



Lesson 1 – Where does our waste go?

Resource 1.4 – Waste Timeline Instructions

Aim for the activity:

- Begin to understand how long different types of waste can take to break down
- Identify the materials that take the longest to break down

Curriculum links for this activity:

Science year 5 programme of study – Property and changes of materials

- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible

Maths year 5 programme of study – Number, multiplication and division

- Multiply and divide numbers mentally drawing upon known facts
- Multiply and divide whole numbers and those involving decimals

Maths year 6 programme of study – Number, addition, subtraction, multiplication and division

- Perform mental calculations
- Solve addition and subtraction multi-step problems in context

PSHE Living in the wider world

- The importance of respecting and protecting the environment

Resources:

Using the same cards from the previous activity, the groups need to keep the following picture cards out:

- Fruit
- Newspaper
- Steel can
- Aluminium can
- Plastic bottle
- Disposable nappy
- Plastic grocery bag
- Glass bottle / jar

Print out the Waste Rotting Timeline Cards in Resource 1.5.

Print out the 'Timeline teacher information cards', below.

Activity outline:

The class can work in small groups again and will use a small selection of the picture cards from the previous activity. You will need to have a clear area on the floor or put the tables in a long line as you will make a timeline with the picture cards. (If you have the wall space you could stick them on the wall to make a display.) Place the large A4 labels in order of time with gaps between for the class to place their picture cards.

When the students place their picture cards along the timeline, make sure the picture is face down. This prevents copying and makes them really think about where they place it. You can help them by asking them about the materials the item is made from, as this will help determine how long it will take to break down.

Once the groups have placed all their cards, settle them down and go through the picture cards. Using the 'Timeline teacher information cards' (below), go through the items and explain in as much detail as you feel is required for them to grasp the information.

Timeline teacher information cards

<p>It takes me up to 2 years to rot in landfill but a few months if put into a composter</p> <p>Piece of fruit – organic, natural, rots away quickly. Organic materials release gases as they break down in landfill because of the lack of oxygen. This is called ANAEROBIC digestion.</p> <p>Gases are CO₂ and methane, which are harmful greenhouse gases and contribute to global warming and climate change.</p> <p>If put in compost bins these gases are not released because there is oxygen to speed up the process. This is called AEROBIC digestion.</p>	<p>It takes me up to 10 years to rot in landfill but a few months if put into a composter</p> <p>Newspaper – what is it made from? Trees! Again natural, organic substances just like the fruit. As we've just said, in order for most items to rot/decompose they need oxygen but also water.</p> <p>Every day, 6 inches (15cm) of soil is placed on the landfill to prevent smells, litter and vermin. The layers of rubbish are therefore starved of air. Water is discouraged from entering the landfill so as to prevent production of a liquid called leachate building up, as this is very harmful to watercourses if it gets out.</p> <p>Because of these conditions it can be like a “dry tomb” – items decompose at a much slower rate than they would in other conditions.</p>
<p>It takes me 80 – 100 years to rot in landfill</p> <p>Steel can – made from iron ore and limestone or recycled metal. The iron ore and limestone have to be mined and it takes much more energy to make the cans from new than it does to recycle them.</p>	<p>It takes me 200 – 500 years to rot in landfill</p> <p>Aluminium can - from bauxite, which is dug from the ground in tropical countries (rainforest at risk) to be made into a powder, from which we get aluminium.</p>

It takes me around 450 years to rot in landfill

Plastic bottle – made from oil, which has to be mined. About 5% of all oil used is for plastics. Plastic is everywhere around us these days. If we took it all out of the classroom there'd be a lot less in here!

It is light, strong and durable but these very qualities that make it such a good material for packaging make it a problem if not disposed of properly.

We see plastic all around us in the environment, stuck in trees and hedges and getting into watercourses. It can be a real problem for animals and birds. A lot of plastic eventually ends up in the oceans where it is extremely dangerous for marine animals (turtle picture in PowerPoint). In the calm places in the centre of the oceans, plastics collect and form dense floating rafts. The largest of these is "The Great Pacific Garbage Patch", which is thought to be an area as large as France to a depth of around 10 metres down! The moral of the story... recycle as much as possible and try not to buy it in the first place if you possibly can – very difficult though!

It takes me 500 – 1000 years to rot in landfill

Plastic grocery bag – again made from oil, which in itself is a scarce and expensive commodity. We were using around 290 carrier bags per person every year, but thankfully this has decreased due the introduction of charging 5p a bag.

Look at home and you'll probably find a stack of them in the cupboard under the stairs or under the sink. Try and reuse them as many times as you can.

Maths question: How much extra a year have you been spending on shopping if you buy on average 290 carrier bags at 5p each?

It takes me 500 – 600 years to rot in landfill

Disposable nappy – YUK! These are a relatively modern invention (1940s). Manufacturers say that 80% of a soiled disposable nappy is biodegradable WHEN CONDITIONS ALLOW, but landfill conditions are not always ideal for this.

Used disposable nappy waste amounts to around 500,000 tons per year. If Henry VIII had been in disposable nappies when he was a baby (he lived from 1491 – 1547) they would still be sitting in the landfill site now!

We could encourage new parents to use modern real reusable nappies, which are much friendlier to the environment, cheaper in the long run and really comfortable and snazzy!

Maths question for the class:

- On average, babies use 5,000 disposable nappies. How many disposable nappies would the whole class have used?
- On average nappies can cost around 11p each for the more expensive brands! How much would this have cost your parents?

It takes me forever/unknown – I will probably NOT rot in landfill!

Glass bottle or jar made from sand, limestone and soda ash – all materials that have to be mined. Glass is one of the easiest things to recycle, it can be recycled over and over and over again and always comes back looking as good as new.

Again, there is a massive energy saving to be had by recycling glass instead of making it from new raw materials. Why send it to sit in the ground forever when it is so easy to recycle? What a waste!