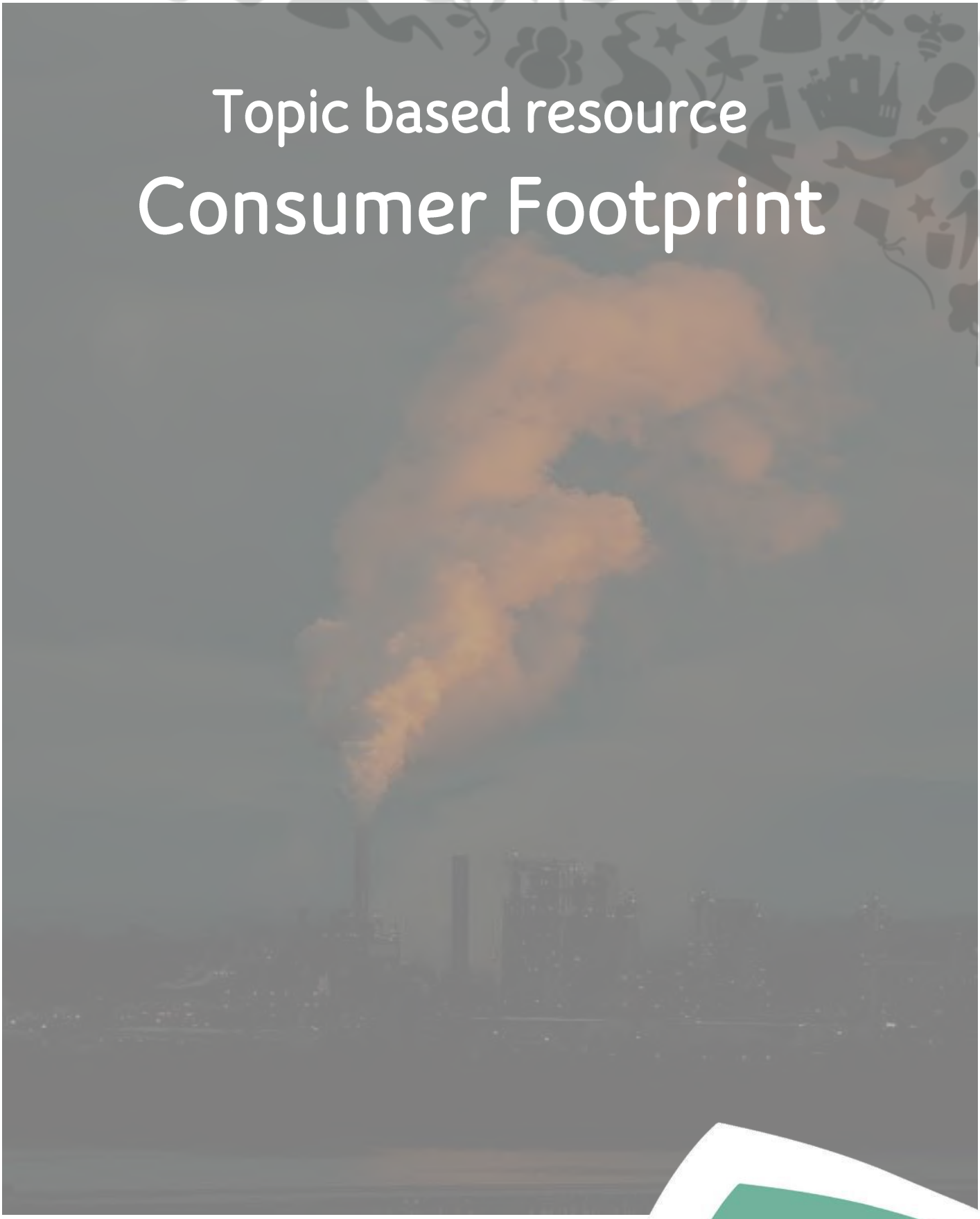
Topic based resource

Consumer Footprint



Eco-Schools
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Ariennir gan Lywodraeth Cymru
Funded by Welsh Government

11 SUSTAINABLE CITIES AND COMMUNITIES

12 RESPONSIBLE CONSUMPTION AND PRODUCTION

13 CLIMATE ACTION

cadwch keep
gymru'n wales
daclus tidy

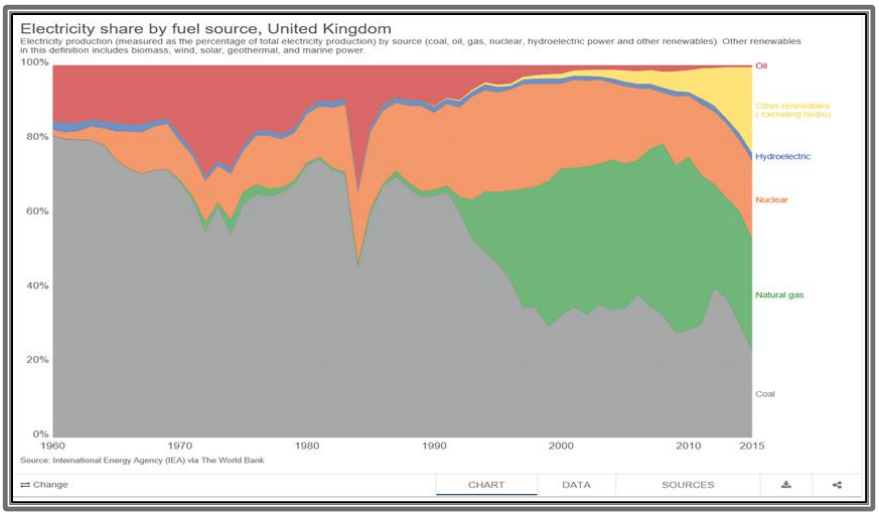
Background Information

We all depend on energy on a daily basis; to heat our homes, cook our food, power our appliances and generally keep life, as we know it in the UK, plodding on.

Electricity has traditionally been produced by burning fossil fuels (oil, gas and coal) in order to heat water, which turns to steam and rotates a giant turbine. The turbine agitates a magnet which produces the electricity that we use in our homes, factories, shops and businesses. Burning of fossil fuels leads to the production of greenhouse gases, primarily carbon dioxide, which are released into our atmosphere and act as an insulator, trapping the heat from the sun and slowly warming our Earth.

We need a level of CO_2 in our atmosphere to keep our planet at an hospitable temperature, too much will however cause our planet to heat up too much, which is what is known as Climate Change.

Within the UK we have seen a positive change over recent years to more sustainable forms of energy production, including Wind, Solar, Tidal and Hydroelectric power. In 2018 33% of our electricity demand in the UK was met through renewable energy production and our use of coal (the most CO_2 intense of the fossil fuels) has decreased significantly which has reduced our overall CO_2 production.



(Graph taken from www.ourworldindata.org)

Domestic use of energy accounted for just under 29% of the overall energy use in 2018. This means that each household can play a significant part in reducing our overall energy use and CO_2 emissions by making energy smart choices.

Climate Perspective

Our demand for energy globally has increased with the steady rise in global population as well as the increase in demand for more 'things'. This has resulted in the highest ever CO_2 concentrations in our atmosphere in 800,000 years. 2016 was the hottest year ever recorded!

Globally the highest user of energy is China but when this is equated to how much they export to other countries, the use drops dramatically. It is therefore important to consider the embedded energy in all the things that we consume when we want to look at our personal or school impact on our climate. You can find much more information and statistics linked to global CO_2 emissions at https://ourworldindata.org/co2-and-other-greenhouse-gas-emissions

Activity

Consumer Footprint

How big is yours?

Key Stage: Upper KS2, KS3, KS4

Global Goals:

- 11 – Sustainable Cities and Communities
- 12 – Responsible Consumption and Production
- 13 – Climate Action

Aims:

- Understand how we can all make sustainable choices to reduce our carbon footprint

Objectives:

- To develop an understanding of what CO_2e means and explore its impact on our climate
- Explore how the consumption of goods contributes to CO_2 emissions and therefore climate change
- Generate actions to reduce our own impact on Climate Change and develop messages to influence others.

Resources:

- Each group of learners will need
  - CO_2e activity sheet resource 1 'products and activities'
  - CO_2e activity sheet resource 2 'food and drink'

Activity Background Information:

Everything we eat, produce, or consume has an impact on our environment. From the raw materials used to make products to the transportation of products to our shops. We can work out how much of an impact a product has by looking at its CO_2e – this means the amount of Carbon Dioxide or equivalent gas such as methane or nitrous oxide that is released into our atmosphere while producing a product. This includes growing, processing, transporting and the packaging products. All figures were taken from the book *How Bad are Bananas* by *Mike Berners-Lee*.

Activity:

1. Have a whole class discussion about the sort of activities that contribute to climate change. What activities do pupils think contribute the most to climate change?

2. Introduce the concept of CO_2e as a measure of a product's carbon footprint.

3. Split the class into groups of 3 or 4 and give each group an activity sheet for 'products and activities' and 'food'.

4. For each worksheet try and rank the activities or products in order of least to most CO_2e impact on our planet. This can be done by ranking the products 1-12 (lowest to highest) or by cutting out each product and ordering.

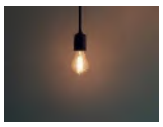
5. When each group has completed the task, share the answers, and discuss the findings. Is there anything surprising? Why are some of the figures so high/low? Are there any changes we could make in our daily lives to help lessen the impact?

Extension Ideas:

There are lots of celebrations that take place across the year where we purchase and consume a variety of different products, including some of the things on these lists. Can you think of alternative celebration ideas to make your choices sustainable? Perhaps you could prepare a calendar of 'buy less' celebration ideas to use throughout the year.

Support Documents

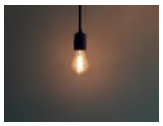
Activity sheet 1 – 'Products and activities'

 100kg o wrtaith 100kg of fertiliser	
 Gadael golau ynni isel 5W ymlaen drwy'r flwyddyn Leaving a 5w low energy light on all year	
 Gwylio teledu am 1 awr (plasma 32 modfedd) Watching 1 hour of TV (32inch plasma)	
 Gyrru 1 milltir Driving 1 mile	
 Jîns Newydd New Jeans	
 Cwpan y Byd The World Cup	
 Pâr o esgidiau arferol An average pair of shoes	
 Trên o Llundain i Glasgow ac yn ôl Train from London to Glasgow and back	
 Hedfan o Llundain i Glasgow ac yn ôl Flying London to Glasgow and back	
 Un ebost An email	
 MacBook 16 modfedd – gallu storio 1TB A new 16 inch MacBook -1TB of storage	
 Rhosyn Coch (o'r Iseldiroedd ar ddydd Sant Ffolant) A Red Rose (on Valentines day from The Netherlands)	

Activity sheet 2 – 'Food and Drink'

	Latte mawr llaeth buwch Large cow's milk latte
	500 ml o ddŵr tap 500 ml of tap water
	Afal (O Dramor/Wedi'i fewnforio) Apple (Overseas/Imported)
	500 ml dŵr potel (wedi ei gynhyrchu yn lleol) 500 ml bottle of water (locally sourced)
	Mefus – bocs 250g (cnŵd tymhorol o'r DU) Strawberries – 250g punnet (grown in season UK)
	Caws caled–250g (DU) Hard cheese–250g (UK)
	Peint o Laeth (DU) Pint of Milk (UK)
	Mefus – bocs bach (wedi hefdan o Dde Affrica neu cnŵd tŷ gwydr wedi ei gynhesu DU) Strawberries – punnet (flown from South Africa or grown in hothouse UK)
	Banana
	Torth o Fara–800g Loaf of bread–800g
	Bocs o 6 wy (DU) Box of 6 eggs (UK)
	Afal (Wedi'i gasglu o goeden yn yr ardd) Apple (Picked from garden tree)
	Byrgyr Caws (cig eidion) Cheeseburger (steak)
	Coffi Du (berwi 'r dŵr angenrheidiol y unig) Black coffee (boiling only the required amount of water)

Activity sheet 1 – 'Products and activities' – Answers

	100kg o wrtaith 100kg of fertiliser	2,700,000g CO2 e
	Gadael golau ynni isel 5W ymlaen drwy'r flwyddyn Leaving a 5w low energy light on all year	15,000g CO2 e
	Gwylio teledu am 1 awr (plasma 32 modfedd) Watching 1 hour of TV (32inch plasma)	237g CO2 e
	Gyrru 1 milltir Driving 1 mile	530g CO2 e
	Jîns Newydd New Jeans	19,000g CO2 e
	Cwpan y Byd The World Cup	2,800,000 tonnes CO2 e (2.8billion KG)
	Pâr o esgidiau arferol An average pair of shoes	11,500g CO2 e
	Trên o Llundain i Glasgow ac yn ôl Train from London to Glasgow and back	64,000g CO2 e
	Hedfan o Llundain i Glasgow ac yn ôl Flying London to Glasgow and back	368,000g CO2 e
	Un ebost An email	0.3g CO2 e
	MacBook 16 modfedd – gallu storio 1TB A new 16 inch MacBook -1TB of storage	620,000g CO2 e
	Rhosyn Coch (o'r Iseldiroedd ar ddydd Sant Ffolant) A Red Rose (on Valentines day from The Netherlands)	2,400g CO2 e

Activity sheet 2 – 'Food and Drink' – Answers

	Latte mawr llaeth buwch Large cow's milk latte	552g CO2 e
	500 ml o ddŵr tap 500 ml of tap water	0.2g CO2 e
	Afal (O Dramor/Wedi'i fewnforio) Apple (Overseas/Imported)	80g CO2 e
	500 ml dŵr potel (wedi ei gynhyrchu yn lleol) 500 ml bottle of water (locally sourced)	200g CO2 e
	Mefus – bocs 250g (cnŵd tymhorol o'r DU) Strawberries – 250g punnet (grown in season UK)	490g CO2 e
	Caws caled–250g (DU) Hard cheese–250g (UK)	3,000g CO2 e
	Peint o Laeth (DU) Pint of Milk (UK)	1100g CO2 e
	Mefus – bocs bach (wedi hefdan o Dde Affrica neu cnŵd tŷ gwydr wedi ei gynhesu DU) Strawberries – punnet (flown from South Africa or grown in hothouse UK)	3650g CO2 e
	Banana	110g CO2 e
	Torth o Fara–800g Loaf of bread–800g	1,000g CO2 e
	Bocs o 6 wy (DU) Box of 6 eggs (UK)	2000g CO2 e
	Afal (Wedi'i gasglu o goeden yn yr ardd) Apple (Picked from garden tree)	0g CO2 e
	Byrgyr Caws (cig eidion) Cheese burger (steak)	3200g CO2 e
	Coffi Du (berwi 'r dŵr angenrheidiol y unig) Black coffee (boiling only the required amount of water)	49g CO2 e

Curriculum Links

Purposes:

- Ethical, informed citizens of Wales and the world.

AOLE's:

- Humanities

What matters statements:

- Informed, self-aware citizens engage with the challenges and opportunities that face humanity and are able to take considered and ethical action.

AOLE's

- Health and Well Being

What matters statements:

- Our decision-making impacts on the quality of our lives and the lives of others.

AOLE's

- Mathematics and Numeracy

What matters statements:

- Statistics represent data, probability models chance and both support informed inferences and decisions.

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33-35 Heol yr Eglwys Gadeiriol, Caerdydd, CF11 9HB | 33-35 Cathedral Rd, Cardiff, CF11 9HB
029 2025 6767 keepwalestidy.cymru info@keepwalestidy.cymru