



ASSESSMENT and  
QUALIFICATIONS  
ALLIANCE

# Mark scheme

# June 2003

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## GCSE

Design and Technology  
Food Technology

3542 (Full Course)

Foundation

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## DESIGN AND TECHNOLOGY: FOOD TECHNOLOGY

**Full Course – Foundation Tier**Question 1

a) Answers may refer to any burger product: fresh, frozen, chilled

<b>advantage</b>	<b>reason</b>
Convenient Consistent: size/ shape/ flavour	If consumer lacks personal culinary skills
Saves time	Many processes already completed
Saves energy	Much preparation complete
Gives variety	Offers wide range of products and flavours Cater for a range of consumers tastes
Good for emergencies/ last minute	Some have extended shelf life due to packaging May be stored for use in future
Labelling gives consumer information e.g. storage, nutritional values, serving suggestions	Enables correct, safe preparation, cooking, informed choices
Value for money/ cheaper/ expensive	Convenient for all incomes/ working families disposable income for use on convenience foods
Guaranteed quality- taste, shape, quantity	Less risk of food poisoning or inferior products if from reputable supplier
Any other relevant answer	With relevant reason

Three relevant advantages well explained	5-6 marks
Two detailed answers showing clear understanding	3-4 marks
Or simplistic and detailed answers	
Simplistic answer showing some understanding	1-2 marks
	<b>6 marks</b>

- b) Focus is on types of information and on the software programs enabling information to be found.

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
  - CAD
  - CAM
  - traceability of ingredients
  - inputting/ storage of business data for future use
- any other relevant correct answer.

Two detailed answers showing clear understanding or mixture of simplistic and detailed answers	3-4 marks
Simplistic answer showing some understanding	1-2 marks
	<b>4 marks</b>
	<b>Total 10 marks</b>

Question 2

- a) Answers must relate to the chart results.  
No marks for 'burger product' as given in rubric

- served with a bread product
- suitable for children
- offers a variety of flavours

3 x 1 mark

**3 marks**

- b) Answers should include notes or labelled sketches.  
Product must be based on the design criteria given in a).  
Work should communicate design ideas for a burger that gives a variety of flavours, is served with a bread product and is suitable for young children.

Responses may include 2 or 3D labelled sketches or prose showing the main features of the product e.g. cross sections, dimensions, flavour, shape, texture, colour, ingredients, finishing techniques, cooking methods, addition of sauces, garnish.

Recognisable sketch/ prose shows good communication of the main features of relevant product. 4-5 marks

Sketch/ prose shows basic ideas for a relevant product but not clearly communicated. 3 marks

Sketch attempted but inappropriate product chosen/ prose. 0-2 marks

2 x 5 marks for each design idea.

**10 marks**

- c) **No marks awarded for choice of best idea.**

Explanation of how the product meets the design criteria.

- how product meets the needs of children e.g. reference to shape/ size/ flavour/dietary needs
- how it is a burger style product e.g. reference to shape, size, type of ingredients
- how products provide a variety of flavours e.g. reference to different flavours in burger/ bread products
- type of bread product chosen e.g. reference to suitability of shape size

A number of simplistic answers or one/ two detailed answers showing clear understanding 3-4 marks

Simplistic answer showing some understanding 1-2 marks

Maximum of 2 marks for straight repetition of design criteria with no qualification.

**4 marks**

- d) i) Work should communicate information related to the **bread product** only.  
Only main ingredients requested, therefore, flavourings, decoration not relevant, unless it is part of candidate's design.

<b>Ingredient</b>	<b>Why used</b>
Flour- plain, wholemeal, granary, strong not self raising.	Bulk, add fibre, texture, colour as appropriate, forms structure and shape
Fat - marg./ butter/ lard/ oil	Lengthen shelf life, add flavour/ colour as appropriate, softens
Salt	Flavour, strengthens
Yeast - dried, fresh, fast action	Rise, light texture
Liquid- water, milk, egg.	Moisture, flavour, colour as appropriate, helps to mix/ bind/ blend/ aids yeast activity
Sugar	Activate yeast

Relevant nutritional reasons acceptable

- Detailed knowledge of ingredient functions 5-6 marks
  - Some knowledge of ingredients and functions 3-4 marks
  - Simplistic knowledge of ingredients and/or functions 0-2 marks
- 6 marks**

- ii) Developments may relate to finish, texture, colour, shape, size or flavour of bread product e.g.

<b>Development</b>	<b>Reason</b>
Addition of cheese, onion, bacon, herbs, sauces, appropriate fruits e.g. dates, raisins. Not sugary foods.	Flavour
Addition of crispy bacon, tomato, wholemeal flour	Texture
Brushing with egg, milk, sprinkling seeds on top	Finish
Suitable small size for child's handling	Size
Interesting shapes to appeal to child e.g. people	Shape
Addition of herbs, tomato, cheese to colour	Colour
Addition of named foods	To increase specified nutrient content

Any other relevant ideas should be credited

A range of detailed ideas with relevant reasons

5-6 marks

A mixture of simplistic and detailed answers

3-4 marks

Simplistic answers or several ideas but no reasons

0-2 marks

**6 marks**

**Total 29 marks**

Question 3

- a) Reasons for using a marinade
- improve sensory appeal e.g. flavour, colour, texture, aroma
  - prevent foods drying out/ add moisture
  - prevent foods from burning
  - draws out moisture from foods/ to form liquid coating
  - to tenderise meat
  - add colour
  - add aroma
- 2 x 1 mark
- 2 marks**
- b) Answer should give different design ideas relevant to meeting the criteria for a colourful, sweet and spicy marinade.

Example:

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

Suitable ingredient to be 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 reasons. 1-2 marks

**6 marks**

- c) i) Answers should relate to 'sensory testing' **not** sensors.  
Sensory tests:

Preference tests            e.g. paired/ hedonic ranking/ triangle  
Grading tests              e.g. ranking/ rating/ profiling  
Accept any relevant generic term or individual named test  
Tasting, taste testing or star charts not acceptable

**1 mark**

- ii) 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
- blindfolding
- cleansing of palate e.g. crackers, water in between
- size of samples to be tasted
- 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.            4-6 marks

Several simplistic answers showing understanding.            2-3 marks

Simplistic answer showing some understanding.            1 mark

**6 marks**



- iii) 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/ random identification.

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/ in identical containers/ in equal portions

Candidates may refer to general 'fair testing' points.

Well explained answer- may give examples.

2 marks

Simplistic answer showing some understanding.

1 mark

**2 marks**

**Total 17 marks**

Question 4

- a) i) Food processor:
- consistency in size through use of appropriate attachments
  - consistency in shape through use of appropriate attachments
  - standard time
  - can test efficiency of production speed
  - less human error
  - examples e.g. chopping/ blending ingredients
  - processor can do more than one task e.g. can mix ingredients as well as cutting/slicing, less equipment needed
  - convenience/ efficient use of preparation time
  - safer method of preparation
  - more hygienic as less human contact with ingredient

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

Several simplistic answers showing understanding. 2-3 marks

Simplistic answer showing some understanding. 1 mark

**4 marks**

- ii) Electronic scales:
- easy to read digital
  - less human error
  - more accurate than balance scales
  - able to use very small amounts

A number of simplistic answers or several detailed answers showing clear understanding. 2 marks

Simplistic answer showing some understanding. 1 mark

**2 marks**

- b) Answers may relate to either the food processor or to general **food** safety but **not personal** safety.

Answers may relate to food safety, hygiene or both.

- food safety and hygiene training/ food hygiene considerations/ individual points related to personal hygiene, kitchen hygiene, time/ temp control checks/ use of food probes/ storage of food/ temperature/ conditions/datemarks/ cross contamination/ covering foods/ references to methods of preventing growth micro-organisms/ examples given.
- good personal habits e.g. not sneezing, coughing over foods.
- not working with food if infected.

A range of simplistic answers or several detailed answers showing clear understanding. 5-6 marks

Several simplistic answers showing understanding. 3-4 marks

Simplistic answer showing some understanding. 1-2 marks

**6 marks**

**Total 12 marks**

Question 5

a) Range of answers appropriate for each stage.

**checks**

Relating to: times, temperature, portion control, measurements, sensory qualities, accuracy of methods used, food safety and hygiene points as relevant.

Credit may be given for answers that show an awareness of checks and reasons why checks are needed. Specific temperatures not essential but may be given credit for extended answer.

**Examples:**

Storage of frozen chicken before use	Temp freezer/ Pest free/ ventilated/ hygienic/ monitoring of temp/ cross contamination. Awareness of use by dates/ stock rotation.
Preparing of chicken	Hygienic surfaces/ equipment/ colour coding of knives, chopping boards/ portion control/ weighing accurately/ thawing of chicken/ cross contamination raw: cooked food
Cooking chicken	Time/ temps/ use of food probes/ hygienic equipment Cross contamination issues
Chilling cooked chicken	Temps/ times/ cooling quickly/ covering/ cross contamination issues
Packaging the barbecue chicken for sale	Metal detector/ check on labelling. Printing/ tamperproof materials/ seal/ secure/ undamaged/ storage during packaging/ quantity Adequate timing for food safety

Credit should be given for correct temperatures when given:

i.e. freezers -18°C to -29°C

refrigerators/ chilling 1° to 8°C

food safety 70°- 75°C for 2 min

Control measures: answers may also relate to the production stage as appropriate e.g

- 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 areas
- 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, storage, preparing
- keeping raw/ cooked food separate
- covering food.
- storing food in correct temp/ manner- must mention refrigerate/freezer/ chiller
- checks on size/ shape/ sensory qualities of product

For each production stage

Qualified answer

2 marks

Simplistic unqualified answer

1 mark

5 x 2 marks for relevant and correct control check

**10 marks**

## b) Problems in production

<b>Problem</b>	<b>Causes</b>	<b>Control</b>
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.	Improve quality control monitoring/ more regular checks on staff/equipment. Alternative preparation methods. Random sampling. Visual checks. Use standard component peppers. Not use of food processor.
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. flour.	Check on temperature. Check on timings. Portion control/ weighing of ingredients.
Apples in salad go brown	Oxidation/ cell walls of apple are damaged during preparation/ exposing them to the air/ oxygen in the air causes 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. Oil is lighter than water therefore floats.	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 clear understanding.

Covers both cause and remedy.

3-4 marks

Several simplistic answers showing some understanding.

1-2 marks

4 x 4 marks

**16 marks**

**Total 26 marks**

Question 6

- a)
- to protect e.g. during transport
  - to promote e.g. to advertise
  - to inform e.g. to give consumer nutritional advice
  - to contain e.g. to prevent spillage
  - to preserve e.g. to extend the product shelf life
  - to stop tampering e.g. to stop people removing contents
  - ease of storage/ stackability
  - prevent contamination
  - provide own cooking container
  - NOT 'keep fresh'

A number of simplistic answers or detailed answers showing clear understanding. 5-6 marks

Several simplistic answers showing reasonable understanding. 3-4 marks

Simplistic answer showing some understanding. 1-2 marks

**6 marks**

- b) i) Specifications may include any of the following:
- will not affect flavour of the food
  - cost effective
  - airtight to prevent dehydration and weight loss
  - provide a moisture barrier
  - strong enough to protect product without crushing
  - lightweight
  - firmly sealed
  - easy for customer to open
  - meets food hygiene regulations
  - allows customers to see product
  - looks attractive to encourage customers to buy
  - provides information about product e.g. nutritional value, storage
  - ease of handling/ storage/ transport
  - appropriate sizing for product

3 x 1 mark

**3 marks**

- ii) Answers may relate to relevant functions of packaging and/ or to properties of materials.

<b>Material</b>	<b>2 reasons</b>
Foil sachets	Can be moulded, strong, reusable, rigid, low cost, easy to print on, good for individual portions, recyclable
Paperboard (not cardboard)	Strong, reusable, low cost, lightweight, easy to print on, recyclable
Plastics/ clear film may relate to different forms of plastic in answer e.g. cellulose film for covering dishes, resistant plastics for containers with relevant properties.	Can be moulded, moisture resistant, lightweight, easy to handle, reusable, can be printed on, strong, low cost recyclable, see through
Polystyrene	Can be moulded, heat resistant, easy to handle, light, low cost, reusable

e.g. plastic bags (1 mark) can be seen through (1 mark) so that the contents can be seen to be in good condition (1 mark)

For each material:

A number of simplistic answers or one detailed answers 2 marks

or one detailed answer showing clear understanding.

Single/ simplistic answers showing some understanding. 1 mark

2 x 3 marks

**6 marks**

- c) i) **High risk foods are:**

- high in protein
- high in moisture
- need care with temperatures/ storage as easily become contaminated e.g. reheating foods on BBQ where heat is not specific, freezing foods, thawing foods
- most likely to cause food poisoning

DO NOT GIVE CREDIT FOR NAMES OF SPECIFIC FOODS. This is required in next question.

A number of simplistic answers or one detailed answer showing clear understanding. 2 marks

Simplistic answer showing some understanding. 1 mark

**2 marks**

- ii) Range of products:  
fish, burgers, steaks, kebabs, salads, dressings, marinades  
**BUT must qualify** the 'high risk food' i.e. chicken kebabs, rice salad
- iii) Candidates should identify items of food labelling that relate to safe preparation, cooking and storing of ready prepared 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/ informs on how to extend shelf life
- gives temperature
- symbols/ temp range
- freezer guidelines if food stored again at home before use
- length of time for storage recommended

Shelf life/ datemark/ use by/ best before

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

Instructions for use

- gives safe cooking times
- gives safe cooking temperatures
- guidelines for safe defrosting

Special claims

- peanut allergy/ lactose etc (link with safe use)

Candidates are not required to give full explanation for mark.

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
Some knowledge of food labelling requirements, some omissions or incorrect.	1 mark

**5 marks**

**Total 25 marks**



Question 7

Answers may include reference to healthy option products available

- Low/ reduced fat
- High fibre
- Low/ reduced sugar
- Low salt

Also

- Vegetarian options
- gluten free
- low cal
- peanut free
- low cholesterol
- additive free
- GM foods
- organic

as a means of better health

**Answers may also include how these are healthier options**

Examples

- low fat: removal of visible fat/ leaner meat/ low fat mayonnaise/ fromage fraise/yoghurt based dips
- high fibre: increase of bran/ whole wheat products/ wholemeal bread buns/ pasta/ rice salads
- low reduced salt: sugar use of sweeteners in sauces, dips, dressings
- vegetarian products use more vegetables- less fat content/ higher vitamin

**Answers may also refer to the risks to health**

- fat: coronary heart disease/ obesity
- sugar: dental cavities/ obesity
- salt: blood pressure
- fibre: digestion problems/ constipation/ diverticular disease/ cancer

Good communication of a wide range of related issues and relevant examples. 5-6 marks

Number of simplistic answers or detailed answers showing understanding of several aspects. 3-4 marks

Simplistic answer showing some understanding. 1-2 marks

**Total 6 marks**

**Total for Paper 125 marks**