Food Mission Handbook

Creating awareness about food in a fun way

Teachers' resource pack
for 9-14 year old students

eit Food

Co-funded by the European Union

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About Youth Mission resource packs

Capitalising on previous assets developed by EIT Food partners, EIT Food invited learning experts to create coherent, ready-to-use resource packs with and for teachers, available in multiple languages. The resource packs are developed for students aged 9-14 (Food Mission) and 15-18 (Food Careers). Our aim is to create a repository of pedagogical tools about food and food careers. This repository includes the development of a variety of skills and competencies needed for the future of the food system.

Both resource packs offer:

- freely accessible online materials in multiple languages
- 3 thematic modules including ready-to-use, detailed lesson plans
- additional resources to be used in the lesson plans (videos, quizzes and others)
- accompanied by teachers' workshops (in the piloting phase)

EIT Food Youth Mission aims to develop knowledge and awareness of healthy and sustainable food, while educating and inspiring primary and secondary school students about career opportunities in the agrifood sector.

Supported skills:

- group work
- creativity
- interviewing
- research
- presentational skills
- brainstorming complex interdisciplinary ideas
- visioning
- critical thinking
- self reflection

The most important learning objectives and outcomes:

Systems thinking: Broadening thinking to identify different elements within food systems and understand their complexity and interrelations.

Systems mapping: Explore the variety of jobs within food systems.

Sustainable lifestyle: Understand sustainability, from farm to fork to disposal.

Healthy eating behaviour: Identify the characteristics of healthy eating patterns.

Introduction to Food Mission resource pack

Food literacy from a young age is essential in supporting the urgently needed transformation of the food system towards healthier and more sustainable diets. However, health and nutrition education programs for children are usually designed to tell children what is healthy and what is not, without letting them engage with critical questions and issues that are relevant to their lives. It is worth emphasising that in many European countries there is a gap in nutritional education especially in relation to current scientific knowledge.

Healthy lifestyle habits and resource management skills developed at a young age are crucial to prevent the development of non-communicable diseases late in life. As such, education on nutrition and food safety during school age has the potential to empower citizens to critically assess the impact of their food on their health and the environment. With the impending 'perfect storm' of an increasing world population, the environmental impacts of food production, the unbalanced distribution of food and its impacts on health, it is essential to educate and inspire citizens to become food-literate.

Most importantly, our project also incorporates the teaching of communication skills and public engagement strategies so that students will be able to clearly communicate their understanding of food production and become food ambassadors in their communities.

Target group, learning objectives and supported skills

Food Mission educational package targets students aged 9-14 with the aim of creating awareness about food-related issues from new angles in an interdisciplinary manner, connecting food with sustainability, health and science communication.

Learning objectives of Food Mission:

- to examine and uncover how food is interrelated with global environmental and social issues
- to support students in applying food health principles to their daily lives
- to explore the field of science communication and learn to identify misinformation
- to empower students to be able to describe the importance of food science in their daily lives and to become 'healthy & sustainable food influencers' in their communities.

Lesson plan types

The authors strived to offer a wide variety of lesson plan types to experiment with. Most lesson plans are interactive, relying on students' collaboration, curiosity and creativity.

Lesson plan types include:

1. Lecture + Discussion
2. Lecture + Exercises
3. Experiment
4. Lecture + Game
5. Games/Simulations

How to use this resource pack?

In the Food Mission resource pack you will find 3 thematic areas/modules included with accompanying, ready-to-use, detailed lesson plans.

Thematic modules for Food Mission resource pack:

- Food & Sustainability
- Food & Health
- Food & Science & Communication.

Conforming to class duration, lesson plans consist of 45 minutes agendas; however, some topics need more time, so you will need more classes for them. This is indicated where appropriate.

Each lesson plan is a coherent unit and can be used separately. However, you can also link lesson plans to each other, creating a series of food-related classes for your students (e.g. ideal for thematic weeks or longer projects).

Lesson plans indicate preparatory time needed, recommended subjects, short descriptions, lesson plan types, agenda, detailed instructions, supporting materials and additional resources (information for teachers' extended learning). You can access supporting materials (hand-outs,

videos, games, etc.) via the links provided in the lesson plans.

A note for national language variation: while authors tried to create a material that can be used all around Europe, they are aware of regional and national differences. Please substitute some resources and materials with something from your own country if you feel it is necessary.

Preparation time. All lesson plans include a reference to the amount of time needed to prepare for class. Classification includes: short (about 15 min.) medium (30 min.) and long (more than 30 min).

Evaluation and assessment of the lesson plans

If time allows, please do a quick evaluation and feedback round of the learning material you have covered and the lesson plan you have used. Our suggestion is to ask students the following questions:

1. Name one thing you did not know before
2. Name one thing that surprised you about the topic
3. Name one thing you want to start doing as a result of what you've learned.

Their feedback can spark new conversations and discussions for the next class and whilst also, guiding you towards the best topics and lesson plans.

Legend

- Learning objectives
- Duration
- Preparation time
- Can be aligned with the following subjects

Modules and **lesson plans**

In this section you can read more about each module and their accompanying lesson plans.

Food & Sustainability lesson plans

Food & Sustainability

Food professionals are today promoting healthy and sustainable diets that meet the health and nutritional needs of different target groups whilst also contributing to food security. This diet should also have low environmental impacts, ensuring a better planet for current and future generations. Sustainable nutrition refers to the ability of food systems to provide sufficient energy and essential nutrients to maintain good health for the current population without compromising the ability of future generations to meet their nutritional needs.

Accordingly, this module focuses on the 'big picture', addressing issues such as (sustainable) food production, circular agrifood systems and (food) systems thinking. It also introduces students to other key concepts related to sustainability such as food waste and food loss.

Learning objectives

Students will:

- Identify food chains
- Describe the food system related to a simple processed food
- Identify basic sustainability issues
- Associate health and sustainability in diet
- Recognise the importance of healthy eating
- Explain the differences between food waste and food loss, and their impact on society

Lesson plans on food & sustainability (click on lesson plan titles to download individual lesson plans):

1. **Food map:** learning about the food supply chain and its sustainability issues.
2. **Food map redesign:** redesigning food products and food systems in a more sustainable way.
3. **From linear to circular:** learning about the importance of the transition from a linear to a circular food system.
4. **Food waste and food loss:** raising awareness on food loss and food waste and gaining practical ideas on how to avoid these.

Food map

Module: Food & Sustainability | **Type of lesson plan:** Lecture + Discussion
Can be linked with lesson plan: Food Map Redesign

Short description of the activity:

Agricultural products from plant production (e.g. fruits, vegetables) as well as from animal production (e.g. milk, meat) are subjected to food processing. Food processing refers to any operation (mechanical, physical or chemical) carried out on a food in order to change its properties[1]. Examples of processing procedures include pasteurisation, baking, frying, sugar preserves, salting, drying, freezing etc. Processed foods are packed, labelled and sold for consumption. The aim of this activity is to map out the production process of a processed food: apricot jam. The students will seek to decode and understand a jar of jam by breaking it down into its source components.

Students will:

- Describe a food supply chain and reflect on its sustainability
- Identify the type, supplier and origin of the raw materials needed to make a simple processed food product.

Duration:

45 min

Preparation time:

short

Can be aligned with the following subjects:

Home Economics / Environmental Education / Geography / Science

[1] 'What is food processing?' FutureLearn

Duration	Activity	Materials/Equipment (download here)
15'	Introduction to the production process of apricot jam	Video on jam production (the following video or another video that the teacher may find in their own language): How It's Made Cherry Jam (4:51), Food Map: PowerPoint (slide 2)
15'	How did an apricot jam in a glass container get on the supermarket shelf?	An apricot jam in a glass container Food Map: PowerPoint (slides 3, 4, 5) Infographic: Sugar: How is it produced from cane?
15'	Group work on Activity Sheet	Activity Sheet Infographic: Canned tomatoes Activity Sheet - Model answer

Detailed instructions:

Introduction on the production process of fruit jam

Many different fruits can be used for jam production, usually depending on what is available locally and seasonally in a particular region. In this lesson plan, apricot jam will be used as the example. Fruit and sugar are usually the main ingredients of jam. Fruit comes from the apricot tree on the farm and sugar comes from processed sugar beet or sugar cane. In terms of packaging, each packaging material (glass container, lid, label) comes from a different raw material.

First, the students watch a video on jam production. The teacher can use one of the following videos (or a video that they find in their own language):

How It's Made Cherry Jam

The steps of the production process are explained by the teacher (slide 2).

The teacher explains that apricot jam (or any other fruit jam) is made by boiling apricots (or another fruit) with sugar in order to produce a gel or semi-solid mass that contains pulped or whole fruit. The gel is formed from the sugar, the acids present in the fruit and pectin found in fruits.

During jam making, the apricots are cut into pieces and the seed is taken out from each apricot. They are mixed with sugar and the mixture is boiled. Lemon juice or pectin may be added to the mixture to help in the formation of a satisfactory gel. When the boiled mixture is ready, it is usually filled in glass containers, closed and labelled.

How did an apricot jam in a glass container get on the supermarket shelf?

The teacher shows the children a glass container of apricot jam and asks them to brainstorm all of the materials that they can see and those they cannot see that were used to make the product. The teacher reads the ingredients to the students and explains that, for simplicity, they will focus only on the two main ingredients – fruit and sugar. Guiding questions posed by the teacher are:

- Where are the apricots coming from?
- Where is the sugar coming from?
- What can you say about the packaging (a glass container with a metal lid)? Where is the glass coming from? Where is the metal coming from?
- What about the label? How was the label made?
- How is the final product transported to the supermarket, to restaurants, etc.? What are the transportation boxes made of?
- What kind of resources are the ore, the plants and the sand?

Based on the above questions, there should be a discussion about the sourcing of each one of the product components (slides 3, 4). The apricots grow on apricot trees on the farm. They are picked and transported to the apricot jam factory. The sugar comes from either sugar cane or sugar beet that grow in fields. Sugar cane or sugar beet are processed in a food factory to produce sugar that is then transported to the apricot jam factory. For sugar production, the teacher can use the following link to show the sugar production flow diagram:

Sugar: How is it produced from cane?

The glass container is made from sand and the metal lid is made from ore (aluminium).

(Optional): The teacher can show the students a video on glass container production and/or metal lid production (see in the additional resources). The label placed on the glass container as well as the cardboard boxes usually used to transport the final product to the selling points (e.g. supermarket) are made from paper which is in turn made from plants.

Two important points to be mentioned by the teacher are that: a) sand, ore/aluminium and plants are all natural resources that are not renewable and b) that a lot of energy (fuel) is needed to manufacture all of these packaging materials.

At this point, the teacher can also make a reference to plastic packaging. They can mention that in this case there is no plastic packaging, but plastic is used extensively as a packaging material and is not easily biodegradable after disposal. It also comes from petroleum which is a non-renewable natural resource. The teacher summarises the apricot jam food system in terms of sourcing the different components (main ingredients and packaging) (slide 5).

Group work on Activity Sheet

The students are divided into groups of 4-5 and each student is given an activity sheet.
The teacher explains that they will now try to apply what they learned about apricot jam production to a different product: a can of tomatoes.
The teacher explains the activity sheet which shows the flow diagram of the production of a can of tomatoes. In the flow diagram, some of the boxes are empty. They are asked to write the missing materials/processes in the empty boxes. Younger children can draw pictures instead of writing.

The groups are allowed to work on the activity sheet. In the end, the teacher, through discussion with the students, fills the flow diagram for the production of a can of tomatoes on the board. The teacher can use the following infographic as part of the final discussion:

Canned tomatoes (in the materials folder).

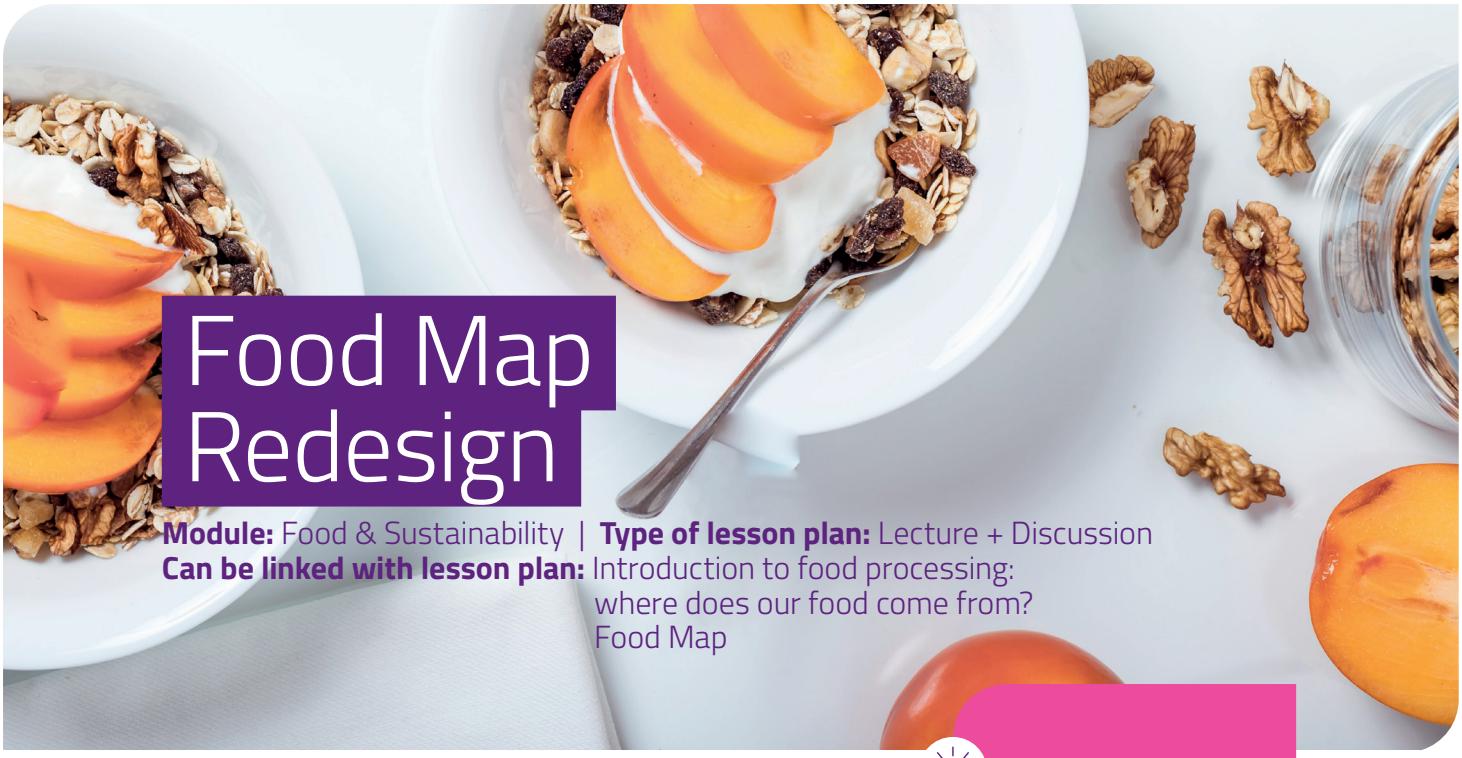
The teacher can find a model answer of the activity sheet below (in the materials folder).

Additional resources:

Video: From Grit to Glass - How bottles are made (2:13)

Video: Magic of making - Glass bottles and jars (up to 3:15)

Video: How to make aluminium screw caps (4:47)



Food Map Redesign

Module: Food & Sustainability | **Type of lesson plan:** Lecture + Discussion
Can be linked with lesson plan: Introduction to food processing: where does our food come from? Food Map

Short description of the activity:

There are many ways to make food systems more sustainable and to decrease the environmental impact of processed foods. The characteristics of raw materials is one key element, such as the distance travelled before processing and the agricultural practices used in their production. In this lesson plan, students will think about ways to make processed food more sustainable.

Students will:

- Explain how choosing local and seasonal ingredients can make processed foods more sustainable
- Explain how choosing organic ingredients can, in most cases, make processed foods more sustainable.

Duration:

45 min

Preparation time:

short

Can be aligned with the following subjects:

Home Economics / Environmental Education / Education for Sustainable Development / Geography / Science

Duration	Activity	Materials/Equipment (download here)
15'	Introduction to three sustainability issues around a processed food	Food Map redesign PowerPoint (slides 2,3)
20'	Exercise on how to redesign the apricot jam (based on a scenario that will be given to the students)	Scenario
15'	Shared suggestions from the groups	Activity Sheet - Model Answer

Detailed instructions:

Introduction to three sustainability issues around a simple processed food

The teacher explains to the students the definition of 'food processing'[2]. The teacher then makes a summary of the flow diagram about producing a glass container of apricot jam (from lesson plan: Food Map) (slides 2 and 3).

Next, the teacher asks the students: what makes processed food more sustainable? The teacher asks the students to share their knowledge on food product sustainability. The teacher then uses guiding questions to draw from the students the following three elements of sustainability:

a) **The effect of transportation on the environmental footprint of processed foods**
In food processing, using ingredients that are produced locally within the region and as close as possible to the processing factory is very important in limiting CO2 emissions from transportation and storage.

b) **The effect of seasonality in the ingredients used.** Seasonality can be defined as globally seasonal (produced in the natural production season but consumed/used anywhere in the world) or locally seasonal (produced in the natural production season and consumed/used within the same region)[3]. Using locally seasonal ingredients in food processing contributes to a processed food with a lower environmental impact.

c) **The use of organic vs conventional (not organic) ingredients.** The use in food processing of ingredients that have been organically produced or produced using integrated pest management also contributes to sustainability due to lower inputs of pesticides onto the field.

Exercise on how to redesign the apricot jam (based on a scenario that will be given to the students)

The teacher gives a copy of the written scenario to each of the students. The teacher gives them enough time to read it and ask questions if they have any.

The teacher organises the students in groups of 4-5 and asks them to discuss among themselves and suggest at least 4 changes that the company can make in order to make its product more sustainable. The teacher asks the students to use any previous knowledge they might have on the issue of enhancing sustainability in the food systems, especially concerning food processing.

Shared suggestions from the groups

Each group chooses a representative to share the suggestions of their group to the rest of the class. The teacher writes on the board all the suggestions and there is a discussion about them in class. A model answer of the activity sheet is found below:

Additional resources:

Are seasonal fruit and vegetables better for the environment?

[2] What is food processing? (FutureLearn)
[3] DEFRA, 2012; MacDiarmid, 2014

From Linear to Circular

Module: Food & Sustainability | **Type of lesson plan:** Lecture + Discussion
Can be linked with lesson plan: Food waste and food loss

Short description of the activity:

Our current food system uses the linear economic model of 'take-produce-consume-discard', which assumes that economic growth can be perpetuated based on the abundance of resources and unlimited waste disposal. However, approximately 30%–50% of food intended for human consumption is wasted at different stages of the food system[4]. Circular economy regarding the food system aims at closing the loop of nutrients and minimising waste. Within a circular food system, food production focuses on nutrient cycling where farmers and processors play a very important role. Food consumption is characterised by efficiency and changes in diet towards more diverse and efficient dietary patterns. Food waste and surplus management refers to the utilisation of by-products and food waste in production stages, and to the reuse of food and surplus avoidance in the consumption stages.

It should be noted, however, that 'reuse' within a circular economy perspective is to be considered only as a second-best solution. 'Prevention' should be the first strategy to be adopted.

This lesson plan (recommended for 12-15 year old students) aims at comparing a linear and a circular food system in order to pinpoint differences, give some examples of how a circular food system can be achieved and also to describe the importance of circular food systems. The orange juice supply chain as well as the tomato sauce supply chain are used as examples to investigate how the discarded materials can be given a secondary purpose.

[4] UN Environment Programme

Students will:

- Explain the difference between a linear and a circular food system
- Give simple examples of circularity
- Describe why circular food systems are important.

Duration:

45 min

Preparation time:

short

Can be aligned with the following subjects:

Home Economics / Environmental Education / Geography / Science

Duration	Activity	Materials/Equipment (download here)
5′	Discussion over waste and possible solutions	From linear to circular PowerPoint (slide 2) Video: Saving Food Educational on Food Waste (3:29)
10′	Introduction to the transition from a linear to a circular food system	From linear to circular PowerPoint (slide 3) Video: What is circular economy? (3:49) Video: Circular food systems - The initiatives and technologies leading a food revolution (1:44)
10′	The example of orange juice production	From linear to circular PowerPoint (slide 4,5,6)
20′	Group work: How can the tomato sauce supply chain be changed from linear to circular?	From linear to circular PowerPoint (slide 7) Video: How tomato ketchup is made, tomato harvesting and processing process with modern technology (from 1:00 until 8:00) Activity sheet (one copy for each group) Internet connection and PC/mobile
10′	Presentations/discussion	

Detailed instructions:

Discussion over waste and possible solutions (slide 2)

In order to unlock the curiosity of the students and initiate a discussion over food system sustainability, the teacher shows slide 2 and asks the students to comment on the pictures and express how they feel.
The teacher shows the following video on food waste:

Saving Food Educational on Food Waste

The teacher poses some guiding questions to the students, e.g.:

- What are the sources of waste in a food supply chain?
- What currently happens to different types of waste?
- What can we do to decrease waste?

Introduction to the transition from a linear to a circular food system (slide 3)

The teacher shows the students two videos to help them introduce the concept of 'food circular economy' and what we mean by 'transition from a linear to a circular food system'.

What is circular economy?

Circular food systems - The initiatives and technologies leading a food revolution

The teacher poses guiding questions to the students:

- What happens in a linear food system?
- What happens in a circular food system?
- Why is it important to treat waste differently from how we treat it now?

Through discussion, the teacher explains that in a linear food supply chain the waste that is produced at the different stages of the chain is discarded

(lost). In a circular food supply chain, the goal is first to decrease waste as much as possible and then find ways to reuse the remaining waste, bringing it back into the food supply chain in creative ways.

The example of orange juice production (slides 5 and 6)

The teacher uses the orange juice supply chain in order to explain how we can move from linearity to circularity (slides: 5, 6)

a) at the farm level: waste includes damaged products (e.g. fruit/vegetables), the plant parts that we do not want/do not eat (e.g., the pepper plant when the peppers are harvested)

b) at the processing level: waste includes fruit/vegetables that are damaged or unripe, pulp/pomace from fruits, skin/seeds, processing wastewater (e.g. water that was used to wash the fruits or vegetables), etc.

c) At the retailer level: expired packages, problematic packages.

Group Activity - tomato sauce production (slide 7)

The teacher asks the students to think about possible waste materials in the tomato sauce supply chain (from farm to table).
Then the teacher shows the students a video on tomato sauce production:

How tomato ketchup is made, tomato harvesting and processing process with modern technology (from 1:00 until 8:00)

The teacher gives the students the activity sheet and explains the exercise. The teacher asks the students to think about the waste materials at each of the 4 stages and how this can be re-purposed so it does not end up as waste. The students are told that they can search on the internet (using phones or computers) for possible ideas and solutions.

Presentations/Discussion

Each group briefly presents their ideas and solutions orally. The teacher summarises the ideas on the board as they are being discussed. A model answer of the activity sheet can be found in the materials folder.

Additional resources:

Video: Circular Economy: Definitions and Examples

Video: Annual Food Agenda Food Sustainability - Zero waste attitude

Video: Annual Food Agenda Too Good to Waste

Video: Circular Aquaculture

All about the Circular Economy

The Food Use Hierarchy

Food and the Circular Economy

Transitioning to a circular food economy: the solution for food waste and food loss?

Characterisation of agricultural waste Co- and Byproducts

Agrocycle for a circular economy

Food Waste and Food Loss

Module: Food & Sustainability | **Type of lesson plan:** Lecture + Game
Can be linked with lesson plan: From Linear to Circular

Short description of the activity:

Food waste and loss has recently become a focus of public attention globally. Today there exists a wide consensus between experts and policymakers that the loss of food causes significant economical, environmental and social damage. Some illustrative data includes: * Roughly one-third of the food produced in the world for human consumption every year - approximately 1.3 billion tonnes - gets lost or wasted. * The food currently wasted in Europe could feed 200 million people (per year, FAO, 2013)[5].

In order to raise awareness of the subject, the UN has declared 29th September as the international day to reduce food loss[6]. In addition, the UN has made this issue as one of the Sustainable Development Goals: target 12.3.[7] This lesson is meant to increase student awareness and knowledge of issues around food loss and food waste, and to explore some practical ideas on how they can be avoided.

Students will:

- Understand the differences between food loss and food waste
- Learn about the damages caused by food loss and waste to the economy, environment and society
- Recognise ways to reduce food waste.

Duration:

45 min

Preparation time:

short

Can be aligned with the following subjects:

Economics / Home Economics / Geography

[5] Find more data here: UN Environment Programme
[6] International Day of Awareness on Food Loss and Waste
[7] Sustainable Development Goals - target 12

Duration	Activity	Materials/Equipment (download here)
5	Opening activity to connect the students to the subject	Food Waste and Food Loss PowerPoint
5	Introduction to provide background and data about food loss and food waste and its consequences	Food Waste and Food Loss PowerPoint
25	Food Waste Quiz (Kahoot or PowerPoint)	Food Waste and Food Loss PowerPoint Personal phones or tablets if using Kahoot for the quiz.
10	Conclusion and reflection	Food Waste and Food Loss PowerPoint

Detailed instructions:

Opening

(slide 2) The UN declared 29.09 as the Food Loss Reduction Awareness Day. Ask the students what they know about loss or waste of food to gauge their initial knowledge and awareness.

(slide 3) Discussion in pairs around this issue: Next week the parliament will propose a law: creating a national day to prevent wasting food, can you think about policies the parliament can propose during that day? Ask the students to discuss this with the student sitting next to them and then return to the class forum and elicit some representative answers (Some ideas can include: Financial incentives for producers, financial support for farmers to modernise, food repurposing in store, national awareness campaigns, charging customers for plate waste in "all you can eat buffet", promotion/obligatory food donations). In the additional sources section below you will find several sources that contain information on policies, such as the EU commission website).

Another **optional opening activity** to gauge initial student interest and understanding (appears on slide 4) asks the question: "do you or your family members throw away food"?
Answers could be:

1. "Never"
2. "Sometimes, mostly leftovers from meals or parts that we have no use for, like potato peels"
3. "Many times, meal leftovers, expired or spoiled, food that was not eaten and so on".

To answer students can either: hold up a note with the numbers 1, 2 or 3. or you could use the Mentimeter platform.

When concluding the opening activity, it is advisable to point out to the students that loss and waste of food is a phenomenon that has gradually worsened throughout recent years, as will be discussed during the rest of the lesson.

Introduction to food waste and food loss

What is food waste and food loss - definitions (slide 5)
Food loss is all the crop and livestock human-edible commodity quantities that, directly or indirectly, completely exit the post-harvest/ slaughter production/supply chain by being discarded, incinerated or otherwise, up to but excluding the retail level. Losses that occur during storage, transport and processing, (including imported quantities) are therefore all included. **Food waste** relates to food that was meant for consumption by people but for many reasons spoiled or was wasted and not eaten by human beings. Loss of food happens at every stage the food supply chain beginning at the stage of production, storage, packaging and processing, and finally with retail and consumers. In less developed countries, most food loss happens at the first stages of manufacturing: the growth process in the fields, the packaging and the processing. In more developed countries, most food is wasted at the consumer stage in homes.

(Definitions in the slide are based on the UNEP definition - found in the food waste index report, p.19).

Data - How much food is lost every year (slide 6): before showing data on the amount of food that is lost every year to the students, ask the students to guess how much food they think is wasted in the world each year.
Answer: data in the slide refers to the world (right side) and Europe (left side). Data is hidden under images that will disappear when clicking. The answer: 30% loss of food globally per year, which is about 1.3 billion tons. Europe is slightly better with only 20% food loss. Optional: Slide 6 is empty and is designed for your (teachers) use - you can add data on your country/municipality/city/etc.

Effects - Slides 8-9-10 deal with the effects of food loss and why it is important for students to engage with. Ask the students why they think we ought to care about food loss. Answer: food loss affects 3 major areas of our lives.

- **Economy** (slide 8): wasted food impacts household income, since we spend more money than we need to. It also increases costs for government and other institutions through landfilling etc.
  Other than the direct additional household costs for food that was purchased but not consumed, food loss creates costs throughout different stages of the value chain prior to consumption. The economic cost of food reflects the entirety of production and sales costs at every stage of the value chain - agriculture, production, packaging, transportation and marketing. Therefore, the food prices in marketing chains incorporate food losses into retailing. Similarly, the price of wholesale food reflects the loss of food in agriculture and production. In the end, all the costs of food losses throughout the different stages of the value chain roll into the consumer's pocket.

- **Society** (slide 9): the social consequences of food waste relate to food inequality and the difficulty gaining adequate nutrition for a large proportion of the population. While a third of the food in the world is thrown away, over 820 million people around the world suffer from hunger or nutritional insecurity (nutritional security is defined as a person's ability to regularly provide for themselves and their immediate family healthy and nutritious food from all main food groups, of a suitable quality and quantity, in socially acceptable ways).

- **Environment** (slide 10): reducing food waste contributes to reducing the amount of pollutants, greenhouse gas emissions, and climate change. Food wastage is responsible for about 8% of greenhouse gas emissions worldwide. In terms of quantities, this equals around 6.3 gigatons worth of carbon dioxide released throughout the production process, transportation and waste management, with an additional 8.0 gigaton worth of carbon dioxide released indirectly as a result of change in land use, deforestation and land cultivation. The effects of climate change also threaten food supply. For example, cocoa beans, cherries, apples, and many other foodstuffs are sensitive to the raising of temperature and other climate change impacts.

Quiz - implementing knowledge

This part is based on a Kahoot quiz with explanations and detailed infographics (link to challenge in slide 11). However, if students do not have individual phones/tablets/laptops we have also included the questions in the PowerPoint (slides 12-32) and the quiz can be conducted by dividing the class into small groups and keeping a score of their right answers. Slide 33 is a template for recording the winners (optional).

Closing/Reflection (Slide 34)

The closing may begin with a question to the students about what they learned today.
Afterwards, the lesson can be concluded with several points:

- Food loss has economical, social and environmental consequences.

- The main cause of food waste from agriculture, management and packaging, production, distribution and consumerism is household consumerism.

- Simple steps may be taken to reduce food loss (slide 20).

Concluding resources: a short video with 5 tips to reduce food waste. Finally, ask the students to point out one thing they can do at home to reduce food loss.

Additional resources:

Food waste in Europe: statistics and facts about the problem

About Food Waste

The UNEP Food Waste Index Report 2021

Infographic: Do not Waste! Change into something new

Video: Food Waste: The Hidden Cost of the Food We Throw Out I ClimateScience #9

Food & Health lesson plans

Food & Health

Our diet has an important relationship with our health. Imbalanced diets can increase our risk of a wide range of chronic diseases, like cardiovascular diseases, diabetes and some forms of cancer.[8,9,10] Unfortunately, increasing numbers of people have unhealthy dietary habits, characterised by low consumption of vegetables and fruit and high consumption of added sugars or saturated fat[11,12] According to Eurostat, weight problems and obesity (markers of poor nutritional health) are increasing at a rapid rate in most EU states, with more than half of Europe's adult population being overweight in 2019.[13]

Such a diet harms not only human health, but also our planet. Nowadays, more than half of habitable land is used for agriculture, with over 70% of that accounted for by livestock agriculture (mainly due to the need to grow feed for farm animals)[14]. Humans and livestock make up the vast majority of biomass of our planet[15]. In the long term, this is unsustainable. Scientists are therefore looking for ways to reconcile human needs with impacts on the ecosystems we depend upon[16].

The lessons in this module aim to teach students about how food interacts with the human body, how to acquire the correct nutrients via our diets, as well as practical skills like reading labels of products in supermarkets. Furthermore, students will get the opportunity to discuss the sustainability of our diets, both for human health and the planet.

Learning objectives

Students will

- Classify different kinds of nutrients and explore their importance for the human body.
- Analyse nutrient content of food, linking the nutrient needs of the human body with their diet.
- Identify the characteristics of healthy eating patterns.
- Discuss the sustainability of diets, and develop an understanding about the connection between healthy diet and planetary health.
- Assess information about diets and how to deal with conflicting dietary messages.

Lesson plans on Food & Health (click on lesson plan titles to download individual lesson plans):

1. **What does healthy eating mean?:** learning about the importance of different food groups and how to combine them into a balanced diet
2. **Understanding food labels:** learning about and understanding food labels and some basic misconceptions of food label components
3. **Breakfast discussion club:** learning about how to create nutrient-rich breakfasts while thinking about environmental impacts of popular breakfast choices
4. **Eat healthy to keep healthy:** learning about different types of nutrients, nutrient needs of our body and our digestive system in a fun way (board game and bingo)
5. **Sustainable pasta superhero:** getting familiar with healthy and sustainable alternatives of ingredients for a familiar food choice: pasta.

[8] WHO
[9] Sage Journals
[10] UN
[11] Eurostat
[12] WHO
[13] Eurostat
[14] Our World in Data
[15] PNAS
[16] EAT - Lancet Commission Summary Report

What does healthy eating mean?

Module: Food & Health
Type of lesson plan: Lecture + Exercise
Can be linked with lesson plan: Eat Healthy to Keep Healthy, Sustainable pasta superhero

Students will:

- Understand why it is important to eat each type of food, how frequently they should do so and the benefits this should provide
- Learn the importance of consuming as much variety as possible within each food group, since each food provides unique combinations of nutrients as well as other non-nutritious components beneficial to health, such as fibre
- Co-create a healthy menu as a team that will motivate children to eat healthy.

Duration:

5 mins set aside in 9 different sessions and then 45 minutes to present the different menus designed by the groups.

Preparation time:

short

Can be aligned with the following subjects:

Natural Science / Biology / Ethics

Short description of the activity:

A healthy diet[17,18] helps to protect our health and prevent cardiovascular diseases, as well as obesity[19], diabetes, high blood pressure, cholesterol and some forms of cancer. Therefore, a healthy diet not only allows our body to function normally, covering our basic physiological needs, but also reduces the risk of suffering from diseases in the short and long term.

But what does healthy eating mean?
This activity aims to show why it is important to eat foods from all food groups in the right amounts in order to provide the body with the nutrients it needs to maintain strength and energy.

It is vital that children from an early age understand that a varied and healthy diet[20] should include the following food types: fruits, vegetables, dairy, meat, fish, eggs, legumes, cereals/bread/rice/pasta, potatoes, nuts and other forms of healthy fats. Each food group has a function in providing various nutrients to our body.

Childhood[21] is the most important time to expose children to new healthy foods and create better healthy eating habits. Habits are actions that are learned by repetition, and home and school are the places where our children generally learn their behaviours. Creating healthy eating habits during childhood is key to encouraging the practice of a healthier lifestyle in the future and to avoid chronic diseases in adulthood. In addition, a well nourished child[22,23] will perform better at school and have more energy for physical activity.

[17] UN
[18] FAO
[19] UN
[20] FAO
[21] Teachingexpertise.com
[22] National Library of Medicine
[23] Researchgate.net

OPTION A:

Duration	Activity	Materials/Equipment (download here)
DAY 1 10'	Warm-up: the importance of eating in a healthy way	Posters in PowerPoint or printed.
DAY 2-8 5'	How should we eat each category of foods?	9 posters printed or shown via PowerPoint. Materials for designing the menus. Posters in PowerPoint or printed.
DAY 9 45'	Wrap up	Materials for designing the menus.

OPTION B:

Duration	Activity	Materials/Equipment (download here)
10'	Warm-up: the importance of eating in a healthy way	Posters in PowerPoint or printed.
45'	How should we eat each category of foods?	9 posters printed or shown via PowerPoint. Posters in PowerPoint or printed. Materials for presenting the posters to the class: papers, pens, post it…
10'	BREAK	
45'	Wrap up	Materials for designing the menus.

Detailed instructions:

OPTION A:

1. Warm-up

Show the first poster and comment on the importance of healthy eating to the whole class.

This is a program that will show students the different categories of foods that exist and why it is important to eat each one of them, using simple language, adapted to their age. The information is contained in 9 posters that are divided as follows:

- Basics
- Fruits and vegetables
- Meat and fish
- Milk and diary
- Eggs
- Cereal products and potatoes
- Legumes
- Fats
- From time to time.

2. How should we eat each category of foods?

Show the rest of the posters and comment.

The idea is to present the posters at the beginning of the day on the related subject. The teachers will read the posters and ask associated questions. These three additional questions could be proposed about each category of food products to the group:

- Which food categories do you already know about?

- What foods within each category do you know about?
- How often do you eat them?
- How many fruits and vegetables do you eat per day?

3. Overview of the posters and co-creation of a healthy menu:

After seeing and commenting on all the posters, the last day will be the chance to put all the learnings together and co-create a menu for a whole day in small groups:

- First the class will be divided into 7 small groups, one for each day of the week. The day of the week will be assigned randomly (choosing a paper with the name of the week).
- In each group, a leader/head chef will be selected. This will be the person who contacts the other groups to coordinate the menus of the week (in order to balance the meals, and to not include meat or fish everyday, for example). The head chef also presents the menu to the class (with the rest of the team's help).
- Each group will have 20 minutes to design a whole menu for one day: breakfast, lunch, dinner and snack, keeping in mind that it must be healthy and balanced. They will also have to explain the menu to the class. The 7 menus will be shared and could be voted on to see the most popular. It is also possible to collect them in one document to be shared with the families and other classes.

OPTION B:

1. Warm-up

Show the first poster and comment on the importance of eating in a healthy way to the whole class.

This is a program that will show students the different categories of foods that exist and why it is important to eat each one of them, using simple language, adapted to their age. The information is contained in 9 posters that are divided as follows:

- Basics
- Fruits and vegetables
- Meat and fish
- Milk and diary
- Eggs
- Cereal products and potatoes
- Legumes
- Fats
- From time to time.

2. How should we eat each category of foods?

Show the rest of the posters and in small groups students need to prepare the content of the poster and present it to the class.

This alternative will be developed in one day. The idea is to present the titles of the posters so students can choose one of them (the class will be split into 8 groups, each choosing one poster, and it is possible to merge some of them in order to reduce the number of groups). For specific food products, other alternatives could be commented on instead in order to get the same nutrients.The teachers will read a poster as an example and ask the proposed questions included there, and these three additional questions could be proposed about each category of food products to the group:

- Which food categories do you already know about?
- What foods within each category do you know about?
- How often do you eat them?
- How many fruits and vegetables do you eat per day?

After seeing and commenting on the posters in each group, they will need to prepare a creative way to present and teach the content to the class by groups.

3. Overview of the posters and co-creation of a healthy menu:

The final part of the class will provide the chance to put all the learnings together and co-create a menu for a whole day in small groups:

- First the class will be divided in 7 small groups, one for each day of the week. The day of the week will be assigned randomly (choosing a paper with the name of the day).
- In each group, a leader/head chef will be selected. This will be the person who contacts the other groups to coordinate the menus of the week (in order to balance the meals, and to not include meat or fish everyday, for example). The head chef also represents the menu to the class (with the help of the rest of the team).
- Each group will have 20 minutes to design a whole menu for one day: breakfast, lunch, dinner and snack, keeping in mind that it must be healthy and balanced. They will also have to explain the menu to the class. The 7 menus will be shared and could be voted on to see which is most popular. It is also possible to collect them in one document to be shared with the families and other classes.

Additional resources:

Recommendation for families included in the materials folder.

More information about nutritional recommendations by each country

Understanding Food Labels

Module: Food & Health
Type of lesson plan: Lecture + Exercise
Can be linked with lesson plan: Breakfast discussion club

Short description of the activity:

Proper reading of food labels is an important skill that can have a high impact on our ability to make informed nutritional decisions. Understanding food labels helps us choose foods that suit our needs and have benefits for us, but in most cases the labels contain a lot of confusing information. This issue is prone to many misconceptions (e.g. the misconception that fat is harmful to the body and therefore should be completely avoided). In this lesson we will learn what food labels consist of, deal with some misconceptions on the subject and acquire tools for making informed decisions on nutrition.

Students will:

- Learn what food labels consist of and be able to understand the different data presented on food labels
- Acquire and use tools for making informed decisions in nutrition based on carefully reading food labels
- Discuss misconceptions on food label ingredients

Duration:

45 min. (optional activities can extend class to an additional 45 min).

Preparation time:

short

Can be aligned with the following subjects:

Science / Home Economics / Economics

Duration	Activity	Materials/Equipment (download here)
10'	Opening to introduce the topic of food labels and why it is important to understand them.	Reading and Understanding Food Labels PowerPoint
25'	Introduce to students and discuss these important issues regarding food labels: ▪ What information appears on food packaging? ▪ How to decipher the ingredients list ▪ How to decipher nutritional labelling ▪ Use by, best before - what do they mean?	Reading and Understanding Food Labels PowerPoint Empty food packages (optional)
10'	Summary - Discussion around these reflection questions: ▪ One thing I learned about food labelling that I did not know before ▪ One thing I learned about food labelling that I thought was the other way around ▪ One thing I learned that I want to tell others about.	

Detailed instructions:

Opening

Objective: Introduce the topic of food labels and why it is important to understand them.

Opening activity (slides 2-8): Tell the students that before starting the lesson, they will be shown examples of ingredient lists and should guess what the product is. (in the attached PowerPoint, there is a slide for each product's list of ingredients and the actual product will pop up upon clicking - it is animated).

Example 1: **Soy drink** (slide 2). Explain to students that the order of the ingredients is according to their quantity in the product, i.e. in a soy drink, the main ingredient is natural mineral water and then soybeans. That is, even though it is a soy drink, it is mostly composed of water.

Example 2: **Chicken stock powder** (slide 3). It is advisable to ask students what the main ingredient in the product is? Answer: sea salt, because it appears first. Tell students that there will be a discussion later about what natural flavours are. Students may be asked if there are elements they do not recognise in the list, for example, dextrose.

Example 3: **Milk chocolate** (slide 4). Emphasise to students that the main ingredient in this chocolate is sugar. If students ask what the E-materials listed in the ingredients are, indicate that they will be studied later.

Example 4-6 (slides 5-7): these are left for any local products that you think would be interesting for your students. The "replace image" (right click the current image) function can be used to add the image before copying the ingredients in the text box (found online usually using a simple google search).

Opening activity summary (slide 8): Ask students why they had a hard time guessing? To sum up the discussion, talk about how we often only look at the front of the package and not at the back of the product that indicates its ingredients.

Main activity

(Slide 9) Start by introducing the structure of the lesson - reading food labels. Discuss with students why they think it is important to know how to read food labels. You can use student comments in the opening discussion and elaborate to discuss whether this information is important for us as consumers or as people interested in healthy food. Answers could include: reading labels allows us to plan our daily intake of nutrients and other important foods. It also enables us to make informed choices when choosing one brand over the other.

You can also stimulate this discussion by using the optional activity below.

Optional activity: Bring empty food packages to class or ask each student to bring one. In small groups, ask them to look at the packages and write down what type of information they see. Ask: is this important information for us as consumers? Or as people interested in healthy food? Some answers could include: reading labels allows us to plan our daily intake of nutrients and other important foods whilst being cautious of allergens. It also enables us to make informed choices when choosing one brand over the other.

(Slide 10) - introduces the information the student will encounter on food packaging. You can quickly go through the list and give examples from foods they might know/packages you bring to class. This lesson will focus on the ingredients and the nutritional labels.

(Slide 11) - Product Name Vs. Food Name. Product name - usually, the common name of the product is a commercial name given to the food by the manufacturer for marketing purposes. This name does not necessarily represent the composition of the product. As opposed to the commercial name of the product, the food name (or description) provides information about the categories of food, its shape, ingredients and how it is processed, if applicable. According to the name of the food, it is possible to understand whether the food contains an ingredient or was prepared in the taste of that ingredient, for example: yoghurt with strawberries - indicates that strawberries are one of the ingredients in the food.

An example: you can click the PowerPoint and a big packet of Lay's potato chips will appear. Another 2 clicks will bring up 2 frames that will point to the "Lay's" (product name) and "potato chips" (food name) as an example.

(Slide 12, this slide is animated) - Ingredients list. The ingredients are usually basic materials and additives used in food production. The list contains all the ingredients in the product. The list is arranged in descending order of quantity - the ingredient at the top is the largest in quantity and so on. This way, we can know what we have more or less of, even if the percentages are not labelled.

Did you know? If the name of an ingredient is in the name of the product, the quantity of it must be indicated on the label: for example, whole grain and rye bread. The percentage of the grain and rye must be on the ingredients list.

(Slide 13) Ask students if all the whole wheat breads in the supermarket are the same. What could be the differences? In this slide, there are ingredient lists from 2 common whole wheat breads. Ask students to point out the differences: *One has many more ingredients, but do we know what they are? *One has high fructose corn syrup as well as sugar, while the other just has honey. *One has different kinds of oats and seeds, the other just has wheat. (The green rectangle will disappear when you click, to reveal the ingredient list that is healthier). Also embedded in this slide is a short clip (2 min) about the importance of whole grain products. Another useful video explains the different types of grains (whole, refined, enriched, and fortified) in a fun, child-friendly way.

(Slide 14) Food additives: in general these are components added during the production process to some food products for a technological purpose (such as preservation or texture improvement), but are not meant, in themselves, for consumption. Food additives do not include flavouring, fragrance or nutritional supplements (especially vitamins and minerals). The European method of labelling food supplements uses a numeric code that begins with the letter E. The USA has a different classification method.

(Slide 15) Which additives exist? Present the EU classification list.

Sometimes the ingredients list contains the name of the compound (e.g sodium pyrophosphate, an emulsifier found in baking soda) or as a number (e.g E450). A pop-up text box will include the different ways in which food additives can appear on ingredient lists:

1. The letter E with a number - E500.
2. A food additive name - sodium bicarbonate.
3. The function of the additive in the food - acidity regulator.

The example above is from baking soda. You can ask the student to look at their pantry when they get home and see how it is written in the brand they buy.

(Slide 16) Another example of food additives with names and numbers: food colouring. Sometimes the name can be indicative of the source, but not always. Though these are all naturally sourced colours, they all have an E number.

(Slide 17). Summarising the ingredients list. Highlighting the main points for students to remember.

(Slides 18-19) - Nutrition labelling. Food labels must show the following nutritional information: the calorific value, protein content, carbohydrates, fats, and sodium (salt). You can use both slides or just slide 20 to introduce this subject.

(Slide 20) - Infographic explaining how calories are defined and calculated.

(Slides 21-25) Optional Activity - Calculating the caloric value of foods. How is the calorific value calculated? The calorific value is composed of carbohydrates (multiplied by 4), protein (multiplied by 4) and fats (multiplied by 9). This means for every 1 gram of carbohydrates there are 4 grams of calories, for every 1 gram of protein there are 4 grams of calories, and for every 1 gram of fats there are 9 grams of calories.

For example, if 1.7 grams of protein is written on the list of ingredients, this particular food will give us 6.8 calories that came from protein.

Using soy milk as an example: in a 100 ml drink there are 46 calories. In soy milk there are 3.6 grams protein, 1.5 grams carbohydrates and 2.8 grams fats. How much energy comes from each of these ingredients?

Answer:
Protein and Carbohydrates multiply by 4: 1.5*4= 6 gr. and 3.6 *4= 14.4 gr. Fats: multiply by 9 so 2.8*9 = 25.2 gr. Total: 45.6. Now look at the label again and see it is marked correctly (slide 26).

(Slide 26) Nutritional label - fats. There are different kinds of fats, with manufacturers required to list the amounts of all of them: cholesterol, saturated fat and trans-fatty acids.

(slide 27) Fats. Use this text to explain about fats (or use the video provided below). Explain to the students that fat is categorised into saturated and unsaturated.

Saturated fatty acids: a fatty acid that is saturated in hydrogen atoms, which are bonded to all the carbon atoms in the carbon chain. The amount of saturated fatty acids is relatively high in animal-source foods like butter, dairy products, meat and eggs, but lower in plant-based foods like cocoa, coconut, and palm oil.Industrial products like margarine and factory-made pastries are also high in saturated fatty acids. In those products, saturated fatty acids are made artificially from unsaturated plant-based fats.

Unsaturated Fatty Acids - Unsaturated fatty acids have several instances where carbon atoms are connected with more than one bond. There are monounsaturated fatty acids and polyunsaturated fatty acids, the difference between them being the number of multiplied bonds.

(The icon link at the top left of the slide contains a link to a short (4:30 min) video that explains fats. It is scientific but is animated and fun (the video is in English but contains subtitles in multiple languages).

Ask the students: if fat has a high caloric or energy value, is this fat good or bad?
Answer: every food group is important for the normal functioning of our bodies and our health.

Recommended daily intake: recommended because 30% of daily energy comes from fats. Why do we need fats in our diets? (1) They are a concentrated source of energy production. (2) They form the building blocks in the structure of the membranes that surround all the cells of the body (3) They help protect tissues and organs in the body from physical injury (4) They are used as an insulating material for preventing loss of body heat (5) They help in the process of absorption of fat-soluble vitamins in the gut and blood.

Fatty Acids - Further details:

Cholesterol: An organic compound from the fat family, found in the cell membrane of all the body cells of all animals, and is a starting material for various hormones, vitamin D and bile salts. Cholesterol is of great importance in many biochemical processes in the body.

Trans Fatty Acids: Trans fatty acids are found naturally in foods made from ruminant mammals. We consume them, therefore, from meat and dairy products. Trans fatty acids are created artificially during production when liquid fats are turned into solids (hardened fats). They are also created during heating or frying of fats in high temperatures.

(Slide 28). Infographic on making nutritional decisions based on nutrition labels. **Summary activity** - in small groups (2,3 students per group) ask students to write a meal planner for one day (breakfast, snack, lunch, snack, dinner). The meals should only use foods that have low or medium values for fat, saturated fat, sugar and salt. Challenge them to find food items they like in these categories. If the students are not sure of these nutritional values, these can be looked up online (search online for nutritional information and the name of the product).

(Slide 29). The last section of the lesson is about expiration dates. It provides information that can be found on the food packaging including details on specific language conventions.

Optional activity - sorting packages according to dates. If there is a variety of food packages in the class, ask the students in groups to sort the packages according to the date labels on them. For example, 'best before', 'use by'. Ask the students to write what they think this means and if they can give a name to the products based on the labelled dates (for example, dairy products).

(Slide 30). Deciphering date labels on food packages. There are a number of types of expiration dates. The manufacturer is responsible for setting ahead of time the length of packaged food's shelf life. The manufacturer decides how long is the product fit for use and how long does the food preserve its characteristics, quality and safety. This determines the expiration date and how it is labelled.

Additionally, the shelf life of several animal-source foods, such as meat, fish and eggs, are set and limited by law (additional information can be found in this leaflet provided by the European Union under EU actions against food waste, which can also be shared with students).

Further details: food products do not transform from being safe products to unfit for consumption overnight. Significant changes in the product are gradual and usually happen with the passing of time as a result of, among other things, exposure to light, oxygen in the air, high temperatures, and so on.

The consumption of sensitive foods, such as animal-source food that has expired, may endanger your health. Therefore, it is recommended to buy food only from organised and licensed places, and to make sure then when purchasing that the product has a sufficiently long shelf life remaining based on the length of time it is expected to stay stored or used.

(Slide 31). The two most commonly used labels are the 'use by' and 'best before':

(Slide 32). "Use by…" - generally in cases of foods that are extremely sensitive to microbial spoilage, which can cause immediate danger to a person's health after a short time. After those words you will either see a date by which the food is preserved and safe to consume, or directions to where to date is printed on the package. It is not advisable to eat the food past that date.

(Slide 33). "Best before…" - in cases of foods that are not sensitive to microbial spoilage. After those words there is either a date which by it the food preserves the quality expected of it, or directions to where the date is printed on the package. Sometimes, the food is safe to use even after the labelled date has passed, as long as the storing instructions have been followed properly and the packaging was not damaged. After the labelled date, the food may gradually lose some of its characteristics, for example: change in flavour, texture, and so on.

(Slide 34). Understanding date labels is important because it enables us to save money and prevent food waste, whilst also being important for our health.

Summary

(Slide 35) Summary and Discussion
This lesson is designed to encourage students to be curious about food labels, and therefore is recommended to have a reflection conclusion using these discussion questions: (1) one thing I learned about food labels that I did not know (2) one thing I learned about food labels that I always thought was the other way around (3) one thing I learned that I want to tell others about.
You can either have a whole class discussion around these questions or have the students write their responses on a shared board (e.g Padlet or Jamboard)

Additional resources:

Food additive, Definition

What are food additives and how are they regulated in the EU?

Understanding nutrition information

EIT Food online course: Understanding Food Labels

Breakfast discussion club

Module: Food & Health
Type of lesson plan: Lecture + Discussion
Can be linked with lesson plan: Understanding food labels, Eat Healthy to Keep Healthy

Short description of the activity:

Good breakfast is an important basis to start each day. However, how do you prepare the best breakfasts to provide your body with all the nutrients it needs? How can you achieve this considering not only your health, but also the health of our planet.

In this lesson, students will learn how to search for nutritional information about products they buy, extract nutrient information and calculate nutritional content in their food. Moreover, they will compare dairy milk with its increasingly popular plant-based alternatives. They will discuss the nutritional differences as well as their environmental impacts (including current gaps in knowledge about their impacts).

Students will:

- Learn where to find information about nutrient content in food
- Learn how to calculate nutrient content in their portion
- Practice critical evaluation of information, critical appraisal of information online and critical discussion over controversial issues.

Duration:

45 minutes

Preparation time:

short

Can be aligned with the following subjects:

Nutrition / Biology / Maths / Media Class / IT / English

Duration	Activity	Materials/Equipment (download here)
10'	Introduction	
25'	My breakfast calculations	Sheets on environmental impact, my breakfast oatmeal, plant-based options, computer
10'	Class discussion and wrap up	

Detailed instructions:

Preparation

The calculation sheet is prepared for basic oatmeal calculations (oatmeal + milk). Oatmeal is used because it is a very basic food, with healthy complex carbs which can be enhanced with a wide range of sweet and savoury flavours, and no added sugars. After the basic milk calculation students can think about how to improve their recipes by adding more ingredients (healthy oils, fruit/veggies, nuts and seeds, spices, sugar, butter etc.) to see how the nutrient content changes.

However, if you feel that oatmeal is not a good example for your students, perhaps if it is not familiar to your region, you can easily switch the basis to another meal, like cereals, cornflakes or other porridge, like rice porridge (prioritising variants without added sugars). The teacher can also bring packages of several variants (granolas etc.) to school, letting the students choose and extract nutrient information about them (mix variants with and without added sugars so students can see the quantity of sugars they may be eating if they make unhealthy choices).

Introduction

If you have time and/or prefer a more interactive introduction activity, you can choose one from the "additional intro activities". They provide you with ideas for 10-15 minutes long "icebreaker" activities to open the topic of healthy eating patterns.

Open discussion about favourite breakfast options. Ask the students if they eat cereal or oatmeal for breakfast and ask them if they think these are healthy options. Ask them how they can prepare basic oatmeal or cornflakes or any other food you are using in the class. Explain to them that we eat food to provide our bodies with nutrients. Nutrients are 'building blocks' which our cells need to function properly, to grow our muscles and to power our brain. There are many kinds of nutrients, but usually they are divided into two big groups: macronutrients and micronutrients. Macronutrients, like proteins, carbohydrates or fat, are the main source of our energy, while micronutrients, like vitamins or minerals, are needed for some of the fine functions of our metabolism and are contained in our bones or hormones. Ask them firstly which micronutrients they know, and secondly which micronutrients they think a bowl of oatmeal/corn flakes contains. Emphasise that if our body cannot get enough nutrients from food, it cannot function properly and we will become unwell (you can find more info on nutrition in additional materials and other lesson plans).

Explain to students that today they will try to prepare such oatmeal/cornflakes but from different types of milk. In addition to people intolerant to lactose, more and more people are preferring plant-based milk alternatives, like soy milk, almond milk or others because they may believe those options are richer in nutrients or more friendly to our planet. This class will help students learn more about whether those beliefs are correct.

Distribute handouts, List of product suggestions and Environmental impact tables to your students. Explain to them that they contain a basic recipe for oatmeal and a table for nutrient content calculation. Instruct them to open the OpenFoodFacts.org website (or similar food database used in your country), where they can search for specific products to look at nutrient content and other relevant information. Additional searches can be conducted on this website (more suitable for basic unprocessed, unbranded food products, like semi-skimmed milk).

Instruct them to choose dairy milk and a plant-based alternative and calculate the nutrient content in their bowl of oatmeal for today's breakfast. Moreover, they should also look at the environmental impact of their selected options. How does this information change their perceived risks and benefits?

My breakfast calculations

Students will fill out the table with required information (nutrient content, labelling, environmental impact). They will think about the information obtained. Which option is best for their health and why? Which is best for the planet?

After the calculation, let them discuss their findings in pairs. Encourage discussions about the contradictory health and environmental impacts of selected options. Do they see any opportunity for compromise?

Additional task: Encourage the students to search deeper in the databases to answer optional questions: is there a way to improve the recipe and its nutrient content even more? For example, adding fruit/vegetables, healthy fats, nuts or anything else that comes to mind. Let them add these extras to the calculation. (Information on possible add-ons can be found in fooddata.dk or any other similar database). They can also search for specific additional nutrients like vitamin C, vitamin B6, zinc or iron.

Class discussion and wrap ups

By the end of the class, let students share their findings and experience. What turned out to be the best breakfast option? Did they find any paradoxical information, like for example more sustainable products being less healthy? What kind of products did they try to calculate? What did they find difficult or what kind of new interesting information did they find? What kind of flavours ("extras") did they use to try and improve the nutrient content?

Do not force the students to share, you can also implement a "voting mechanism" by asking closed-end questions and let students raise their hands as answers.

Additional resources:

About healthy plate and nutrition:
Kid's Healthy Eating Plate | The Nutrition Source |

Planetary diet, sustainability:
Plate and the Planet | The Nutrition Source |

EAT-Lancet Commission Summary Report

For the calculations:
FRIDA Food Database

Open Food Facts

Carbon Food Calculator

Differences in Environmental Impact between Plant-Based Alternatives to Dairy and Dairy Products: A Systematic Literature Review

Eat Healthy to Keep Healthy

Module: Food & Health
Type of lesson plan: Game/Simulation
Can be linked with lesson plan: What does eating healthy mean?

Short description of the activity:

Why do we eat food? What kind of nutrients can our body extract from the meals we are eating, which organs are responsible for its digestion and what is the role of our gut bacteria? Do I eat healthily?

This activity uses games to answer this question. After brief introductory cartoon videos, students will play a Digestive system board game, followed by Cell bingo, in which the students can see how healthy their everyday dietary choices really are and if they are providing their body with all nutrition needed. As optional homework, students can fill out their personal "Eat Healthy to Keep Healthy" folded booklet with which they can recall everything that they have learned during the day.They could even sign a contract with their parents, promising to eat healthily! All materials are also available online.

Originally, the activities were designed to be applied together, during one day or in several days during one week. However, it is possible to choose only one activity (videos/board game/ bingo) and skip the rest, if you wish. However, the learning outcomes will not be as complex as with the "full-day" application.

Students will:

- Learn about different kinds of macronutrients
- Understand the link between food they eat and their health
- Learn about what kind of nutrients their body needs and what kind of nutrients they should limit
- Learn about different parts of digestive system and their functions
- Learn about gut microbiota and their importance
- Learn how to apply this knowledge in their everyday diet.

Duration:

90 minutes
(optionally additional 90 minutes)

Preparation time:

Medium

Can be aligned with the following subjects:

Nutrition / Biology / English as a second language

Duration	Activity	Materials/Equipment (download here)
30'	Introduction	Cartoon videos
60'	Digestive system board game	Digestive system board game
Optional	Cell bingo	Cell bingo game
Optional	Personal folded book	Personal folded booklet

Detailed instructions:

Preparation

In the preparation phase, go through the online repository and get familiar with the content and rules of games, using the text and introductory videos. For deeper knowledge, you can use the "Scientific background" category to learn more details about our body, cells and diet.

Print out and cut the chosen games. One game set is suitable for 4-5 children.

Introduction

If there is additional time and/or preference for more interactive introduction activities, choose one from "additional intro activities". They provide ideas on 10-15 minutes long "icebreaker" activities to open the topic of healthy food habits.

The introductory phase should introduce the students to the cells of the body, the nutrients, the digestive system and how the body gets what it needs from the food. Two introductory videos have been prepared for this phase:

- Intro to the digestive system
- Intro to nutrients

Additionally, the teacher can open the discussion about food and health in class. It is optional to offer a piece of fruit or vegetable to students and ask them what they think is happening with the food while they are eating it. What do they feel? Where does the food go in the body? Are there any questions they have?

After the video animations, print some sentences taken from the video, cut them into pieces and ask the students to play and reconstruct with the new words and sentences. The idea is to get familiar with the major learning outcomes and the new strange names.

Digestive system board game

The digestive system board game aims at teaching students about what happens to the food in the digestive system, how the body gets what it needs from the food. The exact game rules, including instructional video, are available on the repository.

If there is time for two extra classes, continue to deepen the knowledge and support its practical application in everyday dietary choices with an additional game, Cell bingo. Parents can also be involved using the personal folded book.

Optional: Cell bingo

The Cell bingo activity aims at teaching students the amount and proportions of energy and nutrients our cells need and how to choose food that keeps them happy and healthy. It does so by allowing the students to choose the food they want to eat during the day and easily calculate the nutrient content in that daily menu. Using "bingo card" with visualised needs of the human body they can see if they provided their cells everything they need to function, as well as if they did not eat too many "unhealthy" nutrients. The game has 3 phases:

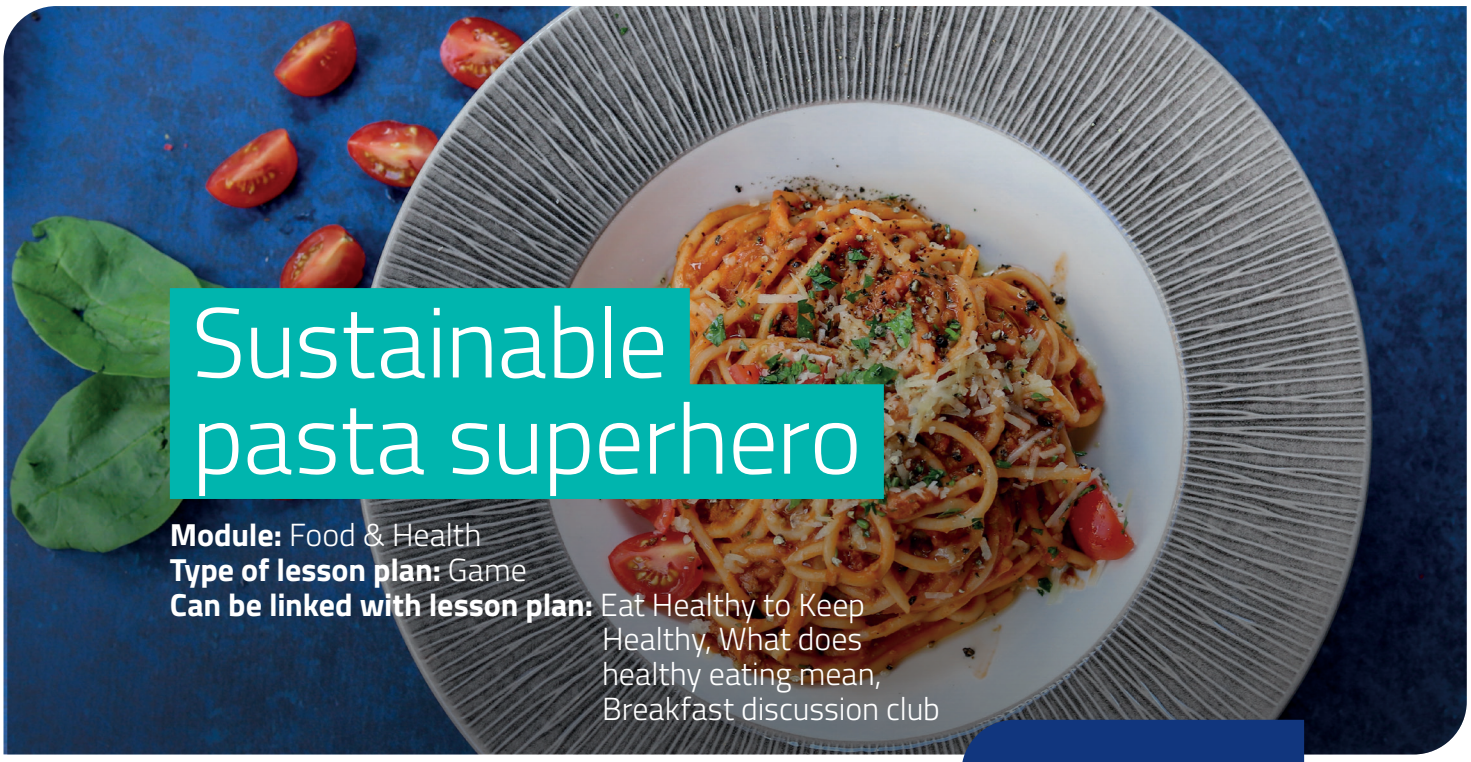
1. Choosing the food from the buffet
2. Filling out cell bingo
3. Reflection.

Teachers are encouraged to go around the classroom during this last part of the activity, and talk to students about their choices and what they could do to give the cells what they need.

Optional: Reflection/Personal folded booklet

By the end of the program, students should be asked to share their thoughts about the activities. What kind of interesting information did they learn? Did something surprise them? Are they going to change something in their diet?

To summarise the knowledge gained and give students a space for their own introspection and feedback, use the personal folded booklet available in the materials folder. They can bring the booklet home and discuss all the information with their parents, too.



Sustainable pasta superhero

Module: Food & Health
Type of lesson plan: Game
Can be linked with lesson plan: Eat Healthy to Keep Healthy, What does healthy eating mean, Breakfast discussion club

Short description of the activity:

Do you like cooking? Imagine being a restaurant chef with one simple task: create the best pasta recipe in town! However, the task is not as simple as it seems - your customers are very well-informed about nutritional quality as well as the environmental impact of food they are buying... and expect the same from their chef!

Improve the basic pasta recipe with the aim to increase the nutrient content and decrease the environmental impact associated with your recipe. Then try to win the bingo competition and be awarded with your own pasta SuperHero title!

Students will:

- Learn about healthy plate concepts
- Learn which kind of nutrients are associated with different food groups
- Learn about planetary diet and environmental impact associated with different food groups.

Duration:

45-90 minutes

Preparation time:

short

Can be aligned with the following subjects:

Nutrition / Maths / Cooking Class

Duration	Activity	Materials/Equipment (download here)
10'	Introduction	
5'	Cooking 1	Basic recipe sheet, ingredients option sheet
10'	Calculation 1	Detailed info tables
10'	Bingo 1	Pasta Bingo tables (Basic recipe sheet)
10'	Wrap-up	

Detailed instructions:

The game is prepared in two versions: simple and advanced. The basic tutorial is written using the "simple version" which skips the exact calculations of nutrients. Instead, students are only calculating "points" (positive or warning) based on nutrient content, environmental impact or any other characteristics of the given ingredients. Caution: the fact that both kinds of food get the same point (e.g. calcium point for milk and broccoli) does not mean that the nutrient content is the same in both. The points are awarded for all food which counts as a 'better than average' source of that nutrient. All calculations are simplified to enable student's calculations. Therefore, the presented points and numbers must be taken with caution and are not a substitute for calculations done by trained dieticians.

Preparation

Print out all the materials, prepare the box with claims (cut the claims with scissors and put the papers into the box to allow for random selection of claims).

Introduction

If there is time and/or preference for more interactive introduction activity, choose one from "additional intro activities". They provide ideas on 10-15 minutes long "icebreaker" activities to open the topic of healthy food habits.

Ask the students if they have ever dreamed about having their own restaurant? What about an Italian one? Do they help their parents with cooking? Let them share their ideas and experiences. Explain to them that their task today will be to design the best pasta recipe ever. However the task is not that simple: they must create a recipe which is not only tasty but also nutritious and sensitive to our planet.

Distribute the Basic recipe sheets to your students, together with a list of possible ingredients (without the Detailed info tables!). Explain to them that today, they become chefs of an Italian restaurant and by winning the hearts of their customers they can become true food superheroes!

Explain to students that on the sheet, they can see what the ideal healthy plate should look like (see resources below for help and explanation). The plate is there to help them with their selection.

Show the students the list of ingredients and ask if they know them all. Give them a space to ask about anything they do not understand.
Instruct the students that they have 5 minutes to select their ingredients. For every main category, they can select up to one option (or skip). In the "Extras" category, they can select up to 3 options, but they should be aware that less is sometimes more! They can fill the names of the selected ingredients in the table, or they can draw them into the correct categories on the plate!

Cooking 1

Students will get 5 minutes to select their ingredients and write that selection into the prepared sheets, eventually drawing how their best pasta looks.

Calculation 1

Distribute Detailed info tables among students. In the tables, they can find points given in every category for every ingredient. They should write

the points into the table and calculate the amount in every category.

Advanced option: Instead of points, more precise amounts of nutrients are available in the table. Their task is to write down the information into the calculation table on their sheets and count the nutrient content for their pasta recipes. Calculations can be done by hand or using an Excel spreadsheet. Allow more time for calculation if using this option!

The points are awarded if the food does not contain a high amount of a nutrient we should limit (added sugar, ultra processed for store-bought products and processed meat), is a good source of a given nutrient (calcium, vitamin C, fibre…), or if it has some other "special properties", e.g.:

- Complex carbs: Awarded to ingredients with high amount of complex starches
- Umami point: The fifth taste! "Savoury without salt", umami is the taste typical for broth, meat, fish and fermented products, but also the reason we love tomatoes, cheeses, fermented vegetables, seaweed or mushrooms, as those are also high in umami. The taste is triggered on our tongue probably through receptors for glutamate and nucleotides (typical components of protein-rich food). Learning which food can add the intensive and deep taste into your recipe is important for every chef
- Herbs and spices: Without herbs and spices our cuisine will taste inferior. Points are added for increasing the richness of your recipe - by herbs, spices or healthy oils. Without fat our food will taste disappointing, no matter how many spices we put in
- Veggie point: Vegetables should be a basis of our healthy plate. This point is awarded if the ingredients are based mainly on vegetables or they can increase the vegetable content
- Plant-based protein: Many scientists argue that our current meat intake is too much and we should limit it for environmental reasons. However, meat is also an important source of protein. If you decide to skip meat, you need to add some other protein source: 1 point is awarded for those who can
- Healthy planet: The 'planetary diet' has its rules. It is estimated that our global diet should include twice as much vegetables and legumes and fish as we currently consume, while halving the intake of red and processed meat and added sugar[24]. Healthy planet points are awarded if the ingredients are in line with those recommendations and have low environmental impact (calculated as emissions of CO2).

Bingo 1

On the sheet, students also get their Pasta Bingo tables. The teacher will choose (randomly) claims from the box/bag and read them out loud, including the 'claim' category. Students for whose recipes the claim is true can check a cell of their selection in the given category, e.g. for claim "Category: Health impact: Recipe does not contain any processed food", student can check any cell in a row "Health impact".

The first student(s) reaching any "winning combination" (see winning combination sheet) in bingo can claim their food SuperHero title!
The suggested superhero titles are different for every winning combination. You can prepare diplomas or any other prizes for your winning students, including some categories for students that do not win, if seeking a less competitive atmosphere.

If you have more time (2 lectures):
Repeat the process (Cooking-Calculation-Bingo) for a second or third time, so the students will get the chance to try to improve their recipe based on previously gained knowledge.

Wrap Up

Ask students how they enjoyed the game. What they learned during the process, what surprised or did not surprise them, what they correctly guessed about nutrient content or environmental impact of their recipe. Ask what they are going to take to their everyday life, if anything.

Optional:
You can also encourage students to create and calculate their very own pasta recipe, using freely available online food databases and the environmental impact calculator (see Additional resources).

[24] EAT-Lancet Commission Summary Report

Additional resources:

About healthy plate:
Kid's Healthy Eating Plate | The Nutrition Source |

Umami:
Umami

What is Umami? | Everything about umami |
Umami |

Planetary diet:
Plate and the Planet | The Nutrition Source |

EAT-Lancet Commission Summary Report

For precise calculations:
FRIDA Food Database

Carbon Food Calculator

Food & Science & Communication lesson plans

Food & Science & Communication

Is chocolate good for concentration? Does frying destroy olive oil? Is sugar from fruits healthy because it is from fruits? Children and teenagers are exposed to a lot of scientific information, often contradictory, inaccurate or completely false, provided to them on every platform they visit. On social media, Whatsapp groups or TV, misinformation is everywhere. This module contains lesson plans that promote skills necessary for fruitful engagement with different aspects of food science, while also creating a multiplying effect by adding science communication skills. Students will learn about the basics of food processing, both theoretical and through hands-on experiments, and are then encouraged to understand how these issues are communicated in the media and social networks. At the same time, students will learn how to share their newly acquired scientific knowledge with different audiences (e.g. parents or peers).

Learning objectives

Students will:

- Gain knowledge about scientific communication and be able to understand the importance of science in general, and food science in particular, in their own lives
- Get familiar with principles and tools to communicate their acquired science knowledge in an engaging way to a diverse audience
- Identify and evaluate online information about science and food science
- Recognise that each food is a living matter that undergoes changes and can be transformed when interacting with its environment or with other ingredients.

Lesson plans on Food & Science & Communication (click on lesson plan titles to download individual lesson plans):

1. **Introduction to food processing: where does our food come from?:** defining what is processed food, differentiating between different types of processed foods (industrial, homemade, etc), discussing smart consumption habits

2. **Evaluating online sources and identifying misinformation:** discovering the importance of evaluating scientific information in the media and social media, discussing difficulties in identifying reliable scientific information, explaining and applying criteria for evaluating scientific information

3. **Food in the lab: Let's experiment with apples!:** recognising that each food is a living material undergoing changes and can be transformed when interacting with its environment

4. **Food in the lab: Let's experiment with yeast fermentation!:** recognising that each food is a living matter undergoing changes and can be transformed when interacting with its environment

5. **Intro to food science communication:** identifying science communication goals and challenges.

Introduction to food processing: Where does our food come from?

Module: Food, Science & Communication
Type of lesson plan: Lecture + Discussion
Can be linked with lesson plan: Food map, and Food map redesign.

Short description of the activity:

It is commonly understood that food is necessary for humans to survive and thrive, but food also has social, health, and other aspects that are poorly understood. Processed foods are created through a range of actions that turn raw materials into something that can be consumed, cooked, and stored. Even processes such as washing, peeling, slicing, and removing inedible parts from the raw material are all considered a certain form of food processing. Food processing also includes adding components to food, for example to extend shelf life, or adding vitamins and minerals to improve the nutritional quality of the food (fortification). For an introduction to the term, 'food processing', what it is and why we do it, follow this link.
The past few years have seen increased consumption of processed and ultra-processed foods, and a related increase in the public discourse. This topic also entails many incorrect concepts and myths, such as defining processed foods solely as industrial; in reality, not all processed foods are the same. Therefore it is important to be mindful of the types of processing that have advantages in our diet.

Students will:

- Be able to define the term "processed foods"
- Be able to differentiate different types of processed foods (ultra, industrial, home, etc.)
- Be able to state the reasons for ultra-processed food consumption and discuss smart consumption of processed foods.

Duration:

45 min. (Can be expanded to 2 lesson to enable more in depth discussion with students)

Preparation time:

short

Can be aligned with the following subjects:

History / Science / Home Economics

Duration	Activity	Materials/Equipment (download here)
10'	Introduction (slide 2): 1. Ask the students to think about their breakfast / dinner and write on each post-it one ingredient (e.g cereal with milk should be written separately as 2 different items). 2. Ask them to place their notes on the board either under a sign of "processed food" or "non-processed food"	White board/big sheet of paper, post-its, markers/ pens. Introduction to food processing: PowerPoint.
25'	Discussion: Definitions, types and classifications of food processing. After learning about formal classification, ask the students again to categorise the food items they listed in the introduction (slide 6)	Introduction to food processing: PowerPoint. Notes from introduction
10'	Summary: Ultra-processed foods and take home messages.	

Detailed instructions:

Introduction

(Slide 2) Tell the students that before talking about processed foods, they are going to play a short game. Ask the students to take post-its (or just empty pieces of scrap paper). On each piece, ask them to write the different foods that they ate yesterday, with each food item on a separate piece of paper. For example, if they ate cereal for breakfast, then they should write "cornflakes" on one piece of paper and "milk" on another. Then ask the students to put up their notes into 2 columns you prepare either on the board or on a big piece of paper on one of the walls of the class: "processed foods" and "non-processed foods". Remind them that at this point, there are no mistakes because they have not yet started learning about the topic.

Any food that has been washed or sliced has undergone a processing procedure. If a student says "cucumber", for example, then ask the student if it was washed, sliced, etc. (Before moving on, take the notes down and keep them for the next part of the lesson).

Definitions, classifications, and necessity

(Slide 3) Definitions of Food Processing. This slide contains several definitions and the class should discuss the similarities and differences. Ask students which one they would adopt for this class?

(Slide 4) Types and Classification of Food Processing. An image from the EUFIC website is provided as a demonstration of the different ways we process food at home and in the industry. Before moving on to the next slide, ask them if all food processed in a factory is the same? Is it healthy or not?

(Slide 5) One food item with many ways of processing, as an example.

(Slide 6) Classification of Food Processing Levels. Similar to the different definitions of food processing we saw in slide 3, there are many categorisation schemes. Today we focus on the one suggested by the International Food Information Council: an American nonprofit with a mission to effectively communicate science-based information about health, nutrition, food safety and agriculture. It contains 5 distinct levels with 2 levels containing sub-categories. After presenting the students with this classification - bring back

the notes (with the food items from the beginning of the class) and sort them according to this classification. This can be done in different ways:
* Bring 5 empty boxes that will represent the categories and ask the students to place the notes in the boxes. *Have 5 pieces of A4 paper with the headlines of the categories and ask the students to pile their notes on top. *This entire activity can also take place using a digital platform - for example, creating a shared presentation, with each category receiving slides, and asking the students to add their food items, and even asking them to add another item they eat from each category.

OPTION - if the classification scheme in slide 6 is too complex for the class - there are less complicated schemes you can use:

1. Unprocessed, minimally, or moderately processed foods
2. Processed foods
3. Ultra-processed foods

Or:

1. Unprocessed and minimally processed foods
2. Processed culinary ingredients
3. Processed food products
4. Ultra-processed products.

(Slides 7-8) OPTIONAL - short historical background of food processing.

(Slide 9) Discussion - Why do we need processed food? Start with asking the students whether processed foods are good or bad? You can use guiding questions such as; is adding vinegar or salt to preserve the food also bad? Is it beneficial? Can we have a decent quality of diet and life without any food processing? Why is it important? Reasons for food processing: there are a variety of reasons, such as washing fruit and vegetables and removing redundant parts (e.g., carrot tops) to make the food edible. There are also preservative processes that enable us to store food over time. Convenience is similarly important. For example, when we want to make a tuna fish sandwich or salad, we will not fillet a fish each time, but simply open a tin of tuna instead. In addition, added vitamins and minerals or producing enriched food are examples of food processing that is suited to specific needs, as with producing products that are suited to allergies such as lactose-free milk.

(Slide 10) summarises students discussion by using these 5 reasons (source: EUFIC, see item 1 in additional resources)

Makes food edible
Grain crops, for example wheat and corn, are not edible in their natural state. Processing techniques, such as milling and grinding, turn them into flour, after which they can be made into breads, cereals, pasta and other edible grain-based products. There are 3 types of flours depending on the processing level; choose whole grain when possible is healthiest. Students can learn more about the journey of grain to bread in our 'Gain on grain' infographic.

Safety, shelf life, and preservation
Processing improves or even ensures food safety by removing harmful microorganisms. The main methods are pasteurisation, air-tight packaging, and the use of preservatives.

Nutritional quality
Food processing can affect the nutritional quality of foods in both ways: it can enhance it, for instance by adding components that were not present, like vitamin D (through 'fortification'), or by lowering fat, salt or sugar. It can also cause some fibre and vitamins and minerals to be lost, for example through excessive refining, heating or freezing.

Convenience
Processing and packaging technologies help to tackle modern day time-constraints by providing a range of convenient foods; ready meals, bagged salads, sliced and canned fruits and vegetables take little time to prepare and can be consumed 'on the go'.

Price
Food processing can decrease the cost of foods. For example, frozen vegetables have a similar nutritional value as fresh ones, but at a lower price, as they have already been prepared, do not contain inedible parts, can be bought in bulk, and can last longer. This way, processing increases the shelf

life of food, and decreases the amount of waste, reducing the overall costs of food production.

(Slide 11) Impact of Food Processing. Infographic for summarising the need and benefits of food processing.

Summary

(Slides 12 and 13) Ultra-processed foods. There are 2 definitions offered here - slide 12 is more scientific and contains some jargon, so might be better for older students. Slide 13 is a simpler and more straightforward definition. Ask the students: if we look back at the 5 categories, ultra-processed foods are in which category of food processing? Answer: 4 and 5.

(Slide 14) Why do we eat more processed foods nowadays? We are exposed to such a wide variety of ultra-processed foods in everyday life. Ask the students to try and calculate how many food items per they eat that are ultra-processed. Key reasons may include their taste appeal, availability and cheapness compared with healthier options.

(Slide 15) Why are ultra-processed foods bad for us? There are studies about specific types of ultra-processed foods, such as meat. Generally, the majority of studies (usually epidemiological studies, which follow people and monitor their food and diet for long periods of time) agree that consuming excessive amounts of them is not healthy.

(Slide 16) Take away messages for conclusion: We cannot really avoid processed foods, but we can make choices based on selecting foods that are processed minimally and limiting our intake of ultra-processed items.

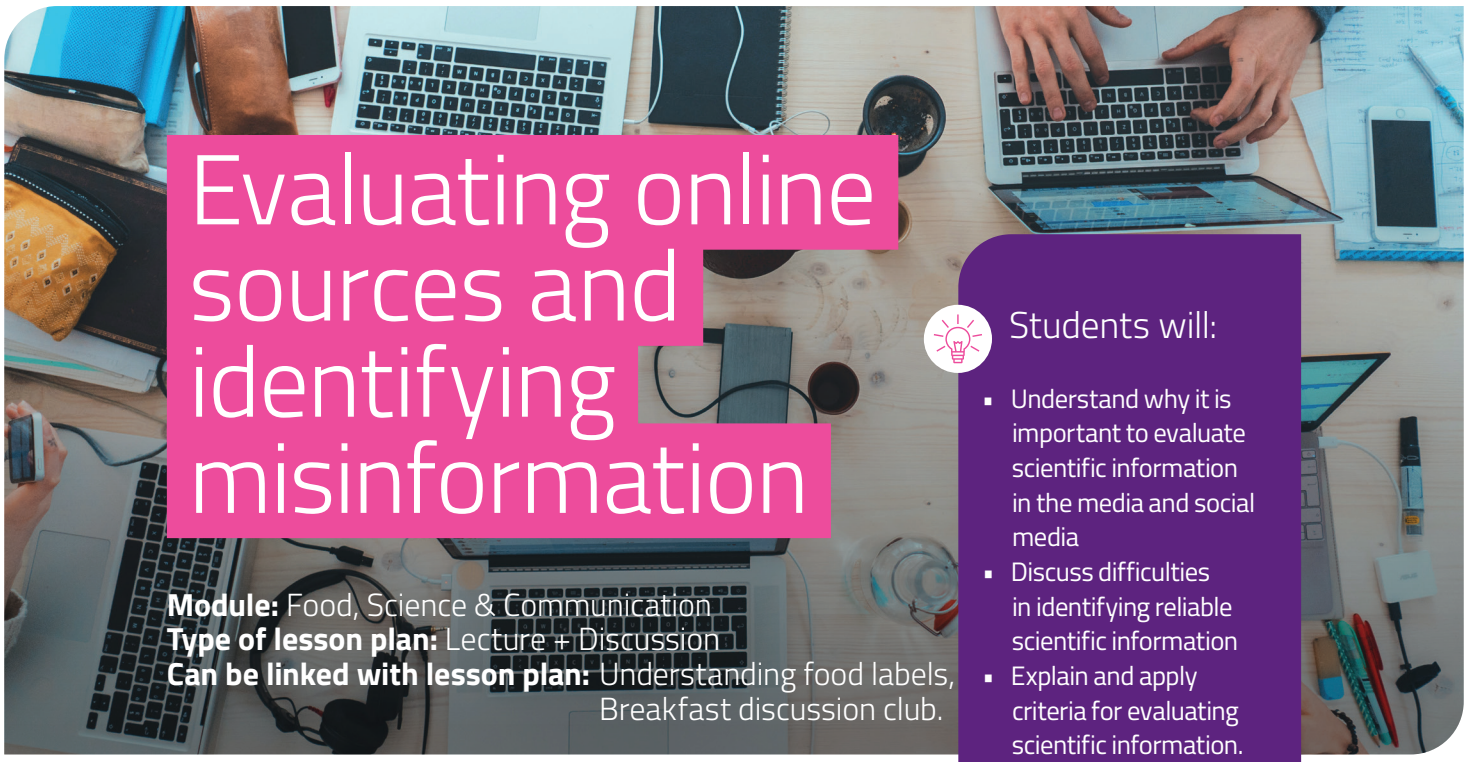
Additional resources:

How are different foods processed ?

Online course: How Food is Made - Understanding Food Processing Technologies

Ultra-processed foods, diet quality, and health using the NOVA classification system

What are ultra-processed foods and are they bad for our health?



Evaluating online sources and identifying misinformation

Module: Food, Science & Communication
Type of lesson plan: Lecture + Discussion
Can be linked with lesson plan: Understanding food labels, Breakfast discussion club.

Students will:

- Understand why it is important to evaluate scientific information in the media and social media
- Discuss difficulties in identifying reliable scientific information
- Explain and apply criteria for evaluating scientific information.

Duration:

45 min. (If there is an additional 45 min. it is advisable to extend this activity so that students have more time in the groups and can evaluate more sources, and discussion can be longer).

Preparation time:

medium. It is advisable to be familiar with basic scientific principles and processes, as presented in this glossary.

Can be aligned with the following subjects:

Language / Arts / Science

Short description of the activity:

The ability to evaluate information, and especially scientific information, is a critical skill today. Many documents about science education (e.g. PISA) highlight the ability to understand scientific information and critique its sources and accountability as one of the key expressions of general literacy and specifically scientific literacy.
In this era, scientific and nutritional information is everywhere, in our social network, in online and print media, even in conversations at home. Learning how to analyse and evaluate this information is also critical for any decision making regarding healthy and nutritious lifestyles.

This lesson encourages the students to expose, evaluate and thoughtfully critique conflicting and often ambiguous information they encounter on a daily basis.

Duration	Activity	Materials/Equipment (download here)
8'	Opening: discussion of different statements about food	Evaluating online sources and identifying misinformation: PowerPoint
30'	Main activity: evaluating sources in small groups	▪ 3 types of students' worksheets (chocolate, eggs, and meat). ▪ for each group - either a phone or laptop or tablet or desktop[25].
7'	Summary: recap and repetition of the criteria presented at the beginning.	

Detailed instructions:

Introduction:

(Slide 2) Students are presented with 6 statements that deal with myths and rumours that have appeared in various media regarding food. Each student must decide whether the statement is true or not. Ask students to take 2 minutes and read them through, then ask them for each statement individually whether they think it is true or not. Ask them either (1) to raise their hand or a note with yes or no, (2) to stand, or (3) use a survey in a Mentimeter that will allow them to see the results after they answer.

Statements: (1) Chocolate is good for concentration (2) Eating tuna helps keep your heart healthy (3) Sugar from fruits is healthy because it is from fruit (4) Tuna contains mercury and should be avoided (5) Frying destroys olive oil and it can cause cancer (6) Chocolate causes acne.

After a quick survey with the students, tell them that these sentences all appeared in various newspaper articles. Ask them: Are there statements here that contradict each other or confuse you? If so, which ones?

After they answer, sum up by giving an example. In one statement it is said that eating tuna helps maintain heart health, but in another it is argued that tuna contains mercury and should be avoided. Explain that anyone who reads this information can be confused: should they eat tuna or avoid it?

The emphasis in this exercise is not on whether this is right or wrong scientifically, but on the fact that these are all headlines from online news outlets that are to some extent contradictory and that we are often exposed to contradictory information online. It is important for the students to understand from this exercise that there is often some truth in the headlines, making it difficult to evaluate whether something is overall true or false.

Main activity: Evaluating sources in small groups.

(Slide 3) Why do we need to learn about evaluating online sources?

Evaluating sources of information is important for our decision making. We make decisions every day, based on the information we read. Ask the students, what nutrition-related decisions have you made in the past day/week?
(Possible answers: what to eat, what not to eat, what to eat after a workout, what to eat before a test, whether to avoid certain ingredients).

(Slide 4) Discuss with the students: What if you read this tweet recently? Would you eat more dark chocolate? What information are you missing to make a decision? One suggestion could be to click the link and go to the USA today website, or try to find the actual research mentioned.

(Slide 5) Healthnewsreview.org already did this and posted what they found out. They point to 3 issues: 1. the fact that this is just a pilot study and has not been tested on a large population (only 10 people). 2. the studies have not been through external review ('peer review' in academic and scientific jargon: when evaluators from within the field of the study review and critique the study)

[25] If students do not have access to any electronic device and or WiFi, you can still have the activity by printing out the home page for each website.

and lastly 3. vague language: what does it mean that chocolate "supports" health- this does not mean anything specific.

(Slide 6) If we want to improve our decision making and understanding of the information we are exposed to we need some tools for evaluation. Introduce to the students these 3 suggested indicators:

1. Authority of
   1a. The author (credentials as well as the experts they rely on, are they relevant experts for the matter at hand? Are they part of a credible organisation?)
   1b. The publisher (platform)

2. Objectivity - Can you identify the interests of the publisher/author? This includes but is not limited to financial interests.

3. How up-to-date is the information?

Afterward show them the matrix for evaluation (slide 7 - very small font) and move to slide 8 with the instruction. Each group will receive a copy of this matrix printed: an empty table with links to conduct their own evaluation (attached to this lesson plan).

The links provided in this lesson plan were selected to represent multiple levels of all criteria to enable discussion and reflection.

They are grouped by topic: eating meat, eggs and chocolate. There are 2 options for conducting the source evaluation activity:

1. **Short.** Choose one theme (meat, eggs or chocolate) for the entire class. All groups receive the same links (2 or 3 - again depending on time and reading level of students). After they discuss and complete their evaluation table in the group - have a vote in the full class forum.

2. **Long.** Use all three topics. Depending on the number of groups - let every 2 or 3 groups use the same topic and links. After evaluation in small groups ends, ask for representatives from each topic to present to the class the links (sources of information) and how they evaluated them.

Summary:

Summary is an opportunity to recap and emphasise the take home messages of this lesson. When encountering science and food related information on social media or mainstream media. Think, reflect and evaluate:

- Nature of science and scientific work - do we have information about any scientific evidence? Can we evaluate it? Do we know someone we can ask?
- What is the authority of the writer or publisher to make the claims they are making?
- What are the underlying interests for publishing this information?
- How recent is it?

Additional resources:

Do you know how to find reliable information online?

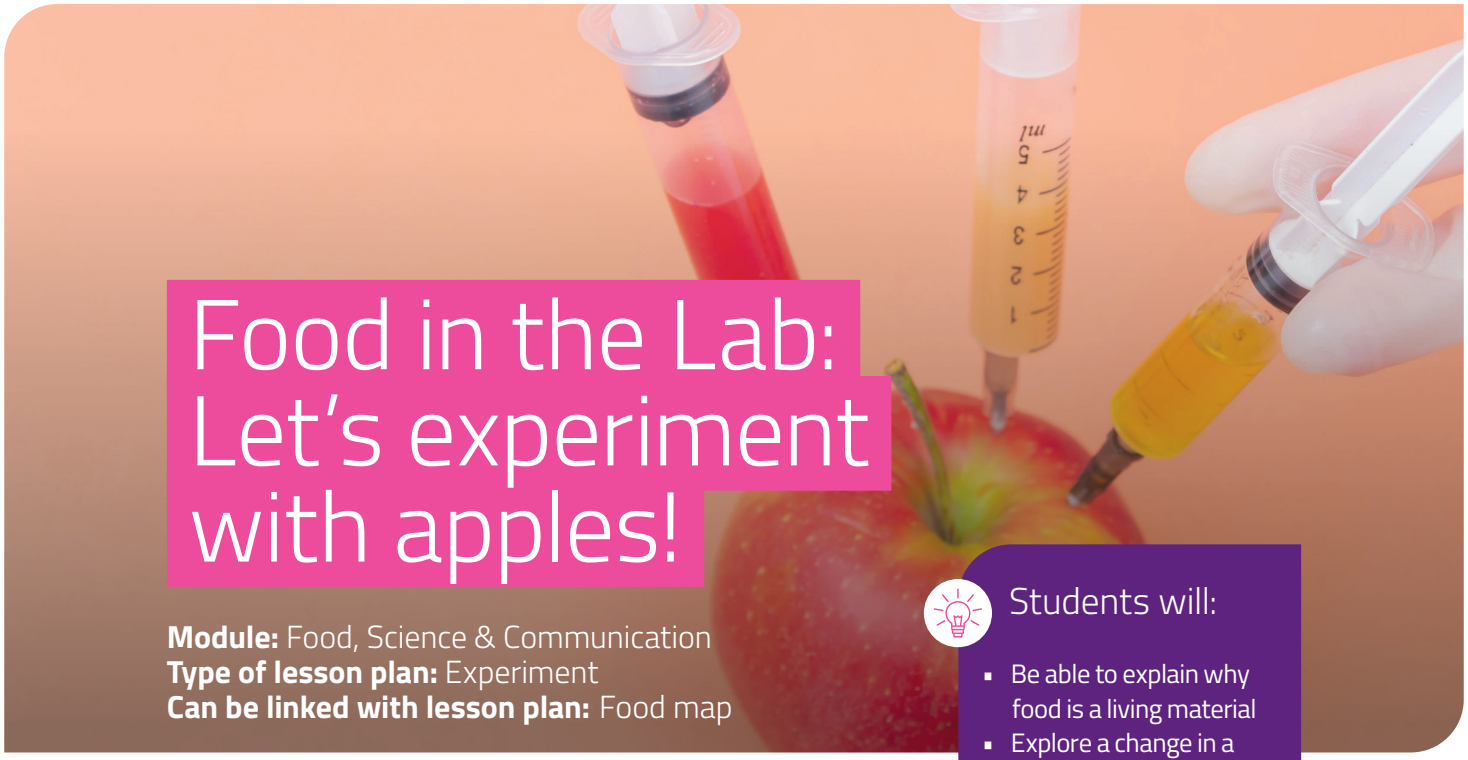
The pandemic has put a magnifying glass on misinformation

Online Fake News about Food: Self-Evaluation, Social Influence, and the Stages of Change Moderation

Why A Journalist Scammed The Media Into Spreading Bad Chocolate Science

Nutritional professor's blog focused on industry influence on nutritional research, including specific examples of studies, discussions about false claims etc.

Food and Nutrition: The Truth Behind Food Headlines, an EIT Food online course



Food in the Lab: Let's experiment with apples!

Module: Food, Science & Communication
Type of lesson plan: Experiment
Can be linked with lesson plan: Food map

Short description of the activity:

Enzymatic browning is an oxidation reaction that takes place in some foods, mostly raw fruits and vegetables, causing the food to turn brown. Enzymatic browning of fruits and vegetables is important to be controlled/inhibited in food preservation and processing as it is considered an undesirable reaction because of the unpleasant appearance of the food. This experiment is a medium-term observation of food and what happens when it is left in different surrounding environments (e.g. liquids). Students collect baseline data and refer back to their observation later as they continue to study the food. Students will learn how food scientists make experiments in order to know more about food behaviour in different environments.

Students will:

- Be able to explain why food is a living material
- Explore a change in a food that occurs due to its reaction to its environment
- Understand how experimenting on a food topic helps scientists find solutions that contribute to more sustainable food systems
- Learn that food is a living material that can be transformed when interacting with its environment.

Duration:

2 X 45 min

Preparation time:

medium

Can be aligned with the following subjects:

Science / Home Economics / Chemistry / Physics

Duration	Activity	Materials/Equipment (download here)
PART A: Introduction, setting up of the experiment and initial observations		
10'	Introducing the experiment and what we want to investigate	Experiment sheet (for the teacher)
35'	Experiment and initial observations	Experiment sheet (for the teacher) Activity sheet (for the student)
PART B: Follow-up observations and conclusions		
30'	Making observations at 15 min and 30 min (in 1-2 hours is optional)	Activity sheet (for the student) 1 hand lens (optional) One smart phone for digital photos (optional)
15'	Discussion - Conclusions	

Detailed instructions:

PART A: Introduction, setting up of the experiment and initial observations

Introducing the experiment and what we want to investigate

The teacher shows the students an apple that has undergone browning and asks them questions such as: What happened to this apple? Where do you think this apple was stored? How can you describe this change and what do you think caused it?

The teacher introduces the students to the topic. Browning is a process of gradual change in the colour of food products to brown or dark brown over time. This reaction is considered undesirable in most fruits and vegetables. However, it is important to produce a unique and characteristic flavour in products such as bread, coffee, black tea and soy sauce.

This lesson plan focuses on enzymatic browning which takes place mainly in vegetables and fruits and involves the presence of an enzyme. In enzymatic browning, the polyphenols (a class of compounds found in many plant foods) present in the fruit undergo oxidation (a reaction occuring in the presence of oxygen) to their corresponding quinones by the enzyme Polyphenol Oxidase (PPO) and then these quinones are polymerised (combined together) to form brown pigments. Enzymatic browning mostly occurs during harvesting, transportation, storage, and processing of fruits and vegetables.

Apple is one of the most popular fruits and thus enzymatic browning of this food is an important topic for farmers, food processors and consumers. Enzymatic browning causes the familiar 'brown bruises' on the surface of damaged or cut apples. The degree of browning depends on the polyphenol concentration in the fruit and on the PPO activity. Apples should be stored in conditions that slow down the action of PPO.

The teacher divides the students into groups of 5 and gives to each group the assembled materials (see experiment sheet).

Experiment and initial observations

The teacher follows the instructions on the Experiment Sheet. This involves observation of: appearance (colour), smell, feel (texture) and, if desirable, taste.

PART B: Follow-up observations and conclusions

Making observations at 15 min and 30 min (also at 1-2 hours is optional)

The teacher follows the instructions on the Experiment Sheet and guides the students with their observations.

As the students are waiting in-between observations, they can discuss the observations they see. They can also watch a video that the teacher shows on apple harvesting and processing. Some ideas are given below:

Touring an apple packing facility

Blippi Visits an Apple Fruit Factory

Discussion - Conclusions

Students discuss their observations in their groups for about 5 minutes.

Then there is a class discussion on the results and whether the predictions of the groups were true. The results are being interpreted on the following lines:

- Vitamin C in lemon juice suppresses enzymatic browning
- Freezing also suppresses the action of the enzyme
- Immersion in water physically prevents oxygen (in the air) from interacting with the fruit and causing enzymatic browning.

But how is enzymatic browning related to the apple industry, to apple consumption and to sustainability? The demand for fresh-cut fruits and vegetables is increasing. Food processors need to find appropriate ways (e.g., additives) to control enzymatic browning (i.e., inhibit PPO activity) so that the shelf life of the cut fruit and vegetables is extended. As consumers are searching for healthy and environmentally-sustainable products, food processors are moving away from synthetic additives towards natural PPO inhibitors (e.g., plant extracts). A second point is that 50% of fresh fruit[26] loss is because of colour deterioration caused by enzymatic browning (Mi Moon et al., 2020). As we are aiming for food systems characterised by less waste, the identification of adequate PPO inhibitors is an important way to reduce food waste and improve sustainability.

[26] Mi Moon et al. (2020). Recent trends in controlling the enzymatic browning of fruits and vegetable products. Molecules, 25: 2754.

Food in the Lab: Let's experiment with yeast fermentation!

Module: Food, Science & Communication
Type of lesson plan: Experiment
Can be linked with lesson plan: Intro to food processing, Food map re-design

Short description of the activity:

Fermentation is a metabolic process in which a microorganism (yeast, bacteria) converts a carbohydrate such as sugar or starch into an alcohol or an acid. Yeasts are vital microorganisms in the food industry (mostly in the bread making). The bakery yeast (also known as the Brewers' Yeast), Saccharomyces cerevisiae, and its different species is the most common in the making of food products. Fermentation occurs when yeasts are in anaerobic conditions, meaning with little or no oxygen. Besides the energy created in the fermentation process, which the yeasts use for maintaining their existence, other materials are also created during fermentation: ethanol (a kind of alcohol), and carbon dioxide. The carbon dioxide aerates the dough during baking while the alcohol is driven off. The existing conditions during the fermentation process have an effect on the activity of the yeast.

Students will be able to:

- Define the process of fermentation
- Describe a simple food experiment
- Experiment how sugar concentration impacts yeast activity during fermentation (used in baking).

Duration:

45 min

Preparation time:

medium

Can be aligned with the following subjects:

Home Economics / Science / Chemistry

Duration	Activity	Materials/Equipment (download here)
10'	Introduction to yeast fermentation	A bread
30'	Experiment: Effect of sugar concentration on yeast activity	Experiment sheet Activity sheet
5'	Conclusions over the experiment	

Detailed instructions:

Introduction to yeast fermentation

The teacher shows the students a bread and asks them questions such as:

- Do you know how bread is made?
- What do we add in bread to make it rise?
- What conditions do you think the yeast needs to work and make the bread rise?
- How can we find the ideal conditions for the yeast to work?

In summary, the teacher explains that yeast is the ingredient responsible for the rising of bread and other bakery products. Explain that yeast is a microorganism that is responsible for a chemical reaction inside the dough that causes the production of a gas called carbon dioxide that ultimately causes the dough to rise. Food scientists experiment with different substances and ingredients in order to understand how they work, under what conditions they work (or not) and what can be done in order to optimise the different processes in food production/food handling.

In this lesson, the students will experiment with yeast in order to find the ideal conditions needed for it to work.

Experiment

This experiment is best carried out in a lab class or in a class where science experiments are usually carried out by students using the appropriate equipment (e.g. test tubes). Furthermore, as this lesson plan is an experiment, it is suggested that it is performed by an experienced teacher who often teaches science/chemistry in school.

The teacher introduces the students to the experiment: Effect of sugar concentration on yeast activity (how does yeast react under 5 different sugar concentrations (quantities)?)

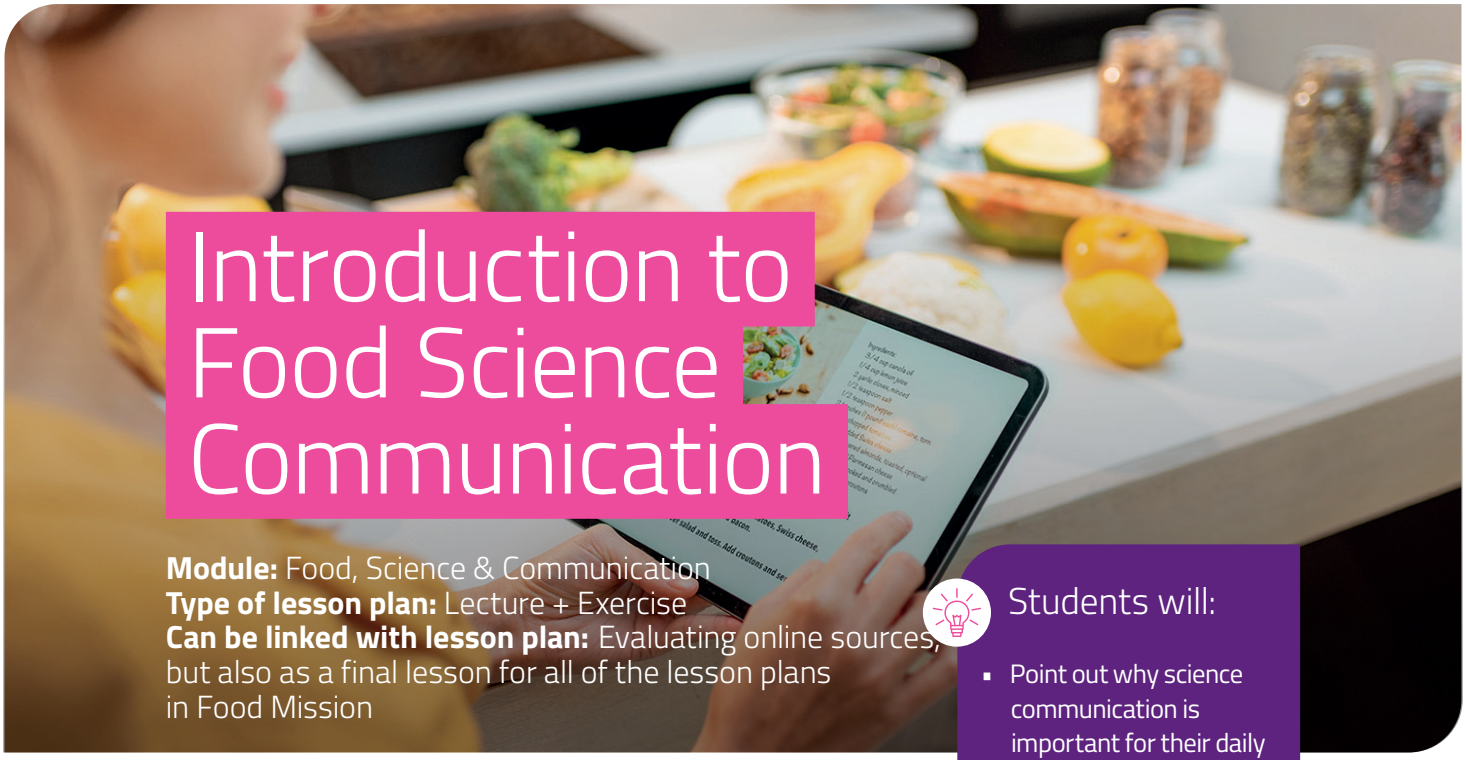
The teacher divides the students in groups of 3-4. The teacher provides each group with the assembled materials (according to the experiment sheet). The teacher guides the students to follow the activity sheet instructions and prepare the test tubes with the appropriate solutions (type/quantity).

When the students prepare their test tubes, they place them in the warm water container. At the end of the incubation period, each group takes their test tubes out of the warm water to measure changes in the foam length (height).

Results of experiment and derived conclusions

The teacher summarises on the board the results of all the groups and there is a discussion about them. There is a discussion over the initial predictions of the groups as compared to the final results. The teacher asks the students what they would conclude from the actual results of the experiment.

Yeast fermentation is a very important process as it is used in the production of bread which is a stable food all around the world. Experimenting with important food science topics such as yeast fermentation is important and can bring students closer to the science of food and closer to food product development.



Introduction to Food Science Communication

Module: Food, Science & Communication
Type of lesson plan: Lecture + Exercise
Can be linked with lesson plan: Evaluating online sources, but also as a final lesson for all of the lesson plans in Food Mission

Short description of the activity:

The relationship between science and society is ever evolving. Scientists talk to the public directly through social media. Scientific studies and their findings are becoming more accessible to public critique, and nowadays some scientific research involves active public participation (i.e citizen science). These changes all make science more transparent to society, and the social discourse on science is following suit.

Science communication includes this discourse about science and technology that takes place in various settings: from social media to radio shows, from parliament committees to theatres. The discourse is, therefore, rich and varied. Some of it is more about scientific methods and findings and some on ethics, law, society, culture. (See below additional resource 1: Science communication MOOC).

**(to expand on science communication skills and connect it with other lessons from our modules, there is an option to create with the students science communication products that communicate the concepts they have learned. Their work can be based on what they have learned in this lesson, as well as a detailed tip book provided in the materials folder. If you are interested in this, please allow additional 2 lessons - 2x45 min).*

Students will:

- Point out why science communication is important for their daily lives
- Define what is communication and what is science communication?
- Identify tools for good scientific communication
- Analyse different science communication products based on the tools they have learned

Duration:

45 min*

Preparation time:

medium

Can be aligned with the following subjects:

Science / Language Arts / English as a second language / Media Studies

Duration	Activity	Materials/Equipment (download here)
10'	Opening: Science in everyday life and why do we need science communication?	Introduction to science communication. PowerPoint
30'	Learning new concepts: ▪ What is communication? ▪ What is science communication? ▪ Who communicates science? ▪ Skills for communicating science ▪ Application of the skills	Introduction to science communication. PowerPoint Speakers (if choosing the video) or notes with concepts (if choosing the game) In the activity that summarises this section, students can work in groups; worksheets must be printed for each group (attached to this lesson plan)
5'	Summary	Introduction to science communication. PowerPoint

Detailed instructions:

Introduction

(Slide 2) What are we going to talk about today? The lesson has three parts:

- What is communication?
- What is science communication?
- Tools for effective science communication.

(Slide 3 - animated) Warming up game- 'let's get to know each other'. Explain to students that they will be presented with a number of statements. Whoever agrees with the statement will raise their hand.

1. Statement 1: I have charged my cell phone in the last 24 hours
2. Statement 2: I heated food today in the microwave
3. Statement 3: In the past I have taken medicine
4. Statement 4: I arrived using a car or any other means of transportation to school today
5. Statement 5: I have flown in an aeroplane in the past year.

(Slide 4) Science in everyday life: summary of the opening game. Explain to the students that science is a part of our daily lives. Go over the pictures in the slide: the food we eat like canned legumes and vegetables, appliances and electronics devices like cell phones, health issues and even cosmetics and hygiene products like shampoo are the product of scientific research. When something is a part of our lives we need to be able to understand it and also have to make decisions about it. For example, what food to eat? Do we sleep near the cell phone charger? Should we heat our food in plastic containers or not?[27] (It is recommended to let students give examples of decisions they make in a scientific context in their life).

(Slide 5) Explain to students that because science is part of our life, it is important that science is accessible to us, which is a core element of science communication. However, before we do so, it is important that we understand what we mean when using the concept of "communication".

Learning New Concepts

If there is enough time (more than 1 lesson) or appetite for a more interactive lesson, use one of the suggested activities to introduce the concept of communication. If not, skip to slide 8.

OPTIONAL ACTIVITY SUGGESTIONS
(SLIDES 6 AND 7): What is communication?
Choose one of the following activities:

1. (Slide 6) : who is communicating and how? Show the students the picture in slide 6 (in this picture different people communicate in different ways). Above each figure there is a number between 1 to 10. Divide students into pairs (recommended to do so

[27] For more information on this, see additional resource #3 below.

by seats). Ask students to write down for each of the characters whether they are communicating and, if so, how? At the end of the work, ask the students to present their answers. Answers for the teacher: Characters 1 and 2: Communication that is more verbal than face to-face. Character 3 talking to the crowd (it is recommended to ask the students if she knows or cares if they are listening?). Character 5 is listening. Characters 4 and 5 also have face-to-face interaction.

2. (Slide 7): In which of the pictures is there communication and of what kind? Show students the 8 pictures in slide 7. Ask students to choose the pictures that demonstrate communication and ask them to write what kind of communication. This can be done in pairs before going over the answers in a class forum. In the discussion it is important to emphasise that in all the images there is communication. Picture 1: Physical communication, this is a sign of the dog's anxiety, which is how to communicate that something is not comfortable with him. Picture 2: Parent and their child, the child smiles, which is how he informs the parent that he is happy. Picture 3: Baby crying. Picture 4: Non-verbal communication, eye contact. Picture 5: Communication by handshake. Picture 6: There are 2 types of communication here; the child who talks to the girl using verbal communication and also the girl who smiles, which is non-verbal communication. Picture 7: There is a colour here, each colour has a different meaning. Picture 8: Like, Dislike, Emoji is also communication.

(Slide 8) So what is communication? You can ask the students to define and then give them the official definition.

(Slide 9) Communication is defined as a process by which information is exchanged between individuals through a common system of symbols, signs or behaviours.

(Slide 10) Now let's think about the definition of science communication. Though there are many definitions, we chose the following because of its simplicity: 'The accurate and undistorted conveyance of ideas, insights, facts, and analytical frameworks derived from science to anyone who has a need to understand them.' Explain to the students the definition in simple words: inform, educate and raise awareness of science related topics among the general public and to non-expert audiences. Ask the students why it is important? Sum up the discussion: science communication has an important role in helping the public to learn about science, to understand science issues when they encounter these issues in their daily lives and to engage in open discussion about them.

(Slide 11) Who communicates science? Show the students 3 pictures of different groups: scientists, journalists and the public. Discuss the differences in the need to communicate science between the three groups. Scientists communicate about their work and research either with the public directly (social media) or through working with journalists who then communicate to the public. But even we are science communicators when we share any scientific information with different audiences (our parents, our peers, etc).

(Slides 12-14) The purpose of these slides is to demonstrate to the students some of the difficulties and problems in science communication, such as using scientific concepts that are not familiar to everyone and tackling the often unattractive ways of delivering messages.

(Slide 12) Communicating science concepts - two activities to choose from:

Option 1: 'Pantomime game*' - Divide the class into several groups (preferably 5-6 students in each group). The game is a competition between groups. In each turn, one member from each group receives a note with a concept and needs to present the definition to the group in pantomime only. The group needs to guess the definition, if they guess they win one point. The winning team is the team that wins the most points. It is important to combine 'easy' clues like movies (e.g. Lion King, Kung Fu Panda) and more 'difficult' science concepts from the project

(cultured meat, energy, saturated fat, protein). At the end of the game ask the students what was harder for them to understand - concepts of leisure activity such as TV shows or concepts that deal with nutrition? Why?

Option 2 (shorter): show the students a short video from the series The Big Bang Theory in which Sheldon explains the Doppler effect. After watching, ask the students if they think that Penny (the girl he explained to) understood what the Doppler effect is? Why? Sum up the discussion: Sheldon used many scientific terms that are not familiar to everyone (you can show them the video again and ask them to count the number of concepts he used in his explanation or the number of terms they know/do not know). Ask them if they can understand what the doppler effect is based on his explanation?

(Slide 13) Delivering a message: which Instagram post is better? The slide contains 2 examples of posts about onions. The posts deal with the same subject: the best way to preserve onions. Ask the students which post is better in their opinion, and why? 'Better' in this case is taken to mean 'which post would they be more likely to read'? Sum up the discussion with (slide 14). Post 1 is more attractive because it uses visualisation and has a clear message. Ask why it is better to use visualisation. Answers should reflect that it makes the information more interesting and attractive to read, it is easier to understand, it gets to the point more quickly and people are more likely to remember it. Sum up this part: although science is part of our everyday life, it is not easy for us to communicate science-related issues, therefore we must learn some techniques for good scientific communication.

(Slide 15): Time to discuss tips and tools for effective science communication. Some of these are also helpful anytime we want to communicate complex ideas.

The two main questions to start with are:

1. What is your goal? What is your message? What information do you want to communicate?
2. Who is your audience? Communicating with a younger sister is different to with a grandparent.

After a clearer idea emerges, move on to: (these are animated in the slide)

- Avoid technical or jargon words as much as possible. If you do use them, explain them
- Curse of knowledge; not everyone you are communicating with has the knowledge you have. Try to think about your own knowledge as unique and not as common knowledge
- Personal connection; try to create a personal connection with the issues/themes you are conveying
- Day-to-day examples should be relevant and common
- Visualisation: "a picture is worth a 1000 words".

Finally, (click again and this text will appear) we must remember that if the message did not go through and have impact, it is not the audiences' fault.

(Slides 16-20) Activity in groups: analysis of posts dealing with food science from social networks. There are two options for the activity, depending on the duration of the lesson.

Option 1 (longer). Divide the class into groups. Each group will receive a page with a post from social networks (worksheets are prepared for the groups). The group should consider whether the post meets the best practice learned for effective science communication and how to make the post more attractive. At the end of the activity each group will present its work.

Option 2 (shorter). Introduce students to the posts in slides 16-19 and discuss in a class forum what they think and how to make the post more attractive.

Some thoughts you can use for discussion:

(Slide 16): Many scientific concepts that are not familiar to everyone, no visualisation, better to add examples of foods that contain these ingredients to connect it to the daily life of the public and to make it relevant and applicable.

(Slide 17) : Inaccurate scientific information and even some misinformation (e.g. pizza or Oreo cookies as a dietary recommendation).

(Slide 18): Chemical formulas but no relevant information.

(Slide 19): Use of many terms and chemical formulas; do they serve the purpose of the post? For which audiences?

(Slide 20): this is a good example: it uses visualisation and the pictures are recognisable from ordinary life, whilst also showing diversity (examples of animal and plant protein for those who do not eat meat).

Summary

(Slide 21) What have we discovered today?

- Science in everyday life: ask the students to give examples of science in their life (it is possible to ask 4-5 students for different examples in different parts of the day, for example at dinner)
- What is communication and what form does it take? Ask the students to define what communication is and give 2-3 examples
- What is science communication? Ask the students to define in their own words
- Who needs to communicate science and why?
- Tools for effective science communication.

Additional resources:

A free online course (MOOC) on science communication.

Why is it important that scientists communicate about science with the public? (A short video excerpt from the science communication MOOC - the resource above)

Consumer and Environmental Safety: Food Packaging and Kitchenware (online course)

** The art or genre of conveying a story by bodily movements only (Merriam Webster Dictionary).*

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Annual Food agenda

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- Food Back
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FoodUnfolded

Eat Healthy to Keep Healthy

- EIT Health
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Content adapted from the online course:

"How Food is Made. Understanding Food Processing Technologies"

- University of Reading
- DIL German Institute for Food Technology eV
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Content adapted from the online course:

"From Waste to Value: How to Tackle Food Waste"

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- Rethink Resource
- Mimica

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About EIT Food

EIT Food is the world's largest and most dynamic food innovation community. We accelerate innovation to build a future-fit food system that produces healthy and sustainable food for all.

Supported by the European Institute of Innovation and Technology (EIT), a body of the European Union, we invest in projects, organisations and individuals that share our goals for a healthy and sustainable food system. We unlock innovation potential in businesses and universities and create and scale agrifood startups to bring new technologies and products to market. We equip entrepreneurs and professionals with the skills needed to transform the food system and put consumers at the heart of our work, helping build trust by reconnecting them to the origins of their food.

We are one of nine innovation communities established by the European Institute of Innovation and Technology (EIT), an independent EU body set up in 2008 to drive innovation and entrepreneurship across Europe.

Find out more at www.eitfood.eu or follow us via social media: Twitter, Facebook, LinkedIn, YouTube and Instagram.

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