Universities and Colleges
Climate Commitment for Scotland

Our Beautiful World:

Beauty Shouldn't Cost the Earth

Sustainable Development and the Beauty Industry: Student Workbook

Dumfries & Galloway College

About the Author

The author of this publication is Dr Elaine Crawford who is the Student Engagement Officer at Dumfries and Galloway College. Elaine has a MA in Environmental Sustainability, a MSc in Carbon Management and a PhD titled Embedding Education for Sustainable Development in the Curriculum in Scotland's Colleges, all from the University of Glasgow. The project to produce this range of workbooks began during a work placement with the Crichton Carbon Centre as part of the MSc in Carbon Management, when the first workbook was produced. As a result of this, a range of further workbooks are now being developed to raise awareness of global issues that will affect us all and to ensure education for sustainable development is fully embedded within all aspects of the Scottish college curriculum.

About the Environmental Association for Universities and Colleges (EAUC)

The EAUC is a strong alliance of universities and colleges, sector bodies and commercial organisations, working together both in the UK and internationally. Our vision is a tertiary education sector where the principles and values of environmental, economic and social sustainability are embedded. The EAUC is a not for profit Member based charity run by Members for Members. We are financed by subscriptions and service generated revenue which funds our work of representing and promoting the interests of Members and the provision of support services to drive sustainability to the heart of tertiary education across the UK and internationally. The EAUC will lead, inspire and support Members and stakeholders with a shared vision, knowledge and the tools they need to embed sustainability and facilitate whole institution change through the involvement of everyone in the institution.

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1. Introduction

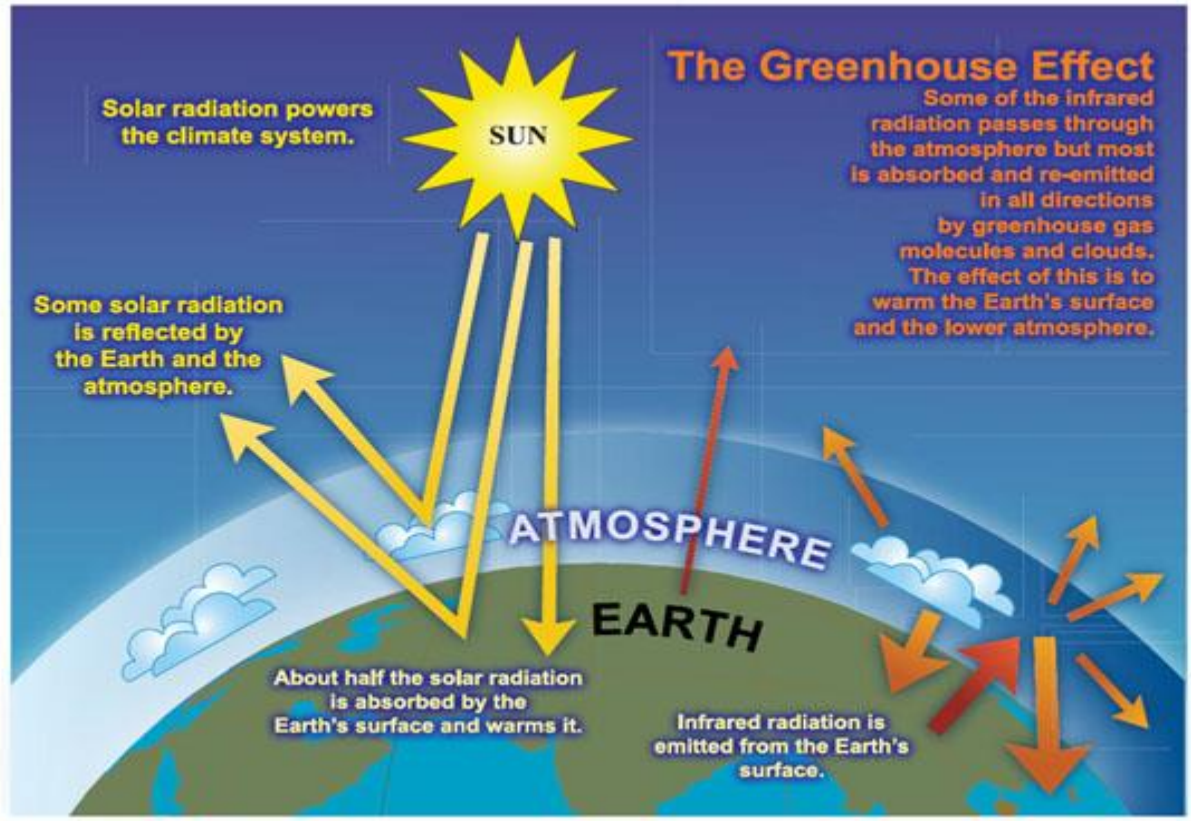
The purpose of this workbook is to introduce the topics of sustainability and sustainable development and to link them to the beauty industry where applicable. There are a number of reasons why sustainability and sustainable development have become increasingly important in recent years, including the issue of climate change caused by human actions. However, sustainability does not mean only looking at climate change and the problems associated with it, but also considers other issues such as population growth, the use of limited resources and social justice. This workbook begins by explaining why we should be concerned about climate change and then moves on to provide information about other areas of our lives we could consider changing in order to live a more sustainable life within the confines of the one planet we call home – the planet Earth. Furthermore, links are made to the beauty industry and curriculum when possible to enable students to understand sustainability in terms of their chosen career choice.

1.1 Climate Change

The Earth's climate has varied naturally throughout its history, with periods when it was much warmer than today and 'ice ages', when Scotland was under glaciers a kilometre deep. However, during these times the Earth was much less densely populated than it is today. As you are probably aware, the Earth is now going through another period of warming – but this is different from those that have happened in the past. Over the last century global temperatures have been rising and scientists have concluded that this recent warming cannot simply be explained as natural variability. Human activities, mainly the emission of greenhouse gases (GHGs), are playing a major part. The main causes are the burning of fossil fuels (such as oil, coal and gas), and changes in land use, such as deforestation. As we increase emissions, the GHGs in the atmosphere also increase. This is resulting in an increase in global average temperatures, average sea level is rising, and snow and ice are melting at an alarming rate (IPCC, 2014). The Intergovernmental Panel on Climate Change has also concluded that most of the warming that has occurred since the mid twentieth century is very likely due to man-made GHG emissions.

These GHG emissions are 'enhancing' the natural greenhouse effect. The greenhouse effect is a process which keeps the planet warm due to GHGs in the atmosphere trapping radiation from the sun – without it, the Earth would be much colder, around -18°C. The best known GHG is carbon dioxide (CO_2), but there are a number of others, including methane (CH_4), nitrous oxide (N_2O) and water vapour (H_2O). Put simply, adding GHGs to the atmosphere enhances the greenhouse effect and results in global warming. Diagram 1 – The Greenhouse Effect shows the natural greenhouse effect without man made interference, however the addition of extra GHGs in the atmosphere causes more of the sun's solar radiation to be trapped causing the temperature on earth to increase.

Diagram 1 – The Greenhouse Effect



Source: Intergovernmental Panel on Climate Change Assessment Report 4 (2007)

The latest research conducted by experts at the Met Office suggests that if we (and others around the world) continue to operate on a 'business as usual' basis, then we could see an increase in the global average temperature of around 4°C before the end of the 21st century. In addition to the changes already mentioned, this increase in global temperature will bring with it major changes to weather patterns and an increasing frequency and intensity of extreme weather events such as hurricanes, heavy rainfall events and heat waves. Such a large and fast change in climate is dangerous and will have severe and costly impacts (Stern, 2007). For example, our ability to produce food around the world will decrease significantly, hundreds of millions of people will face water stress while millions of others will face flooding, and around a third of all species are likely to become extinct by the end of the century (IPCC, 2014).

Scotland, and the rest of the UK, will not be immune from the effects of climate change. Unless we seriously change our lifestyles to cut CO_2 emissions, average temperature increases of up to 3°C in the winter and 4°C in the summer are likely to be experienced by our grandchildren and great-grandchildren (Met Office). The related weather changes are likely to mean floods, droughts and dangerous heat waves, with a rise in heat-related deaths. In 2003, 37,000 people died as a result of a heat wave in Europe, over 2,000 of which were in the UK (Met Office). Winters will be significantly wetter, with more intense rainfall. This would mean more flash floods, with rivers bursting their

banks more often. Other impacts include an increasing incidence of severe gales and sea level rise affecting coastal areas causing flooding of coastal homes and businesses and coastal erosion. Action now needs to be taken to reduce GHG emissions to ensure that global temperatures do not rise by more than 2°C; this will help to limit the most severe impacts of climate change. This challenge has been accepted by the UK and Scottish governments with the passing of The Climate Change Act 2008 and The Climate Change (Scotland) Act 2009, both of which set a legally binding target to reduce emissions by 80% from 1990 levels by 2050. In Scotland, the first interim target is a reduction of 42% below 1990 levels by 2020. As a result, we will see an increasing regulatory requirement to reduce emissions in both the workplace and the home. Everyone has to play their part in the drive to a more resource efficient, low carbon system if we are to meet these targets and avoid catastrophic interference with the climate system.

Due to the global recession, it is likely that global emissions have fallen due to a reduction in fossil fuel use. The Earth's climate is also going through a natural cooling period, hiding the true extent of climate change for a short period. This may make it seem like we have turned a corner and that the problem has been solved. This will not be the case. Tackling the global climate will be a major project for the whole of humanity and throughout the lives of everyone at the College. We need to do all we can to reduce our GHG emissions by using fewer fossil fuels, more renewable energy and changing our lifestyles to reflect this. Climate change is coming, but with your help, we can reduce its impacts for ourselves and the generations which follow us.

1.2 Sustainable Development

Climate change will affect us all, and is impacted by our current economic model which is reliant upon the use of fossil fuels for continual economic growth. However, people around the world are increasingly recognising that current economic development trends are not sustainable and that there is an alternative model which is sustainable development. Sustainable development is a difficult concept to define; it is also continually evolving which makes it even more difficult to define. One of the original descriptions and arguably the most famous was coined by the Brundtland Commission and states that,

'Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs' *(WCED, 1987).*

With sustainable development the economy is not considered in isolation but is interlinked with society and the environment. If the three aspects of sustainable development are considered as three circles of the same size, the overlap in the centre is where human well-being is achieved. As

the three elements of society, environment and economy become more aligned, the area of overlap will increase and so will human well-being.

In order to move towards sustainability, public awareness, education and training are required – which is the purpose of this workbook. Whilst it is acknowledged that education is one of the key drivers to moving society towards global sustainability, the difficulty in defining sustainable development and whether it is achievable or not, continues to hamper progress. Also, different cultures have different visions of what a sustainable community will look like and how it will function. These issues and the lack of an agreed definition and vision has made efforts to implement education for sustainable development (ESD) very challenging.

1.3 Education for Sustainable Development

The United Nations Decade for Education for Sustainable Development (UNDESD) ended in November 2014. The UNDESD was a global initiative that recognised the vital role that education has to play in the transition to achieve societal change that motivates all generations to develop a sustainable future (UNESCO, 2004). The overarching goal of the UNDESD was to 'integrate the principles, values and practices of sustainable development into all aspects of education and learning, and all areas of life including communities, the workplace and society in general ' (UNESCO, 2004). The Scottish Executive stated Scotland's response to the UNDESD by publishing the '*Learning for our Future*' action plan which advised what it wanted to achieve in the first five years of the UNDESD. An important aim of *'Learning for our Future'* was by 2014 to give people the 'knowledge, understanding, skills and values to live sustainable lives by fully integrating sustainable development into all stages of the formal education system' (Scottish Executive, 2006). Five years on the Scottish Government published *'Learning for Change'*, Scotland's action plan for the Second Half of the

UNDESD which reviewed the original plans to consider progress made to date, and also advised the actions required for the second half of the UNDESD. The Scottish Government announced progress made in the education sector taking into account climate change targets where they praised the progress made to date in the further education sector but highlighted the need to further embed ESD within all curriculum areas.

The concept of using education to achieve sustainability through a just and ecological society is not a new one. Schumacher (1973) acknowledged education as the 'greatest resource' we have at our disposal for attaining a paradigm shift to a sustainable way of life. The World Conservation Strategy also stated 'a new ethic, embracing plants and animals as well as humans is required for human societies to live in harmony with the natural world' and 'the long-term task of environmental education is to foster attitudes compatible with this new ethic' (IUCN, UNEP & WWF, 1980). Although this brought the term sustainable development to the public arena, it aimed to achieve it through conservation and was therefore limited to ecological sustainability and did not link sustainability to wider social and economic issues (Baker, 2006, p18).

It was not until the Brundtland Report that social, economic and ecological aspects of development were explicitly considered together (WCED, 1987). The Brundtland Report also argued that 'teachers had a crucial role to play in helping to bring about the extensive social changes necessary for sustainable development' (WCED, 1987). In 1992 the United Nations Conference on Environment and Development produced Agenda 21, a comprehensive document which committed countries to promoting environmental sustainability through practice. This included education and community based projects at a local level highlighted by Local Agenda 21.

The first difficulty to overcome prior to evaluating or implementing ESD is determining exactly what it means. It was first defined by Chapter 36 of Agenda 21 which identified four major components of ESD which are, to improve basic education, reorient existing education to address sustainable development, develop public understanding and awareness and training (UNDESA, 1992). However definitions vary and attempting to establish an agreed definition of ESD still causes considerable academic debate which means it remains a contested phrase (Jones *et al*. 2008). One definition is that 'ESD should be presented as 'coping with' rather than definitively 'solving' the 'ecological crisis' (Barry, 2007). However, this suggests we should adapt to the ecological crisis we are enforcing upon the Earth because it is inevitable, rather than change our behaviour to lessen our impact and avoid ecological crisis. ESD has many definitions, but this workbook encompasses the view that 'sustainable development education is the process of acquiring the knowledge, skills and attitudes needed to build local and global societies that are just, equitable and living within the environmental limits of our planet, both now and in the future' (SDE, 2008). Definitional conflict about all aspects of sustainability is nothing new, and there is still conflict today in understanding the term sustainable development, as it appears to 'bring into harmony two politically attractive but potentially conflicting notions' which is difficult to reconcile (Bonnett, 1999). If sustainable development still cannot be defined easily it is not surprising that neither can ESD.

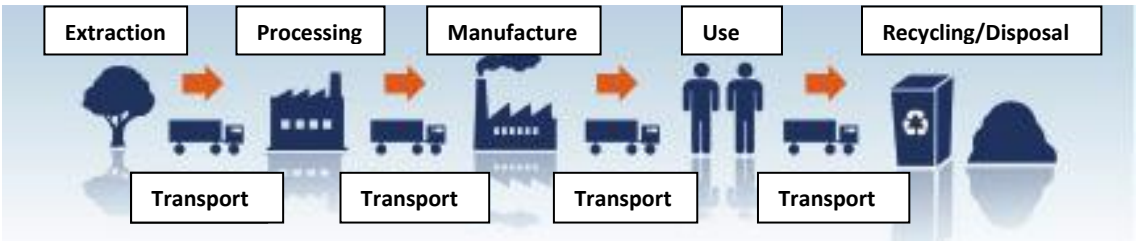
There is definitely scope for further research into the Scottish College system to establish best practice for incorporating ESD within the curriculum at all levels in Scotland's Colleges. Dumfries and Galloway College has taken a major step forward in embedding ESD within the curriculum by

implementing this project to produce a range of workbooks across the curriculum. However, to be effective it has been acknowledged that staff and student engagement is vital.

The chapters that follow aim to provide some of the information required for staff and students to make informed choices about living their lives in a more sustainable fashion and offers advice and activities where sustainability can be embedded within the Beauty curriculum.

2. The Life Cycle of Everyday Objects

Life Cycle Analysis (LCA) is a process used to measure the environmental impact of a product or process, from the beginning of its life to the end, or from the 'cradle to grave'. As we can see from the diagram below, to make any product we need to start with the raw materials and then determine how they are processed to make the product, how the product is then used, before it is either discarded or recycled.



Stage 1 • **Raw Materials** - such as extraction from the ground or farming. Therefore for farming you would need to consider land use change and fertiliser use.

Stage 2 • **Manufacturing** - all of the production processes and the waste this generates. This would include site related energy use within the factory.

Stage 3 • **Distributing** - all stages of transport and storage.

Stage 4 • **Retail** - storage at the retailers and display within retails units. Therefore you would need to consider the energy use within warehouses and shops.

Stage 5 • **Use** - consumer travel to take the product home and then use of the product. Using the product may require energy use and water for example.

Stage 6 • **Disposal** - all of the steps in the disposal of the good from transport to landfill or the energy required to recyle it.

Think about what everyday objects are made of, the resources and energy used to make them, how long they can be used for, and what happens to them at the end of their useful life. You may also need to consider the following:-

- Different types of products and services have their most significant climate impact at different stages in their life cycles.
- For products with a long life and high energy consumption, the Use Phase typically accounts for the most significant climate impact, for example a washing machine.
- Other products will have their greatest impact during the production phase – this is usually the case for food production.
- Some products may not be recyclable and may need to go to landfill.

This is just a small snapshot of the impacts of the life cycle of an object. To see the full environmental impact of the products we consume, go to http://www.storyofstuff.com/ and watch the Story of Stuff video.

2.1 Activity 1 – The Life Cycle of Cotton Wool

Here we have a picture of some cotton wool. It looks like a fairly simple product. Have a good look at the picture and think about the following questions. Use the internet to search for information to answer the questions.

Q1. How are the materials produced to make cotton wool? Where do the materials come from?

Q2. How is it processed? What energy do you think has been used?

Q3. Once made, how does it get to the distributors that sell it?

Q4. What happens to cotton wool after it has been used?

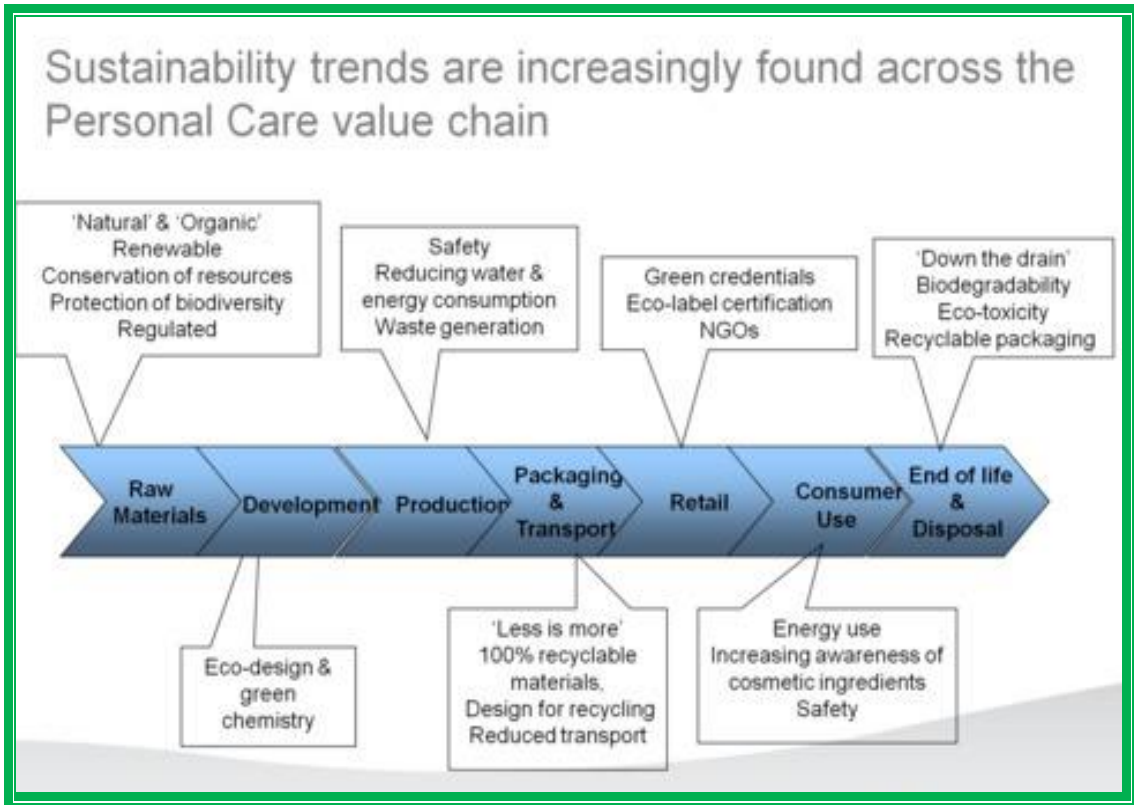
Q5. Can you think of other environmental impacts not already considered? (For example, what about water resources to grow cotton and how are the people treated that grow it)?

There are a number of materials used in the beauty industry that are designed to be used once and then thrown away. Take manicures for example, how many of the accessories used are disposable, or used once and thrown away? Should there be reusable alternatives? Or should we be using finite resources for something else other than our nails?

2.2 The Life Cycle of Beauty Products

The following diagram clearly illustrates the life cycle of 'personal care' products which includes beauty products. It can be broken down as follows:

- Raw materials – taking into account natural or organic materials, conservation of raw materials and regulation to protect biodiversity which may be affected by harvesting the raw materials.
- Development – how can the finished product be developed to be as environmentally friendly as possible?
- Production – how to reduce the use of resources such as water and energy and to keep waste generated to a minimum.
- Packaging and transport – to reduce transport emissions and the amount of packaging required. Can the packaging be recycled?
- Retail – does the retailer have any green credentials and do they consider their environmental impacts?
- Consumer use – is there a way to educate consumers of the energy they consume to use the product and are they aware of the ingredients within the product?
- End of life and disposal – what do consumers know of the environmental impacts of disposing of the product and are they aware of recycling packaging?



Some of these points are illustrated in more detail on the Story of Stuff website in the Story of Cosmetics video, available at http://storyofstuff.org/movies/story-of-cosmetics/

3. Carbon Footprints

In the previous section the environmental impact of making things was considered. In our everyday lives we use hundreds of different products, all of which have an environmental impact throughout their lifetime. Producers of goods and services are increasingly becoming aware of these impacts and are starting to think of measures they can use to limit the amount of environmental damage their product is responsible for. One method of measuring this impact is carbon footprinting. A carbon footprint is the total set of greenhouse gas (GHG) emissions caused by an organisation, event or product (UK Carbon Trust, 2009). To make it easier to report, it is often expressed in terms of the amount of carbon dioxide, or the amount of carbon dioxide equivalent of any other GHGs emitted.

A product's carbon footprint is the total amount of GHGs produced across its life cycle from extraction to recycling or disposal. To measure a product footprint there is a 'basket of six' greenhouse gases that are measured, these are:-

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)
- Hydrofluorocarbons (HFCs)
- Perfluorocarbons (PFCs)
- Sulphur hexafluoride (SF_6)

Many producers are now starting to measure the carbon footprint of the goods they produce. If a producer or manufacturer wants to reduce the carbon footprint of a product or services it needs to know how big it is first. Boots the Chemist, with help from the Carbon Trust, has measured the carbon footprint of their Botanics shampoo range and as a result they determined where they could make reductions in the footprint of the products.

3.1 Carbon Footprint of Products

A number of companies are now looking at their products to establish how they can reduce the carbon and environmental footprint of their products. Lush, for example has taken steps to reduce the environmental impact of their products, such steps include:

- recycling 85% of its waste,
- retrofitting their shops to improve energy efficiency,
- banning domestic flights for staff,
- installing renewable energy systems,
- designing products to be package free
- designing their handmade products that do require packaging to be made from recycled materials,
- encouraging customers to return used containers and plastic bottle tops which they recycle internally,
- investing in sustainable farming and community projects in developing countries

More information about how Lush manages to be a profitable, but sustainable, beauty product developer can be found on their website.

It is not just hair and beauty products that manufacturers are looking at, below is an example of carbon footprint information for a brand of washing powder and an Innocent smoothie.

When measuring a carbon footprint, it is important to explain what the amount of carbon measured relates to, or to provide a meaningful unit. In this example the carbon footprint of 850g CO_2 is the amount per washing machine load.

This example refers to the amount of CO_2, 294g, per bottle of mangoes and passion fruits smoothie.

The main benefits of calculating a product footprint are to identify savings both in terms of money and for reducing carbon emissions. Also as customer demand grows for more 'eco-friendly' products it can be used to advertise a company's green credentials. If customer demand is sufficient this puts pressure on producers and suppliers to think about the environmental impact of their products they make and sell.

The internet is a useful tool for finding information on the carbon footprint of products. A good place to start is the Carbon Trust website at **http://www.carbontrust.com/our-clients** and look at some of the case studies for ideas on reducing GHG emissions which help lower carbon footprints. Carbon footprinting can also be used to measure the GHG emissions from an event such as a conference or a festival.

3.2 Activity 2 - Your Carbon Footprint

It is not only organisations, products and events that have carbon footprints. Activities in our daily lives cause GHG emissions and we can measure the amount to determine our own individual carbon footprint, just like we considered product carbon footprints in the previous section.

The areas of our lives that generate most of our individual GHG emissions are as a result of:

- Electricity use
- Travel and transport
- Food production
- Buildings we use
- Waste

Carbon footprints are a sub-section of ecological footprints. Ecological footprints look to measure one person's impact upon the world, or the amount of resources or space that are required for an individual to live their life. Go to the following website, http://footprint.wwf.org.uk/ and enter the data to reflect your lifestyle, it will only take a few minutes to do so. Based on the information you provide regarding the way you live, the calculator will estimate how much of your share you are using to support your lifestyle. This is based on the amount of land required to produce the quantity of resources that you consume.

Record here how much of your share your lifestyle requires _____%

You may be surprised by the results! Remember we only have one earth!

Available Resource

=

1 Planet Only!

Guidance for 3.2 Your Carbon Footprint

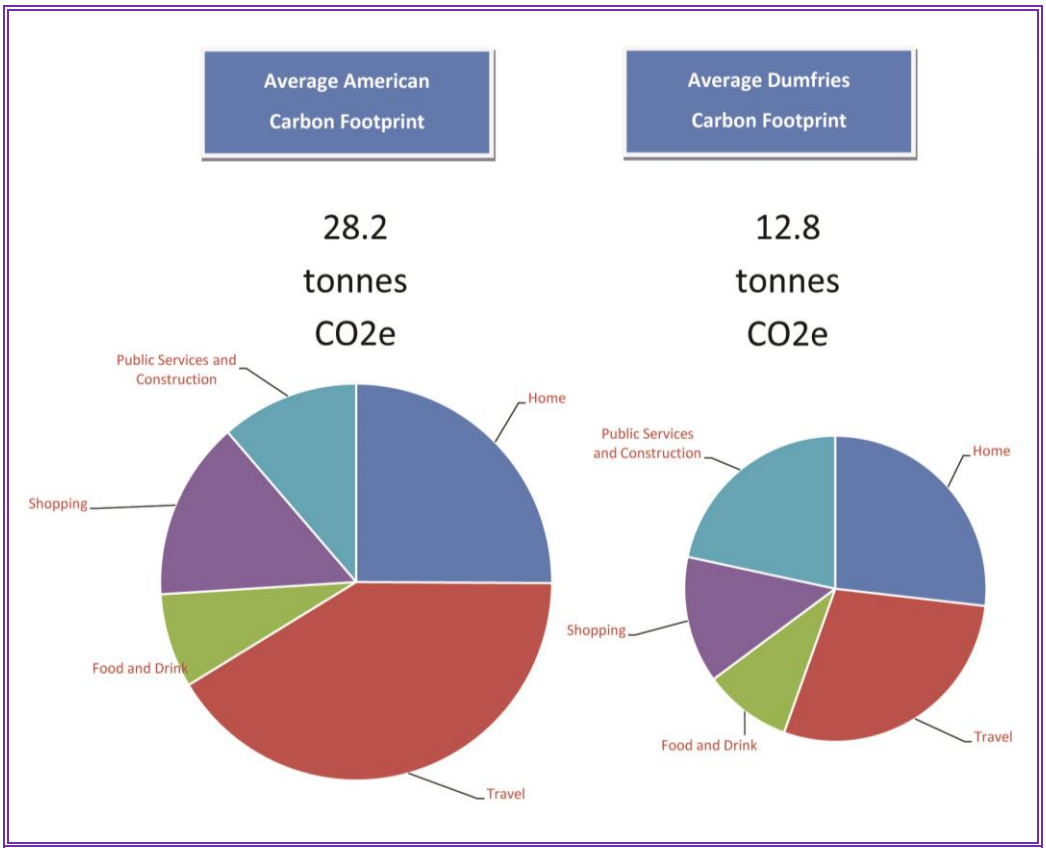
The share that your lifestyle requires, or your 'ecological footprint' will be calculated based on your lifestyle, so your answer will be different to that of your colleagues or students. This also applies to the number of tonnes of carbon your lifestyle generates.

This exercise can be used to generate discussion as to why your lifestyle produces different figures from someone else's. Does one of you fly more than the other, does someone use more public transport instead of a personal car, and maybe someone grows their own food and only buys organic, seasonal produce wherever possible, whereas someone else buys all pre-packaged processed food. The amount of 'stuff' you consume will also affect the numbers, as will the size of house you live in and how you use energy in it.

This exercise is a good way to compare and contrast lifestyles of different people around the world, looking at those who live within the confines of one planet and those who don't. It can be used to debate the social injustice of those who have and those that don't. This would also be a good opportunity to look at the United Nations Sustainable Development Goals.

3.3 Carbon Footprints around the World

Not everyone in the world lives in the same way as many of us do in Scotland and other industrialised countries. Some people are more environmentally aware and try to limit their impact upon the Earth and its resources wherever possible, whilst others don't. Also, not everyone has access to the same amount of the Earth's resources or the means to live as we do in the Western world. The diagram below shows the average carbon footprint of the average American in tonnes of carbon dioxide equivalent, this is compared against the average carbon footprint of someone who lives in Dumfries in Scotland.



In 2010 the average American had a carbon footprint of just over 28 tonnes of carbon dioxide equivalent and the average carbon footprint in Dumfries was nearly 13 tonnes of carbon dioxide equivalent. Whist the carbon footprint of the average person in Dumfries is significantly lower than the average American; we are still not living within the available resources on the Earth if everyone alive were to have the same share. Ecological footprints measure the amount of hectares of land that are required to provide all of the goods and services a person consumes. To put this into perspective, the average American person needs 8 hectares of land to support their lifestyle, the average British person needs around 5 hectares and the average person in Malawi uses only uses 0.6 hectares of land (Global Footprint Network). This highlights the social injustice that exists between different lifestyles around the world.

Put simply if everyone in the world lived like the average American we would need another five planets to supply all of the resources required!

Unfortunately we do not have FIVE EXTRA Earths!

4. Raw Materials

- What is in our beauty products and where do the raw materials for our beauty products come from?
- How are the raw materials manufactured into the finished beauty products?
- What chemicals are used in them?

These are just some of the questions that spring to mind if we want to start thinking about the sustainability and environmental impacts of obtaining the raw materials and processing and manufacturing them into the beauty and personal care products we use every day.

4.1 Ingredients in Beauty Products

Some common ingredients in beauty products are petroleum and palm oil. To help highlight sustainability and environmental issues associated with the production of beauty products which contain these ingredients we will now look at these ingredients in more detail.

Petroleum

Petroleum is another for word for oil and oil is a fossil fuel. If you remember, earlier on in the workbook, the contribution to global climate change from burning fossil fuels was discussed. Straightaway this demonstrates the first issue of using petroleum in beauty and personal care products – the influence of burning these products on global climate change. Secondly, petroleum is a fossil fuel and is a finite resource, which means at some point in the future it will run out. Petroleum is not only found in beauty products, in fact it dominates so much of our lives and as petroleum is also used in other products such as some medicines and artificial limbs, as well as being an important energy source, should we think about conserving it for future generations for uses other than beauty products?

Some common beauty and personal care products that contain petroleum or petroleum by-products;

- **Bobby pins**
- **Body lotion**
- **Shampoo and conditioner**
- **Lipstick and lip-gloss**
- **Mascara**
- **Nail polish**
- **Foundation and concealer**
- **Eye make-up remover**

Palm Oil

Palm oil is another ingredient which is found in a number of beauty and personal care products. In order to produce palm oil large areas of tropical forests and other ecosystems with important high conservation values have been cleared and replaced with large scale palm oil plantations. This destroys important habitats for many endangered species. Also, just as burning fossil fuels contributes to man-made climate change, so does clearing rainforests. Land use change is the second biggest cause of climate change after burning fossil fuels. Rainforests absorb carbon dioxide as they grow, which is then released as they are cleared. Carbon dioxide is a greenhouse gas which is why this impacts climate; moreover the rainforests are then no longer there to absorb more carbon dioxide in the future. This is why the world's rainforests are often referred to as the 'lungs of the planet'.

This is what a palm oil plantation looks like

This is an example of large scale monoculture which means only one type of plant is grown for harvesting. This means only species that like this plant as their habitat can survive here; however as this is a commercial crop grown for profit, it is highly likely pesticides will be used to kill other species so they are not harming the crop. As a result this type of plantation does not support biodiversity and unfortunately this is happening in some of the most biodiverse areas of the world.

This is a picture of the Amazon rainforest

On the other hand if we compare the picture of the palm oil plantation to the picture of the Amazon rainforest we can see the abundance of different types of plant shown here. This abundance and variety means many different species can live here supporting a web of biodiversity from different plant and insect species to larger mammals such as orang-utans.

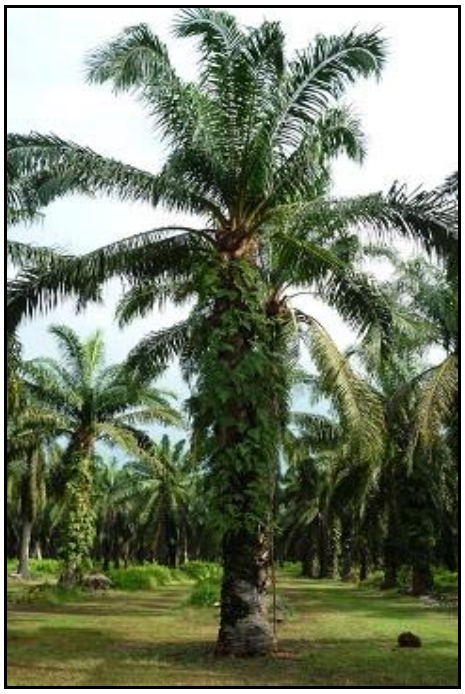
The top five producing nations of palm oil are:

- Indonesia
- Malaysia
- Thailand
- Nigeria
- Colombia

Malaysia and Indonesia produce 85% of global palm oil and globally 4.5 million people earn a living from palm oil. Most of the people earning a living from palm oil are in developing countries and this may be one of a few options they have to earn money and support themselves and their families. So the solution is not as simple as just banning palm oil as this would have considerable social implications in communities that are supported by palm oil production. One solution is to only use palm oil that is produced sustainably. Some environmental campaigners claim that in as little as 15 years, nearly all of the Indonesian and Malaysian rainforests will be gone unless drastic measures are taken to find more sustaianble ways of producing palm oil. The expansion of palm oil plantations has led to conflicts between local communities and the palm oil companies which have led to, in some instances, fair trade and sustainable palm oil. Sustainable palm oil production can support small scale farmers and local communities by providing fair treatment and pay and by supporting local conservation and biodiversity. The following website which is endorsed by the Roundtable on Sustainable Palm Oil provides information on sustainable palm oil:

http://www.greenpalm.org/

There is serious concern with palm oil production that is not sustainable, with issues ranging from obvious environmental ones such as loss of biodiversity and soil degradation, however there are also social and economic problems relating to local people and land rights. As already mentioned, the conversion of large areas of forest with high conservation value threatens the rich biodiversity in these ecosystems. This can be demonstrated using the orang-utan as an example, as their habitat is being devastated by palm oil production. In 1900 there were around 315,000 orang-utans but today there less than 50,000 in the wild which are split into small groups with little long term chance of survival as they are unable to reach other groups to mate. It is now widely accepted that the greatest threat to orang-utans is the palm oil industry and the species will likely be driven to extinction in the wild over the next few years unless the destruction of their natural habitat is stopped.



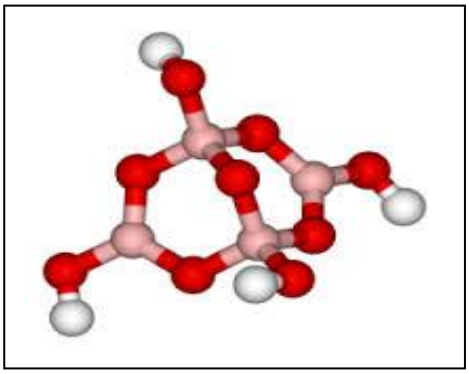
The picture on the left shows an African palm oil tree. They grow to 20 metres tall and have an average life span of around 25 years. They start to bear fresh fruit bunches after 3 years and each fruit bunch contains 50% oil. They can be harvested all year round and each tree can produce 10 tonnes of fresh fruit bunches per hectare. On a positive note, leftover fibre from palm oil production can be used in animal feed and to make paper or fertiliser and palm oil requires 10 times less land than other oil producing crops.

Chemicals and Plastics in Beauty Products

Whilst palm oil and petroleum have associated environmental issues associated with them, they are naturally occurring raw materials. Other raw materials found in beauty and personal care products are manufactured in laboratories and have their own impacts upon the natural environment, other species and sometimes our health, and have even been listed as carcinogens, reproductive toxins and hormone disruptors.

These chemicals include:

- Triclosan
- Sodium laureth sulphate
- Polyethylene glycols – PEGs
- Diethanolamine – DEA
- Phthalates
- 1,3-butadiene
- Polyethylene terephthalate



QUICK QUIZ – 'google' each of these chemical compounds to see what they are used for in beauty and personal care and some of the potential associated health and environmental problems that may be caused by their use

- Go to the 'Story of Stuff' website and watch the micro beads video 'Lets Ban the Bead'! Available at http://storyofstuff.org/movies/lets-ban-the-bead/

4.2 Environmental Impacts of Deforestation

The establishment of vast monoculture palm oil plantations has a number of environmental impacts which we have started to consider by looking at palm oil production. We will now consider two of the most serious impacts in a bit more detail.

Large Scale Forest Conversion

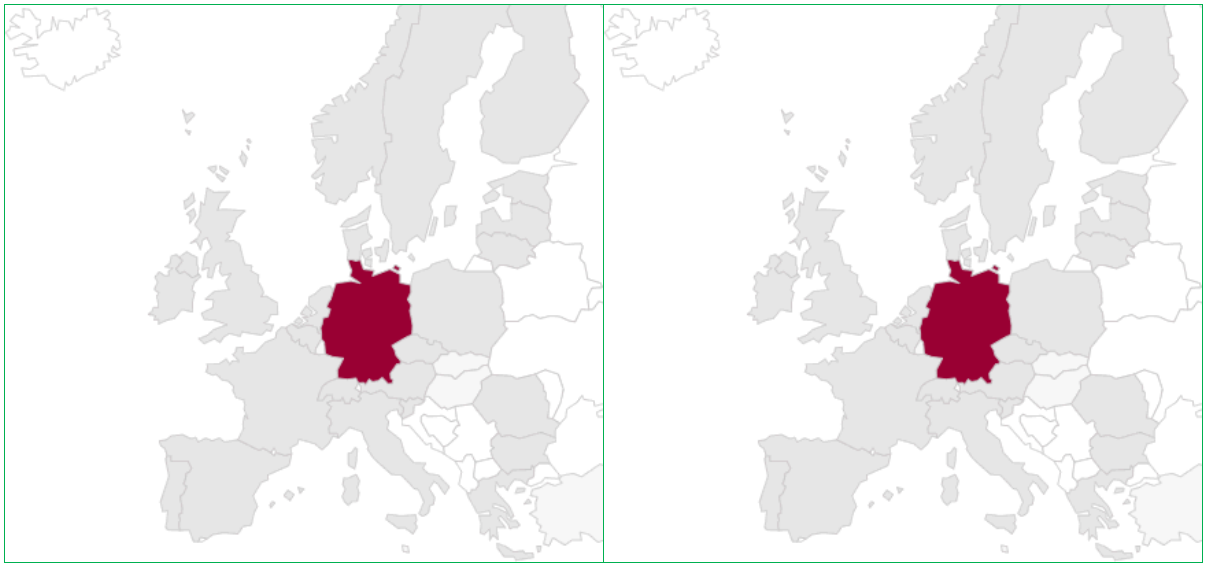
Palm oil trees grow in tropical areas in countries such as Indonesia and Malaysia. Indonesia and Malaysia are islands with some of the most biodiverse tropical forests anywhere in the world. However, in recent years, there has become a direct relationship between the growth of palm oil estates and deforestation on these islands. As a result, vast plantations now cover large areas in these regions, on land that was previously covered in high conservation value tropical forests. These forests were considered of high conservation value because not only did they have the most species of trees per hectare, but they were also home to a high number of other plant and animal species as

well. Even more worrying is the fact that demand for palm oil is predicted to increase and most of the area on these islands left which is suitable for palm oil production also happens to be of high conservation value tropical forests. This loss of tropical rainforests brings us on to our second area of concern**.**

Loss of Critical Habitats

Loss of species habitats in Indonesia and Malaysia for palm oil plantations causes severe problems for the insects, plants and animals that would usually live there. However, loss of habitats for palm oil plantations is not only a problem in Indonesia and Malaysia. Over the last twenty years it has been estimated that the Amazon rainforest has lost nearly 800,000 square kilometers, this is around the same size as two Germanys. Although deforestation in the Amazon rainforests is not only due to palm oil plantations, but also for other reasons such as logging, palm oil production does contribute significantly to deforestation of the Amazon rainforests. The loss of Amazon rainforests not only impacts on other species but also has other consequences. The Amazon works as a giant pump as it channels moisture inland through a network of smaller tributary rivers. This helps rainclouds form over the forest areas which maintains the moisture levels required for the tropical forests to thrive. The Amazon rainforest also acts as a buffer zone against extreme weather events such as tornados and hurricanes, helping to protect people and infrastructure. It is estimated that over the last 20 years the Amazon rainforest has decreased in size by nearly 800,000 square kilometers.

To put this into perspective, this is around the size of two Germanys. The diagram below highlights the size of Germany compared against the United Kingdom.



4.3 Activity 3 – Other Impacts of Deforestation

Using the internet, search the impacts listed below to find out how deforestation in the Amazon Rainforest, and other rainforests around the globe, contributes to the following:

- Soil erosion and pollution
- Air and water pollution
- Climate change
- Loss of biodiversity
- Social and ethical problems

The results can either be presented as a group project to the rest of the class, looking at a number of the impacts, or as an individual piece of work choosing one topic and designing a poster or PowerPoint presentation to highlight the associated impacts of that topic.

4.4 Alternative Beauty Products

THINK ORGANIC

If you have decided you want to reduce your carbon footprint, one way that might help you achieve this is to choose organic beauty products for you and your family. Here are some of the reasons why it is a good idea. As we have already seen, some of the ingredients within personal care and beauty products can be some of the most environmentally damaging raw materials that we use in everyday life. Artificial chemicals and petroleum products are not only damaging in their production and extraction from the ground, but also when they find their way back into our water supply. These resources are often not sustainable, for example petroleum will run out soon, if not in our lifetimes than probably within our children's lifetimes. So we are using precious resources that will not last forever.

Other environmental concerns have long been considered such as the use of aerosol cans for hair spray and deodorants which cause damage to the ozone layer. The damage was so extensive that governments had to come together from around the world to implement legislation to stop the holes in the ozone layer becoming any bigger. Besides the toxic ingredients contained in the products themselves, the packaging is an additional area for concern. Usually the containers the products are in are not recycled and remain in landfill sites long after the lotions and make up they contain are gone.

If you wish to choose organic beauty products, to help reduce your carbon footprint and to minimize other environmental impacts, you still need to check these products to ensure they live up to their green credentials. In order to be certified organic, the ingredients within the product must be made of natural agricultural ingredients such as cocoa butter, shea butter, natural oils and herbs. However, unlike organic food, there are no regulatory requirements for companies that produce and sell organic or natural products to be certified. The Soil Association offers certification for organic beauty products. More information can be found at,

http://www.sacert.org/healthbeauty/whycertifyyourorganiccosmetics

The following website provides information about various different organisations around the world that provide organic and natural beauty product certification, including each organisation's standards.

http://www.beingcontent.com/knowledge.htm/content-approved/organic-skincare-certifications

As well as being friendlier for the environment, there are other reasons to choose eco-friendly products. Firstly, they can be much better for you. Many regular skin care products contain alcohol and alcohol can be very drying to your skin which may lead to the premature appearance of brown spots and other signs of aging. In addition, alcohol can disrupt the skin's natural balance making it more vulnerable to bacteria and viruses. So with natural products you know exactly what you are putting on your skin.

Remember this can include fair trade cosmetics and sustainable palm oil products also.

MAKE YOUR OWN

What about making your own? Whilst this may not be practical on a large scale within a business, it is a fun way to start to really think about what you are putting on your skin and thinking about natural alternatives.

The next few pages provide some ideas to help you get started.

Strawberry

Strawberries contain several polyphenols that have high antioxidant capacities. They are also high in vitamin C which is also a potent antioxidant.

Strawberry Hand and Foot Exfoliator

- 8-10 Strawberries
- 2 tablespoons Apricot Oil (you may substitute olive oil)
- 1 teaspoon of coarse salt, such as sea salt

Mix together all ingredients, massage into hands and feet, rinse, and pat dry. Strawberries contain a natural fruit acid which aids in exfoliation.

Kiwi

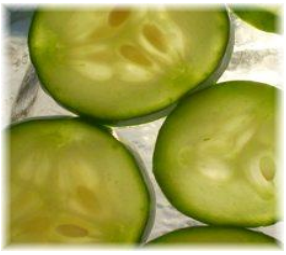
Kiwis are high in vitamin C and enzymes and have detergency properties making it good for skin and hair preparations.

Kiwi Facial Cleanser (for dry or oily skin)

- 1 kiwi fruit
- 2 tablespoons of plain yogurt
- 1 tablespoon orange water
- 1 tablespoon apricot or almond oil
- 1 tablespoon honey
- 1 teaspoon finely ground almonds
- 2 drops orange (or your favourite citrus) essential oil

- Puree the kiwi fruit in a food processor until liquidised. During processing, add the yogurt, orange water, almond or apricot oil, and ground almonds. Process it until thick and cream like. Add the essential oil and stir to mix. To apply, massage gently over neck, face and décolleté to cleanse and then rinse well.

Cucumber



A vegetable used for its cooling and astringent properties. Try a couple of slices for your tired eyes.

Cucumber- Honey Toner

- **1 medium cucumber, peeled and cut up into pieces**
- **2 teaspoon of honey**

Puree cucumber in a blender. Line a sieve with cheesecloth and set the sieve over a glass bowl or measuring cup. Pour the cucumber puree through the sieve and let it stand for 15 minutes for the juices to drip into the bowl. Pour the clear juice into a clean bottle and add honey.

To use, shake the bottle and saturate a cotton pad with the lotion. Sweep over face, neck and chest morning and night, and let it air dry (about 3 to 4 minutes). Store covered in the refrigerator for up to 1 week.

Rosemary

This delightfully refreshing scented herb has antibacterial and antifungal properties and is used extensively in hair care products for its tonic properties.

Lavender/Rosemary Hair Oil


- **1 oz. oil of Rosemary**
- **1/8 oz. oil of Lavender**

Quantity: Enough for about 6 months of use.

To Make: Simply mix the two oils together and store in the dark or in a small amber or light-proof bottle.

To Use: Put a few drops of the oil on your palm, brush your palm against your hairbrush and then brush your hair.

Chocolate Facial Mask

This decadent face mask is an excellent moisturiser and leaves your skin baby soft.

Recommended for normal skin

Ingredients:

- **1/3 cup cocoa**
- **3 tablespoons heavy cream**
- **2 teaspoons cottage cheese**
- **¼ cup honey**
- **3 teaspoons oatmeal powder**

Instructions: Mix all ingredients together and smooth onto face.

Relax for 10 minutes before rinsing.

4.5 Activity 4 – Product Design

Taking into account everything you have learnt so far about the life cycle of products and carbon footprints, your job is to design and market a beauty product aimed at the environmentally aware consumer. This can be any type of beauty product you want such as a facial scrub or even a piece of electrical equipment that would be used in the salon. You will need to decide the type of product and give it a name. You will also need to consider who your market is, for example are you designing equipment to sell to salons, or a beauty product aimed at the youth market.

How would you design and advertise your product to appeal to your target market? Bear in mind whoever your market is they are environmentally conscious and want a product that has as little impact upon the environment as possible. Your marketing campaign can take a number of different forms as long as the information in the box below is included. Remember, it will need to be colourful and imaginative if it is to appeal to your target audience. A poster or a PowerPoint presentation may be a good way to present your campaign.

Remember: **The Internet is a good resource to utilise for information.**

You may want to consider some or all of the stages in the life cycle of a product which are:

- Extraction of raw materials
- Processing and manufacturing
- Transport and distribution
- Retail and consumer use
- Disposal

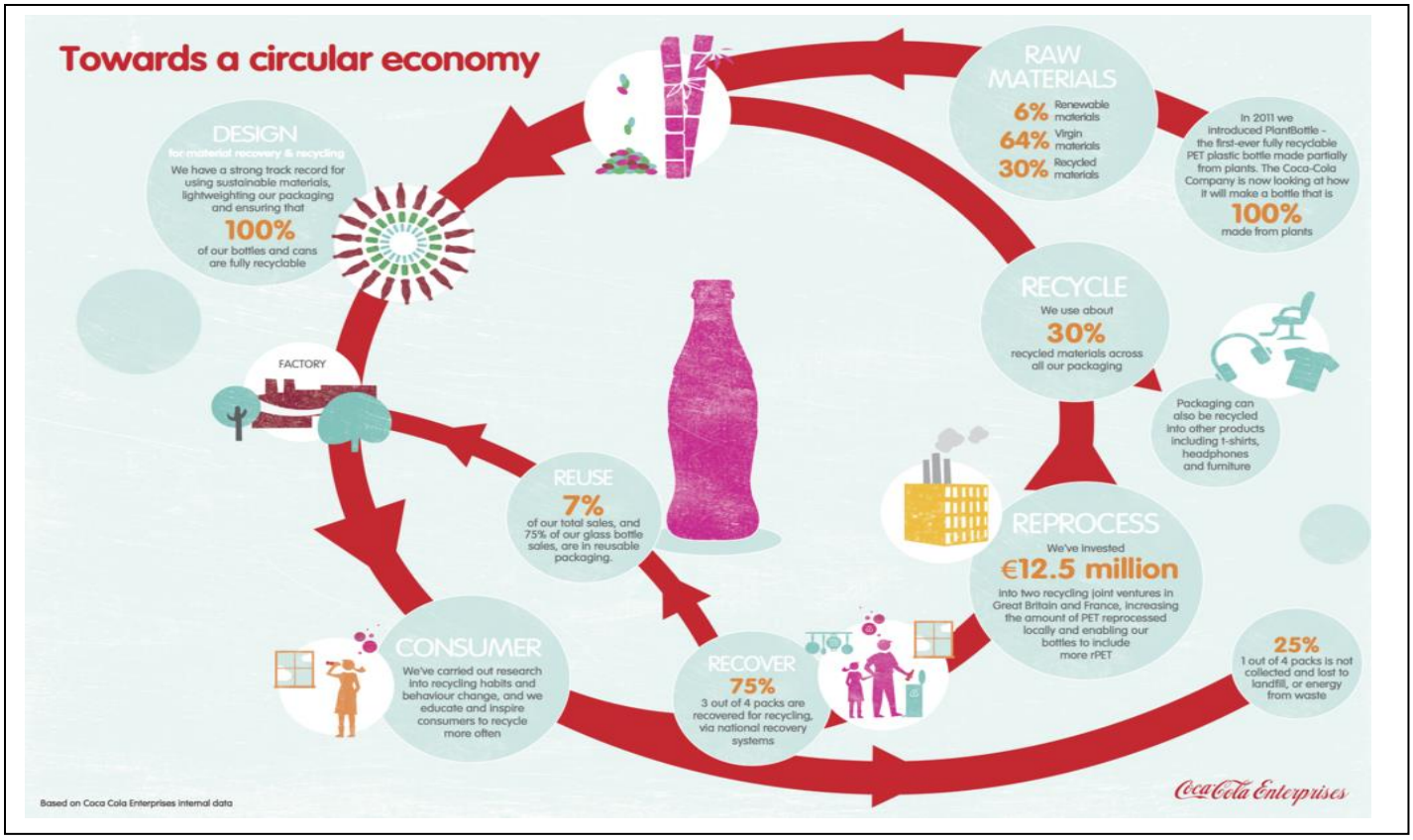
Taking account of these points, consider how your product could be classed as 'eco-friendly' and how you would market it as such.

4.6 Sustainable Procurement

Increasingly individual consumers and businesses are asking for products that fit with a more sustainable ethos. From the ingredients within the product to the packaging it comes in. Some manufacturers are also starting to consider how their products can have less of an environmental impact. One solution starts with product design and manufacture in order to make recycling and

reusing components easier and a natural part of the process. This can be shown in the Coca Cola example below from The Ellen MacArthur Foundation which actively promotes the circular economy as a way of designing and manufacturing goods in a more sustainable manner.

Circular Economy



More information about The Ellen MacArthur Foundation and the circular economy is available at http://www.ellenmacarthurfoundation.org/

Coca Cola are not the only company taking this approach and increasingly more companies are doing this with their packaging. In the beauty and personal care industries, a good example is Lush whose ethos included naked packaging. This is where they actively try to avoid packaging wherever possible. However, where packaging is unavoidable they prefer to use recycled materials and as much as 90% of their packaging is recycled and they are working on the remaining 10%. They are aiming to have 100% of their packaging to be either recyclable or compostable. If Lush can do it then so can other companies. Only by consumers demanding products such as this through procurement will companies take notice and change.

Visit the Lush website to learn more, not only about their recycling policies but also about their overall sustainability ethos including ethical buying and fighting against animal testing.

https://www.lush.co.uk/

5. Calculating Energy Consumption

5.1 Electricity – Understanding Watts and Kilowatt Hours

We calculate electricity in units of kilowatt hours (kWh). A kWh is the number of watts used in one hour.

When we look at anything that runs on electricity, such as a high speed steriliser or a wax heater, there is usually a label that tells us how energy hungry it is - this is the number of watts (W) the piece of equipment uses – or its 'wattage'. Have a look at electrical equipment in your salon to identify the wattage information.

Before calculating how much energy is used by electrical beauty equipment in salons, we will look at an example of electricity consumption using light bulbs.

Stage 1

If there are 8 light bulbs in a salon and each light bulb is 100 W, then to find out the total wattage of the lights you need to multiply the number of bulbs by the wattage:

Total wattage (8 bulbs) = 8 x 100 W = 800 W

Stage 2

To work out the **'watt hours' (Wh)** that a piece of equipment uses, we need to know the wattage and the number of hours it is turned on for.

Watts x hours = watt hours

Stage 3

Then to find out how many kilowatt hours this is, we divide the number of watt hours by 1000:

Watt hours ÷ 1000 = kilowatt hours

For example, if the eight 100 watt bulbs in the salon are turned on for 5 hours, then:

800 watts x 5 hours = 4000 watt hours
4000 watt hours ÷ 1000 = 4 kilowatt hours

To calculate how much energy the salon uses for lighting in a year, we need to estimate how many hours the lights are turned on for in a year. To do this we need to estimate the number of hours they are on per day, the number of days they are on per week, and the number of weeks per year. The salon lights are usually on for 8 hours per day, there are 5 days in the college week, and 40 college weeks per year, so the salon lights are on for:

[8 hours/day x 5 days/week x 40 weeks/year = 1600 hours/year]

And the energy they use in a year is:

800 W x 1600 hours/year = 1,280,000 Wh/year

1,280,000 Wh/year ÷ 1000 = 1280 Wh/year (kWh/yr)

Based on an average electricity unit price of £0.10, 1 kWh costs £0.10

Therefore, 1280 kWh/yr costs 1280 x £0.10 = £128.00

This means to light the salon during working hours for one year, using 8 100 W bulbs costs the College **£128.00**

5.2 Activity 5 - Changing Light Bulbs

The College has low energy fluorescent lighting in the beauty salons. Each light fitting contains two 35 W bulbs, and there are 11 fittings in the salon. Prior to moving into a new College building, the salons at the old building used light fittings with 100 W bulbs, with 15 of these bulbs in a salon. Therefore how much energy and money did the College save when they moved to the new building by changing the bulbs in the salons?

Hint: Estimate how many hours the lights are on each day based on an eight hour day. Remember there are 5 college days in a week, and 40 college weeks in a year, so there are 200 college days in a year.

Remember: (watts x hours per year) ÷ 1000 = kilowatt hours per year

(Answers are provided in red)

	Wattage of 1 bulb [W]	Number of bulbs	Total watts of all bulbs [W]	Hours on per day [hours / day]	Hours on per year [hours / year]	Kilowatt hours of energy per year [kWh / year]
Old bulbs	100	15	100 W x 15 bulbs = 1500 W	8	8 hours x 200 days = 1600 hours	1500 W x 1600 hours = 2,400,000 W hours ÷ 1000 = 2400 kWh / year
New bulbs	35	22	35 W x 22 bulbs = 770 W	8	8 hours x 200 days = 1600 hours	770 watts x 1600 hours = 1,232,000watt hours ÷ 1000 = 1232 kWh / year
		Savings	1500 – 770 = **730 watts**		**Savings**	2400 – 1232 = **1168 kWh / year**

Q1 Therefore how many kWh of electricity have been saved in a year in one salon by changing the bulbs? **1168 kWh / year** kWh / year

Remember: the average cost of 1 unit of electricity costs the College £0.10

1kWh of electricity costs **£0.10**

Therefore a reduction in use of **1168kWh saves 1168 x £0.10 = £116.80 year**

Q2 The new College building has 3 beauty salons, therefore how much electricity and money has the College saved by changing the light bulbs in all 3 salons?

One salon means a reduction of _____ kWh / year, so 3 salons means a reduction of _____ kWh / year

One salon saved £_____ a year, so 3 salons save £_____ a year

5.3 Activity 6 – Calculating Energy Use from Changing Microdermabrasion Machines

Over the summer break, due to wear and tear, all of the microdermabrasion machines in the college salons have been replaced ready for the new academic year. Instead of each salon having four Kendal Professional Diamond Microdermabrasion machines which each use 1100 W of electricity, there are now four Nova NV-8081 Micro-crystal Dermabrasion machines which use 300 W of electricity. Complete the table below to estimate how much electricity in kilowatt hours (kWh) each salon will save in a year, and then how much will be saved from the electricity bill for the College in a year.

Hint: There are 4 machines in each salon and if on average each machine is used for 2 hours per day complete the following table to calculate the electricity saved by changing the machines in one salon in a year.

Remember: **there are 200 college days in a year**

Machine Model	**Wattage of 1 machine [W]**	**Number of machines in a salon**	**Total watts of all 14 hairdryers [W]**	**Hours on per day [hours/day]**	**Hours on per year [hours/year]**	**Kilowatt hours of energy per year [kWh/year]**
Kendal Professional Diamond Microderm-abrasion	**1100**	**4**	**1100 x 4 = 4400 W**	**2**	**2 hours x 200 days = 400 hours**	**4400 W x 400 hours = 1,760,000 Wh ÷ 1000 = 1760 kWh/year**
Nova NV-8081 Micro-crystal Dermabrasion	**300**	**4**	**300 x 4 = 1200 W**	**2**	**2 hours x 200 days = 400 hours**	**1200 W x 400 hours = 480,000 Wh ÷ 1000 = 480 kWh/year**
		Savings	**3200 W**		**Savings**	**1,280 kWh/year**

Now we know how much electricity the microdermabrasion machines use in a year in one salon and how much electricity could be saved by changing them, we can calculate the amount of electricity used in total. We can calculate the total electricity consumed by the old machines and the new machines and the amount of electricity saved in all of the College's salons by replacing the machines.

	kWh/year for 1 salon	**kWh/year for 3 salons**
Old machines	**1,760 kWh/year**	**5,280 kWh/year**
New Machines	**480 kWh/year**	**1,440 kWh/year**
Savings	**1,280 kWh/year**	**3,840 kWh/year**

Hint: 1kWh of electricity costs £0.10

Therefore a reduction in energy use from the 3 salons of _____kWh saves £_____ per year

5.4 Activity 7 - Energy Use at Home

Look around your home and choose five pieces of electrical equipment you can find the wattage easily for. Remember, for many items this can be found on a little panel, failing that you can find the wattage in the manufacturer's guide, if you still have it, or by searching on the internet (a good site is www.sust-it.net). The items can be anything electrical, for example, a television, kettle, microwave, or even something more unusual such as an electric drill.

Hint: Once you have selected your electrical equipment, make an estimate of how many hours a day on average it is switched on and then complete the following table. The first line has been completed as an example.

Remember: there are 365 days in a year

Type of equipment	Make and model	Wattage [W]	Hours of use per day [hours / day]	Hours of use per year [hours / year]	Kilowatt hours of energy per year [kWh/year]
Television	Sony KDL 32EX603 32"	80	4	4 x 365 = 1460 hours / year	80W x 1460 hours = 116800 Wh ÷ 1000 = 116.8 kWh/year

Q1. What is the most energy intensive piece of equipment you found? Remember this is the piece of equipment with the highest wattage.

Q2. Which piece of equipment consumes the most electricity per year?

Q3. Were you surprised by any particular result? If so, what is the piece of equipment and why were you surprised?

Q4. Can you think of an example of an electrical item that you could substitute manpower for and still achieve the same result?

Q5. What room in your house do you think is the most energy intensive in terms of electricity? Why do you think this is?

Q6. Take the piece of equipment with the highest electricity consumption and search the internet for a less energy intensive alternative. What did you find?

Q7. Electricity aside, can you think of any other ways energy is consumed by your household?

Guidance for 5.4 Energy Use at Home

There are no right or wrong answers for this exercise. The aim of this exercise is to raise awareness of energy use in the home; following on from looking at light bulbs in the college and the money that could be saved from making small changes such as switching to a lower wattage bulb. This can help you consider if there are changes you can make to the equipment you use at home to be more energy efficient. This doesn't mean replacing equipment in perfectly good working order for more energy efficient models, if the equipment you are replacing ends up in landfill, but when the item does need replaced, consider replacing it with a model that uses less energy.

Being aware of how much energy a piece of equipment uses and how much it costs to use it will hopefully make you think about your energy use. Consider if you really need to switch it on and if so, don't leave it on standby, wasting energy and money when not in use.

6. Water Use

Water is essential for all living things on Earth, however it is a resource we take very much for granted in Scotland where we rarely have water shortages. Due to this, we do not always consider water as a finite resource and that not everyone in the world has access to readily available clean water, as we do. In 2007 the average Scottish person used 146 litres of water per day, which is 6% more water per person per day than we used 20 years ago (Scottish Water).

6.1 Water Conservation

It is difficult to appreciate the need for water conservation when it rains so often in Scotland. However, even in Scotland, the lack of rain sometimes means we can experience water shortages and this will become more common in summer months in the future due to climate change. This is already a reality in many places around the world, and as global average temperatures rise, this will only get worse. By 2025, it is estimated by the World Wildlife Federation that 5.5 billion people around the world, 67% of the population, will live in areas where drought, as a result of climate change, will make water scarce. There are already conflicts over water in some areas of the world, for example some communities' water supplies are disrupted due to water being required for golf courses for wealthy tourists.

As a result of this we should be conserving water wherever possible. There are a number of easy ways to conserve water around the home and garden. Here are just a few examples:

- Only use your washing machine and dishwasher when they are full
- Keep a pitcher of water in the fridge for cold drinks instead of running the tap.
- Water your garden in the morning and evening when temperatures are cooler to minimise evaporation.
- Wash fruit and vegetables in a pan of water instead of running the tap and then reuse the water on houseplants.
- Wash dark clothing with cold water on a short cycle which reduces water and energy used and also helps your clothes keep their colour.
- Take showers instead of baths and reduce the time spent in the shower.
- Install a water butt in the garden to collect rainwater for watering the garden.
- Fix any dripping taps.
- Don't wash your car yourself instead use a commercial car wash that recycles water.

Some other changes are not so straightforward and inexpensive to implement, however they can save money in the long run. Technology can be used for water conservation, for example there are taps available which reduce the amount of water that flows from them and there are washing machines which use a lot less water per load than standard ones. If you need to replace such equipment in a beauty salon, or even in your own household, it may be worth considering

alternatives that use less water, especially if this leads to reduced water bills if your water is metered, as most businesses are, which can reduce your overall business costs.

6.2 Water Calculator

It is possible to calculate your water footprint within your home, just like earlier in the workbook when you calculated your carbon footprint. Calculate your water footprint at:

http://news.bbc.co.uk/1/hi/in_depth/629/629/5086298.stm

Were you surprised by the amount of water consumed in your home?

6.3 Water Resources and Climate Change

Climate change will affect global water resources. Whilst an increase in global precipitation is expected, the regional patterns of rainfall will vary, meaning some areas will have more rainfall, while others will have less. There are high levels of uncertainty about how the pattern of precipitation will change but areas where agriculture is dependent on seasonal rainfall, like the Indian and West African monsoons, are particularly vulnerable. If monsoon patterns change or the monsoons weaken, millions of people could face food shortages.

Changes in climate and increases in some extreme weather events, such as floods and droughts, will disrupt the stability of the food supply, as well as people's livelihoods, making it more difficult for them to earn a stable income to purchase food. Some areas may face droughts with changing rainfall patterns, for example, in the Himalayas people are dependent upon seasonal melt water from glaciers which provides drinking water during the dry season. Climate change is causing glaciers to retreat which will endanger their fresh water supply as well as increase flood risks during the rainy season. Other problems associated with decreased water availability and quality in some areas, are increased health and sanitation problems, such as diarrhoeal disease and changes in the patterns of vector-borne disease, which can result in increased levels of malnutrition.

Unfortunately, many of the regions which are likely to be affected are in developing countries where the cost of climate change will be borne most by the poor. People in developing countries are highly dependent on rain fed agriculture for food security so they are particularly vulnerable to changes in annual precipitation levels. Also, because the poor have very limited resources they do not have the ability to adapt to climate change impacts like we can in wealthier industrialised nations.

There are also other indirect impacts of climate change upon water resources. Climate change is not only causing melting ice, but an increase to global temperatures means thermal expansion of the oceans causing sea levels to rise. Rising sea levels leads to salt water intrusion into groundwater supplies, which threatens the quality and quantity of freshwater which will impact large percentages of the population.

6.3 Activity 8 – Water Conservation Calculations

Standard taps use around 15 litres of water per minute. There are taps available that can reduce this to 3 litres per minute by using aerated water. If we assumed the taps in your salon were using 15 litres per minute, how much water could be saved if they were changed to those that use 3 litres per minute?

Hint: **For this exercise assume there are 4 sinks in each salon and there are 3 salons in the college**

	Tap flow per minute for 1 tap [litres / minute]	**Tap flow per minute for 4 taps [litres / minute]**	**Tap flow per minute for 3 salons [litres / minute]**
Standard Tap	**15**		
Low Flow Tap	**3**		
Savings			

Q1. In total, how many litres of water per minute would be saved if the taps were changed in all 3 salons?

_____ Litres / Minute

If the college were to pay on average an amount of 8 pence per litre to their water company for water and waste water supply and disposal, it is easy to see how saving water can mean real financial savings over a year when thousands of litres of water will be used in the salons alone.

6.4 Activity 9 – Water Conservation Poster

Design a poster to be displayed within the Beauty Department of your college to highlight the importance of water conservation. The poster needs to be colourful and eye-catching whilst clearly stating what is required and why. The poster could be based on ways to save water within the salon itself or could relate to water that is used in the making of beauty and personal care products. Some points that may help with the design are below:

- Changing taps to ones that are more water efficient and repairing dripping taps.
- Ensure the washing machine always has a full load and when it needs to be replaced consider replacing it with a water efficient model.
- Consider changing to disposable eco towels to save water from washing them.
- Look at beauty companies corporate social responsibility to see what steps they take to reduce water consumption.

7. Culture, Beauty and Ethics

How do ethical concerns affect the beauty industry and do you think this is an area as a beauty practitioner you should be informed about? Have you ever thought about cultural differences around the world, would different cultures approach the beauty industry differently or have practices that we might find unacceptable in Europe and the UK?

7.1 The Different Faces of Beauty

What is considered beautiful, is it what the media tells us is beautiful? Should beauty practitioners be concerned about the effects on women of airbrushing to show celebrities as flawless? Do you think this gives women and teenage girls unrealistic ideals of what beauty should be? This is an issued in the Western world where we are constantly bombarded with images and adverts all the time. It may be that the Western ideal of beauty is now having influence in other parts of the world in a negative manner which will be considered shortly.

However, there are also cultural differences around the world of what is considered beautiful.

Long Necks

The Kayan tribe in Thailand start wearing brass rings around their necks as children and they add more rings as they grow older to elongate their neck which is considered beautiful and elegant in this part of the world.

Body Scars

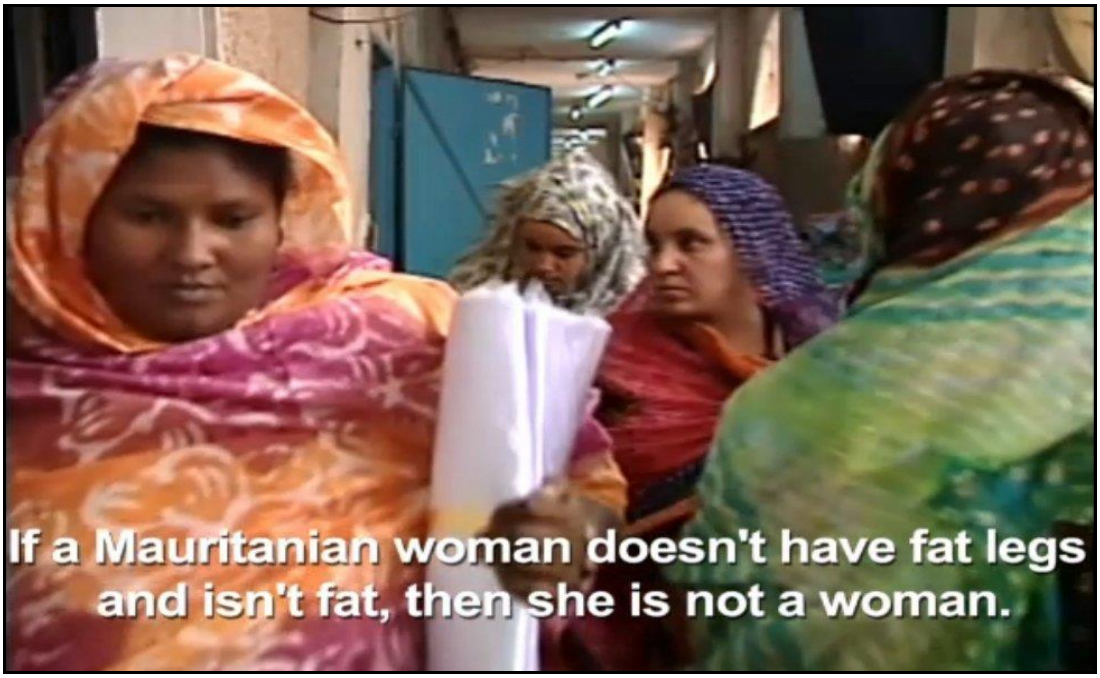
The Karo tribe in Ethiopia believe self-inflicted scars on women's bodies to be beautiful. Karo tribesmen also have self-inflicted scars to represent their social status and the number of enemies they have killed in battle.

A Kayan Tribeswoman

A Karo Tribeswomen

Super-sized Bodies

Mauritanian women are considered more attractive if they have a larger body size. Girls are often sent to camps where they eat up to 15,000 calories a day to 'fatten them up'. Larger women are considered more desirable as wives as they are seen as a status symbol for their husband. There are other cultures with the same belief where a fuller figure is seen as a sign of fertility in women and also a sign of wealth particularly if lack of food and hunger are an issue.



Mauritanian Women and their Belief about Body Size

Long Ear Lobes

Masai women in Kenya pierce and stretch their earlobes using stones and pieces of elephant tusk as long ear lobes are considered beautiful.

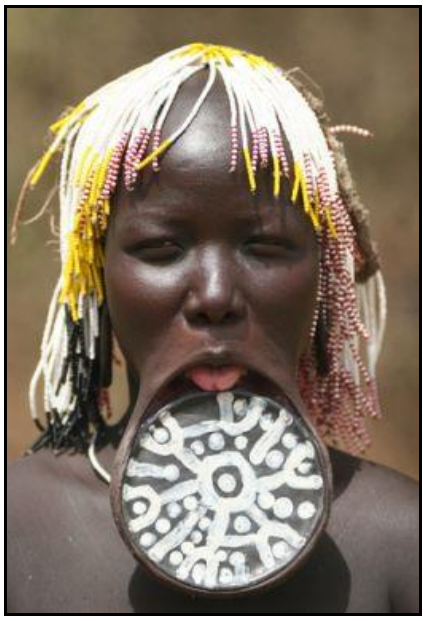
A Masai Woman

Stretched Lips

The Mursi women of Southern Ethiopia stretch their bottom lips using clay plates which gradually get bigger each time. This is seen as a sign of sexual maturity and beauty.

Face Tattoos

In New Zealand, Maori women with tattooed lips and chins are considered to be the most beautiful and the more tattoos a woman has the more desirable she is. Maori men also have face tattoos which in the past were to show how fierce they were in battle. Face tattooing did lose popularity over the last 100 years but it is now becoming more popular again to demonstrate their cultural pride.



A Mursi Woman

A Maori Woman

Whilst these practices may be considered extreme by some and vastly different from beauty ideals in the UK and Europe, in their own cultures they are perfectly normal and most have been practiced for many generations. This is only a few examples of cultural beauty difference around the world. If you search the internet for cultural beauty ideals or differences you will find many more examples.

7.2 The Ugly Face of Beauty

The previous section looked at different cultural beauty ideals around the world which are largely traditional and have a long history and cultural significance within that community. However there are other practices which may be harmful to health and are not necessarily cultural over generations but are being implemented mainly because of the entertainment industry and how the media and advertising represent beauty, often based on Western ideals of what is beautiful.

The following examples are being used to start discussion and debate and to highlight ethical and health questions relating to the beauty industry. They have not been chosen as examples to state what is considered right or wrong.

Skin Bleaching

Skin bleaching really highlights ethnic and cultural differences. Whilst there are regulated products available, skin bleaching is often achieved using unregulated products that can cause health related problems from long-term use. Many of these unregulated products use a chemical called hydroquinone which is a bleaching agent and is banned from use in the European Union. Hydroquinone removes the top layer of skin, which brightens it, but it also removes the skin's natural protection against infection and sun damage which can result in skin cancer. If it enters the bloodstream it can cause liver and kidney damage. Apart from the physical dangers, another issue is why do people who use these products feel they need to change the colour of their skin so we all end up looking the same? Also, is the desire for a fairer skin any different from those with fair skin who desire to have a suntan?

If you use Google Images and search for skin bleaching you will find many images, some of which suggest many prominent people of colour have lightened their skin over the years. Do you think they felt they needed to do this to be more successful?

Surgery Bandages

This is a fairly new practice that involves rhinoplasty (nose jobs). In Iran nose jobs are so common – and are a considered a status symbol – so much so that women will proudly wear their surgery bandages afterwards to show they have had a nose job. Some women will even wear fake bandages when they have not had any surgery!

Air Brushing and Photo Shopping

We may be or may not be aware that many images in the media and advertising – particularly relating to the beauty and fashion industries – are often air brushed and photo shopped to make the image perfect. There has been ethical debate surrounding its use on beauty photo shoots. Follow the link below to watch a video of a 'before and after photo shop demonstration'.

https://www.youtube.com/watch?v=318iFsOOWr8

What are your thoughts on this topic? Do you think it is just part of the beauty industry or do you feel that images should be shown naturally?

Body Image

Airbrushing and photo shopping may be one reason why some people have negative body images. Ideals of the perfect body portrayed by the media will often show light skinned, thin long legged women and tall broad muscular men. Due to globalisation these images are not shown all over the world and not all cultures and ethnicities would view this as the body norm. Even in Western countries where this may be a more frequently occurring body type, those with a different body shape may feel as if they do not meet these expectations.

Media Influence

The media influences what is shown in relation to celebrity culture, entertainment and the beauty industry. The media may be responsible for influencing body image perceptions by using images in advertising campaigns that have been air brushed and photo shopped. These images of perfection may make us feel inadequate and that we have to change the way we look. Media influence may also be one of the reasons that practices such as skin bleaching have become popular in recent times.

7.3 Animal Testing

It is not only how we treat our own bodies that causes us to ask ethical questions about the beauty and personal care industries. The treatment of other species in the form of animal testing also comes under the ethical spotlight. Due to the strong public backlash against cosmetic testing on animals, most cosmetic manufacturers now say their products are not tested on animals. However, they are still required by trading standards and consumer protection laws in most countries to show their products are not toxic and are not dangerous to public health. They are also required to prove that the ingredients are not dangerous in large quantities, such as when they are in transport or in the manufacturing plant. It is not always easy to

Lush against animal testing – available at https://www.lush.co.uk/

distinguish which brands are cruelty-free and which are not because many companies do not clearly label their products, and some companies make ambiguous statements when referring to theirs. For example, a bottle of shampoo claiming "this product has not been tested on animals," may not be telling the full story. It may mean the finished product had not been tested on animals but some of the ingredient may have been. Also chemicals designed for other industries, such as for pharmaceuticals or manufacturing, but that are then used in some cosmetics may have been tested on animals. Another issue associated with animal testing is that the results may be limited as the effect on humans may be different from the effect on the animal the product was tested on. Therefore animal testing may be unreliable and ineffective and human safety cannot be guaranteed. Alternatives to animal testing using human skin cells and computer models can offer more reliable results and be conducted much quicker making them more cost-effective than tests that use animals.

In some countries, it is possible to meet the safety requirements needed without any further tests on animals; however in other countries animal testing is required to meet their legal requirements. We can look at some different countries for examples of this.

The European Union (including the United Kingdom)

It is illegal to use animals to test cosmetic products or any of their ingredients in the UK and all other member states of the European Union. Also since March 2013, it is also illegal to sell cosmetic products in all European Countries which have been tested on animals, or which contain ingredients which have been tested on animals.

The United States of America

The United States of America has frequently been criticised for their insistence on stringent safety measures, which until recently often required animal testing. However, many retailers in the USA did take a stance against animal testing and would declare this to distinguish themselves from other retailers that did not. In March 2014, the Humane Cosmetics Act was introduced to the U.S. congress which would ban cosmetic testing on animals and eventually would ban the sale of cosmetics tested on animals. However, it will take a number of years for all of these changes to be implemented.

China

The Chinese government conducts mandatory animal testing on all cosmetics imported into the country. They also until recently conducted random animal testing on cosmetic products pulled off shelves; however from June 2014 there is no longer mandatory testing of domestically produced cosmetic products. Therefore, even if a product has not been tested on animals by the manufacturer that produced it, if it is sold in China it cannot be classed as cruelty free. A further problem is that China is a huge marketplace and every brand will want to sell in China because of this. If animal testing could be eliminated for all cosmetic brands sold in China this would make a huge difference and would nearly eliminate all cosmetic testing on animals globally.

Australia

In Australia, the End Cruel Cosmetics Bill was introduced in March 2014, which would ban local testing and stop the development, manufacturing, selling, advertising or importing into Australia cosmetics, or ingredients for cosmetics, which have been tested on live animals after the commencement of the Bill. The Bill has now passed Senate and the next stage is for legislation to make the Bill law.

Israel

Since the start of 2013, Israel has banned the importing and marketing of all cosmetics, toiletries or detergents that were tested on animals.

India

In 2013, India followed Israel to become the second country in Asia to announce a ban on testing cosmetics on animals.

From this brief snapshot it can be seen that progress is being made. However, remember there is **STILL NOT A GLOBAL BAN.**

Much more information about the human treatment of animals, including testing for the beauty industry, is available on the People for the Ethical Treatment of Animals (PETA) website, available at http://www.peta.org.uk/

7.4 Fair Trade Beauty Products

Another concern you may have about the production of personal care and beauty products is whether they are truly green in terms of where they have been produced and that the producers and suppliers, particularly if they are in developing countries, have not been exploited. The Fairtrade Foundation has developed certification so you can be confident that the producers have been treated fairly.

Producers that supply Fairtrade products are inspected and certified by the international certification body Fairtrade Labelling Organisations International (FLO). They receive a minimum price that covers the cost of sustainable production and also an extra amount of money is invested in social or economic development projects in their communities. Fairtrade Labelling was created in the Netherlands in the late 1980s and today the FLO co-ordinates Fairtrade Labelling in 20 counties including the UK.

You will recognise certified products because they carry the FAIRTRADE mark. This is their consumer label which guarantees that producers, workers and communities in the developing world are getting a better deal.

As well as Fairtrade there are a number of organisations which address sustainability, ethics and animal rights within the beauty industry. Below are a few examples, however if you search the internet you will find many more.

Join our Ethical Beauty Revolution!

HANDMADE WITH LOVE IN THE UK

AGAINST ANIMAL TESTING

100% REGISTERED VEGAN

100% CERTIFIED HALAL

RESPECTS THE EARTH

http://www.phbethicalbeauty.co.uk/about_us

7.5 Activity – Ethical Debate

Split the group into two teams. One team is the proposition and argues in favour of the motion, the other team is the opposition and they argue against the motion. The motion should be based on one of the topics highlighted in this chapter. Possible motions could be:

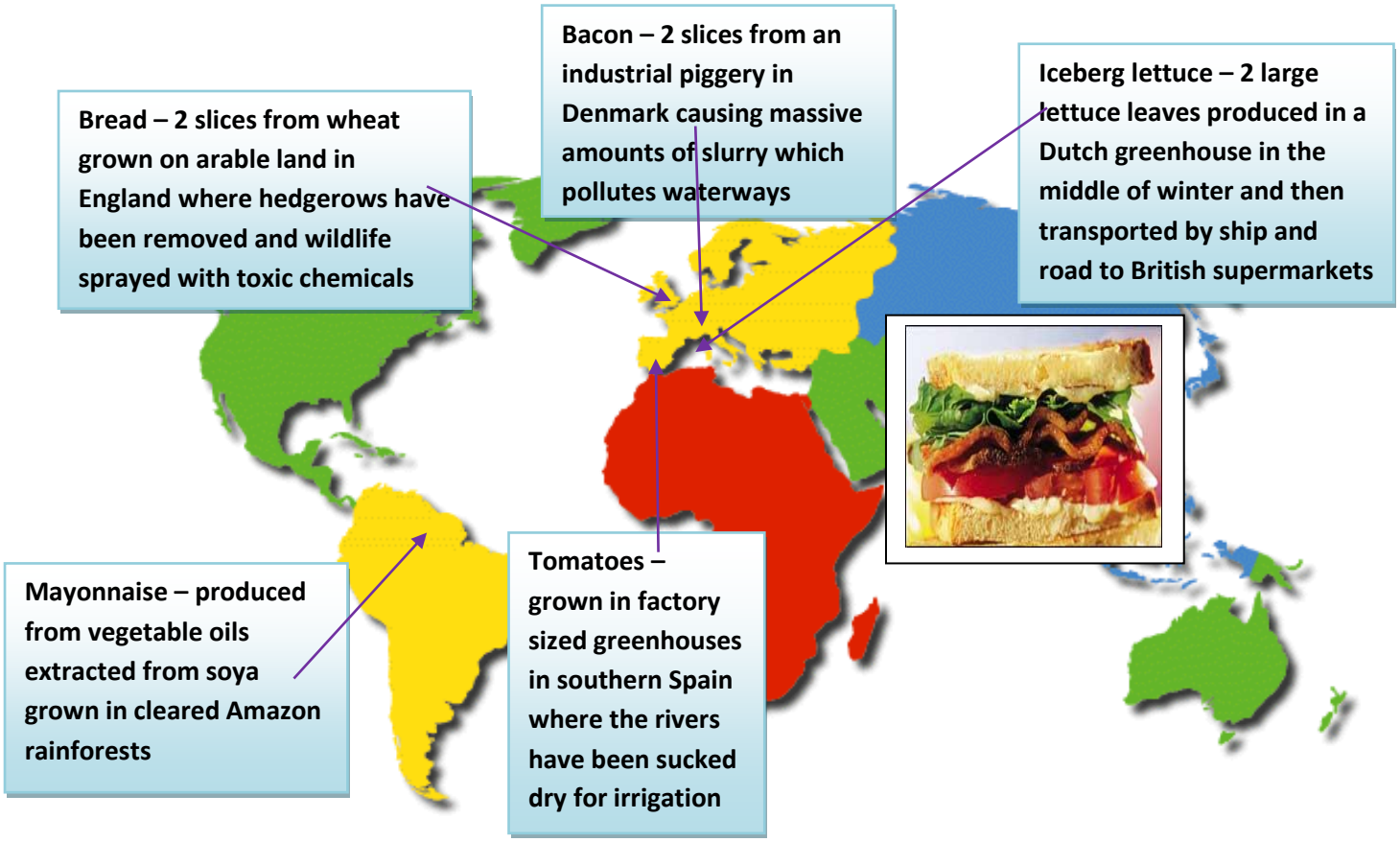
- Animal testing should be allowed to ensure beauty products are safe for people to use.
- There should be global regulation in place for beauty products.
- Skin bleaching is an individual choice and is no different from changing our skin colour by sun tanning.
- As we are all now considered global citizens the Western ideal of beauty should be the only images used in advertising.

This is not an exhaustive list and you should be able to think of many different examples of areas you would like to debate in class.

8. Food

It should already be evident to you, from calculating your carbon footprint, that one of the major contributors to our ecological and carbon footprints is the food we consume. But how do our eating habits have such a great effect on our ecological and carbon footprints? The easiest way to explain it is to look at an example of an everyday snack or lunch we may enjoy.

Taking a bacon, lettuce and tomato (BLT) sandwich as an example, where do all of the ingredients come from?



Source: Adapted from the Teachers pack School Global Footprints (WWF Scotland, 2006).

We can see from the example above, just how far our food often travels before it ends up on our plate. In the last section on transport, we calculated the amount of greenhouse gas emissions that resulted from different forms of travel. Therefore, it should be evident that if we were to consume less food grown in other countries and transported to the UK, and eat more food produced in the UK, this would reduce the carbon footprint of our food consumption. However, it is not always this straightforward. What would we do if we wanted fresh strawberries in January or pineapple at any time? Should we only eat seasonal fruit and vegetables that can be grown in the UK without the need for energy intensive hot houses?

8.1 Environmental Impact of Food

As we have seen, everything we eat has an impact upon the environment however there are steps we can take to help reduce the environmental impact of food, including the following:

- Shop locally and if possible, leave the car at home
- Plan one big trip if using a large supermarket instead of going two or more times per week
- Buy locally grown produce when it is in season
- Avoid food which is over packaged whenever possible
- Buy organic produce
- Buy fair-trade goods which support third world communities and are usually transported by sea

8.2 Fair Trade and Food

Fair Trade has gained in popularity over recent years in our shops and supermarkets, especially with specific goods such as tea, coffee, cocoa, chocolate and bananas. The purpose of Fair Trade is to provide justice and equality for the small independent producers and the workers on plantations. The plantations are located in developing countries where workers are often exploited. In the past many of these farmers and workers were paid low wages and forced to work in poor conditions meaning they had to live in poverty. All of this meant they had little opportunity to improve their situation. Fair Trade aims to reverse this trend by ensuring there are standards in place for working conditions, and by implementing prices for traders and consumers. This means the farmers and workers are paid a fair wage. Fair Trade also ensures that the welfare conditions for the workers are acceptable, that children are not employed who should be in school and that farming practices are sustainable.

When we think of Fair Trade products, some of the first things that spring to mind include tea and coffee, or chocolate and bananas, none of which grow in the UK. Therefore, sometimes we need to think about compromising one belief or value we have, to support another. In this case the carbon emissions to transport these goods around the world, versus the need to help communities in developing countries support themselves and receive a fair income.

There may be other areas apart from Fair Trade where you may choose to compromise; especially in terms of the money you have available to spend, in order to support an environmental belief. For example, it is more expensive to buy free range chicken than battery farmed, which means you may choose to eat the more expensive free range chicken once a week instead of the cheaper alternative more often. Another example is looking for tuna that is pole and line caught which is more

expensive than standard tins of tuna which have been caught by a process called purse seining. This involves huge nets which catch everything in the marine environment, including sharks and turtles (and sometimes even dolphins, although they state on the tin they are 'dolphin friendly'). These other species are then discarded as by-catch and thrown back into the sea dead.

8.3 Activity 9 – Environmental Impacts of Food Production

Decide what your favourite meal is, whether this is a burger, a curry, or fish and chips, and think about what the environmental implications could be of producing that meal. Use the internet to search for the implications of the ingredients within the meal. Think about where and how the ingredients are grown and how they reach the supplier you have purchased them from.

My favourite meal is

_____

The ingredients include:

-
-
-
-
-

Record here what you think some of the environmental impacts of your meal could be

-
-
-

Guidance for 8.3 Environmental Impacts of Food Production

There are many different environmental impacts that could be highlighted in this exercise; here are just a few examples:

- Has the food been sourced sustainably, such as fish, is it from a sustainable fishery?
- Have any of the ingredients been flown to the UK, if so why. Are they ingredients not grown in the UK, or are they not in season in the UK?
- Are any of the ingredients Fair Trade?
- Are the ingredients organic?
- Are there are any animal welfare issues, such as free range or battery chicken or eggs? Are there any animal ingredients from countries outside the UK where animal welfare rules are different?

9. Waste

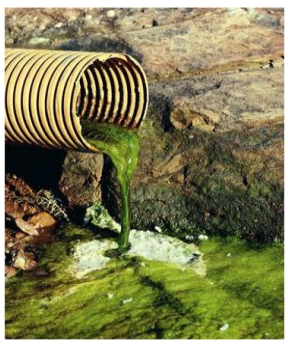
Waste Aware Scotland
Reduce Reuse Recycle towards zero waste

natural scotland
SCOTTISH GOVERNMENT

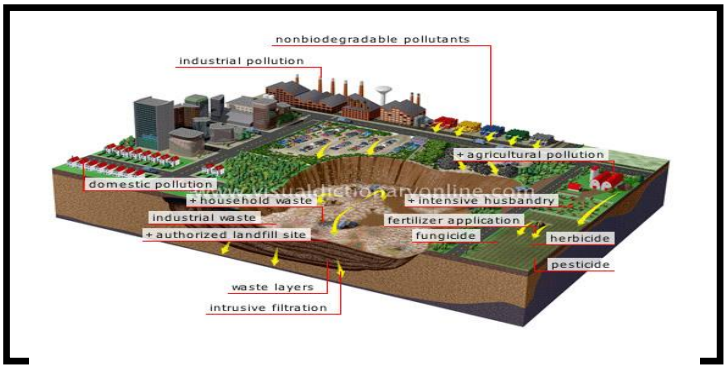
There is a limit to the amount of waste the Earth can absorb. When we look at a product and the waste it generates, we need to look at it from cradle to grave. This is why we have looked at products so far starting with the raw materials they are made from and ending with the disposal of the item. In order to reduce the amount of waste we produce, we need to reduce the number of products we consume. We have more money to buy more 'stuff' and as we like new 'stuff' we are always buying more. Also, products are not made to last like they were in the past. Our grandparents would 'make do and mend' whilst we just throwaway and replace. Economies of countries are driven by producing and selling more materials, so to make products that last longer does not make economic sense.

Packaging is a major source of waste. The minute we remove it from a product waste is produced. One way to reduce the amount of packaging is by consumers putting pressure on suppliers to not over package their goods. This may be difficult for an individual, however if you are responsible for purchasing products on a large scale for an employer or your own business, this may then become possible. It is also worth investigating if a supplier has an environmental policy and, if so, what it consists of, before deciding to use that supplier. As was established in the section on the life cycle analysis of a product, we should consider waste impacts from 'cradle to grave' for a product. If we produce and use less packaging, this means there are less raw materials required to make the packaging and less energy being used. Less packaging also means less waste to recycle, which also uses energy, or less waste to send to landfill.

Some of the waste produced in the College, for example in the hair and beauty salons or the workshops, is not only a concern due to the disposal of packaging but also due to disposal of the chemicals used in the products. Chemical waste causes pollution, which can be either point source or non-point source. Point source pollution is usually defined as pollution where the origin can be defined from one source, such as at the end of a pipe. Non point source pollution is caused indirectly by chemicals leaking into groundwater. If disposed of incorrectly, chemicals can cause pollution to our environment by leaching into our groundwater from landfill sites. This can have a negative long-term effect on human health and also impacts upon plants and animals.



Point Source Pollution



Non Point Source Pollution

However, attitudes towards waste in our society are changing. The best way to minimise the amount of waste we produce is to reduce the amount we produce in the first place. Failing this the next best option is to re-use it wherever possible and if this is not possible then recycle it. Most of you will probably be familiar with this concept already:

Reduce **the amount of waste we produce**

(For example by manufacturers using less packaging on products or by consumers buying re-fill packs which use less packaging. Consumers can also put pressure on manufacturers and retailers to use less packaging.)

Reuse **packaging or waste wherever possible, either for the same purpose or find a new use for it**

(For example, save last year's Christmas cards and wrapping paper. Wrapping paper can be used again and Christmas cards can be cut up and used as name tags or decorations. Old magazines and newspapers can be used as wrapping paper with some pretty ribbon or bows added).

Recycle **break your waste down and reprocess it**

(However, remember this uses further energy and some items cannot be recycled because of toxic chemicals in them or because they may have manufactured from different materials squashed together).

So most of us are familiar with the message reduce, re-use, recycle. However, this can also be added to with:

Repair **broken items instead of discarding them and buying new ones**

(For example, with our clothing, skills such as sewing are not so prevalent nowadays as they were in the past when clothing items would be mended instead of discarded. Also have shoes re-heeled or re-soled where possible instead of throwing them away).

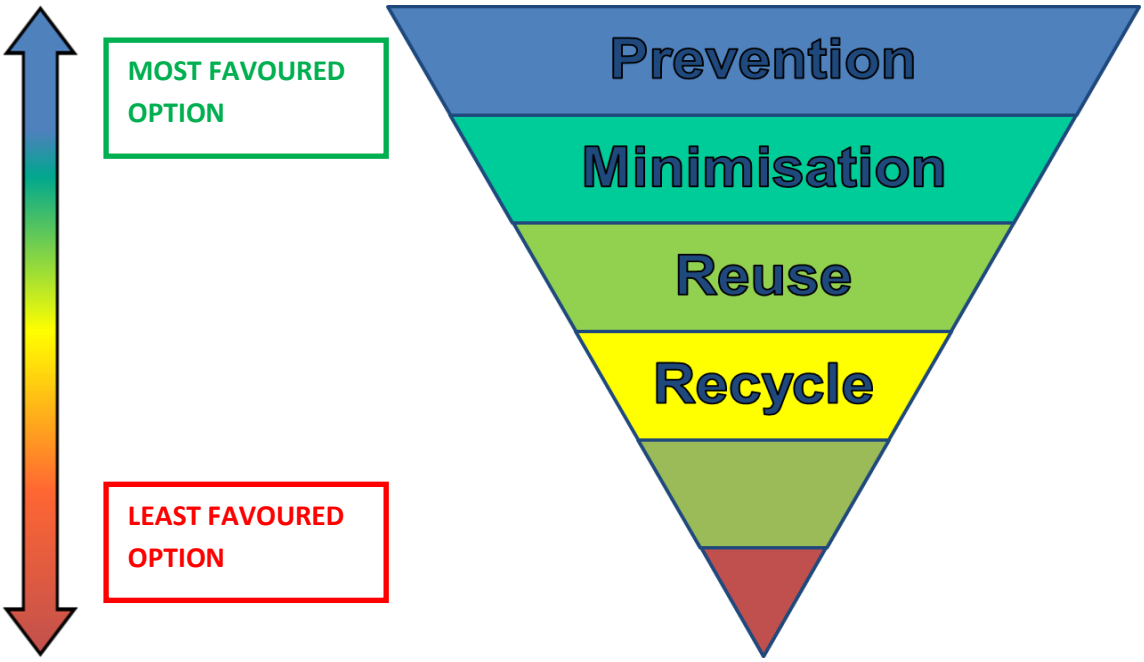
Refill **empty containers**

For all non-renewable resources such as metals, glass and plastics, we need to remember, as they say in the supermarkets for special offers **'when it's gone, it's gone'.**

The Earth is a closed system and once these materials have been used up the Earth can't make any more of them within human timescales.

Another way to view the elimination and reduction of waste in any business or in our everyday lives is as follows.

Waste Hierarchy



- **PREVENTION –** do not produce the waste in the first place (this may be difficult for beauty products as they generally need to be placed in a container of some sort, however additional packaging for transportation may be eliminated)
- **MINIMISATION -** using less material in design and manufacture, designing products for a longer life and using less hazardous materials
- **REUSE –** clean and repair in order to be reused (glass nail polish bottles and plastic containers for example)
- **RECYCLE –** turning waste into new products (recycling plastic beauty packaging into new beauty packaging)
- **RECOVERY –** producing energy from waste through anaerobic digestion, incineration with energy recovery, pyrolysis and gasification which produce energy fuels (this can be applied to packaging waste)
- **DISPOSAL –** landfill and incineration without energy recovery (the last resort for any packaging waste)

9.1 Activity 10 – Waste Generated in our Everyday Lives

Think of the products and materials that are used in an everyday household and make a list of the waste you think is generated within a normal week. If possible think of how this waste could be eliminated, reduced or recycled, or if this is not possible, how would you dispose of it with as little environmental impact as possible? Some examples have been provided to start the table. Use the internet to search for recycling or waste disposal methods, a good site to start with is http://www.direct.gov.uk/en/Environmentandgreenerliving/Wasteandrecycling/DG_180525

Waste Produced		Method to Eliminate, Reduce, Recycle or Dispose
Food waste		Only buy what you will use, avoid 2 for 1 offers in the supermarket unless you know you will eat both Disposal – compost where possible
Used batteries		Use re-chargeable batteries wherever possible Disposal – do not put in your household trash, where they can end up in landfill. Contact the council for disposal facilities in your area. If your college does not already do it, consider battery recycling collection points.
Unwanted furniture/household items		Consider selling at a car boot sale or place unwanted items on recycling websites where someone else can then get use of it. Also charity shops will often take large items away for free that they can sell in their shops. Disposal - contact your council to see if they have any recycling facilities for what you are looking to get rid of
Paper coffee cups		Consider offering cash savings at your college coffee bar for those who use their own reusable mug. Dumfries and Galloway College offer 20 pence off your coffee if you 'lug your own mug'. Disposal – if you must dispose of paper cups in college ensure you have appropriate recycling methods in place

Now do the same activity but for waste generated at work in a beauty salon. Some examples have been provided to get you started.

Waste Produced	Method to Eliminate, Reduce, Recycle or Dispose
Cotton wool	
Disposable needles	

10. And Finally ……

The last activity is to consolidate all of the information contained within the workbook. You can use the information you have learnt from any section of the workbook provided it relates to what is being done in your curriculum area to tackle sustainability issues.

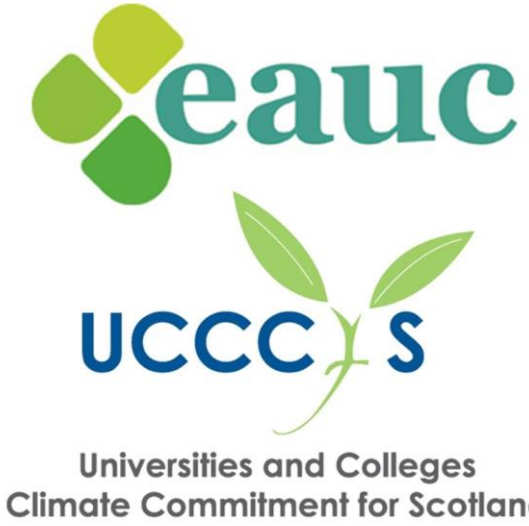
10.1 Activity 11 - Poster Competition

Design a poster to advertise what is happening in the Beauty area of the college to promote sustainability. The project can be related to any aspect of your college life, whether this is a class project, a Citizenship project or a cross college project your class is engaged in. Ask if the winning designs can be made into artwork and displayed around the college. The poster below may give you an idea of what is required. This poster was designed in Dumfries and Galloway College and used as part of a campaign to promote the use of reusable mugs. Using reusable mugs instead of paper cups stops paper cups ending up in landfill sites, and saves the resources that were required to make them in the first place, such as wood and water.

To give you some ideas, here are some topics your poster could be about:

- ▶ RECYCLING
- ▶ PRODUCT USE
- ▶ WATER CONSERVATION
- ▶ ENERGY CONSERVATION

Commissioned and delivered by:



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