Food and Agriculture Organization of the United Nations

INTERNATIONAL FOOD WASTE COALITION

EDUCATION MATERIAL PACKAGE ON FOOD WASTE REDUCTION IN PRIMARY AND SECONDARY SCHOOLS

DO GOOD: SAVE FOOD!

For age group 4 14 YEARS UP

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Foreword

Making children aware of world food challenges "is about involving them in building the future we want." (José Graziano da Silva, FAO Director-General)

Today, an estimated 1.3 billion tons of all food produced for human consumption is lost or wasted on an annual basis, at a cost of more than USD 940 billion to the global economy, while approximately 815 million people across the globe suffer from chronic malnutrition and more than 2000 million people suffer from micronutrient deficiencies.

Educating young people to value food, in an effort to reduce food waste, will go a long way to bringing about the behavior change required to stem the problem now and in the future.

"DO GOOD: SAVE FOOD!" is an education package designed for that purpose. This education package is the output of a comprehensive, scientific and inclusive development process that involved the input of both public and private sector stakeholders. It responds to the growing public demand for information on the causes of and solutions to addressing food waste and seeks to engage children in the global endeavour to reduce food waste and alleviate its associated economic, environmental and social impacts.

The package lays out a holistic food systems perspective in tandem with a communication style and tools that are appropriate for the sensitisation of children to the issues. It is designed to enable teachers and educators to select and implement components they consider to be most pertinent. Examples and tips on how children can become active 'food-savers' as well as agents of change through transmitting the messages to their families and friends are also provided.

The content of the package has been designed in a format that can be easily adapted for different target audiences, whether from developed or developing countries.

The package will contribute to meeting the global target for food loss and waste reduction: Sustainable Development Goal (SDG) target 12.3 - *halve per capita global food waste at the retail and consumer levels and reducing food losses along production and supply chains (including post-harvest losses) by 2030* as well as addressing other related targets such as malnutrition, climate change and natural resource preservation.

We hope that this training package will stimulate thought and action among children and their families, to reduce food waste.

Anna Lartey

Director
Nutrition and Food Systems Division

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INTRODUCTION

Background

Food loss and waste are a massive global problem: One-third of all the food produced in the world is either lost or wasted, which means that every year, a staggering 1.3 billion tonnes of perfectly good and edible food does not reach the end-consumer – 100 kg for each of us. Not only does this wastage create immense economic costs of around USD 1 trillion; food loss and waste also come at a high environmental and social price.

Reducing food loss and waste is an important global endeavour that we can, and should, all take part in; particularly in industrialised countries, changes in consumer behaviour can significantly reduce the amount of food wasted. Getting children and teenagers involved is a central aspect of fighting waste, they are the future of our planet and their knowledge and actions will shape future life on earth.

From a pedagogical point of view, discussing the reasons for, and consequences of, food loss and waste with students touches upon and reinforces central educational aspects: It encourages children and teenagers to think about their relationship with the environment and their own important place in the social, political and ecological world. Students have the opportunity to appreciate their role as global citizens and agents of change. The role students can play as disseminators of food waste reduction knowledge and as experts within their families and local and school communities has the potential to raise their level of self-assurance and self-esteem.

The development of an education material package on food waste reduction for primary and secondary schools, under the slogan "DO GOOD: SAVE FOOD!" by the Food and Agriculture Organization (FAO), in close collaboration with the International Food Waste Coalition (IFWC), took place against this backdrop.

This resource, conceptualised as a teaching material package, aims to raise awareness among school children, teachers and staff and their related families/networks on food loss and waste issues, and to introduce good practices that are conducive to food waste prevention and reduction, with an expected long-term impact. It also contributes to the achievement of multiple Sustainable Development Goals (SDGs), particularly target 12.3, which aims to halve food waste and to reduce food loss globally by 2030.

How to use this teaching material

This teaching material on food waste reduction in primary and secondary schools has been tailored for four age groups: five to seven (age group 1), eight to nine (age group 2), ten to thirteen (age group 3) and fourteen years and above (age group 4), reflecting the different abilities and interests that exist throughout the wide age range covered.

For each age group, the package consists of **two core lessons** and **various follow-on activities**. Our rationale in designing this material has been to make it as flexible as possible: You will find enough material here to fill a whole series of lessons, but if you have limited lesson time available, one or a few activities can stand on their own.

The core lessons consist of a series of **illustration slides** (these can be found in the appendix) plus accompanying voice-over scripts (these can be found within the main body of the material). The core lessons provide students with the fundamental knowledge required before moving on to the follow-on activities. The starting-point is the information-centred **core lesson 1, "DO GOOD: SAVE FOOD!**", which outlines the causes and consequences of food waste while offering some initial practical solutions. Practice-based **core lesson 2**, "**Feed yourself, don't feed the bin: nine easy tips to reduce food waste**", on the other hand, features a more hands-on approach and introduces concrete actions to reduce food waste. Depending on time and resource availability, technical appliances in the classrooms, as well as the age and abilities of the students, teachers can decide to project or print the illustration slides and then read the voice-over in the form of a story (probably most suitable for younger students), have it read out by the students themselves, adapt it to form a small drama/role-play exercise, or assign the thorough reading of it as a homework task (more suitable for the older students of age group 4).

2 CORE LESSONS

Starting point: The information-centered core lesson 1 "DO GOOD: SAVE FOOD!"	2nd step: The practice-based core lesson 2 "Feed yourself, don't feed the bin: nine easy tips to reduce food waste"
	

Each presentation is accompanied by a set of follow-on activities that aim to reinforce the message conveyed. The activities come in a variety of forms. These range from worksheets to discussions, games, drama/writing exercises and projects suitable for students and groups with diverse interests, talents and creative, analytical and content-related experience. Each activity includes learning objectives and useful instructions that detail the time and resources required for successful implementation.

FOLLOW-ON ACTIVITIES	
Worksheets	Foster a deeper understanding of the topic's main issues, enable textualisation and consolidate content.
Discussions	Content-driven group activities that allow for further intellectual and/or creative involvement with the topic.
Games	Revisit the topic's main issues and give students the opportunity to deepen their understanding in a playful manner.
Writing exercises	Foster creative and cognitive involvement with the topic.
Projects	Hands-on, practice-based activities that take place over the course of several days and encourage behavioural changes.

Flexibility was at the forefront of the planning process. The materials have been structured in a way that enables teachers to select those activities that best match the needs, abilities and interests of their students while also conforming to time and resource constraints. Both core lessons and most follow-on activities exist for all age groups and only differ in terms of the depth in which they discuss the topic, so if you feel that a particular exercise is too challenging or not challenging enough for your students, the material will give you the opportunity to choose the same activity from a different age group. The majority of the activities can be completed within 45 minutes; those that cannot have been split up into different parts. These particular lessons can be conducted over the course of a few days. Further materials, such as posters, leaflets and brochures, can be found on the FAO website.

We would love to hear about your experience of using these materials! Your feedback will help us to improve and update the product. Please get in touch by email: Save-Food@fao.org.

Overview of the core lessons and follow-on activities

Activity	Students are asked to ...	Learning objective	Time requirement
CORE LESSON 1: DO GOOD: SAVE FOOD!			
DO GOOD: SAVE FOOD! 	... read or listen to a presentation about the problems and consequences of food waste, and about solutions for avoiding food waste at home and school.	Students can recall key facts about, and techniques for, saving food.	45 min
Revision sheet: DO GOOD: SAVE FOOD!	... answer worksheet questions by extrapolating from the presentation the key facts and techniques for saving food.	Students can extrapolate key facts and techniques for saving food.	20 min
FOLLOW-ON ACTIVITIES FOR CORE LESSON 1: DO GOOD: SAVE FOOD!			
WORKSHEETS			
Crossword puzzle	... solve a crossword puzzle featuring some of the key tips and concepts of food saving.	Students recall key facts about, and techniques for, saving food.	15 min
Food waste pop quiz 	... answer food-waste-related questions based on the presentation	Students can extrapolate key facts about food waste and food-saving techniques.	15 min
Food waste or food loss?	... determine whether various examples represent food waste or food loss.	Students can distinguish between food loss and food waste.	20 min
Causes and prevention of food loss and waste	... extrapolate from an FAO source text the reasons for, and possibilities of, preventing different types of food loss.	Students can apply their knowledge of the differences between food loss and food waste to concrete examples.	45 min
Sum it up, waste it down	... solve mathematical exercises based on the theme of food waste.	Students can apply their understanding of food loss and waste and translate this to a mathematical level.	25 min
DISCUSSIONS			
The long way from the farm to the table 	... think their way through the food supply chain, using an example of their choice.	Students can apply their understanding of food loss and waste and transfer this to the food supply chain.	90 min
Uncovering the footprints 	... research information about food loss and waste footprints online and summarise it for presentation.	Students can identify, sequence and catalogue information about food loss and waste footprints.	110 min
The role of FAO in food loss and waste reduction	... learn more about the role of FAO in reducing food loss and waste by conducting and presenting their own research.	Students can recognize the role of FAO in reducing food loss and waste and in fighting world hunger.	60 min

Activity	Students are asked to …	Learning objective	Time requirement
GAMES			
Memothree	… play a food-waste-themed game of Memothree (more challenging version of Memory).	Students can recall key facts about, and techniques for, saving food.	30 min
WRITING EXERCISES			
Supply chain interview FSSENTIAL	… pick an actor from the food supply chain and conduct an imagined interview with them.	Students can identify food loss and waste and their associated problems along the food supply chain.	30–40 min
Eat up!	… discuss the common saying that we shouldn't waste food because "there are children starving elsewhere."	Students can judge common conceptions about food waste and discuss the interconnectedness of their own actions and world issues.	30–40 min
Precious food	… discuss how food waste is related to the value we place on food.	Students scrutinise society's and their own treatment of food and how these are related to food waste.	30–40 min
CORE LESSON 2: Feed yourself, don't feed the bin! Nine easy tips to reduce food waste			
Feed yourself, don't feed the bin! FSSENTIAL	… read or listen to a presentation highlighting nine key tips for avoiding food waste at home.	Students can recall the key tips about, and techniques for, saving food.	30 min
Revision sheet: Feed yourself, don't feed the bin!	… answer worksheet questions by extrapolating the key techniques for saving food from the presentation.	Students can extrapolate and reproduce key techniques for saving food.	20 min
FOLLOW-ON ACTIVITIES FOR CORE LESSON 2: Feed yourself, don't feed the bin!			
WORKSHEETS			
Stop food waste	… repeat the key ways to reduce food waste.	Students can investigate key food-saving tips and specify tips of their own.	25 min
Let's fight food waste! FSSENTIAL	… evaluate their treatment of food at home and consider steps to reduce food waste in their family.	Students can identify and determine their food-saving practices at home.	20 min
DISCUSSIONS			
Fight the waste!	… create posters on "How we can avoid wasting food", and "What we can do with left-overs".	Students can recall key concepts of food-waste reduction and investigate their application at home.	70 min

Activity	Students are asked to …	Learning objective	Time requirement
Poster 	… illustrate one poster for each key tip and discuss how food-saving practices can be implemented at home and in school.	Students can recognise and discuss key concepts of food-waste reduction.	100 min
Storage knowledge	… determine the perishability of certain foods, and think about where these would best be stored.	Students acquire and discuss information about safe food storage.	45 min
Fridge frenzy	… after a group discussion, students colour in, cut out and paste different items of food onto a picture of a fridge.	Students recall and discuss information about safe food storage.	25 min
GAMES			
Speed storage	… in a game of speed and knowledge, students rush around the room correctly storing food in pre-determined spaces and containers.	Students can determine the perishability of certain foods, and can extrapolate information about safe food storage.	40 min
Board game	… play a board game featuring key facts of how to avoid food waste.	Students can recall key facts about, and techniques for, waste reduction.	30 min
WRITING EXERCISES			
Covering food waste	… write and/or illustrate a newspaper, journal or blog article about food waste.	Students can recall and adapt key food-saving issues and tips.	30–40 min
PROJECTS			
Save food diary 	… keep track of and evaluate their efforts at reducing food waste at home.	Students can apply and evaluate food-saving practices and introduce these to their families.	Several days
Get cooking	… come up with recipes for commonly wasted food and try these at home.	Students can recall and are able to practice effective ways of re-using food that might otherwise have gone to waste.	45 min
Spread the word	… design and distribute flyers with the key tips, and lead a guided interview with the people they shared the flyers with.	Students can recall, categorise and evaluate food-saving practices.	90 min

CORE LESSON 1

DO GOOD: SAVE FOOD!

CORE LESSON 1: **DO GOOD: SAVE FOOD!**

CORE LESSON 1: DO GOOD: SAVE FOOD! explains the problems and consequences of food waste and introduces solutions for avoiding food waste at home and school. In the first core lesson, students learn about the problems and consequences of food waste and also begin to understand how they can avoid food waste at home and in school. The main tool to teach the contents of core lesson 1 is Presentation 1: "DO GOOD: SAVE FOOD!" Depending on the time and (technical) resources available, you can decide to project or print the illustration slides (to be found in the annex of this document).

The presentation is designed to go with the accompanying voice-over text (to be found on the following pages) for you to read out or draw inspiration from for telling a story. For older students, it might be more suitable to have it read by the students themselves, adapt it to form a small drama/role-play exercise, or assign the thorough reading of it as a homework task. Use the accompanying revision sheet to help students extrapolate the key issues from the presentation.

Within the voice-over text you will find questions for discussion and engagement with the students. These are only suggestions, so feel free to change, complement or shorten them.

NB: The voice-over to slide 5 mentions the possibility of war and conflict as a result of climate change. If you feel that this will disturb your students, please feel free to leave that sentence out.

45 min

ESSENTIAL

You will need:

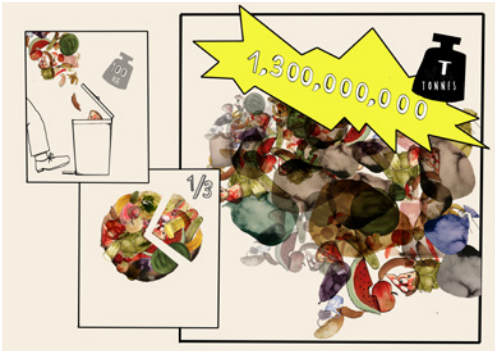
- A video projector and a computer that can open PDF files
- A digital copy of the presentation
- *Alternatively, print the slides on transparencies and use an overhead projector, or else print them on A4 sheets of paper and have a student hold them up while you are reading the voice-over to the class.*
- If you want to use them: printouts of the voice-over and revision sheet RS 1 (one per student)

Instructions:

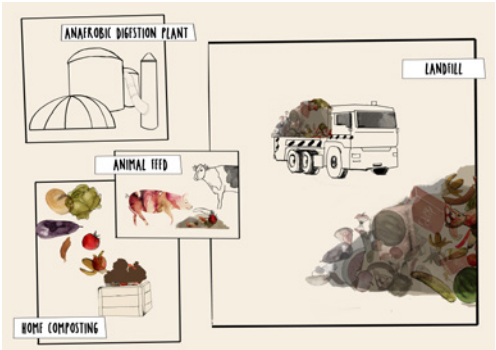
1. Show the presentation and read/narrate the accompanying voice-over script or have students read the voice-over script during class or as homework.
2. Discuss the content with the students. You might find the questions provided in the voice-over a good starting-point for discussion.
3. Hand out the revision sheets and ask students to fill it in.
4. Compare and discuss results: What did the students learn from the core lesson? What is the relevance of this information to their own lives? How can they change their own behaviour to reduce food waste? Why is it important for each of us to change our behaviour?

CORE LESSON 1: VOICE-OVER

DO GOOD: SAVE FOOD!



1 It has been estimated that, globally, more than 1.3 billion tonnes of food is lost or wasted every year. This means that, in total, nearly 1/3 of all food produced is either lost or wasted yearly. This is about 100 kg of food loss or waste for each of us.



2 Some of this wasted food is used to create energy in anaerobic digestion plants. Here, biodegradable material such as food waste can be used to create power. Some of the wasted food is fed to animals, and some people use food waste in their own gardens to create compost.

However most of the wasted food ends up on landfills, where it rots.

Once it has been thrown away, food waste often occupies land that could have been used for other purposes. Transporting it to the landfill costs energy and money and produces CO_2. Rotting away in landfills, wasted food pollutes the surrounding area and, again, produces greenhouse gases.

Dealing with the food once it has been wasted is only part of the bigger picture, however. Let's have a look at what we call the food supply chain.

3 The process of how food from a farm or another production site ends up on our plates is called the food supply chain. It includes all the various stages that food goes through along this path.

(3a) The food supply chain starts with the farmer. Fruits, grain and vegetables are grown in a field or a greenhouse. Animals are raised on farms or in fisheries.

(3b) Fruits and vegetables are taken to markets or handling and processing centers, where they are packaged, sometimes processed, and prepared for transport. Animals are taken to the slaughterhouse, and their meat is then also taken to handling and processing centers. Most

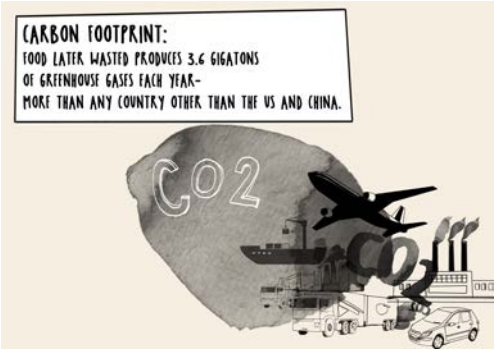
fruits, vegetables, grain and meat become parts of different products; so from the packaging center they are taken to a production plant, where they are processed into ready-made meals or other foods. Again, these are packaged and then **(3c)** distributed to retailers **(3d)**. The next step takes the food **(3e)** either to a restaurant or cafeteria or to our homes. Ideally, the food supply chain would end here, but as you already know, a lot of food is in fact not eaten **(3f)** but is then thrown away and fed into the system of food-waste disposal.

Food supply chains have become much more globalized in recent decades. While much of the food supply chain used to take place in the same country, or at least on the same continent, today products may be transported to any other part of the world.

Q: What are the benefits, and what the problems, associated with the globalization of the food supply chain?

A: Among the benefits are the fact that companies can produce their goods where it's cheapest to do so, which lowers the prices for the end-consumer. Global food supply chains also allow for a greater variety of available foods. The biggest problems are caused by greenhouse-gas emissions created through the global transport of food, which contribute to global climate change. Food origin and food safety and quality may also be less easy to trace and document.

Let's have a look at the problems food loss and waste may cause at the various steps of the food supply chain.



4 Producing, distributing and preparing food uses up fuel and energy and produces greenhouses gases such as CO_2, methane and nitrogen. 3.3 gigatons of greenhouses gases are emitted each year in the production, processing, storage and transportation of food that is lost or thrown away afterwards and which then decompososes in landfills, where it also produces greenhouse gases.

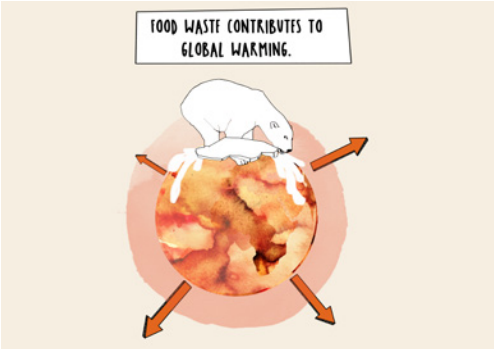
Q: Why are the greenhouse-gas emissions so high in food production?

A: A lot of CO_2 is produced in agricultural operations such as ploughing and harvesting, and of course in the transportation of food around the world. Treating crops with nitrogen fertilizers releases nitrous oxide – a greenhouse gas 300 times more powerful than CO_2 and a major ozone-depleting chemical – into the soil and the air. Large amounts of electricity are needed in the storage and processing of food, and a lot of greenhouse gases are emitted at that stage. Furthermore, decomposing food produces methane, another greenhouse gas, as does cattle farming.

This creates a carbon footprint bigger than that of any country, except for China and the U.S. – which means that if less food were to be lost or wasted, we could actually cut down greenhouse-gas emissions and help fight climate change quite effectively.

Q: What is a carbon footprint?

A: A carbon footprint is what we call the total amount of greenhouse gases emitted by a single source (e.g. person, organization, product or event).



5 The Earth is wrapped in several layers of what we call greenhouse gases. Together, these make up the atmosphere. The Earth's atmosphere stops it from cooling off in space: it lets some rays of the sun in, but also stops some of the heat from leaving the Earth again. Greenhouse gases occur naturally, and without them, there would be no life on Earth. However, humans have been producing more and more greenhouse gases through industry, agriculture, waste disposal activities and by burning fossil fuel in cars and coal-fired power stations. The greenhouse gases we produce have unbalanced the natural atmosphere, and have led to climate change: too great a volume of these gases is now in the atmosphere and not all of the heat that should leave the Earth can escape into space. Climate change makes our planet warmer than it should be. If we continue producing such high amounts of greenhouse gases, a lot of the ice on Earth will melt, the sea level will rise, and there will be less land area for people and animals to live on. The weather will become extreme. Some animals and plants will not survive these new temperatures, and it will become more difficult for many people to grow food and to find places to live. Most likely, the risk of conflicts will also increase due to competition for land, water and food.

6 Among other things, climate change, which is accelarated by the amount of food we are wasting, contributes to water shortages, droughts and desertification in many places on Earth.

At the same time, producing food uses a lot of water. A quarter of all the water we use for agriculture is utilised to grow food that later ends up as lost food or else is wasted. The water footprint of food loss and waste is therefore roughly the same amount of water as all the households in the world use per year, or as much as the Volga river – the longest river in Europe – discharges over the course of a whole year.

7 Another concern is the land occupation footprint of food waste, i.e. the amount of land that is used to grow food which is later wasted. Food that is later lost or wasted is grown on about 1.4 billion hectares of land. If we compare this area to the surface of the largest countries on earth, it is second only to the total land area of the Russian Federation. Production sites for food later lost or wasted occupy a land mass bigger than that of China or Canada.

8 The way we grow food can also be a major threat to biodiversity.

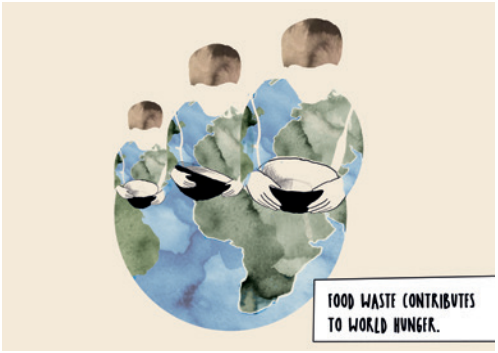
Q: Do you know what biodiversity is?

A: The term "biodiversity" refers to the variety of life on Earth at all levels, from genes to microbes, animals to ecosystems. All species and organisms contribute something to their common environment so it's very important to interfere as little as possible with functioning ecosystems.

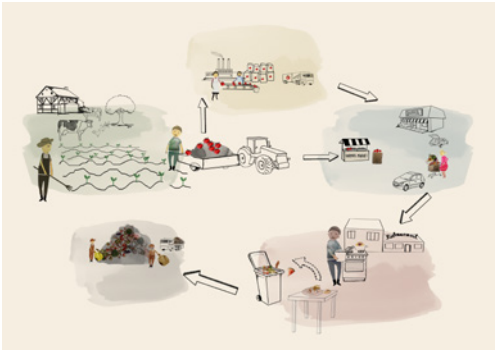
Forests are cut down to make space for crop fields in particular. Through this process, which is called deforestation, a lot of animals lose their habitat and are ultimately threatened by extinction. Moreover, the plants in these forests are lost, which intensifies the problems associated with CO_2 and other greenhouse-gas emissions.

Q: Why does cutting down forests lead to climate change?

A: Plants use sunlight and CO_2 to produce energy. During this process, they release oxygen. Plants thus filter the air and capture CO_2. When we cut down forests, all the CO_2 is released into the atmosphere, which contributes to climate change.



9 If we don't change the way we treat our food, the problems associated with food loss and waste will increase significantly in the future: The global population is rising and we will have to make considerable improvements in how we grow and use food in order to be able to feed us all in the future: avoiding food waste therefore directly helps to reduce world hunger.



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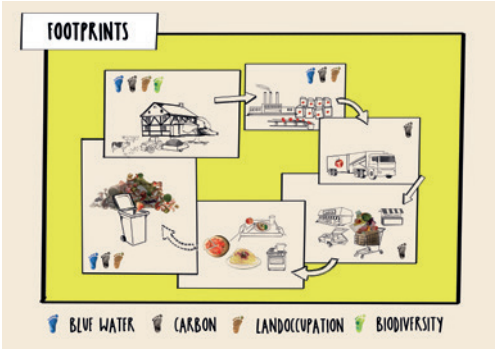
Q: Where within the food supply chain do you suppose the individual footprints occur?



11

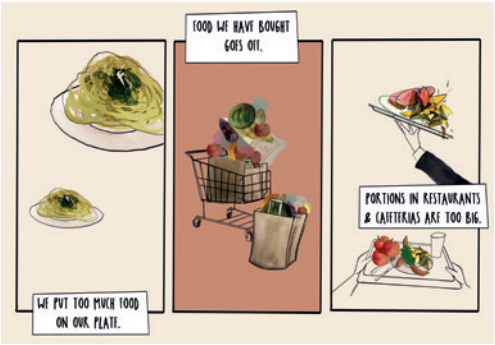
A: Water is used to grow and process food (water footprint).

The **land occupation footprint** is highest at production sites, but land is of course also used to build processing and handling plants and to create landfills. Food waste's **biodiversity footprint** is also highest at production sites where, as we have already found out, forests and other habitats are cut down in order to make space for new fields and farms, but biodiversity is also threatened at processing sites and landfills.

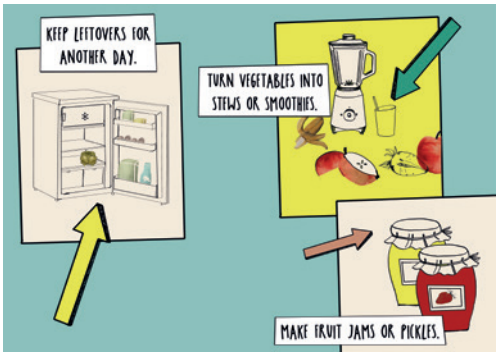
Because food travels all the time, greenhouse-gas emissions occur at nearly all stages of the supply chain (**carbon footprint**): Diesel engines used for agricultural work at the production sites create CO_2, as do the processing and packaging plants, as well as the cold storage facilities. CO_2 is also emitted when food is transported to the shop and from the shop to our home.

At the end of the chain, **landfills** do not use water, but the toxins from landfills can pollute the ground and drinking water (**water footprint**). There are over ten toxic gases released from landfills, the most serious of which is methane, which also contributes to the **carbon footprint** of food waste.

12 As you might suspect, food is wasted all along this supply chain. To make it easier to discuss the problem, there are two different terms that we use to address these processes of lost food. Any food that is wasted even though it could once have been eaten because of neglect and our behaviour, e.g. poor planning, or overshopping, is called food waste. If something goes off in your fridge because you haven't eaten it in time, if you have put too much on your plate and then throw away your left-overs instead of eating them later, this is food waste. Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains, e.g. lack of appropriate storage or refrigeration, is called food loss. If stored corn is eaten up by mice, fish goes off during transportation because the cooling system has stopped working, or if you drop and break your eggs on the way home from the shop, this is food loss. If we want to talk about the whole process through which food is lost, we use the term "food loss and waste".

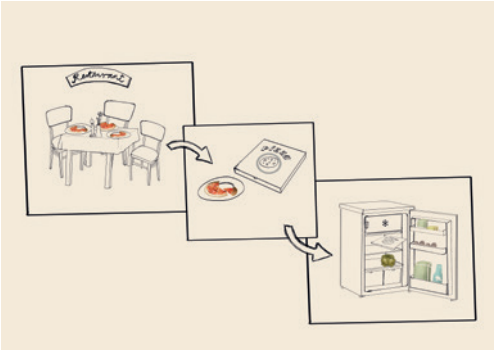


13 As individuals, we can do little against food loss. But we can do a lot to avoid food waste.
Food waste exists because we put too much food on our plates, we buy too much food and don't eat it before it goes off, or restaurants or school cafeterias serve portions that are too big.



14 So what you can simply do is to take smaller portions and go back for more should you still be hungry. Whatever left-overs there are, put them in the fridge to eat the next day, or – if possible – in the freezer to eat at another time. Try and think of ways to use food that is in danger of spoiling – freezing is an option, but you can also use vegetables to make a stew or a smoothie. Fruit about to spoil can also become a smoothie, or you can make chutney or jam out of it.

15 Think carefully about what you need when you shop. Take a shopping list and stick to it. When you're out shopping, consider buying oddly shaped vegetables and fruits. Many supermarkets offer these at lower prices, and even if they don't, by choosing the oddly shaped fruit, you show the shop owner that you're buying food for its taste and nutritional value and not shape. When you put food in the fridge or cupboard, rotate it so that the newest stuff is at the back.



16 If you're at a restaurant or a cafeteria that you know tends to serve too much, ask for a smaller portion to start with. If you cannot finish your plate, ask for a doggie bag and enjoy the rest of your meal at home the next day. Lobby for your school cafeteria to install a system of food loss and waste reduction.

17 Wasting food means wasting energy, land and water. If we avoid wasting food, fewer people in the world will go hungry, fewer animals will lose their habitat, and the rate of climate change will slow down. Every one of us can make a difference: by putting smaller portions on our plates, by keeping and reusing left-overs and by shopping sensibly. Together, we can fight food waste. So, DO GOOD: SAVE FOOD!

REVISION SHEET: CORE LESSON 1

1. How much food is estimated to be lost or wasted every year...
   - per person? _____
   - in the world? _____
   - in percentage terms (in relation to all the food available)? _____

2. What happens to the food we throw away? ➜ _____

3. What problems are associated with disposing of food waste? ➜ _____

4. What is a food supply chain? ➜ _____

5. Briefly outline the various stages of a food supply chain. ➜ _____

6. Producing, distributing and preparing food uses up fuel and energy and produces greenhouses-gases such as CO_2, methane and nitrous oxide. How many tonnes of greenhouse gases are emitted by food-waste-related processes and actions every year? Why is this harmful to our planet? ➜ _____

7. The amount of CO_2 produced through food loss and waste is called its carbon footprint. Which other two footprints are relevant to food waste? How high are they? ➜ _____

8. How is food loss and waste related to biodiversity? ➜ _____

9. What is the difference between food waste and food loss? ➜ _____

10. What can we as consumers do to avoid food waste? ➜ _____

Revision sheet: core lesson 1 (Solutions)

1. How much food is estimated to be lost or wasted every year …

- per person? 100 kg
- in the world? More than 1.3 billion tonnes
- in percentage terms (in relation to all the food available)? 33.3 % (1/3)

2. What happens to the food we throw away?

Food that has gone to waste might be taken to anaerobic digestion plants where it is used to create power. Some of it is used as animal feed or in household or industrial compost plants. Most of it is taken to landfills, where it rots away unused.

3. What problems are associated with disposing of food waste?

Transportation: Transporting food waste to digestion or compost plants or to landfills costs energy and money and produces CO_2.

Pollution: If it is taken to a landfill, wasted food occupies land that could have been used for other purposes. It also pollutes the surrounding area and produces methane.

4. What is a food supply chain?

The term "food supply chain" refers to the process of how food from a farm or another production site ends up on our plates. It encompasses all the different stages that food goes through along this path.

5. Briefly outline the various stages of a food supply chain.

1. Farm: Fruits, grains and vegetables are grown in a field or a greenhouse. Animals are raised on farms or in fisheries.
2. Markets / handling or processing centres: fruits and vegetables are taken to markets or handling and processing centres, where they are packaged and prepared for transport. Animals are taken to the slaughterhouse and their meat is then also taken to handling and processing centers.
3. Processing centres: Most fruits, vegetables, grains, and meat become parts of different products, so from the packaging centre they are taken into a production plant, where they are processed into ready-made meals or other foods. Again, these are packaged and then distributed to retailers.
4. Retailer: Here, food items are sold to individuals or companies.
5. Consumption: From the retailer, the food is taken to a restaurant or cafeteria or to our home. Ideally, the food supply chain would end here.
6. Waste disposal: Food that is not eaten is disposed of in digestion or compost plants, fed to animals, or taken to landfills.

6. Producing, distributing and preparing food uses up fuel and energy and produces greenhouse gases such as CO_2, methane and nitrous oxide. How many tonnes of greenhouse gases are emitted by food-waste-related processes and actions every year? Why is this harmful to our planet?

3.6 gigatonnes of greenhouse gases are emitted each year. This is very harmful because the rise in greenhouse gases has unbalanced the Earth's natural atmosphere and has led to climate change. Climate change makes our planet warmer than it should be. In the future, as a result of climate change, a lot of the ice on Earth may melt, the sea level may rise, and there may be less land for people and animals to live on. The weather may become more extreme. Some animals and plants may not survive these new temperatures, and it may become more difficult for a lot of people to grow food and to find places to live.

7. The amount of CO_2 produced through food loss and waste is called its carbon footprint. Which other two footprints are relevant to food waste? How high are they?

1. Water footprint: One-quarter of all the water we use for agriculture is used to grow food that later ends up as waste. The water footprint of food waste is roughly the same amount of water as all the households in the world use per year and as much as the Volga river – the longest river in Europe – discharges over the course of a whole year.
2. Land occupation footprint (the amount of land that is used to grow food that is later wasted): Food that is later wasted is grown on about 1.4 billion hectares of land. If we compare this area to the surface of the largest countries on earth, it is second only to the total land area of the Russian Federation. Production sites for food later wasted thus occupy a land mass bigger than that of China or Canada.

8. How is food loss waste related to biodiversity?

Forests are cut down to make space for crop fields, production and processing sites and landfills. Through this process, which is called deforestation, a lot of animals lose their habitat and become threatened by extinction. Moreover, the plants in these forest are lost, which intensifies the problems associated with CO_2 and other greenhouse-gas emissions.

9. What is the difference between food waste and food loss?

Any food that could have been eaten but is wasted because of neglect and our behaviour (e.g. poor planning, overshopping) is called food waste.

Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains (e.g. lack of appropriate storage or refrigeration) is called food loss.

10. What can we as consumers do to avoid food waste?

Food waste exists because we put too much food on our plates or are served excessive portions in restaurants or cafeterias, or because we let food spoil after we have bought it. In order to save food, we can take or ask for smaller portions and go back for more if we are still hungry. We can put left-overs in the fridge to eat the next day or in the freezer to eat at another time. Food which is about to spoil can also be frozen or used to make stews, smoothies, chutneys or jams. An even easier way to avoid spoiling food is to shop carefully and only buy what we really need and can be sure of using up in time.

To discourage shops from throwing away food, we can consider buying oddly shaped fruits and vegetables. Many supermarkets offer these at lower prices than "correctly" shaped produce, and even if they don't, by choosing the oddly shaped fruit we can show the retailer that we're buying food for its taste and nutritional value and not its shape.

FOLLOW-ON ACTIVITIES

for CORE LESSON 1

DO GOOD: SAVE FOOD!

The FOLLOW-ON ACTIVITIES are designed to further engage the students and deepen their understanding of the key points outlined in core lesson 1.

CORE LESSON 1: **WORKSHEETS**

Crossword puzzle

The repetition of some of the presentation's key terms in this crossword puzzle helps strengthen the central ideas of food waste reduction.

15 min

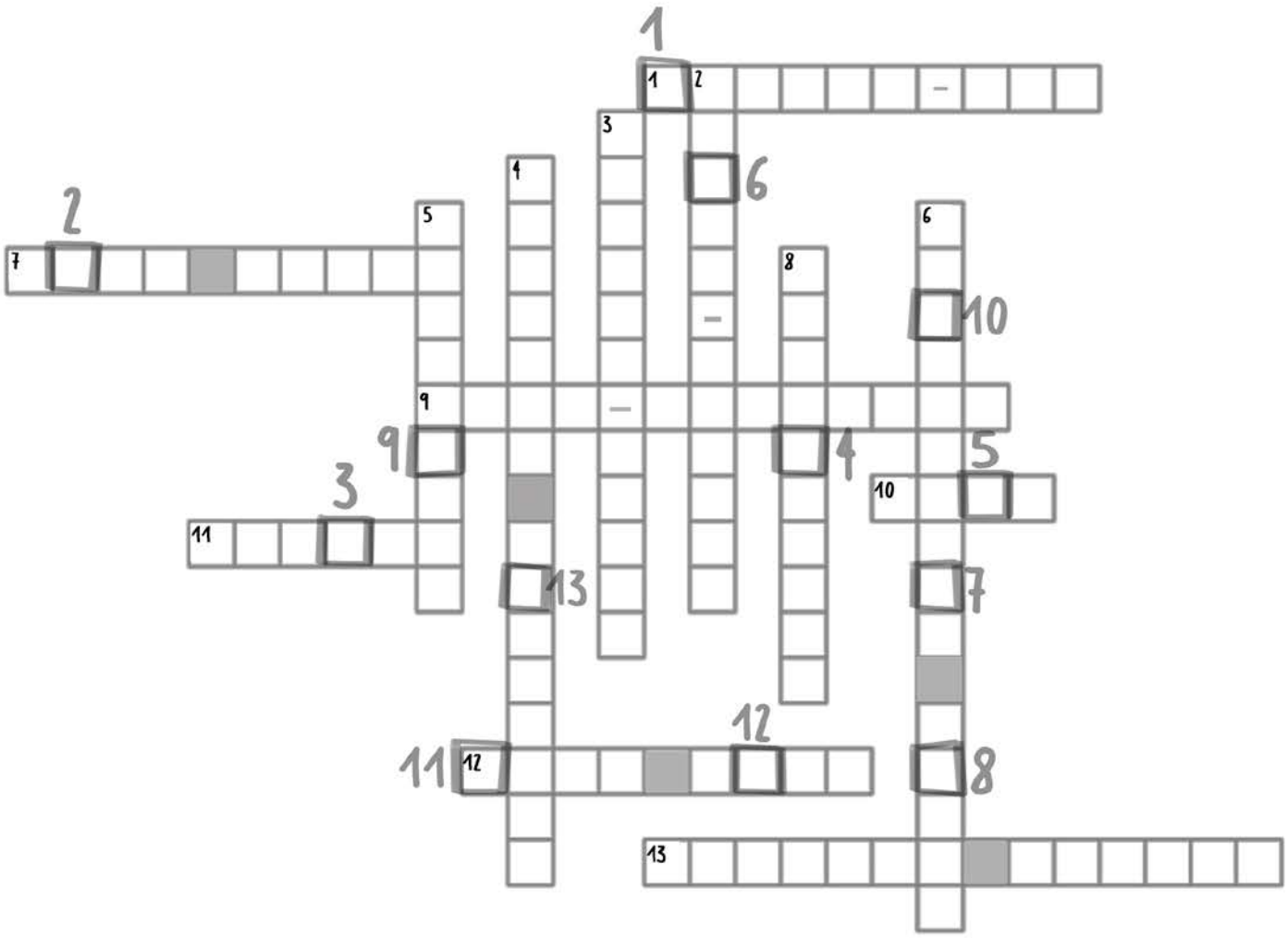
You will need:

- Printouts of worksheet WS 1 (one for every two students)
- One copy of the solution sheet for yourself

Instructions:

1. Split the students into groups of two.
2. Hand out crossword puzzles and ask students to solve them together.
3. Compare results.

CROSSWORD



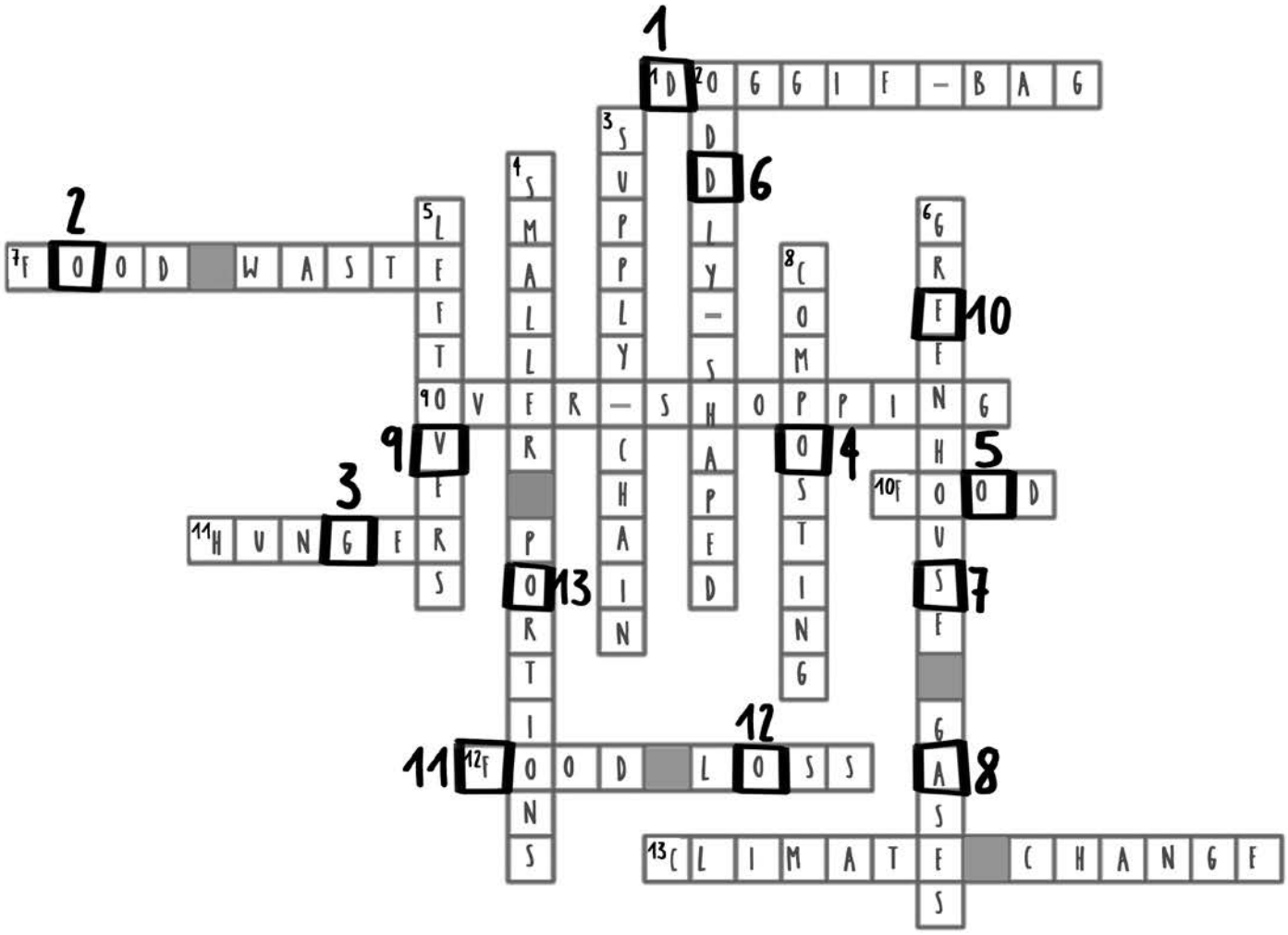
ACROSS

1. AT THE RESTAURANT, ASK FOR A ... TO TAKE LEFTOVERS HOME IN.
7. ANY FOOD WASTED FOR AVOIDABLE REASONS.
9. CAN BE AVOIDED BY TAKING A SHOPPING LIST.
10. DO GOOD: SAVE ... !
11. FOOD WASTE CONTRIBUTES TO WORLD ... .
12. ANY FOOD LOST FOR REASONS OUT OF YOUR CONTROL.
13. MAKES OUR PLANET WARMER THAN IT SHOULD BE.

DOWN

2. BUY ... FRUIT AND VEGETABLE TO AVOID THEM GOING TO WASTE.
3. THE ROUTE OUR FOOD TAKES FROM THE FARM TO OUR TABLE.
4. ASK FOR ... TO AVOID WASTING LEFTOVERS.
5. KEEP THESE IN THE FRIDGE FOR ANOTHER DAY.
6. OUR ATMOSPHERE IS MADE UP OUT OF ... .
8. TURNS KITCHEN SCRAPS INTO NEW SOIL.

SOLUTION CROSSWORD



DO GOOD : SAVE FOOD !

1 2 3 4 5 6 7 8 9 10 11 12 13

Food waste pop quiz

In this nine-question pop quiz, students can revisit and test their knowledge of food waste.

15 min

You will need:

- Printouts of worksheet WS 3 (one per student)
- One copy of the solution sheet for yourself

Instructions:

1. Hand out worksheets.
2. Split students into groups of two and ask them to work on the quiz together.
3. Compare results.

FIGHTING FOOD WASTE
POP QUIZ

Tick the boxes with the correct answers. Sometimes multiple answers are correct.

1. How much food does each of us waste every year?

- ☐ An estimated 50 kg.
- ☐ An estimated 100 kg.
- ☐ An estimated 200 kg.

2. How much of the food produced worldwide is lost or thrown away instead of being eaten?

- ☐ One-fifth.
- ☐ One-quarter.
- ☐ One-third.

3. How much water is used for food that is later lost or thrown away?

- ☐ One quarter of all the water used in agriculture.
- ☐ As much as China and Canada use per year.
- ☐ As much as all the households in the world use each year.

4. Shortage of water may lead to:

- ☐ droughts.
- ☐ desertification.
- ☐ global warming.

5. How big is the land occupation footprint of food waste together with that of food loss, i.e. how much land does food later wasted occupy?

- ☐ An area the size of the Atlantic ocean.
- ☐ An area bigger than China or Canada.
- ☐ 1.4 billion hectares.

6. What is the volume of greenhouse gases produced in the production and transportation of food that is later lost or wasted?

- ☐ More than by any country in the world except the US and China.
- ☐ 1.3 gigatons.
- ☐ 3.6 gigatons.

7. Greenhouse gases:

- ☐ contribute to global warming.
- ☐ are produced by burning fossils, e.g. in cars or coal-fired power stations.
- ☐ are produced in agriculture, industry and waste management activities.

8. What is the difference between food waste and food loss?

- ☐ Food loss refers to vegetables that go to waste – while food waste refers to all meat products wasted along the supply chain.
- ☐ Any food that is wasted even though it could once have been eaten because of neglect and our behaviour (e.g. poor planning, overshopping) is called food waste. Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains (e.g. lack of appropriate storage or refrigeration) is called food loss.
- ☐ Food loss is all the food wasted before it reaches the shop. Food waste is any food wasted after it has reached the consumer.

9. We can fight food waste by:

- ☐ putting only what we will actually be able to eat on our plates.
- ☐ asking for smaller portions in school cafeterias and restaurants.
- ☐ shopping carefully.

Fighting food waste – Pop quiz (Solutions)

Tick the boxes with the correct answers. Sometimes, multiple answers are correct.

1. How much food does each of us waste every year?
   - ☐ An estimated 50 kg.
   - ☑ **An estimated 100 kg.**
   - ☐ An estimated 200 kg.

2. How much of the food produced worldwide is lost or thrown away instead of being eaten?
   - ☐ One-fifth.
   - ☐ One-quarter.
   - ☑ **One-third.**

3. How much water is used for food that is later lost or thrown away?
   - ☑ **one quarter of all the water used in agriculture.**
   - ☐ as much as China and Canada use per year.
   - ☑ **as much as all the households in the world use each year.**

4. Shortage of water may lead to:
   - ☑ **droughts.**
   - ☑ **desertification.**
   - ☐ global warming.

5. How big is the land occupation footprint of food waste together with that of food loss, i.e. how much land does food laterlost orwasted occupy?
   - ☐ an area the size of the Atlantic ocean.
   - ☑ **an area bigger than China or Canada.**
   - ☑ **1.4 billion hectares.**

6. What is the volume of greenhouse gases produced in the production and transportation of food later wasted?
   - ☑ **more than by any country in the world except the US and China.**
   - ☐ 1.3 gigatons.
   - ☑ **3.6 gigatons.**

7. Greenhouse gases:
   - ☑ **contribute to global warming.**
   - ☑ **are produced by burning fossils, e.g. in cars or coal-fired power stations.**
   - ☑ **are produced in agriculture, industry and waste management activities.**

8. What is the difference between food waste and food loss?
   - ☐ Food loss refers to vegetables that go to waste – while food waste refers to all meat products wasted along the supply chain.
   - ☑ **Any food that is wasted even though it could once have been eaten because of neglect and our behaviour (e.g. poor planning, overshopping) is called food waste. Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains (e.g. lack of appropriate storage or refrigeration) is called food loss.**
   - ☐ Food loss is all the food wasted before it reaches the shop. Food waste is any food wasted after it has reached the consumer.

9. We can fight food waste by:
   - ☑ **putting only what we will actually be able to eat on our plates**
   - ☑ **asking for smaller portions at school cafeterias and restaurants**
   - ☑ **shopping carefully**

Food waste or food loss?

This worksheet deepens students' understanding of the difference between food loss and food waste.

15 min

ESSENTIAL

You will need:

- Printouts of worksheet WS 3 (one per student)
- One copy of the solution sheet for yourself
- Computer, projector, and digital copy of presentation 1, "DO GOOD: SAVE FOOD!"
- *Alternatively: printout of slide 12 from presentation 1, "DO GOOD: SAVE FOOD!"*

Instructions:

1. Ask whether students remember the difference between food loss and food waste. (Any food that is wasted even though it could once have been eaten because of neglect and our behaviour [e.g. poor planning or overshopping] is called food waste. Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains [e.g. lack of appropriate storage or refrigeration] is called food loss.) Show slide 12 from the presentation to refresh their memory.
2. Hand out worksheets.
3. Split students into groups of two or let them work individually on the worksheet.
4. Compare results and discuss why the different examples can be defined as food loss or food waste.

FOOD WASTE OR FOOD LOSS?

Any food that is wasted even though it could once have been eaten because of neglect and our behaviour (e.g. poor planning or overshopping) is called food waste. Any food that is unintentionally lost because of malfunctioning or inadequacies in food supply chains (e.g. lack of appropriate storage or refrigeration) is called food loss. Sometimes it is easy to differentiate between food loss and waste; sometimes it is a little tricky. Try to determine which of the following examples involve food loss and which involve food waste.

1. Because of rigorous quality standards concerning weight, size, shape and appearance, crops are sometimes rejected by shops. **This is an example of** _____.

2. Crops are contaminated by animal droppings during storage. ➜ _____

3. Customers do not buy oddly-shaped and -sized vegetables. ➜ _____

4. In standardised production lines, errors during processing lead to final products with the wrong weight, shape or appearance, or damaged packaging, without affecting the safety, taste or nutritional value of the food. ➜ _____

5. Due to a lack of infrastructure for transportation, storage and cooling, fresh products are spoilt in hot weather. ➜ _____

6. In order to ensure delivery of agreed quantities to retailers, farmers end up producing larger quantities than needed and sell the surplus to processors or as animal feed. ➜ _____

7. Consumers do not buy food close to its sell-by date and the food goes off before it is bought. ➜ _____
_____

8. Left-overs from the family dinner are eaten by pets. ➜ _____

9. Toxic residues (e.g. from the use of pesticides or veterinary treatment) make food unfit to be consumed by humans. ➜ → _____

10. Left-over food is sent back to the restaurant kitchen. ➜ _____

Food waste or food loss? (Solutions)

1. **Because of rigorous quality standards concerning weight, size, shape and appearance, crops are sometimes rejected by shops.**
   This is an example of **food waste**: The crops would have been good to eat; it is just the retailers' and/or customers' idea of what they should look like that keeps them from being sold in shops. We can try to change shopkeepers' minds about this by consciously choosing oddly-shaped fruit and vegetables when we're out shopping. Often, these products are even available at a reduced price.

2. **Crops are contaminated by animal droppings during storage.**
   This is **food loss**: The crops aren't wasted by choice but due to this contamination, they became unfit for human consumption. This type of food loss can be reduced by improved storage systems; it is not something that we as consumers can influence directly.

3. **Customers do not buy oddly-shaped and -sized vegetables.**
   This practice leads to **food waste** because many of us do not buy oddly-shaped or -sized fruits and vegetables, and shop keepers won't accept non-standard crops from farmers. This means that a lot of good and healthy crops either aren't even harvested because they are the wrong size or shape, or are used for animal feed, or again taken directly to waste disposal. As in example 1, we can directly influence this practice by buying oddly-shaped crops.

4. **In standardised production lines, errors during processing lead to final products with the wrong weight, shape or appearance, or to damaged packaging, without affecting the safety, taste or nutritional value of the food.**
   This often leads to **food waste** because most shops won't offer any items that are seen as even slightly imperfect. Processed food that features such an imperfection (e.g. a wonky label or discoloured packaging) will not even be offered to consumers.

5. **Due to a lack of infrastructure for transportation, storage and cooling, fresh products are spoilt in hot weather.**
   This is an example of **food loss**: Because of infrastructural problems, some food is spoilt so that it is unfit for human consumption. As in example 2, there is little we as individual consumers can do about this type of food loss: Improved infrastructure, particularly in developing countries, is required to reduce this type of food loss.

6. **In order to ensure delivery of agreed quantities to retailers, farmers end up producing larger quantities than needed and sell the surplus to processors or as animal feed.**
   This is an example of **food waste**: Retailers want to make sure that they have a consistent and calculable supply of products at all times. If farmers cannot meet the agreed amounts, they risk having to pay fines and/or the loss of contract for the following season. To avoid this, for instance in case of a bad harvest, farmers sometimes overproduce and end up leaving their crop in the field, selling it off for animal food, or disposing of it (e.g. in landfills).

7. **Consumers do not buy food close to its best-before date, and the food goes off before it is bought.**
   This leads to **food waste**: Even though most food is still good to eat after its best-before date, many consumers don't want to buy food once it is close to its best-before date, and shops end up throwing away perfectly good food. We can reduce this type of food waste by not refusing to buy food close to its best-before date. If we plan our shopping carefully, buying food bought close to its best-before date won't go to waste in our homes.

8. **Left-overs from the family dinner are eaten by pets.**
   This is **food waste**. Having pets eat left-overs is better than throwing left-overs away altogether, but it still involves wasting food that would have been fit for human consumption. A better way to use left-overs is to put them in the fridge and eat them the following day. An even better way of avoiding food waste is to cook and serve more appropriate portions to start with.

9. **Toxic residues (e.g. from the use of pesticides or veterinary treatment) make food unfit to be consumed by humans.**
   This is an example of **food loss**. Food that was initially fit for human consumption isn't healthy for humans any longer. There is little we as individuals can do to stop this kind of food loss. One small way of helping to reduce it is to shop for organic food, in which the use of pesticides and antibiotics for the treatment of animals is not permitted to start with.

10. **Left-over food is sent back to the restaurant kitchen.**
    This is a form of **food waste**. If there is too much on your plate in a restaurant, ask for a doggie bag and take the food home with you to eat another time. If this happens to you regularly, try asking for a smaller portion to start with.

Causes and prevention of food loss and waste

This exercise builds on WS 4 (Food waste or food loss) and asks students to extrapolate from an FAO source text the reasons for, and possibilities of, preventing different types of food loss.

45 min

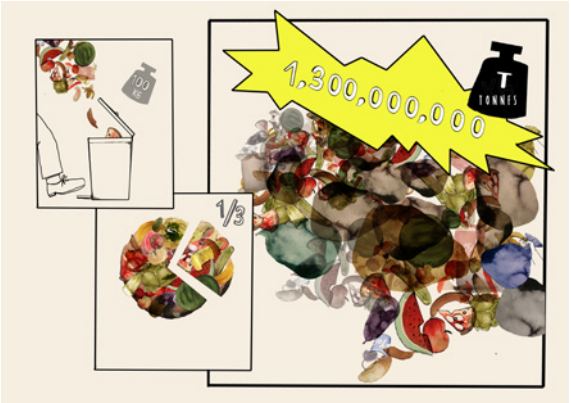
You will need:

- Printouts of the source text: Chapter 4, pages 10–14 of "Global food losses and food waste". The publication is a report published by FAO in 2011. It can be accessed at http://www.fao.org/docrep/014/mb060e/mb060e.pdf
- Printouts of worksheet WS 4b (one per student)

Instructions:

1. Hand out the source text "Global food losses and food waste". If your students are used to reading secondary texts, ask them to read the text and to highlight and summarize the key points. If they are new to secondary sources, read the text together and address possible questions as you go through the text.
2. Hand out worksheet WS4 and ask students to work on it (individually or in pairs).
3. Compare results.

CAUSES AND PREVENTION OF FOOD LOSS AND WASTE



There are many strategies for helping to avoid food loss and waste. Pick one example of food loss and one of food waste, consult the FAO publication on "Causes and prevention of food losses and waste" (http://www.fao.org/docrep/014/mb060e/mb060e03.pdf), and determine preventative strategies for those types of food loss and waste.

I have picked the following type of **food loss**: _____

_____

_____

_____

_____

Root causes for this type of food loss: _____

_____

_____

_____

_____

_____

It can be prevented by: _____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

CAUSES AND PREVENTION OF FOOD LOSS AND WASTE

This is how I can help: _____

_____

_____

_____

_____

I have picked the following type of **food waste**: _____

_____

_____

_____

_____

Root causes for this type of **food waste**: _____

_____

_____

_____

_____

It can be prevented by: _____

_____

_____

_____

_____

_____

_____

_____

This is how I can help: _____

_____

_____

_____

_____

Sum it up, waste it down!

This activity allows students to connect with the presentation's content on a mathematical level.

25 min

You will need:

- Printouts of worksheets WS 5 (one per student)
- Printout of solution sheet(s) for yourself

Instructions:

1. Hand out the worksheet
2. Ask students to solve the exercises (in groups or individually)
3. Compare results.

SUM IT UP, WASTE IT DOWN!

1. Anna and Theo buy 1 apple, 1 packet of walnuts, 1 bunch of grapes, 3 pears, and 2 bananas.
They use 3/4 of an apple, 1/3 of a packet of walnuts, 2/3 of a bunch of grapes, $2^{1}/_{2}$ pears, and $1^{3}/_{4}$ bananas. Please calculate what fraction and percentage of the food they have used.

Overall, they have used ☐ or ☐ % of the food.

2. In the last year, Anna and Theo's family has wasted 310 kg of food.
Sofia's family has wasted 505 kg, Raheem's 265 kg. Please calculate the mean wastage per family.

On average, each family has wasted ☐ kg of food.

Anna and Theo live with their dad; Sofia, with her parents and her sister. Raheem lives with his parents and has no siblings. On average, how much food has **each individual** wasted?

The mean wastage of each individual was ☐ kg

3. The food we waste and throw away needs to be picked up and removed.
If it takes 10 workers 3 days to remove the food waste of a city, how long would it take 4 workers?

It would take 4 workers ☐ days to clear away the same amount of waste.

If only 1/3 of the food was wasted, how long would it take 5 workers to clear it away?

It would take 5 workers ☐ days to clear away 1/3 of the waste.

Sum it up, waste it down!

1. Anna and Theo buy 1 apple, 1 packet of walnuts, 1 bunch of grapes, 3 pears, and 2 bananas.
They use 3/4 of an apple, 1/3 of a packet of walnuts, 2/3 of a bunch of grapes, $2^{1}/_{2}$ pears, and $1^{3}/_{4}$ bananas. Please calculate what fraction and percentage of the food they have used.

Overall, they have used [3/4] or [75] % of the food.

2. In the last year, Anna and Theo's family has wasted 310 kg of food.

Sofia's family has wasted 505 kg, Raheem's 265 kg. Please calculate the mean wastage per family.

On average, each family has wasted [360] kg of food.

Anna and Theo live with their dad; Sofia, with her parents and her sister. Raheem lives with his parents and has no siblings. On average, how much food has **each individual** wasted?

The mean wastage of each individual was [108] kg

3. The food we waste and throw away needs to be picked up and removed.

If it takes 10 workers 3 days to remove the food waste of a city, how long would it take 4 workers?

It would take 4 workers [7.5] days to clear away the same amount of waste.

If only 1/3 of the food was wasted, how long would it take 5 workers to clear it away?

It would take 5 workers [2] days to clear away 1/3 of the waste.

CORE LESSON 1: **DISCUSSIONS**

The long way from the farm to the table

Students are asked to choose an ingredient from a dish of their choice and to identify causes of, and solutions to, food loss and waste that occur at each step of the food supply chain. The discussion aims to deepen their understanding of the many factors and resources involved in bringing food to our plates.

90 min (45 min for part 1; 45 min for part 2)

ESSENTIAL

You will need:

- Printouts of support sheet D 1a and worksheet D 1b (one per student)
- Computer, projector and digital copy of presentation 1, "DO GOOD: SAVE FOOD!"
  Alternatively: printout of slide 3 from presentation 1, "DO GOOD: SAVE FOOD!"
- A2 or A3-size paper (one for every four students)
- Coloured pencils, watercolours or crayons
- Adhesive tape
- *Alternatively: one overhead transparency for every four students, overhead markers, and overhead projector*

Instructions:

Part 1:

1. Introduce the food supply chain and its various stages by using the diagram from slide 3 of presentation 1 ("The food supply chain: from the farm to your table").
2. Split the students into groups of three. Ask them to make a list of the various supply chain steps displayed in the diagram (see support sheet). Beside each step, the groups should attempt to note what they think happens at that particular stage of the supply chain. Groups will then feed back their ideas to the entire class, with the teacher consolidating all ideas on the board.

Part 2:

3. Explain to students that they are going to investigate the food supply chain of a simple dish of their choice. Instruct the students that meals are composed of a number of ingredients and that it will be their job to attempt to determine the process that the particular item of food undergoes before it reaches their plate. Each group will be asked to look at one of the ingredients that make up the chosen dish.

4 Hand out a copy of the support sheet and Discussion sheet 1, "From the farm to your table: the food supply chain." Each group D 1a should clearly label the sheet with the ingredient of their choice. Then, they should attempt to determine what happens to the ingredient at each stage of the supply chain, starting at the farm stage. Groups are encouraged to use the support sheet as guidance. It is important to stress to students that they may not necessarily know everything about the supply chain. Rather, the exercise seeks to introduce the concept of a value chain while simultaneously instilling a sense of appreciation of the value of food.

5. Instruct the groups to try to identify factors that could cause loss or waste at each stage of the supply chain. Following this, students are encouraged to propose possible solutions that address the previously identified factors that cause loss or waste.

6. Ask each group to present their findings to the class. As a concluding plenary activity, ask the students what they have learned about where their food comes from in order to reinforce a sense of appreciation of the value of food.

The long way from the farm to the table: support sheet

Supply chain stage	Description	Potential problems
Farm/production	Crops, fruits and vegetables are grown and stored at this stage. Animals are raised.	▪ Disease. ▪ Bad weather. ▪ Lack of equipment and knowledge.
Processing	Fruits and vegetables are taken to markets or handling and processing centres, where they are packaged, sometimes processed, and prepared for transport. Animals are taken to the slaughterhouse, and their meat is then also taken to handling and processing centres.	▪ Lack of cold storage. ▪ Rough handling. ▪ Inefficient processing. ▪ Poor hygiene. ▪ No or poor packaging.
Transportation	Food is distributed to retailers.	▪ Lack of cold storage during transport. ▪ Delays in transport. ▪ Poor organisation.
Retail	Food is sold at the retail stage.	▪ Shops order too much food.
Consumption	Food is taken to homes or restaurants to be cooked and eaten.	▪ People/restaurants buy and cook more food than they need. ▪ People buy food and forget about it.
Disposal	Food that is no longer good to eat is thrown away.	▪ If disposed of in a landfill, food waste can lead to greenhouse-gas emissions and other issues.

THE LONG WAY FROM THE FARM TO THE TABLE: THE FOOD SUPPLY CHAIN

On its way from farm to fork, our food goes through various steps in the food supply chain. Pick one main ingredient from a dish of your choice and try to determine what happens to it at the various stages of the food supply chain. Think about problems that may arise at each step that could lead to food loss or waste. Think also about possible solutions.

My ingredient: _____

What happens at the **farm**: _____

_____

_____

_____

Problems that might lead to food loss and waste: _____

_____

_____

Possible solutions: _____

_____

_____

What happens at the **processing centre**: _____

_____

_____

_____

Problems that might lead to food loss and waste: _____

_____

_____

Possible solutions: _____

_____

_____

What happens during **transport**: _____

_____

_____

_____

Problems that might lead to food loss and waste: _____

_____

_____

Possible solutions: _____

_____

_____

What happens at the **shop**: _____

_____

_____

_____

Problems that might lead to food loss and waste: _____

_____

_____

Possible solutions: _____

_____

_____

What happens at **home/the restaurant**: _____

_____

_____

_____

_____

Problems that might lead to food loss and waste: _____

_____

_____

Possible solutions: _____

_____

_____

Tomato sauce (Solutions)

Supply chain stage	Description	Factors leading to food loss or waste
Farm/production	▪ Field is prepared for cultivation. ▪ Seeds are planted. ▪ Tomato plants grow and are tended. ▪ Fertiliser and pesticides may be used. ▪ Irrigation/watering may take place. ▪ Tomatoes are harvested. ▪ Tomatoes are stored.	▪ Bad weather (too much/not enough rain or sunshine). ▪ Disease may damage fruits. ▪ Pests e.g. aphids may attack the tomato plant. ▪ Rough handling during harvest and storage. ▪ Inadequate or prohibitively costly labour during key stages of production (e.g. harvesting). ▪ Prohibitive cost, inadequate supply or improper use (e.g. due to lack of training) of essential inputs such as fertiliser and pesticides.
Processing	▪ Tomatoes are initially washed. ▪ The pulp is then extracted. ▪ The pulp is filtered to eliminate any unwanted material. ▪ The product undergoes pasteurisation. [There are a number sterilizing technologies including pasteurisation. You can just say "using technologies to ensure that the product is sterile".] ▪ Water may be removed to obtain a concentrated product. ▪ Other ingredients such as sugar, salt, and other preservatives may be added. ▪ The sauce is then packaged, usually into glass, plastic or metal jars or cans. The packaging must be sterilised.	▪ Careless handling at the processing centre. ▪ Unhygienic equipment. ▪ Accidental breakage/power outage. ▪ Lack of safe operating procedures. ▪ Lack of training for staff on safe operating procedures. ▪ Lack of food regulations, or lack of enforcement of these.
Transportation	▪ Sauce is taken from the processing centre to depots/warehouses. ▪ Sauce is transported to supermarkets/retail outlets, usually via lorry. Depending on the nature of the sauce, it may need to be refrigerated during transit.	▪ Accidental breakage. ▪ Inadequate cold storage during transport. ▪ Unhygienic conditions. ▪ Improper storage practice.
Retail	▪ Sauce is ordered. ▪ Jars are placed on shelves for customers to purchase.	▪ Accidental breakage. ▪ Ordering too much stock. ▪ Improper handling or storage.
Consumption	▪ Sauce is purchased at a shop and transported to the home/restaurant. ▪ Sauce is stored. ▪ Sauce is used as an ingredient during meal preparation.	▪ Consumer purchases sauce and does not use it before the use by date. ▪ Consumer cooks too much food, cannot eat it all and throws it into trash. ▪ Consumer uses some of the sauce, but allows the rest of it to spoil.

Uncovering the footprints

This exercise revisits the issue of the various footprints that accumulate during the production, transportation, and disposal of food (e.g. the carbon or the water footprint). Students are encouraged to research information online and to summarise it for presentation.

110 min

(20 min for part 1; 45 min for part 2; 45 min for part 3; + homework)

You will need:

- Printouts of worksheet D2 (one per group)
- Access to computers and presentation software (e.g. Microsoft Powerpoint or the freeware Open Office [free download here: http://www.openoffice.org/download/index.html])
- Projector
- *Alternatively: overhead transparencies, markers, and overhead projector; or A2 or A3-size paper and coloured markers*

Instructions:

Part 1:

1. Which footprints are connected to the production, transportation and disposal of food? Brainstorm together what students remember from the presentation. A: "Carbon, water, land occupation, biodiversity." What is the impact of food loss and waste on these footprints?
2. Split students into groups of three to four and ask each group to pick one of the footprints. Make sure that each footprint is taken up by at least one group.
3. Instruct students to brainstorm what they remember of the footprint they are working on.
4. For homework, ask them to meet up and research the footprint they are working on. Research questions may include: What is the definition of their footprint? What can we as individuals do to reduce our individual footprint? How big is the contribution of food loss and waste to the footprint? What other information might be interesting or relevant to your classmates? The FAO publications "Food wastage footprints: Impacts on natural resources" (www.fao.org/docrep/018/i3347e/i3347e.pdf) and "Food wastage footprints" (www.fao.org/3/a-ar428e.pdf) are good places to start their online research – and to prepare a computer presentation (alternatively: a poster or slides). They should also prepare a handout for their classmates and a pop quiz of about five questions to do in class. Ask them to bring copies of their handout for each student and a copy of their pop quiz for each group. Designate about one week as timeframe for their homework. If it is not possible for your students to meet up for their homework, set aside some time for them to work on their task during class. You may want to split up each group into two – one part of the group can work on the presentation, the other on the pop quiz.

Part 2:

5. Explain to the students that they are expected to evaluate their peers' presentations. Hand out the evaluation guide D 2 and go through the categories together.
6. Invite groups to present their findings in turn. After each presentation, ask the audience to grade the presentation. Each group can cast a collective vote on each of the categories (organization, content, presentation), with 1 as the lowest and 5 the highest possible vote for each category.

   Add up the groups' overall scores from their peers' grading. List the groups according to their overall score and award them points according to their relative position. For instance, if there are five groups, the group with the lowest overall score will get 1 point, the group with the highest overall score 5 points.

Part 3:

7. Ask students to distribute the pop quizzes they prepared (not the handouts!). Members of the same group should work together to solve the pop quizzes.
8. Let the groups swap their completed pop quizzes so that each group is marking another group's quizzes. Compare results and determine the relative scores of each group. Again, if you have five groups, the group with the highest number of correct answers will get 5 points, the group with the lowest number of correct answers 1 point.
9. Add up the scores from the presentation and the pop quizzes, divide by two, and declare the group with the highest score the winning team.
10. Ask students to distribute their handouts to their classmates.
11. Discuss: Were you surprised by the impact of food waste on the environment? Does this change your outlook on food waste and your own efforts? In what other ways can we try to reduce our own footprints, particularly water and carbon?

UNCOVERING THE FOOTPRINTS – PEER EVALUATION

On a scale of 1 (poor) to 5 (outstanding), please grade your peers' presentations in the following categories:

ORGANISATION

How was the content structured (i.e. did the presentation have a logical sequence, did it provide the right amount of information [i.e. neither too much nor too little])?

CONTENT

How was the content communicated *(i.e. did the presenters use appropriate and accessible language, was there a good conclusion or summary at the end, did they explain the material in an understandable way)?*

PRESENTATION

How was the presentation conducted *(i.e. did the presenters maintain eye contact, did they speak* [*more or less*] *freely, how well were the visual aids prepared, and how informative and effective were these)?*

The role of FAO in reducing food loss and waste

This exercise invites students to learn more about the role of FAO in reducing food loss and waste by conducting and presenting their own research.

60 min (15 min for part 1; 45 min for part 2; + homework)

You will need:

- Access to computers and the internet (at home or at school)
- Sheets of A2 or A3-size paper (one for every four students)
- Coloured pencils
- Adhesive tape
- *Alternatively: one overhead transparency for every four students, overhead markers, and overhead projector; or projector, and access to computers and presentation software (e.g. Microsoft PowerPoint or the freeware Open Office - free download here: www.openoffice.org/download/index.html)*

Instructions:

Part 1:

1. Return to slide 13 from the presentation and brainstorm what students remember about FAO.
2. Split students into four to six groups.
3. Assign topics for each group:
   - Group 1: What is FAO? Research its objectives, actions, history and structure.
   - Group 2: What is the Global initiative of food loss and waste reduction? What are its aims and objectives? How does it propose to achieve them? Who is directed towards? How is it related to FAO?
   - Group 3: What is the FAO-UNEP Sustainable food systems programme? How is it related to food waste reduction? What are its objectives? How are they followed?
   - Group 4: What is post-harvest management? How is it related to food loss and waste? How is FAO involved in post-harvest management?

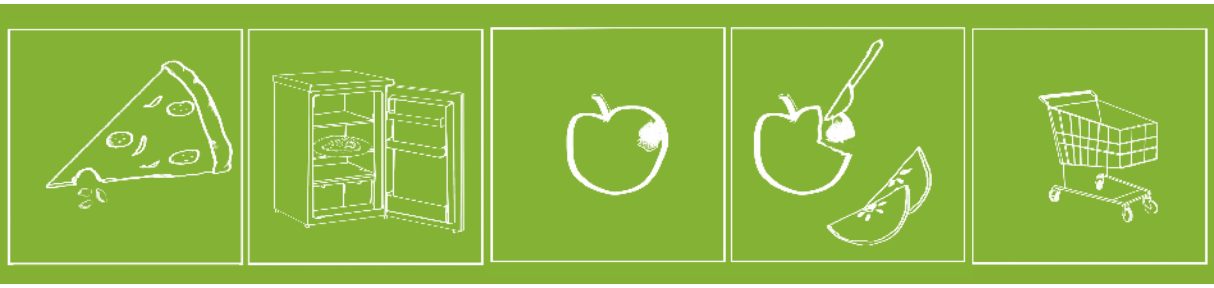
   For information on the topics for groups 1–4, direct students to the section of FAO's homepage on food loss and food waste: http://www.fao.org/food-loss-and-food-waste/en.

   - Groups 5–6: Which concrete action is FAO involved in? Choose and research one of the projects outlined here: http://www.fao.org/in-action/fao-projects/en. What are the project's objectives? What concrete steps have been taken to accomplish them? Has the project already shown results?
4. Ask students to prepare a poster (alternatively: overhead transparency, or PowerPoint presentation) on their topic as homework. If it is not possible for your students to meet up for their homework, set aside some time for them to work on their task during class.

Part 2:

5. When the homework is due, ask students to present their findings to the class.
6. Discuss: What makes FAO an important agent for changes in the food system? How does it follow its motto *Fiat panis* ("Let there be bread")? How does the fight against food loss and waste fit in to its overall objectives?

CORE LESSON 1: **GAMES**



Memothree

In this version of the popular "Memory" game, students revisit some of the key ideas and concepts of the presentation.

Some students may find this game too childish, while other groups may be up for some fun in between all their studying. You're the best judge of this!

30 min

You will need:

- Printouts of the "Memory" game G 1a (one per three to four students)
- One printout of teacher cards G 1b
- Scissors

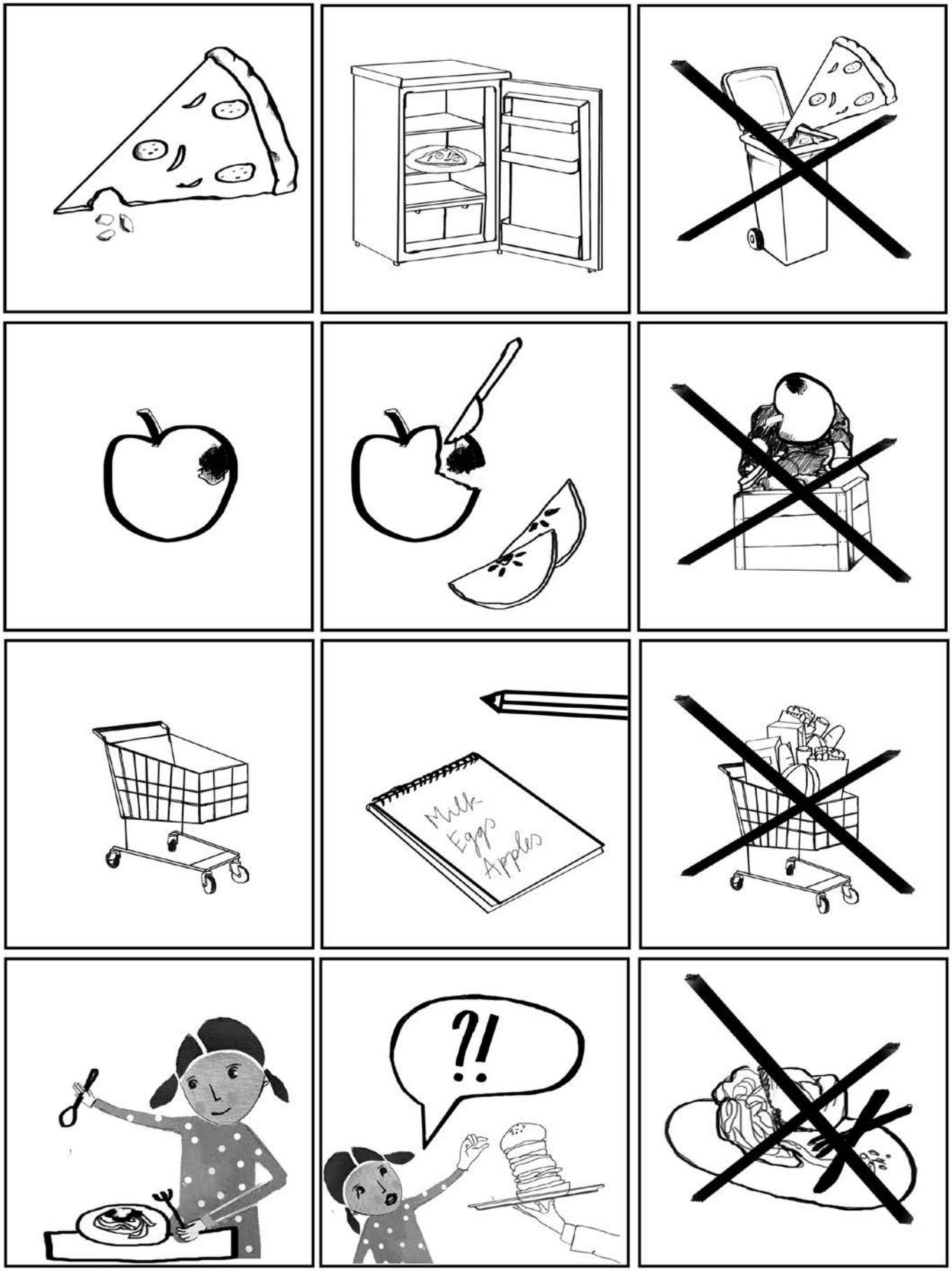
- Mix up the cards and lay them in rows, face down. The first player turns over any three cards. If they match, the player keeps them and is allowed to go again; if they don't match, it's the next player's turn.
- The game is over when all the cards have been matched. The player with the most matches wins.

Note: Unlike in regular "Memory", the matching cards here do not depict the same image. Rather, the images are associated with each other. Check the flash cards to see which cards go together.

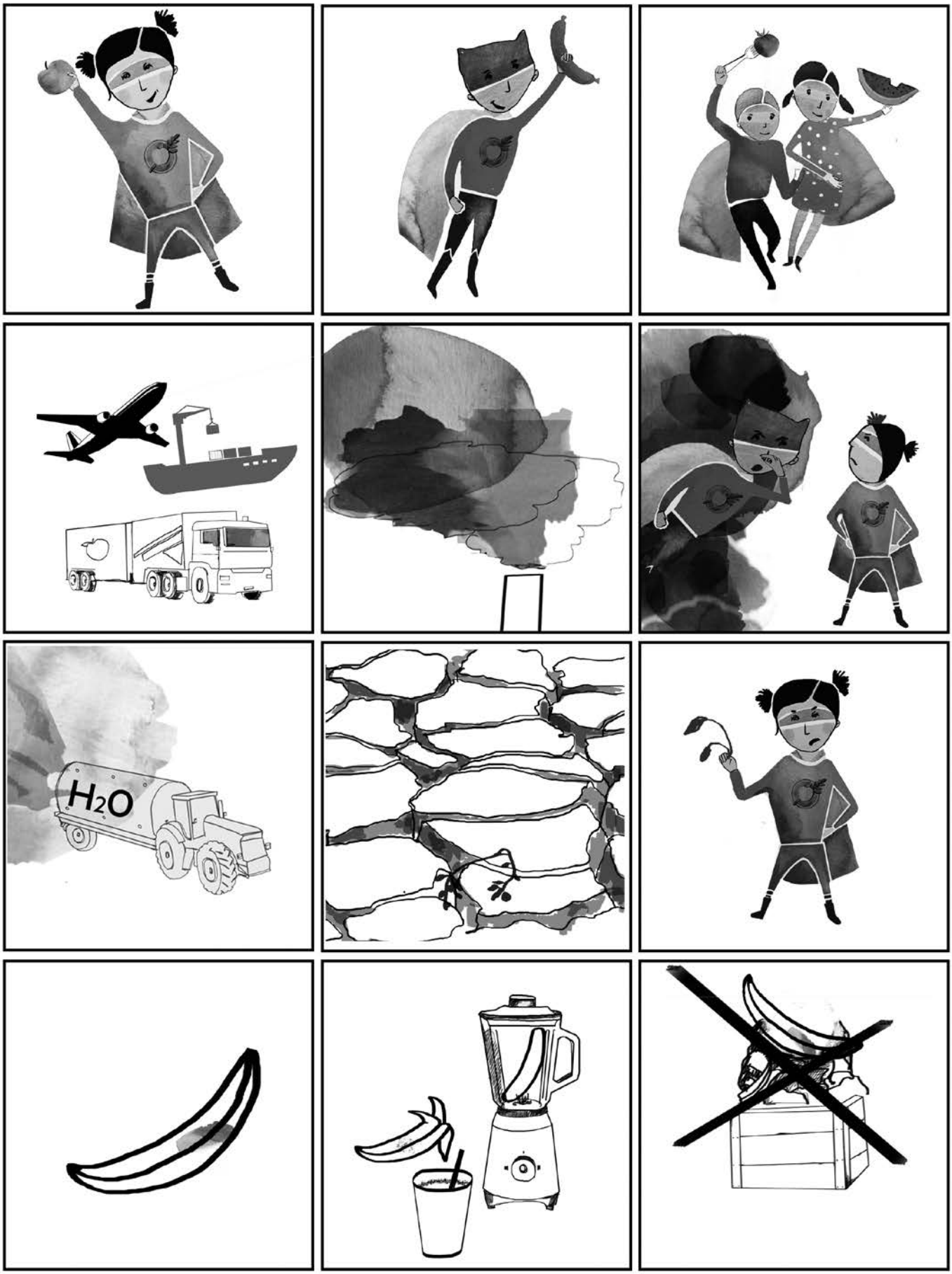
Instructions:

1. Using the teacher cards or the presentation, go through each set of pictures to make sure students understand which cards belong together. Discuss what is depicted in each set.
2. Split students into groups of three to four. You will need one printout of the Memothree game per group.
3. Ask the students to cut out the game.
4. Explain the rules (see above).
5. Play!

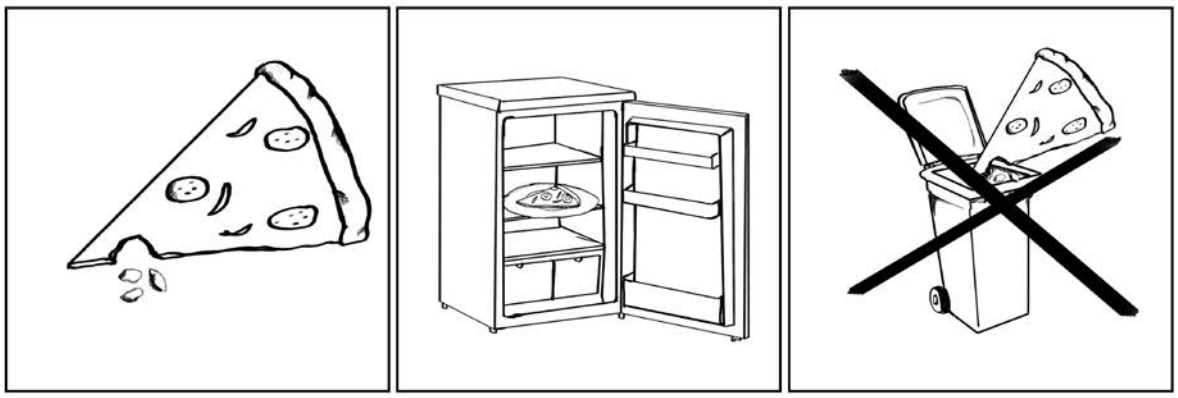
MEMOTHREE



MEMOTHREE

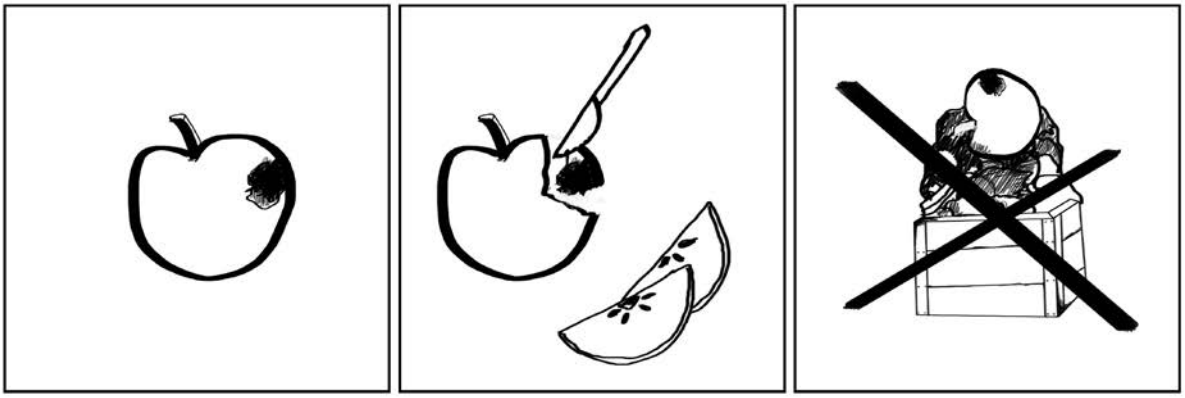


Memothree (teacher cards)



1

KEEP LEFT-OVER PIZZA IN THE FRIDGE TO EAT ANOTHER DAY INSTEAD OF THROWING IT AWAY.



2

IF YOUR APPLE HAS A BROWN SPOT, CUT IT OUT AND EAT THE REST OF THE FRUIT INSTEAD OF THROWING IT AWAY.

3

TAKE A SHOPPING LIST TO THE MARKET OR SHOP IN ORDER TO AVOID OVER-SHOPPING.

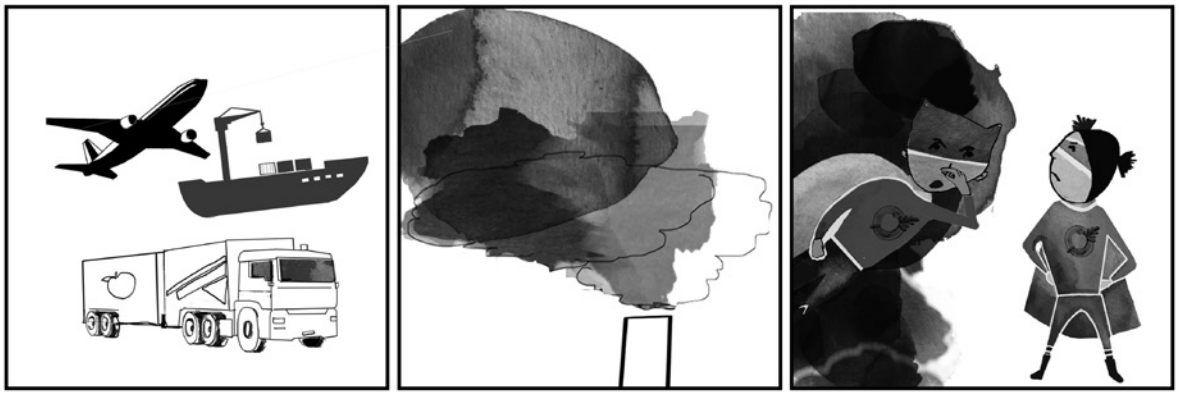
4

HELP YOURSELF TO SMALLER PORTIONS OR ASK FOR SMALLER HELPINGS TO AVOID WASTING FOOD.

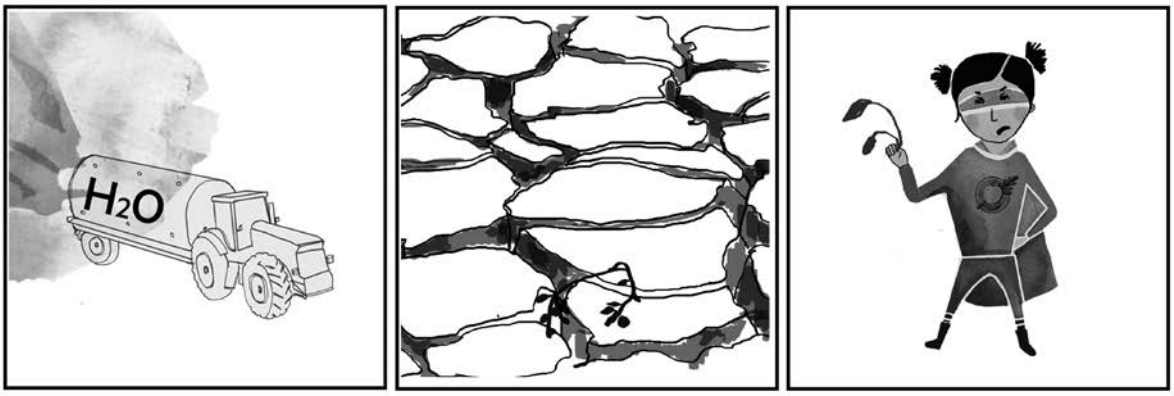
5

JOIN THE NO-WASTERS IN THEIR FIGHT AGAINST FOOD WASTE!

6



PRODUCING AND TRANSPORTING FOOD PRODUCES GREENHOUSE GASES WHICH CONTRIBUTE TO CLIMATE CHANGE.



7

GROWING AND PRODUCING FOOD CAN LEAD TO WATER SHORTAGES.

8

INSTEAD OF THROWING AWAY OVER-RIPE FRUIT, USE IT FOR SMOOTHIES OR JAMS.

CORE LESSON 1: **WRITING EXERCISES**

Writing exercises foster creative and cognitive involvement with the topic. Invite your students to join in these exercises individually or in pairs and ask them to share the written works with each other.

WE 1: Food supply chain interview

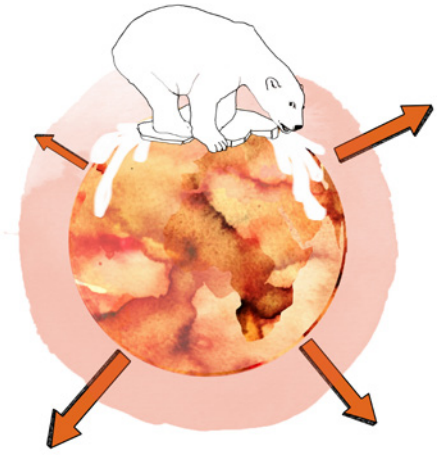
Think back to the description of the food supply chain and pick an actor from along that chain (e.g. a farmer, a truck driver, a chef, a parent or guardian cooking dinner, someone working in waste disposal). Imagine you are interviewing her or him for a newspaper. What would you ask her/him? What would she/he reply? Add in italics and as a new paragraph: "Discussion D1 ("The long way from the farm to your table") tackles the same issue. You may want to continue with D1 after this writing exercise or use it as an introduction to the exercise."

WE 2: Eat up!?

"Eat up – there are children starving in Africa!" Is there any sense in making children finish their meal because of world hunger? Discuss.

WE 3: Precious food

"Food waste only exists because people have lost all appreciation for food. As long as we don't value our food, we will not value the amount of labour, energy, and environmental pollution that occur during its production, and food waste will continue to escalate." Discuss.



CORE LESSON 2

FEED YOURSELF, DON'T FEED THE BIN: NINE EASY TIPS TO REDUCE FOOD WASTE

CORE LESSON 2: **FEED YOURSELF, DON'T FEED THE BIN: NINE EASY TIPS TO REDUCE FOOD WASTE**

CORE LESSON 2 highlights nine key tips for avoiding food waste at home, and briefs the students on how they and their families can reduce the amount of food they waste.
The main tool to teach the contents of core lesson 2 is Presentation 2, "Feed yourself, don't feed the bin! Nine easy tips to reduce food waste!" Depending on the time and (technical) resources available, you may decide to project or print the illustration slides (to be found in the annex of this document).

The presentation is designed to go with the accompanying voice-over text (to be found on the following pages) for you to read aloud or draw inspiration from. For older students, it might be more suitable to have it read by the students themselves, or to assign the thorough reading of it as a homework task.

Use the accompanying revision sheet to help students extrapolate the key issues from the presentation.

Within the voice-over text, you will find questions for discussion and engagement with the students.

These are only suggestions, so feel free to change, complement or shorten them.

30 min

ESSENTIAL

You will need:

- A video projector and a computer that can open PDF files
- A digital copy of the presentation

  Alternatively, print the slides on transparencies and use an overhead projector, or print them on A4 sheets of paper and have a student hold them up while you are reading the voice-over to the class
- If you want to use them: printouts of the voice-over and the revision sheet (RS 2) (one per student)

Instructions:

1. Show the presentation and read/narrate the accompanying voice-over script, or else have students read the voice-over script during class or as homework.
2. Discuss the content with the students. You might find the questions provided in the voice-over a good starting-point for discussion.
3. Hand out the review sheet and ask students to fill it in.
4. Compare and discusss results: What did the students learn from the core lesson? What is the relevance of this information to their own lives? How can they change their own behaviour to reduce food waste? Why is it important for each of us to change our behaviour?

CORE LESSON 2: VOICE-OVER

FEED YOURSELF, DON'T FEED THE BIN: NINE EASY TIPS TO REDUCE FOOD WASTE

Wasting food is bad for the environment: It contributes to climate change and to water shortages. Food later wasted needs land to grow on, and many animals lose their habitat because the forests they live in are cut down to make room for more fields. Food loss and waste contribute to world hunger and inequality. Wasting food means wasting money, labour and resources.

But the good news is that wasting food can be avoided: Reducing the amount of waste we produce is quite easy, and we can all do something to stop wasting food!

1 **Help yourself to smaller portions.** The easiest way to reduce food waste is to put less on your plate. Serve yourself a smaller plateful and go back for seconds if you still feel hungry after finishing it. That way, you only eat as much as you need, and no left-over food is thrown away. You can do the same at the restaurant or cafeteria: If you know that the portions tend to be too big for you, ask for a smaller helping to start with in order to avoid left-over food being thrown away.

2 **Love your left-overs**.

In your family, what do you do with left-overs?
Can you think of (other) ways to love your left-overs?

If you do end up with left-overs, keep them for another day. Using left-overs to make meals is a smart way to ensure you eat everything you buy. Instead of scraping them into the bin, why not use left-overs as tomorrow's ingredients? Or, having put what is left of your meal into the fridge, simply reheat it again and have the left-over portion of that delicious vegetable curry the next day? A bit of tuna could be added to pasta and made into a baked dish. A tablespoon of cooked vegetables can be the base for a soup. If you're not sure whether you will be able to eat left-overs the day after they have been cooked, freeze and save them for later, or ask your parents to do so.

Remember that it is very important to store left-overs in the fridge or freezer within two hours of their having been prepared. In the summer months when it is warm, this time should be reduced to one hour. By dividing left-overs into several clean, shallow containers, you'll allow them to chill faster. Loving your left-overs means chilling or freezing them promptly so you can reuse them safely!

3 **Shop smart**. The pineapple that looks so appetising in the shop but half of which goes to waste because you're the only one in your family who likes its taste; the chicken you throw away after is has spoilt because you forgot there was already some mince at home waiting to be cooked; the biscuits that go to waste because you couldn't finish them off after all: We often buy more food than we are able to eat before it goes off. There are easy ways to avoid over-shopping, though.

Q: Can you think of ways to reduce over-shopping?

Most importantly, you should think before you buy: Ask your parents to plan meals, use grocery lists, and avoid impulse buys. That way, you're less likely to buy things you don't need and which you're unlikely to consume. Going shopping on a full stomach can also stop you from buying too much food.

Why do you think shopping on an empty stomach might make you over-shop?

4 **Buy "ugly" fruits and vegetables.** An apple should be round and plump, a carrot long and straight, a potato perfectly smooth – or should they? In fact, fruits and vegetables come in all sorts of shapes and sizes and each one of them is just as tasty and good to eat as the next. An apple can have rough spots, a carrot can be a little bent, and a potato can be crooked and knobbly: none of this affects their taste, nutritional value or other qualities in any way. As long as the outside is intact, the inside of fruits and vegetables is always sterile, and therefore safe to eat.

Q: What is the funniest-looking fruit or vegetable you have ever seen?

We are so used to the idea of what is considered perfectly shaped fruit and vegetables, that a lot of good and healthy food is not even put on the shelves for us to buy: Shop-owners think that customers won't buy these foods, and so they are often thrown away before they even reach the shops.

Many shops are starting to offer "ugly" fruits and vegetables, though. If you see some oddly-shaped fruits and vegetables, consider buying them instead of the regular-looking ones, or ask your parents to do so. That way, you can show that you care about not wasting food, and you can do your part in making sure that less food is lost and wasted. And since many shops offer irregular food at reduced prices, you can save money at the same time. So remember: Shapes and sizes of fruits and vegetables vary, and this has nothing to do with their quality. Be open-minded and food-conscious, and buy oddly-shaped fruits and vegetables.

5 Check your fridge.

Q: What do you think we should bear in mind when checking our fridge?

To keep it fresh and safe to eat, refrigerated food needs to be stored between 1 and 5 degrees Celsius. Make sure your fridge is set to the right temperature and get to know where in the fridge different types of food are best kept. Make sure that the fridge isn't packed too full! An overloaded fridge uses more energy, and it is quite likely that you will forget to use something that has been shoved into its furthest corner.

6 FIFO: First in, first out!

Q: What do you think FIFO could mean?

What sounds vaguely like a strange football rule is actually one of the easiest ways to avoid food waste: When you or your parents put your shopping away, rotate the food in your fridge and cupboard so that the older stuff comes forward and the newest – which may keep the longest – goes right to the back. That way, you will use up your earlier buys and your newest food will still be good when you come around to eating it.

7 Learn to understand the dates on your food

Q: Which date labels can you think of?
What do you think "Best before", "Sell by" and "Use by" mean?

A lot of packaged food comes with dates stamped onto it. The most important date label is the "use-by" date. Some food, such as raw meat, has a very strict expiry date. Eating this food after the expiry date can make you very ill. If you find that you won't be able to eat food before the date on its "use-by" label, you can freeze it, and defrost and eat it at a later time. Once the "use-by" date has passed and you haven't frozen the food, you will have to throw it out.

Things are quite different with "best-before" dates: If something is labelled "best before" a certain date, it means just that: the food probably tastes, smells, and looks best before that date. The information says very little about when the food will actually lose quality or go off altogether and be no longer safe to use. If the packaging is intact and the food has been stored correctly, food is generally still safe to eat after the "best-before" date. You can normally tell by having a good look at your food or asking an adult to do so. If the food looks, smells, and tastes good after its "best-before" date, it is normally still good to eat.

8 **Turn it into garden feed.** If you do end up wasting some of your food, recover it by turning it into garden feed.

Q: Can you think of another word for garden feed? (A: compost) Why would we call call compost "garden feed"? (A: Because the composted soil is as nourishing to our garden as good food is to us.)

Instead of throwing it in your regular bin and contributing to the green-house-gas emissions connected to the transport and disposal of waste, why not set up a compost bin for food waste and fruit and vegetable peelings? In a few months, you will end up with rich, valuable compost for your plants.

9 **Sharing is caring.** In the last few years, many people have become very aware of the problems connected with food loss and waste. In many places, initiatives have started that help people share food: Soup kitchens use food that is nearing its "best-before" date to make meals for poor people. School cafeterias donate left-overs to food banks, and "Taste the Waste" restaurants cook only with food that was destined to be wasted in shops. There is a growing network of Food Savers – check them out and join them!

Q: Can you think of any local initiatives that help us save and re-use food?

Wasting food means wasting money, labour, energy and other resources. When we use our food smartly, we save money and fight climate change. So shop with care, store your food smartly, and re-use and share your left-overs. Get your friends and families to do the same: Together, we can DO GOOD: SAVE FOOD!

REVISION SHEET: CORE LESSON 2

1. Why is wasting food bad for the environment? ➜ →

2. What are the nine key tips for saving food? ➜ →

3. What precautions do we have to take when storing left-overs? ➜ →

4. What does FIFO stand for? ➜ →

5. What do the labels "Best before", "Sell by" and "Use by" mean? ➜ →

6. At what temperature should our fridge be set? How should we stock it in order to reduce greenhouse-gas emissions and avoid wasting food? ➜ →

7. What are the benefits of buying oddly shaped fruits and vegetables? ➜ →

8. How can we shop smartly? ➜ →

Revision sheet: core lesson 2 (Solutions)

1. Why is wasting food bad for the environment?

Wasting food increases greenhouse-gas emissions, contributes to water shortages, occupies land, threatens biodiversity and pollutes and diminishes soils. Food loss and waste contribute to world hunger and inequality. Wasting food means wasting money, labour and resources.

2. What are the nine key tips for saving food?

1. Help yourself to smaller portions.
2. Love your left-overs.
3. Shop smart.
4. Buy ugly fruits and vegetables.
5. Check your fridge.
6. FIFO: first in, first out!
7. Learn to understand the dates on your food.
8. Turn it into garden feed.
9. Sharing is caring.

3. Which precautions do we have to take when storing left-overs?

Left-overs need to be stored in the fridge or freezer within two hours after having been prepared (during the summer, this should be done within one hour). If left-overs are divided into several clean, shallow containers, they will chill faster. Cold temperatures slow the growth of harmful bacteria. Loving our left-overs means chilling or freezing them promptly so that we can re-use them safely.

4. What does FIFO stand for?

FIFO stands for first in, first out: When we put our shopping away, we should rotate the food in the fridge and cupboard so that the older stuff comes forward and the newest – which may keep the longest – goes right to the back. That way, we can use up our earlier buys, and the newest food will still be good when we come around to eating it.

5. What do the labels "Best before", "Sell by" and "Use by" mean?

"Best-before" dates are manufacturers' suggestions for peak quality: They indicate until the date until which the food will be at its best in terms of smell, texture, and taste. That information says very little about when the food will actually lose quality or go off altogether and be no longer safe to use. If the packaging is intact and the food has been stored correctly, food is generally still safe to eat after the "best-before" date.

Some food, such as raw meat, has a very strict expiry date. Eating this food after the expiry date can make us very ill. If we find that we won't be able to eat food before the date on its "use-by" label, we can freeze it and defrost and eat it at a later time. Once the "use-by" date has passed and the food hasn't been frozen, it will need to be thrown away.

"Sell-by" dates are merely for the sellers' information, and indicate by which time they should sell the product. Our food will still be good long after the "sell-by" date has passed.

6. At what temperature should our fridge be set? How should we stock it in order to reduce greenhouse-gas emissions and avoid wasting food?

Refrigerated food needs to be stored between 1 and 5 degrees Celsius for maximum freshness and longevity. To save energy and reduce greenhouse-gas emissions, we should make sure that the fridge is defrosted regularly. We should also make sure that the fridge is not packed too full. An overloaded fridge uses more energy, and it is quite likely that we will forget to use something that has been shoved into the back.

7. What are the benefits of buying oddly shaped fruits and vegetables?

Fruit and vegetables come in all sorts of shapes and sizes, and each one of them is just as tasty and good to eat as the next. As long as the outside is intact, the inside of fruits and vegetables is always sterile, and therefore safe to eat. Increasingly, shops are offering "ugly" fruit and vegetables.
By buying these, we can show that we care about not wasting food, and we can do our part in making sure that less food is lost and wasted. And since many shops offer irregular food at reduced prices, we can save money at the same time.

8. How can we shop smartly?

Easy ways of shopping smartly include planning meals ahead, using shopping lists, and avoiding impulse buys. That way, we're less likely to buy things we don't need and which we're unlikely to actually consume. Going shopping on a full stomach can also stop us from buying too much food.

FOLLOW-ON ACTIVITIES
for core lesson 2

FEED YOURSELF, DON'T FEED THE BIN: NINE EASY TIPS TO REDUCE FOOD WASTE

These FOLLOW-ON ACTIVITIES feature a more hands-on approach and introduce concrete action to reduce food waste as outlined in core lesson 2.

They are designed to encourage students to take action against food waste and to deepen their practical understanding and knowledge of how to do so.

CORE LESSON 2: **WORKSHEETS**

Stop food waste!

In this exercise, students are asked to evaluate their treatment of food at home and to consider steps to reduce food waste in their family. *Discussion D 2 (Poster) incorporates this worksheet into a more detailed treatment of ways to reduce food waste.*

25 min

You will need:

- Printouts of worksheet WS 6 (one per student)

Instructions:

1. Explain: "Now that we've heard about ways to reduce food waste, let's think about how each of us can do so at home."
2. Ask students whether they already follow some of the advice given in the presentation at home. How could they avoid wasting food in the future, and what might their next steps look like?
3. Ask students to answer the questions in worksheet 6.
4. Initiate a classroom discussion: What common strategies are undertaken to reduce food waste? Can you think of other actions that might be missing from this list?

STOP FOOD WASTE!

1. What steps have you taken to save food at home and/or in school in the past?

2. What concrete steps could you take to further reduce food waste in your home?

3. What steps could we take together to further reduce food waste in school?

Let's fight food waste!

In this exercise, students are asked to repeat the key ways of reducing food waste.

This worksheet can be combined with discussion D 4.

20 min

ESSENTIAL

You will need:

- Printouts of worksheet WS 7 (one per student)

Instructions:

1. Brainstorm with the students: What ways of reducing food waste were mentioned in the presentation? Can you come up with additional ideas?
2. Hand out copies of worksheet WS 7.
3. Ask students to fill in their worksheet.
4. Split students into groups of two to four.
5. Ask them to compare their findings within their groups and to add group members' ideas for reducing food waste that they hadn't thought of themselves.

LET'S FIGHT FOOD WASTE!

Wasting food is bad for the environment, it is costly and it contributes to world hunger. But you can do a lot to avoid food waste! Try to remember the most important steps:

I can avoid wasting food by _____

_____

_____

_____

_____

_____

_____

_____

_____

If there are any left-overs, I can _____

_____

_____

_____

_____

_____

We should avoid wasting food because _____

_____

_____

_____

_____

_____

_____

_____

_____

CORE LESSON 2: **DISCUSSIONS**

Fight the waste!

By creating posters together, this activity lets students revisit and deepen their understanding of the key concepts of food waste reduction.

70 min (35 min for part 1; 35 min for part 2)

You will need:

- Printouts of worksheet WS 7 (previous page, "Let's fight food waste", one per student)
- A2 or A3 paper (one sheet for every four students)
- Coloured pencils, crayons, or water colours
- Scrap bits of material, newspaper and magazine clippings
- Scissors
- Glue
- Adhesive tape

Instructions:

Part 1

1. Brainstorm together: How can we avoid food waste? What can we do with left-over food?
2. Hand out copies of worksheet WS 7 and ask students to fill them in (individually or in groups).
3. Split students into groups of four.
4. Ask each group to choose one of the following topics: "How we can avoid wasting food", and "What we can do with left-overs".
5. Instruct students to create a mind-map of their topic.

Part 2

6. Pin up the mind-maps around the room.
7. Rotate group members: Assign students in each group a number from one to four, then ask all 1s, 2s, 3s and 4s to join up in new groups. You should now have four new groups, and each of these groups should have at least one member of the original groups in them.
8. Spread the groups out across the room so that each group is standing in front of a poster. Ask the group members who participated in creating that particular poster to explain it to their new group. Invite the other students to comment on the posters and point out oversights if they spot any.
9. After about two minutes, give a short signal (clap, whistle, etc.) and ask the groups to move on to the next poster.
10. Repeat until the groups have come full-circle.
11. Ask students to get back into their original groups and to include the feedback from their classmates in their poster.

Poster

Students illustrate one poster for each key tip and present it to the class.

100 min (45 min for part 1; 25 min for part 2; 30 min for part 3)

You will need:

- Coloured markers, pencils or water colours
- Nine sheets of flipchart or poster paper
- Adhesive tape or pins
- Slips of paper with numbers 1 to 9
- Small bell or whistle
- One copy of D3 (class contract template)

Instructions:

Part 1:

1. Split students into nine groups and let each group draw a number. The number refers to the key tips from the presentation (e.g. the number 1 corresponds with the tip to "Shop smart", number 2 to "Buy ugly fruits and vegetables" etc.).
2. Ask each group to design a poster illustrating the corresponding tip.

Part 2:

3. Pin up the posters along the available walls in the room and let students form new groups. Each group should consist of one member from the original groups.
4. Start the groups at opposite ends of the poster run. As they walk from poster to poster, the member of their group who helped create that particular poster should explain it to them. Every two to three minutes, ring the bell or blow your whistle to indicate that it's time to move on to the next poster.

Part 3:

5. After the round of poster presentations has been completed in this way, reassemble and discuss: Do you already follow some of this advice at home? What do you think will be the easiest tip for you to follow? What will you find the hardest? Why?
6. Brainstorm together: How could you reduce food waste at school and in your class? (Possible ideas include: Visiting other classes and talking to them about food waste, distributing flyers, or organising a food waste audit in the school cafeteria).
7. Draw up a class contract detailing what, as a group, you intend to do about food waste at school, and pin up that contract. *Document D3 gives an example of what a class contract could look like.*

WORKING TOGETHER TO SAVE FOOD: OUR CLASS CONTRACT

Wasting food is bad for the environment, it wastes money, and contributes to world hunger. In order to save food, we, the students of class _ _ _ _ _ _ _ _, will:

1. Take our time to eat.
2. Ask for adequate portions in our lunch boxes.
3. Donate what we cannot eat ourselves to our free-for-all left-over plate.
4. Remind each other about not wasting food.
5. Compost or recycle food waste we can't avoid.

Let's do good: save food!

Name of school and town, date *Signatures*

Storage knowledge

In a classroom discussion, students try to determine the perishability of certain foods, and think about where these would best be stored.

30 min (+ homework)

You will need:

- One set of printouts of storage knowledge flash cards D 4a
- Printouts of support sheet D 4b and worksheets D 4c and D 4d (one each per student)
- Black-/whiteboard, chalk or board markers
- Adhesive tape
- Scissors

Instructions:

1. Draw two big circles onto the black-/or whiteboard and pin up the cards "Refrigerate as soon as possible" and "Won't spoil easily" above each. In the circle marked "Refrigerate as soon as possible", draw a smaller circle and pin up the card "Take great care!" within it.
2. Explain: "Storing food safely is a precondition for not wasting it because it stops it from going off before we can consume it." Ask students what they know about storing food correctly. What can happen if food is not stored safely?
3. Hand out the support sheet D 4b and read through it together. With the help of your students, fill in your overview on the black-/whiteboard with the food items mentioned on the worksheet. Underneath "Take great care with", you should add "raw meat"; underneath "Refrigerate as soon as possible", "cooked chicken", "cooked rice", "cooked pasta", "cheese" and "left-over pizza"; and underneath "Won't spoil easily", "bread and "lettuce and strawberries".
4. Brainstorm with your students which other items of food and drink they can think of and where within your overview these should be placed.
5. Hand out copies of worksheet D 4c and D 4d and read through the instructions together. Ask students to cut out and place the food items on the second onto the first page (to be glued in after classroom discussion).
6. As homework, ask students to complete the worksheet by picking one of their favourite foods, researching how it should be kept and stored, and filling in the blanks on the worksheet.

STORAGE KNOWLEDGE FLASHCARDS

REFRIGERATE AS SOON AS POSSIBLE

WON'T SPOIL EASILY

TAKE GREAT CARE!

Storage knowledge - Support sheet

Food is sometimes wasted because it has gone bad. If we store our food properly, we will waste less of it. Follow these tips to keep your food fresh and safe to eat!

Take great care with ...

... raw meat: Raw meat absolutely needs to be kept refrigerated, so make sure you take it home straight from the shop, and put it in the fridge as soon as possible. Do not use raw meat after the "use-by" date has passed (unless it has been frozen from before that date). If you cannot use it before the "use-by" date has passed, freeze it. Frozen meat will stay edible for a very long time.

Refrigerate these foods as soon as possible:

Cooked chicken: Cooked chicken needs to go into the fridge or freezer as quickly as possible. Help it cool down by putting it into several shallow dishes or containers. If you want to reheat it, make sure you heat it up thoroughly for at least two minutes to kill off any bacteria.

Cooked rice: Dried rice will last a very long time, but once it is cooked, it will only keep for two to three days. It is vital that cooked rice should be put into the fridge as quickly as possible. To cool it down quickly, put the rice into several shallow containers, and then place it in the fridge as soon as it is no longer hot.
Cooked rice that is left to cool down slowly and is not refrigerated promptly can cause food poisoning.

Cooked pasta: Just like dried rice, dried pasta will keep for a very long time, but it needs to be consumed within two or three days of being cooked. Put left-over cooked pasta in the fridge once it has cooled down sufficiently. Put it into shallow containers to speed up the cooling-down. When cooked pasta is left to cool down slowly and is not refrigerated, it can cause food poisoning.

Cheese: Cheese needs to be refrigerated. Once opened, sliced cheese will stay soft and moist if you cover it up with plastic foil or put it in an airtight container. If it not covered up properly, it will go hard.

Left-over pizza: Left-over pizza will stay safe for three to four days if it is refrigerated properly. Please make sure that you put it in the fridge as soon as it has cooled down.

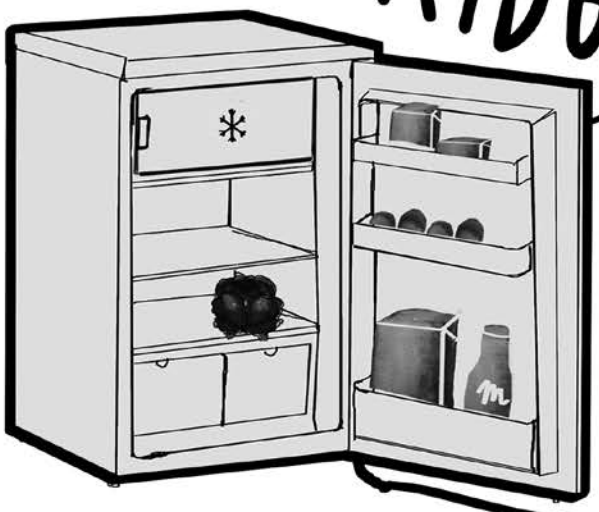
These food items don't spoil easily:

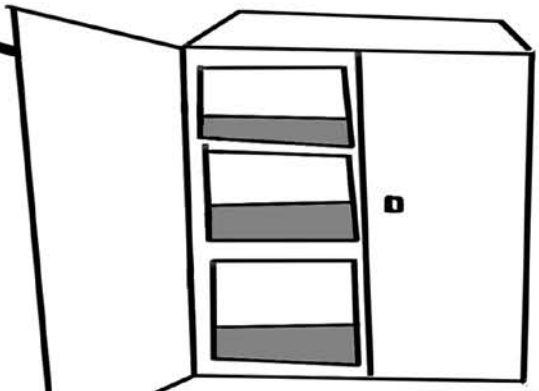
Bread: Fresh bread is best stored in a paper bag: the paper allows the bread to breathe, so there is less chance of mould affecting the loaf. Sliced bread is best stored in the plastic bag that it comes in to keep it fresh. You can also freeze bread in an airtight freezer container or in the plastic bag it came in. Pay close attention to mould on bread: Once the bread is mouldy, do not eat it. Even if the mould is only on one slice, throw away the whole loaf. If your bread has gone stale but there is no sign of mould, it is perfectly safe to eat and you can still use it for croutons, French toast, or stuffing.

Fruits and vegetables: Some fruits and vegetables, such as nectarines, peaches, tomatoes, kiwis and pears, can be left on the kitchen worktop to ripen. After they have ripened, they will keep longest if refrigerated. Sliced fruit should be covered up and placed in the fridge. This reduces discolouring and maintains quality and safety. Drizzling lemon juice onto sliced fruit and vegetables such as apples or avocados will keep them from going brown for a while. Apples will go brown rather quickly once they're cut, but they're still good to eat, as long as they are not slimy.

FOOD IS SOMETIMES WASTED BECAUSE IT HAS GONE BAD. IF WE STORE OUR FOOD PROPERLY, WE WILL WASTE LESS OF IT. CUT OUT THE ITEMS OF FOOD ON THE NEXT PAGE AND PASTE THEM WHERE YOU THINK THEY BELONG.

FRIDGE





CUPBOARD

ONE OF MY FAVOURITE ITEMS OF FOOD IS: .....

IT SPOILS IF I .. ..

TO KEEP IT FRESH AND SAFE FOR CONSUMPTION, I HAVE TO .....

..... .

RAW MEAT

COOKED CHICKEN

COOKED RICE

COOKED PASTA

CHEESE

LEFTOVER PIZZA

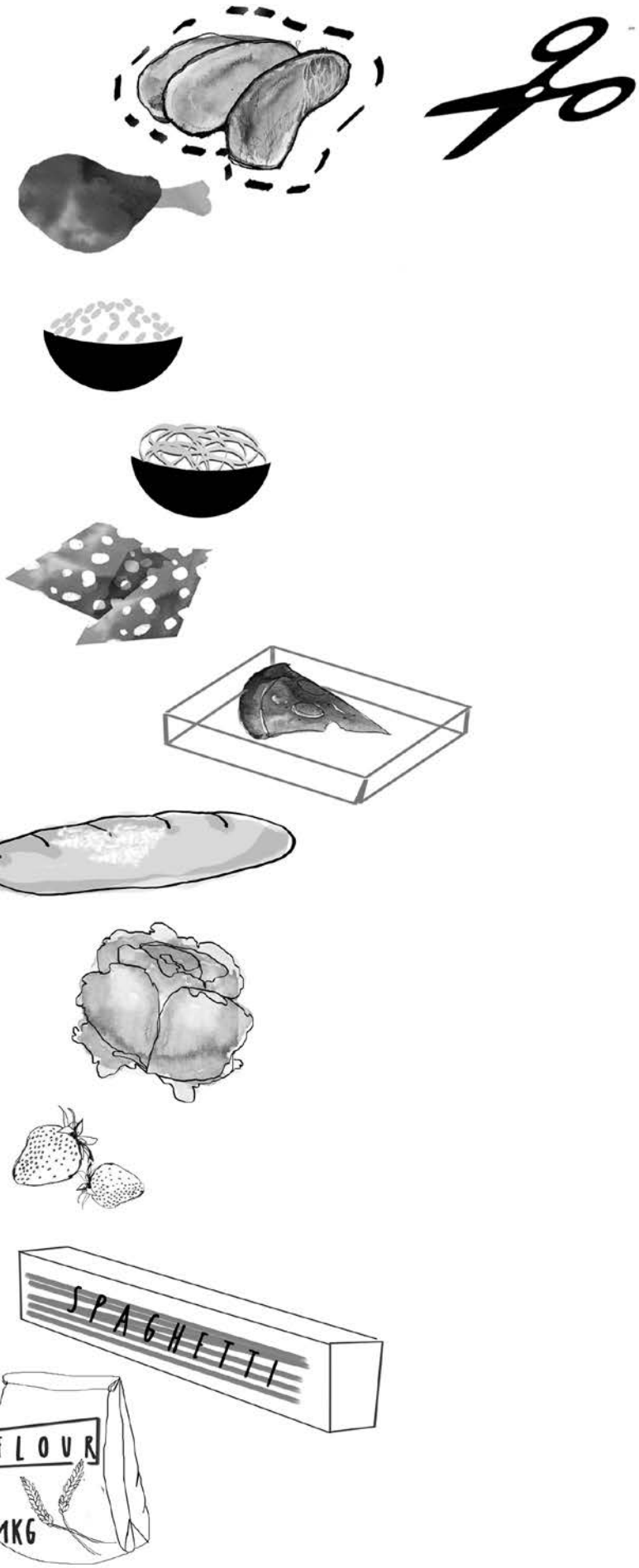
BREAD

SALAD

STRAWBERRIES

DRY PASTA

FLOUR



D 4d

Fridge frenzy

With the help of this discussion, students learn where to place certain foods within the fridge.

25 min (+ homework)

ESSENTIAL

You will need:

- Printouts of worksheet D 5a and the flyer "Fridge frenzy – What goes where?" (D 5b) (one of each per student)
- Coloured pencils

Instructions:

1. Explain: The temperature in the fridge varies, and to keep your food fresh for the longest time possible, you have to know where is the best place for it in the fridge.
2. Hand out copies of D 5a and invite students to look at the first page (the depiction of the fridge). Ask students: Where do you think is the coolest place in the fridge? What should be kept there? Where is the warmest part? What do you think should be kept there? Do you know where fruits and vegetables are supposed to go?
3. Hand out the flyer D 5b and explain: "Most fridges have crisper drawers at the bottom, which keep fruits and vegetables moist. Use one of those drawers for vegetables, the other for fruits." Instruct students to colour in the crisper drawers on the worksheet D 5a in green and to add a key to their worksheet in order to help them remember what each color represents.
4. Explain: "Above the crisper drawers (on the bottom shelf) is the coolest place within the fridge. This is where you should keep food that spoils easily: raw fish and meat. Make sure that you keep raw fish and meat in airtight containers. This will help to keep them fresh, but it will also stop juice from dripping onto other food: The juice from raw meat and fish can contain bacteria that can make you very ill, so make sure it doesn't come into contact with any food that you might eat without cooking it first (such as salad or cheese)." Instruct students to colour in the bottom shelf in blue on their worksheet.
5. Explain: "The top shelves are the second-warmest part of the fridge. Here, you can store food that doesn't need to be cooked, such as left-overs, sliced meat, yoghurts and cheese." Ask students to colour in the two top shelves in orange.
6. Explain: "Doors are the warmest part of the fridge, so you should only keep food in there that won't spoil easily, such as juices or tomato ketchup. Even though many fridges have a special compartment for eggs in their door, eggs should not be kept here but on the top shelves of the fridge. The same goes for milk." Ask students to colour in the fridge doors in red.
7. Individually or in groups, ask students to stock the fridge on their worksheet by writing at least four items of food on the shelves and in the door.
8. Compare results.
9. As homework, students should have a look into their fridge at home together with their parents or guardians to check whether the food in there is stored correctly. If it is not, ask them to rearrange it with the help of their parents or guardians. Ask them to pin up the flyer on the door of their fridge at home.
10. When the homework is due, discuss: How did their fridge "hold up" in comparison to the instructions they received at school? Did they rearrange anything and if so, what?


FRIDGE FRENZY
DON'T OVERPACK YOUR FRIDGE!
CLOSE YOUR FRIDGE AS SOON AS POSSIBLE AFTER YOU'VE TAKEN OUT WHAT YOU NEEDED.
KEEP YOUR FRIDGE AT A TEMPERATURE BETWEEN 1 AND 5°C!

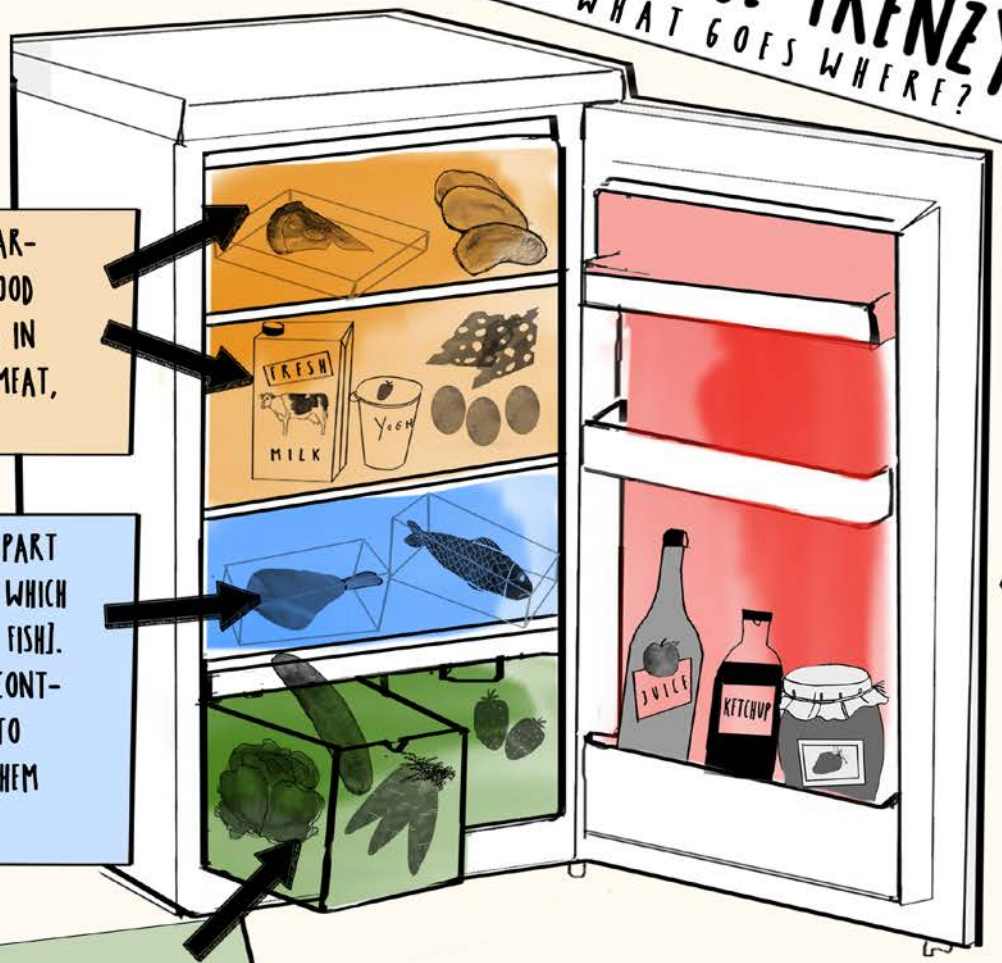
FRIDGE FRENZY

WHAT GOES WHERE?

TOP DRAWERS ARE THE SECOND WARMEST PART OF THE FRIDGE. KEEP FOOD THAT DOESN'T NEED TO BE COOKED IN HERE [SUCH AS LEFTOVERS, SLICED MEAT, YOGHURT, OR CHEESE].

THE BOTTOM SHELF IS THE COOLEST PART OF THE FRIDGE. KEEP FOOD IN HERE WHICH SPOILS EASILY [E.G. RAW MEAT OR FISH]. IDEALLY, PACK THEM IN AIRTIGHT CONTAINERS TO KEEP THEM FRESH AND TO STOP BACTERIA SPREADING FROM THEM TO OTHER FOOD.

CRISPER DRAWERS KEEP FRUITS AND VEGETABLES MOIST.



DOORS ARE THE WARMEST PART OF THE FRIDGE. ONLY KEEP FOOD IN THERE THAT DOESN'T SPOIL EASILY [SUCH AS KETCHUP OR JUICES].

→ DON'T PACK YOUR FRIDGE TOO FULL!

→ CLOSE YOUR FRIDGE AS SOON AS POSSIBLE AFTER YOU'VE TAKEN OUT WHAT YOU NEED.

→ KEEP YOUR FRIDGE AT A TEMPERATURE BETWEEN 1° AND 5°C!

CORE LESSON 2: **GAMES**

Speed storage

In this game of speed and knowledge, players have to assign the correct storage places to different types of food.

Please note: *due to health and safety concerns, this exercise should only be undertaken in a wide and clear space (such as the gym hall). Depending on regional/national regulations, the exercise may have to be supervised by a PE teacher. Please make sure that you know the regulations applicable to your country/regions, and comply with them.*

45 min

You will need:

- Printouts of flash cards G 2a, "Speed storage" (one for every four students)

  You will need to tell the cards from the different teams apart at the end of the game, so mark the cards on the back for each group (i.e. all the cards from one group should have the same number or symbol on them).
- Non-transparent bags (one for every four students)
- Plastic food containers (one for every four students)
- Three big cardboard or plastic boxes (alternatively: stake out three sections of floor with string, or use table-tops)
- One set of printouts of the storage signs G 2b (fridge, cellar, cupboard, worktop)
- A printout of the solution sheet
- Printouts of support sheet D 4b, "Storage knowledge"

Rules:

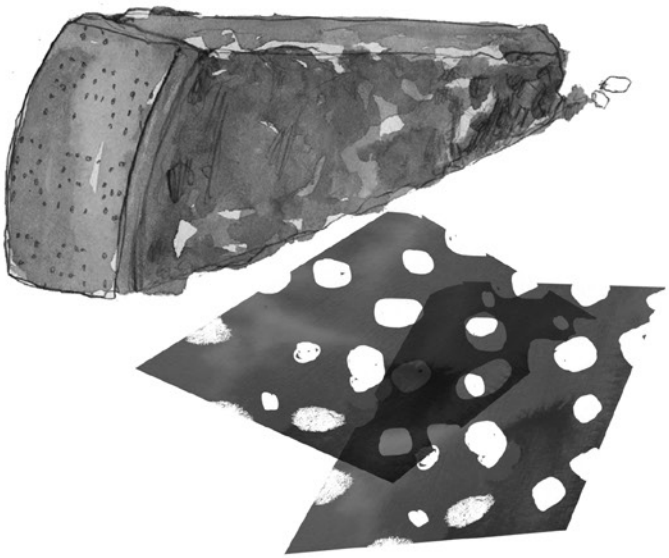
- You have just been shopping and are in a rush to put away your food. You have to make sure that the food is put away quickly, but you also have to make sure that it is stored safely, i.e. in a place where it will keep best.
- Each team has a bag of different items of food, represented by illustrated flash cards. You're only allowed to take out one at a time.
- When you have taken a card out, discuss where it should be placed. One of your team members should rush to place the card in the appropriate place. Once he or she is back, take out and discuss the next card. Repeat until your bag is empty.

- One of the food items needs to go into a container. Make sure you place it in the container and close the lid before you put it in the correct storage place.
- There are points for speed, but there are twice as many points for correct storage. So make sure you're fast, but be certain that you put the food away properly, too!

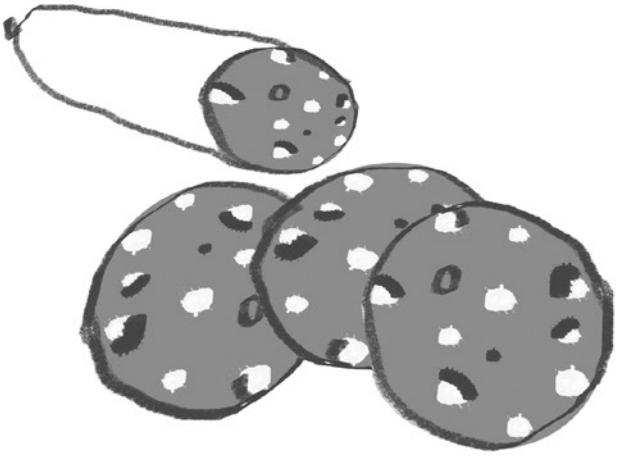
Instructions:

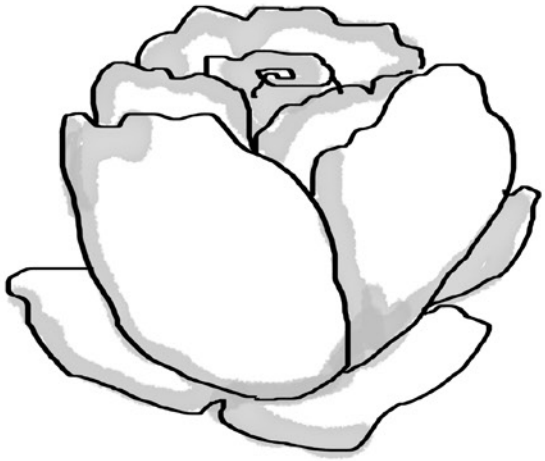
1. Split the class into teams of three to four students. Hand each team a non-transparent bag containing one set of food-item printouts.
2. Place the cardboard boxes or tables in different corners of the room (or mark off sections with string). While designating each to be a fridge, cellar, cupboard or kitchen worktop by pinning up the storage signs on or above them, ask: "What makes this place special in terms of food storage?" (e.g. fridge: low temperatures; cellar: dark and cool; cupboard: dark but little air circulation; worktop: air circulation but fluctuating and generally higher temperature).
3. Explain the rules of the game.
4. Play!
5. Keep note of the order in which the different groups finish. The last group is awarded one point, and each subsequent group one more.
6. After the game has finished, take students to each storage place in turn and discuss: what should have gone into here? Why? (Check the support sheet D 4b, "Storage knowledge" on page 87) if you are unsure of the solutions yourself. Check which cards are in there and keep a tally of the different teams' records. The team with the lowest number of correct placements is awarded two points, and each subsequent group two more. The team with the highest number of overall points wins.
7. Ask students to sit down again and discuss: Why is it important to store food properly? (answer: storing food in the appropriate places makes sure that it keeps as long as possible. It can also help prevent you from falling ill from the effects of eating food that has gone off.) Do you know of any additional rules about storing food?
8. Hand out support sheet D 4b, "Storage knowledge" and read through the storage tips together. If you have come up with additional tips in the discussion before, let students add them to the worksheet.
9. As homework, instruct students to ask their (grand)parents or guardians about any additional tips they may have. Compare notes the following day.

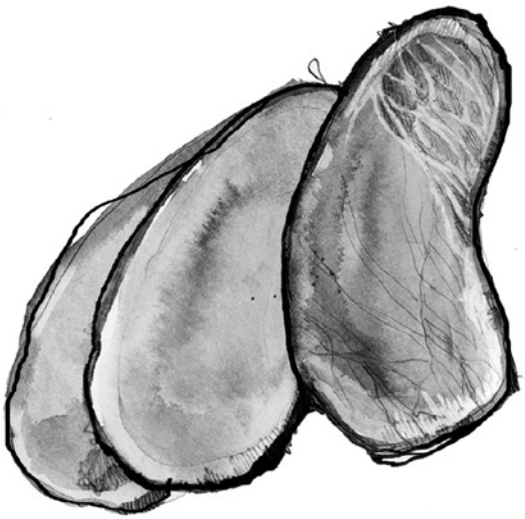
SPEED STORAGE ONE



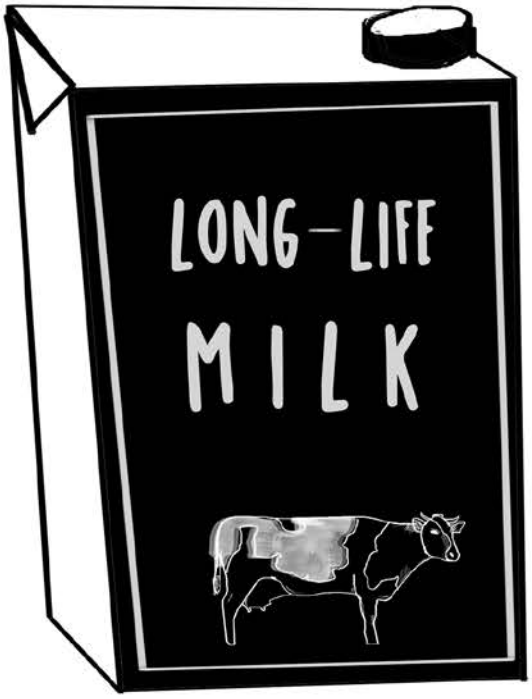
SPEED STORAGE TWO

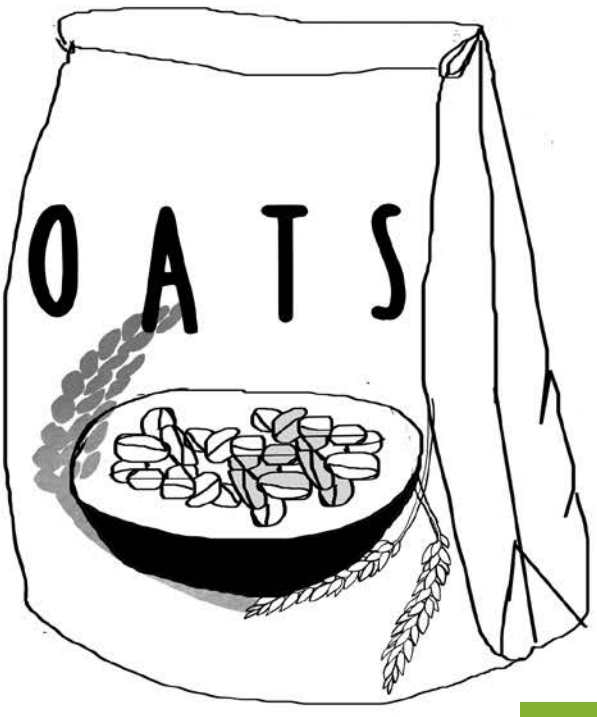






SPEED STORAGE THREE



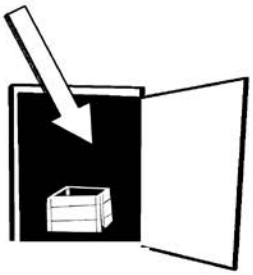


G 2a

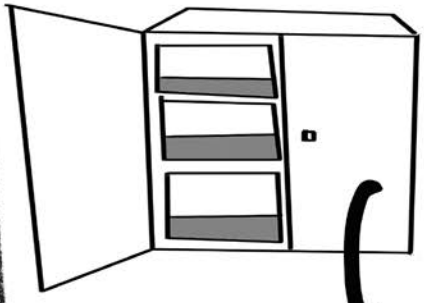
SPEED STORAGE

FRIDGE

CELLAR



WORKTOP



CUPBOARD

Don’t waste it! Board game

Featuring key facts of how to avoid food waste, this game of chance can be played by two to six people. Students repeat key tips for food waste reduction along the way.

15 min

You will need:

- Printouts of the board game G 3 (one for every three to four students)
- Game pieces (alternatively: differently coloured chips or little stones, one per student)
- Dice (one for every three to four students)

Rules:

The object of the game is to be the first player to reach the final square.

The person who has thrown away the smallest amount of food over the last two days starts. If you cannot determine who that was, the person who first throws a six starts.

To take your turn, roll the die and move your game piece forward the number of spaces you threw. The person to your left goes next (unless you threw a six, in which case you are allowed to take an extra turn.)

If you land on an action space, read the message out loud and move your game piece accordingly.

Instructions:

1. Split the students into groups of three to four.
2. Hand out the copies of the game.
3. Explain the rules.
4. Play!
5. Discuss: What has the game taught you about good and bad habits of handling food?

BOARD GAME

FORWARD

BACK

START

+1 YOU BOUGHT A CROOKED CARROT

-3 YOU PUT TOO MUCH ON YOUR PLATE AND COULDN'T EAT IT ALL

-3 YOU COULDN'T FINISH YOUR PLATE BECAUSE YOU ASKED FOR MORE THAN YOU COULD EAT

+2 YOU TOOK RESTAURANT LEFTOVERS HOME IN A DOGGIE BAG

-2 YOU DIDN'T FINISH AN APPLE BECAUSE IT HAD GONE BROWN

YOU PRACTICED FIFO: NEWEST FOOD TO THE BACK AND OLDEST TO THE FRONT +4

+3 YOU WENT SHOPPING WITH A SHOPPING LIST

YOU MADE SURE YOUR FRIDGE IS SET AT BETWEEN 1 AND 5°C +2

LEFTOVERS SPOILT BECAUSE YOU FORGOT TO PUT THEM IN THE FRIDGE -4

YOU INVITED FRIENDS OVER TO COOK A MEAL WITH LEFTOVERS +2

YOU THREW AWAY LEFTOVERS INSTEAD OF PUTTING THEM IN THE FRIDGE -5

-2 YOU HAD TO THROW OUT SPOILT FOOD AT THE BACK OF YOUR FRIDGE

END

CORE LESSON 2: **WRITING EXERCISES**

Writing exercises foster creative and cognitive involvement with the topic. Invite your students to join in these exercises individually or in pairs and to share the written works with each other.

Covering food waste

Ask your students to do the following: "Imagine you're a journalist who is asked to write about food waste, and choose a style of magazine or newspaper you would have fun writing for (e.g. a tabloid, a broadsheet, a magazine aimed at young women, sports enthusiasts, children etc.). Think about what messages you want to emphasise for your particular target audience, and which language would be appropriate for your audience. You have one page to write (and if you want, illustrate) your article."

CORE LESSON 2: **PROJECTS**

Save food diary

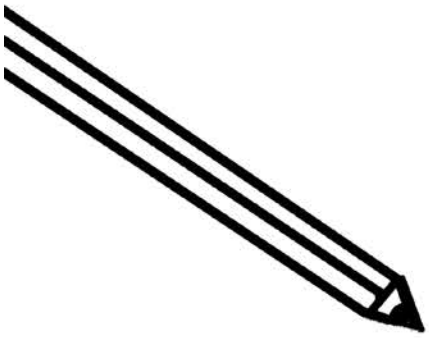
The diary will help students keep track of their efforts at reducing food waste and will also introduce the topic to their families. Students are encouraged to keep the diary for three days.

You will need:

- Printouts of the Save food diary pages P1 (one copy per student for each day)

Instructions:

1. Reflect in groups: Do you think you waste a high, low, or moderate amount of food? What makes you think that? What items of food do you tend to waste and on what occasions do you waste them? Can you think of any reasons why this might be?
2. Hand out copies of the Food waste diary P1.
3. Explain how the diaries work: After each meal (not at the end of the day!), each student should note what and how much of it they threw away and why they did so. At the end of the day, they should note any additional food they threw away during the day.
4. Each day, e.g. in morning circle, ask students how they fared with their diaries. After two days, discuss: Were they surprised by the amount of food they wasted? If so, do they think it is necessary to change the colour of their signal point?
5. When the week of keeping the diary is up, discuss: What did you learn during this week? Did your habits change? Did your tracking affect the way your family dealt with food waste? Do you think you can keep up reducing the amount of food you waste? What might help you on that path?



SAVE FOOD DIARY

MY NAME:

DATE:

BREAKFAST

LUNCH

DINNER

OTHER FOOD I THREW AWAY TODAY:

I THREW AWAY...	BECAUSE...

Get cooking!

Students are asked to come up with recipes using those items of food they tend to waste most. Students are encouraged to try some of these recipes at home (under adult supervision).

Since it comprises some impromptu food waste surveying, this activity can easily be combined with project P 1 "Save food diary" (under adult supervision).

Please note: *because it entails students meeting up for cooking sessions in their homes, this exercise may not be appropriate for every class. Please make sure to instruct the students that they will need adult supervision if they are cooking at home.*

45 min (+ homework)

You will need:

- One loose-leaf binder

Instructions:

1. Explain: "It is sometimes difficult to know what to do with your left-overs. If you or your parents or guardians are out of ideas for left-over dishes, there are some interesting websites that can help you come up with recipes (e.g. www.lovefoodhatewaste.com/recipes and www.bigoven.com/recipes/left-over).

2. As homework, ask students to determine what food is left over and in greatest danger of being wasted in their homes during the course of the next week. If no single item stands out, they should ask their parents or guardians what food they think is wasted regularly in their homes. Once they have established one or more food items, ask them to come up with a recipe in which these are used. They could check cook books for inspiration, talk to (grand-) parents or guardians, or check out online recipe generators such as those mentioned above. Ask them to copy out and illustrate their recipe.

3. Collect the homework and bind the various recipes together. Ideally, get your students to scan in their recipe or to take a picture of it and create a file to pass on to the class.

4. Ask students to form groups of no more than four. From your collection of recipes, ask them to choose one for their group and to try it out at home over the course of the next week. If your students are minors, remind them that they will have to do so under adult supervision. Ask them to prepare some documentation of their efforts, such as an illustrated poster with photos of their cooking event and a commentary, or a short video clip of their preparations and meal.

5. Invite students to present their documentation in class and discuss: Did you enjoy the cooking? And the meal? Did the fact that you prepared the meal yourself and that you shared it with friends influence your eating experience? Did it affect the way you regard food?

Spread the word!

Students are asked to design flyers with the key tips and to take them home to share with family and friends. As a follow-up, they lead a guided interview with the people with whom the information was shared to see how it was received.

90 min

You will need:

- (Coloured) paper
- (Coloured) pencils

  Alternatively: access to computers with a word processing programme such as Microsoft Word or the freeware Open Office, download here: www.openoffice.org/download/index.html, and a printer
- Scissors
- Printouts of the guided interview P2 (one per student)

Instructions:

1. Split students into groups of three to four and ask them to design flyers with key tips on how to avoid food waste.
2. Set up a few presentation tables on which the students can place their flyers, and ask them to walk around and examine their classmates' work and to provide feedback in a subsequent classroom discussion.
3. If your school has a photocopier, make four copies per student to take home and give to their parents, other family members and friends. If you do not have access to a photocopier, ask students to do one to two copies by hand to take home.
4. Hand out copies of the guided interview (P2, "Spread the word") and read through it together. Explain to the students that for homework, they will be required to hand out their flyers to family and friends and, a few days later, to check up on how the information was received by conducting an interview with one of the people they shared the information with.
5. Over the course of the next week, remind students of their homework and set aside time for them to talk about their experience.
6. After the week is up, split the students up into groups of three to four and ask them to summarise their findings: How was the information received? Were they able to change some people's perception of food waste? Were they able to detect concrete changes in the way people were dealing with food waste? Discuss the groups' findings and experiences in class.

SPREAD THE WORD!

You have spread the word on food waste – well done! Now, prepare to follow up on your instructions and ask the person to whom you have given your information the following questions. Make sure to take note of the answers!

Ask your friend, parent or family member:

1. Did you understand all the tips? If not, can I help you with any of them?

2. Did you learn something new, or had you already been aware of the various ways to avoid wasting food before?

3. Which tip did you find most helpful? Why?

4. Were there any tips that you found difficult to follow? If so, which ones? Why?

5. Has the information changed the way you treat food?

Letter to parents & informational flyer

Dear Parents and Guardians,

Your child may have already talked to you about a topic that our class/school will be involved in over the coming weeks: food waste.

Food loss and waste are a massive global problem: One-third of all the food produced in the world is either lost or wasted, which means that every year, a staggering 1.3 billion tonnes of perfectly good and edible food does not reach the end-consumer – 100 kg for each of us. Not only does this wastage create immense economic costs, both for ourselves as consumers and for the economy; food loss and waste also come at a high environmental and social price.

In class, your child will learn about the consequences of wasting food, and he or she will also learn about ways to avoid food waste. In order to avoid wasting food, we can:

- serve smaller portions;
- shop carefully;
- re-use left-overs; and
- store our food properly.

In the leaflet accompanying this letter, you will find some simple tips on how we can achieve these changes in the way we treat our food.

During the next few weeks, your child will be asked to consider how you can reduce food waste in your family and thus not only save money but also contribute to environmental conservation and protection and the fight against world hunger. Please join your child in his or her endeavours to reduce food waste at home and discuss and participate in the possibility of improving the way you handle food at home.

The efforts are based on a supplementary package of education materials, developed by educational expert from the United Nation's Food and Agriculture Organization (FAO). If you have any more questions or suggestions about this important topic and the way we approach it in class, please feel free to get in touch with me.

Hoping that you will join the students and me in our efforts to, as our slogan goes,
"*DO GOOD: SAVE FOOD!*"

Yours sincerely,


Food and Agriculture Organization of the United Nations
9 EASY TIPS
TOGETHER WE CAN FIGHT FOOD WASTE
1 ASK FOR SMALLER PORTIONS
2 LOVE YOUR LEFTOVERS
3 SHOP SMART
4 BUY "UGLY" FRUITS AND VEGETABLES
5 CHECK YOUR FRIDGE
6 PRACTICE FIFO: FIRST IN, FIRST OUT!
7 UNDERSTAND DATES ON YOUR FOOD
8 TURN WASTE INTO COMPOST
9 SHARING IS CARING: GIVE TO HELP
DO GOOD: SAVE FOOD!
INTERNATIONAL FOOD WASTE COALITION

DO GOOD: SAVE FOOD!

nine easy tips to reduce food waste.

WHAT IS FOOD WASTE?

"Food waste" refers to all the food wasted even though it would have been good to eat: if something goes off in your fridge because you haven't eaten it in time, for example, or you have put too much on your plate and throw away your leftovers instead of eating them later... this is food waste.

WE NEED TO STOP WASTING FOOD BECAUSE:

- Wasting food means wasting money, labour and resources such as energy, land and water that go into producing the food.
- Wasting food increases greenhouse gas emissions and contributes to climate change.

1 ASK FOR SMALLER PORTIONS

Make sure you start your meals with a small portion on your plate. You can always go back for more if you're still hungry.

2 LOVE YOUR LEFTOVERS

Instead of scraping leftovers into the bin, use them as ingredients for tomorrow's meal, or simply reheat them as the same meal again. Remember, if you want to use leftovers, it's very important to store them in the fridge or freezer within two hours of preparing your meal.

3 SHOP SMART

We often buy more food than we can eat before it goes off. To avoid over-shopping, try to plan ahead, make a shopping list, and don't go shopping on an empty stomach!

4 BUY "UGLY" FRUITS AND VEGETABLES

Many shops and farmers' markets offer irregularly shaped fruit and vegetables, which are just as good to eat as regularly shaped and coloured ones. Buy "ugly" fruits and vegetables to show that you do not want any food wasted!

5 CHECK YOUR FRIDGE

To make sure that food is properly stored and kept fresher for longer in your fridge, set it to the right temperature (between 1 and 5 °C), store products in the right places in the fridge, and follow the instructions on the packaging or the fridge manual. Don't pack the fridge too full: you will use less energy and you'll be less likely to forget to use the food you bought.

6 PRACTICE FIFO: FIRST IN, FIRST OUT!

When you put your shopping away, rotate the food in your fridge and cupboard so that the older food comes forward and the most recent shopping – which will keep the longest – goes to the back. But keep an eye on the use-by and best-before dates – some of the new food you have bought may need to be eaten quickly.

7 UNDERSTAND DATES ON YOUR FOOD

After the "use-by" date has passed, food is not safe to eat anymore. "Best-before" dates, on the other hand, only show when the food is at its best quality in terms of smell, texture, and taste. If well stored, most of non-perishable food is still edible after the "best-before" date!

8 TURN WASTE INTO COMPOST

If you do end up wasting some of your food, recover it by turning it into garden food: instead of throwing it in your regular bin and contributing to the greenhouse-gas emissions connected to the transport and disposal of waste, why not set up a compost bin for food waste and fruit and vegetable peelings?

9 SHARING IS CARING: GIVE TO HELP

Give your surplus to help those who need it. When hygiene and sanitary conditions and traceability requirements are ensured, it's easy to give your surplus food to those in need. Learn about existing initiatives in your cafeterias, your stores and your city to give a boost to food aid associations and reduce waste.

SAVE FOOD
Global Initiative on Food Loss and Waste Reduction

Food and Agriculture Organization of the United Nations (FAO)
Viale delle Terme di Caracalla
00153 Rome, Italy

www.fao.org/save-food
Save-Food@fao.org

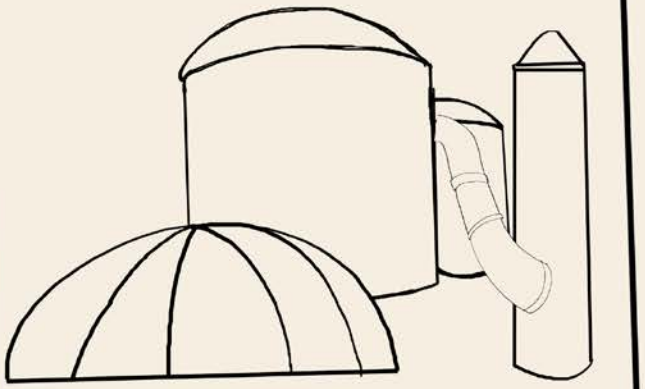
ANNEX 1

PRESENTATION 1: DO GOOD: SAVE FOOD!

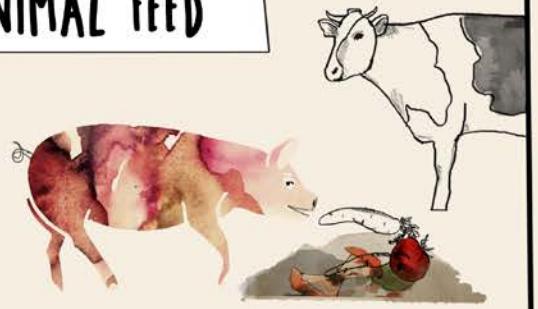

DO GOOD:
SAVE FOOD!


100 KG
1/3
1,300,000,000
T
TONNES

ANAEROBIC DIGESTION PLANT



ANIMAL FEED



HOME COMPOSTING

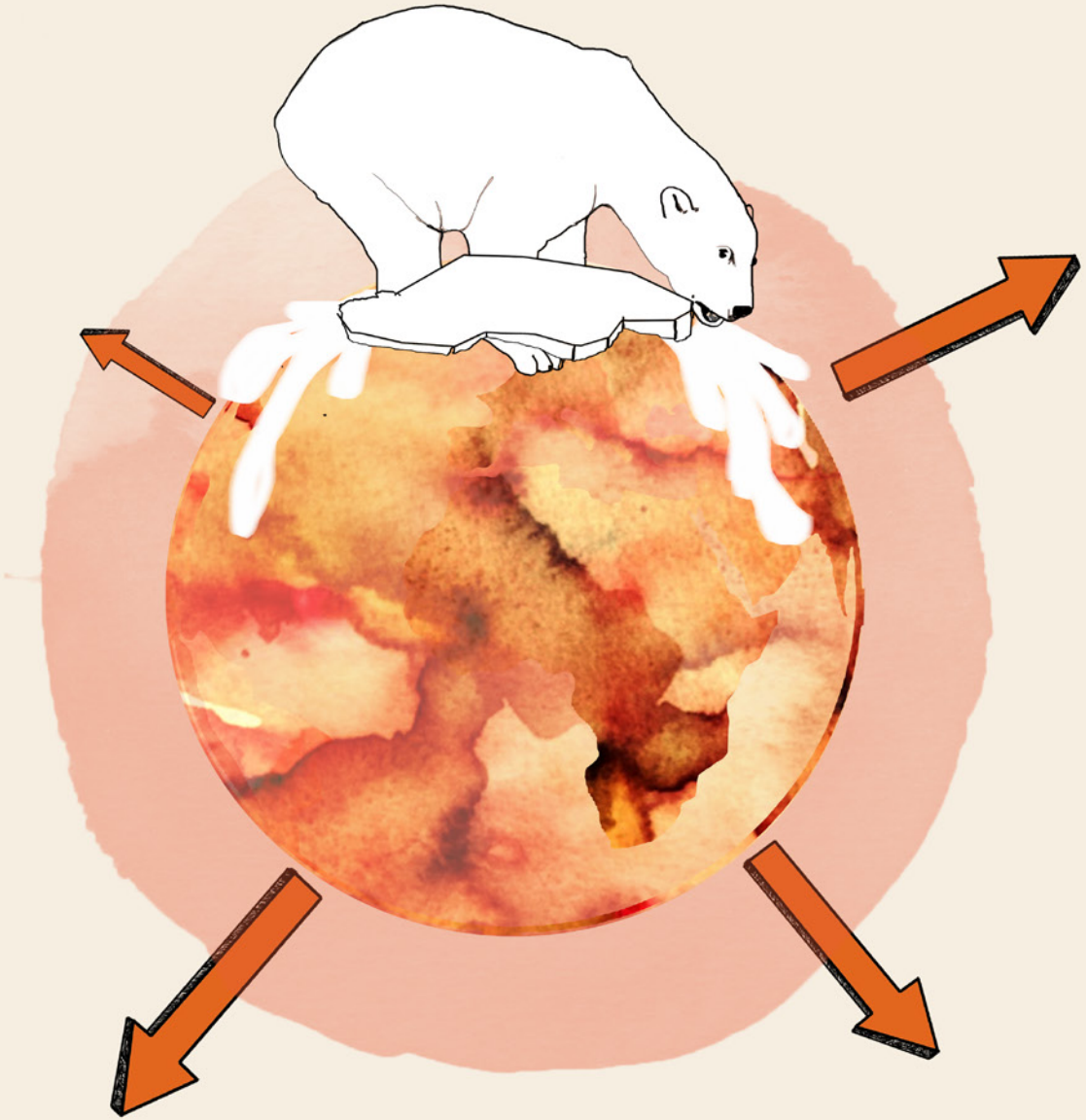
LANDFILL


THE FOOD SUPPLY CHAIN:
FROM THE FARM TO YOUR TABLE
SUPER

CARBON FOOTPRINT:

FOOD LATER WASTED PRODUCES 3.6 GIGATONS
OF GREENHOUSE GASES EACH YEAR-
MORE THAN ANY COUNTRY OTHER THAN THE US AND CHINA.

FOOD WASTE CONTRIBUTES TO GLOBAL WARMING.

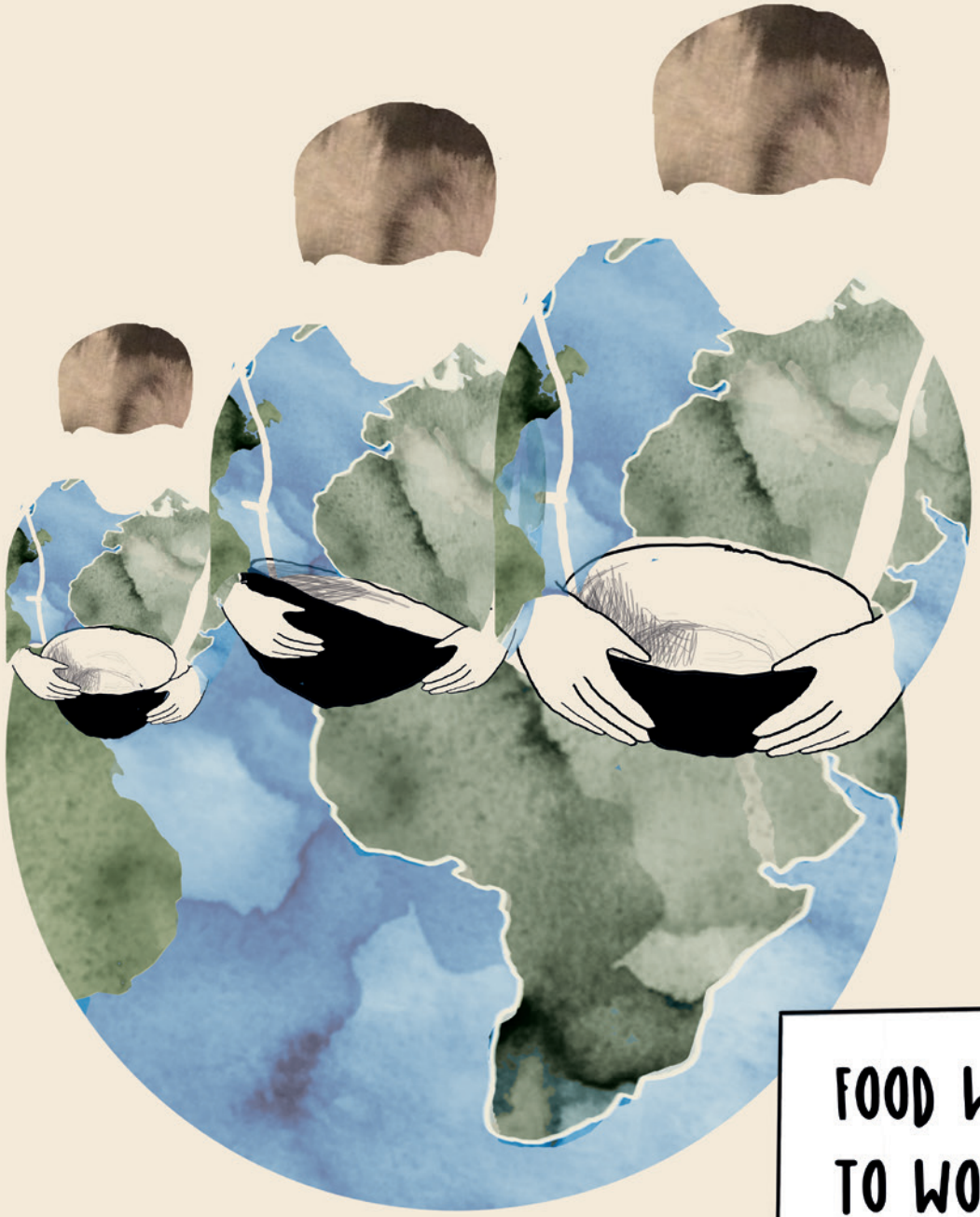



WATER FOOTPRINT:
1/4 OF WATER USED IN AGRICULTURE
IS USED IN FOOD THAT WILL END UP AS WASTE.

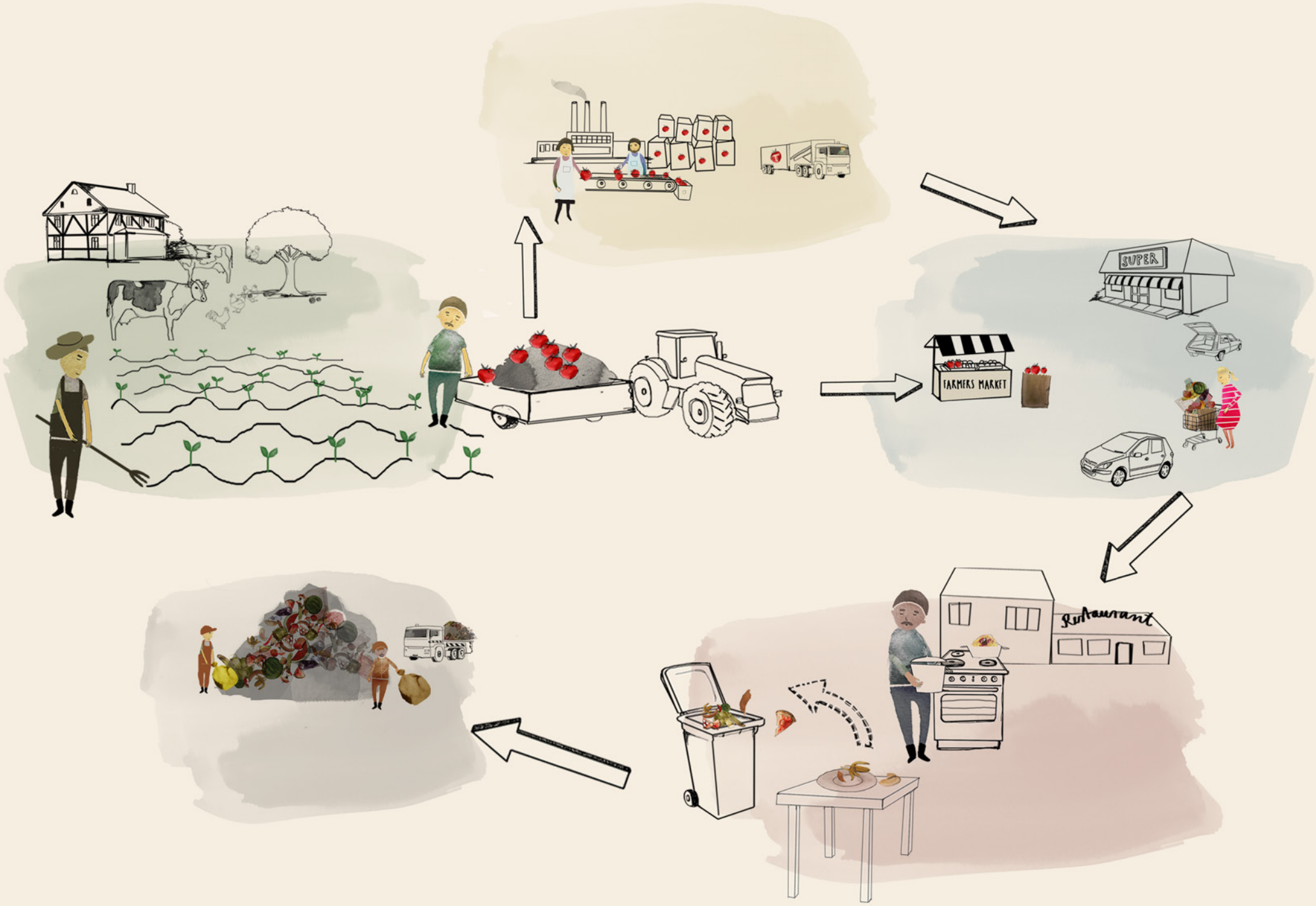
LAND OCCUPATION FOOTPRINT:

IF LAND ON WHICH FOOD LATER WASTED
IS GROWN WAS A COUNTRY,
IT WOULD BE BIGGER THAN CHINA.

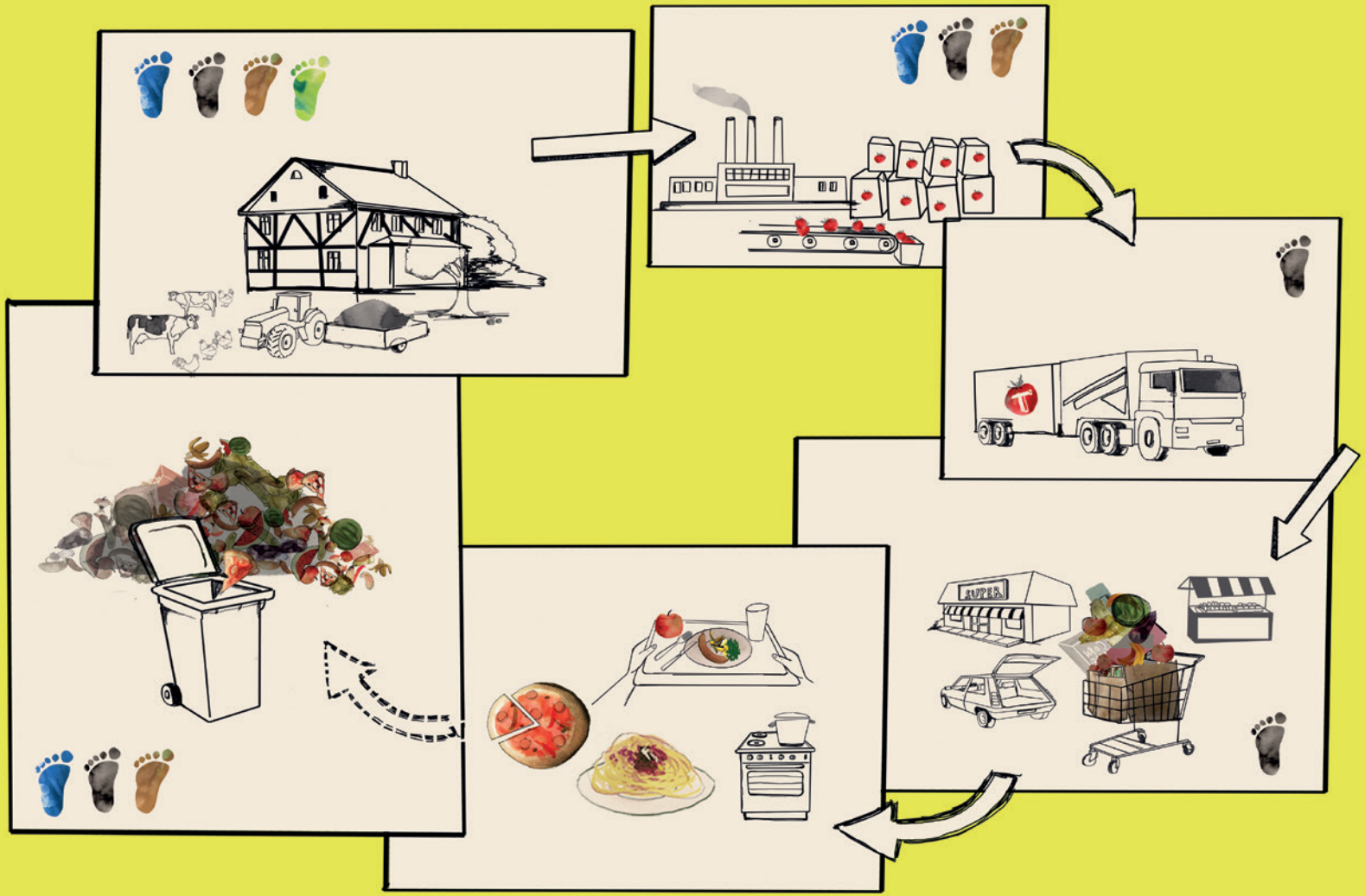

FARMING IS A MAJOR THREAT
TO BIODIVERSITY.



FOOD WASTE CONTRIBUTES TO WORLD HUNGER.


SUPER
FARMERS MARKET
Restaurant

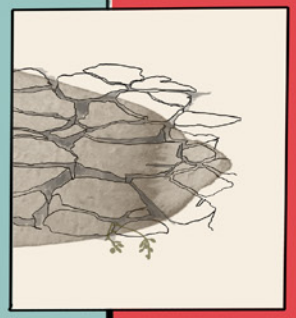
FOOTPRINTS



BLUE WATER CARBON LANDOCCUPATION BIODIVERSITY

FOOD LOSS AND WASTE

FOOD LOSS



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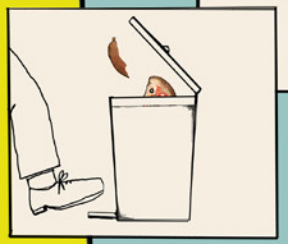
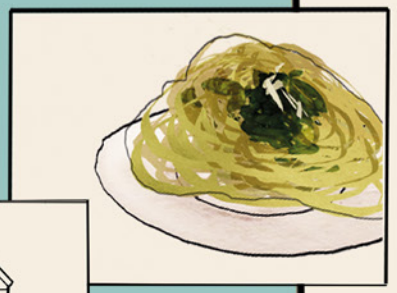
ANY FOOD THAT IS UNINTENTIONALLY LOST BECAUSE OF MALFUNCTIONING OR INADEQUACIES IN FOOD SUPPLY CHAINS, E.G. LACK OF APPROPRIATE STORAGE OR REFRIGERATION.

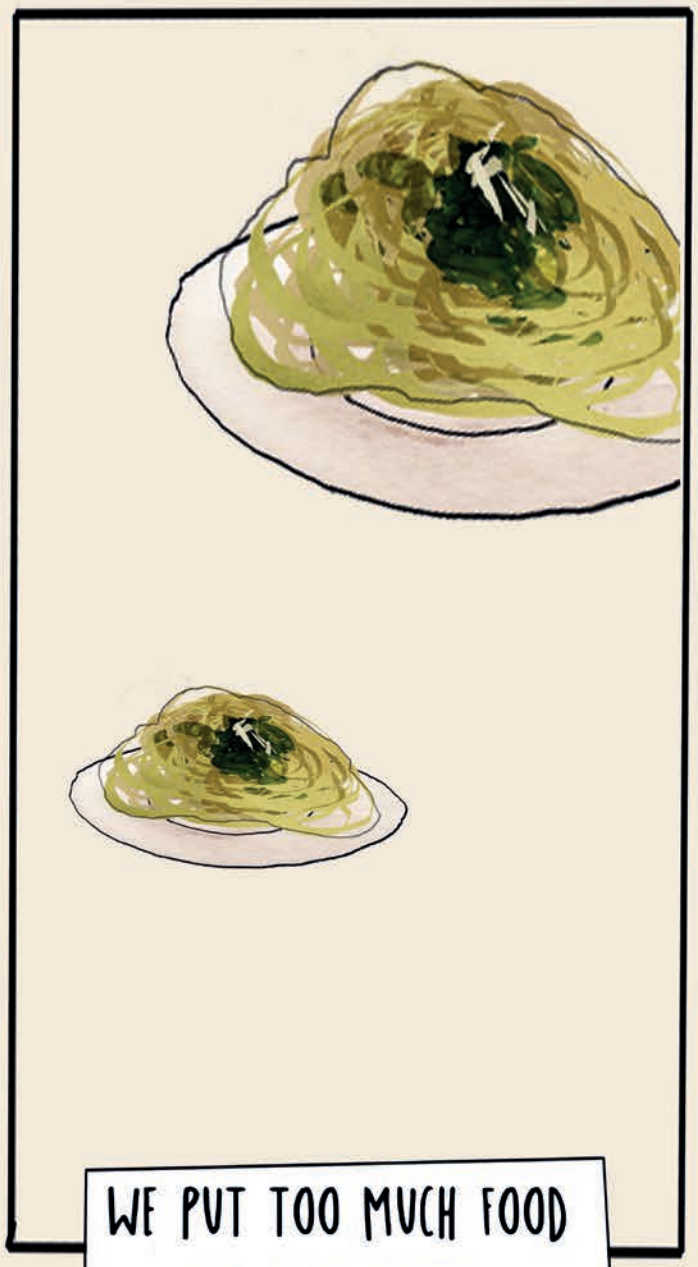
FOOD WASTE

=

ANY FOOD THAT IS WASTED EVEN THOUGH IT COULD ONCE HAVE BEEN EATEN BECAUSE OF NEGLECT AND OUR BEHAVIOUR, E.G. POOR PLANNING, OVERSHOPPING.





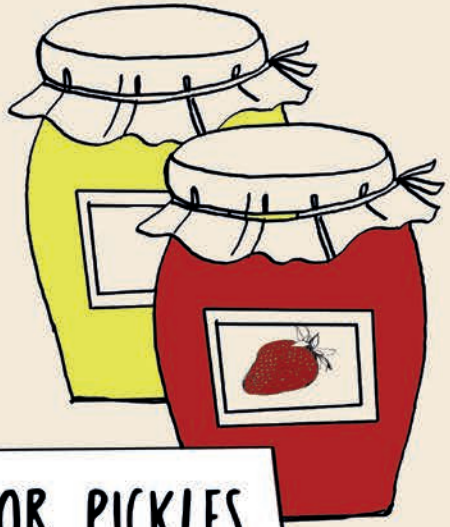

WE PUT TOO MUCH FOOD
ON OUR PLATE.


FOOD WE HAVE BOUGHT
GOES OFF.


PORTIONS IN RESTAURANTS
& CAFETERIAS ARE TOO BIG.

KEEP LEFTOVERS FOR ANOTHER DAY.

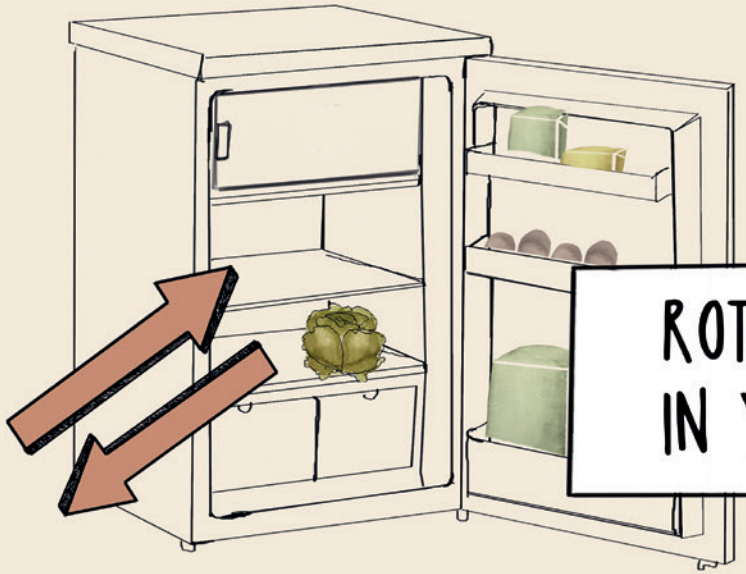
TURN VEGETABLES INTO STEWS OR SMOOTHIES.



MAKE FRUIT JAMS OR PICKLES.

BUY IRREGULARLY SHAPED FRUIT AND VEGETABLES.

WRITE A SHOPPING LIST.



ROTATE THE ITEMS IN YOUR FRIDGE.


Restaurant
pizza


DO GOOD:
SAVE FOOD!

ANNEX 2

PRESENTATION 2: FEED YOURSELF, DON'T FEED THE BIN: NINE EASY TIPS TO FIGHT REDUCE FOOD WASTE

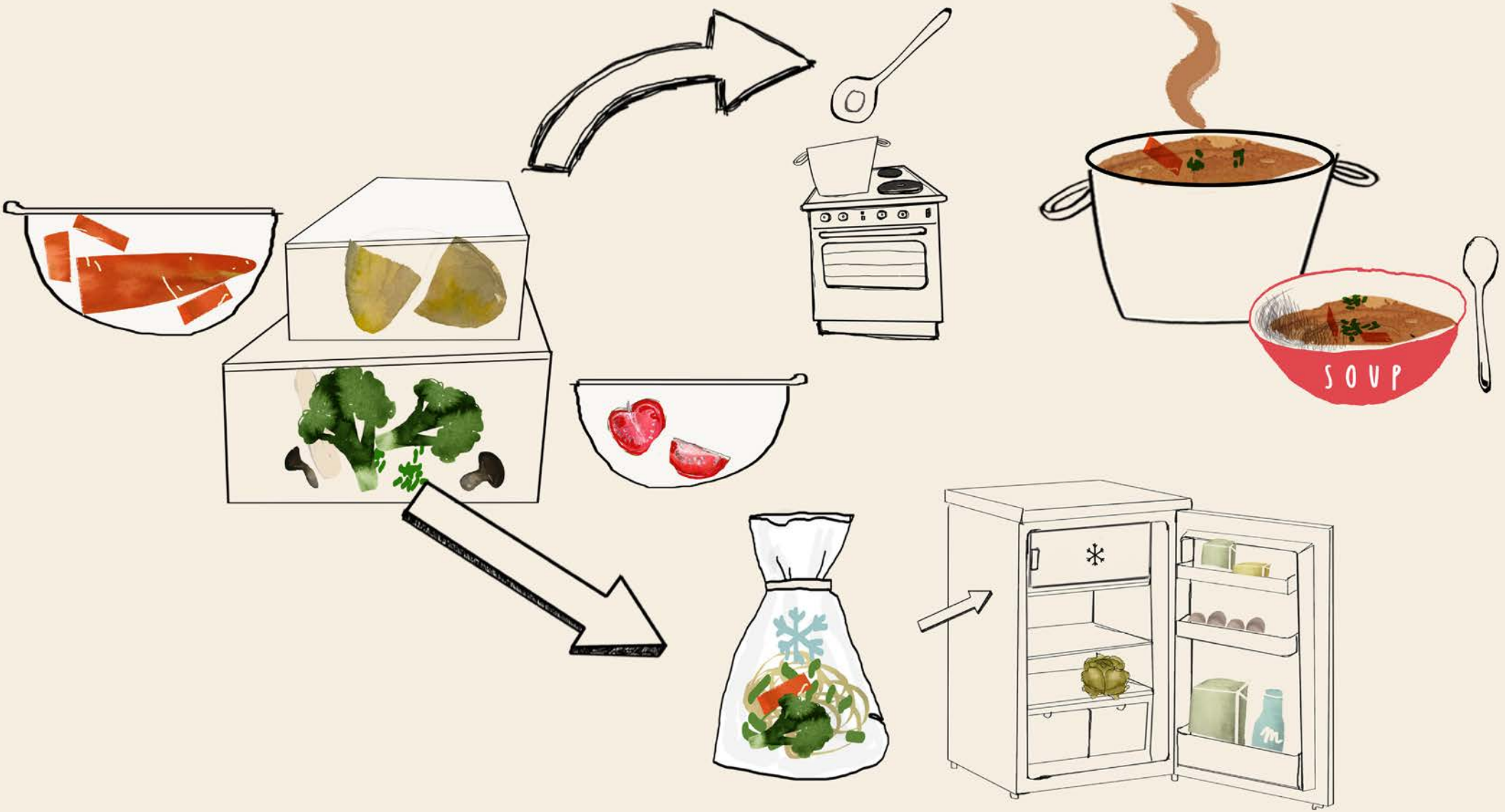
FEED YOURSELF, DON'T FEED THE BIN :

9 EASY TIPS

TO REDUCE FOOD WASTE

1 HELP YOURSELF TO SMALLER PORTIONS

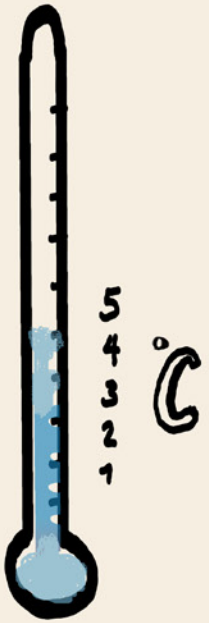
2 LOVE YOUR LEFTOVERS



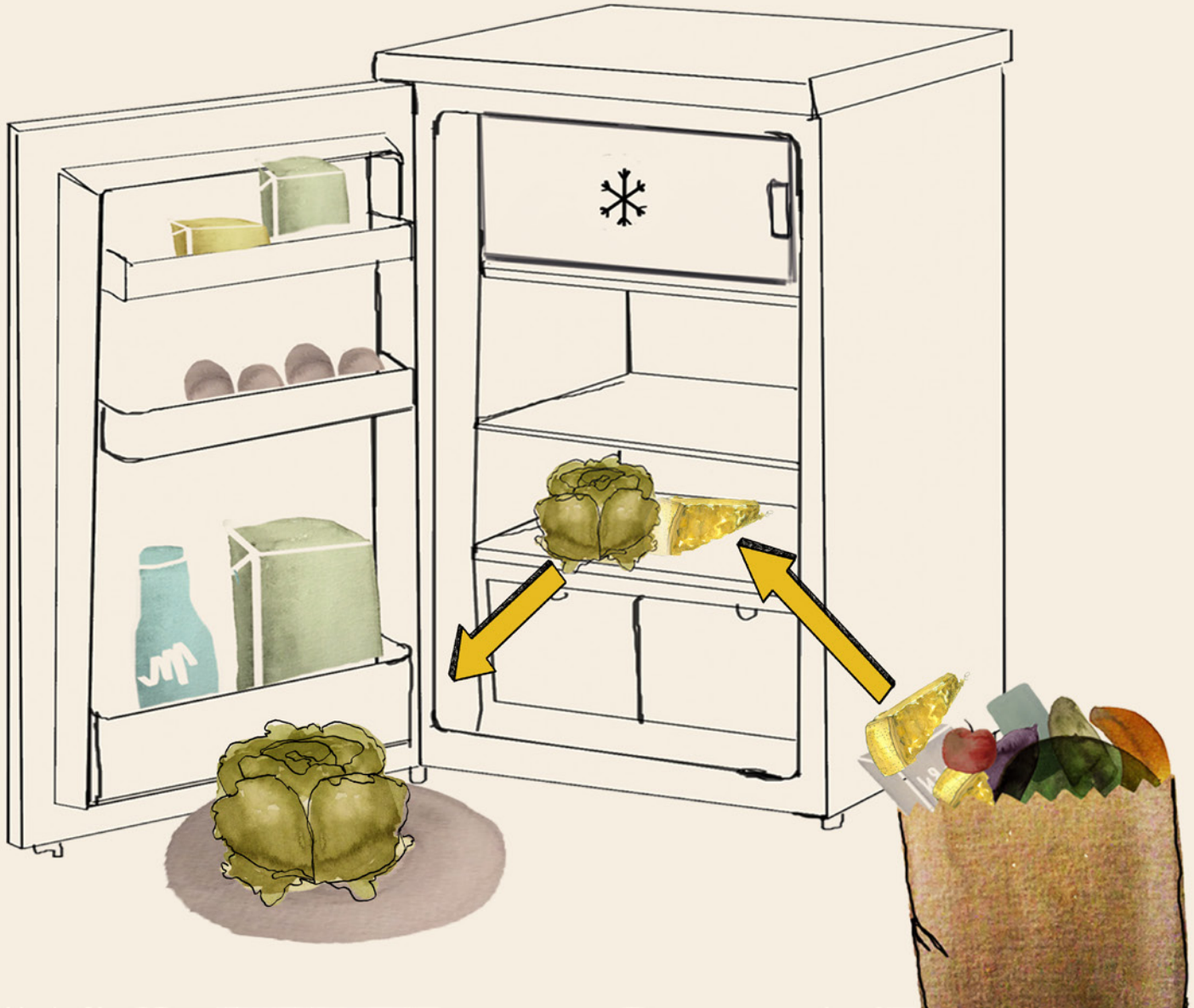
3 SHOP SMART

4 BUY "UGLY" FRUITS AND VEGETABLES

5 CHECK YOUR FRIDGE



6 FIFO: FIRST IN, FIRST OUT!



7 LEARN TO UNDERSTAND THE DATES ON YOUR FOOD

8 TURN IT INTO GARDEN FEED

9 SHARING IS CARING

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Food and Agriculture Organization of the United Nations (FAO)
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