



Sustainable consumption: individual action – teacher notes

Education in Chemistry

Sustainability in chemistry 2021

Goal 12: ensure sustainable consumption and production patterns

rsc.li/2ULAaWW

Use these resources to get your students thinking about how their individual actions can reduce the materials they consume.

Learning objectives

- Learners can reflect upon their individual actions to determine how they could reduce consumption of materials.
- Learners understand the impact these individual actions can have on the climate and society.

The task

Task 1 – Learners work through a list of individual actions that help to support sustainable consumption and production patterns. They are asked to consider the impact of each action and whether they would commit.

Task 2 – Learners link each of these actions to some data on global greenhouse gas emissions by sector.

There are several ways to set this activity up with your class, for example:

- Learners choose one of the actions to research.
- Set up as a group exercise and then each group presents back to the class.
- You could incorporate a poll, eg a Kahoot quiz, to see what others in the class think.
- Adapt presentations or polls for an assembly to expand the polling to the whole school.

Some students may need a little prompting with some of the statements – the guidance sheet provides links to articles and infographics. The notes in the table below will help you to point them in the right direction. A class discussion around any issues relating to the individual actions is a great opportunity to listen to their concerns and to understand their views.

The second task allows students to interpret data from a pie chart as well as have a discussion around the difficulties with interpreting data for such a complex issue.

Notes on task 1

Individual action	Why might this help?
Switch to energy efficient light bulbs	The UN state that if people worldwide switched to energy efficient lightbulbs, the world would save \$120 billion annually https://www.un.org/sustainabledevelopment/sustainable-consumption-production/ . Discussions about the initial outlay could also be a good discussion point.
Recycle your electrical devices rather than keep them in a drawer	The UN state that 'electronic waste continues to proliferate and is not disposed of properly', with each person generating around 7.3 kilograms of 'e-waste' but only 1.7 kilograms being recycled in 2019. Use this graphic to help - https://sdgs.un.org/sites/default/files/2021-07/SDG_report_2021_Goal%2012.png . They also state that e-waste is exported to 'lower income countries' where the 'e-waste management infrastructure is not yet developed' https://unstats.un.org/sdgs/report/2021/extended-report/Goal%20(12)_final.pdf .
Choose 'ugly' fruits to help reduce waste	The UN state that 'each year, an estimated 1/3 of all food produced – an equivalent of 1.3 billion tons, worth around \$1 trillion – ends up rotting in the bins of consumers and retailers or spoiling due to poor transportation and harvesting practices'. While the consumer is not entirely at fault, it is important for our students to understand the role that they play. Sometimes these sorts of numbers are incomprehensible, so it may be useful to use statistics such as in 2019, the average UK family wasted £810 of food in just one year https://wrap.org.uk/sites/default/files/2020-08/Retail-Survey-2019.pdf .
Campaign for better recycling in your school/area	With the global material footprint increasing from 8.8 metric tons per capita in 2000 to 12.2 metric tons in 2017, the UN state that 'it is essential to decrease reliance on raw materials and increase recycling and circular economy approaches to reduce environmental pressures and impact' https://unstats.un.org/sdgs/report/2021/extended-report/Goal%20(12)_final.pdf .
Choose a 'green energy tariff' despite it being more expensive	Students may not be aware of what a green energy tariff is and you may need to explain it to them. In theory, it is a tariff whereby the supplier matches all (or some) of the energy you use with renewable energy. They have been criticised recently for being 'misleading' https://www.bbc.co.uk/news/business-56602674 .
Buy good quality, second hand clothes	Students are often unaware of the impact that 'fast fashion' has on the environment. The life cycle assessment here is useful to get your students thinking about how to reduce their consumption of these materials https://edu.rsc.org/resources/assessing-the-life-cycle-of-fashion-14-16-years/4010470.article .
Use reusable plastics or sustainable alternatives	The fight on plastics has gained momentum over recent years, but future sustainable technologies may depend on plastics. Understanding how chemistry contributes to understanding and mitigating the impact of plastics in the environment, through developing how they are recycled and ensuring the materials they are made of are more sustainable, is key https://www.rsc.org/new-perspectives/sustainability/progressive-plastics/ .

Notes on task 2

Individual action	Which sector does this action contribute to?	Put the actions in order of global greenhouse gas emissions from 1 (largest) – 7 (smallest)*
Switch to energy efficient light bulbs	The 'energy sector' is very broad (73.2%), so energy use in buildings – 17.5% – is the best estimate.	
Recycle your electrical devices rather than keep them in a drawer	Not linked directly to greenhouse gas emissions, however the transportation of electrical devices as e-waste will contribute to global greenhouse gas emissions. Energy sector again, this time transport – 16.2% of the energy sector itself.	
Choose 'ugly' fruits to help reduce waste	'Agriculture, forestry and land use' – 18.4%. The food system as a whole accounts for a quarter of all greenhouse gas emissions. There are several possible sub-sectors such as cropland (1.4%), deforestation (2.2%) and crop burning (3.5%).	
Campaign for better recycling in your school/area	Whilst being a broad statement, if things are not recycled, they often end up at landfill. The waste sector accounts for 3.2% with 1.9% of that coming from landfill.	
Choose a 'green energy tariff' despite it being more expensive	Again, the energy sector is very broad (73.2%), so energy use in buildings – 17.5% – is the best estimate. This of course accounts for many different actions and a discussion could be had around which one will make the largest impact.	
Buy good quality, second hand clothes	Energy use in industry (24.2%) of which, 10.6% comes from 'other industry' including mining, quarrying and importantly textiles, from which clothes are made. Again, this one action would not account for the 10.6% of greenhouse gas emissions but is the most appropriate from the data.	
Use reusable plastics or sustainable alternatives	Plastics are often made from petrochemicals (3.6%) and are known to contribute to landfill waste (1.9%) and pollution, but they are crucial to society, now and in the future. Therefore alternative, sustainable plastics will need to be developed.	

* Learners may, rightly, find the final column difficult. This is because each sector is very complex and contains a huge number of different 'actions' which make the data very difficult to interpret. This is important for students to understand and a discussion as to why students put statements in a particular order will be beneficial.