



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCSE

Design and Technology

Food Technology

3542 (Full Course)

Higher

Copyright © 2003 AQA and its licensors. All rights reserved.

DESIGN AND TECHNOLOGY: FOOD TECHNOLOGY

Full Course – Higher TierQuestion 1

- a) Answers may refer to:
- barbecues becoming more popular and reasons why barbecues have become more popular
 - influence of other cultures as people holiday abroad more
 - influence of multi cultural consumers
 - more leisure time
 - busy lives - less time to cook and prepare foods
 - less skills needed
 - easier/quicker to prepare than fresh
 - new technologies have led to wider range of products available
 - gender issues - men cooking
 - lifestyle changes - use of garden/ leisure time/ influence of continental eating outdoors
 - global changes/changing weather patterns
 - value for money
 - media influences

A number of simplistic answers or one detailed answer showing clear understanding. 3-4 marks

Several simplistic answers showing some understanding. 1-2 marks

4 marks

- b) Answers should refer to disadvantages of ready prepared foods.
- more processed foods
 - nutritionally may be inferior e.g. high in fat, salt, calories, soya, sugar, low in fibre
 - may need specialist storage facilities e.g. freezer
 - no control over manufacturer e.g. quality of ingredients, production methods
 - reference to some economy products being poor value for money/ inferior compared to 'home made' (cheaper/ more expensive need to be qualified)
 - may include GM modified ingredients
 - nutrients lost in processing not replaced
 - may include ingredients relating to food allergies
 - cannot be modified to suit consumers or individual needs of family members
 - impact on small butchery business
 - more waste from packaging
 - high risk of food poisoning if instructions not followed

A number of simplistic answers or several detailed answers showing clear understanding. 3-4 marks

Several simplistic answers showing some understanding or one detailed answer. 1-2 marks

4 marks

- c) Focus is on types of information and on the software programs used by manufacturers
Use of computers for gathering information:

- use of Internet for searches/ comparative shop/ costings
 - Internet/ Email to contact other people/ manufacturers
 - Word processing for production of surveys/ questionnaires
 - DTP for producing surveys and questionnaires
 - spreadsheets to communicate results as graphs/ charts
 - nutritional/ product analysis programs to investigate product characteristics
 - Databases to give information on products/ customers
 - CD roms (not disks) as information sources
 - Digital cameras- photographs for research
 - bar coding
 - input, recording business data for future use
 - business data for future use
 - CAD - information on appropriateness of design proposals
 - CAM- feedback of information from production line e.g. size, quality
 - traceability of ingredients
- any other relevant correct answer.

A number of simplistic answers or one detailed answer showing clear understanding. 3-4 marks

Several simplistic answers showing some understanding. 1-2 marks

4 marks

Total 12 marks

Question 2

- a) i) Answers should include notes and labelled sketches.
Responses may include prose, 2D or 3D labelled sketches showing a range of the main features of the product e.g. cross sections, ingredients, dimensions, colour, finishing techniques, cooking methods for both the main product and the marinade.
- 2 different main products should be shown
 - 2 different marinades
 - N.B. Mayonnaise/ sauces not classed as marinades
 - Examples of acceptable ingredients: Marinades may include yoghurt, vinegar, oil, onions, lemon/ lime juice, tomato juice (not sauce), honey, mustards.

Recognisable sketch/ prose shows good communication of the main features of the relevant product.	4-5 marks
Sketch/ prose shows basic ideas for a relevant product but not clearly communicated.	2-3 marks
Sketch/ prose attempted but inappropriate product chosen.	0-1 marks
2 x 5 marks for each design idea	

10 marks

- ii) Responses should describe how chosen idea meets the criteria e.g.
- savoury, main course indication of savoury ingredients
 - type of marinade used
 - how product meets the needs of the consumers e.g. dietary/cultural needs/veg/age related
 - how product includes both sweet and savoury flavours
 - how product includes variety of colour
 - how product provides a hot barbecue item
 - products chosen are suitable for serving without use of cutlery

Answers should expand upon design criteria given in the question and not be repeats of the same points. Maximum of 3 marks for straight repetition of design criteria with no qualification.

Describes in detail how product meets the criteria.	7-8 marks
Identifies how some of the design criteria are met.	5-6 marks
Some attempt to show how criteria are met.	3-4 marks
Little attempt to show how design criteria are met.	1-2 marks
	8 marks

iii) How and why ingredients are used:

Ingredient	Function
At least one ingredient for the product	Identifies different functions correctly Texture/ taste/ colour/binding/ enriching/ bulking
At least one ingredient for the marinade	As appropriate to ingredient Nutritional functions

Clear communication of a range of ingredients of **main product and marinade** identifying full range of functions correctly. 8-10 marks

Communication of main ingredients of product and marinade. (May only cover product or marinade). Identifies correct functions of some of the ingredients. 6-7 marks

Shows basic ingredients and some functions not clearly communicated. Some ingredients omitted or incorrect functions. 3-5 marks

Inappropriate ingredients chosen or little attempt to show functions. 1-2 marks

10 marks

b) Packaging of product:

Answers should include details of

- materials suitable: glass, metals, plastics, paper, paperboard, cellophane wrap, polythene, polystyrene as appropriate.
- with relevant reasons for use: lightweight, easy to print on, temp resistant, cost effective, recyclable, moulded.
- labelling details: Product name/ ingredient list/ storage/ shelf life/ cooking and instructions for use/ name address manufacture/ place of origin/ weight or volume.

Recognisable, detailed sketch/ notes, showing clear communication of a range of main features/ materials of packaging and labelling details. 8-10 marks

Recognisable, sketch/ notes/ shows clear communication of main features/ materials of relevant packaging. 6-7 marks

Sketch/ notes shows basic ideas for packaging but not clearly communicated. Some attempt to show labelling and/ or materials. 3-5 marks

Sketch/ notes attempted but inappropriate packaging chosen or little attempt to show materials/ labelling. 1-2 marks

10 marks

Total 38 marks

Question 3

- a) Answer should give different design ideas relevant to meeting the criteria for a colourful, sweet and spicy dip.

Examples:

Ingredients to be added	Reason
Sugar, chutneys, fruit, pineapple, honey, sauces, appropriate fruits e.g. dates, raisins, artificial sweetener.	To improve 'sweet' criteria result
Flavoured vinegars, tomato puree/ sauce, fruit, sweet and sour sauce/ Chilli, mustard, pepper, garlic, paprika, curry powder, Tabasco sauce, Worcester sauce, spices	To improve 'spicy' criteria result
Beetroot, carrot, mustard, mayonnaise, yoghurt, cream, herbs	To improve 'colour' result
Chopped vegetables, nuts, cornflour for thicker consistency	To improve 'texture' criteria result
Strong smelling ingredients e.g. onion, garlic	To improve aroma

Suitable ingredient added

1 mark

Reason given

1 mark

3 x 2 marks

Improves two different criteria appropriately, relevant reasons given for most.

5-6 marks

At least two different improvements given, some reasons may be omitted.

3-4 marks

Improves at one/ two criteria appropriately, may not include relevant reasons.

1-2 marks

6 marks

- b) i) Description of method may include an awareness of:
- number of people involved
 - number of samples involved
 - size of samples
 - labelling of samples
 - general method
 - what results to record
 - how results recorded
 - may name appropriate test: preference tests(e.g. paired/ hedonic ranking/ triangle)/grading tests (e.g. ranking/ rating/profiling)
 - blindfolding
 - cleansing of palate e.g. crackers, water in between samples
 - size of samples to be tasted
 - use of music background or quiet areas so environment does not affect sampling
 - random identification of samples
 - identical quantities, containers for samples
 - prior preparation of results charts
 - evaluation of results
 - clarity of instructions given to testers
 - leaving time between samples
 - target group

A number of simplistic answers or several detailed answers showing clear understanding. Names test used. 5 marks

Several simplistic answers showing understanding. 3-4 marks

Simplistic answer showing some understanding. 1-2 marks

5 marks

- b) ii) May give definition of testing in controlled conditions/ same conditions during design or production so that results are reliable or may give examples as shown below.

Environment:

- Controlled/ quiet/ well ventilated/ free from odours which could interfere with tasting
- away from the food preparation area
- large enough for panel members to be apart from each other/ individual booths
- suitable lighting for sensory testing
- clear instructions for panel
- use of background music or quiet areas so environment does not affect sampling

Consistency of approach:

- panel members must not talk to each other
- provide cold water/ plain biscuits/ bread for in between tastings
- food must be of the same temperature
- food must be labelled
- random identification
- identical containers for samples
- equal portions/identical quantities

Well explained answer - may give examples.

2 marks

Simplistic answer showing some understanding.

1 mark

2 marks

- c) Preservative:

- extends shelf life/ lasts longer
- additive
- prevents growth of micro-organisms/ food spoilage
- destroys/ inactivates micro organisms preventing food spoilage
- inhibits action of enzymes additive e.g. sulphur dioxide, anti oxidants
- NOT 'goes off'

Modified starch:

- thickens mixture/ improves mouthfeel/ aids uniformity
 - blending/ stabiliser
 - thickener not affected by acid
 - stabiliser/ to prevent separation
 - smooths texture/ prevents curdling
 - gives starchy component for energy
 - some pre gelatinised for instant thickening
 - can be used as a fat replacer in low fat mayonnaise
- NOT: binding/ flavouring

A number of simplistic answers or one detailed answer showing clear understanding.

2 marks

Several simplistic answers showing some understanding.

1 mark

2 x 2 marks

4 marks

Total 17 marks

Question 4

- a) i) allowances/ limits given
maximum and minimum limits/ national/ European
working outside limits will lead to unsuccessful outcome
important for consistency of outcome

Detailed response showing good understanding. 2 marks

Several simplistic answers showing some understanding. 1 mark

2 marks

- ii) specifications may include:
- dimensions weight/ size/ shape e.g. maximum and minimum limits
 - qualities of ingredients used e.g. tolerances in nutritional profiles %
 - names of ingredients and quantities e.g. tolerances in ingredient weights/ proportions
 - sizes to which ingredients may be prepared e.g. limits for size cut/ grated/ shredded to
 - cooking methods/ temperatures/ critical control points e.g. maximum and minimum temps.
 - packaging requirements e.g. size/ shape/ material of packaging
 - cooking instructions e.g. temperatures advised
 - storage instructions e.g. shelf life, temperatures

A number of simplistic answers or several detailed answers showing clear understanding and examples of tolerances. 5-6 marks

Several simplistic answers showing understanding, but may lack examples. 3-4 marks

Simplistic answer showing little or no understanding. 1-2 marks

6 marks

b) Hazards: Candidates should give a different hazard for each stage as relevant.

Stage	Hazards	Control
Preparation Shaping Chilling Packaging	<p><u>Microbiological</u>: e.g.</p> <ul style="list-style-type: none"> - cross contamination from other foods/ equipment - micro-organisms/ bacteria (not 'germs') - candidates may name different micro-organisms e.g. salmonella - packaging materials <p><u>Physical</u> e.g.</p> <ul style="list-style-type: none"> - glass from bottles/ jars/ light fittings - metal from machinery/ equipment/ packaging - wood from pallets - insects from plants, open windows - personal items from workers/ jewellery/ hair/ cigarettes <p><u>Chemical</u> e.g.</p> <ul style="list-style-type: none"> - cleaning chemicals/ paint/ oil from work area <p><i>*'microbiological/ physical/ chemical' are not essential for awarding marks</i></p>	<ul style="list-style-type: none"> - training of staff in food hygiene - food hygiene precautions e.g. protective clothing for staff - monitoring of activities e.g. use of digital temperature displays/ regular temperature checks/ packaging checks - regular checks on environment/ condition of work area - metal detectors - pest control/ insect repellent equipment - cleaning of surfaces/equipment with anti bacterial wipes/ cleaning agents - where food safety is hazard the use of critical control points for temp/ time to reduce risk e.g. chilling, storing, preparing - keeping raw/ cooked food separate - covering food storing food in correct temp/manner - must mention refrigerate/ freezer/ chiller - awareness of use by dates/ stock rotation checks - checking condition of packaging/ tamperproof/ sealing of packaging
4 x 1 different and relevant hazard, 4 x 1 related controls		

- Clear communication of a wide range of hazards and the related control measures needed throughout the production system. 6-8 marks
 - Communicates some knowledge of hazards and the control measure related to most of these. 3-4 marks
 - Communicates basic knowledge of most common hazards and/ or the related control measures. 1-2 marks
- 8 marks**

c) Critical control checks:

May describe checks related to CRITICAL times or temperatures.

*note: critical controls relate to aspects that may cause physical harm to consumer.

Therefore dimensions/ colour/ shape not applicable.

Examples

- times: cooking, storing
- temperatures: use of food probes/ temp of refrigerator/ freezer/ reheating temps
- detection of foreign bodies/ metal detection
- monitoring of stock rotation/ ingredient quality/ random sampling
- bacterial count

Qualified answers giving detail of checks.

3-4 marks

Simplistic answer/s naming area of check only.

1-2 marks

4 marks

Total 20 marks

Question 5

Problem	Causes	Control
Uneven size of red pepper	Incorrect setting/ attachment used on equipment. No quality control checks on size. Poor quality raw ingredients. Poor staff training/ not following product spec. Faulty equipment/ incorrect equipment. Inappropriate chopping techniques.	Improve quality control monitoring/ more regular checks. Alternative preparation methods Random sampling Visual checks Use of food processor not suitable Use standard component peppers.
Burger buns do not rise	Poor quality yeast/ inactive yeast. Incorrect temperatures/ times during preparation/ cooking proving. Incorrect proportions of ingredients/ incorrect ingredients used. More liquid to create steam. Not S.R. Fat slows down yeast growth	Check on temperature Check on timings Portion control/ weighing of ingredients. Reduce fat content.
Apples in salad go brown	Oxidation/ cell walls of apple are damaged during preparation/ exposing them to the air/ oxygen in the air cause Browning effect/ enzyme browning Relevant reference to insect activity/ bruising. Left out/ in the air/ not covered/ open. Not 'rotted' or 'not fresh'.	Coat pieces in a dressing/ cover with lemon juice to change acidity during preparation stage of production. PH testing. Use of MAP packaging Relevant preservation techniques.e.g. not salt Chill to slow down action Prepare immediately before use.
Oil and vinegar separate	Oil and vinegar do not mix/ will separate if left to stand. No emulsifying agent/stabiliser. Oil is lighter than water therefore floats. It is a temporary emulsion.	Mix immediately before use/ add emulsifying agent to stabilise e.g. egg, lecithin. Shake vigorously to suspend droplets before serving. Reference to hydrophilic/ hydrophobic ingredient.

A number of simplistic answers or one detailed answer showing clear understanding.
Covers both cause and remedy.
Several simplistic answers showing some understanding.

3-4 marks

1-2 marks

4 x 4 marks

Total 16 marks

Question 6

- a)
- incorrect/ unhygienic handling of food
 - not thawing food sufficiently
 - not cooking food for long enough
 - not cooking food to high enough temperatures
 - cross contamination from ingredients/ equipment
 - food left outdoors in too high temp.
 - food not protected from pests/ heat
 - lack of close water supply
 - inexperienced 'chefs'
 - many bbq foods are high risk foods likely to cause food poisoning
 - give credit for naming of food poisoning bacteria: e.g. salmonella
- other relevant answers

A range of simplistic answers or one/ two detailed answers showing clear understanding. 4-5 marks

Several simplistic answers showing some understanding. 1-3 marks

5 marks

- b) Candidates should identify items of food labelling that relate to safe preparation, cooking and storing of high risk foods.

Candidates may be given credit for identifying that some items are legal requirements/ prevention of food poisoning.

List of ingredients

- Can identify any high risk foods included in product so that control can be put in place.

Storage instructions

- identify best conditions to keep food
- gives temperatures
- symbols/ temp. range
- freezer guidelines if food stored again at home before use
- length of time for storage recommended

Shelf life/ use by/ best before/ display until dates

- will indicate safe time product can safely be kept/ used
- credit can be awarded for detailed description of different terminology

Special information

- may indicate if bones/ nuts/ additives are present these may endanger some consumers.

Instructions for use

- cooking instructions/ times/ cooking methods/ temperature/ preparation needed

Labelling specifically for the retailer: therefore **not relevant**

- bar coding for stock control
- display until dates

Communicates knowledge of a range of labelling and the implications to food safety related to most of these.

4-5 marks

Communicates some knowledge of most common food labelling and/ or the related food safety issues.

2-3 marks

Shows little knowledge of food labelling and/ or related food safety issues.

1-2 marks

5 marks

Total 10 marks

Question 7

Answers should relate examples to social, moral and cultural needs. Candidates do not have to cover all 3 areas to gain maximum marks.

Social needs:

- More leisure time: need for recreational foods
- Less skills: need for easy and quick convenience foods

Age related needs:

- Meeting the dietary needs of different aged consumers:
- credit to be given for examples e.g. mini burgers/ buns/ flavours
- special products for elderly/ children additive free/ allergies

Meeting the different dietary/ health needs:

- healthy option products for low fat, low sugar, high fibre
- health related conditions e.g. diabetes, fat CHD/ sugar- dental caries/ salt- blood pressure/ fibre - constipation, diverticulosis, cancer
- vegetarian options meeting moral issues related e.g. killing of animals

Moral needs:

- GM foods/ organic foods/ Environmentally friendly packaging/ additives
- Ethical issues: farming/ fishing methods/ sourcing of local produce/ fair trade/vegetarianism

Cultural needs:

- Meeting the needs of different cultures:
- religious food preferences
- traditional products related to country
e.g. kebabs from Italy/ Greece
burgers from America
- wide range of Continental salads
- sauces/ dressings using traditional ingredients:
e.g. different oils, herbs,
- wide range of flavours for marinades
e.g. Chinese, sweet and sour, BBQ, tandoori

*Credit may also be given for answers that explain why manufacturers are offering such a wide range e.g. changing lifestyles and greater awareness of social, moral and cultural issues.

Identifying needs through market/ consumer research	
Communicates sound knowledge of relevant products and can relate to a range of issues related to consumer needs.	9-12 marks
Communicates good knowledge of relevant products and can relate to different issues related to consumer needs.	7-8 marks
Communicates reasonable knowledge of products and can relate some of these to issues consumer needs.	4-6 marks
Shows basic knowledge of product range and how it meets consumer needs.	1-3 marks
	12 marks
	Total 12 marks

Total Marks on Paper 125