

WJEC GCSE Food and Nutrition

Approved by Qualifications Wales

Guidance for Teaching: Unit 2

Teaching from 2025

For award from 2027



This Qualifications Wales regulated qualification
is not available to centres in England.

Made for Wales.
Ready for the world.

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Introduction

The WJEC GCSE Food and Nutrition has been approved by Qualifications Wales and is available to all centres in Wales. It will be awarded for the first time in Summer 2027, using grades A* to G.

Aims of the Guidance for Teaching

The principal aim of the Guidance for Teaching is to support teachers in the delivery of WJEC GCSE Food and Nutrition and to offer guidance on the requirements of the qualification and the assessment process. The Guidance for Teaching is **not intended as a comprehensive reference**, but as support for teachers to develop stimulating and exciting courses tailored to the needs and skills of their learners. The guide offers possible classroom activities and links to useful resources (including our own, freely available digital materials and some from external sources) to provide ideas for immersive and engaging lessons.

Additional ways that WJEC can offer support:

- sample assessment materials and mark schemes
- professional learning events
- examiners' reports on each unit
- direct access to the subject officer
- free online resources
- Exam Results Analysis
- Online Examination Review.

Qualification Structure

WJEC GCSE Food and Nutrition consists of three units. The qualification is linear and does not contain tiering. There is no hierarchy to the order the units should be taught.

	Unit title	Type of Assessment	Weighting
Unit 1	Principles of Food and Nutrition	Digital examination	40%
Unit 2	Food Investigation	Non-examination assessment	20%
Unit 3	Food and Nutrition in Action	Non-examination assessment	40%

Assessment

Summary of Assessment – Unit 2

Unit 2: Food Investigation
Non-examination assessment: 8 hours
20% of qualification
Marked by the centre and moderated by WJEC

40 marks

Set and marked by the centre and moderated by WJEC.
The assessment will feature two pre-released briefs which will be set by WJEC each year. Centres can choose one of the two pre-released briefs they would like learners to complete.

The pre-released briefs, which will include several tasks, will be available via the WJEC Portal.

Overview of Unit 2

Food Investigation (20% of the qualification)

The purpose of this unit is to:

- apply knowledge and understanding of the working characteristics, functions and chemical properties of ingredients in a recipe.

In this unit, learners will develop knowledge, skills and understanding in:

2.1	The science of food
2.2	Planning food science experiments
2.3	Food science in action

Unit 2 Assessment objectives and weightings

AO1	Demonstrate knowledge and understanding of: <ul style="list-style-type: none"> • food and nutrition • preparing, cooking and presenting food. 	-
AO2	Apply knowledge and understanding of: <ul style="list-style-type: none"> • food and nutrition • preparing, cooking and presenting food. 	15%
AO3	Analyse and evaluate different aspects of: <ul style="list-style-type: none"> • food and nutrition • preparing, cooking and presenting food (including food and dishes made by themselves and others). 	5%
AO4	Plan, prepare, cook and present dishes, using appropriate skills and techniques.	-

Unit 2 Teacher Guidance

2.1 The science of food		
	Content Amplification	Teacher Guidance
2.1.1 The working characteristics of ingredients in a recipe	<p>Learners should understand how the working characteristics of ingredients contribute to the success of a recipe.</p> <p>Learners should understand the working characteristics of ingredients in a recipe, including:</p> <ul style="list-style-type: none"> • colour and appearance • emulsification and binding • foaming • heat transfer and cooking properties • texture • viscosity. <p>Learners should be aware of the food commodity groups within ingredients in a recipe.</p> <p>Learners should be aware of:</p> <ul style="list-style-type: none"> • current trends in cooking methods • cooking methods and techniques from local, national and international cuisines. 	<p>It is important for learners to understand ingredients and the functions of ingredients in a recipe and focusing on key concepts within an investigation. Learners should be given opportunities to investigate the working characteristics of ingredients through completing practical work and understand the science behind what they have seen from the practical work/investigation.</p> <p>Learners should be given the opportunity to investigate cooking methods and heat transfer and to explore how all food commodities change during cooking. One example would be how protein foods coagulate and change in colour and shape and how protein can determine the texture of foods.</p> <p>Example activities:</p> <ul style="list-style-type: none"> • Learners could investigate the working characteristics of ingredients. This could be done through e.g. making butter and cheese to understand the working characteristic of emulsions or making mayonnaise to understand the science of emulsions and using a viscosity chart to assess the outcomes. • Learners could investigate how wheat, salt and ph. can influence the outcome of recipes by using ice water to blanch vegetables after steaming to retain colour and maximum Vitamin C. • Learners could use a munsel chart as a resource, to measure the outcome of caramelisation of shortbread and understand how the caramelisation of sugars are used to produce rich brown colours and flavours. • Teachers could plan a practical lesson using a recipe, such as a Swiss Roll, and explain how the science of coagulation, dextrinization etc. happens at each point of the making process e.g. whisking, baking.

		<p>Heat transfer: conduction convection and radiation and use examples of each method through practical lessons Demonstrate the stages of certain cooking processes, like melting sugar, and explain how flavours, colours, and textures change with each stage. Learners could make a story board of the process within each recipe.</p>
2.1.2 The functional properties of ingredients in a recipe	<p>Learners should understand the functional properties of ingredients in a recipe, including:</p> <ul style="list-style-type: none"> • aerating • binding • bulking • colouring • flavouring • glazing • modifying nutritional content • preserving • raising agents • setting • tenderising • thickening. <p>Learners should understand the function of ingredients in a recipe, by:</p> <ul style="list-style-type: none"> • selecting and adapting recipes • considering variables that affect results • making modifications to a recipe. 	<p>It is important for learners to define key terms and know the definitions of functional food properties such as those listed to the left. Teachers can explain why understanding these functional properties is essential in the preparation, making, cooking and storing of food.</p> <p>Example activities:</p> <p>Hands on experiments such as whipping egg whites to demonstrate how air is incorporated creating volume and foams. These could then be used to make meringues to avoid food waste.</p> <p>Explore methods of preserving and conduct a taste test preserved versus fresh e.g. could use fresh fruit as readily available, freezing, jam making or beetroot – fresh versus pickled.</p> <p>Show videos that highlight the various processes and discuss how the food industry rates the importance of these properties in food production and food safety.</p> <p>Conduct tasting session/show flash cards which show different products so that learners can identify the functional properties in the product. This could be paired work or group work.</p> <p>Breaking down recipes and discussing the roles of the ingredients and grouping ingredients into categories such as preserving, bulking, binding, emulsifying. Carry out practical cooking sessions and encourage Learners to observe the scientific changes, questioning what happens to each ingredient as they cook. For example, what happens to the egg when making an egg custard tart, quiche lorraine. Create charts of the cooking process, before during and after, could include images at the different stages to highlight the impact that each function has on the outcome of the product.</p>

	<p>Example activities:</p> <p>Create a practical challenge where Learners must use certain ingredients in a specific way linking their knowledge of ingredients in their practical skills combining the science with flair and creativity.</p> <p>Use a simple recipe, like pancakes, and explain the purpose of each ingredient (e.g. flour gives structure, eggs help bind, sugar adds sweetness). Ask deeper thinking questions "What do you think would happen if we left out an ingredient?"</p> <p>Take a recipe such as shortbread and ask students to make it gluten-free, vegan, or low-sugar. Compare the results and discuss what's different.</p> <p>Group work: Make a recipe such as cookies with one group baking at a higher temperature and another at a lower one. Look at the differences and discuss why they happened.</p> <p>Use a simple recipe such as pancakes and have students try using more or less of one ingredient, such as flour or sugar. Discuss which version worked best and why.</p>
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<p>2.1.3 The chemical properties of ingredients in a recipe</p>	<p>Learners should understand the chemical properties of ingredients in a recipe, by:</p> <ul style="list-style-type: none"> • selecting and adapting recipes • considering variables that affect results. <p>Learners should be aware of recipes that demonstrate specific characteristics, including:</p> <p>Carbohydrates:</p> <ul style="list-style-type: none"> • caramelisation • dextrinization • gelatinisation • Maillard reaction. <p>Fats and oils:</p> <ul style="list-style-type: none"> • aeration: steam, chemical and mechanical action • emulsification • plasticity • shortening or flakiness. <p>Fruits and vegetables:</p> <ul style="list-style-type: none"> • enzymic browning • oxidisation. <p>Protein:</p> <ul style="list-style-type: none"> • complementary actions • coagulation • denaturation: acid, heat and mechanical action • foam formation • gelation • gluten formation • Maillard reaction • stabilisation • viscosity. 	<p>Learners need to understand the chemical properties of ingredients within a recipe and the variables that affect a recipe are crucial for achieving consistent and desirable outcomes.</p> <p>Learners should be encouraged to define key terminology by explaining terms, such as ph. and acidity and how the chemical properties affect flavour, colour and texture. Teachers should give learners an introduction of common chemical reactions that take place in cooking, such as caramelisation and gelatinisation.</p> <p>Learners should be given the opportunity to discuss how changing an ingredient or method can alter the outcome and be able to identify key variables of time, temperature and ingredient. For example, the time in fermentation. Discuss how changing an ingredient or method can alter the outcome.</p> <p>Provide explanations of the chemistry behind the reactions such as the stages of melting sugar.</p> <p>Example activities:</p> <ul style="list-style-type: none"> • Teachers could share with learners a range of failed recipes and encourage learners to analyse the recipes to identify which variables may have contributed to the undesired outcomes. • Teachers and/or learners could make a range of gels from flours and use a viscosity mass to discuss the consistency of the sauce. • Learners could observe toast being made and explain the process of dextrinization and dry heat. • Learners could make notes on a teacher demonstration of the specific characteristics of caramelisation and making brittle. • Learners could investigate the shortening properties of a variety of fats, lards, butters etc. and measure the flashiness of each fat in a batch of shortcrust pastry.
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	<ul style="list-style-type: none">• Learners or teachers could make a batch of mini lemon meringue pies and explain what is happening at each stage, identifying the key terms of the process of making the pastry (shortening) and expand on the science of the filling and the topping.• Learners could investigate why some fruits and vegetables turn brown when cut, enabling them to study and explain the chemical process of enzymes browning and investigate methods of prevention.• Learners could examine the specific characteristics on chemical reactions in food. The flavour produced by the Maillard reaction e.g. When making cookies, the thickening properties of flour in a roux sauce and gelatinisation making popcorn – demonstrated a physical and chemical reaction.
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2.2 Planning a food science experiment		
	Content Amplification	Teacher Guidance
2.2.1 Planning a food investigation	<p>Learners should understand the stages of a food investigation plan, including:</p> <ul style="list-style-type: none"> • research question • developing a hypothesis • identifying variables • experimental controls • equipment required • collecting results • analysing results • presenting investigation results • drawing conclusions • evaluating results. <p>Learners should be aware of sustainability practices to prevent food waste when conducting a food investigation.</p>	<p>This can be approached like a science investigation as a food scientist would work in the food industry. Mini-investigations can be carried out throughout the course, such as investigating the role of sugar in a biscuit, investigating how the use of different flours or fats affects the quality of shortcrust pastry and what ingredients make the best shortbread.</p> <p>Example activities</p> <p>A simple approach could be taken with parts of the making process in a recipe such as investigating the browning reactions in fruit and vegetables (enzymic browning) or from flour (dextrinization) to a full investigation on the success of using different flours when making bread.</p> <p>A “mock” assessment could be undertaken, if time allows, using one set commodity/recipe or part “mini” assessment using different commodities/recipes.</p> <p>Teaching sustainability practices to prevent waste during cooking experiments is essential in fostering good habits in learners. Teachers can encourage discussions on the impact of food waste on the environment and its consequences, use statistics and data, or news stories to highlight the impact and why it matters.</p> <p>Example activities:</p> <p>Recipes should be planned mindfully, for example:</p> <ul style="list-style-type: none"> • choose recipes with a longer shelf life i.e. that produce using outcomes that can be tested a few days later, or use ingredients that have a longer shelf life so they can be used again • use seasonal and local ingredients • scale down recipes, if necessary • using the whole or part of ingredients • creatively using leftovers

		<ul style="list-style-type: none"> the tracking of waste can generate discussions and encourage learners to think about how this can be reduced in future activities.
2.2.2 The role of variables in a food experiment	<p>Learners should understand the role of variables in a food experiment, including:</p> <ul style="list-style-type: none"> cooking methods cooking times ingredients preparation methods quantities temperatures. <p>Learners should understand how to modify variables within a food experiment to test a hypothesis.</p> <p>Learners should be aware of the complimentary actions of ingredients in a recipe.</p>	<p>Learners should understand the steps of carrying out experiments and how to modify variables in food experiments to test the hypothesis understanding the type of variables will help guiding through the process: independent, dependent and controlled variables. The hypothesis should be clear for example if the sugar content of shortbread is increased, it will be browner, sweeter and chewier.</p> <p>Example activities</p> <p>Investigate the impact on nutritional value of the various cooking methods/cooking times of boiling, steaming, baking etc. learners produce an extended piece of writing and produce a written report.</p> <p>Research how people can have individual preferences on how food is cooked, conduct experiment on preference of method e.g. steaming over boiling.</p> <p>Allow learners to experiment with recipes, changing one ingredient at a time and could be group work, encourage substitutions such as honey in a cake recipe. Create variable charts listing the independent, dependent and controlled variable this helps visualise the experiment.</p> <p>Encourage learners to concentrate on one variable at a time, and relevant to their hypothesis, if the hypothesis is on ratios the focus should be on the ratios.</p> <p>Demonstrate how the roles of ingredients come together in a recipe such as pancakes, explaining each ingredient, such as flour giving the pancake structure, sugar sweetening the batter etc. What would happen if there was no sugar? What would happen to the batter if it was put int the oven instead of fried? Explore pairings of ingredients such as garlic and butter, tomatoes and basil. Encourage learners to substitute ingredients such as honey instead of sugar and discuss the effects.</p>

	<p>Example activities: Engage learners to research and present on different ingredient pairings, discussing how these ingredients enhance each other's flavours and the science behind their findings.</p> <p>Taste Tests: Organise a taste test where students sample dishes featuring complementary ingredients and discuss how the flavours enhance one another.</p> <p>Recipe Modification Challenge: Provide a basic recipe and ask learners to modify it by adding or substituting complementary ingredients, preparing the modified recipe, and sharing their observations.</p> <p>Flavour Wheel Creation: Learners can create a flavour wheel (use the flavour thesaurus) that includes various ingredients and their complementary pairs, using colours or images to represent different flavour profiles.</p>
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<p>2.2.3 Testing sensory qualities</p>	<p>Learners should understand the sensory qualities of food including:</p> <ul style="list-style-type: none"> • appearance • aroma • flavour • texture • viscosity. <p>Learners should be aware of how to apply sensory descriptors appropriately.</p> <p>Learners should be aware of how to test sensory qualities such as:</p> <ul style="list-style-type: none"> • discrimination tests • preference tests • star diagrams. 	<p>Learners should understand the sensory qualities of food, as these attributes significantly impact their overall experience and appreciation of what people eat. Understanding the appearance of food allows learners to assess freshness, ripeness, and presentation, which can influence food choices. Understanding aroma helps learners identify flavours and enhances the ability to appreciate and analyse dishes. Flavour encompasses the combined impact of taste and smell, which is vital for developing the palate and foster creativity. Texture contributes to the mouthfeel of food, affecting satisfaction and enjoyment; it plays a crucial role in determining whether a dish is considered appealing. Viscosity influences the perception and enjoyment of sauces, soups, and dressings. By exploring these sensory qualities, learners can make informed choices and transfer gained knowledge into the practical situation.</p> <p>Use digital technology, via the internet, to research how major food companies and retailers use sensory analysis to help develop new products.</p> <p>Example activities</p> <p>Introduce key sensory attributes by describing various foods such as fruity, smooth, encouraging learners to use the senses.</p> <p>E.g. compare the appearance of a ripe banana with an unripe banana in terms of colour and texture or the smell of fresh herbs versus dried herbs.</p> <p>Learners create their own word banks of key words to use in task.</p> <p>Demonstrate sensory testing methods, for example offer samples of apple juice and see which they prefer.</p> <p>Activities could be based on group work and conduct tests on samples of snacks looking at chosen attributes and collect data to create star diagrams.</p>
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2.3 Food science in action		
	Content Amplification	Teacher Guidance
2.3.1 Conducting a food investigation	<p>Learners should be aware of food hygiene and safety practices and procedures when conducting a food experiment, including:</p> <ul style="list-style-type: none"> • personal hygiene • safe working practices • the safe preparation, cooking, and storage of food. <p>Learners should be able to:</p> <ul style="list-style-type: none"> • follow the stages of their food experiment plan • conduct a food experiment to test a hypothesis based on a research question • modify variables within a food experiment to achieve different results. 	<p>Teachers should discuss with learners the importance of personal hygiene and safe working practices in cooking activities and within the various job roles within the food industry, and all food preparation activities.</p> <p>Key discussion topics include:</p> <ul style="list-style-type: none"> • hand washing • cleanliness • danger zone • key temperature • cross contamination. <p>Learners should be encouraged to ask questions, make hypotheses and test ideas throughout their food investigation. Learners should be aware of how changes that are made can affect results such as the amount of baking powder in a cake mixture or how the amount of gluten affects bread structure. Learners can choose research questions that interest them, develop a hypothesis and explain how the hypothesis is a testable statement that predicts an outcome, based on a research question.</p> <p>Example activities: Learners should be aware of how changes that are made can affect results such as changing the amount of baking powder in a cake mixture.</p> <p>Link to a food topic such as testing the effects of different storage methods on food quality. Group work could include assigning roles to food safety such as temperature checks.</p>

<p>2.3.2 Collecting, analysing and presenting results</p>	<p>Learners should understand suitable methods used to collect results when testing a hypothesis, such as:</p> <ul style="list-style-type: none"> • observations • measurements • testing, including sensory quality testing, using sensory descriptors. <p>Learners should be aware of the importance of validity and reliability when collecting results.</p> <p>Learners should be able to present results for analysis, using methods such as:</p> <ul style="list-style-type: none"> • annotated photographs/illustrations • bar/pie charts • star diagrams • tables. <p>Learners should understand how to analyse the results of their food experiment.</p>	<p>Teaching Learners suitable methods for collecting results when testing a hypothesis is essential for developing their scientific skills. Learners should be introduced to the different types of data that they may collect such as [star profiles, preference tests in sensory testing and made aware of the differences between qualitative (descriptive) data and quantitative (numerical) data.</p> <p>Teachers should explain what observations are and provide relevant food science examples e.g. colour changes, texture in food and viscosity for learners to record observations in detail. Learners should be encouraged to provide specific and measurable observations, not just a description of what they see.</p> <p>Teachers should encourage learners to present results effectively as this is crucial for analysis. and understanding in any investigation. The importance of clear titles and labelling for charts as well as photographs should be emphasised to learners. Annotated photographs (using arrows and labels to note specific areas) and bar charts etc. are a good way of providing visual representations of results. Learners should choose key photographs that best illustrate important findings such as before and after images of food science experiments.</p> <p>Example activities:</p> <ul style="list-style-type: none"> • After conducting a sensory test, learners could use software or apps like CANVA and PowerPoint for editing and annotating the images. • Learners can create bar charts and pie charts comparing the average score of different samples across various attributes.
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<p>2.3.3 Reflection and evaluation</p>	<p>Learners should be able to reflect on their food experiment, including:</p> <ul style="list-style-type: none"> • drawing conclusions • evaluating results. 	<p>Drawing conclusions and evaluating results are critical skills in scientific investigations. It is important to emphasise that conclusions summarise findings and assess whether the hypothesis was correct or incorrect. Evaluating involves critical analysis thinking, data identifying patterns/trends and considers the validity or reliability of the findings.</p> <p>Teachers should encourage learners to restate their original hypothesis before analysing results, this will help frame the conclusions and evaluation. Learners should support their conclusions with specific evidence from their results. For example, the average spice score for sample 259 was 4, indicating that it was milder than sample 300 which had a score of 8.</p> <p>Learners should beware of the constraints/limitations of their investigations such as, time, size of sample and human error.</p> <p>Guide Learners with the reliability of the data: were results consistent?</p> <p>Example activities:</p> <p>Provide opportunities for hands-on experimentation by allowing learners to adjust ingredients or methods and observe how these changes affect recipes. Encourage them to make predictions before testing and discuss outcomes afterwards. Writing about their findings and helping them connect theory to practice. Encourage learners to document their observations during each experiment, noting how changes in time, temperature, and ingredients affect results. Use mind maps or star diagrams to amplify findings.</p> <p>Encourage learners to reflect on what they have learnt from the process, what surprised them, what skills have they learnt.</p> <p>Suggest improvements, encourage Learners to think about their investigation if they were to repeat it, what changes would enhance the accuracy or reliability of results.</p>
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Learning Experiences

Learners should be encouraged to consider the following learning experiences and skills to further develop their understanding, appreciation and awareness of the subject content. Information in the table below provides opportunities for teachers to integrate the learning experiences into delivery.

Learning Experience	Exemplification of Learning Experience
Take part in a variety of cooking tutorials and experiences, such as practical demonstrations from teachers or professional chefs, either in person or online	Opportunities for this learning experience can be found in: <ul style="list-style-type: none"> • 2.2.1 • 2.3.1 • 2.3.2
Gain experience of receiving and responding to feedback	Opportunities for this learning experience can be found in: <ul style="list-style-type: none"> • 2.3.2 • 2.3.3
Work collaboratively when planning and preparing meals and menus	Opportunities for this learning experience can be found in: <ul style="list-style-type: none"> • 2.3.1 • 2.2.2 • 2.3.2
Explore the various career opportunities within the related sectors	Opportunities for this learning experience can be found in: <ul style="list-style-type: none"> • 2.2.3 • 2.2.1
Make appropriate use of digital technology	Opportunities for this learning experience can be found in: <ul style="list-style-type: none"> • 2.2.1 • 2.2.3 • 2.3.2 • 2.3.3

Opportunities for embedding elements of the Curriculum for Wales

Curriculum for Wales Strands								
Cross-cutting Themes								
		<p>There are many opportunities to include Local, National and International Contexts in GCSE Food and Nutrition. These opportunities are important to Learners because it ensures that classroom activities connect learning opportunities to their daily lives and the world around them supporting broader educational themes and preparing for the life outside of education.</p> <p>Below are some examples of how Local, National and International Contexts can be embedded into teaching and learning:</p>						
		<table border="1"> <thead> <tr> <th>Specification Reference</th><th>Amplification</th><th>Seasonal and local food investigation:</th></tr> </thead> <tbody> <tr> <td>2.1.1 2.2.3</td><td>The studying of this topic will add depth and relevance to learners learning experience. This approach helps them understand the impact of food science on health, sustainability, and culture.</td><td>Learners can research and experiment with seasonal ingredients available in their area. They might explore how using seasonal produce impacts a recipe such as flavour, and nutrition, and conduct taste tests comparing local seasonal vegetables to out-of-season imports. Learners could compare common staple foods from different countries, such as rice, pasta, and bread. They could investigate cooking times, flavour, aroma, and texture and discuss how different cultures meet their nutritional needs through these staple ingredients.</td></tr> </tbody> </table>	Specification Reference	Amplification	Seasonal and local food investigation:	2.1.1 2.2.3	The studying of this topic will add depth and relevance to learners learning experience. This approach helps them understand the impact of food science on health, sustainability, and culture.	Learners can research and experiment with seasonal ingredients available in their area. They might explore how using seasonal produce impacts a recipe such as flavour, and nutrition, and conduct taste tests comparing local seasonal vegetables to out-of-season imports. Learners could compare common staple foods from different countries, such as rice, pasta, and bread. They could investigate cooking times, flavour, aroma, and texture and discuss how different cultures meet their nutritional needs through these staple ingredients.
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Local, National & International Contexts								

Sustainability	<p>There are many opportunities to include Sustainability in GCSE Food and Nutrition. These opportunities are important to Learners because it addresses the impact of food production on the environment society and future generations.</p> <p>Below are some examples of how Sustainability can be embedded into teaching and learning:</p> <table border="1"> <thead> <tr> <th data-bbox="460 382 684 462">Specification Reference</th><th data-bbox="684 382 1133 462">Amplification</th><th data-bbox="1133 382 1939 462">Example</th></tr> </thead> <tbody> <tr> <td data-bbox="460 462 684 1027"> 2.1.2 2.2.3 </td><td data-bbox="684 462 1133 1027"> <p>Teaching sustainability is essential in the curriculum as food production, consumption, food waste and energy resources are some of the most significant issues impacting our planet's health and resource availability. Sustainability in food and nutrition teaches learners to make choices that protect the planet, support their health, and ensure food resources for future generations and learning to be responsible, informed consumers.</p> </td><td data-bbox="1133 462 1939 1027"> <p>Raising awareness of where food comes from and making informed choices.</p> <p>Encourage Learners to be cost effective, by buying in season goods and use local produce to reduce their carbon footprint.</p> <p>Learners could conduct food preservation experiments, such as drying, pickling, or making cheese e. g cottage, to see how these methods extend shelf life and reduce waste.</p> <p>Conduct taste tests and nutritional comparisons between traditional and alternative proteins, such as dried insects/critters, tofu, or legumes. Students can discuss the potential of alternative proteins to meet global nutritional need for sustainably.</p> </td></tr> </tbody> </table>	Specification Reference	Amplification	Example	2.1.2 2.2.3	<p>Teaching sustainability is essential in the curriculum as food production, consumption, food waste and energy resources are some of the most significant issues impacting our planet's health and resource availability. Sustainability in food and nutrition teaches learners to make choices that protect the planet, support their health, and ensure food resources for future generations and learning to be responsible, informed consumers.</p>	<p>Raising awareness of where food comes from and making informed choices.</p> <p>Encourage Learners to be cost effective, by buying in season goods and use local produce to reduce their carbon footprint.</p> <p>Learners could conduct food preservation experiments, such as drying, pickling, or making cheese e. g cottage, to see how these methods extend shelf life and reduce waste.</p> <p>Conduct taste tests and nutritional comparisons between traditional and alternative proteins, such as dried insects/critters, tofu, or legumes. Students can discuss the potential of alternative proteins to meet global nutritional need for sustainably.</p>
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2.1.2 2.2.3	<p>Teaching sustainability is essential in the curriculum as food production, consumption, food waste and energy resources are some of the most significant issues impacting our planet's health and resource availability. Sustainability in food and nutrition teaches learners to make choices that protect the planet, support their health, and ensure food resources for future generations and learning to be responsible, informed consumers.</p>	<p>Raising awareness of where food comes from and making informed choices.</p> <p>Encourage Learners to be cost effective, by buying in season goods and use local produce to reduce their carbon footprint.</p> <p>Learners could conduct food preservation experiments, such as drying, pickling, or making cheese e. g cottage, to see how these methods extend shelf life and reduce waste.</p> <p>Conduct taste tests and nutritional comparisons between traditional and alternative proteins, such as dried insects/critters, tofu, or legumes. Students can discuss the potential of alternative proteins to meet global nutritional need for sustainably.</p>					

Human Rights Education and Diversity	<p>There are many opportunities to include Human Rights Education and Diversity in GCSE Food and Nutrition. These opportunities are important to Learners because it promotes ethical and moral awareness in the consumption and production of food.</p> <p>Below are some examples of how Human Rights Education and Diversity can be embedded into teaching and learning:</p> <table border="1" data-bbox="466 404 1941 786"> <thead> <tr> <th data-bbox="466 404 691 786">Specification Reference</th><th data-bbox="691 404 1122 786">Amplification</th><th data-bbox="1122 404 1941 786">Example</th></tr> </thead> <tbody> <tr> <td data-bbox="466 500 691 611"> 2.1.1 2.1.2 2.2.1 </td><td data-bbox="691 500 1122 786"> Embedding human rights and diversity into food and nutrition helps students understand the social impact of food choices and appreciate the social and ethical dimensions of food production and make informed choices about food choices. </td><td data-bbox="1122 500 1941 786"> Learners are given the opportunity to think critically about where food comes from, how ingredients, cultural differences of choice of ingredients react with one another and how it affects communities and the planet. This approach not only builds their understanding of food science but also encourages them to think globally and act responsibly in their everyday lives. </td></tr> </tbody> </table>			Specification Reference	Amplification	Example	2.1.1 2.1.2 2.2.1	Embedding human rights and diversity into food and nutrition helps students understand the social impact of food choices and appreciate the social and ethical dimensions of food production and make informed choices about food choices.	Learners are given the opportunity to think critically about where food comes from, how ingredients, cultural differences of choice of ingredients react with one another and how it affects communities and the planet. This approach not only builds their understanding of food science but also encourages them to think globally and act responsibly in their everyday lives.
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Careers and Work-Related Experiences	<p>There are many opportunities to include Career and Work-Related Experiences (CWRE) in GCSE Food and Nutrition. These opportunities are important to Learners because it prepares learners for careers in the food industry giving them practical application of the world of a food scientist/food technologist.</p> <p>Below are some examples of how CWRE can be embedded into teaching and learning:</p> <table border="1" data-bbox="466 976 1941 1378"> <thead> <tr> <th data-bbox="466 976 691 1087">Specification Reference</th><th data-bbox="691 976 1122 1087">Amplification</th><th data-bbox="1122 976 1941 1087">Example</th></tr> </thead> <tbody> <tr> <td data-bbox="466 1087 691 1378"> 2.2.1 2.2.3 2.3.2 </td><td data-bbox="691 1087 1122 1378"> Allowing the learners the opportunity to engage in careers and work-related experiences into food science can give students valuable insights into the wide range of professional paths in the field and make learning more applicable to real-world situations. </td><td data-bbox="1122 1087 1941 1378"> Invite guest speakers from different areas within food science, such as food technologists, nutritionists, quality control specialists, or environmental food officers. Experts can share industry standards. Have learners explore different roles in the development process such as food scientist, food technologist or quality control specialist. Allowing them to experience the various careers involved in bringing a product to market. </td></tr> </tbody> </table>			Specification Reference	Amplification	Example	2.2.1 2.2.3 2.3.2	Allowing the learners the opportunity to engage in careers and work-related experiences into food science can give students valuable insights into the wide range of professional paths in the field and make learning more applicable to real-world situations.	Invite guest speakers from different areas within food science, such as food technologists, nutritionists, quality control specialists, or environmental food officers. Experts can share industry standards. Have learners explore different roles in the development process such as food scientist, food technologist or quality control specialist. Allowing them to experience the various careers involved in bringing a product to market.
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Cross-curricular Skills – Literacy			
	<p>There are many opportunities to include Literacy in GCSE Food and Nutrition. These opportunities are important to Learners because the ability to effectively communicate will enhance their subject understanding and build essential life skills that will help them in their future careers.</p> <p>Below are some examples of how Literacy can be embedded into teaching and learning:</p>		
	Specification Reference	Amplification	Example
Listening	2.2.1 2.2.3 2.3.2 2.3.3	Essential for learners when following instructions, taking part in discussions, and understanding explanations of scientific processes.	Following instructions during food science experiments, which ensures safety and fair testing. Listening to peers when they present their findings or ideas, which encourages collaborative learning and respect.
Reading	2.3.1 2.2.2 2.3.2	Reading is essential in understanding scientific processes and information.	When undertaking research tasks, learners will need to read about specific chemistry topics such as caramelisation and use the information to base experiments on and make predictions. Following scientific methods and analysing and interpreting findings.
Speaking	2.2.3 2.3.2 2.3.3	Oracy skills help learners to articulate their thoughts and communicate concepts to others effectively, being able to communicate effectively and work well within a team.	Presenting ideas to peers, explaining ingredient or variable choices in an experiment, communicating step by step procedures to team members of a group or explaining experiments clearly.

Writing	2.2.1	Allowing learners the opportunity to document their ideas effectively, enabling them to use specific subject terminology.	During experiments, learners make detailed observations where they record findings from experimental work/recipe development, data, and any relevant insights in real-time. Build skills in persuasive and technical writing, preparing students to justify and plan their own scientific investigations.	
	2.3.1 2.3.2 2.3.3			
Cross-curricular Skills – Numeracy				
<p>There are many opportunities to include Numeracy in GCSE Food and Nutrition. These opportunities are important to Learners because they will help them understand calculations, ratios, interpreting data and nutritional information, which are important life skills.</p> <p>Below are some examples of how Numeracy can be embedded into teaching and learning:</p>				
Developing Mathematical Proficiency	Specification Reference 2.2.3 2.3.2	Amplification The development of mathematical proficiency allowing learners to work accurately with data, analyse results and make scientific decisions based on their findings.	Example Using real world/life situations such as scaling recipes, using ratios and proportions, understanding food labels and allowing learners the opportunity do so. In carrying out experiments, using data, temperature conversions and calculating the PH and acidity of recipes.	

<p>Understanding the number system helps us to represent and compare relationships between numbers and quantities</p>	<p>Specification Reference</p> <p>2.2.1 2.2.3 2.3.2</p>	<p>Amplification</p> <p>Within food and nutrition, understanding the number system is essential because it allows learners to represent, compare, and work with quantities in practical and meaningful ways that are real life situations and applies their understanding.</p>	<p>Example</p> <p>Accurately scaling recipes and measuring/weighing. Estimating and predicting outcomes based on the relationships of ingredients with numbers and quantities.</p>
<p>Learning about geometry helps us understand shape, space and position and learning about measurement helps us quantify in the real world</p>	<p>Specification Reference</p> <p>2.2.3 2.3.2</p>	<p>Amplification</p> <p>Measurement is essential in food science to understand how the weight and size/proportion of ingredients can affect the outcome.</p>	<p>Example</p> <p>Formulating recipes, accurate measurements, creating balance of flavours and textures. Nutritional analysis determines nutritional composition, quantifying nutrients in a sample. Temperature control ensures food is cooked safely without damaging food.</p>
<p>Learning that statistics represent data and that probability models chance help us make informed inferences and decisions</p>	<p>Specification Reference</p> <p>2.2.1 2.3.2 2.3.3</p>	<p>Amplification</p> <p>Statistics is essential in food science for analysing data, ensuring quality control, and making data-driven decisions.</p>	<p>Example</p> <p>Understanding variables used in food science experiments to standardise recipes understanding variability in products such as the water content of an ingredient. Analysing taste tests on experimental work carried out on food products using scoring and ranking tests.</p>

Cross-curricular Skills – Digital Competence			
	<p>There are many opportunities to include Digital Competence in GCSE Food and Nutrition. These opportunities are important to Learners because digital tools are well used within the food industry and it enables learners with strong digital tools to become competent and successful in food related professions such as food science, marketing and product development.</p> <p>Below are some examples of how Digital Competence can be embedded into teaching and learning:</p>		
Interacting and Collaborating	Specification Reference 2.2.1 2.2.3	Amplification Digital skills allow learners to enhance their research skills, plan, analyse and present findings whilst using digital tools.	Example Using google drive to store and gather information such as recipes and sharing via Google Drive or Google Classroom using the interactive jam board for mind mapping ideas. Use of online platforms like <i>youtube</i> , where learners can learn from experts or collaborate on recipe techniques. Interactive learning tools such as Kahoot or Quizlet learning through quizzes and fostering teamwork. Online web sites from reliable sources such as the NHS.

Producing	Specification Reference	Amplification	Example
	2.2.1 2.3.2	Allow learners to use digital tools to enhance and innovate in the world of food science.	<p>Using spreadsheets to make a cost and nutritional analysis and nutritional software such as MyFitnessPal using recipe apps and their tools and online platforms. Using digital platforms to store recipes and organising them for accessibility. Online carbon footprint calculators when looking at sustainability.</p> <p>Understanding trends and applying digital skills in food technology which plays a significant role in food product development to ensure they make evidence-based decisions enables learners and equips them with skills to effectively research reliable information.</p> <p>Digital food photography and positive use of digital marketing platforms such as Instagram that promote food business and trends.</p>
Data and Computational Thinking	Specification Reference	Amplification	Example
	2.2.2 2.2.3 2.3.2	An understanding that food scientists use digital technology to present their work to enable them to make sound decisions for the food industry.	<p>Learners in food science learn to break down problems, such as calculating the best cooking time for different ingredients and recipes.</p> <p>Collect data from taste tests and surveys to see what flavours and textures people like best. Spotting trends. Using digital technology helps them sort and analyse this feedback to create recipes that appeal to consumers.</p>

Integral Skills			
Creativity and Innovation	<p>There are many opportunities to include Creativity and Innovation in GCSE Food and Nutrition. These opportunities are important to Learners because creativity is an essential element of the food industry. Creating new and innovative products, experimenting with flavours or adapting recipes for dietary needs.</p> <p>Below are some examples of how Creativity and Innovation can be embedded into teaching and learning:</p>		
	Specification Reference	Amplification	Example
Critical Thinking and Problem Solving	<p>2.1.1 2.1.2 2.1.3</p> <p>Understanding the role of ingredients fosters creativity in recipe development.</p>		
		<p>Experiment with ingredients and allow learners to try and work with unusual combinations to draw inspiration from other subjects such as Art and Design.</p> <p>Reinvent recipes that have become dated and tired. Explore the earth's natural flavours such as edible flowers and herbs.</p>	

	2.1.3 2.2.1	<p>Allows learners the opportunity to use critical thinking skills and allows them to carry out experimental work to gain a full understanding of how recipes and ingredients work, the chemical and physical properties of food.</p>	<p>Learners can develop their problem-solving skills when analysing failed recipes and identifying which variables contributed to the undesired outcomes. Critical thinking helps students interpret nutritional labels, assess and identify health claims made by manufacturers.</p> <p>Adapt recipes, troubleshooting variables such as flavour, cooking temperatures. Deciding which ingredients are best for health, budget, sustainability and function within a recipe. Resolving practical challenges such as ingredient substitutions for cost or health implications.</p> <p>Applying scientific principles such as fermentation and bread rising or the tenderising of meat.</p>
<p>Planning and Organisation</p> <p>There are many opportunities to include Planning and Organisation in GCSE Food and Nutrition. These opportunities are important to Learners because it teaches learners how to manage resources, keep ahead of time, coordinate multiple tasks and meet deadlines preparing them for their life and careers ahead.</p> <p>Below are some examples of how Planning and Organisation can be embedded into teaching and learning:</p>		<p>Specification Reference</p> <p>2.2.1 2.2.3</p> <p>Amplification</p> <p>Allowing learners to plan and organise food science experiments will yield efficient processes and reliable results.</p>	
			<p>Example</p> <p>Organisational skills help learners manage resources, their time, effectively, and in a logical sequence.</p> <p>Time management of experimental work, co ordinating multiple variables, track progress and paying attention to detail.</p>

		<p>Prioritising tasks such as preparing ingredients for experimental work, cleaning up as they go along ensuring a smooth workflow.</p> <p>Formulating hypotheses.</p> <p>Resource Management and ingredients: organising equipment needed for experimental work, ensuring results are reliable, keeping records of work carried out. Personal effectiveness involves reflecting upon what went well and identifying areas for improvement in practical and theory work fostering a growth mindset.</p>						
Personal Effectiveness	<p>There are many opportunities to include Personal Effectiveness in GCSE Food and Nutrition. These opportunities are important to Learners because managing your time, prioritising tasks, resources, critical thinking and problem solving are critical elements in food and nutrition.</p> <p>Below are some examples of how Personal Effectiveness can be embedded into teaching and learning:</p>	<table border="1"> <thead> <tr> <th>Specification Reference</th><th>Amplification</th><th>Example</th></tr> </thead> <tbody> <tr> <td>2.2.3 2.3.2 2.2.3</td><td>Allowing learners to develop the skills of self-management to foster accountability.</td><td> <p>Allowing learners to set SMART criteria and goals in investigations.</p> <p>Encouraging learners to manage their time, breaking down tasks and estimate how long each task will take, prioritising the steps to complete experiments efficiently.</p> <p>Problem solving, supporting decision making such as adapting recipes, structuring and planning research execution and evaluation in a clear and logical format.</p> </td></tr> </tbody> </table>	Specification Reference	Amplification	Example	2.2.3 2.3.2 2.2.3	Allowing learners to develop the skills of self-management to foster accountability.	<p>Allowing learners to set SMART criteria and goals in investigations.</p> <p>Encouraging learners to manage their time, breaking down tasks and estimate how long each task will take, prioritising the steps to complete experiments efficiently.</p> <p>Problem solving, supporting decision making such as adapting recipes, structuring and planning research execution and evaluation in a clear and logical format.</p>
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Glossary for Unit 2

Term	Definition
Acid	A substance with PH below 7.
Additive	Ingredients added to food to enhance specific qualities or add flavour, preserve it, or improve appearance.
Aeration	Incorporating air into a mixture.
Antioxidant	A molecule that inhibits the oxidation of other molecules.
Caramelisation	A change in the foods molecular structure due to the removal of water resulting in a brown colour and nutty flavour.
Colloid	A mixture in which one substance is evenly dispersed in another e.g. milk.
Denaturation	A change in protein structure when proteins bond together, usually by heat, or an acid or manipulation.
Dextrinisation	The browning which occurs when foods containing starch are cooked or exposed to an acid or alkali.
Emulsion	Mixing two unmixable liquids used in the making of a salad dressing or mayonnaise.
Enzymes	Biological catalysts which speed up reactions without changing themselves.
Enzymic browning	A chemical process where oxygen and enzymes in the food react to cause the surface to brown.
Fermentation	A process carried out by yeast to convert simple sugars to acids or alcohol altering food properties.
Foam	When bubbles form on the surface of a liquid because of a chemical reaction.
Fortification	The addition of vitamins and minerals to foods.
Gel	A liquid which is dispersed into a solid.
Gelatinisation	The thickening of a starch mixture in the presence of heat.
Gluten	Formed from two wheat proteins gliadin and glutenin in the presence of water. Gluten is developed by the process of kneading.
Hypothesis	A prediction as to what may happen.
Lecithin	A natural emulsifier found in egg yolk.
Maillard reaction	A chemical reaction between a protein and a carbohydrate in the presence of dry heat.
Preservation	Slowing down the rate of food spoilage and decay by minimising most bacteria and enzyme activity i.e. removing moisture.
Raising agent	A substance added to a food product that makes it rise when cooked.

Rancidity	Unpleasant taste or odour that fats and oils develop over time.
Shortening	Ingredients such as fats and oils help to shorten a flour mixture such as pastry by making it crumbly in texture.
Variable	A variable is any factor, trait, or condition that can change or vary in an experiment or recipe.
Viscosity	The thickness of a liquid.