rot)	13
Other, including packaging, clinical and mineral waste	12
Paper	7
Metals	4
Chemicals and plastics	3
Glass and textiles	2
Total	100





## Activity two: Waste around the world: Activity sheet W1 continued Waste footprints

### Disposal of solid waste in various EU countries, given in % values

(Source: Warmer Bulletin 2000/Out of the Bin into the Secondary Curriculum, Aylesbury DEC)

Country	Landfill	Incineration/ energy recovery	Composted	Recycled	Total
Austria (1996)	35	17	14	34	100
Denmark (1996)	11	58	2	29	100
France (1993)	49	39	6	6	100
Germany (1993)	54	18	5	23	100
Italy (1997)	80	7	10	3	100
Netherlands (1998)	12	43	6	39	100
Norway (1995)	62	15	1	22	100
Spain (1997)	74	6	17	3	100
Sweden (1997)	30	36	8	26	100
Switzerland (1996)	13	45	11	31	100
UK (1996)	85	6	1	8	100

### Contents of a typical family dustbin in the 1990s compared to the 1940s, given in % values

(Source: Out of the Bin and into the Secondary Curriculum, Aylesbury DEC)

Category	1990s	1940s
Rags	4	3
Metal	8	6
Glass	10	4
Plastic	9	N/A
Paper and card	33	20
Compostables	18	15
Ash and dust	10	40
Other	8	12
Total	100	100



**Activity three: Takeaway throwaway:**  
**Activity sheet W2**  
**Hidden costs recording sheet**

- Use the scales to measure the weights of the products and packaging in columns B - D.
- Use the table of 'Energy costs for making packaging materials' on W3 to work out the answer for column E (use W3a for learners at Third Level and W3b for learners at Second Level).
- Use your head or a calculator to work out columns F and G.

A. Product	B. Total weight (grams)	C. Weight without packaging (grams)	D. Weight of packaging (grams)/ packaging material	E. Energy cost of packing (kj)	F. Weight of packing for 100 items (grams)	G. Weight of packing for 1,000 items (grams)
Frozen chips	200	150	50 plastic	$50 \times 43.1$ =215.5	5,000 = 50kg	50,000 = 500kg
Fresh potatoes						
Frozen chips						
Can of potatoes						
Bag of crisps						
Packet of instant potato						



**Activity three: Takeaway throwaway:  
Activity sheet W2 continued  
Hidden costs conclusion**

1. Which was the least processed product? \_\_\_\_\_
2. Which was the most processed product? \_\_\_\_\_
3. Which packaging material requires least energy to produce/gram? \_\_\_\_\_
4. Which packaging material requires most energy to produce/gram? \_\_\_\_\_
5. Rank the products in the order of the size of Ecological Footprint they would make - in the order smallest to largest.
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
  - \_\_\_\_\_
6. What could be done to reduce the Ecological Footprint of packaging?  
\_\_\_\_\_  
\_\_\_\_\_
7. What choices can we make as consumers to reduce the hidden costs of processing and packaging food?  
\_\_\_\_\_  
\_\_\_\_\_
8. From what you have learnt, which food product that you eat do you think is most costly in wasted energy and packaging? What can you do about it?  
\_\_\_\_\_  
\_\_\_\_\_



### Activity three: Takeaway throwaway: Activity sheet W3a Energy costs for making packaging materials

This table gives the amount of energy needed to produce 1 gram of each of these materials. A kilogram is 1,000 grams. We have also included the rot away times if the packaging is left as litter or dumped in landfill sites.

The unit of energy used in science is a joule (j). The amount of heat energy needed to raise 1 gram of water by 1 degree Celsius is 4.18 joules. A kilojoule is 1,000 joules.

Packaging material	Kilojoules/gram	Years taken to rot
Aluminium	228.6	80 - 100
Paper	47.7	1 - 5
Plastic	43.1	Crisp packets: up to 8; plastic bags: 10 - 12; bottles: indefinite; nylon fabric: 30 - 40
Steel	34.7	50
Glass	17.6	indefinite

We have also included the rot away times if the packaging is left as litter or dumped in landfill sites.



### Activity three: Takeaway throwaway: Activity sheet W3b Energy costs for making packaging materials

This table gives the amount of energy needed to produce 1 gram of each of these materials. A kilogram is 1,000 grams. We have also included the rot away times if the packaging is left as litter or dumped in landfill sites.

The units of energy can be compared.

Category	Kilojoules/gram	Years taken to rot
Aluminium	230	80 - 100
Paper	50	1 - 5
Plastic	40	Crisp packets: up to 8; plastic bags: 10 - 12; bottles: indefinite; nylon fabric: 30 - 40
Steel	35	50
Glass	20	indefinite

We have also included the rot away times if the packaging is left as litter or dumped in landfill sites.



## Activity four: Throwaway world: Activity sheet W4 SOS

Here's the letter left on the bin liner. Use what you find in the bin liner to work out the riddle...

Dear Class

I am in trouble and need the help of some thoughtful young people to help me. Over the years, a simple truth has been forgotten. I need your help to reveal its value again. If you are able to solve my riddle, you will show that you are up to the task and that I have chosen wisely. Will you help? If so, read on:

I am the thing that you can't throw away when you've finished with me!

I have five letters to my name. What am I?

### My first letter...

... is the same as the first letter of something invisible that allows you to think, do or make anything. Its waste harms both of us.

### My second letter...

... is the same as the first letter of the thing that you can take to help me.

### My third letter...

... is the first letter of a set of three (sometimes five) words which describe things you can do to help me stay healthier than I am now.

### My fourth letter...

... begins with the first letter of something that you are running out of, to put things right for me.

### My fifth letter...

... is the last letter of what you may call the stuff you throw away in the bin!

When you have looked at the things in this bin liner and worked out the answer to my riddle, I think it will be clear how you can help some more. Thank you for your friendship and helping me.

Have fun!



**Activity four: Throwaway world:**  
**Activity sheet W5**  
**Diamond ranking activity statements**



By practising the 5Rs we are just following orders from adults	By practising the 5Rs we are showing that we are responsible citizens and care for the environment and other people	By practising the 5Rs we help to reduce the amount of pollution affecting the environment
By practising the 5Rs we are saving the planet for future generations to enjoy and benefit from, like us	By practising the 5Rs we are helping to reduce the need to use the Earth's natural resources so quickly	By practising the 5Rs we can save money
By practising the 5Rs we are providing jobs for people, making up for those lost in manufacturing	By practising the 5Rs we are showing we care about how we affect the natural environment, both locally and globally	By practising the 5Rs we can have fun and meet the challenge



## Activity four: Throwaway world: Activity sheet W6 Diamond ranking

1. Discuss what we mean by the 5Rs... think of an example for each one.  
Use your flipchart to record at least one use.

**Reduce** the amount of waste created

**Reuse** an object either for the same use, or find another use for it

**Repair** a broken or torn item instead of buying a new one

**Refill** your empty containers

**Recycle** your waste so that it can be broken down, reprocessed and remanufactured - even though this takes up energy.

Can you think of any more? For example, refuse to buy or accept something that uses unnecessary packing. In Germany, the law makes it possible for shoppers to leave behind excess wrapping at the supermarket, and the packaging industry has to clear it up!

Remember to think before you put something in the bin - does it really need to be thrown away?

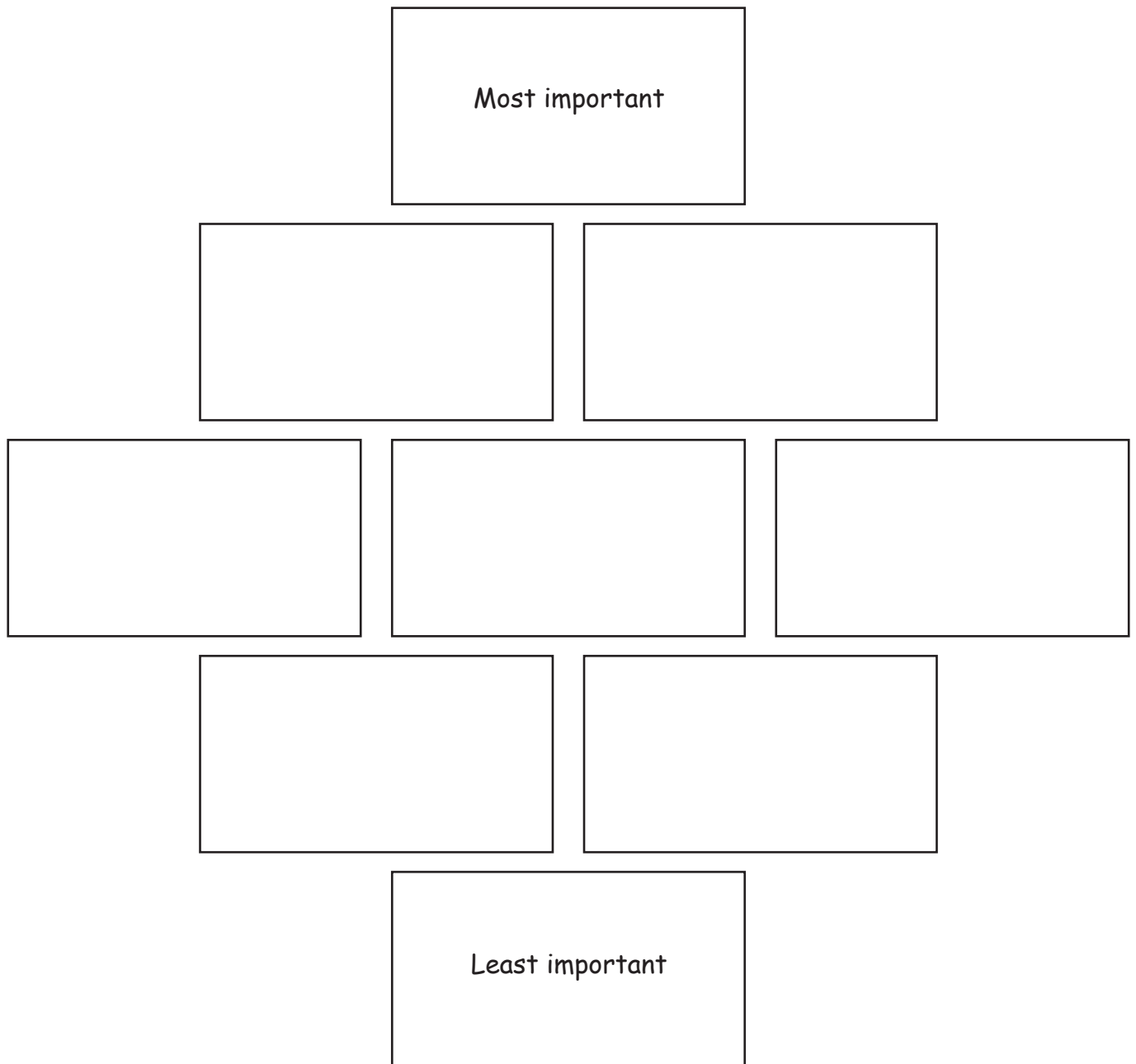
2. You will be given an envelope with a set of cards, each with a statement. In your group, sit in a circle and place the cards face down in the middle, in a pile. Take it in turns to turn up the cards and discuss each one in turn. Ask questions if you don't fully understand what the statement means.
3. You will be given a sheet with nine boxes arranged like a diamond. Either on your own, with a partner or in a group, agree an arrangement of the statements, so that the most important in your opinion is at the top, and the least important at the bottom. Arrange the rest in between, with the more important nearer the top. Make sure you can explain why you chose the arrangement you have made. Remember there are no right answers!
4. When you have arranged all the statements, see how your arrangement compares with other groups. There are no correct answers, but if there are differences try to find out why you had different opinions.





**Activity four: Throwaway world:  
Activity sheet W6 continued  
Diamond ranking activity**

Place the statements in your chosen order - try sorting out the top and bottom first and then sort out the rest.







# Part 2

## Unit 7:

# Water

### Key ideas

- Water is a unique natural resource, essential for life and all living things. *(Taken for granted, Water worldwide)*
- Water is a finite resource and access to it is unequal - humans compete with other living things for this supply, as well as with other humans. *(Water worldwide)*
- Water is easily wasted, but also conserved. Technology can help, both at simple and hi-tech levels. *(Taken for granted, Water worldwide)*
- Water shortage is not restricted to the South, but where there is also poverty, it is more difficult. *(Taken for granted, Water worldwide)*
- Problems are rarely the result of a linear cause and effect process. More often they are complex webs. *(Bottled up)*
- The media and marketing processes have a powerful role in shaping public opinion and influencing individual/collective decision-making and behaviour. *(Bottled up)*
- Freshwater habitats support a rich diversity of plant and animal species, and in turn, enrich local landscapes; negative consequences result from careless water abstraction and pollution. *(Taken for granted)*
- Choosing responsible and sustainable ways of using and disposing of water means taking informed, realistic choices/actions now. *(Taken for granted, Water worldwide, Bottled up, Calculating footprint)*
- Getting involved in acting for, or raising awareness of, the actions required for now/the future requires personal commitment and effort. *(Water worldwide, Bottled up).*

# Background notes

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In 2007, the average water consumed per person per day was 146 litres (Scottish Water). Scots use 6% more water per person per day than 20 years ago.

It is difficult to appreciate how precious water is as a natural resource when you live in a cool, moist temperate climate, as in the UK. It is also an easy resource to waste as it drains down the plughole/toilet and disappears out of sight. There are many associated issues that can help learners to explore the values and attitudes of people to water and its wise use. By 2025, it is estimated that 67% (estimated 5.5 billion) of the world's population will live in areas of scarce water, due largely to drought, increasing as a consequence of climate change. Already conflicts have risen over water, and in the future wars may be over access to water, not oil supplies.

Past and present conflicts are often about the removal of the potential drinking water for local communities for the economic use of water – irrigation of farmland and golf courses, industrial plants, and tourist developments. In Kerala, Southern India, local activists believe severe water shortages, due to a 60% decline in rainfall over recent years, have been exacerbated by heavy water use in a soft drinks bottling factory; similarly in Goa, the need to irrigate the golf course at a wealthy tourist resort has caused severe shortages in the local community's water supplies. In late 2002, Israel and Lebanon came into conflict over plans by Lebanon to access water from a tributary feeding the river Jordan and the Sea of Galilee. Closer to home, and not as life threatening, the planting of extensive conifer plantations in some areas of Scotland in the 1960s, caused some private water supplies to be severely reduced 30 years later. Where mains supplies are not possible, some properties have had to find other solutions.

Having clean water and proper sanitation was one of the main rights discussed and agreed at both the Rio (1992) and Johannesburg (2002) World Summits, and gave rise to some of its clearest agreements:

- by 2015, to halve the proportion of people without access to safe drinking water
- by 2015, to halve the proportion of people without access to basic sanitation.

According to the Red Cross, four million people die every year due to unclean water supplies. Children especially die from diseases caused by lack of access to safe drinking water, inadequate sanitation and poor hygiene. In areas of Africa and Asia, women walk an average of 6 km a day to collect water for the family, and don't allow children out to play in the hot sun, so that they don't sweat and get thirsty.

Sales of bottled water in the UK have exploded in recent years, largely as a result of a public perception of purity driven by advertisements and packaging labels, featuring pristine glaciers and crystal-clear mountain springs. But bottled water sold in the UK is not necessarily cleaner or safer than most tap water. The first launch (February 2004) of Coca Cola's bottled water contained purified South Thames tap water. After 'purification', water analysis found it to have high levels of bromide, and all bottles on sale were retrieved and the product taken off the market. Another firm in the south of England launched a bottled water

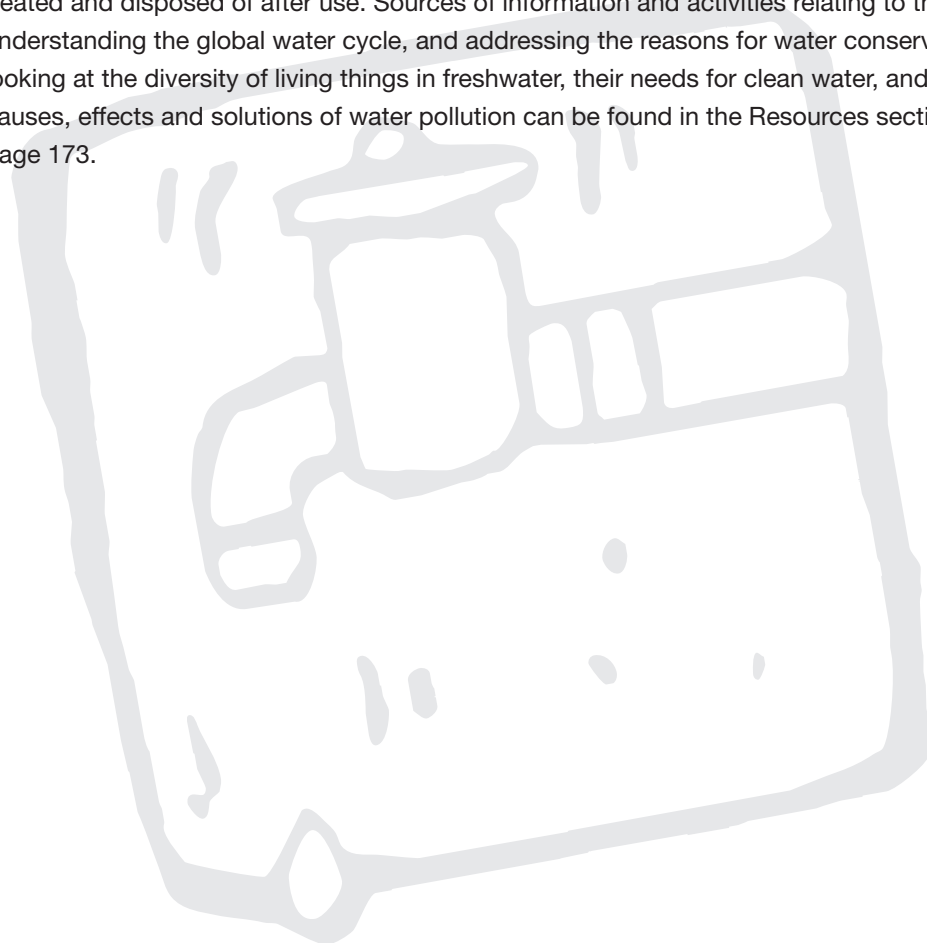
line soon after, and made no pretence of the fact it was bottled tap water. They said they were selling it bottled, because they believed it was the convenience value of the bottle that made people buy it, and the advertising plays to this idea.

In the USA, the Natural Resources Defense Council undertook a four year scientific study ([www.nrdc.org/water/drinking/nbw.asp](http://www.nrdc.org/water/drinking/nbw.asp)). It included testing of more than 1,000 bottles of 103 brands of bottled water. While most of the tested waters were found to be of high quality, some brands were contaminated: about one-third of the waters tested contained levels of contamination – including synthetic organic chemicals, bacteria, and arsenic! In at least one sample these substances exceeded allowable limits of state and/or bottled water industry standards or guidelines.

Bottled water is up to 1,000 times more expensive than tap water. Other arguments against the industry, apart from whether it is better for you, are the environmental impacts in terms of packaging, transportation and waste disposal of the empty bottles. In Nepal, along the major trekking routes, the disposal of trekkers' empty plastic bottles is causing considerable disposal problems.

There are a number of alternative technologies looking to minimise the treated water we have to use, and to minimise the impact of processing before and after use. An opportunity can be taken to look at some of these, e.g. reed beds, grey water, low flush and compost loos. These investigations can be enhanced by combining research with firsthand experience – visits to local water collection and treatment works, and from local 'experts'.

It is important that the learners have a sound foundation of understanding about where Scotland's water comes from; how and why it is collected and treated; how and why it is treated and disposed of after use. Sources of information and activities relating to the above; understanding the global water cycle, and addressing the reasons for water conservation; looking at the diversity of living things in freshwater, their needs for clean water, and the causes, effects and solutions of water pollution can be found in the Resources section on page 173.



# Objectives and outcomes

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Young people should learn:

## Knowledge

- To describe where water comes from and how water supplies reach our homes, and what happens once it goes down the drain; who is responsible for water supplies/treatment in Scotland. *(Taken for granted)*
- To describe the importance of the water component of our Ecological Footprint and water conservation in this country and in dry climate areas; to describe at least three methods of saving water through alternative technologies and lessening the water component of our Ecological Footprint. *(Taken for granted, Water worldwide)*
- How increasing efforts by people around the world are working towards sustainable development and improving access to clean water. *(Water worldwide, Alternative choices)*
- To demonstrate an understanding of the connections between personal values, beliefs and behaviour. *(Taken for granted, Water worldwide).*

## Skills

- To think laterally about the processes leading to a problem and their connections, as a means of problem solving. *(Taken for granted, Bottled up)*
- To think critically about the different ways in which advertising, our family, peers and others influence our 'needs/wants' and choices. *(Bottled up)*
- To demonstrate an ability to use the information available to make informed and balanced choices, and justify their choices. *(Taken for granted, Alternative choices, Calculating footprint).*

## Values and dispositions

- To openly share and communicate their feelings and opinions within the group. *(All activities)*
- To appreciate the need to develop lifestyles which reflect sustainable resource use and reduce the size of the water component of our Ecological Footprint. *(Taken for granted, Water worldwide, Calculating footprint)*
- To be willing to act as a responsible citizen, learning from and working with others to use water wisely, and where possible help provide clean water and sanitation for those who do not have it. *(Water worldwide).*

# Activity one: Calculating your school's water footprint

## You will need

- access to data giving the amount of water the school used in the past year
- paper, pencil
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- the Excel workbook downloaded from [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)



## Time

**Allow 40 minutes plus follow up**

## What to do

Brainstorm the ways that the school's use of water affects the size of the water component of its Ecological Footprint: drinking, washing, cleaning, cooking school meals, flushing the toilet, more? Energy is used to collect, clean and pump water from the water company to the school. Most of the energy comes from fossil fuels that are not only non-renewable resources but also release carbon dioxide when burnt.

Calculate the size of the water component of the school's Ecological Footprint by finding the amount of water the school uses in one year. This information may be available from the Council. Or, if your school has an accessible water meter, check the number on the meter at the same time on the same day, one week apart. Subtract the number for Week 1 from the number for Week 2 to get the total number of litres used during the week. Multiply the result by the 40 weeks in the school year so to give the total litres of water used each year. Divide the year's total by the number of learners (or learners and staff) in the school to find the school's water use in litres for each person per year.

	Meter reading	Litres of water per week
Week 1 Monday 10am		Week 2 minus Week 1 reading =
Week 2 Monday 10am		

Litres of water per week	Litres of water per year (40 weeks)	Number of people	Water used (litres per person per year)

Record and save the results in the water tab of the downloaded Excel workbook. Then enter these results into the water section of the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint) Click on 'calculate' to reveal the size of the water component of your school's Ecological Footprint, given in global hectares per person per year. The calculator also shows the amount of carbon dioxide emitted as result of the water used, given in kg of carbon dioxide per person per year – remember that this 'Carbon Footprint' contributes to your Ecological Footprint (see page 12 of this handbook for a full explanation).

Now that the size of the water component of your school's Ecological Footprint has been calculated, begin to look at ways to reduce it. The Action Programme for Change section of this handbook (starting on page 181) contains information and advice on how to do this. You can repeat the calculations after changes have been made to see how much you have managed to reduce the size of the water component of your school's Ecological Footprint.

## Activity two: Taken for granted

### You will need

- copies of both sides of Activity sheet WT1
- internet access to the online footprint calculator at [www.LTScotland.org.uk/schoolsglobalfootprint](http://www.LTScotland.org.uk/schoolsglobalfootprint)
- library sources
- suitable space for circle time.



**Time**  
**Allow 1.5 hours**

### What to do

Look at the size of the water component of the school's Ecological Footprint – what activities use most water at school? Is it the same in our homes? Each day, it is estimated that every person in Scotland uses around 146 litres of water for a variety of purposes – washing ourselves, washing up, cleaning the house/car, flushing the toilet, cooking and drinking. Who/what are the water guzzlers in your home? Where does your home's/school's water come from – the Scottish Water mains, or a private water supply (where is this likely to happen)? Is there a difference between the amounts used by households on a private supply compared to the mains? Where does it go when you're finished with it?

Set things up for the following scenario:

“The country is beginning to experience ‘official’ drought, the reservoirs are almost empty and water shortages are imminent. People on private supplies have already found their burns and tanks have run dry. Shops have already sold out of bottled water supplies. The Meteorological Office is not forecasting any rain – weather conditions are set stable for several more weeks.

Scottish Water has requested that each household voluntarily reduces its water use by 30% (about one-third). Decide how you will meet this request.”

A notice has been received at home from Scottish Water. What choices will households make to decrease their consumption? What are the household priorities? Share their priorities and choices. How will they manage? If they have a private supply running low, what would they do?



As a homework exercise, ask the learners to take home the Activity sheet WT1 and after a few days' research, to list the ways their family commonly uses water in an average day. In class, using the figures it provides as a guide, ask learners to calculate how much their household needs each day. Then ask them to find a realistic solution to the scenario provided. For example, you can ask them to identify three to five changes they can make in their water use habits, either cutting down on the ways they use water, or the amount of water they use for any daily habit needing water. Once discussed and agreed, they can record the changes on the chart on the second side of the sheet and calculate the difference these will make to overall water consumption. Is it enough? If necessary make more changes.

Take some circle time to share their experiences. How did everyone do? Did they make the same choices? What influenced people's choices?

Consider the consequences of drought or excessive water abstraction elsewhere in the town/ in the countryside; for example, what happens to our wildlife (freshwater and land living) and the landscape in drought conditions, and what are the consequences for farming and the tourism industry? If necessary do some research. Why will a habit of water conservation adopted by all of us help?

## Activity three: Water worldwide

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### You will need

- a link school to contact in a Southern country
- copies of Activity sheet WT2
- access to a computer suite and the internet.



### Time

**Allow at least 2 hours**

### What to do

Make contact with a link school in a Southern, dry country, where potable water is difficult to obtain, e.g. Africa or India<sup>13</sup>. Ask about the problems faced by the school and the children in their homes (compiling questions, writing emails/letters). Make comparisons with their own lifestyle and its dependence on accessible water.

Circle up, and ask the learners if one of the issues for them, in looking at the problems faced by others across the world, is that as individuals we feel powerless to make changes that matter. Read the story of Ryan's Well (Activity sheet WT2). Using their ICT skills – use the search engine words "Ryan's Well" – they should visit the Ryan's Well Foundation website ([www.ryanswell.ca](http://www.ryanswell.ca)), and follow up other related sites through the links, or highlighted within the search engine search. What are the characteristics of Ryan, his story and his success?

Ask the learners to prepare a wall display telling Ryan's story/organise an assembly; write how they feel about the story and what Ryan has achieved.

13. See the 'Global linking' section on page 13 of this handbook for pointers on how to do this.

# Activity four: Bottled up

## You will need

- copies of Activity sheet WT3 – 1 per group
- copies of bottled water advertisements and different packaging – 1 set/group
- access to computers, the internet and the library
- space for circle time.



## Time

Allow 1.5 – 2 hours

## What to do

Set up the activity by saying “We have been asked for our opinion on this scenario”. Read the problem and solution from WT3 out aloud.

Using a whiteboard/flipchart, demonstrate diagrammatically how the process has worked, i.e. the traditional linear model path to problem solving. Ask what is the main problem, what solution has been decided upon, and what is the end story. For example:

P → S → E

**Problem (P)** – people in school are not drinking enough water and it is not easily available

**Solution (S)** – make water more easily available, in an easy and convenient way

**End of story (E)** – Water at Work provide an easy, affordable service – waste is collected and disposed of.

Let’s think about this model in more detail. Divide the class into small groups (four or five) and give each group a copy of Activity sheet WT3. Ask the groups to brainstorm the different causes of the problem outlined and how their effect contributes to the main problem. Ask them to analyse the solution given – the water carrier and the other ‘things’ it depends on, e.g. power supply, cups, transport to bring/takeaway water containers, and all the impacts these will have – environmentally, socially, economically. (Introduce/remind them of the cradle to grave scenario and the ‘Route finder’<sup>14</sup> as a tool.) Alternatively, they can note down their ideas using the mindmap method/arrows on their activity sheet.

In their small groups, ask them to consider other solutions to the problem/s outlined; whether the original solution represents the solution most in keeping with sustainable development, and why. They should select a spokesperson for their group. Take a brief report back from each group, and summarise all their ideas on the whiteboard/flipchart. Ask them to reflect on what this approach to problem solving has revealed and whether they think the original solution is still the most appropriate and why.

Return to the traditional, linear model on the board/flipchart. What process have we gone through? If we think laterally, or link our thinking in looking at causes and effects, what other model may we come out with? i.e. P – S – P/P/P/S/S/S – E.

14. Refer to page 60 and 61 of unit one ‘Making connections’

For example:

**Problem (P)** – people in school are not drinking enough water and it is not easily available; but also the school is kept generally at too high a temperature, often not controllable by the school – causing dehydration; learners/teachers/support staff are not actively encouraged to drink water during the day – no motivation; advertising has promoted bottled water as being better ‘quality’ than tap water – it’s now trendy to be seen drinking bottled water – high motivation.

**Solution (S)** – make water more easily available, in an easy and convenient way – a water container and disposable cups; but also learners/staff bring/are issued with their own labelled water bottle/washable mug which they fill from the tap/jugs during the day – take home and wash/school wash up; obtain thermostats on all radiators, so school has control of heating; lower overall thermostat temperature; there is a healthy thinking policy in school which encourages learners to drink during the day and especially in the classroom – responsibility for their own health; find out the ‘real’ quality of bottled water.

**End of story (E)** – make water more easily available without unnecessarily using additional natural resources and creating non-recyclable waste for landfill and heat from powering the water cooler. Make a more informed and sustainable choice. If there’s a will, there’s a way!

On reflection, reinforce the key points:

- simple linear problem solving can generate more problems
- we need to understand the influences (media, advertising) and connections to gain new understanding, and develop solutions that generate more solutions
- there are no easy answers and sometimes the outcomes are unpredictable
- the whole and the parts have to be looked at in finding solutions
- different perspectives and ideas are useful (hopefully you get different answers from every group).

What about bottled water? Do they like it? Can they tell the difference from tap/filtered water? Try it out with unlabelled cups containing tap and bottled water. Why do they drink it? What is the real quality of bottled water? What does research show?

What affect have advertising and packaging had on our perception of tap water? Look at some advertisements in their small groups and identify the explicit and hidden messages they portray.

Circle up, and share the findings of the different groups. Finish by standing around the edge of an imaginary swimming pool. On the word ‘go’, if they had felt fully involved in the activity they should ‘dive’ into the middle (and stand near the middle of the ‘pool’), if they had not felt very involved, they should stand just ‘dipping a toe’ in at the edge, otherwise they should stand near the position they felt involved – nearer the edge or the middle.

# Activity five: Alternative choices

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## You will need

- access to a computer suite, the internet, PowerPoint, telephone, local contacts, library
- art materials for posters
- time to organise an interesting way of allowing self-selection of themes.



**Time**  
**Open, your choice**

## What to do

Allow groups to select one of the themes they wish to investigate, or a water related issue of their choice, using a search engine and the internet – see list below, for example. Particularly focus on the environmental/natural heritage benefits.

- reed beds
- greywater – try searching for irrigation also
- low flush toilets
- compost toilets
- rainwater collection
- water conservation.

Ask them to prepare a PowerPoint presentation or a wall poster summarising the key points of their research.

Encourage field visits – water reservoir and treatment plant, wastewater treatment plant, a functioning reedbed or compost loo, golf course using grey water, or/and related fieldwork, and get different groups to organise the visits, with support as necessary.

# Assessment and evaluation

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## Teacher observations

- Ease/difficulty of contributing to group discussion
- Ease/difficulty in identifying key points
- Ease/difficulty in expressing own viewpoints and accepting others
- Ease/difficulty in identifying and applying the range of factors affecting problem solving, and identifying causes and effects
- Ease/difficulty in making connections between issues, and local and global scales
- Ease/difficulty in interpreting adverts and expressing ideas
- ICT skills – using software and accessing the internet.

## Self/peer observation

- Use the 'Active Citizenship Skills Chart' from *Get Global!* (see the Resources section on page 173 for details)
- Use 'swimming pool' analogy as described in Bottled Up.

# Resources



## **For teachers**

### ***Get Global!***

Book and video by Action Aid/CAFOD/Oxfam/Christian Aid/Save the Children/DFID. Full of great ideas and activities, enabling higher order thinking by learners – good for approaches to issues and investigations. ISBN 1 872502 91 1.

Available in pdf format on the websites below:

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

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

[www.christianaid.org.uk/learn](http://www.christianaid.org.uk/learn)

[www.oxfam.org.uk/education](http://www.oxfam.org.uk/education)

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

### ***Whose right to water?***

A useful resource for 11– 14 year olds by Worldaware with Thames Water and RWE Group, as part of a programme called Water in Schools. Activities cover rights to clean water, global and local links, as well as taking action. ISBN 0 901988 66 9.

Website: [www.worldaware.org.uk](http://www.worldaware.org.uk) Email: [info@sos-uk.org.uk](mailto:info@sos-uk.org.uk)

### ***Water rights***

Activity book for children 11– 14 years by WaterAid, available for £3/copy or £30/35 copies. Website contains downloadable information and case studies looking at the lives of children in the South. Also contains online activities.

Website: [www.wateraid.org/uk/learn\\_zone](http://www.wateraid.org/uk/learn_zone)

### ***Scottish Water***

Fact sheets relating to water use, water cycle and water treatment.

Website: [www.scottishwater.co.uk](http://www.scottishwater.co.uk)

### ***Second Nature – Society, Science and Technology***

A4 spiral-bound resource from RSPB Scotland. ISBN 1 901930 36X. Full of imaginative and practical activities. Good section on ‘Scottish Streamkeepers’ covering freshwater ecology/water conservation/focus for language and expressive arts. Available from RSPB Scotland, Dunedin House, 25 Ravelston Terrace, Edinburgh EH4 5TP.

[www.wwfscotland.org.uk](http://www.wwfscotland.org.uk) – WWF’s work safe guarding Scotland’s rivers, lochs and seas

[www.snh.gov.uk](http://www.snh.gov.uk) – Scottish Natural Heritage’s website

[www.rspb.org.uk](http://www.rspb.org.uk) – Royal Society for the Protection of Birds website

[www.metoffice.gov.uk](http://www.metoffice.gov.uk) – Meteorological Office website – this is the place to go for rainfall data and maps of rainfall distribution

[www.ifrc.org/](http://www.ifrc.org/) – International Committee of the Red Cross/Red Crescent website – useful facts on the development aspects of water – North versus South

### **For teachers and learners**

[www.ukbap.org.uk](http://www.ukbap.org.uk) – UK Biodiversity Action Plan site with descriptions of all the freshwater/wetland habitats, e.g. fens, bogs, reed beds, the main threats and conservation measures

[www.biodiversityscotland.gov.uk](http://www.biodiversityscotland.gov.uk) – Scottish Biodiversity Groups' website

[www.biodiversityscotland.gov.uk](http://www.biodiversityscotland.gov.uk) – provides a collection of stories illustrating the importance of biodiversity to human beings

[www.stepin.org](http://www.stepin.org) – a technology based site with teacher's notes – uses case studies aimed at solving problems in the South. There are two on water: water pumping and purification – aimed at 12+, but adaptable – go to Case Studies

[www.ryanswell.ca](http://www.ryanswell.ca) – Ryan's Well Foundation website

[www.bbc.co.uk/schools/riversandcoasts](http://www.bbc.co.uk/schools/riversandcoasts) – BBC Education site on rivers and coasts – includes animation of water cycle

[www.response.restoration.noaa.gov/kids/kids.html](http://www.response.restoration.noaa.gov/kids/kids.html) – information and activities relating to water pollution and oil spills – provides good links

[www.sahra.arizona.edu/programs/water\\_cons](http://www.sahra.arizona.edu/programs/water_cons) – provides an interactive 'home' looking at water conservation in each room of the house

[www.globalfootprints.org/issue/water](http://www.globalfootprints.org/issue/water) – looks particularly at the social and global dimension.





**Activity two: Taken for granted:**  
**Activity sheet WT1**  
**How you use water in your family – calculation sheet**

Activity	Average amount per day (litres)	Number of times a day	Number in family	Total litres
Taking a shower (5 minutes)	27			
Taking a bath	95			
Flushing the loo	10			
Washing your face	9			
Getting a drink of water	1			
Washing dishes by hand (not rinsing)	7.5			
Dishwasher load	38			
Washing machine load	110			
Watering the garden with a sprinkler	95/minute			
Washing the car with a hose running	500			
Having a dripping tap (per 24 hours)	90			
<b>GRAND TOTAL</b>				







### Activity three: Water worldwide: Activity sheet WT2 Ryan's story

In January 1998, six year old Ryan Hreljac sat in a Canadian classroom and grew more and more distressed as his schoolteacher described the sad situation of children living in Africa with little access to medicine, food or clean water.

Ryan decided he would do something about it. \$70 would pay for a well and he was determined to raise the money. His parents initially turned down his request for the money. "You don't understand," Ryan cried. "Children are dying because they don't have clean water!" Ryan's mum and dad agreed to pay him \$2 for every additional chore he performed. So he set about cleaning (two hours worth earned him \$2), washing windows, picking up pine cones and more. Within three months he had raised enough for a well.

His mother, impressed by his hard work, arranged for him to present the money direct to WaterCan, a nonprofit organisation that funds well-building in developing countries.

When presenting the money, Ryan learned that although \$70 would buy a hand pump, it actually cost \$2,000 to drill a well. Six year old Ryan's response? "I'll just do more chores then."

Given that the Canadian International Development Agency matched WaterCan's funds two for one, Ryan needed to raise \$700 to get that well. Ryan's parents wanted to encourage him. They emailed all their family and friends telling them about Ryan's project. An article on Ryan and his project was printed in the town paper. Donations came in and Ryan continued doing his chores. By August, Ryan had raised the required \$700.

In recognition of his achievement Ryan, by now turned seven, was invited to a WaterCan Board meeting to hear a Ugandan director of Aid and Development speak. The Director hugged Ryan, thanking him for his well. He then went on to describe how so many places needed wells, yet the process of digging was very slow. With a hand auger it took 20 people digging for 10 days. How good it would be if they could buy a portable motorised drill. But it would cost \$25,000.

"I'll raise the money for that drill," said Ryan. "I want everyone in Africa to have clean water." And so Ryan, with some help from mum and dad, set about the task. He needed to raise around \$8,000, with the Canadian Government committed to a two for one matching contribution. The **Ottawa Citizen** newspaper printed an article about Ryan which was rerun in newspapers across Canada. A local TV station interviewed Ryan. Donations started to flow in. Ryan responded to each with a thank you note. He spent hours hand-printing letters, seeking donations from business. His schoolmates started a contribution fund. By November 1999, the required amount had been received. The Ugandan Aid and Development agency got their portable drill.



### **Activity three: Water worldwide: Activity sheet WT2 continued Ryan's story**

Ryan's neighbour, impressed by his effort, donated his frequent flyer points to enable Ryan and his mother to travel to Uganda to see the well he had originally raised money for. When he arrived, in July 2000, he was greeted by 5,000 cheering children and the village elders of Angolo, the town in which the well was built. They took him to the well which had a message at its base: 'Ryan's Well: Formed by Ryan Hreljac For Community of Angolo Primary School'. For these people water was life, and they spent the day feasting and dancing in honour of Ryan.

Ryan Hreljac reminds us of the impact we can have when we respond to the needs of others with compassion and determine to actually do something. His story is also a reminder that though we may not be able to change the world, we can change a part of it for good.

Source: Reported in Readers Digest, July 2001. © John Mark Ministries. Articles may be reproduced in any medium, without applying for permission (provided they are unedited, and retain the original author/copyright information)!



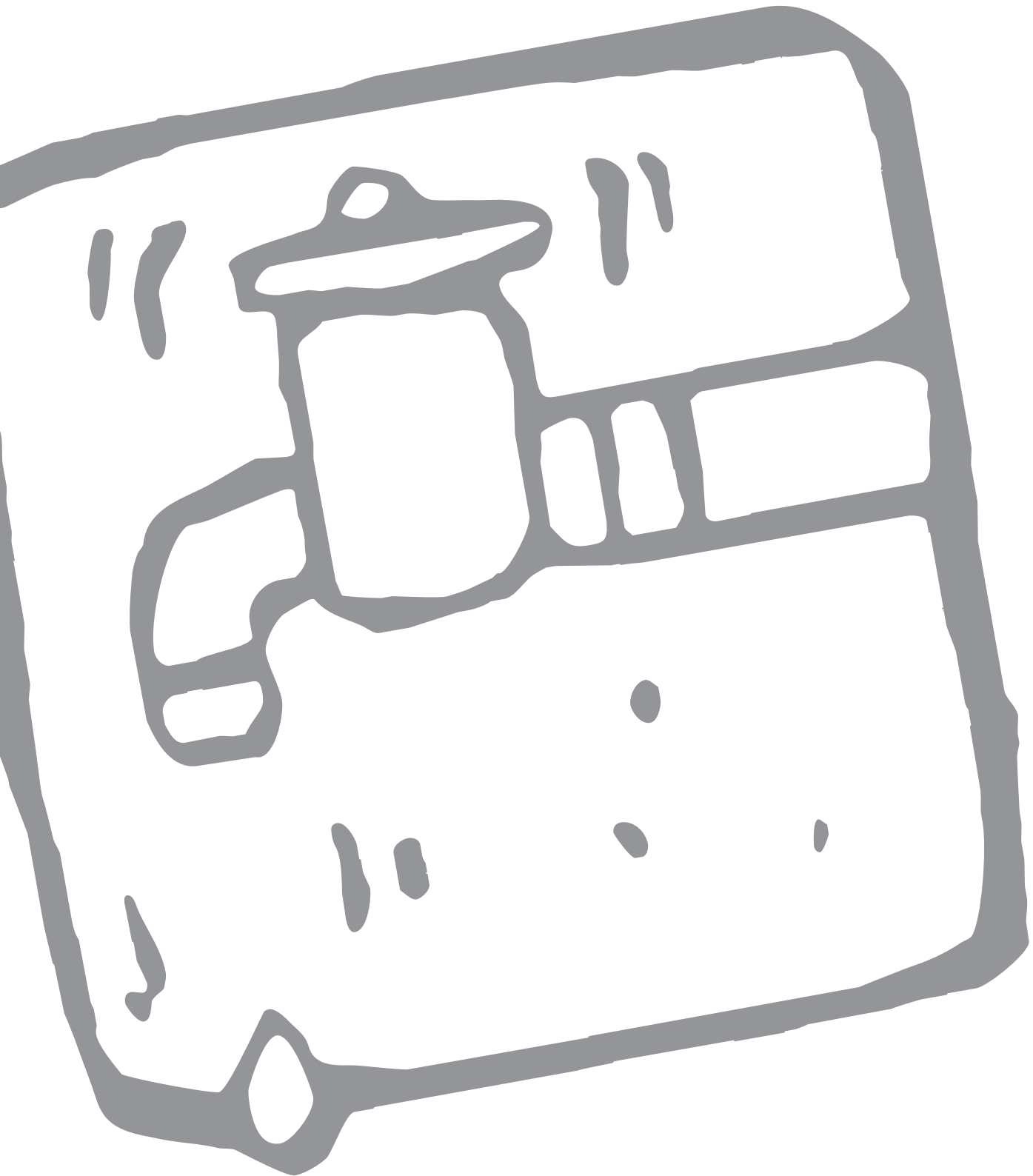
## **Activity four: Bottled up: Activity sheet WT3 Drinking water challenge**

- Read the following piece again carefully within your group.
- Think about and identify all the problems outlined; look again at the solution provided and discuss the issues you think of - is it reasonable? What are the connected environmental, social and economic results of such a solution? Can you think of other, workable solutions?
- Decide whether the school/Eco-School Committee should accept the solution provided, with your reasons.

**"[School Name] Secondary School has a challenge. There are more and more pressures on the school to be a health-promoting school, as well as an Eco-School. Access to, and the availability of, water to everyone within the school is seen as a priority. A key reason for this is that water is necessary to our overall health (eight glasses a day are recommended), but particularly helps concentration and raises levels of achievement throughout the day, for adults and learners alike.**

**In addition, the heating system in the school means the temperature in the school buildings is high throughout the school year, and a drinking fountain is available only in the learners' toilets. Most learners bring cans/bottles or boxes of drinks with them, these are often left as litter around the school grounds.**

**In an effort to address these related problems, the local Council is planning to put in a water carrier (provided by WateratWork) with plastic, disposable, non-recyclable cups, in each corridor, reception, the staff room and the (dining) hall. In this way, they say, water will be available to staff, learners and visitors - encouraging everyone to drink more water for a healthier lifestyle."**



# Part 3

## Action Programme for Change



# Introduction

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**“The Ecological Footprint is a tool asking us ‘how much nature do we have, compared with how much we use?’ It cannot tell us what to do, but allows us to make informed decisions.” WWF Scotland**

Successive Mori polls have shown that children are very concerned about environmental and global issues, but at the same time do not feel empowered, or able to make a difference.

This Action Programme, as part of *Schools Global Footprint*, offers a ‘safe’ environment in which learners can experiment in community participation and action, and achieve real change. Involvement in this process should draw learners into activities that they see and feel making a difference, in the school or the wider/local community.

The Action Programme is a means of drawing together all that has been learnt through using the *Schools Global Footprint* resource. It provides a ‘reality check’, demonstrating real school commitment to sustainable development – by taking positive action to reduce the school’s Ecological Footprint. It is no ‘quick fix’: the Action Programme should be part of a long-term, whole school process, implemented over a period of years, not months. There may be some quick returns built in, to maintain momentum, but overall a long-term view is more realistic.

As such, the Action Programme comes with a ‘health warning’. The added value and benefits from developing and implementing the Action Plans and Action Programme will be enormous. However, the learners need to see that the adults and school management are serious and committed; it needs to be for real, with long-term, sustained action, not adopted for just a token week/topic/term.

Action should only be addressed if the teachers, support staff, school Senior Management Teams and parents are committed to finding solutions to the problems, applying new and alternative strategies, and otherwise contributing to and supporting real changes for the long term.

Using the *Schools Global Footprint* resource, the learners can be motivated and confident (being in possession of technical data and practical experience and skills) in contributing both ideas, and direct action, for change. This can provide an opportunity for the whole class or group to stimulate and/or contribute to a whole school approach in developing ideas for action – whether it’s an awareness-raising campaign, a school policy document, and/or some kind of related direct action/s affecting school management practices – for reducing the school’s Ecological Footprint, or a component of it. Learners should be encouraged to see their involvement in bringing about change as active citizenship, both at a local and global level.

# Guidelines for an Action Programme

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(from *Water Stewardship* by Milton McLaren, 1995)

**Take only positive action** – Be for something rather than against.

**Do your homework** – Be prepared. Complete your research so that you know what you are saying is based on evidence and fact.

**Probe the force field** – Become aware of who else is involved. If you encounter a problem, back off, reconsider options and make a new plan.

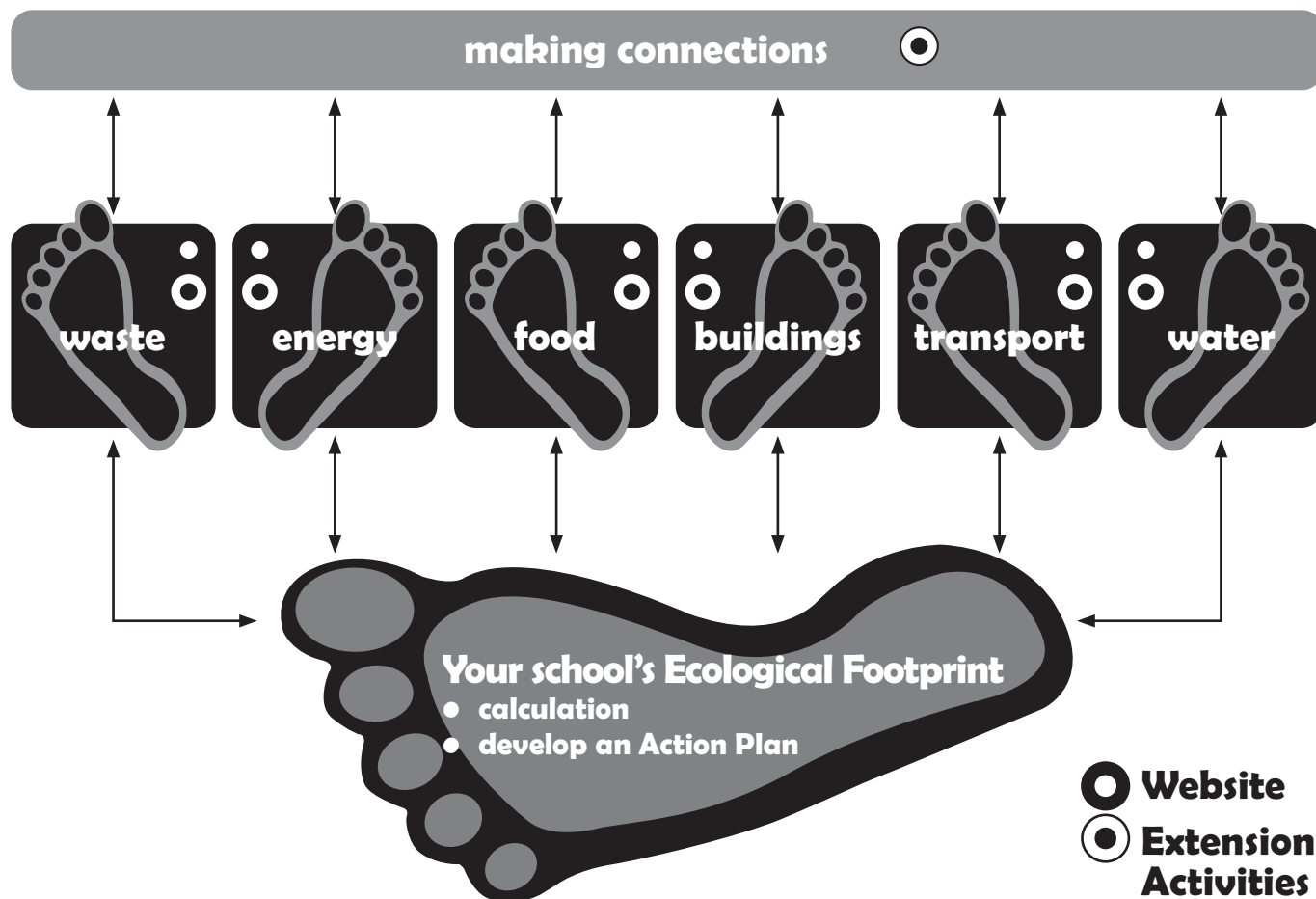
**Keep a balanced view** – Empathise with all people's views. Attempt to see all sides of the issue.

**Remain flexible** – Keep the options open. Be willing to adjust your view in the light of new information.

**Milestones** – Help learners see the 'end goal' as several small steps. This will help to prevent flagging enthusiasm.

**Celebrate** – Hold a celebration when significant parts of, or/and the whole plan or programme is completed.

# How to go about it



## Challenge:

Develop Action Plans for the components of your school's Ecological Footprint that you have been working on and combine them into an achievable Action Programme, involving the whole school community, thereby reducing the overall impact of the school's footprint. As you work on other components in the future you can add their Action Plans into the Action Programme.

## Stepping stone 1 – Make a list of the real issues, for each component of the footprint.

- Consider how you (as a school community) would like things to change for the better i.e. reducing the school's overall footprint. Use the V for Visions framework (Activity sheet MC14, see page 65) to help organise early thinking.

## Stepping stone 2 – Make a list of the most realistic and effective changes that could be made.

- Encourage the learners to use the online footprint calculator and the internet for research, and to use what they have learnt to develop their ideas to make realistic and effective changes. They may find out what others have done successfully, and how.
- If a whole school approach<sup>15</sup> is to be successful, ownership needs to be shared with others representing the whole school community, at an early stage. An elected Working Group (e.g. Eco-Schools committee, Learner Council) with representatives from year groups and other school representatives will carry forward the momentum of the project.

15. Several organisations, e.g. Eco-Schools and Grounds for Learning, promote whole school approaches towards Action Plans, and have guidance on the principles and practice of the whole process. Look at their websites for more ideas.



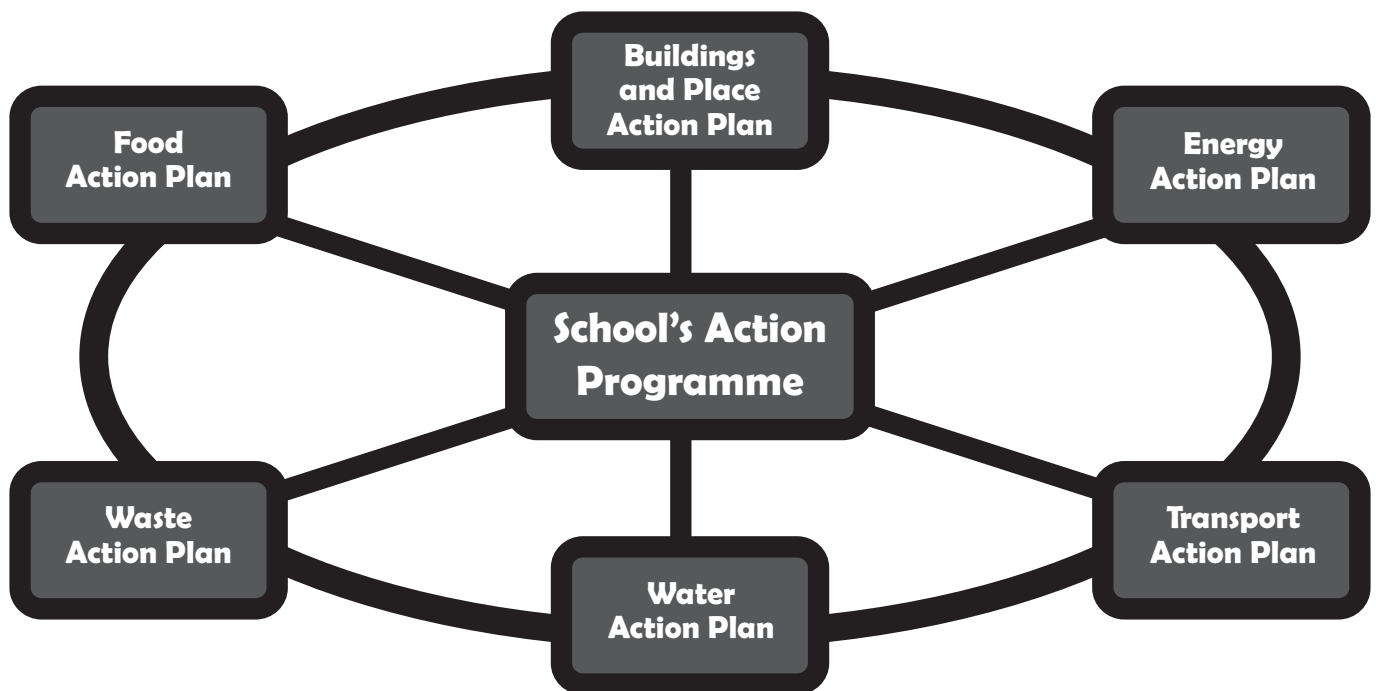
**Stepping stone 3 – Develop an Action Plan for each component of the footprint, matching a list of key objectives with actions.**

- Remember action depends on a lot of variables, including the availability of time, money, expertise, legal constraints, champions, help/enthusiasm from others available. Sometimes the final selection of objectives and actions has to be a compromise.

**Stepping stone 4 – Agree the Action Plans and the priorities with everyone across the whole school community.**

Encourage the following types of question:

- What are the steps/changes required to achieve each objective?
- How long may it take to achieve each step?
- Who would need to be involved to make such changes work?
- What actions need to be taken to encourage and motivate people to help make the changes and sustain any new habits?
- What have local campaigning organisations, other local people got to offer?
- What can the local Council do to help?
- What will make a difference?



**Stepping stone 5 – Draw up an overall Action Programme and help those involved think about monitoring, evaluating and promoting its progress.**

The overall Action Programme should include:

- Clear, realistic targets/objectives, prioritised actions to be taken, and by whom;
- Timescales (over a three to five year period) and costs/sources of funding;
- Ways of monitoring progress and evaluating what is achieved. Every so often, have a review... are we meeting our targets? Have we made a difference? How do we know? How might we do it differently next time?
- Ways of keeping everyone in touch with progress – knowing about it and celebrating it.

### **Stepping stone 6 – Celebrate the launch of the Action Programme, and let people know what's going on and that you mean business!**

- Celebrate and let people know about every significant success along the way
- Help the learners to organise themselves, make local contacts, find information and make decisions involving small steps towards making a difference. Keep everyone in the school community informed of progress as it happens – dedicated notice board, assemblies, newsletter, etc.

## **When to go about it**

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The Action Programme may be left until all the units are complete and used as a means of reflection and reinforcement for the class. This may also provide an opportunity to involve the whole school in the development of Action Plans and/or the Action Programme. For example, during a 'Sustainable Living' or 'Environment Week', the whole school could be involved, with each class addressing a different component, guided by member groups of the class involved in calculating the footprint, and drawing on everything they have learnt. Ideas for reducing the size of this component could then be collected and developed. The task of prioritising a long-term (e.g. three year) Action Programme to reduce the school's Ecological Footprint could then be handed back to the lead class or an elected Working Group (e.g. Eco-School Committee). The Action Programme should then be taken forward by the whole school.

Alternatively, you may select a staged approach, with a progression in the scale of the component Action Plans over a period (P6/7 or S1/S2). In this way, the development of skills in participation and direct action can be planned through each of the footprint components as it is measured and explored. Where primary and secondary schools share the same campus, the opportunities for this kind of cooperation and progression are greater.

An important final outcome for learners should be that they understand the connections between the component parts of the *Schools Global Footprint* (even though presented to them in 'boxes') and that decisions and actions for one footprint component may affect what is done under another component. Learners should also understand that they can be part of making real and meaningful changes around the school.

The final Action Programme will demonstrate a broad programme of changes helping reduce the school's Ecological Footprint, and everyone's part in helping to reduce it. In this way, there is ample opportunity for *Schools Global Footprint* to inform and add value to the development of an Eco-Schools Action Plan, the School Development Plan and/or other policy developments.



Local Footprints is a joint project between WWF Scotland and the Sustainable Scotland Network (SSN) with funding and support from Eco-Schools Scotland, the Improvement Service, the Scottish Government and Scottish Power.



*footprint support  
for local authorities*

#### **Local Footprints**

c/o Sustainable Scotland Network  
Telephone: 01786 468770

**[www.localfootprints.org](http://www.localfootprints.org)**

#### **Eco-Schools Scotland**

Telephone: 01786 468234

**[www.ecoschoolsscotland.org](http://www.ecoschoolsscotland.org)**

#### **WWF Scotland**

Telephone: 01350 728200

**[www.wwfscotland.org.uk](http://www.wwfscotland.org.uk)**