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Teacher's Guide

Edexcel GCSE in Design and Technology: Food Technology

ALWAYS LEARNING

PEARSON

Contents

Delivery models

The following delivery models highlight just three of the possible strategies that you could employ when structuring your course.

- Traditional combined design and make activity.
- Separate design and make activities.
- Design and make activities related but separate.

Delivery model 1 : Traditional combined design and make activity

This model of delivery should be very familiar to centres. In Year 10 an induction period is used to develop basic skills leading to specific investigation, design and make tasks. The investigation task develops product analysis skills, a series of design tasks could be used to develop creativity and working to limited deadlines and a making task is used to develop modelling skills. All of these skills prepare students for the 'major coursework project' in Year 11.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Combined design and make activity ie special dietary needs				Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Delivery model 2: Separate design and make activities

This model involves students designing one product and making another. The design activity could involve producing a range of ideas suitable as a sports nutrition product. The make activity could involve producing a ready meal using various cultures as the focus. For example, using different fillings/sauces/pastry would require high-level making skills to produce all the individual ingredients.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Design activity ie sports nutrition		Unit 2: Make activity ie multi-cultural		Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Delivery model 3: Design and make activities related but separate

Here, the make activity is tackled first by all students making, for example, a range (more than two) of party foods, using vegetarianism as the focus, from a manufacturing specification provided by the teacher. All students produce a range of products (more than two) that can be used in the design activity later on in the year. The design activity that follows can focus on, for example, a range of vegetarian party foods suitable for a celebration. The two activities could be further related by producing a range of vegetarian products (sweet, savoury or both) suitable for a vegan at an engagement party.

	Autumn term		Spring term		Summer term		
Year 10	Induction tasks	Investigation task(s)	Design task(s)	Making task	Work related learning	Design task(s)	Marketing task
	Autumn term		**Spring term**		**Summer term**		
Year 11	Unit 1: Make activity ie vegetarians		Unit 2: Design activity ie celebration		Unit 2 exam revision	Unit 2 June sitting	Summer vacation

Teaching ideas

This section contains some ideas for teaching the content.

The following three tasks focus on how to develop important investigation, design and making skills needed for coursework whilst addressing key examination topics.

Investigation task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	To disassemble a layered dessert which is suitable for a special dietary need, eg low calorie trifle for diabetics. Components to include: sponge, fruit, jelly, custard, cream and decoration, eg sprinkles/chocolate curls/roasted almonds. Other suitable product areas might include: • ready meals • sweet baked goods • sweet and savoury snacks. To outline the main factors affecting the specification criteria for the trifle.	**1.2: Research** Present selective and focused research. Students should be discouraged from presenting unnecessary research or 'padding'. Use product disassembly in order to analyse a relevant, existing product's performance, materials and components, processes, quality and sustainability issues. Product analysis is an ideal focused research activity as it enables students to understand the work of professional designers and uncover the problems that they had to solve.	**Topic 5.2 Analysing products** When analysing a product, students should take into account the following criteria. • Sensory analysis of product and separate components. • Weighing of product and separate components. • Method of production. • Use of individual ingredients, function. • Nutritional information from label and analysis. • Packaging information, environmental issues, shelf life, storage. • Target market group, value for money. • Quality of design, meeting needs of target group, packaging, promotion and quality of packaging construction. • Quality of manufacture, organoleptic qualities, legal requirements for safety. • Generating specification for product.
2	To discuss the ingredients used in the trifle, including fresh versus processed.	**1.2: Research**	**Topic 2.2 Functional properties and working characteristics** Knowledge and understanding of the properties and working characteristics of raw materials and ingredients and how their different functional properties affect finished products.

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
3	To discuss the industrial processes for batch producing the trifle. To discuss dietary guidelines, individual nutritional requirements, special diets and Government recommendations relevant to the product.	1.2: Research	**Topic 4.1 Production methods** Knowledge and understanding of batch production methods used within the food industry. **Topic 1.7 Dietary guidelines** • Healthy eating **Topic 1.9 Individual nutritional requirements** • Adults **Topic 1.10 Special diets** • Medical – obesity **Topic 1.8 Government recommendations** • Nutritional labelling
4	To discuss the function of the additives and standard components used in the trifle. To discuss the importance of packaging and labelling.	1.2: Research	**Topic 3.10 Additives that change** Knowledge and understanding that additives and standard components are used in both home and industry food processing. Functional properties and use of the following: • sensory, physical and storage characteristics • other additives • standard components. **Topic 4.7 Packaging** • Materials • Function • Uses • Special packaging **Topic 4.8 Labelling** • Legal information • Additional information
5	To discuss sustainability issues relating to the use of ingredients, materials used, and disposal of the packaging.	1.2: Research	**Topic 4.5 Issues** Knowledge and understanding of issues within the food industry • Moral – fair trade, organic • Environmental – food miles, pollution, packaging

Design task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	**Brief**: To design a range of (at least three) snacks suitable for sports nutrition. The snacks can either be savoury, sweet or both. To carry out a detailed survey of existing sports products and suitable ingredients/produce that could be used in designing the sports products. Carry out a product analysis of existing sports products. Consider the sporting activity, eg rowing, swimming, running, and the nutritional requirements of participants.	**1.3: Specification** Produce realistic, technical and measurable specification points which address some issues of sustainability for their own product. The specification is an extremely important document as it focuses the designer and enables them to review their design ideas as they progress. Each specification point needs to be fully justified and not simply a statement.	**Topic 5.2 Analysing products** When analysing a product, students should take into account the following criteria. • Sensory analysis of product and separate components. • Weighing of product and separate components. • Method of production. • Use of individual ingredients, function. • Nutritional information from label and analysis. • Packaging information, environmental issues, shelf life, storage. • Target market group, value for money. • Quality of design, meeting needs of target group, packaging, promotion and quality of packaging construction. • Quality of manufacture, organoleptic qualities, legal requirements for safety. • Generating specification for product.
2	To design **three** different initial ideas for sports products.	**2.1: Initial ideas** Present alternative initial design ideas that are realistic, workable and detailed. This is the opportunity for students to demonstrate their creativity and flair for design. A wide range of different initial design ideas should be explored. Demonstrate their understanding of ingredients, processes and techniques applicable to their initial design ideas. Annotation should clearly show knowledge and understanding of ingredients or industrial applications relevant to each design idea. Address specification points through their initial design ideas. Annotation should be clearly related to the specification points.	**Topic 2.2 Functional properties and working characteristics** Knowledge and understanding of the properties and working characteristics of raw materials and ingredients and how their different functional properties affect finished products. **Topic 3.10 Additives that change** Knowledge and understanding that additives and standard components are used in both home and industry food processing. Functional properties and use of the following: • sensory, physical and storage characteristics • other additives • standard components.

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
3	To review all design ideas and select **one** for further development.	**2.2: Review** Present objective evaluative comments against their original specification criteria. Initial design ideas are 'raw' at this stage and it is therefore important to determine which design can be developed into workable solutions by testing against specification points. Use user group feedback and issues of sustainability to evaluate their initial design ideas. All design is concerned with people, and their opinions are extremely useful in gaining another perspective on further development of ideas.	
4–5	To develop **one** idea into a final design proposal.	**3.1: Development** Develop their initial design ideas into a single, final design proposal that is significantly different, and improved, to any previous initial design idea. Development should refine technical aspects of the product design and not simply focus on cosmetic changes. Evaluate their ideas against relevant design criteria as they progress.	**Topic 2. 1 and 2 Primary and secondary foods** Knowledge of the nutritional content, uses, types, and functional properties of primary foods. **Topic 1. Nutrition** The function in the diet and sources of the nutrients. **Topic 1.6 Energy balance** Knowledge and understanding of nutritional concepts. **Topic 4.3 Technological development** Knowledge and understanding of technological development within the food industry. **Topic 3.8 Food processing techniques – industry** Knowledge and understanding of food processing techniques, names, uses, advantages/ disadvantages and: • safety issues employed in industry • an understanding of the concept of HACCP. **Topic 4.4 Quality** Knowledge and understanding of quality within the food industry. OR **Topic 4.6 ICT** Knowledge and understanding of ICT within the food industry. • Modelling: nutritional databases
6–8	To make the design proposal. OR Model the nutritional content of the design proposal.	**3.1: Development** Use relevant ingredients to produce the design proposal. Nutrition is important and must be the focus. OR Changing ingredients can affect the nutritional content of a product. A comparative analysis will provide useful information for the design team. Produce a comparative analysis of your sports design and a standard product. **5.3: Health and safety** Demonstrate a high level of safety awareness throughout all stages of manufacture. No other formal evidence is required.	

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
9	To produce a detailed manufacturing specification. A final image of the product should be included, this could be a sketch, clip art, scan or digital photo. To outline industrial and commercial applications relating to the final design.	**3.2: Final design** Present a final design proposal in an appropriate format that communicates their design intentions. Present technical details of materials and/or components, processes and techniques relating to their final design proposal. Final images should be clearly annotated and dimensioned so that they can be understood by a third party.	
10	To test the final design proposal against specification criteria and to evaluate objectively.	**6.1: Testing and evaluation** Devise and carry out a range of suitable tests to check the performance and/or quality of the final product. Tests should be measurable and refer to specification points, if appropriate, to determine the product's fitness for purpose. Evaluate their final product objectively with reference to specification points and user group feedback. No product is ever perfect so students should discuss the positive and negative aspects of their final product. User group feedback should provide a further perspective.	**Topic 5.2 Analysing products** When analysing a product, students should take into account the following criteria. • Sensory analysis of product and separate components. • Weighing of product and separate components. • Method of production. • Use of individual ingredients, function. • Nutritional information from label and analysis. • Packaging information, environmental issues, shelf life, storage. • Target market group, value for money. • Quality of design, meeting needs of target group, packaging, promotion and quality of packaging construction. • Quality of manufacture, organoleptic qualities, legal requirements for safety. • Generating specification for product.

Making task

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
1	**Brief**: To make a ready meal suitable for a supermarket's 'multi-cultural' range of products. Other suitable products might include: • sweet baked goods • desserts • snacks. To discuss the specification criteria for a ready meal. Consider fusion/ hybrid food products and the influence of various cultures.	**1.1 : Analysing the brief** Analyse their design brief in enough detail to be able to clarify design needs. This will involve analysis of key words and phrases that help in understanding the issues related to the chosen/given design task.	**Topic 3.3. Processing** An understanding of the principles of primary and secondary food processing. **Topic 3.4 Food preparation techniques – home** Knowledge and understanding of food preparation techniques, names, uses, advantages/ disadvantages and safety issues employed in the home. **Topic 3.5. Food processing techniques – home** Knowledge and understanding of food processing techniques, names, uses, advantages/ disadvantages and safety issues employed in the home. **Topic 1.11 Ethnic and religious groups** Knowledge and understanding of the food rules of different ethnic and religious groups.
2	To produce a production plan for the making of the ready meal product.	**4.1 : Production plan** Produce a detailed production plan that considers the stages of manufacture for their product. Charts should clearly communicate the correct order of making and timings. Identify and describe the stages during making where specific quality control procedures should take place. Feedback in charts should state where quality control will take place.	**Topic 3.8 Food processing techniques – industry** Knowledge and understanding of food processing techniques, names, uses, advantages/ disadvantages and: • safety issues employed in industry • an understanding of the concept of HACCP. **Topic 4.4 Quality** • Design

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
3–8	Make the ready meal product.	**5.1: Quality of manufacture** Attempt challenging making tasks involving the manufacture of different components of the product using a range of materials, equipment, techniques and processes. Students must ensure that their product provides an opportunity to manufacture several different elements from different ingredients using different processes. This could include: different sauces, fillings, finishes, pastries, pastas. Select tools, equipment and processes, including CAD/CAM where appropriate, for specific uses. Demonstrate a detailed understanding of the working properties of materials they selected for a specific use. Students should use their work plan to justify their choices. Demonstrate a wide range of making skills with precision and accuracy. This is an opportunity for students to be rewarded for the range of making skills they demonstrate during the making activity. **5.3: Health and safety** Demonstrate a high level of safety awareness throughout all stages of manufacture. Teachers will award these marks based on their observations of students during the make activity.	**Topic 3.4 Food preparation techniques – home** Knowledge and understanding of food preparation techniques, names, uses, advantages/ disadvantages and safety issues employed in the home. **Topic 3.5 Food processing techniques – home** Knowledge and understanding of food processing techniques, names, uses, advantages/ disadvantages and safety issues employed in the home. **Topic 3.8 Food processing techniques – industry** Knowledge and understanding of food processing techniques, names, uses, advantages/ disadvantages and: • safety issues employed in industry • an understanding of the concept of HACCP. **Topic 4.4 Quality** • Design • Manufacture.
9	To present the final ready meal product to the group. To discuss the performance and quality of the final ready meal product with peers.	**5.2: Quality of outcome** Produce a high-quality dish that is accurately assembled and well finished to produce a high-quality product overall. Produce a completed product that is fully functional as a food product. The final product should be fit for purpose.	

Lesson	Objectives	Appropriate Unit 1 content	Appropriate Unit 2 content
10	To test and evaluate the completed ready meal product to determine performance and quality factors.	**6.1 : Testing and evaluation** Devise and carry out a range of suitable tests to check the performance and/or quality of the final product. Tests should be measurable and refer to specification points, if appropriate, to determine the product's fitness for purpose. Evaluate their final product objectively with reference to specification points and user group feedback. No product is ever perfect so students should discuss the positive and negative aspects of their final product. User group feedback should provide a further perspective.	**Topic 4.4 Quality** Knowledge and understanding of quality within the food industry: • design • manufacture • control • assurance.

Student guide

Is this the right subject for me?

Do you enjoy:

- Investigating food? ❑
- Problem solving? ❑
- Designing food products of the future? ❑
- Making models? ❑
- Testing and tasting your ideas? ❑

If you have ticked any of the boxes above, then this GCSE Food Technology course is the ideal subject for you.

What do I need to know, or be able to do, before taking this course?

Throughout Key Stage 3 you will have produced a wide range of exciting projects in Design and Technology, including graphics, textiles, food, electronics and RMT. If you particularly enjoyed the creative design side of design and technology then you now have the opportunity to specialise in one of those subject areas and follow a two-year course in GCSE Food Technology.

What will I learn?

GCSE Food Technology covers a wide range of topics, including special diets, sports nutrition, multi-cultural, celebration and sustainability.

Over the course of two years you will develop a whole range of creative designing and making skills, technical knowledge and understanding relating to food products and invaluable transferable skills such as problem solving and time management.

How will I be assessed?

GCSE Food Technology consists of two units:

Unit 1	Unit 2
Creative Design and Make Activities	Knowledge and Understanding of Food Technology
Controlled Assessment	Examination
60%	40%

You will have the option of completing your coursework unit in two different ways.

- Through a combined design and make activity where you design a product and then make a model of it, OR
- Through separate design and make activities where you design one product and make another.

The examination will be based on a structured exam paper which your teacher will be able to guide you through. Everything that you need to learn for this unit is set out in the specification so your teacher will know exactly how to prepare you for the exam.

What can I do after I've completed the course?

Many students have enjoyed studying GCSE Food Technology so much that they go on to study A Level Food Technology for a further two years. However, it is possible to study any D and T-related course at post-16. Food technology students usually study one or more of the numerous food-related subjects including: A Level Home Economics – Food and Nutrition, City and Guilds NVQs and VRQs in Catering and Food Manufacture, BTEC Nationals in Catering and Hospitality.

Of course, if post-16 is not for you, employers in the food industry value this GCSE Food Technology qualification for the development of creative, technical and transferable skills.

Next steps!

If you want to find more about this GCSE in Food Technology course then you can visit the Edexcel website at **www.edexcel.com**

You should also talk to the Head of Design and Technology at your centre who will be able to describe the course in detail and advise you of what you need to do next when it comes to your options.

Assessment overview

This grid gives an overview of the assessment for this GCSE Food Technology course. Edexcel recommend that you make this information available to students to help ensure they are fully prepared and know exactly what to expect in the assessment of Units 1 and 2.

From summer 2014 onwards students will be required to sit all of their examinations at the end of the course. Students may complete the controlled assessment task at any point during the course and controlled assessment work must be submitted for moderation at the end of the course.

The first certification opportunity for this qualification will be June 2011.

Unit 1	Percentage	Marks	Time	Availability
Creative Design and Make Activities This unit is internally assessed under controlled conditions. Students must complete a design and make activity. These activities can be linked (combined design and make) or separate (design one product, make another).	60%	100	40 hours Controlled assessment External moderation	June

Unit 2	Percentage	Marks	Time	Availability
Knowledge and Understanding of Food Technology This unit is assessed through an examination paper set and marked by Edexcel. The examination paper will consist of multiple-choice, short-answer and extended-writing type questions.	40%	80	1 hour 30 minutes External assessment	June

Description	Knowledge and skills
The development of the student's design folder and manufacture of the product(s) must take place under controlled conditions. Students will be supervised by a teacher at all times. Students' work must be collected in at the end of the lesson and handed back at the beginning of the next lesson. Students' work must be produced individually. Centres will be given a list of five broad themes for task setting. Suggested food products 1. **Special dietary needs**, for example • A range of products for the elderly • A range of products for diabetics 2. **Vegetarians**, for example • A range of products for lacto vegetarians • A range of products suitable for vegans 3. **Sports nutrition**, for example • A range of products for elite athletes • A range of products for rowers 4. **Multi-cultural**, for example • A range of products influenced by Italian recipes • A range of products influenced by Asian recipes 5. **Celebration**, for example • A range of products suitable for a children's birthday party • A range of products suitable for an engagement party Centres can contextualise the task(s) to best suit their specific circumstances, which includes the availability of and access to resources. See the controlled assessment guide on page 37 for more information.	The Assessment Objectives covered in this unit are: Recall of knowledge and understanding **AO1**: 6% Application of knowledge and understanding **AO2**: 45% Product analysis **AO3**: 9% Students will follow the basic creative design process. This includes research, product development, communication skills, application of knowledge and understanding of food products (materials, processes etc), planning and making a high-quality product/s and testing and evaluating.

Description	Knowledge and skills
This unit is assessed through an examination paper set and marked by Edexcel, lasting 1 hour and 30 minutes. The examination paper will: • be structured in the same way each year so that it is accessible to all students • be a question and answer booklet and all questions are compulsory • consist of multiple-choice, short-answer and extended-writing type questions. The total number of raw marks available is 80.	The Assessment Objectives covered in this unit are: **AO1**: 24% **AO2**: 8% **AO3**: 8% Students will develop a knowledge and understanding of a wide range of materials and processes used in design and technology. Students will learn about industrial and commercial practices and the importance of quality checks, and the health and safety issues that have to be considered at all times. The knowledge and understanding students develop in this unit can be easily applied to *Unit 1: Creative Design and Make Activities*.

Understanding Unit 1

Applying the assessment criteria

To support you in accurately and confidently applying the assessment criteria, Edexcel have written the mark bands like a mark scheme with key trigger points.

The table below shows how the descriptors in each mark band have been broken up into their individual marking points (denoted by bullet points). The marking points within each mark band are equally weighted. Edexcel suggest that you look at your students' work for each criteria holistically and place it into the appropriate mark band. You must then determine the actual mark you wish to award.

For example:

b) Research	Level of response not worthy of credit.	0
	• Research is **superficial** and does not focus on the needs identified in the analysis. • Analysis of existing products is **insufficient** to aid the writing of specification criteria.	1-2
	• Research is **general**, focusing on some of the needs identified in the analysis. • Product analysis is used to inform the writing of **some** specification criteria.	3-4
	• Research is **selective** and focuses on the needs identified in the analysis. • The performance, materials, components, processes, quality and sustainability issues of relevant existing products are explored in **sufficient detail** to aid the writing of specification criteria.	5-6

1. Initially, I think the student's research is selective and worthy of the 'high' mark band.

2. However, I don't think that the student's product analysis is strong enough to warrant a high mark – more 'medium'.

Where a students work does not fit perfectly to the descriptor statements in a band, a holistic (best fit) decision must be taken by the teacher when deciding upon the final mark. Look at the example above. The teacher cannot award the full 6 marks for research as the student has not fully met the criteria in the top band with one aspect (product analysis) achieving a level better described in the middle band. In this case the student is awarded 5 marks. If the product analysis was better described by the lowest band descriptor then the holistic decision taken by the teacher would be that the work was more appropriate for the middle band overall and would therefore be awarded 4 marks.

Design activity (50 marks)

Investigate (15 marks)

Sub-sections	Descriptor	Mark range
a) Analysing the brief	Level of response not worthy of credit.	0
	• Analysis is superficial leading to unclear design needs.	1
	• Analysis is **limited** with some design needs clarified.	2
	• Analysis is **detailed** with most design needs clarified.	3
b) Research	Level of response not worthy of credit.	0
	• Research is **superficial** and does not focus on the design needs identified in the analysis. • Analysis of existing products is **insufficient** to aid the writing of specification criteria.	1-2
	• Research is **general**, focusing on some of the design needs identified in the analysis. • Product analysis is used to inform the writing of **some** specification criteria.	3-4
	• Research is **selective** and focuses on the design needs identified in the analysis. • The performance, materials, components, processes, quality and sustainability issues of relevant existing products are explored in **sufficient detail** to aid the writing of specification criteria.	5-6
c) Specification	Level of response not worthy of credit.	0
	• Specification points are **superficial**. • Specification points are **not justified**.	1-2
	• **Some** specification points are realistic and measurable. • **Some** specification points are developed from research but are not justified.	3-4
	• **Most** specification points are realistic, technical, measurable and address some issues of sustainability. • Specification **fully** justifies points developed from research.	5-6

Design (20 marks)

Sub-sections	Descriptor	Mark range
d) Initial ideas	Level of response not worthy of credit.	0
	• Alternative design ideas are **similar**. • Ideas are **simplistic**. • Ideas are **superficial** and **limited** research is used. • **Limited** specification points are addressed.	1–4
	• Alternative design ideas are **realistic**. • Ideas are **workable**. • Ideas are **detailed** and **relevant** research is used. • Ideas address **most** specification points.	5–8
	• Alternative design ideas are **realistic**, **workable** and **detailed**. • Ideas demonstrate **detailed** understanding of materials, processes and techniques. • Ideas are **supported** by research information. • Ideas address **all** key specification points.	9–12
e) Review	Level of response not worthy of credit.	0
	• General and **subjective** comments against **some** specification points. • **Limited** use of user group feedback.	1–2
	• **Objective** evaluative comments, against **most** specification points. • Evaluation considers **user group** feedback and issues of **sustainability**.	3–4
f) Communication	Level of response not worthy of credit.	0
	• Use of a **range** of communication techniques, including ICT where appropriate. • Demonstrate **sufficient** skill to convey an understanding of design ideas.	1–2
	• Use of a **range** of communication techniques and media, including ICT and **CAD** where appropriate • Demonstrate **precision** and **accuracy**.	3–4

Develop (15 marks)

Sub-sections	Descriptor	Mark range
g) Development	Level of response not worthy of credit.	0
	• Developments from alternative design ideas are **minor** and **cosmetic**. • **Simple** practical activities (modelling) are used. • Test **an** aspect of the final design proposal against **a** design criterion.	1–3
	• Developments are **appropriate** and use **details** from alternative design ideas to change, refine and improve the final design proposal. • Practical activities (modelling) using ingredients and/or **3D computer modelling** are used. • Test **some** aspects of the final design proposal against **relevant** design criteria.	4–6
	• Development is used to produce a final design proposal that is **significantly different** and **improved** compared to any previous alternative design ideas. • Practical activities (modelling) to **scale** using ingredients or 2D and/or 3D computer simulations are used. • Test **important** aspects of the final design proposal against **relevant** design criteria. **User group** feedback is used in final modifications.	7–9
h) Final design	Level of response not worthy of credit.	0
	• Final design proposal includes **limited** consideration of materials and/or component parts, processes and techniques for a range of products.	1–2
	• Final design proposal includes **details** of **some** materials and/or component parts, processes and techniques for a range of products.	3–4
	Final design proposal includes **technical details** of **all** materials and/or component parts, processes and techniques for a range of products.	5–6

Make activity (50 marks)

Plan (6 marks)

Sub-sections	Descriptor	Mark range
a) Production plan	Level of response not worthy of credit.	0
	• **Superficial** production plan that outlines **some** stages of manufacture for a range of products. • Plan shows **limited** reference to quality control.	1–2
	• **Limited** production plan that considers the main stages of manufacture for a range of products. • Plan shows **some** reference to **appropriate** forms of quality control.	3–4
	Detailed production plan that considers stages of manufacture in the **correct sequence** for a range of products. • Plan includes **specific** forms of quality control.	5–6

Make (38 marks)

Sub-sections	Descriptor	Mark range
b) Quality of manufacture	Level of response not worthy of credit.	0
	• Tools are selected **with guidance**. • Equipment is selected **with guidance**. • Processes, including CAD/CAM where appropriate, are selected **with guidance**. • **Limited** understanding of the working properties of materials used when selecting for manufacturing a product. • The task is **undemanding**. • A **limited** range of skills is used. • A **limited** range of processes is used. • Student shows **little** attention to detail in the use of skills and processes.	1-8
	• Tools are selected with **some** guidance. • Equipment is selected with **some** guidance. • Processes, including CAD/CAM where appropriate, are selected with some guidance. • **Some** understanding of the working properties of materials used when selecting for manufacturing a product. • The task offers **some** challenge. • A **range** of skills is used. • A **range** of processes is used. • Student demonstrates **attention to detail** in the use of skills and processes.	9-16
	• Tools are selected for specific uses **independently**. • Equipment is selected for specific uses **independently**. • Processes, including CAD/CAM where appropriate, are selected for specific uses **independently**. • An **appropriate** understanding of the working properties of materials used when selecting for manufacturing a product. • The task is **challenging**. • A **wide range** of skills is used. • A **wide range** of processes is used. • Student shows **precision** and **accuracy** in the use of skills and processes.	17-24
c) Quality of outcome	Level of response not worthy of credit.	0
	• Product includes the manufacture of **some** good quality component parts. • Product remains either unassembled or **poorly** assembled. • Product/components are **poorly** finished. • Completed product functions **poorly**.	1-4
	• Product includes the manufacture of **good** quality component parts. • Product is generally **well** assembled. • Product/components are generally **well** finished. • Completed product functions **adequately**.	5-8
	• Product includes the manufacture of **high-quality** component parts. • Product is **accurately** assembled. • Product/components are **well** finished. • Completed product is **fully functional**.	9-12

Sub-sections	Descriptor	Mark range
d) Health and safety	Level of response not worthy of credit.	0
	• Demonstrate an awareness of safe working practices for most specific skills and processes.	1
	• Demonstrate a high level of safety awareness throughout all aspects of manufacture.	2

Test and evaluate (6 marks)

Sub-sections	Descriptor	Mark range
e) Testing and evaluation*	Level of response not worthy of credit.	0
	• One or **more simple** tests carried out to check the performance and/or quality of the final product. • Evaluative comments are **subjective** and reference a **few** specification points **superficially**.**	1–2
	• A **range** of tests carried out to check the performance and/or quality of the final product. • Evaluative comments are **objective** and reference **most** specification points.	3–4
	• A **range** of tests carried out to check the performance and/or quality of the final product with **justifications**. • **Objective** evaluative comments, including **user group** evaluation, consider most relevant, measurable specification points in **detail**, including **sustainability** issues.	5–6

Notes

* Opportunity for students to be assessed on Quality of Written Communication: strand (iii) – organise information clearly and coherently, using specialist vocabulary when appropriate.

** The student uses basic language and the response lacks clarity and organisation. Spelling, punctuation and the rules of grammar used with limited capacity.

*** The student uses some design and technology terms and shows some focus and organisation. Spelling, punctuation and the rules of grammar used with some accuracy. Some spelling errors may still be found.

**** The student uses a range of appropriate design and technology terms and shows good focus and organisation. Spelling, punctuation and the rules of grammar used with considerable accuracy.

Exam question guide

This exam question guide looks at the style of questions your students will be faced with when they sit the written paper. Those of you already familiar with the current format of Edexcel's GCSE D and T paper will clearly recognise the style of the majority of questions in the Sample Assessment Material although clearly, to comply with QCA regulations there are some differences, notably introduction of questions that require some extended writing. It should be highlighted that this change is a small percentage of the examination and therefore its impact on students should be minimal. Another change is the inclusion of some multiple-choice questions to give students confidence at the start of the paper.

The examination paper is 'ramped' and within each question the sub-questions are ramped as well. The advantage of ramping the whole paper is that the questions at the beginning of the paper are accessible to the whole ability range, thereby easing the student into the paper and allowing them to work with confidence. As they work through the paper, the questions will get progressively more challenging as they move through the grade range G – A*.

However, students are advised to attempt all questions as there will be opportunities to gain marks throughout the paper.

The examination paper contains different types of questions:

- multiple choice
- short answer
- design questions
- extended writing.

Each Food Technology exam paper will be structured in the following way:

Questions 1-10	Question 11	Question 12	Question 13	Question 14
Multiple choice.	Knowledge and understanding of Food Technology. Structured questions based on a theme.	Designing products.	Analysing products.	Knowledge and understanding of Food Technology. Short-answer and extended-writing type questions.
10 marks	19 marks	16 marks	16 marks	19 marks

(Total 80 marks)

Command words

Students should be reminded to always read each question carefully before they respond. They should always look at the amount of marks awarded for each question in brackets. This will give them a good indication of how many points need to be raised in their response. As a general rule of thumb, look at the following command words and what students have to do in order to gain the marks.

Command word	Marks awarded	Description
Give/State/Name	(1 mark)	These types of question will usually appear at the beginning of the paper or question part and are designed to ease students into the question with a simple statement or short phrase.
Describe/Outline	(2 + marks)	These types of question are quite straightforward. They ask students to simply describe something in detail. Some questions may also ask students to use notes and sketches, therefore, they can gain marks with the use of a clearly labelled sketch.
Explain/Justify	(2 + marks)	These types of question are asking students to respond in detail to the question – no short phrases will be acceptable here. Instead, students will have to make a valid point and develop/justify it to gain full marks.
Evaluate/Discuss/ Compare	(4 + marks)	These types of question are designed to stretch and challenge students. They will always be awarded the most amount of marks because they require students to make a well-balanced argument, usually involving both advantages and disadvantages.

Questions 1 – 10: Multiple choice (10 marks)

New to D and T exam papers – this paper starts off with 10 multiple-choice questions which become gradually more demanding. These questions can cover any part of the specification. For example:

2. Milk is a good source of:

Please mark a cross (☒) in the correct box.

☐ A iron

☐ B calcium

☐ C sodium

☐ D fluoride

Total 1 mark)

Answer

Students simply have to enter a cross in the relevant box to record their response. In this question: B calcium

Examiner comment

An extremely straightforward question which applies knowledge and understanding from Topic 1.5 Minerals and Topic 2.1 Primary foods.

Question 11(a): Name and give the use of tools and equipment (4 marks)

Question 11 starts with four marks awarded to students for either naming or giving the use of tools and equipment related to Food Technology. The tools and equipment will be laid out in a table format, for example:

11. (a) The table below shows some tools and equipment.
Complete the table below by giving the missing names.

Tools/Equipment	Name	Use
	**(Total 1 mark)**	To drain vegetables

Answer

Tools/Equipment	Name	Use
	colander	To drain vegetables

Examiner comment

Students have to write clearly within the relevant box. Here, the student has stated the correct word 'colander'. An examiner would not penalise a student for using the word 'strainer' as the meaning is still very clear. However, we strongly encourage the correct use of specialist technical terminology throughout this paper to avoid any potential miscommunication.

Students should be familiar with a wide range of specialist tools and equipment through the course of their design and make activities and Topic 3.4 Food preparation techniques – home, use of small equipment in home.

Question 11b – (f): Knowledge and understanding of food technology (15 marks)

Subsequent question parts comprise short-answer type questions, for example:

> 11 (d) Explain one problem caused by having too much sugar in the diet.
>
> **(Total 2 marks)**

Answer

Excess sugar is stored in the body as fat this can lead to weight gain/obesity.

Examiner comments

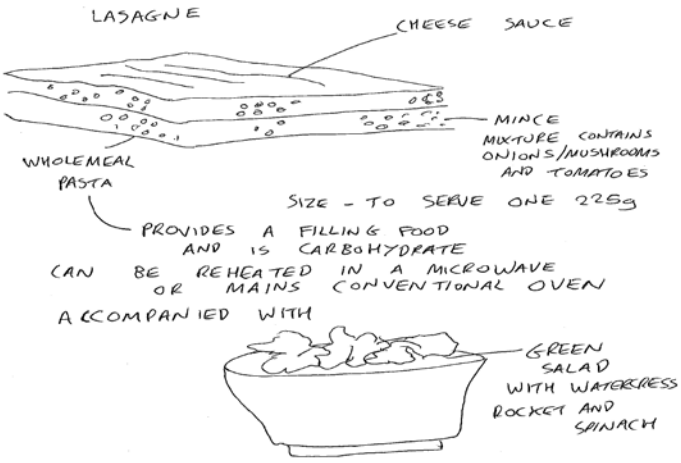
An `explain' type question requires a statement and then a justification in order to be awarded full marks. The answer gains a mark for explaining that excess sugar is stored in the body as fat and another mark for stating that this can lead to obesity. This question focuses on Topic 1.2 Carbohydrates – function of sugar in the diet, Topic 1.6 Energy balance – balanced diet and Topic 1.7 Dietary guidelines – healthy eating.

Question 12: Designing products (16 marks)

Question 12 enables students to respond creatively to a given need and detailed specification, for example:

> **12.** A manufacturer is developing a new range of main course dishes that are suitable for pregnant women.
>
> The specification for the main course dish is that it must:
>
> - be savoury
> - include one protein food
> - include one carbohydrate food
> - include the mineral iron
> - be a single portion
> - be filling
> - have a range of textures
> - be suitable to be reheated.
>
> In the boxes opposite, use sketches and, where appropriate, brief notes to show **two different** design ideas for the main course dish that meet the specification points above.

Answer



Examiner comments

Please note. The second design solution must be conceptually and technically different in design and construction and not simply variations on a theme. Students must use annotated sketches in the boxes provided in order to design a product that satisfies the criteria outlined in the design specification. Here, the student has used a simple 3D and 2D sketch to convey their design idea. No drawing equipment needs to be provided for this exam so clear annotated sketches are sufficient. The annotation is extremely important for showing the examiner how the design idea satisfies each of the specification criteria.

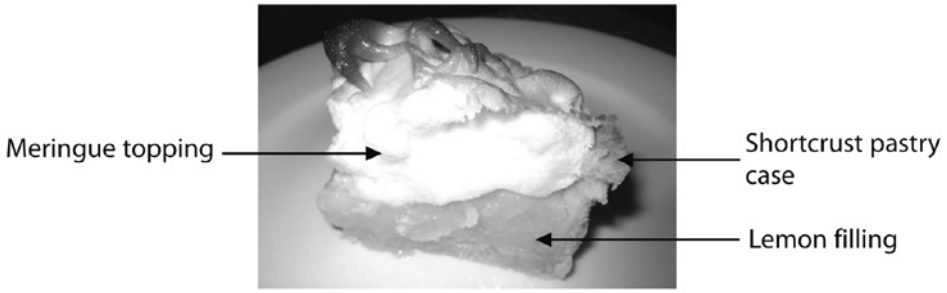
For example, annotation point `Wholemeal pasta' addresses two criteria:

- include one carbohydrate food (pasta is a suitable carbohydrate ingredient for this product)
- be filling (pasta and especially wholemeal pasta is a filling ingredient due to the increase in fibre which produces fullness).

Question 13: Analysing products (16 marks)

In question 13, students will be given a labelled diagram of a specific product and are required to answer a series of questions relating to it, for example:

13. The image below shows a portion of lemon meringue pie that is sold pre-packed in a supermarket.



(a) The pastry case is made using shortcrust pastry.

Give **two** properties of shortcrust pastry that make it suitable for the case.

For each property, justify your answer.

(Total 4 Marks)

Answer

Property 1: strong.

Justification: pastry sets/holds it shape when filled with other ingredients.

Property 2: easy to shape/cut.

Justification: pastry pliable and easy to handle.

Examiner comments

This short-answer type question is very similar to an 'explain' question. The student must state two properties of shortcrust pastry and justify both. In this case the answer is awarded a mark for each property and justification. This question requires students to apply their knowledge and understanding of Topic 2.1 Primary foods – cereals – functional properties and Topic 2.2 Functional properties and working properties – shortening, gelatinisation (pastry when baked).

Question 14: Knowledge and understanding of food technology including extended-writing style questions (19 marks)

Some part questions will require an extended-writing response. This is designed to stretch and challenge students, for example:

> **14. (f)** Consumers are becoming more environmentally aware.
> Discuss the ways in which food manufacturers could alter packaging to reduce its environmental impact.
>
> **(Total 6 marks)**

Answer

Packaging is essential, it protects, informs, promotes and enables effective distribution. However, consumers are now concerned that the amount and type of packaging used is having an adverse effect on the environment. Manufacturers must take the role of packaging seriously in order to reduce its impact on the environment.

A food manufacturer can alter packaging by reducing the amount of layers or size of packaging. Many food products are over packaged. Excess packaging results in excess waste, leading to an increase of waste in landfill sites. This can lead to pollution, with fast food packaging linked to ozone depletion. Less packaging equals less waste.

Food manufacturers should consider using materials that can enhance the environment. Using materials from sustainable sources reduces the carbon footprint. As sustainable packaging is sourced, manufactured, transported and recycled using renewable energy. Also using materials that can be broken down (bio-degradable), recycled, composted or incinerated for energy, reduces the greenhouse effect by reducing harmful emissions.

INCPEN (The Industry Council For Packaging and the Environment) and programmes such as 'Living Smarter' and 'Green Kitchen' are just two initiatives which aim to educate both the consumer and manufacturer on packaging issues.

Examiner comments

This 'discuss' question requires students to write an extended-writing style response.

This question has a levels mark scheme. The student response fits into **Level 3** (5–6 marks).

Student identifies a range of impacts with associated developments showing a detailed understanding of the impacts. Writing communicates ideas effectively, using a range of appropriately selected D and T terms and organising information clearly and coherently. The student spells, punctuates and uses the rules of grammar with considerable accuracy.

Controlled assessment

About controlled assessment

Controlled assessment is similar to coursework except that controls have been added to ensure that all of the work is the student's own.

The level of control for each activity in each subject is specified by QCA. This section explains the level required for each activity and what it means for you and your students, and the frequency of change.

Task setting

What is the level of control?

High.

What does this mean?

Tasks will be set by Edexcel and centres will choose from a list available on our website in September of each academic year. Centres can contextualise the task(s) to best suit their specific circumstances, which includes the availability of and access to resources.

Suggested tasks

Special dietary needs

- A range of products for the elderly or a range of products for diabetics.

Vegetarians

- A range of products for lacto vegetarians or a range of products suitable for vegans.

Sports nutrition

- A range of products for elite athletes or a range of products for rowers.

Multi-cultural

- A range of products influenced by Italian recipes or a range of products influenced by Asian recipes.

Celebration

- A range of products suitable for a children's birthday party or a range of products suitable for an engagement party.

How often will the tasks change?

Edexcel will review the tasks every two years. Edexcel will look at the tasks in the light of student performance and make any amendments necessary to make the tasks clearer.

Any students wanting to retake the controlled assessment unit will need to use the one available for the session in which they are retaking, regardless of what task they did originally. If students are taking the same task, they must start from scratch and do the whole task again.

Task taking

The task taking controls have been designed to ensure that the task is carried out by the student and that all work is their own. This means that students cannot carry out work at home and bring it to the classroom.

The task is split into two phases:

- initial research
- design and make tasks.

The levels of control and the effect are different for each part.

What is the level of control?

Initial research: Low.

Design and make tasks: Medium.

What does this mean?

Initial research

Students can undertake research to locate sources outside of the classroom without supervision. They can locate as many sources to take into the write up phase as they wish.

Design and make tasks

The student must complete the following under classroom supervision:

- write up of their portfolio
- making their product.

However, students are allowed to us the following to help them complete their task:

- their initial research they have undertaken outside of the classroom to produce focused selective research for their portfolio
- sources the centre provides.

A student can bring in additional research notes at any time provided the write up of their research is done under the same supervised conditions.

Students cannot take any information away from the classroom to complete. They can make an outline plan for the task beforehand and bring it to the classroom.

You will need to monitor the student in the classroom to ensure the whole of the task is their own work. You can answer questions but you must not guide students along a particular path or advise on how to approach the task.

This stage is not an exam and requires supervision not invigilation. There is no need to set up the room like an exam or for the room to be silent. The key requirement is that students are supervised at all times.

The task must be taken during curriculum time.

Task marking

This is similar to the current arrangements, so will be familiar.

What is the level of control?

Medium

What does this mean?

You will mark all the tasks. You then fill in a form to show all the marks achieved. Edexcel will ask for a sample of the work to moderate, including student work with the highest and lowest scores.

Edexcel will moderate the work and you will receive a summary report on results day.

Training courses on marking tasks will be available to help you mark the work effectively. Our specification experts can also provide support, just email dandt@edexcelexperts.co.uk

Controlled assessment exemplars

Centres will appreciate that no student has actually submitted controlled assessment work under the new specification at the time of publication. Therefore, existing examples of students' GCSE Food Technology work have been modified by the Principal Moderator for illustrative purposes only

Suggested timings

As a guideline only, we have suggested times for each of the stages in the design and make activities. Obviously, you as a teacher will be best suited to gauge the times needed to complete each task as you know your students best.

Design activity

Stage	Tasks	Suggested times
1. Investigate	1.1 Analysing the brief	1 hour
	1.2 Research	3 hours
	1.3 Specification	1 hour
2. Design	2.1 Initial ideas	5-6 hours
	2.2 Review	1 hour
	2.3 Communication	Evidenced throughout
3. Develop	3.1 Development	5-6 hours
	3.2 Final design	1-2 hours

Make activity

Stage	Tasks	Suggested times
4. Plan	4.1 Production plan	1-2 hours
5. Make	5.1 Quality of manufacture	16 hours
	5.2 Quality of outcome	
	5.3 Health and safety	Evidenced throughout
6. Test and evaluate	6.1 Testing and evaluation	1-2 hours

Student outcomes

The following examples of student work are to show indicative content only. Centres will appreciate that as no student has actually submitted coursework under the new specification at the time of publication, existing examples of students' GCSE Food Technology work have been modified by the Principal Moderator for illustrative purposes only.

Investigate: Healthy eating – A range of low fat products suitable for teenagers

Task: 1.2 research

CRITERIA 1: Identifying Needs and Use of Information Sources to Develop Detailed Specifications

Nutritional Requirements of Target Group

I have chosen to design a product that will be suitable for both teenagers and adults and low in fat. They have different dietary requirements as they are in different stages of life. An insight into what they need in their food would help me decide what ingredients and nutrients should be contained in my product.

Teenagers, at 13 to 19 years old are going through their most important stage of life, where puberty and rapid physical and emotional growth is occurring. Good quality food is vital in these years. It is extremely important that the food they eat contain all the necessary nutrients, vitamins and minerals so they can develop a healthy body. They also need a lot of energy in their food to keep them going throughout the day as they are very active and protein for the body to develop. The amount calcium needed also increases significantly, as bones and teeth are undergoing rapid growth.

Adults, at 20 to 50 years old, have already passed their growth period and the amount of protein and calcium needed decreases. Protein is still needed to aid daily growth and repair, and calcium for strengthening bones and teeth. Other vitamins and minerals are needed to help the body function normally. The amount of energy also decreases, as they are less active than teenagers at this stage of life. Therefore, adults must avoid eating too much fatty foods and carbohydrates then they need.

ENERGY REQUIREMENTS	Teenagers (13-19 years)		Adults (20-50 years)	
Gender	Male	Female	Male	Female
Amount of Energy Needed per day (kcal)	2250-2750	1800-2200	2600	1900

Fats in the Diet

Even though fat is vital in our diet, a lot of people from busy places today are eating too much foods with high fat contents. The amount we take is often too much that our body cannot use up all the energy which the fat provides, and it is stored inside or bodies. People often eat from fast food restaurants, instant meals and takeaways to match their busy lifestyles. Those meals often contain high saturated fat and cholesterol levels, and studies have shown that they link to many health problems such as obesity, high blood cholesterol levels, coronary heart diseases and maybe even cancer.

Fat Intake Guidelines

The US recommendation is to keep the total daily fat intake between 20-35% of our calories needed, about 0-3 servings a day. The fats should be from sources of polyunsaturated and monounsaturated fatty acids, not trans fats or saturated fats. According to MAFF (UK Ministry of Agriculture, Fisheries and Food, now Department for Environment, Food and Rural Affairs) guidelines, a 100g portion snack that contains over 20g of fat is considered 'high in fat', therefore my product must have less than 20g of fat in a 100g portion.

Ways of Cutting Down Fat Intake

- Modify recipes and decrease the amount of fats used
- Reducing intake of nuts and pulses
- Use less oil/fats in cooking and eating
- Reduce intake of junk food

Cooking Methods:

Boiling, steaming, baking, grilling instead frying and deep frying as less oil is used

Low Fat alternatives:

Cream → Milk, low fat types
Butter → Margarine, low fat spreads
Sugar → Artificial sweetener, natural sources (honey, fruit)
Cream cheese → Ricotta, cottage cheese, low fat types

Product Location Research: Italian Tomato Café

As previously stated in the Reasons for Choice for my design brief, I chose to design a dessert for sale at Italian Tomato Café because they lack low-fat dessert options. I chose to do some research on my product location because it would give me some ideas about potential customers, what they like and what is currently available on the market.

Italian Tomato Café are a line of casual, Japanese-style cafes in Hong Kong. The company is based in Japan, but there are many stores located in Hong Kong. Apart from cafes, Italian Tomato also run cake and gelato shops under the same brand name. The café mainly sells western dishes, such as pasta, risotto, pizzas, salads and sandwiches. Their cakes are also a speciality; there are quite a few choices for the customers there. However the cakes are the only choice of dessert at the cafes. A slice of cake is always included in set lunches and dinners and, it is vital that the dessert satisfies the customer. Here is a sample of their cake menu leaflet:

Italian Tomato provides a relaxed dining atmosphere.

Range of cakes available

Existing Products at Italian Tomato Cafe:

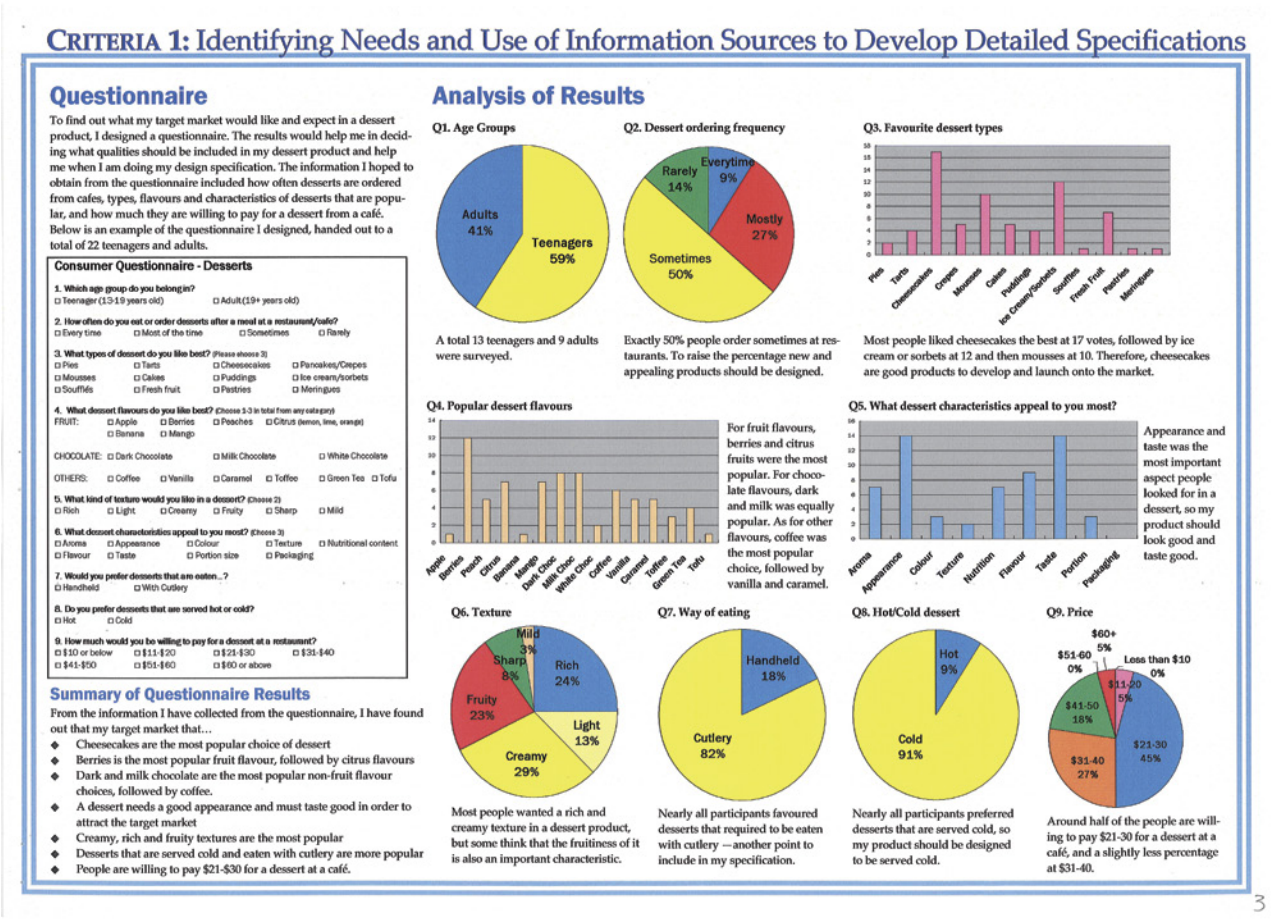
Strawberry Cake, Mango Strawberry Quartet, Strawberry Mango Cake, Mille-Feuilles, Chestnut Black Forest Cake, Chestnut cake, Green Tea Chocolate Cake, Banana Pie, Mango Mousse Cake, Chocolate Mouse Cake, Mocca Coffee Cake, Tiramisu, German Cheesecake, New York Cheesecake, Raspberry Cheesecake, Mango Cheese Tart, Zucotto, Cherry Cheesecake, Cream Cheesecake, Blueberry Cheese Tart

Summary of Location Findings

As we can see, Italian Tomato currently offers a large range of cakes already. Prices range from $20-28 for each slice. Whole cakes are also available for sale. Many people like to go there for a slice of cake for afternoon tea, and often chooses the range of cakes for desserts.

However, as a regular customer, I have noticed that most of the cakes are not healthy and are high in fat, such as types with large amounts on cream piled on or filled in each portion, so I think a low-fat product would be very appealing out of the many other cakes, giving customers a wider choice and a choice for people on a low fat diet.

2



CRITERIA 1: Identifying Needs and Use of Information Sources to Develop Detailed Specifications

Questionnaire

To find out what my target market would like and expect in a dessert product, I designed a questionnaire. The results would help me in deciding what qualities should be included in my dessert product and help me when I am doing my design specification. The information I hoped to obtain from the questionnaire included how often desserts are ordered from cafes, types, flavours and characteristics of desserts that are popular, and how much they are willing to pay for a dessert from a café. Below is an example of the questionnaire I designed, handed out to a total of 22 teenagers and adults.

Consumer Questionnaire - Desserts

1. Which age group do you belong in?
□ Teenager (13-19 years old) □ Adult (19+ years old)

2. How often do you eat or order desserts after a meal at a restaurant/cafe?
□ Every time □ Most of the time □ Sometimes □ Rarely

3. What types of dessert do you like best? (Please choose 3)
□ Pies □ Tarts □ Cheesecakes □ Pancakes/Crepes
□ Mousses □ Cakes □ Puddings □ Ice cream/sorbets
□ Soufflés □ Fresh fruit □ Pastries □ Meringues

4. What dessert flavours do you like best? (Choose 1-3 in total from any category)
FRUIT: □ Apple □ Berries □ Peaches □ Citrus (lemon, lime, orange) □ Banana □ Mango
CHOCOLATE: □ Dark Chocolate □ Milk Chocolate □ White Chocolate
OTHERS: □ Coffee □ Vanilla □ Caramel □ Toffee □ Green Tea □ Tofu

5. What kind of texture would you like in a dessert? (Choose 2)
□ Rich □ Light □ Creamy □ Fruity □ Sharp □ Mild

6. What dessert characteristics appeal to you most? (Choose 3)
□ Aroma □ Appearance □ Colour □ Texture □ Nutritional content
□ Flavour □ Taste □ Portion size □ Packaging

7. Would you prefer desserts that are eaten...?
□ Handheld □ With Cutlery

8. Do you prefer desserts that are served hot or cold?
□ Hot □ Cold

9. How much would you be willing to pay for a dessert at a restaurant?
□ $10 or below □ $11-$20 □ $21-$30 □ $31-$40
□ $41-$50 □ $51-$60 □ $60 or above

Summary of Questionnaire Results

From the information I have collected from the questionnaire, I have found out that my target market that...

- Cheesecakes are the most popular choice of dessert
- Berries is the most popular fruit flavour, followed by citrus flavours
- Dark and milk chocolate are the most popular non-fruit flavour choices, followed by coffee.
- A dessert needs a good appearance and must taste good in order to attract the target market
- Creamy, rich and fruity textures are the most popular
- Desserts that are served cold and eaten with cutlery are more popular
- People are willing to pay $21-$30 for a dessert at a café.

Analysis of Results

Q1. Age Groups

A total 13 teenagers and 9 adults were surveyed.

Q2. Dessert ordering frequency

Exactly 50% people order sometimes at restaurants. To raise the percentage new and appealing products should be designed.

Q3. Favourite dessert types

Most people liked cheesecakes the best at 17 votes, followed by ice cream or sorbets at 12 and then mousses at 10. Therefore, cheesecakes are good products to develop and launch onto the market.

Q4. Popular dessert flavours

For fruit flavours, berries and citrus fruits were the most popular. For chocolate flavours, dark and milk was equally popular. As for other flavours, coffee was the most popular choice, followed by vanilla and caramel.

Q5. What dessert characteristics appeal to you most?

Appearance and taste was the most important aspect people looked for in a dessert, so my product should look good and taste good.

Q6. Texture

Most people wanted a rich and creamy texture in a dessert product, but some think that the fruitiness of it is also an important characteristic.

Q7. Way of eating

Nearly all participants favoured desserts that required to be eaten with cutlery —another point to include in my specification.

Q8. Hot/Cold dessert

Nearly all participants preferred desserts that are served cold, so my product should be designed to be served cold.

Q9. Price

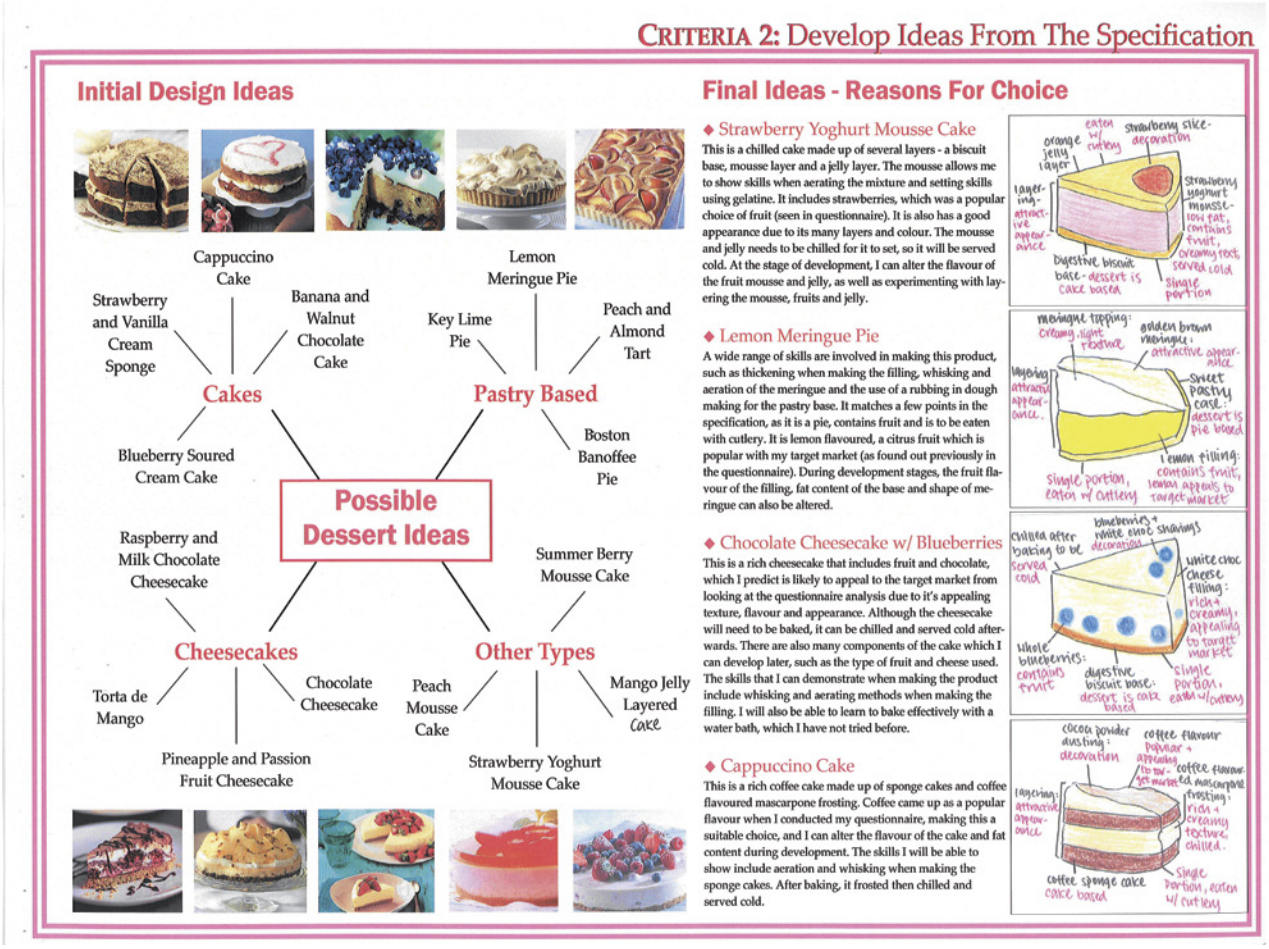
Around half of the people are willing to pay $21-30 for a dessert at a café, and a slightly less percentage at $31-40.

3

Moderator comments

Teachers should encourage students to gather research that is focused and selective. Students should ensure their design area is not too wide as this often results in research which does not inform the reader about the task being undertaken. Areas for useful research include similar product analysis to establish the ingredients and nutritional content of existing items. Market research should be used to determine potential user preferences and relevant ingredients. Taste tests can be used to assess current products and the opinions of the target user group. Selectivity, relevance and succinct presentation are necessary to demonstrate effective research. In the example shown, students investigate fats in the diet and existing products to learn about the materials, and use a questionnaire to establish the preferences of the user group.

Task: 2.1 Initial ideas



CRITERIA 2: Develop Ideas From The Specification

Initial Design Ideas

Final Ideas - Reasons For Choice

◆ Strawberry Yoghurt Mousse Cake

This is a chilled cake made up of several layers - a biscuit base, mousse layer and a jelly layer. The mousse allows me to show skills when aerating the mixture and setting skills using gelatine. It includes strawberries, which was a popular choice of fruit (seen in questionnaire). It is also has a good appearance due to its many layers and colour. The mousse and jelly needs to be chilled for it to set, so it will be served cold. At the stage of development, I can alter the flavour of the fruit mousse and jelly, as well as experimenting with layering the mousse, fruits and jelly.

◆ Lemon Meringue Pie

A wide range of skills are involved in making this product, such as thickening when making the filling, whisking and aeration of the meringue and the use of a rubbing in dough making for the pastry base. It matches a few points in the specification, as it is a pie, contains fruit and is to be eaten with cutlery. It is lemon flavoured, a citrus fruit which is popular with my target market (as found out previously in the questionnaire). During development stages, the fruit flavour of the filling, fat content of the base and shape of meringue can also be altered.

◆ Chocolate Cheesecake w/ Blueberries

This is a rich cheesecake that includes fruit and chocolate, which I predict is likely to appeal to the target market from looking at the questionnaire analysis due to it's appealing texture, flavour and appearance. Although the cheesecake will need to be baked, it can be chilled and served cold afterwards. There are also many components of the cake which I can develop later, such as the type of fruit and cheese used. The skills that I can demonstrate when making the product include whisking and aerating methods when making the filling. I will also be able to learn to bake effectively with a water bath, which I have not tried before.

◆ Cappuccino Cake

This is a rich coffee cake made up of sponge cakes and coffee flavoured mascarpone frosting. Coffee came up as a popular flavour when I conducted my questionnaire, making this a suitable choice, and I can alter the flavour of the cake and fat content during development. The skills I will be able to show include aeration and whisking when making the sponge cakes. After baking, it frosted then chilled and served cold.

Moderator comments

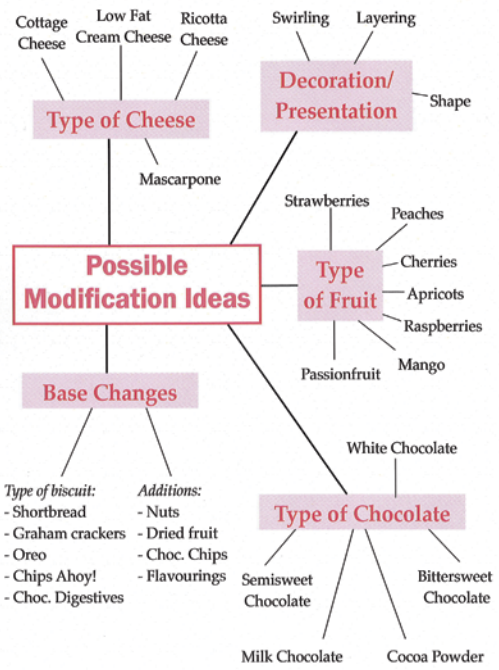
In this assessment criterion, it is expected that students will produce a range of alternative ideas that reflect their knowledge and understanding of the needs of the product specification. Because students need to produce a range of products they need to have a number of initial ideas. Some of these should be cooked in order to decide which elements are going to be developed.

Students must, however, keep their design task in mind and suggest and make initial ideas that relate to the design brief.

Task: 3.1 Development

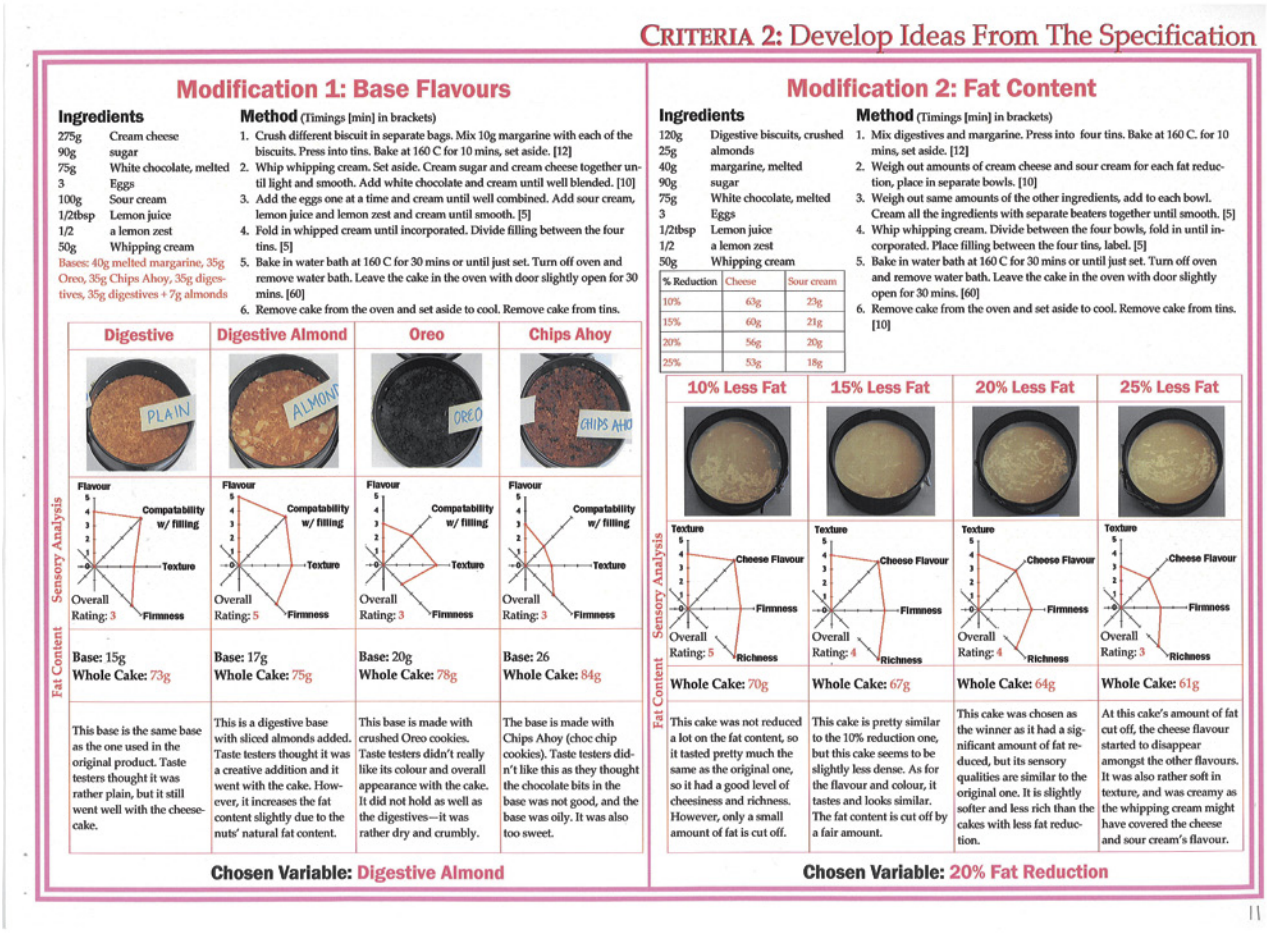
CRITERIA 2: Develop Ideas From The Specification

Possible Modifications - Ideas



Design Proposal Planning

Test	Focus of Practical	How it will be conducted	Reasons	Ingredients/ Methods to Investigate	How feedback will be obtained
1	Base Flavours	Additional ingredients or different types of biscuits will be used to create new flavours for the base.	As taste testers thought that the base was too plain, so the addition of ingredients will improve the base's flavour.	I will use the following ingredients with melted margarine to make the base: ◆ Plain Digestives (control) ◆ Digestives + Almonds ◆ Chips Ahoy ◆ Oreo	Sensory analysis will be carried out, taste testers will be asked to try the cheesecakes with different bases and produce feedback and comments for each of them.
2	Fat Content	The amount of cream cheese and sour cream will be reduced in order to reduce the fat content. The amount of cream will be kept the same, as it only takes up a small proportion of the ingredients.	The product must be low fat (as mentioned in design brief & specification), and the cream cheese and sour cream contains most of the fat of the product.	I will reduce the cream cheese and sour cream by the following percentages: ◆ 10% less fat ◆ 15% less fat ◆ 20% less fat ◆ 25% less fat	As above, sensory analysis will be carried out, taste testers will be asked to try the cheesecakes with different fat contents. A nutritional profile for each will be produced to compare the fat content.
3	Type of Chocolate	The type of chocolate will be changed, and the amount will be kept the same. All other ingredients will be kept the same.	The modification is to find out what type of chocolate is most appealing, and some chocolate w/ lower fat contents can also be used.	I will use the following types of chocolate: ◆ White Chocolate (control) ◆ Milk Chocolate ◆ Semisweet Chocolate ◆ Bittersweet Chocolate	Sensory analysis will be conducted, and taste testers will be asked the to sample the cheesecakes with different chocolate flavours.
4	Type of Fruit & Decoration	In this modification the type of fruit will be changed. The decoration will also be arranged using the fruit that is in the cheesecake.	The modification is to find out which fruit is the most suitable to go along with the chocolate and base flavour and most appealing to the target market.	I will use the following types of fruit: ◆ Blueberries (control) ◆ Strawberries ◆ Raspberries ◆ Peaches	Sensory analysis will be conducted, and taste testers will also be asked to comment on the design of the decoration along with each cheesecake's flavour.



CRITERIA 2: Develop Ideas From The Specification

Modification 1: Base Flavours

Ingredients

275g	Cream cheese
90g	sugar
75g	White chocolate, melted
3	Eggs
100g	Sour cream
1/2tbsp	Lemon juice
1/2	a lemon zest
50g	Whipping cream

Bases: 40g melted margarine, 35g Oreo, 35g Chips Ahoy, 35g digestives, 35g digestives + 7g almonds

Method (Timings [min] in brackets)

1. Crush different biscuit in separate bags. Mix 10g margarine with each of the biscuits. Press into tins. Bake at 160 C for 10 mins, set aside. [12]
2. Whip whipping cream. Set aside. Cream sugar and cream cheese together until light and smooth. Add white chocolate and cream until well blended. [10]
3. Add the eggs one at a time and cream until well combined. Add sour cream, lemon juice and lemon zest and cream until smooth. [5]
4. Fold in whipped cream until incorporated. Divide filling between the four tins. [5]
5. Bake in water bath at 160 C for 30 mins or until just set. Turn off oven and remove water bath. Leave the cake in the oven with door slightly open for 30 mins. [60]
6. Remove cake from the oven and set aside to cool. Remove cake from tins.

	Digestive	Digestive Almond	Oreo	Chips Ahoy
Sensory Analysis				
Fat Content	Base: 15g Whole Cake: 73g	Base: 17g Whole Cake: 75g	Base: 20g Whole Cake: 78g	Base: 26 Whole Cake: 84g
	This base is the same base as the one used in the original product. Taste testers thought it was rather plain, but it still went well with the cheesecake.	This is a digestive base with sliced almonds added. Taste testers thought it was a creative addition and it went with the cake. However, it increases the fat content slightly due to the nuts' natural fat content.	This base is made with crushed Oreo cookies. Taste testers didn't really like its colour and overall appearance with the cake. It did not hold as well as the digestives—it was rather dry and crumbly.	The base is made with Chips Ahoy (choc chip cookies). Taste testers didn't like this as they thought the chocolate bits in the base was not good, and the base was oily. It was also too sweet.

Chosen Variable: Digestive Almond

Modification 2: Fat Content

Ingredients

120g	Digestive biscuits, crushed
25g	almonds
40g	margarine, melted
90g	sugar
75g	White chocolate, melted
3	Eggs
1/2tbsp	Lemon juice
1/2	a lemon zest
50g	Whipping cream

% Reduction	Cheese	Sour cream
10%	63g	23g
15%	60g	21g
20%	56g	20g
25%	53g	18g

Method (Timings [min] in brackets)

1. Mix digestives and margarine. Press into four tins. Bake at 160 C. for 10 mins, set aside. [12]
2. Weigh out amounts of cream cheese and sour cream for each fat reduction, place in separate bowls. [10]
3. Weigh out same amounts of the other ingredients, add to each bowl. Cream all the ingredients with separate beaters together until smooth. [5]
4. Whip whipping cream. Divide between the four bowls, fold in until incorporated. Place filling between the four tins, label. [5]
5. Bake in water bath at 160 C for 30 mins or until just set. Turn off oven and remove water bath. Leave the cake in the oven with door slightly open for 30 mins. [60]
6. Remove cake from the oven and set aside to cool. Remove cake from tins. [10]

	10% Less Fat	15% Less Fat	20% Less Fat	25% Less Fat
Sensory Analysis				
Fat Content	Whole Cake: 70g	Whole Cake: 67g	Whole Cake: 64g	Whole Cake: 61g
	This cake was not reduced a lot on the fat content, so it tasted pretty much the same as the original one, so it had a good level of cheesiness and richness. However, only a small amount of fat is cut off.	This cake is pretty similar to the 10% reduction one, but this cake seems to be slightly less dense. As for the flavour and colour, it tastes and looks similar. The fat content is cut off by a fair amount.	This cake was chosen as the winner as it had a significant amount of fat reduced, but its sensory qualities are similar to the original one. It is slightly softer and less rich than the cakes with less fat reduction.	At this cake's amount of fat cut off, the cheese flavour started to disappear amongst the other flavours. It was also rather soft in texture, and was creamy as the whipping cream might have covered the cheese and sour cream's flavour.

Chosen Variable: 20% Fat Reduction

Moderator comments

In this section, students should develop a number of elements in order to produce a range of final design ideas. Their products should match most points of the product specification. Develop means 'change' and students should show how their final designs have moved on from initial ideas to a point where they are ready to be made.

Students should cook elements of their initial ideas (modelling). This is an important part of development and helps to inform decisions for example flavours and skills for the final product. These developments should be tested against the specification requirement. There must be a point to developments (modelling) and this should be explained, for example to test proportions, change in textures/flavours, nutritional content etc.

In the example here, the student has shown possible design development and reasons for the activities. Changes to the flavour base have been produced and tested. The student has also considered the effect of changing the fat content.

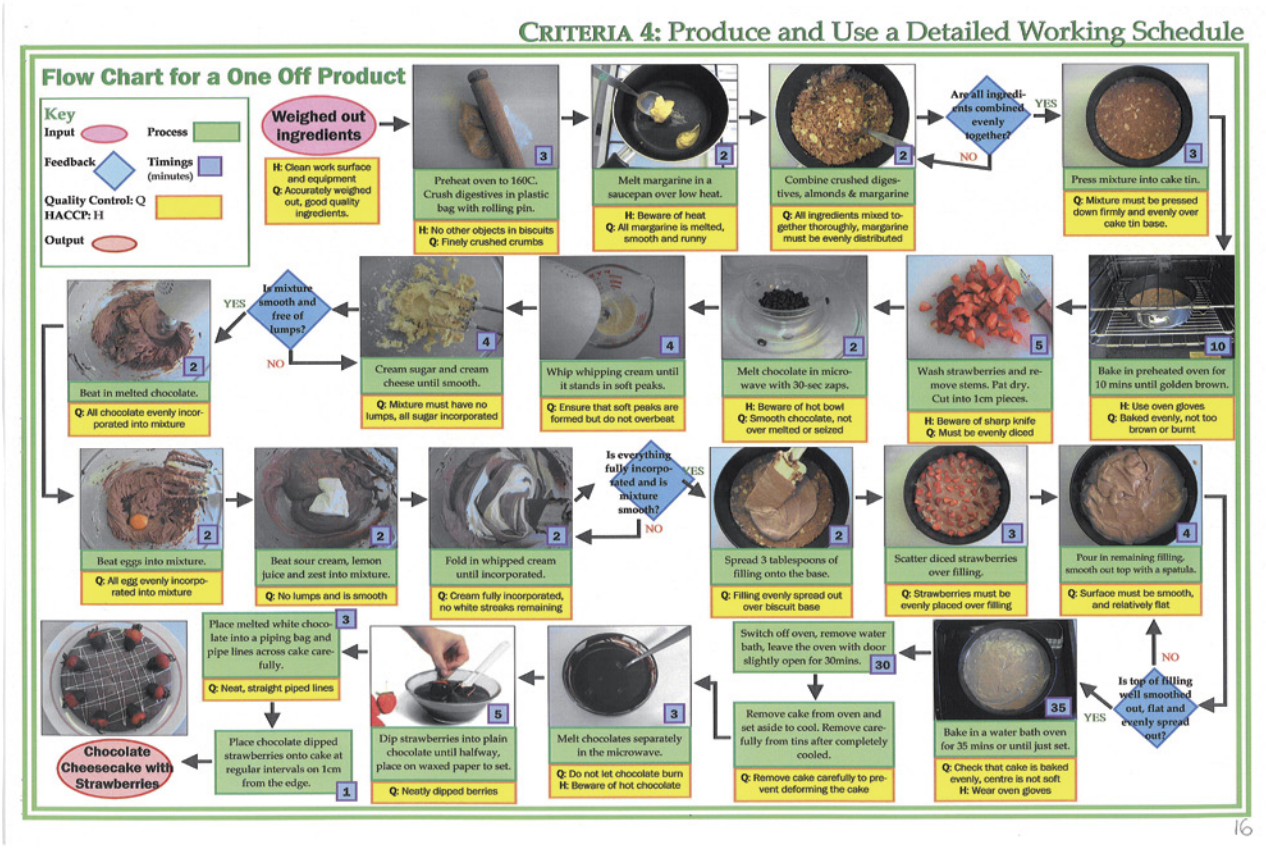
Task: 4.1 Production plan

CRITERIA 4: Produce and Use a Detailed Working Schedule

Work Schedule for a One Off Product

Input	Process	Timings (mins)	Feedback H: HACCP Q: Quality Control	Output
Cake Base Digestive Biscuits 120g Margarine 40g Sliced Almonds 25g	1. Preheat oven to 160C. 2. Crush digestives in plastic bag with a rolling pin. 3. Melt margarine in saucepan over low heat. 4. Combine digestives and melted butter, mix thoroughly until all the biscuit crumbs are evenly coated with margarine. 5. Press mixture firmly and evenly in cake tin. 6. Bake in preheated oven for 10mins until golden brown, set aside.	1 3 2 2 3 10 **Total: 21 mins**	--- **H:** No foreign objects in biscuits **Q:** Finely crushed crumbs **H:** Beware of heat **Q:** All margarine is melted, smooth and runny **Q:** All ingredients mixed together thoroughly, margarine must be evenly distributed **Q:** Mixture must be pressed down firmly and evenly over cake tin base. **H:** Use oven gloves **Q:** Baked evenly, not too brown or burnt	
Filling Cream Cheese 224g Eggs 3 Caster Sugar 90g Sour Cream 80g Semisweet Choc. 75g Whipping Cream 50g Lemon Juice 7ml Lemon Zest 5g Strawberries 100g	1. Wash strawberries and hull. Pat dry, cut into evenly diced pieces. 2. Melt chocolate in microwave. 3. Whip whipping cream until it stands in soft peaks. Set aside. 4. Cream sugar and cream cheese together until smooth and fully combined. 5. Beat melted chocolate into mixture. 6. Add eggs in to cheese mixture and cream until smooth. 7. Add sour cream, lemon juice and zest. Cream until smooth. 8. Fold in whipped cream until incorporated. 9. Spread three tablespoons or filling onto base evenly. 10. Scatter strawberries evenly over cake base. 11. Pour remaining cheese mixture carefully into tin. Smooth out the top with a spatula. 12. Bake in a water bath in preheated oven for 35 minutes or until just set. 13. When done, leave the cake in the switched off oven with door slightly oven for 30 mins. 14. Remove cake from oven and set aside to cool. Remove carefully from tins after completely cooled.	5 2 4 4 2 2 2 2 2 3 4 35 30 **Total: 97 mins + cooling time**	**H:** Beware of sharp knife **Q:** Must be evenly diced **H:** Beware of hot bowl **Q:** Smooth chocolate, not over melted /seized **Q:** Ensure that soft peaks are formed but do not overbeat **Q:** Mixture must have no lumps, all sugar incorporated **Q:** All chocolate evenly incorporated into mixture **Q:** All egg evenly incorporated into mixture **Q:** No lumps and is smooth **Q:** Cream fully incorporated, no white streaks remaining **Q:** Filling evenly spread out over biscuit base **Q:** Strawberries must be evenly placed over filling **Q:** Surface must be smooth, relatively flat, evenly spread out **Q:** Check that cake is baked evenly, centre is not soft **H:** Wear oven gloves --- **Q:** Remove cake carefully to prevent deforming the cake	
Decoration Strawberries 8 Plain Chocolate 20g White Chocolate 10g	1. Melt the chocolates separately in the microwave. 2. Dip washed and strawberries into plain chocolate until halfway, remove and place on waxed paper to set. 3. Place white chocolate into a piping bag and pipe lines across cake carefully. 4. Place chocolate dipped strawberries onto cake at regular intervals on 1cm from the edge. 5. Transfer whole cake into refrigerator, chill until serving.	3 5 3 1 **Total: 12 mins**	**Q:** Do not let chocolate burn **H:** Beware of hot chocolate **Q:** Neatly dipped berries **Q:** Neat, straight piped lines --- ---	
Number of workers: 1 **Scale of Production:** Small, 8 portions.	**Equipment** Electronic scales, rolling pin, plastic bag, mixing bowls, spoons, 20cm spring form cake tin, baking paper, knife, electric beaters, fork, spatula, palette knife, cooling rack, piping bag, waxed paper	**Total: 130mins**	**Overall Safety:** ◆ Worker must have apron on and hair tied up at all times, hands need to be washed at the start and end of each process. ◆ No foreign bodies accidentally falling into product at any stage ◆ Work surface and equipment used must be clean and free of dirt at all times **Overall Quality:** ◆ High quality ingredients must be used ◆ Each process must be followed accurately and all quality checks performed to ensure a high quality product	**Finished Product:** Chocolate Cheesecake with Strawberries **Packaging:** N/A **Storage:** In fridge to keep cake chilled and set

15

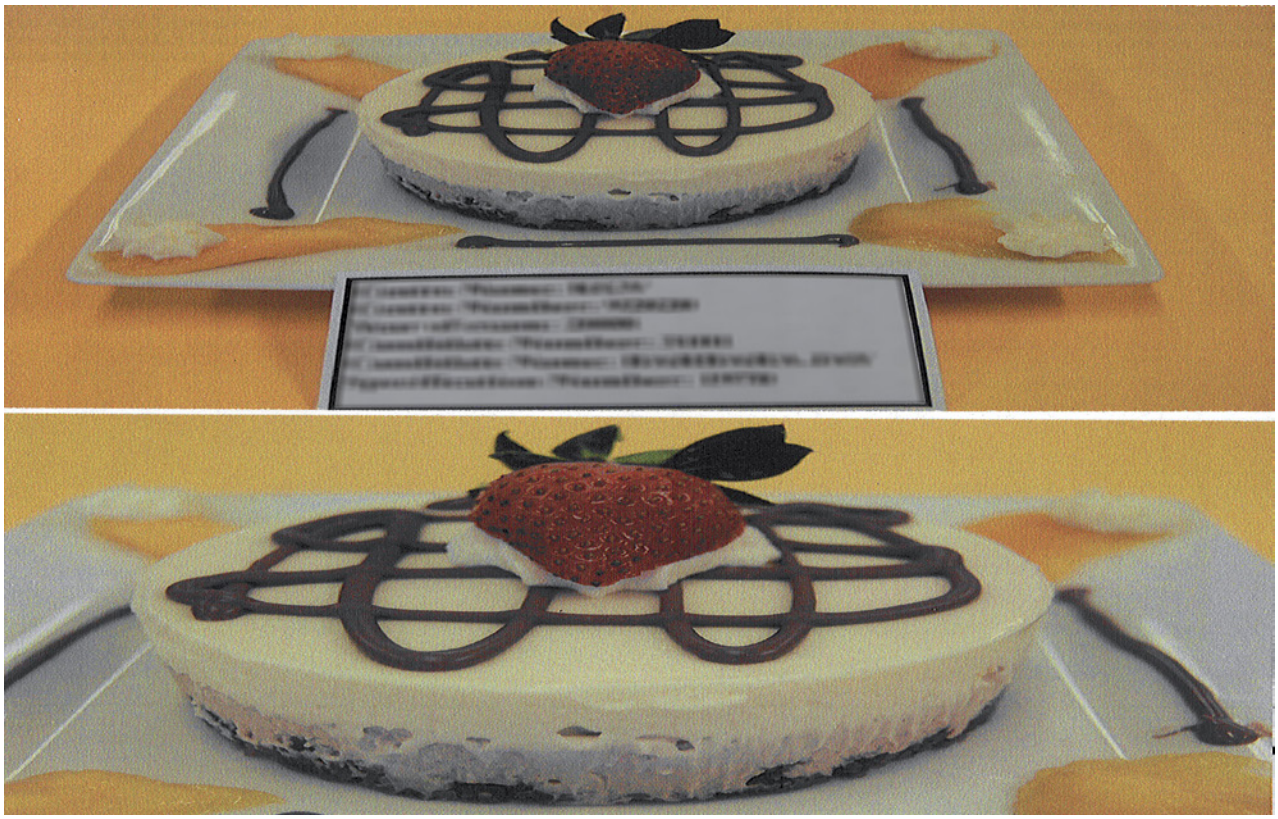


Moderator comments

The production plan should show the correct sequence for the range of products to be made. The time plan should include the processes, temperatures, timings and quality control to be undertaken during a student's intended product manufacture and this can be done through a chart or a flow chart that covers the stages of production and identifies where quality checks can be made.

The example here shows a comprehensive work schedule and a flow chart for one product, but centres can submit time plans in a format that suits the centre.

Task: 5.1 Quality of manufacture and 5.2 Quality of outcome



Moderator comments

It is essential that students provide detailed evidence of them making their product and this should be done through a series of clear photographs that illustrate the processes, techniques and skills involved. Photographs of making in progress and the final outcomes are the only evidence a moderator will see, so it is essential that images are detailed in order to show what a student has done. In the images shown here, the student has provided sound evidence of a range of skills and processes that support the range of final products.

Task: 6.1 Quality of manufacture and 5.2 Quality of outcome

CRITERIA 6: Devise and Apply Tests to Check the Quality of the Product

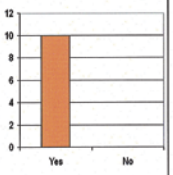
Tests and Checks

Total specification points met: 9 out of 11

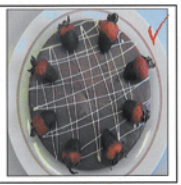
On this page I will list out all my design specification points and evaluate my product against each of them, using evidence from various sources to see how I have achieved points on my specification.

During the taste testing of my final product, I produced a questionnaire for my participants to fill in, which gives me feedback on the product based on my specification as well as the sensory qualities for the product. All the participants were part of my target group—teenagers and adults. All the graphs on this page are the results of the various questions I had, and the bolded questions under each specification point is a particular question included in my questionnaire.
The questionnaire can be seen on the next page.

Design Specification Point 1: ✓
Eaten after a meal for dessert or tea
Do you think this dessert is suitable to be eaten as a dessert after a meal or as a tea time snack?
All participants of the questionnaire agreed that my product is suitable to be eaten after a meal for dessert of as a part of a tea meal.



Design Specification Point 2:
Cake, pie or tart based
My product is a cheesecake, so it is a cake type of dessert. ✓

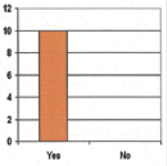


Design Specification Point 3: ✓
Appeal to teenagers and adults
Does this dessert appeal to you in an overall sense?
All my participants thought that my product was appealing to them.

Design Specification Point 4: ✗
Low in fat (Below 20g in 100g portion)
My product is not low in fat as it contains 26g of fat in a 100g portion. However, the fat content has already been reduced, but only by 6g. This means my fat reduction was not very successful.

g	g	g	g	g	g		
Protein	Fat	CHO	Sugar	Starch	NSP	kCal	KJ
4	26	23	17	6	1	324	1349

This product is modified to be low in fat. Do you think the texture and taste of the product is still acceptable after the reduction of the fat content?
Most people thought that the product didn't taste like it has been reduced in fat.

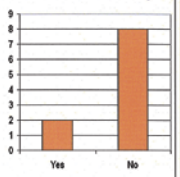


Design Specification Point 5: ✓
Include fruit
Do you think there is a sufficient amount of fruit in the dessert?
My product includes fruit as there are strawberries both in the filling and for the decoration. However, feedback tells me that there could have been more fruit in the cake.

Design Specification Point 6: ✓
Good appearance
Does the appearance and presentation of this cake appeal to you?
All of my taste testing participants thought that the cake had a good appearance, and they would try the cake judging by its appearance.

Design Specification Point 7: ✓
Have a creamy, rich and fruity texture
Does the dessert have a creamy, rich and fruity texture?
According to the sensory analysis, the cheesecake is very creamy and the texture of filling was also high rated. Participants thought that the cheesecake was fairly rich. I think that the cheesecake was not very fruity as the fruit was not incorporated into the filling.

Design Specification Point 8: ✗
Served cold
Do you think that this dessert is served cold enough?
Although the cheesecake is to be served chilled after manufacture, I did not have enough time to chill my product for taste testing, so most participants thought that my product was not served cold enough. However, if it was to be manufactured commercially, it is certainly possible to have the cake chilled.



Design Specification Point 9: ✓
Eaten with cutlery
Do you think that this dessert is suitable to be eaten with cutlery?
All the participants thought that my dessert is suitable to be eaten with a fork or a spoon.

Design Specification Point 10: ✓
Served as a single portion
Is the size of the dessert suitable to be served as a single portion?
Most people thought that the portion size is suitable, but some people still thought it could have been slightly larger.

Design Specification Point 11: ✓
Cost between $21-$30 per portion
If this dessert was sold for $21 to $30 at Italian Tomato Café, would you buy it?
Most participants are would buy my product at the stated price, but some thought it was still a bit too expensive. However, to lower the cost the product can be sold at around $20 to $25, and probably most people would buy it at that price.

NUMBER OF PORTIONS	8.00
COST PER PORTION	$8.44
BULK INGREDIENTS DISCOUNT	$5.91
OVERHEADS MARK-UP	$17.72
SELLING PRICE PER PORTION	$17.72

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Criteria 6: Devise and Apply Tests to check the Quality of the product– Test and Checks

A Cheesecake Evident in pic(ture) ✓

Here is a picture of my final product, complete with the decoration that will have to made by hand when being produced in batch production, as the handling of the ingredients to make the decoration will have to be very delicate, which could only be achieved by hand.

Made with milk chocolate (Evident in ingredients) ✓

From the picture of my dessert and the method to create it, It clearly shows that the product is indeed, **a cheesecake** that is made by **milk chocolate**, which is a main ingredient, and thus a **non-fruity dessert**. By choosing ingredients such as chocolate and mango, and as desserts are preferably and usually **sweet**, this specification point was easy to achieve. It is an obvious **western dessert** that incorporates **soft ,creamy texture** and **could be sold chilled.** It evidently has both **fruity and non-fruity garnish**, the strawberry, whipping cream and chocolate, and is a **medium portion** that could be **eaten with cutlery**

A non-fruity dessert (Evident in picture) ✓

A western dessert (Evident in picture and ingredients) ✓

Fruit + Non-Fruity Garnish (Evident in picture) ✓

A cold dessert (Evident in method) ✓

Could be sold chilled (Evident in method) ✓

A single, medium sized portion? (Evident in picture) ✓

A sweet dessert (Evident in ingredients) ✓

We can see by the sugar content levels in the nutritional analysis or the ingredients used such as: milk chocolate, sugar, mango

Has a soft, creamy texture (Evident in ingredients and method) ✓

Nutritional Analysis

g	Product	Protein	Fat	CHO	Sugar	Starch	NSP	kCal	KJ	Na	Ca	Fe	VitA	VitD	VitC	VitE
311	Totals	14	58	78	70	8	1	958	3990	494	425	1	426	0.1	1	7.4
		g	g	g	g	g	g			mg	mg	mg	µg	µg	mg	mg
g	Per Portion	Protein	Fat	CHO	Sugar	Starch	NSP	kCal	KJ	Na	Ca	Fe	VitA	VitD	VitC	VitE
311	1	14	58	78	70	8	1	958	3990	494	425	1	426	0.1	1.2	7.4
		g	g	g	g	g	g			mg	mg	mg	µg	µg	mg	mg
g	Per 100g	Protein	Fat	CHO	Sugar	Starch	NSP	kCal	KJ	Na	Ca	Fe	VitA	VitD	VitC	VitE
100		5	18	25	22	3	0	307	1279	158	136	0	137	0.0	0.4	2.4

High in Calcium ✓

From the nutritional analysis, you can see that this dessert is high in calcium and it may be predictable that the dessert will be high in calcium due to its main ingredients begin cream cheese and milk chocolate, which are both extremely high in calcium.

xpected Shelf Life ✓

Along with many other Starbucks desserts, my product has additives which prolongs it shelf life. The predicted shelf life of my product is 3-7 days, providing that it is chilled in suitable chillers in Starbucks. This means that in a mass/batch production, production has to provide enough

Target Consumer Group - Teenagers ✓

This specification point is easy to achieve and to test whether I've achieved as my test testers are all teenagers. Whatever they complimented on the dessert, I kept and whatever their comments, I used it to modify the product. In the end, the final product was suitable for teenagers and well tailored to their needs/wants.

Low in fat ✓

Although the product is low in fat compared to many other products, there can be another modification whereas the amount of fat could be lowered. In other words, the product's fat content to be lowered even further. Examples would include using low fat chocolate and low fat cream. However, this specification point is achieved to a certain standard of 'low fat'.

High in Energy ✓

Again, according to the nutritional analysis the product contains 3990, which is an enormous amount of energy that will be sufficient for teenagers, who require that energy for daily activities and sports. This specification point was achieved extremely successfully and efficiently.

High in Iron ✗

Unfortunately, by looking at the nutritional analysis, the product was has virtually no Iron (Fe). To improve, and if I had more time or if I was allowed to, I would include a modification which would increase the amount of iron..

aten With Cutlery ✓

In my questionnaire, I asked my twenty taste testers whether they thought my dessert was a medium portion and whether it can be eaten with cutlery. All answered Yes, which means my final product meets this design specification point.

Also, my taste testers required forks to try my product, which further proves the need for cutlery. Also the recipe book where I got my original recipe was written by a western, including more western methods and flavors.

Suitable for Batch Production ✓

This product is suitable for batch production, and a detailed flowchart of how the factory should operate is shown in Criteria 4, and a detailed work schedule is also displayed, talking about what safety and hygiene actions should be taken to prevent accidents/ bacterial contamination. This product is highly suitable as there are equipment that are suitable for factory production of cheesecakes that are available.

Sensory Analysis Diagram

20 taste testers between the age of 14-17 taste tested my product then rated each of the following attributes (on the star diagram) on a scale of one to five. I then added all the scores up from each taste tester and calculated the average.

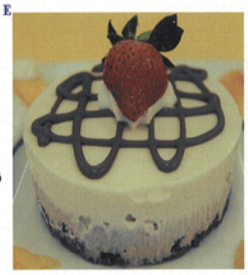
Costing

NUMBER OF PORTIONS	4.00
COST PER PORTION	$7.44
BULK INGREDIENTS DISCOUNT	$5.20
OVERHEADS MARK-UP	$15.61
SELLING PRICE PER PORTION	$15.61

Cost: Between $15-$25 ✓

The cost, including overheads, bulk ingredients discount, amount to $15.6. This meets my Design specification as it specifies the product to be in between the price $15- $25. Considering most Starbucks' desserts cost around $20-25, Starbucks can either raise the price to $20-$25 to earn more profit, or keep it as $15 to attract more customers who are willing to pay at that price for a high quality product.

E



'The finished product matches all but one specification: high in iron.'

Aim of Tests and Checks: This allows me to see whether I have met my design specification points or not and whether I still require modification from points I haven't achieved. This test and check allows me to reflect on what I've done and what will be needed to be done if I could have more modifications. In my dessert's case, I see from above my evaluation, that I still need to increase the amount of iron, and I've successfully achieved all other points.

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Criteria 6: Devise and Apply tests to check the Quality of the product

Modifications of the Product

The aims of modifying the product was to bring change that will nutritionally improve the product, or to improve its aesthetic appearance to the consumer. On the left is my final product, with it's four different modifications being made to the biscuit in its base, type of chocolate on the bottom layer, another flavor in the middle, and the type of cream cheese used. This affected a wide range of things: flavor, texture, appearance, color, aroma. If I could have one more modification, it would be to increase the level of iron.

Design Feature	Modification
Product Design	To create a product that is suitable for teenagers, high in calcium, iron and energy and is low in fat. It is also made so that it can be suitably sold in Starbucks
Ingredients	I could use standard components to reduce costs and time. The crushed biscuits in the base could be a standard component. However, it may change the texture and flavor. Also, by changing certain ingredients such as the fruit, I could change the flavor and texture of the product.
Manufacturing Process	To make the manufacture more cost effective I could modify the process by using a production line which reduces costs for transportation of ingredients and products within the factory. Also, by using machines instead of people, production can go for 24 hours and does not require a raise. How could you modify the process to make it more cost effective to manufacture? During the manufacture of the one-off product, I felt that there was always a rush and always constantly felt a time constraint. Chilling of each layer takes as long as 10-15 minutes per layer, and as there are two, it takes quite a large amount of time and requires expert handling in order to complete in time and a constant reminder.
Scale of production	We could modify the process to manufacture the product to a higher volume by using machines that will be able to hold the larger amount of ingredients that would be required to make a higher volume and amount of products. Also, this time, the scale of production was small and created only four cheesecakes. The processes altogether took a long time and many modifications could be done to save the time and reduce the time spent.
Target Market Group	This product is suitable for a large range of people, nutritionally and sensory-wise. Although my taste testers were all teenagers, it does not mean that my market is restricted. This product is also suitable for families, adults, children and pregnant women, as it is high in calcium, energy and is low in fat.

Evaluation of Product;

Summary of all the results of my tests and checks

Specification Point	Yes or No?
Cost	
Between the price (including profit) of $15-$25	YES
Product type	
A cheesecake	YES
Cold/Chilled Product	YES
Made with Milk Chocolate/Non-fruity	YES
A sweet dessert	YES
A single medium portion	YES
Can be eaten with cutlery	YES
Fruity and non-fruity garnish	YES
Western styled dessert	YES
Creamy soft texture	YES
Nutritional Detail	
High in calcium	YES
Low in fat	YES
High in energy	YES
High in iron	NO
Target consumer group	
Teenagers	YES
Expected Shelf Life	
3-7 days (Chilled in Starbucks)	YES
Suitable for Batch production	YES

My design brief was to design and to create a product that is high in calcium, energy, high in iron and low in fat. It also has to be suitable for Starbucks and for my target market, teenagers. I have answered everything except for the 'high in iron'.

Questionnaire;

(Circle the appropriate answer)

What is your age?
12 13 14 15 16 17 18 19+

1. Do you think this dessert is suitable for teenagers? (Yes/No)
2. Would you buy this product if it was sold in Starbucks for $16? (Yes/No)
3. Do you think this product is a single medium sized portion? (Yes/No)
4. Do you think this a western dessert? (Yes/No)
5. Do you think this product's main ingredient is chocolate? (Yes/No)
6. Would you eat this product with cutlery? (Yes/No)
7. Do you think that this product is served cold? (Yes/No)
8. Should this product be chilled when stored? (Yes/No)
9. Does this dessert contain fruit? (Yes/No)
10. Is this dessert soft and creamy? (Yes/No)
11. Do you think that this dessert is appealing? (Yes/No)
12. Do you think this product is high in
    - Calcium? (Yes/No)
    - Iron? (Yes/No)
    - Energy? (Yes/No)
    - Low in fat? (Yes/No)

I created a questionnaire for the evaluation and analysis of my final product which included ten taste testers who have been coming regularly to my taste testing for a consistent level of criticism who know how many product generally to give a fair comment of what had changed, what improved and what needs improving. By doing this I can see my overall progress, and contrast to what I've started with and ended with. My taste testers throughout the whole project were teenagers, as my target market states, but it doesn't mean that my dessert won't appeal to other markets such as fami-

Results

Question	Yes	No
1	10	0
2	8	2
3	7	3
4	8	2
5	10	0
6	10	0
7	10	0
8	10	0
9	10	0
10	10	0
11	9	1
12a	9	1
12b	2	8
12c	7	3
12d	7	3

Results;

Some said that they would buy this product for $16 and two people considered it to be quite cheap in terms of good quality Starbucks products which is usually priced at $20-$25. They commented on how they would purchase this product, should it be presented into the market and be sold by Starbucks. Some thought that the product was a bit on the large size, although majority thought it was ok. All agreed that chocolate was the main ingredient, that the dessert required cutlery. The dessert must be served cold and chilled when stored, to preserve its freshness and prolong the shelf-life, they commented as well. All agreed that there was fruit in the cheesecake: mango and that this contributed to the soft and creaminess of the cheesecake. They said that the dessert is highly appealing and would buy this dessert in Starbucks often. After showing the taste testers my nutritional analysis, they agreed that the product is high in calcium, high in energy, low in fat low in iron.

If I were to modify my product, I would lower it even more in fat and increase the iron levels. I would also modify a larger range of fruits used for flavoring and to modify the fat content in the base and in the cream cheese. Some taste testers commented that the portion size was a bit on the large size though some say that they are getting their money's worth.

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Moderator comments

It is important that final products are tested and evaluated to establish whether or not they have been successful. In the example shown, the student has completed an integrated design and make activity, so the original product specification can be used to measure the performance and quality of the product.

If separate design and make activities had been set, a manufacturing specification would have been given to students and this would have been used to test the performance of the product. Students can also set their own test criteria, so long as they are able to use it to test the performance and quality of their work objectively.

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