# Education Pack Fighting against food waste



Primary 1 - 3



Primary 4 - 6



Primary 6 - 7



Secondary



Whole school



### Introduction

Welcome to the Love Food Hate Waste education pack for the Scottish curriculum. Love Food Hate Waste is here to help us all make the most of the food we love. By taking simple steps we can all reduce the food that we end up throwing away, saving ourselves money and reducing our impact on the planet. In Scotland, Love Food Hate Waste is run by Zero Waste Scotland as part of our drive to value resources and inspire change.

Through a variety of engaging and easy to use inter-disciplinary lessons, your learners are given a voice on a significant problem facing our world today. They are able to contribute directly in a positive and tangible way to the Global Goals for sustainable development from the United Nations and the Scottish Government pledge to reduce the food we throw away by 33%.

We are here to support your teaching and enhance learning. Along with curriculum links and engaging activities this pack includes:

### Primary lessons

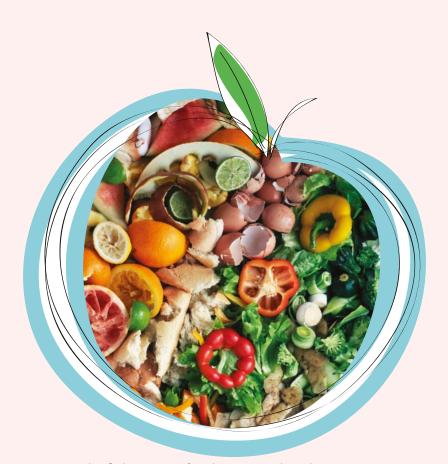
The first lesson of each age group will inform and inspire your learners, the second will have them loving and valuing food, while the third will give them all the practical know-how to hate waste and save food from the bin.

### Secondary lessons

Subject specific and stand-alone, these lessons are the perfect opportunity to embed Learning for Sustainability across the curriculum and tackle a pressing global issue in a different context.

### • Whole school lessons

Putting your learning into practice, the whole school lessons facilitate your engagement with food in the school setting and support you in sharing what you've learned with the wider community.



Thank you for joining us in the fight against food waste and we hope you enjoy taking your learners along on this journey to save food from the bin.

The Love Food Hate Waste team, Zero Waste Scotland.

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Primary 6 - Primary 7

# **Curriculum links**

Lesson 1 The road to reduction	Lesson 2 Cultures of taste and waste	Lesson 3 Investigating change	
HWB 1-35a / 2-35a	HWB 2-33a, HWB 2-34a, HWB 1-35a / 2-35a	HWB 2-33a, HWB 3-33a, HWB 2-36a	
MNU 2-01a, MNU 2-03a, MTH 2-05c, MNU 2-07a, MNU 2-11b		MNU 2-10b	
		SCN 2-13a, SCN 2-19a,	
SOC 1-08a, SOC 2-08a	SOC 1-08a, SOC 2-08a, SOC 2-16c, SOC 2-19a		
TCH 1-02a, TCH 2-02a		TCH 1-02a, TCH 2-02a	
	The road to reduction  HWB 1-35a / 2-35a  MNU 2-01a, MNU 2-03a, MTH 2-05c, MNU 2-07a, MNU 2-11b  SOC 1-08a, SOC 2-08a	The road to reduction  Cultures of taste and waste  HWB 1-35a / 2-35a  HWB 2-33a, HWB 2-34a, HWB 1-35a / 2-35a  MNU 2-01a, MNU 2-03a, MTH 2-05c, MNU 2-07a, MNU 2-11b  SOC 1-08a, SOC 2-08a SOC 2-16c, SOC 2-19a	





### In a nutshell

In this lesson the environmental impact of food waste is explained both in terms of the effort involved in producing it and the gases released if it is sent to landfill. Learners are encouraged to think about what is wasted in their own homes and on a broader scale across the country including how Scotland has pledged to reduce what is thrown away.



### Core learning

We are learning that wasting food is bad for the planet because we understand that if we put it in the landfill bin it releases harmful gases and wastes all the effort that went into getting it to our plates.

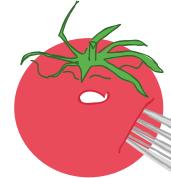


### Preparation

Prior to this lesson ask learners to fill out a 'Food waste diary' for one week.









### Starter

Divide learners into groups of 2 or 3 and ask them to discuss their food waste diaries.

Ask learners to think about these questions:

- What types of food did you waste? (e.g. Fruit and Veg, Dairy, Bakery, Meat and Fish)
- What type of food did you waste most?
- Why do you think you wasted this food?
  - Didn't like the taste?
  - Felt too full?

If your school is completing the whole school activity remind the class that during the 'Autopsy of food waste' lesson we learned that there is unavoidable food waste (e.g. peelings, skins, apple cores, egg shells) and avoidable food waste (i.e. food that could have been eaten).

- Ask learners to discuss any food waste in their diaries that they think was avoidable.
- Ask learners to add up the food wasted at home to find a total weight for the whole week. Write learner's individual totals on the whiteboard and calculate an overall total for the class.
- Ask learners what is the average amount of food wasted per class member during 1 week?

Total weight of food wasted

Number of learners in the class

In Scotland we throw away 600,000 tonnes of food from our homes every year.

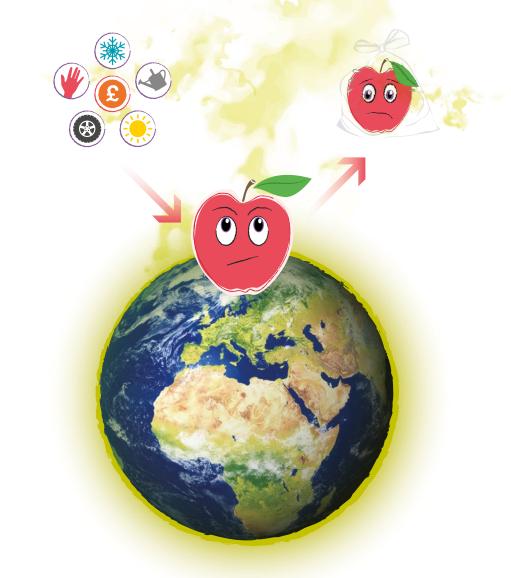
Of this food waste, roughly 60% is classed as avoidable.

- Ask learners what is this in tonnes? (= 360,000 tonnes)
- Ask learners, if our class has wasted X kg of food in 1 week and 60% of this food waste is avoidable, what is the weight of food we may have wasted unnecessarily?

Show learners the 'Road to reduction' PowerPoint.

The main message that learners should take away from this PowerPoint is that in terms of affecting the planet food is very important because it can be doubly damaging.

- Producing food uses energy, natural resources and activities that create greenhouse gases.
- If we then waste the food we bought, and it is sent to landfill, this will create yet more greenhouse gases that causes our planet to heat up.
- Recycling any food waste is better, as it will be sent for composting or anaerobic digestion - a process that creates energy from the waste. For more information on this see the food waste recycling lessons from Recycle for Scotland.
- BUT by binning it you're still wasting all the energy, resource and effort to produce it and get it to you in the first place - so why not save it from the bin?



Tell learners that a lot of things we do affect our environment but food waste is actually something that we have the power to change. By not wasting food, we can help protect our planet.

You may also wish to show learners this short film on food waste from the United Nations:

https://www.youtube.com/watch?v=loCVrkcaH6Q



### Main

Explain to learners that we can now begin to understand that when we throw away food not only do we waste all the effort that goes into producing it, our wasted food also lets off harmful gases in landfill that damage our environment. These gases are often called greenhouse gases because of the way they make our planet warmer in the same way that a greenhouse makes plants warmer.

- Tell learners that if we saved all the avoidable food waste from the bin in Scotland it would have the same positive environmental impact as taking 1 in 4 cars off the road.
- Tell learners that the Scottish Government has pledged to reduce food waste in Scotland by 33% by 2025 and that we are on a journey to get there.

In the Starter section we have calculated the weight of food our whole class has wasted in 1 week.

- Ask learners, if we waste X weight in 1 week, how much will we waste in 1 year? (i.e. multiply by 52 weeks)
- Ask learners to calculate how much food will we waste in the next 8 years if we do nothing to reduce this? (8 years = 2017 2025)

Now ask learners to complete column 1 of the table on the last slide of the PowerPoint. You should use the total weight of food wasted over 8 years and the average transport weight provided.

How many buses / trains / jumbo jets / ferry boats of food will we waste by 2025 if we do nothing?

Type of Transport	Average Weight	1  How many will  we waste by 2025?	2  How many can  we save by 2025?  (i.e. reduce by 33%)
Bus	10 tonnes		
Train carriage	38 tonnes		
Jumbo Jet plane	180 tonnes		
Ferry boat	2643 tonnes		

- If we reach Scotland's target of reducing food waste by 33% by 2025 how many tonnes of food will we have saved? (8 years total food weight wasted minus 33%)
- Ask learners to complete column (2) of the table by calculating how many buses / train carriages / jumbo jets / ferry boats of food can they try to save?











### Dessert

Ask learners to create a way of communicating what they have learned in the lesson so far using the tonnages from the Main activity. This could be in the form of:

- A sway presentation to another school about what they've learned.
- A visual 'map' poster of why we should reduce food waste using the transport tonnages with a 33% reduction as the end of the journey.
- A leaflet for a local restaurant telling diners about the impact and scale of food waste in Scotland.



### Extra helping

Why not share learners presentations via your school website or a class blog?

# Curriculum for Excellence Experiences and Outcomes Health and Wellbeing

- HWB 1-35a / 2-35a: When preparing and cooking a variety of foods,
   I am becoming aware of the journeys which foods make from source to
   consumer, their seasonality, their local availability and their sustainability.
   Numeracy and Mathematics
- MNU 2-01 a: I can use my knowledge of rounding to routinely estimate the answer to a problem, then, after calculating, decide if my answer is reasonable, sharing my solution with others.
- MNU 2-03a: Having determined which calculations are needed, I can solve problems involving whole numbers using a range of methods, sharing my approaches and solutions with others.
- MTH 2-05c: Having explored the patterns and relationships in multiplication and division, I can investigate and identify the multiples and factors of numbers.

- MNU 2-07a: I have investigated the everyday contexts in which simple fractions, percentages or decimal fractions are used and can carry out the necessary calculations to solve related problems.
- MNU 2-11b: I can use the common units of measure, convert between related units of the metric system and carry out calculations when solving problems.

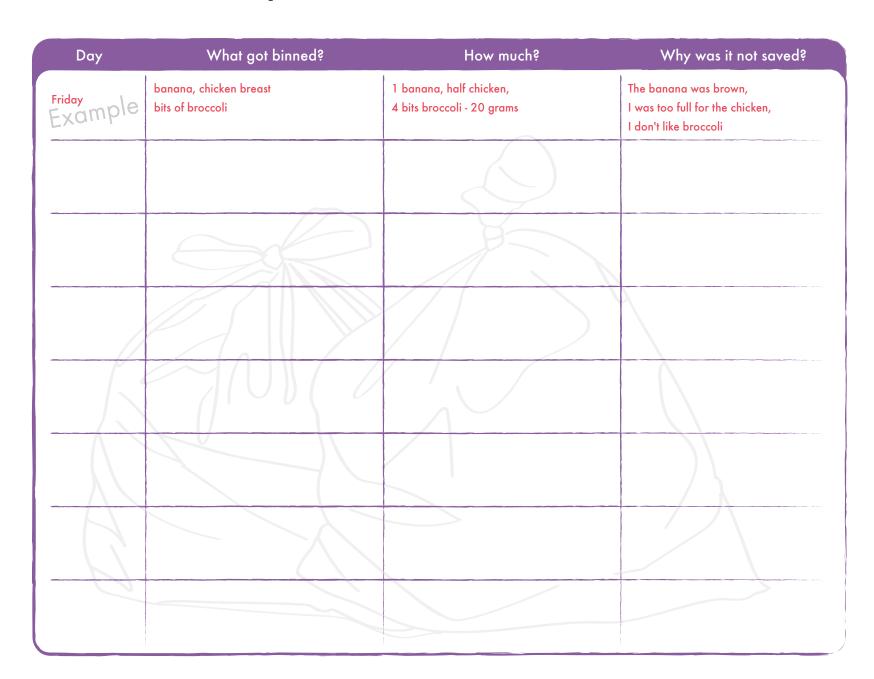
#### Social Studies

- SOC 1-08a: I can consider ways of looking after my school or community and can encourage others to care for their environment.
- SOC 2-08a: I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally responsible way.

### Technologies

- TCH 1-02a: Throughout all my learning, I can take appropriate action to ensure conservation of materials and resources, considering the impact of my actions on the environment.
- TCH 2-02a: Having analysed how lifestyle can impact on the environment and Earth's resources, I can make suggestions about how to live in a more sustainable way.

# Food waste diary





### Helpful tips

Pin your diary to the fridge to remind you to fill it in!

Record waste from every meal

Include all food waste (e.g. peelings, fruit skins, tea bags etc.)

A rough estimate of the quantity will be fine.



### 2. Cultures of taste and waste



### In a nutshell

In this lesson learners will explore the importance of valuing food by looking at how countries around the world celebrate food and use up leftovers in interesting ways. They will design their own leftover recipes and create a poem inspired by the traditional celebration of Scotland's national dish - 'Address to a Haggis'.

### Core learning



We are learning how food is valued and celebrated in different cultures across the world and in Scottish culture. We understand that cooking with leftovers is a way of valuing food and saving it from the bin.

### Preparation



- Access to the internet.
- 'Cultures of taste and waste' PowerPoint.
- Share the 'Reimagining leftovers' sheet with the class or print -1 per learner.
- Display 'Address to a Haggis' on a whiteboard/projector.





### Starter

Tell the class that what we eat is affected by the country we live in.

Ask learners why they think this might be? It could be because of geography and what food we have access to but it could also be down to our culture - our preferences that we've developed over time. You may want to show learners these **photographs** from the book 'Hungry Planet: What the World Eats'. It shows different families from around the world with all the food they eat in one week and how much this costs.

Divide learners into small groups and give each group a country to research; they may wish to select it themselves.

#### Ask learners to research:

- What food is their chosen country famous for?
- What food is eaten on special occasions such as birthdays, religious festivals or weddings?
- How do they celebrate food in their chosen country?

Ask learners to present their findings back to the rest of the class.

### After the presentations ask learners:

- Can you name any food that Scotland is famous for? (Haggis, salmon, beef, venison, shortbread, porridge, oatcakes, Arbroath smokies).
- Explain that Scotland has produce and dishes that we should be very proud of and that if you are proud of food you should save it from going in the bin. Food is something that should be celebrated and not chucked out!
- If your school has a <u>Food For Life</u> catering mark, why not ask where your school dinners come from? Are there local foods you can be proud of?

### 2. Cultures of taste and waste



### Main

Tell learners that one way to show that we are proud of food and that we value it is to use up or reimagine food we have leftover after meals.

Show the class the following slides on leftover dishes from different countries and explain each dish to them.

### Meat & Vegetables:

- Slide 1- This slide shows leftover meat and vegetables from an everyday meal.
- The next two slides show that the meat and vegetables have been transformed into a Frittata from Spain and a Pytt i Panna from Sweden.

#### Rice:

- Slide 4 This slide shows a pile of leftover rice.
- The next two slides show that the leftover rice has been transformed into Nasi Goreng from Indonesia and Arancini from Italy. It is worth explaining to learners at this point that leftover rice is safe to eat if it has been cooled down quickly, stored in a sealed container in the fridge and used within a few days.

### **Bread:**

- Slide 7 This slide shows several slices of leftover bread.
- The next two slides show that the left leftover bread has been transformed into Pain Perdu or 'eggy bread' from France and Pudina tal-Hobz a bread pudding using cocoa and raisins from Malta.

#### **Potatoes:**

- Slide 10 This slide shows some leftover cooked potatoes.
- The next two slides show that the potatoes have been re-imagined into Bubble & Squeak from the UK (have learners ever had this made from Sunday roast leftovers?) and German Bratkarfoffeln or 'pan fried potatoes' that are made from leftover potatoes, bacon and onion.

If learners have completed their food waste dairies during the previous lesson it may be helpful to refer to them. Discuss what could have been used-up or reimagined. Give learners the 'Reimagining leftovers' worksheet and have them fill in the sheet to create their own leftover recipes.

Ask learners to share the dishes that they have reimagined in the worksheet with the rest of the class. Do any of the dishes sound similar to dishes from any of the countries

that they have been researching?

If it is possible you may wish to create some of their dishes or why not work with your school kitchen to get them on the menu.



### 2. Cultures of taste and waste



### Dessert

Discuss with learners if they think that we value food in Scotland. If not why not? You may wish to refer to the food discussed at the beginning of the class and the aspirations for Scotland's food waste discussed in the previous lesson.

Explain to learners that a traditional way that we celebrate food in Scottish culture can be seen on Burns Night. You may wish to show pictures or videos of a traditional Burns Supper.

Ask learners how this compares to the food celebrations in the countries that they researched?

Read the poem 'Address to a Haggis' to learners and ask them to create their own poem about valuing food and reimagining any leftovers to save them from the bin.



### Extra helping

Why not have learners perform their poems at an assembly and/or share the poems on the school website or via a class blog'?

# Curriculum for Excellence Experiences and Outcomes Health and Wellbeing

- HWB 2-33a: Having learned about cleanliness, hygiene and safety, I
  can apply these principles to my everyday routines, understanding their
  importance to health and wellbeing.
- HWB 2-34a: Through exploration and discussion, I can understand that food practices and preferences are influenced by factors such as food sources, finance, culture and religion.
- HWB 1-35a / 2-35a: When preparing and cooking a variety of foods, I am becoming aware of the journeys which foods make from source to consumer, their seasonality, their local availability and their sustainability.

#### Social Studies

- SOC 1-08a: I can consider ways of looking after my school or community and can encourage others to care for their environment.
- SOC 2-08a: I can discuss the environmental impact of human activity and suggest ways in which we can live in a more environmentally responsible way.
- SOC 2-16c: I can discuss issues of the diversity of cultures, values and customs in our society.
- SOC 2-19a: By comparing the lifestyle and culture of citizens in another country with those of Scotland, I can discuss the similarities and differences.





1. Pick one of the following foods to be reimagined:

Meat Vegetables Fruit 2. Ideas for reimagining leftovers:

Meat - pasta or rice dish Vegetables - soup or omelette Fruit - smoothie or pancakes 3. Draw a picture of your dish and write down what is in it

# Your dish

What is in your dish? What does it taste like?



Fair fa' your honest, sonsie face, Great chieftain o the puddin'-race! Aboon them a' ye tak your place, Painch, tripe, or thairm: Weel are ye worthy o' a grace As lang's my arm.

The groaning trencher there ye fill,
Your hurdies like a distant hill,
Your pin wad help to mend a mill
In time o need,
While thro your pores the dews distil
Like amber bead.

His knife see rustic Labour dight,
An cut you up wi ready slight,
Trenching your gushing entrails bright,
Like onie ditch;
And then, O what a glorious sight,

Warm-reekin, rich!

Good luck to you and your honest, plump face,
Great chieftain of the sausage race!
Above them all you take your place,
Stomach, tripe, or intestines:
Well are you worthy of a grace
As long as my arm.

The groaning trencher there you fill,
Your buttocks like a distant hill,
Your pin would help to mend a mill
In time of need,
While through your pores the dews distil,
Like amber bead.

His knife see rustic Labour wipe,
And cut you up with ready slight,
Trenching your gushing entrails bright,
Like any ditch;
And then, O what a glorious sight,
Warm steaming, rich!





### In a nutshell

In this lesson learners will be introduced to key behaviours that help reduce food waste at home. They will put what they've learned to the test by conducting an experiment on where is best to store certain types of food. Finally, they will build on their existing knowledge and use their imaginations to design a technological solution to save food from the bin.



### Starter

Show learners the '<u>Investigating change</u>' PowerPoint, the key points to note include:

- **Portioning** Eating just the right amount for us and not taking more than we need can save food from the bin and help our planet too.
- Date labels The 'use by' date is important as it is about food safety, but the 'best before' date is just an indication of when food is at it's absolute best in terms of quality.
- **Planning** Knowing what's in our cupboards before we go to the shops can really help us save food from the bin. What do learners think of writing a shopping list how can this help us to save food from the bin?
- **Storage** Do you know that the freezer acts like a pause button on food and keeps the freshness locked in? Explain to learners that they will be looking at storage in more depth later in this lesson.



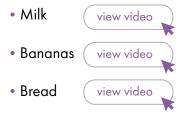




### Main

Tell learners that we are now going to investigate why some storage places are better than others for different food.

Why not watch these time-lapse videos, which show different foods going off? If you want learners to predict what is going to happen show these at the end of the lesson.



### **Experiment - What's best where?**

Explain to learners that they will be exploring storage conditions for a banana, some yoghurt and bread. Learners will be aware of the correct storage conditions for these items from the PowerPoint earlier but this activity will allow them to put the theory to the test.

### Set up:

Place the yoghurt into two clear and sealed containers. One container should be kept in a fridge while the other should be left at room temperature.

- Place one banana in its skin in the fridge for the duration of the experiment the other should be kept at room temperature.
- Leave one slice of bread out in the open and put another slice in an airtight bag (such as a sandwich bag) for the duration of the experiment.

With learners, decide on a plan and timeline for your experiment:

- How many days will it last for?
- How often would learners like to observe the food and how they are going to record their findings during the course of the investigation?
   E.g. take photos of the bread, draw pictures of any changes that have occurred, describe changes that they observe.

Once the details of the experiment have been decided, place the food in the designated storage areas and observe them over the course of the next few days. At each observation learners should record the condition of the food by rating it out of 10 with 10 being fresh and 1 being stale. When scoring learners should pay attention to what the food looks like (colour, texture and mould growth) and what it smells like.



Ask learners to write this table in their jotters and to fill in the results each day.

Conditions of food storage	Day 1	Day 2	Day 3	Day 4	Day 5
Banana - fridge					
Banana - out of fridge					
Bread - sealed					
Bread - out in the open					
Yoghurt - fridge					
Yoghurt - out of fridge					

#### **Results:**

Ask learners to plot the results of their experiment in a line graph with one axis being the score out of 10 and the other being the number of days.

- It is expected that the banana in the fridge will have turned black while the banana left at room temperature will still be a similar colour.
- It is expected that the yoghurt kept out of the fridge will have changed in appearance and smell, showing signs of mould, whilst the yoghurt kept in the fridge will be relatively unchanged.
- It is expected that the bread kept out in the open will be firmer to the touch and showing signs of going stale in comparison to the sealed bread.

### **Conclusions:**

Ask learners to write down their conclusions from this experiment and have a discussion with the class about the results.

- Bananas should not be stored in the fridge but why is this? Bananas are grown in hot countries. Cold temperatures speed up the chemical reaction in the skin.
- Yoghurt should be stored in the fridge. The bacteria in yoghurt grow faster in warmer temperatures and are more active causing the condition of the yoghurt to change quicker.
- Bread should be kept sealed not out in the open. Bread loses moisture if left in air and this together with a chemical reaction involving starch causes it to go dry and stale.

The overarching conclusion from this experiment is that all foods have an optimal method of storage to keep them fresh for as long as possible. Explain to learners that storing food in the right place is important if we want to save it from ending up in the bin.





### Dessert

Tell learners that they have seen how technology and inventions like a fridge have a big impact on how long we can keep food fresh and how we can reduce what we throw in the bin.

Explain to learners that Scotland is aiming to become a good food nation. This means that we are committed to looking after our food, making sure that everyone has access to good food and that food doesn't go to waste.

Ask learners to research what other technologies are currently on the market or being developed to help reduce food waste.

#### There are:

- Smart fridges, which have built in cameras (accessible via an app), so that owners can check their contents while out shopping to save over buying.
- Innovative food labels or packaging technology that changes colour to remind us not to forget when food is going off. Why not check out the Bump Mark food freshness checker?
- Apps like Olio and Too Good To Go which help to connect people or restaurants that have leftover or surplus food to people that want it.

Once they have researched what is out there/coming soon, ask learners to design a technological solution to reduce food waste. The invention could look at one of the key behaviours that were discussed at the beginning of the lesson (storage, portioning, freezing, date labels, planning).

### Ideas might include:

- Something that helps with storing food in the fridge or cupboard.
- New packaging or a product that keeps food fresher for longer.
- An app that helps use leftovers maybe you take a photo of your food and it tells you what to make with it.
- An invention that cuts costs and reports financial or even environmental savings.

Give each learner a 'Waste fighting tech challenge' worksheet.

Encourage them to be as innovative and creative as possible when coming up with their product.







### Extra helping

Why not organise a dragons den style event and have dragons judge which solution wins? You might want to ask one of the <u>Food and Drink</u>
<u>Federation Scotland</u> industry ambassadors to come in and help to judge or contact us on:



Remember to share what learners have designed on your school website where they can get feedback from teachers and learners



# Curriculum for Excellence Experiences and Outcomes Health and Wellbeing

- HWB 2-33a: Having learned about cleanliness, hygiene and safety, I
  can apply these principles to my everyday routines, understanding their
  importance to health and wellbeing.
- HWB 3-33a: I can apply food safety principles when buying, storing, preparing, cooking and consuming food.
- HWB 2-36a: By investigating food labelling systems, I can begin to understand how to use them to make healthy food choices.

#### Sciences

- SCN 2-13a: I have contributed to investigations into the role of microorganisms in producing and breaking down some materials.
- SCN 2-19a: I have collaborated in activities which safely demonstrate simple chemical reactions using everyday chemicals. I can show an appreciation of a chemical reaction as being a change in which different materials are made.

### Numeracy and mathematics

 MNU 2-10a: I can carry out practical tasks and investigations involving timed events and can explain which unit of time would be most appropriate to use.

### **Technologies**

 TCH 1-11a / TCH 2-11a: Through discovery and imagination, I can develop and use problem-solving strategies to meet design challenges with a food or textile focus.

# Waste fighting tech challenge

Name of product:

Brief description: What will it do or how will it be used?
Research: What things have you seen on the market that are similar to your
product?
Feedback: Ask classmates, family and friends if they think that your product is a good idea. Listen to the feedback that you get and make a list of suggestions that they make here:





# A'peeling links & resources

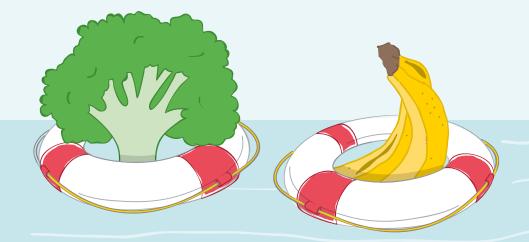
We hope that you have enjoyed working through this food waste fighting education pack from Love Food Hate Waste. If you're still hungry for more, why not explore some of the links below?

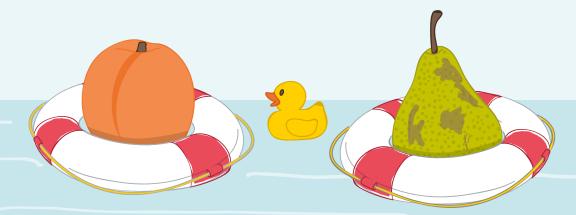
- The Global Goals for sustainable development from the United Nations - this pack contributes directly to goal 12.
   Responsible Consumption & Production but touches on others including goals 11 and 13.
- Wasteless
- Food for Life don't forget to share your success in the stories section.
- Quality Meat Scotland
- Royal Highland Education Trust
- Food and Drink Federation Scotland
- Eco Schools Scotland
- Chefs @ School

- Royal Environmental Health Institute of Scotland
- Food Standards Scotland
- Scottish Business in the Community Food for Thought
- Seafood in Schools
- Better Eating Better Learning
- Making Things Last A Circular Economy Strategy for Scotland, including the food waste target.
- The Crunch Food, Health & our Environment

With special thanks to Do Be Ltd for their work in developing this resource.







### Love Food Hate Waste is delivered in Scotland by Zero Waste Scotland





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