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for the environment

TEACHER'S GUIDE TO LESSONS ON WASTE, RECYCLING AND THE ENVIRONMENT IN SURREY

INTRODUCTION

What is this guide?

Thank you for downloading this teacher's guide to lessons on waste, recycling and the environment in Surrey. This guide and the associated slides were produced by the Surrey Environment Partnership (SEP) in collaboration with the Young People's Trust for the Environment (YPTE). You are welcome to modify it by adding your own slides to the presentations or deleting ones you don't need.

The lessons have been designed to support learners in Upper Key Stage 2 (Years 5 and 6) with understanding how to recycle household waste and the beneficial effects that recycling can have, both locally and for the environment as a whole. The lessons explain how it is important to conserve natural resources, many of which are non-renewable. Children learn that the creation of new resources create greenhouse gas emissions, which can accelerate climate change. They draw links between recycling and helping to protect the environment.

SEP comprises Surrey County Council and the eleven district and borough councils in Surrey. It aims to manage Surrey's waste in the most efficient, effective, economical and sustainable manner. Discover more about SEP at <https://www.surreyep.org.uk> or get in touch at: comms@surreyep.org.uk

YPTE wants to encourage more and more young people to learn about taking care of our world and their website is a great starting point for this. You can

find lots more supporting information by visiting the 'Explore' section of <https://yppte.org.uk>

This package of lesson plans consists of four lessons:

- **Lesson 1:** Waste and the environment
- **Lesson 2:** Waste reduction
- **Lesson 3:** Food waste: recycling and reduction
- **Lesson 4:** Recycling right - contamination

Links to National Curriculum

- Science
 - Compare and group together everyday materials on the basis of their properties (*Year 5, Properties and changes of materials*).
- Citizenship
 - Understand that resources can be allocated in different ways and that these economic choices affect individuals, communities and the sustainability of the environment. (*Key stage 2*).

Notes to teachers

- These teaching notes and activities run alongside PowerPoint presentations and all slides are referred to in the notes. The information can be adapted to suit different learners at different stages by adding/deleting slides on the presentation and varying the level of detail used from the teacher notes.
- Although these lessons are designed to run in sequence, you may choose to teach each as a standalone session. If choosing this approach, it would be helpful to refer back each time to the slides from lesson 1 which explain the impact that waste can have on climate change.
- Activities given are suggestions only. The main purpose of these resources is to provide key information and visual aids for teachers to adapt to their needs.

LESSON 1: WASTE AND THE ENVIRONMENT

Learning Objectives

- Children will understand that natural resources are running out and it's important that we use less of them.
- They will discuss the fact that climate change is happening and that its consequences could be very damaging for humans and the planet.
- Children will recognise that reducing the amount of waste we produce means we use fewer natural resources and create fewer emissions, which can help fight climate change.

Suggested starter activity

Materials sorting activity

Invite each child to select any item from the classroom. In their table groups, they should take it in turns to describe the item in terms of the material it is made from, such as 'this ruler is made from plastic'.

Gather together the children's findings on the board, grouped into their materials.

Which materials are the most commonly found ones in the class? Where do the children think these materials actually come from?

Teacher notes for Powerpoint presentation

Slide 3: Natural resources are running out and it's important that we use less of them. From the food that we eat, to the goods that we use, planet Earth has provided the raw materials!

Earth Overshoot Day is the date each year when humanity has used up all the natural resources that it would be possible for Earth to regenerate naturally in that same year. Ideally, we would be looking to last a whole year without reaching that date. In fact, in 2021, Earth Overshoot Day was July 29th. That means that every day of 2021 after that date, people were using more than the planet could sustain. It isn't possible to keep doing this forever. The world is currently using around one and three quarter Earth's worth of resources a year - but we don't have any more Earths!

KEY QUESTION: So where do our resources come from?

Slide 4: Metals (such as those used to make food and drink cans and a range of items in the classroom) have to be mined from under the ground. They also go

through many energy-intensive processes in order to shape them into the items that we use every day. Metal mining causes many environmental impacts such as deforestation, soil erosion and contamination of soil and waterways.

Slide 5: Paper, cardboard and wood are made from trees. Humans are responsible for cutting down and burning huge areas of forests. This deprives many creatures of their homes. Over two million trees are cut down every day just to make paper. This adds up to around four billion trees every year. Trees absorb carbon dioxide (CO₂) through their leaves and release oxygen back into the atmosphere, helping to regulate the climate. The more trees we use, the less CO₂ is removed from the air.

Slide 6: Plastics are made from oil, a fossil fuel that is drilled from deep in the earth. Plastic is cheap to make and can be moulded into all kinds of shapes, but it doesn't biodegrade like natural materials. It can 'photodegrade' though. When plastic is exposed to strong sunlight for long periods, it becomes brittle and can start to break into small fragments called 'microplastics'.

Slide 7: Coal, oil and natural gas are known as fossil fuels because they were created millions of years ago from fossilised remains of organic material such as plants and animals. Over hundreds of millions of years, heat and pressure turned these remains into the coal, oil and gas that we use today. Humans have been using fossil fuels for thousands of years (there is evidence that coal was being burned in China before 1,000BC) but we have become increasingly dependent on them since the Industrial Revolution, which began in Britain in the 1800s. These fuels are a finite resource, meaning that one day, they will run out.

Slide 8: Fossil fuels can be burned in power stations to heat water and create steam, which in turn generates the electricity that we use every day in our homes, schools and businesses. For more information, watch <https://yppte.org.uk/videos/how-is-electricity-made>. Industrialised countries burn huge amounts of fossil fuels in power stations as well as using them for heating and to power vehicles.

Slide 9: Oil is used to make petrol and diesel to power most of the vehicles that we use to transport ourselves and all of the resources we use around the world. Humans used around 91 million barrels of oil a day in 2020. More than 60 million barrels per day are used to fuel transport.

KEY QUESTION: We know that fossil fuels are running out. But why else are we trying to cut down on the use of fossil fuels globally?

Slide 10: Unfortunately, when fossil fuels are burned, they produce gases (such as carbon dioxide, sulphur dioxide, methane and nitrous oxide) into the atmosphere as waste products. We now understand that these gases can harm the environment.

Slide 11: Carbon dioxide is released into the atmosphere as a waste product. It then acts as an invisible blanket, trapping heat from the sun and warming the Earth - this is called the greenhouse effect. The more fossil fuels that are burned, the thicker the blanket becomes and the more heat is trapped. Records show that global temperatures have been rising more rapidly since the time we started burning fossil fuels in large quantities.

A more detailed explanation of the greenhouse effect can be found on YPTE's video which can be downloaded using this link: <http://yppte.org.uk/videos/the-greenhouse-effect>

Slide 12 : The Earth's climate is definitely changing - it is heating up. There have been peaks and troughs in temperature over the years, but there is now a steady and unrelenting trend in the records which show that the Earth has warmed by an average of 1°C since the 1850s. This might not sound like very much, but it has very big implications for the people and animals on our planet. Rising temperatures don't just mean we'll get nicer weather. As the climate is changing, our weather is becoming more extreme and unpredictable.

Slide 13: Climate change is increasing the risk of drought and bushfires in hot countries with low rainfall. Droughts cause animals and people to die and crops to fail. Australia experienced one of its worst droughts in decades with bushfires still raging across the country in late 2019 and early 2020, especially in New South Wales. Over 10 million hectares of land were destroyed as of mid-January 2020 and millions, maybe even billions of animals were killed.

Slide 14: Higher temperatures mean more water is evaporating from the oceans. This means there is more moisture in the air, leading to more frequent and more powerful rainfall and storm events around the world. In southern England there were severe floods during the winter of 2013-14 when the region experienced the wettest weather for 250 years. Storms brought heavy rainfall which caused widespread flooding of villages, farmland and roads. Some villages on the Somerset Levels were completely cut off for over a month.

Slide 15: Meanwhile, the world's ice is melting at an ever-increasing pace. Experts believe that Arctic Sea ice is melting at a shocking rate of 9% per decade. The Greenland and Antarctic ice sheets, which between them store the majority of the world's freshwater, are both shrinking at an accelerating rate. This leads to rising sea levels, risks of flooding for people living in low lying and coastal areas and the destruction of crops and habitats. Animals such as polar bears, which depend on sea ice as a habitat, are becoming threatened.

Slide 16: Sea level has risen by 20cm in the last 100 years and the rate of sea level rise has increased in recent decades. This causes flooding of coastal and low-lying areas and with this comes the destruction of homes, schools, crops and habitats. Hundreds of thousands of people have already lost their homes in the coastal areas of Asia.

Many of the world's cities are located in coastal areas and almost a quarter of the world's population live near the coast, so this is a huge concern.

A 3°C rise in global temperatures would completely re-shape the way that the world looks, with many low-lying areas completely covered by water. Millions of people would become refugees seeking new places to live if the waters rose over their home

You might like to watch this video about climate change with the class:

<https://yppte.org.uk/videos/climate-change>

Slide 17: Discussion activity: Gather ideas about how we can help on an individual scale. What type of activities do the children already do at home and school to minimise their energy use?

Point out to children that it can be hard for individuals to make significant change unless we have help from our government. Explain that the government provides money to councils so that they can take action. The council sets up plans for communities to follow - then it's important that we play our part by understanding and joining in with these.

We can all help to fight climate change. When we all play our part together, our small actions can add up to make a big difference. There are many ways to do this including making sure that you waste as little as possible, recycle as much as you can and make sure you don't put things that can't be recycled in recycling bins.

KEY QUESTION: HOW CAN RECYCLING HELP IN THE FIGHT AGAINST CLIMATE CHANGE?

Slide 18: Reducing the amount of waste we produce in the first place is the best way to help the environment. Every time a product is made, it uses up a lot of resources. By taking care of the items that we own, not upgrading every time we have a chance to, and by learning to mend the things we already have, we are living more sustainably.

Slide 19: Recycling as much as you can means we don't have to use as many resources to produce new items. For example, it only takes about 5% as much energy to recycle aluminium, as it does to make new aluminium (from the mineral bauxite). Aluminium can be recycled again and again. Using less energy means producing fewer emissions and that is better for the environment.

Slide 20: Even when you try very hard to reduce the number of new items coming into your home, you will still need to buy things which will create some waste. If things can't be re-used, then the next best thing to do before throwing rubbish away, is to check whether it can be recycled. It's really important to make sure that you use the correct bin for your recycling and to make sure that the items you recycle are clean and dry. Throwing away dirty packaging can contaminate a whole truckload of recycling, meaning it has to be thrown away.

Slide 21:

KEY QUESTION: WHAT OTHER STEPS CAN WE TAKE TO REDUCE THE AMOUNT OF WASTE THAT WE PRODUCE?

In the UK, we throw away 10.2m tonnes of food waste each year.

Slide 22: A very effective way of reducing food waste is to sit down as a family and plan your meals. Then, make a shopping list of ingredients for those meals and only buy the food that you need. This prevents buying more food than you need and having food that goes off and needs throwing away.

(Obviously, there are increasing numbers of children who come from homes which are experiencing food scarcity, so please use your discretion when talking about the idea of having 'excess' food at home, if you know that this is not the case for individuals in your class.)

Slide 23: One of the biggest differences you can make when reducing waste at home, is to eat what you buy. However, there will always be some food waste, like peelings, meat bones and food past its use by date. Use a caddy for all your food waste. If it's put in the rubbish bin, it is burned and turned into energy, which is more expensive and not as good for the environment than when it goes into a caddy. When caddies are collected by your council, food waste is turned into fertiliser to help new things grow and gas that makes electricity and heat.

Slide 24: If you still end up with extra food that is going to go off even after meal planning, you can often freeze it and then defrost it to use at a later date. This can work with all kinds of different foods, from things that are still in their packets, to leftover portions from meals. Freezing food before its use by date means you have time to plan what to use it for later.

Slide 25: Another way to use up leftovers can be to put them into other meals. You can use all sorts of things in soups, for example. A soup can be a great way to use vegetables that are slightly past their best, and you can freeze portions of it for a quick and simple meal - just reheat it when you are ready!

Slide 26: Sometimes people serve themselves a big portion of food and then don't finish it all. When this happens, the food left on their plates is often just scraped into the bin. Serving yourself a smaller portion means that you are more likely to eat it all up and not produce any waste. It's important to eat enough food to give you energy to move and grow, so there's no need to cut down your portions too much, just enough to make sure you aren't throwing any away. Remember, you can always go back for seconds!

Slide 27: Try to stop using single-use items that are going to be thrown away after only one use.

Discussion - work in pairs. How many items can you think of that are made to be used only once?

(Plastic bottles, plastic cutlery, food packets, wet wipes)

What are some ways to avoid using these items? Take a reusable drinks bottle to school and don't buy drinks in plastic bottles. Never use a plastic straw when you get a drink and make sure to have a reusable bag to take shopping so that you never need to take a plastic carrier bag away. You might also want to consider giving up chewing gum! It contains a rubber-like substance, and each piece can take up to 500 years to be completely decomposed and recycled back into the natural environment!

Slide 28: You can help to reduce waste by reusing items as many times as possible. Reusing items as much as you can helps keep them from being thrown away. Even junk modelling can be good for the environment! There are a range of craft activities using recycled materials on the Surrey Environment Partnership website at: <https://www.surreyep.org.uk/reduce-reuse-recycle/schools/craft-activities/> that you might like to try with the class.

Slide 29: It's not unusual these days for products to be designed to break after a short time, so that people are forced to buy more new items! Ask students if they have ever heard of 'hack-spaces' - places that teach you how to fix your own belongings - from phones to bikes. Mending things is really cool. It's a way of learning new skills and saving the planet at the same time!

Slide 30: How many children in the class would consider wearing clothes that were second hand? Instead of buying everything new, it is far better for the environment to try and buy items second hand when possible. Obviously, until you stop growing, you are going to need to replace your clothes as they become too small for you! Instead of buying new clothes that are the same things everyone else is wearing, start thinking about second hand clothes. There are some really great bargains to be found as you develop your own, unique, planet saving style!

Donating your unwanted clothes, toys and household items to charity stops them being thrown away and gives them a new lease of life for someone else. You can use the Young Planet app <https://www.youngplanet.com> to give away unwanted children's clothes and toys to other people.

Slide 31: If you aren't sure which items go in which bins, or whether you can recycle something, Surrey Environment Partnership has designed a great search tool which is available online or as an app.

You can use the Surrey Recycles tool to investigate how best to deal with all the different kinds of waste from your home. Just type your postcode into the search box at <https://www.surreyep.org.uk/what-to-do-with-an-item/>, type in the items you want to find out about, then select the relevant choice from the drop down menu.

ACTIVITY: Waste reduction pledge

Invite children to think of one key action that they will take during the week to reduce the impact that their waste has on the planet.

Suggested classroom activities

Re-used classroom resources

How many everyday items from the classroom could be made from reused materials? Clean tin cans make excellent pen pots (make sure there are no sharp edges) and can be decorated with paint or by drawing a design on a paper wrap. Plastic bottles can be repurposed as plant pots and as watering cans to water the plants! Challenge the children to design and make a classroom item at home or at school.

Paper waste challenge

It's inevitable that schools use quite a lot of paper, but are there ways that the amount can be reduced? Investigate paper usage in different places and carry out research to find out what steps could be taken to cut down. Are there certain resources that are printed or photocopied that needn't be? Could school newsletters be provided online? Are unwanted bits of paper being reused as scrap paper before they are thrown away? Children could report back to the school council or governing body with a list of suggestions for reducing school paper waste.