CAMBRIDGE
International Education

Cambridge IGCSE™

FOOD & NUTRITION **0648/12**

Paper 1 Theory **October/November 2025**

MARK SCHEME

Maximum Mark: 100

Published

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

Cambridge International will not enter into discussions about these mark schemes.

Cambridge International is publishing the mark schemes for the October/November 2025 series for most Cambridge IGCSE, Cambridge International A and AS Level components, and some Cambridge O Level components.

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Generic Marking Principles

These general marking principles must be applied by all examiners when marking candidate answers. They should be applied alongside the specific content of the mark scheme or generic level descriptions for a question. Each question paper and mark scheme will also comply with these marking principles.

GENERIC MARKING PRINCIPLE 1:

Marks must be awarded in line with:

- the specific content of the mark scheme or the generic level descriptors for the question
- the specific skills defined in the mark scheme or in the generic level descriptors for the question
- the standard of response required by a candidate as exemplified by the standardisation scripts.

GENERIC MARKING PRINCIPLE 2:

Marks awarded are always **whole marks** (not half marks, or other fractions).

GENERIC MARKING PRINCIPLE 3:

Marks must be awarded **positively**:

- marks are awarded for correct / valid answers, as defined in the mark scheme. However, credit is given for valid answers which go beyond the scope of the syllabus and mark scheme, referring to your Team Leader as appropriate
- marks are awarded when candidates clearly demonstrate what they know and can do
- marks are not deducted for errors
- marks are not deducted for omissions
- answers should only be judged on the quality of spelling, punctuation and grammar when these features are specifically assessed by the question as indicated by the mark scheme. The meaning, however, should be unambiguous.

GENERIC MARKING PRINCIPLE 4:

Rules must be applied consistently, e.g. in situations where candidates have not followed instructions or in the application of generic level descriptors.

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GENERIC MARKING PRINCIPLE 5: Marks should be awarded using the full range of marks defined in the mark scheme for the question (however; the use of the full mark range may be limited according to the quality of the candidate responses seen).
GENERIC MARKING PRINCIPLE 6: Marks awarded are based solely on the requirements as defined in the mark scheme. Marks should not be awarded with grade thresholds or grade descriptors in mind.

Science–Specific Marking Principles

1	Examiners should consider the context and scientific use of any keywords when awarding marks. Although keywords may be present, marks should not be awarded if the keywords are used incorrectly.
2	The examiner should not choose between contradictory statements given in the same question part, and credit should not be awarded for any correct statement that is contradicted within the same question part. Wrong science that is irrelevant to the question should be ignored.
3	Although spellings do not have to be correct, spellings of syllabus terms must allow for clear and unambiguous separation from other syllabus terms with which they may be confused (e.g. ethane / ethene, glucagon / glycogen, refraction / reflection).
4	The error carried forward (ecf) principle should be applied, where appropriate. If an incorrect answer is subsequently used in a scientifically correct way, the candidate should be awarded these subsequent marking points. Further guidance will be included in the mark scheme where necessary and any exceptions to this general principle will be noted.
5	<u>'List rule' guidance</u> For questions that require ***n*** responses (e.g. State **two** reasons …): • The response should be read as continuous prose, even when numbered answer spaces are provided. • Any response marked *ignore* in the mark scheme should not count towards ***n***. • Incorrect responses should not be awarded credit but will still count towards ***n***. • Read the entire response to check for any responses that contradict those that would otherwise be credited. Credit should **not** be awarded for any responses that are contradicted within the rest of the response. Where two responses contradict one another, this should be treated as a single incorrect response. • Non–contradictory responses after the first ***n*** responses may be ignored even if they include incorrect science.

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6 Calculation specific guidance

Correct answers to calculations should be given full credit even if there is no working or incorrect working, **unless** the question states 'show your working'.

For questions in which the number of significant figures required is not stated, credit should be awarded for correct answers when rounded by the examiner to the number of significant figures given in the mark scheme. This may not apply to measured values.

For answers given in standard form (e.g. $a \times 10^n$) in which the convention of restricting the value of the coefficient (a) to a value between 1 and 10 is not followed, credit may still be awarded if the answer can be converted to the answer given in the mark scheme.

Unless a separate mark is given for a unit, a missing or incorrect unit will normally mean that the final calculation mark is not awarded. Exceptions to this general principle will be noted in the mark scheme.

7 Guidance for chemical equations

Multiples / fractions of coefficients used in chemical equations are acceptable unless stated otherwise in the mark scheme.

State symbols given in an equation should be ignored unless asked for in the question or stated otherwise in the mark scheme.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standard isation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
	Correct point or mark awarded
	Incorrect point or mark not awarded
BOD	Benefit of the doubt given
^	Information missing or insufficient for credit
REP	Repetition in response
I	Incorrect or insufficient point ignored while marking the rest of the response
R	Incorrect point or mark not awarded
CON	Contradiction in response, mark not awarded
SEEN	Point has been noted, but no credit has been given or blank page seen
	Key point attempted / working towards marking point / incomplete answer / response seen but not credited / blank page seen

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Question	Answer	Marks
1	*term used to describe a diet that provides all the necessary nutrients in the correct proportions* balanced (diet);	**1**

Question	Answer	Marks
2(a)	*different sources of plant protein* cereal e.g. wheat / spelt, oats, barley, rye, rice, maize, millet / teff sorghum; nuts e.g. almond, Brazil, hazelnut, walnut; seed e.g. hemp, chia, flax, pumpkin, quinoa, buckwheat, amaranth; Quorn;	**3**
2(b)	*how soya beans are nutritionally different from most other plant protein foods* soya is HBV / is a complete protein; soya contains all essential amino acids; most other plant proteins are LBV; most other plant proteins lack at least one essential amino acid;	**2**
2(c)	*reasons why the elderly require a good supply of protein in their diet* maintain bone health / repair bones; maintain / repair / renew worn out / damaged cell / body tissue / muscles; manufacture of antibodies / helps immune system; manufacture of enzymes; manufacture of hormones; facilitates transport in the body, e.g. haemoglobin is a transporting protein which carries oxygen;	**3**

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Question	Answer	Marks
3(a)	*sugar commonly found in fruit* fructose / glucose / sucrose;	**1**
3(b)	*animal foods that are a good source of carbohydrate* (dairy) ice–cream; buttermilk; cheese; crème fraîche; dairy food / product; fromage frais; kefir; milk; sour cream; yogurt;	**3**

Question	Answer	Marks
4(a)	*characteristics of polyunsaturated fat* does not add to body's cholesterol level / contains low cholesterol; found mainly in plants and fish; hydrocarbon chain is NOT saturated with hydrogen atoms / can accept more hydrogen / can be hydrogenated; has double bonds / contains more than one (C=C) double bond in molecule / two or more double bonds; liquid or soft fat (at room temperature);	**4**

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Question	Answer	Marks
4(b)	*good sources of polyunsaturated fat* canola oil / rapeseed; corn / maize oil; fish liver oil (or named e.g.); margarine; nut oil / butter or named example e.g. almonds, cashews, macadamia, pecan, pistachio, walnut; oily fish (or named e.g.); peanut / groundnut oil / butter; seed oil / butter or named example e.g. pumpkin, flax, safflower, sesame, sunflower;	**4**
4(c)	*changes that occur when fats and oils become rancid* aroma / smell; colour; loss of vitamins; oxidised; taste / flavour;	**2**
4(d)	*enzyme found in duodenum that converts fats to glycerol and fatty acids* lipase;	**1**

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Question	Answer	Marks
5(a)	*plant foods that are a good source of calcium* amaranth / teff grains; black–strap molasses; named dried fruit e.g. apricots, figs, currants; named fresh fruit e.g. prickly pear, orange, blackcurrants, kiwi; fortified breakfast cereals; fortified milk eg soya, pea, oat almond; green vegetables e.g. broccoli, cabbage, Chinese cabbage / bok choi / pak choi, kale, okra, spinach / kangkong (water spinach), Brussels sprouts, watercress; nuts e.g. almonds, Brazil nuts; pulses e.g. chickpeas, soya beans / edamame, haricot beans, peanuts; seaweed or e.g. Kombu, nori, wakame; seeds e.g. sesame / tahini, chia, flax; named soya product e.g. tofu, tempeh, TVP, flour; oats / oatmeal;	**3**
5(b)	*effects of calcium deficiency on the body* fatigue / lack of energy / tiredness; irregularity in muscle contractions / aching muscles / cramp / irregular heartbeat; osteomalacia / adult rickets / weakened bones; osteopenia; poor blood clotting; poor functioning in nerve cells / tingling of hands / finger / feet / toes; rickets / weakened bones; tetany; tooth decay / weakened teeth / sensitive teeth; weakened nails;	**4**

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Question	Answer	Marks
6	*functions of iron in the body* (haemoglobin) transports oxygen from lungs to body / cells / muscles; aids brain / cognitive function; aids immune system; component for formation of haemoglobin / red pigment in blood; component for formation of myoglobin (used to store / supply oxygen to muscles); involved in the production of energy / helps in conversion of food to energy / oxygen used by cells to produce energy; maintenance of cell functions / cell division / mitosis; prevents anaemia; reduces fatigue / lack of energy / tiredness; transports CO_2 to lungs for breathing out / disposal; used in enzyme systems;	**4**

Question	Answer	Marks
7	*health issues that may result from an excess intake of energy* energy stored as fat that leads to being overweight / obesity; type 2 diabetes; CHD / heart disease / stroke; hypertension; damage to joints / arthritis; risk of complications during surgery / pregnancy; varicose veins; hernia; psychological problems / low self–esteem;	**5**

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Question	Answer	Marks
8(a)	*reasons why bread is a staple food* affordable / cheap; bread is easy to make / bake; contains B–group vitamins; contains iron if wholemeal; convenient e.g. available precooked, ready to eat; easily available in many food outlets as preprepared or ingredients; filling; good source of carbohydrate / starch / source of energy; good source of plant / (LBV) protein; may contain calcium if fortified; versatile as can be eaten with different meals e.g. toast, roll, part of dish, sandwich, accompaniment; wheat can be grown in many countries; wholemeal varieties have dietary fibre / NSP;	**5**
8(b)	*reasons why people choose to make bread at home* can cater for allergies e.g. use gluten free flour, avoid nuts, make it suitable for anyone with lactose intolerance; can control the nutritional content for dietary needs e.g. use less salt / lo–salt, oil not butter, wholemeal flour; can personalise / add / choose ingredients going into the bread e.g. cheese, olives, dried tomatoes, onions; enjoy cooking; family tradition; have a bread maker; like having fresh bread whenever you want it; more convenient than having to shop for it every day / inaccessibility to shops / bakers; prefer the taste of home–made bread / tastes better; quality / know what is in bread e.g. additives / preservatives; religious concerns as to if bread is kosher / halal;	**5**

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Question	Answer	Marks
8(c)	*instructions for making a loaf of bread* sieve flour / salt; rub butter into flour / melt butter and add; add sugar and yeast to flour **OR** add sugar and yeast to water and allow to become frothy / ferment; add water to sugar, yeast and flour **OR** add fermented yeast, sugar and water to flour and mix to form a soft dough; knead thoroughly; cover and leave (in warm place) till double in size / prove; knead again / knock back; shape; prove till doubled in size; bake in hot oven;	**6**
8(d)	*ingredients that could be added to the bread recipe to change the flavour* cocoa / chocolate / chocolate chips; coconut; dried fruit e.g. apple, apricots, raisins, sultanas, currants, dates, strawberry, banana; garlic; grated cheese; honey; named essence e.g. vanilla, orange; named fresh fruit e.g. apple, strawberry, banana; named herb e.g. basil, oregano; named spice e.g. ginger, cinnamon, paprika; nuts / nut butter or named example e.g. almond, Brazil, walnut; olives; onion; seeds or named e.g. sesame, poppy; sun dried tomato;	**3**

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Question	Answer	Marks
8(e)	*different ways to make the bread attractive* glaze with egg wash, milk, milk and egg, butter; dust with flour; sprinkle with herbs e.g. basil, thyme, parsley; sprinkle with seeds e.g. sesame, poppy; sprinkle with oats; sprinkle with nuts; shaping / forming e.g. plait, cottage loaf, twist; top with sliced tomato, onion, olives, grated cheese; sugar sprinkled on top to caramelise; put design on top e.g. heart, letters, flowers;	**3**

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Question	Answer	Marks
9	*points to consider when choosing a wok* balance / weight of pan; colour; durable / long lasting / good quality / brand / manufacturer; thickness / gauge of pan; handle; handle; non–stick interior; pan material; price; size; type of stove it will be used on; *explanation of points to consider when choosing a wok* pan should be comfortably balanced / not too heavy / difficult / awkward to lift, manipulate / when filled with food / flipping food; pan will match / enhance / blend with kitchen décor; choose pan to get value for money and not have to replace too regularly; pan should retain heat / be strong enough to retain shape, not buckle; handle should be firmly riveted or welded to carry weight of pan when full of food; handle is insulated / made of material that is a poor conductor of heat so as not to burn hands; interior should be easier to clean / food will not stick to pan; pan should be good conductor of heat to cook food quickly; pan should be rust and corrosion resistant (carbon steel / aluminium / stainless steel / enamel / copper / cast iron); pan should be priced to suit budget dependent upon how much it will be used / compare prices; reliable brand with a warranty / relative to quality; diameter and depth of pan to suit intended purpose / family size / size of hob / storage space available; pan base suits hob so it will not wobble and makes good contact with burner / ring; reliable / well–known brand with a warranty;	**4**

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Question	Answer	Marks
10(a)(i)	*types of connective tissue found in meat* collagen;	**1**
10(a)(ii)	*effect of moist heat on each type of connective tissue* collagen is converted to gelatin by moist heat; very little change occurs in elastin during cooking;	**2**
10(b)(i)	*sources of vitamin C to serve with a grilled steak* black / red currants as sauce, individual, dessert, juice; blueberries as sauce, individual, dessert, juice; citrus fruit or named example as sauce, slice, dessert, juice; bell peppers; green vegetables or named example lettuce, peas, broccoli, cabbage, spinach; kiwi fruit as sauce, slice, dessert, juice; mango as sauce, slice, dessert, juice; potatoes; parsley; pineapple as sauce, slice, dessert, juice; strawberries as sauce, slice, dessert, juice; tomatoes;	**3**
10(b)(ii)	*how heat is transferred by radiation* heat causes meat molecules to vibrate which cooks meat; heat from grill travels through space / vacuum / air, no medium (gas, liquid, solid) is needed; heat is transferred directly onto meat from the grill; heat is transferred from grill by electromagnetic / infrared rays / microwaves; heat travels in straight lines from the heated grill to the meat; meat absorbs rays from grill / heat source; no direct contact of heat source and meat; no medium such as gas, liquid or solid is used;	**4**

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Question	Answer	Marks
10(c)	*reasons why some cuts of meat may be tough* age of animal, young animals have short, fine muscle fibres, older animals have long, thick muscle fibres; animal stressed before slaughter / animal must be rested beforehand without stress; frozen meat not defrosted thoroughly before cooking; incorrect cooking method used / tough meat requires moist heat / dry methods do not make tough meat tender / not cooked properly / oven temperature too high / overcooked / undercooked; meat contains a large amount of collagen / connective tissue and gristle / elastin; meat has long muscle fibres; meat has big / thick muscle fibres; meat not aged / matured / hung long enough after slaughter; meat not tenderised / marinated; muscles have had most movement / well–used parts produce thicker fibres with more collagen e.g. neck, leg;	**3**

Question	Answer	Marks
11	*reasons for having good ventilation in kitchen* avoid accumulation of bacteria; avoid build up of cooking smells; avoid build up of grease; avoid build up of smoke / vapours / fumes / gases; avoid build up of steam / condensation; avoid incidence of fainting / dizziness / poor respiration / suffocation of cook; avoid attracting flies / vermin to kitchen; avoid kitchen becoming too hot / stuffy / remove heat / hot air / maintain good working temperature / allow clean / fresh air to circulate / aeration of kitchen; avoid lack of air for complete combustion when using fired appliances; avoid potential for mould / fungi growth; avoid risk of gas poisoning / carbon monoxide accumulating;	**6**

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Question	Answer	Marks
12	*It is important for consumers to be aware of hygiene when buying food to reduce the risk of contamination. Discuss different ways that personal and food hygiene should be considered when buying food in shops and markets.* *personal hygiene [max 8 marks]* consumer / food handler should handle food with the appropriate, clean utensils / tongs / disposable gloves to avoid cross–contamination; consumer / food handler should have all cuts / wounds covered with (blue) plaster to prevent cross–contamination; consumer / food handler should have clean hands / short fingernails no nail varnish as bacteria thrive in dirt under nails; food handler should have clean overall / apron so bacteria from clothing is not transferred to food; food handler should have hair tied back / covered wear a beard net to prevent hair falling in food; consumer / food handler should not be coughing / sneezing or wear mask to avoid cross–contamination; food handler should not blow into bags to open them / lick fingers when picking up wrapping paper as bacteria in mouth passes to bag then food; food handler should not handle food and money as dirt on money is passed to food / wash hands if handling money and food unavoidable; food handler should use clean / different equipment / knives / boards for raw and cooked food as this avoids cross–contamination;	**15**

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Question	Answer	Marks
12	*food hygiene [max 8 marks]* check eggs before buying to make sure that none are cracked or dirty as they are a high risk food; check frozen food has not been stored above the load line as it may have started to defrost so bacteria may have grown; check the cleanliness of the premises / buy only from shops / stalls where environment is hygienically clean and tidy with no rubbish as this creates smells which attracts vermin / pests that can pass microorganisms on to food / food not stored on floor / bins covered; chemicals should not be stored near food in case of spillage which could affect foodstuffs; chiller / refrigerator / freezer should display temperature, if not cold enough bacteria will not be inactive so food with sp oil more quickly; choose markets that are in clean areas, not close to dusty places or where there is traffic pollution; choose reliable and reputable shops / markets that have hygiene certificates displayed; displayed food such as cakes, pastries, bread unless packaged should be covered to prevent attracting vermin, being covered in dust or people touching; do not buy food with damaged packaging as food may be contaminated with bacteria; do not buy tinned food which is dented / blown / rusted / bulging at the ends as harmful bacteria may have grown and food has begun to decompose; do not purchase food, especially high–risk food such as meat, eggs, milk, cheese, fish with abnormal appearance / foul smell as food may be contaminated; fresh meats, fish and dairy produce should be in a chilled cabinet and covered to prevent vermin, dust and people touching; premises should be insect free / have an insect electrocuter to prevent spread of bacteria from flies; premises should have separate hand washing / equipment washing facilities to maintain hygiene; raw and cooked foods should be stored separately to prevent cross–contamination; select fruit and veg that have a good vibrant colour with no damage / avoid fruit and veg infected with insects / holes in leaves / mould / black spots / slimy appearance / bruised / rotten or with bad smell as these will be vehicles to pass on contamination; when purchasing hot food ensure it is piping hot to ensure it is safe to eat; dry goods need to be stored in dry area not near wet food e.g. bag of flour beside fresh fish display to avoid cross–contamination;	

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Question	Answer	Marks
13	*Using your knowledge of nutrition and meal planning discuss ways to provide well–balanced, attractive meals for the healthy development of young children.* *nutrition and meal planning [max 10 marks]* follow nutritional tools – may name and describe a nutritional tool and how it helps support providing well–balanced meals for healthy development; have regular, small meals, ensure portion sizes are appropriate as children have small appetites and this will prevent over–eating / under–eating at meal times and avoid grazing / snacking between meals leading to reduced hunger at meal time; restrict consumption of processed foods that may be high in fat, sugar, salt and additives as these may lead to becoming overweight, dental caries, allergies; children need small / not excessive amount of fat as a concentrated source of energy / conveyor of fat soluble vitamins A / D / E / K; choose poultry, white fish, lean meats, cut fat off meat and choose cooking methods that involve little use of fat as it is harder to digest and can cause child to be overweight e.g. grill, bake, steam instead of fry; provide a nutrient–dense source of starchy carbohydrates (bread, pasta, rice, potatoes, breakfast cereals) for energy, wholegrain versions provide satiety to keep children feeling fuller and less likely to snack between meals and also promote good bowel health; reduce / limit consumption of sugary foods / ready–made desserts / cakes and biscuits / sugar–coated breakfast cereals / confectionery and fizzy drinks / dilute fruit juices / do not reward children with sweets to prevent tooth decay becoming overweight; no more than 2–3g of salt per day as excess may cause problems with kidneys / heart / liver / high blood pressure; include calcium / vitamin D to absorb calcium / fluoride / phosphorus for growth and development of strong bones and teeth, help with blood clotting, muscle contraction and reduce risk of rickets; include iron for formation of haemoglobin / energy production; include vitamin C for absorption of iron, bone structure and to aid the immune system, make connective tissue and heal wounds and prevent anaemia; include a variety of HBV and LBV protein for period of rapid growth and repair; include vitamin A for visual purple, support the immune system, aid growth and act as an antioxidant; include vitamin B group (thiamine / riboflavin / niacin) for release of energy from carbohydrates, fats and protein, aid normal growth and help nerve function; include vitamin K to assist blood clotting / aid absorption of calcium for bone development / health; provide adequate NSP / water to prevent constipation and dehydration but avoid too many NSP rich foods which are filling and may not allow other nutrient dense foods to be eaten;	**15**

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Question	Answer	Marks
13	*attractive meals [max 6 marks]* make the food easy to eat and digest by cutting or mash food if necessary to encourage independence / children may be put off by too much chewing or lumpy food; encourage children to participate in preparation of meals to stimulate interest and willingness to try different dishes; introduce new foods to broaden palette and provide variety and interest so picky / faddy / fussy eating is avoided; children like to pick at food / be interactive with food so encourage finger food eating if possible; use colour when presenting food to make meals more exciting and interesting and encourage them to eat e.g., eat all the orange food on your plate; make / cut food into interesting shapes to encourage fun mealtimes e.g. 'mountain' of mash with broccoli trees on the slope / a 'pond of cous cous' filled with shaped goldfish carrots / a face made with spaghetti hair etc.; provide a variety of textures with a meal to make a more pleasurable eating experience; decorate and garnish food appropriately to encourage consumption e.g. water lily tomato / cucumber butterfly / fruit swirl on top of yogurt; use named individualised / portioned / themed plates and cutlery to make presentation more attractive;	

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