



WORKING
TOGETHER TO
INSPIRE AND
EMPOWER
PEOPLE



A DIFFERENT WAY OF LOOKING AT WASTE

A resource for primary schools to explore food that
is healthy for people and healthy for the planet

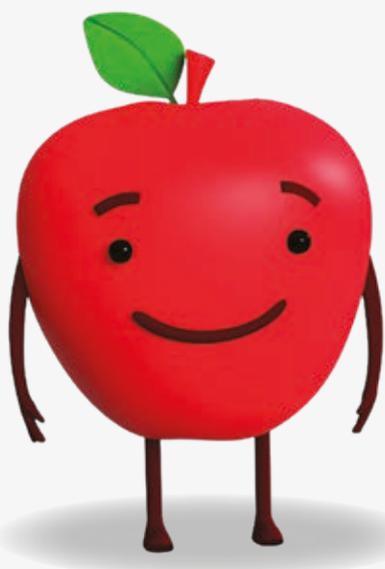
FOCUS ON WASTE



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OVERVIEW

As the UK is facing a health crisis associated with poor diet and lack of exercise, there is a need for children to reconnect with healthy eating and to understand better where their food comes from. Children who grow their own fruit and vegetables and learn how to cook are more likely to apply the principles of a healthy diet throughout their life, and working on the veggie patch can also mean they may become more active and spend more time outdoors.



What we choose to eat and the way our food is produced can have a huge impact not only on our health, but also on the health of the planet. The way we grow and produce food constitutes one of the biggest environmental threats we face. Today 60% of the Earth's land surface is used in agriculture and food production, and the global demand for food is rising with the rapid increase of the world population. Yet we waste a third of all the food that is grown globally and, in the UK, we throw away a third of all the food we buy. This is the equivalent of buying three bags of food and putting one straight in the bin! Waste is created at every stage of food production, distribution and consumption, from

water and energy loss to rotten food and packaging ending up in landfill sites. The topic of food provides a unique opportunity to explore sustainability issues and to inspire pupils to consider actions they can take to make a positive difference.

The aim of this resource is to encourage 7 to 11 year olds to find out more about where our food comes from and the impact of food production on the environment, with a particular focus on waste. The resource provides an innovative approach to the topic of food by looking at how we can produce food the way nature does, without creating any waste. In nature, plants and animals use only what they need and one

creature's waste becomes another's food. Even in a tiny patch of soil, millions of living things work together to turn waste from plants and animals into rich nutrients. Using inspiring examples of food production and packaging, pupils are encouraged to form and articulate their own ideas and to reflect on the impact of their food choices on the environment.

This resource has been produced as part of WWF's Green Ambassadors 'Plant2Plate' campaign, which offers a host of activities to develop pupils' knowledge and skills around the topic of food and to develop an interest in cooking and growing their own food. For more information, visit: wwf.org.uk/greenambassadors and wwf.org.uk/plant2plate



ACTIVITY 1
Bin investigators: A practical activity to discover what ends up in our kitchen bins and to explore ways of cutting down on food waste.

ACTIVITY 2
The packed lunch challenge: A Design and Technology activity to put together a waste free packed lunch that is good for us and good for the planet.

ACTIVITY 3
What's the link between ducks and rice?: A photo-based activity to explore how we can produce food without creating any waste, as nature does.

ACTIVITY 4
The plastic story: With a focus on Science and English, an activity for pupils to investigate the properties of plastic and to write creatively about the journey of a plastic object that is not needed any more.

ACTIVITY 5
Making soil as nature does: A fun, engaging activity to turn food waste into rich soil and to encourage the whole school to take part.

ACTIVITY 6
Love your leftovers: Drawing on the know-how of the whole school community, an activity to compile yummy recipes using leftovers into a fun cookbook.

CURRICULUM LINKS

England KS2

Design and Technology Cooking and nutrition, design, make and evaluate; **Science** Plants, living things and their habitats; **Geography** Locational knowledge, human and physical geography; **English** Language, comprehension and composition; **Mathematics** Number, measurement, statistics

Northern Ireland KS2

Curriculum objectives Personal health, citizenship, education for sustainable development; **The World Around Us** Interdependence, place, change over time; **Personal and Mutual Understanding; Language and Literacy; Mathematics and Numeracy** Number, measures, sorting

Scotland Curriculum for Excellence P4-P7

Sciences Planet Earth – Biodiversity and interdependence, energy sources and sustainability; **Social Studies** People, place and environment; **Health and Wellbeing** Food and health; **Technologies** Food; **Languages** Literacy and English; **Mathematics** Number and measure, information handling

Wales KS2

Geography Locating places, environments and patterns, understanding places, environments and processes; **Design and Technology** Designing and making; **Science** Interdependence, the sustainable Earth; **Personal and Social Education** Active citizenship, health and emotional wellbeing, sustainable development and global citizenship; **English** Language and literacy; **Mathematics** Using number, measuring and data skills





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BIN INVESTIGATORS

OVERVIEW

Pupils get their hands dirty and investigate what ends up in the kitchen bin. They also reflect on positive actions they can take to help reduce food waste.

OBJECTIVES

- To sort waste into material types
- To explore actions we can take through our own food choices to reduce waste

WHAT YOU NEED

- Resource sheet 'Recording waste'
- Protective gloves for handling rubbish
- Scales
- Magnets (steel items stick to the magnet, aluminium doesn't)



GET GOING

Discuss what pupils already know about the sorts of things that end up in the kitchen bin (e.g. leftovers, rotten or wasted food, packaging, etc) before finding out about the main sources of food waste. Depending on what you think would work best for your class, you could prepare a big bag of rubbish with different materials and invite the class to see what's been thrown away, arrange for them to investigate the food waste in the cafeteria at school after lunch, or ask them to carry out an audit of the kitchen bin at home with an adult. Wearing protective gloves, pupils should sort and weigh the different sorts of waste and record their findings on the resource sheet. They can use their computing skills to display their data on a graph and calculate the total weight of rubbish thrown away by the class. What is the average per pupil and how much would it be for all the pupils in the school? What do they think happens to all this waste? (Most of it ends up in landfill sites, taking a huge amount of space and releasing gases that contribute to climate change). What are the main sources of waste? Is waste inevitable? As a group, discuss how we can reduce or even eliminate food waste (e.g. eating less processed food and 'take-aways' to reduce packaging, serving suitable portion sizes). Pupils are introduced to the idea of reusing and recycling materials in an endless loop, as nature does. Natural materials (food, cardboard) can be returned to the soil through composting, whereas human-made materials (glass, plastic, metals) can be reused or recycled to make something else. In pairs, ask pupils to think of how one product from their kitchen bin could be designed differently so it would not end up as waste (e.g. food packaging that can be composted, broken pan that can be disassembled and repaired, disposable cutlery).



RESOURCE SHEET: RECORDING WASTE



Name

Date

MATERIAL TYPE **WEIGHT (GRAMS)**

Paper

Cardboard

Aluminium

Steel

Plastic

Glass

Foil

Food

Juice carton (plastic and cardboard)

Other (please specify)

.....

TOTAL





THE PACKED LUNCH CHALLENGE

OVERVIEW

In this Design and Technology activity, pupils plan a waste free packed lunch, thinking about how to cut down on waste as well as applying the principles of a healthy diet.

OBJECTIVES

- To develop an understanding of where our food comes from and how it is produced
- To develop an understanding of the impact of food production on the environment
- To explore how we can create a meal without producing any waste, as nature does

WHAT YOU NEED

- Resource sheet 1: Our waste free lunch box
- Resource sheet 2: WWF Livewell principles



GET GOING

A class picnic provides an excellent starting point to introduce the topic of food and waste. Invite pupils to prepare and bring a packed lunch and the leftovers can be used to investigate what ends up in the bin (e.g. drink cans, packaging, leftover food, disposable cutlery, etc.). What other 'wastes' are produced in the food growing and production process? (e.g. polluting gases from transport, 'run-off' into our rivers and streams from chemicals used to enrich the soil, water and energy, etc.)? As a group, discuss how we can reduce waste in our packed lunch (e.g. choose food grown locally to reduce transport, organic food to reduce chemical use, less processed food to reduce energy use and packaging, or even homegrown food).

Leftovers can be composted and used to enrich the soil to grow new food. Reusable packaging also helps to reduce waste. In pairs, ask pupils to plan a waste free packed lunch so there is nothing to throw in the bin when they have finished. They write down or draw the ingredients on the resource sheet and can use the WWF Livewell principles to make sure it is good for them and for the planet too. Come back together as a class and invite pupils to share their lunch ideas. You could plan a waste free picnic day for the whole school to raise awareness of the importance of reducing food waste.

RESOURCE SHEET 1: OUR WASTE FREE LUNCH BOX



What about using a reusable container rather than a bag, cling film or foil?

Can you use refillable bottles rather than cans or cartons?

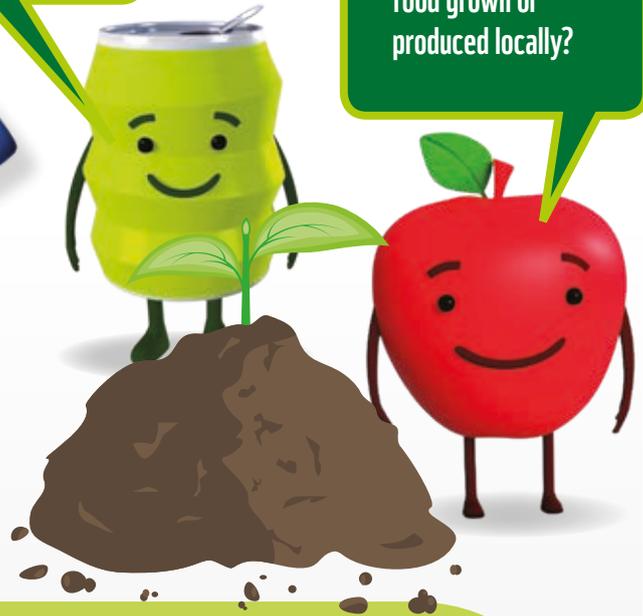
Can the packaging be composted or recycled?

LOCAL PRODUCE

Is the amount of food just right?

Can you compost the leftovers?

What about using food grown or produced locally?



What's in your waste free lunch box?

A large green rounded rectangle containing ten horizontal dotted lines for writing.



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RESOURCE SHEET 2: WWF'S LIVE WELL PRINCIPLES



EAT MORE PLANTS

Enjoy vegetables, fruits and whole grains.

EAT A VARIETY OF FOODS

Have a colourful plate!



WASTE LESS FOOD

One third of our food is lost or wasted.



EAT FEWER FOODS HIGH IN FAT, SALT AND SUGAR

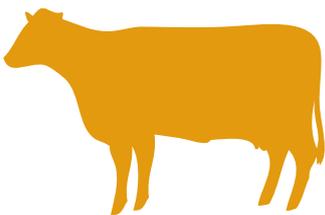
Keep sweet and salty foods for occasional treats.

BUY FOOD THAT MEETS A CREDIBLE CERTIFIED STANDARD

Consider MSC, free-range and fair trade.

MODERATE YOUR MEAT CONSUMPTION

Try other sources of proteins such as peas, beans and nuts.



MSC stands for 'Marine Stewardship Council'. This logo means that the fish you buy was caught in a way that maintains fish stocks and protects the marine environment.



Free range means that the meat and eggs you eat come from animals that have been raised outdoors, at least some of the time.



Fair trade means that workers have received a fair amount of money for their products and worked in safe conditions.



WHAT'S THE LINK BETWEEN DUCKS AND RICE?

OVERVIEW

Through the use of photographs, pupils are encouraged to ask questions to find out more about how food is produced and how it could be done without creating any waste, as nature does.

OBJECTIVES

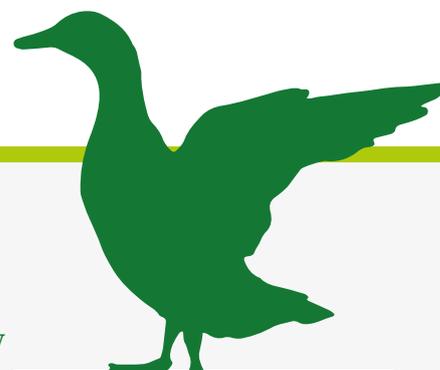
- To identify what pupils want to find out about farming and food production
- To explore the links between elements of a food production system
- To develop critical thinking and enquiry skills through the use of photographs

WHAT YOU NEED

- Resource sheet: What's the link between ducks and rice? [Five photographs of duck, rice plants, Argentinian snail (pest), bowl of rice, farmer]
- One large sheet of paper per group
- Scissors
- Glue
- Pens

GET GOING

Working in small groups, pupils stick the five photographs onto a large sheet of paper and write down their own questions about each photograph (e.g. Where does rice grow? What do snails eat? What do ducks need to survive?). They are then encouraged to think about what could be the link between these photographs. Ask the groups to volunteer their ideas and then introduce the case study 'The power of ducks', which provides an innovative model of food production aimed at eliminating waste. Other photographs about farming and food production could be combined for a similar activity. In pairs, pupils could also design a cool label for an ingredient of their choice that has been grown as nature does, without creating any waste (e.g. food grown at home or in the school garden or ingredient from a local farmers' market).



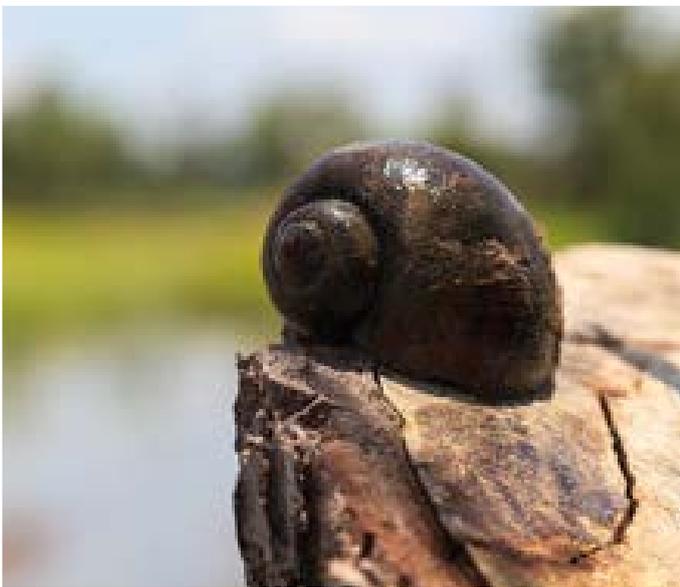
CASE STUDY

THE POWER OF DUCKS

In Japan, a farmer has rediscovered an ancient way of growing rice without the need for chemicals to feed the soil and kill unwanted bugs. They use the power of ducks! The birds eat insects, snails and weeds without touching the rice plants. Moving amongst the plants, the ducks turn the soil with their feet and bills and enrich it naturally with their droppings. Using ducks costs less than expensive chemicals and produces more rice per hectare. And the farmers can sell duck meat and eggs, as well as rice. Today, thousands of farmers across Asia are introducing ducks into their rice paddies. Source: made2bmadeagain.org



RESOURCE SHEET: WHAT'S THE LINK BETWEEN DUCKS AND RICE?





THE PLASTIC STORY

OVERVIEW

In this Science and creative writing activity, pupils find out about the origin of plastic and investigate the different types of plastic packaging. They use their imagination and creative skills to describe the journey of a plastic item when it is not needed anymore.

OBJECTIVES

- To find out how plastic is made and to identify properties of materials
- To look at ways of reducing food waste
- To use language in a creative way

WHAT YOU NEED

- Examples of packaging waste made from different materials (paper, cardboard, plastic, metals, fabric)
- Youtube film 'Ducks Overboard' <https://www.youtube.com/watch?v=fjxLIMF2Fq0>
- Resource sheet 1: Plastic labels (1 PET, 2 HDPE, 3 PVC, 4 LDPE, 5 PP, 6 PS, 7 Plastic made from plants)
- Resource sheet 2: What's in your fridge? (showing the different types of plastic found in a fridge)
- Resource sheet 3: The plastic story (one set of cards per team)

GET GOING

Using a selection of packaging materials, discuss with the class what packaging is made of and why it is important (e.g. to keep food fresh, for transport, etc.). Invite pupils to investigate one of the most widespread packaging materials – plastic. Each pupil brings an item of plastic packaging to school. As a class, sort out the different types of materials, using the labels and information on Resource sheets 1 and 2. Why do we use different types of plastic for packaging? How do the materials differ (soft, rigid, waterproof, etc.)? Which ones can be recycled? (You can find out recycling provision from your local authority). What happens to the rest of plastic waste? The animation film 'Ducks Overboard' can be used to show how plastic in our oceans can spread around the world while a quick search for 'plastic pollution' through your preferred search engine will bring up lots of images showing the effects on the environment. In pairs, pupils research the origin of plastic and place the pictures of the production process shown on Resource sheet 3 in the right order. They can then choose one plastic packaging of their choice and use their imagination to continue the story. What happened to their plastic item when it was no longer wanted? Encourage them to be creative and to think about how it could be reused or recycled to make something else. Examples of packaging imitating nature can be shown (e.g. packaging created by mushrooms, cheese wrapped in leaves, compostable plastic made from plants).

CASE STUDY

COOL PACKAGING

Increasingly, companies are looking at innovative ways of producing packaging that can be composted, reused or recycled. Some packaging is made from crop waste with the help of mushrooms. The mushroom roots help to grow billions of tiny fibres around the waste, forming a solid shape. It takes 5 to 7 days and the packaging can be thrown straight onto the compost heap. Some plastic packaging materials are made entirely from plants while others are made from plastic waste recovered from the ocean. A number of food ingredients are now sold in containers that can be reused and refilled.

RESOURCE SHEET 1: PLASTIC LABELS



PETE



HDPE



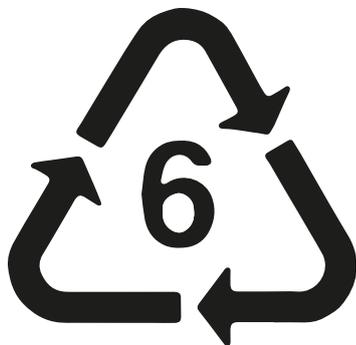
V



LDPE



PP

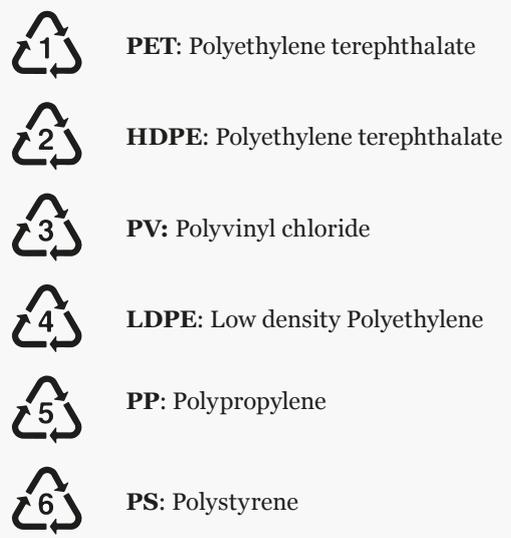


PS



PLASTIC MADE
FROM PLANTS

RESOURCE SHEET 2: WHAT'S IN YOUR FRIDGE?



1 PET: Polyethylene terephthalate

2 HDPE: Polyethylene terephthalate

3 PV: Polyvinyl chloride

4 LDPE: Low density Polyethylene

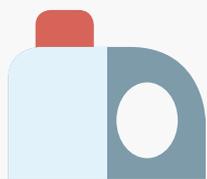
5 PP: Polypropylene

6 PS: Polystyrene

Fizzy drink bottle: **PET**



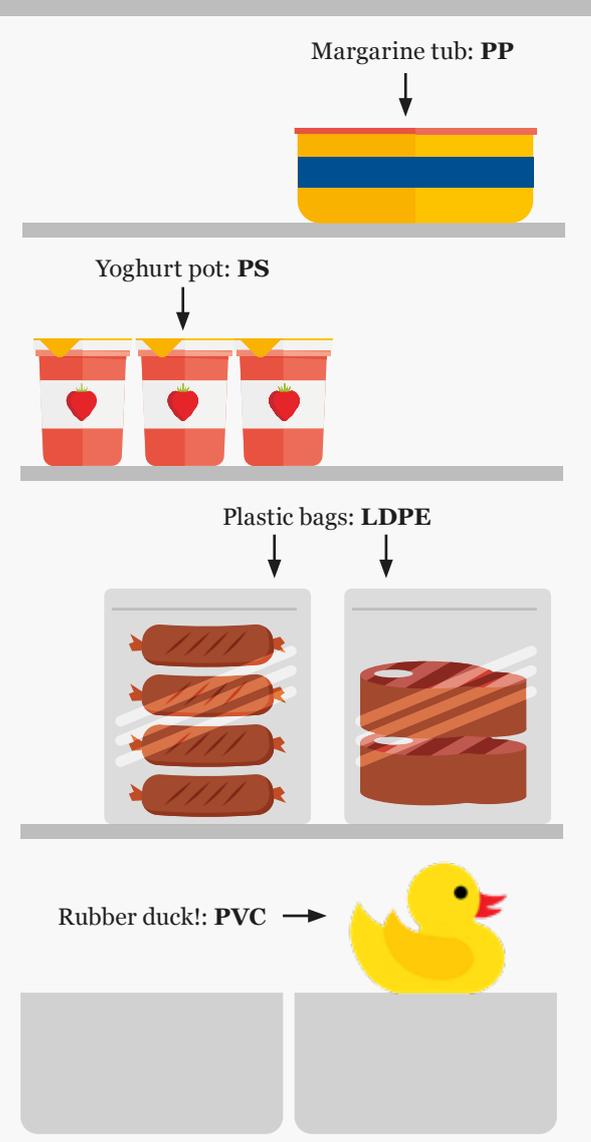
Milk bottle: **HDPE**



Water bottle plastic made from plants



Each type of plastic has to be sorted and recycled separately which can make recycling difficult and costly.



Margarine tub: **PP**

Yoghurt pot: **PS**

Plastic bags: **LDPE**

Rubber duck!: **PVC**

Which plastic goes in the recycling bin?
Look for the recycling symbol



- YES ▶ PET, HDPE
- MAYBE ▶ LDPE and PP (Depending on recycling facilities around your school)
- NO ▶ PVC and PS

RESOURCE SHEET 3: THE PLASTIC STORY



Decide which order the images above should go in and then match the letter to the right number.

1 2

3 4

AMAZING FACT
Time for a plastic bottle to decompose: 500 years to never!





MAKING SOIL AS NATURE DOES

OVERVIEW

This Science and Design and Technology activity encourages pupils to learn about compost as a natural process and to set up a collection system for the whole school.

OBJECTIVES

- To learn that composting is a natural process and an important part of the life cycle of plants
- To discover which foods can be composted and how to create a compost
- To provide real opportunities for pupils to take action to reduce food waste

WHAT YOU NEED

- Resource sheet 1: Compost or bin?
- Resource sheet 2: How to build your compost heap
- Resource sheet 3: Top tips for your compost heap



GET GOING

The project can start with a fun game in the classroom or in the school grounds where two corners are created for pupils to gather: compost or bin. Each pupil is given a card from Resource sheet 1 and is asked to gather in the right corner. Introduce the idea that natural materials (e.g. vegetable peelings, fruit skin, grass cuttings etc.) break down over time whereas some human-made materials (e.g. plastic, metals) can last forever in the environment. Encourage the class to start composting food waste and set up a collection system for the whole school. You can buy a compost bin or build one in the school ground as a Design and Technology project. Making compost is copying what happens in nature by recycling the nutrients found in plants to help new plants to grow. Not only is making compost good for plants, it also cuts down on the amount of food waste and is good for the planet! Composting also provides plenty of opportunities for scientific investigations, looking at how soil forms or studying the life of worms and other invertebrates. Setting up a collection system will help pupils to develop their teamwork and communication skills.

RESOURCE SHEET 1: COMPOST OR BIN?



Apple core



Autumn leaves



chicken bones



cardboard



old carrots



rotten fruit



plastic bag



crisp packet



cut flowers



drink can



drink carton



egg box



egg shells



yogurt pot

RESOURCE SHEET 1: COMPOST OR BIN?



foam packaging



glass bottle



plastic bottle



newspaper



meat leftovers



fish leftovers



paper bag



orange peel



banana skin



tin



grass cuttings



old house plant

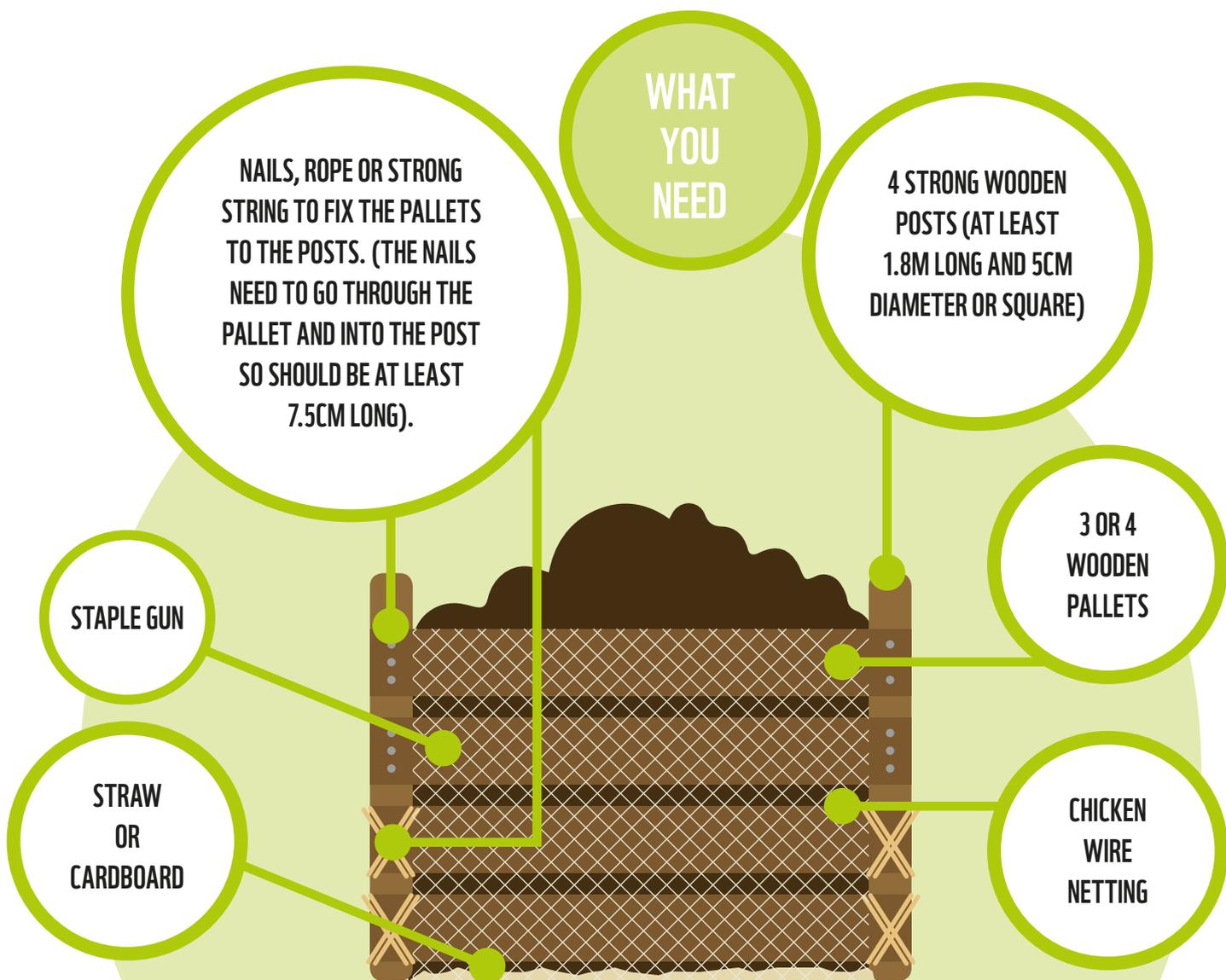


potato peels



cardboard box

RESOURCE SHEET 2: HOW TO BUILD A COMPOST HEAP



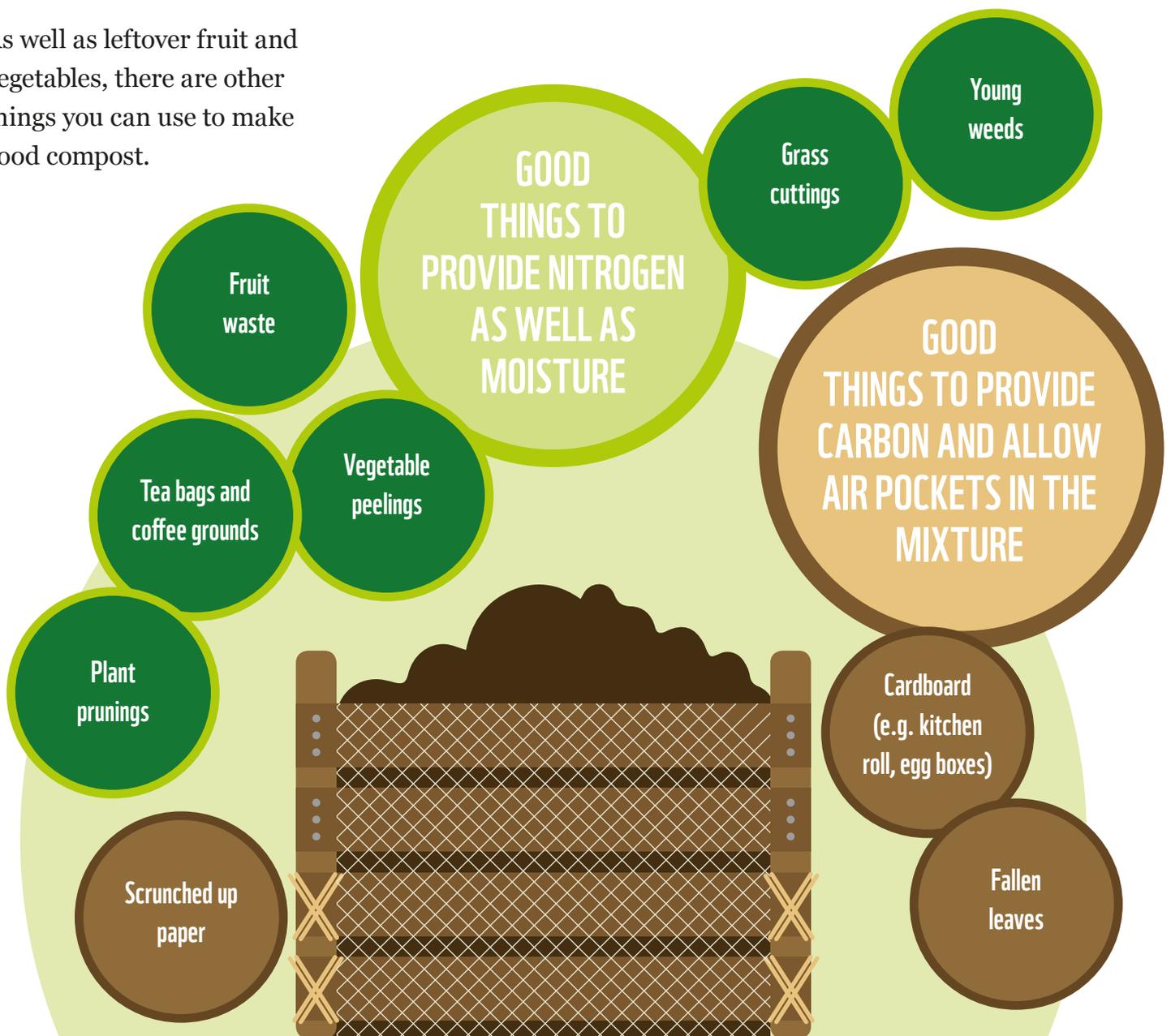
GET GOING

1. Choose the perfect spot for your compost heap, in a sunny or semi-shaded position, directly on the soil or turf and in a well-drained area.
2. Mark out a square – each side should be the same length as the pallets (or other wood) you use.
3. Dig in a post at each corner of your square with a hammer, deep enough so the heap doesn't collapse in a year or two.
4. Nail the three pallets at the sides and back of the heap to the posts, making sure they are really secure. You can also use rope to tie the pallets on.
5. Staple the chicken wire to the inside and outside of the pallets, and then fill the gap in between with straw. (This is optional but it helps to keep the heat in and speed up the composting process).
6. Spread some straw or cardboard on the base of your compost heap to make sure it will drain well. You can then tie a pallet to the front of the heap or leave it open and ready to go!



RESOURCE SHEET 2: TOP TIPS FOR YOUR COMPOST HEAP

As well as leftover fruit and vegetables, there are other things you can use to make good compost.



KEY NOTES

The key is to provide the right mix of ingredients and let nature do the rest. The perfect compost should have alternating layers of 'greens' (kitchen waste, grass cuttings) and 'browns' (cardboard, fallen leaves) for a good balance of nitrogen and carbon. If your compost is too wet, add more 'browns'. If it's too dry, add more 'greens'. Turning your compost heap also helps to aerate and mix up the waste, speeding up the process.

THINGS TO AVOID PUTTING IN YOUR HEAP:

- Meat, fish and dairy products or cooked food (as it can attract vermin)
- Diseased plants
- Perennial weeds (such as dandelion and thistle) or weeds with seed heads.



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LOVE YOUR LEFTOVERS

OVERVIEW

Pupils are encouraged to find yummy recipes from their family and friends using leftovers and to compile them into a fun cookbook or write a recipe blog.

OBJECTIVES

- To raise awareness of the importance of reducing food waste in the school and local community
- To develop creative writing and computing skills

WHAT YOU NEED

- Access to a computer

GET GOING

Invite the class to create a well-designed questionnaire in order to gather recipes from the local community, using food leftovers. Stale bread can be turned into a delicious desert and ripe bananas make perfect ingredients for healthy smoothies. This activity is also a great opportunity for pupils to find out more about food and cooking habits from different cultures in the school community. The class can compile their recipes into a 'Love your leftovers' cookbook or post them on a food blog on the school website.



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WHAT DOES WWF DO?

Food is at the heart of many environmental issues – it's a significant contributor to climate change and responsible for 60% global biodiversity loss. Livewell is WWF-UK's work on sustainable food consumption and looks at the food changes we need to make to achieve a sustainable future.

Livewell presents a diet – the Livewell Plate – which is healthier for people and our planet. Over the year's we've developed Livewell Plates for four countries: the UK, France, Spain and Sweden. The last three were part of a European Commission funded project called LiveWell for LIFE, which aimed to show how sustainable diets can help reduce greenhouse gas emissions from the EU food supply chain by at least 25% by 2020 – whilst being healthy, nutritious and affordable!

Our Livewell work has helped shape the debate on sustainable diets over the last few years. From being a niche topic, it is now making its way into the mainstream. We work with policy-makers, academics and food business to influence change. But the great thing is that Livewell is accessible to everyone, for example with the help of our Six Livewell Principles which help us to learn more about how we can lead a healthy, sustainable life.



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