

TRASH

'Take Responsibility and Show How'

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Carbon Footprint - calculation



Resources

- WWF website Carbon footprint calculator <https://footprint.wwf.org.uk>
- Carbon footprint slides <http://www.s4s.org.uk/wp-content/uploads/CarbonFootprintSlides.pdf>

Calculating your Carbon Footprint

1 Do you know what a **carbon footprint** is. Discuss the answer and use the slide to explain what a carbon footprint is.

2 Using the WWF website Carbon footprint calculator <https://footprint.wwf.org.uk> answer the questions in the calculator. Think about other people you know and if their answers would be different.

3 Look at the results.

- What do the percentages in the graph mean?
- What does the total footprint mean?
- How does it compare to the UK average and world average?
- Which area would you tackle first, e.g. if travel is the largest percentage, what could be done?

4 Extension option – complete the calculator and decide what actions to take to reduce your footprint.

Water Footprint

Resources

- Data from www.waterfootprint.org



What is the water footprint?

1 A water footprint is the total amount of fresh water used to make a product. Measure out a litre of water so you can visualise it. Explain / demonstrate what 1m³ water looks like.

2 Choose a number of objects from the water footprint website. Include a variety such as a burger, an egg, cheese, apple, a cotton shirt, milk, paper. Collect the objects themselves, photographs or drawings of them.

3 Think about one of the items and what water will have gone into its production. Estimate how much water you think would have been needed to produce each of them OR put them in order low to high. Then find out what the actual water footprint is of the objects.

4 Why this is important? Where were some of these things produced? What would be the impact of climate change on water stress in some of those areas?

5 Some key facts:

- The average water footprint in Britain is 1245 m³/per person/per year
- 70% of this footprint is created outside Britain
- We are using other people's water when we buy things that are imported
- By 2050, 5 billion people across the globe are expected to suffer from water stress

Check national water footprints per person

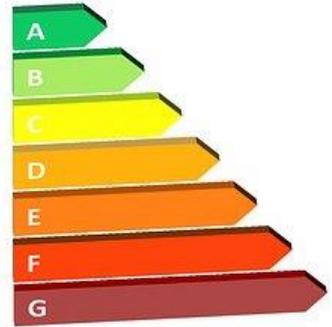
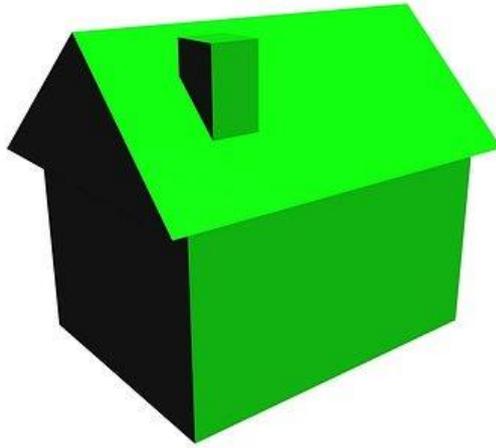
www.waterfootprintassessmenttool.org/national-explorer/

Water Footprint Data

www.waterfootprint.org

	Litres of water
One apple	125
One slice of bread	50
A pizza margherita	1259
250ml cow's milk	255
250ml soya milk	75
One egg	200
100g portion of beef	1540
80g portion of broccoli	20
30g portion of cheese	30
100g portion chicken	430
25g chocolate	45
50g portion nuts	540
150g beef burger	2350
150g soya burger	158
One sheet of A4 paper	10
Cotton t shirt	2700

Home Energy



Resources

- Home choices sheet

<http://www.s4s.org.uk/wp-content/uploads/HomeChoicesSheet.pdf>

Home choices

1 Look at the Home Choices sheet and decide which of these actions you would choose to improve the energy efficiency of your home. Will you do things now, in the future or never? E.g. you either choose double or triple glazing but not both. You would not choose a condensing boiler and an air source heat pump. Say why you have made these choices.

2 Ask them to think about the following questions:

- What could you do in your home from the list?
- Find out your fuel bills (gas, electricity, oil, wood). How do these compare with the average? How could you reduce them?
- Get a Smart meter and see how much electricity different appliances use. How could you reduce your use?
- Who supplies your energy? Are they a 'green' supplier (100% renewable energy)?
- How could your energy use be reduced? (think about heating and electricity use)
- What improvements could be made to the 'fabric' of the building (e.g. external walls, windows etc)?

One Tonne Travel



Resources

- Images for card sort exercise <http://www.s4s.org.uk/wp-content/uploads/OneTonneTravelImageCards.pdf>
- Slides 'Travel – how many tonnes?' <http://www.s4s.org.uk/wp-content/uploads/OneTonneTravel-HowManyTonnesSlides.pdf>
- Travel diary template
- <https://www.carbonfootprint.com/calculator.aspx>

Card Sort

1 What causes the Greenhouse Gas Emissions from travel? Answers should include fuel used by cars, planes, boats. Answers may include low/no emissions from walking, cycling, scooting.

2 Look at the 6 images for the card sort and sort them from high to low. What are your reasons for your choices?

3 Use the slides to show the actual high to low. How does the answer differ from yours?

4 Look at the slide of emissions from different sorts of transport. Discuss these figures.

5 Look at the slide to see what travel can be achieved if limited to 'One tonne travel'. What would you choose if you only had one tonne per year?

Travel Diary

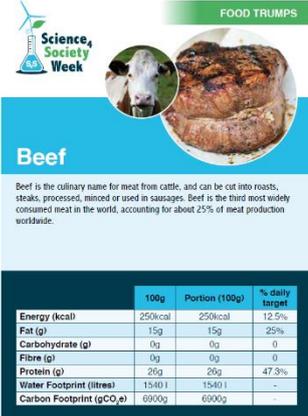
1 Travel Diary – complete a travel diary for a typical week and then for last week Use the carbon footprint calculator at <https://www.carbonfootprint.com/calculator.aspx> to work out the tonnes of CO₂e.

2 Extension option - to complete a travel diary for a month and see what could be reduced.

Food Cards

Resources

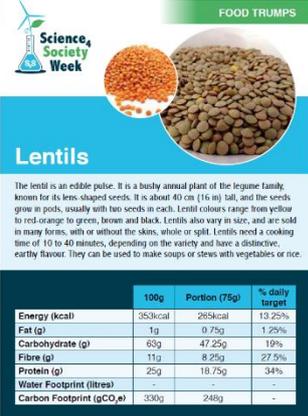
- S4S Food Cards (download www.s4s.org.uk/food-cards/ or contact info@s4s.org.uk to purchase them)



Beef

Beef is the culinary name for meat from cattle, and can be cut into roasts, steaks, processed, minced or used in sausages. Beef is the third most widely consumed meat in the world, accounting for about 25% of meat production worldwide.

	100g	Portion (100g)	% daily target
Energy (kcal)	250kcal	250kcal	12.5%
Fat (g)	15g	15g	25%
Carbohydrate (g)	0g	0g	0
Fibre (g)	0g	0g	0
Protein (g)	20g	20g	47.3%
Water Footprint (litres)	1340l	1540l	-
Carbon Footprint (gCO ₂ e)	6900g	6900g	-



Lentils

The lentil is an edible pulse. It is a bushy annual plant of the legume family, known for its lens-shaped seeds. It is about 40 cm (16 in) tall, and the seeds grow in pods, usually with two seeds in each. Lentil colours range from yellow to red-orange to green, brown and black. Lentils also vary in size, and are sold in many forms, with or without the skins, whole or split. Lentils need a cooking time of 10 to 40 minutes, depending on the variety and have a distinctive, earthy flavour. They can be used to make soups or stews with vegetables or rice.

	100g	Portion (75g)	% daily target
Energy (kcal)	353kcal	265kcal	13.25%
Fat (g)	1g	0.75g	1.25%
Carbohydrate (g)	63g	47.25g	18%
Fibre (g)	11g	8.25g	27.5%
Protein (g)	25g	18.75g	34%
Water Footprint (litres)	-	-	-
Carbon Footprint (gCO ₂ e)	330g	248g	-

Playing Food Cards

- 1 At least two people are needed to play Food Cards trumps. Deal the cards to the players.
- 2 Play trumps with the cards using the carbon footprint or water footprint values for 100g. The person with the lowest number wins the cards. Play until one person is knocked out when they have no cards left. Deal the cards again to play another game.
- 3 Ask, 'What have you noticed about the footprints of different types of food?'

What you could do to reduce their food carbon footprint.

Food Line up

- 1 Line up the cards in order of the value of the carbon footprint of the food on their card.
- 2 'What do you notice about the types of food with the highest footprints?'
- 5 Compare the nutritional aspects of some foods, e.g. protein of meat and lentils; footprints of cows' milk and soya milk.

What they you do to reduce your food carbon footprint.

Food Diary



Resources

- Slides with food diary instructions
<http://www.s4s.org.uk/wp-content/uploads/FoodDiaryFourComponentsSlides.pdf>
- Food Diary categories
- Food diary template

Activity

1 Using the slides, look at the contribution of the four aspects (Production, Processing, Packaging, Transport) to the carbon footprint of food. Look at the A-E categories of each aspect A=low through to E=high.

2 Look at the example of how to complete the food diary.

3 Complete the food diary for a typical meal, or for the following:

- Chicken, potatoes, carrots, green beans.
- List each food in a separate row.
- Note the relevant A-E categories of each food item.
- How could each be reduced to achieve closer to A?

4 Complete a food diary for a day or a week.

5 Think about how the carbon footprint of your food could be reduced (how could the food items get closer to A).

Food Diary

Production – (farming)

A seasonal fruit and vegetables, nuts and pulses

B grains, pasta, bread and vegetable oils

C out of season fruit and vegetables

D pork, chicken, eggs, fish, milk

E beef, lamb, cheese, butter

Processing

A items that have not been processed at all

B food that has been processed very simply (pulses, grains, fresh meat, tinned fruit and vegetables)

C items with 1–5 ingredients

D items with more than 5 ingredients

E anything frozen

Packaging

A food sold loose or with no packaging at all

B lightweight paper, card or plastic

C heavier paper, card or plastic

D steel cans and glass

E aluminium packaging of any kind

Transport

A anything home-grown or produced within 30 miles which you had delivered or walked or cycled to collect

B anything else produced within 30 miles

C items produced in the UK

D food from overseas delivered by truck or boat

E items that came by air

Waste Hierarchy - 7 Rs



Resources

- Slides for waste 7Rs activity <http://www.s4s.org.uk/wp-content/uploads/WasteDisposalLandfillOr7RsSlides.pdf>
- Images of waste <http://www.s4s.org.uk/wp-content/uploads/WasteImages.pdf>
- 7Rs worksheet

7 Rs card sort

1 Look at the 7 Rs using the slides. A number of actions can be chosen before choosing recycling and the aim is to avoid sending waste to landfill.

2 Look at the worksheet with the 7Rs listed with their definition and a set of images to sort into what they think is the appropriate R. The images could be replaced with actual examples, e.g. sock with a hole, broken phone, plastic bag, apple core, item of clothing,

3 Some items could be in more than one category. Could anything be moved 'up' the hierarchy? If you have decided something should be recycled – could it be repaired or repurposed rather than recycled?

4 What could you do to reduce sending waste to landfill.

Waste Hierarchy – 7Rs Worksheet

7 Rs	Definition	Examples
Refuse	Say no to things you do not need	
Reduce	Cut down on what you use	
Reuse	Use something more than once – or offer it to someone else	
Repair	Mend something that is broken rather than throw it away	
Repurpose	Turn an item into something else which is useful	
Rot	Organic matter that can decompose in a process called composting	
Recycle	To process materials so that they can be remade or reused into something useful	

Waste – The Story of Bottled Water



Resources

- The Story of Bottled Water
<https://www.youtube.com/watch?v=Se12y9hSOM0&t=5s>
- Worksheet - questions

Activity

- 1 Complete the questions on the worksheet before watching the film
- 2 Watch the film 'The Story of Bottled Water' – 8 minutes
- 3 What did you already know? What was new to you? What surprised you?
- 4 What could you choose to do to reduce your consumption in general.

The Story of Bottled Water

Where do you get your drinking water from – from the tap or bottled water?

Is tap water safe?

Is bottled water better for you than tap water?

What is 'manufactured demand'?

What is the environmental impact of bottled water?

Air Quality



Resources

- Slides Air Quality – True or False?
- Air Quality Factsheet <http://www.s4s.org.uk/wp-content/uploads/AirQualityFactsheet.pdf>

Quick Quiz (based on the Friends of the Earth ‘Clean Air’ schools pack)

1 Look at Quick Quiz statements and answer as True or False.

	Air Quality Quick Quiz	True or False?
1	You can always see air pollution	
2	Diesel vehicles are often the most polluting vehicles on the road	
3	The surface area for gases to diffuse through in human lungs is roughly the same size as a tennis court	
4	You can always smell air pollution	
5	Walking on the inside of the pavement and away from the road can help you breathe in fewer car fumes	
6	It's always better to be inside a car to protect you from air pollution	

2 Look at the correct answer below. What are the implications? Remember that this Air Quality information relates to pollution from transport. There are other air pollutants and other non-transport sources, e.g. wood burning, industry, agriculture.

	Statement	True or False?
1	You can always see air pollution	False. A lot of air pollution is invisible
2	Diesel vehicles are often the most polluting vehicles on the road	True
3	The surface area for gases to diffuse through in human lungs is roughly the same size as a tennis court	True
4	You can always smell air pollution	False. A lot of air pollution is odourless
5	Walking on the inside of the pavement and away from the road can help you breathe in fewer car fumes	True
6	It's always better to be inside a car to protect you from air pollution	False. Cars can trap pollution.

Air Quality – definitions

Resources

- Air Quality words and definitions
- Air Quality Factsheet
<http://www.s4s.org.uk/wp-content/uploads/AirQualityFactsheet.pdf>



Card Match Activity (based on the Friends of the Earth 'Clean Air' schools pack)

1 Create two sets of cards – one with the words and another with the definitions. In groups ask participants to match the definition to the word.

OR Bingo Activity (based on the Friends of the Earth 'Clean Air' schools pack)

1 Fold a sheet into a 4x4 grid to give 16 squares. Write one word/phrase from the list into each square so that each person has the words in different orders. Give them the chance to ask what the terms mean if they are not familiar with them.

2 Read out a definition (not the word) from the list. The first person to get a row (across, down or diagonal) wins. Remember that this Air Quality information relates to pollution from transport. There are other air pollutants and other non-transport sources, e.g. wood burning, industry, agriculture.

Words	Definitions
Petrol	a fossil fuel when burned causes air pollution
Nitrogen Dioxide	a harmful pollutant in the air
Immune System	helps your body fight off infections, and can be affected by air pollution
Asthma	a condition which affects some people, making it harder for them to breathe
The Great Smog	happened in 1952 and caused the early deaths of around 8,000 to 12,000 people
Cars	there are about 25 million of these on the roads in Britain
Lungs	a part of your body which helps you to breathe
Particulates	tiny particles of dust, soot, and liquid in the air, which are too small to see
Pollutants	particulates and nitrogen oxides are both examples of these
Exhaust	the part of the car which ejects dirty waste
Atmosphere	another name for the air around you
Air quality	a measure of how clean or dirty the air in a particular area is.
Diesel	a fossil fuel which is heavily polluting when burned.
Breathe	what we all do every few seconds
Acid rain	damages trees and plants; nitrogen oxides contribute to it
Contaminated	how air which contains pollutants could be described

Air Quality – Transport Challenges



Resources

Challenges list (see below)

Challenges Activity

1. Review the challenges activity and decide which of these could be done.
2. Either
 - plan individual actions
 - plan a campaign of actions from the list (or other ideas!). How could others be inspired by your actions? Prepare materials for your campaign – leaflets, a presentation, posters etc.

Air Quality Challenges

- **Switch travelling by car to walking, cycling or using public transport**
Car drivers can be exposed to twice as much air pollution as pedestrians and nine times more than a cyclist. So as well as cutting down the amount of pollution, reduce your exposure to air pollution and get some exercise.
- **Use a car less**
Cut down on car journeys by car-sharing or lift-sharing. Do you need to travel at all?
- **Discover the side streets**
Using quieter streets when you're on a bike or on foot can lower your exposure to air pollution by 20%.
- **Avoid strenuous activity when pollution is high**
There are about 10 to 20 high pollution days a year when it's better to avoid working out too hard if you have a heart or lung condition. For most people, most of the time, it is healthier to exercise than not.
- **Switch the engine off when stationary**
By turning off your car engine whenever you're not moving – and it's safe to do so – you'll help to make the air cleaner for you, other drivers and pedestrians. This is especially relevant outside schools and colleges.
- **Inspire others**
Encourage others to take the actions above to improve the air we breathe.