Zig Zag Education

Food and Nutrition GCSE (9–1) | Eduqas

Differentiated Homeworks

for Eduqas GCSE Food Preparation and Nutrition

zigzageducation.co.uk **POD 8906**

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Contents

Teacher's Introduction

This resource contains a complete set of 21 homeworks which cover the theory content of the new Eduqas GCSE (9–1) Food Preparation and Nutrition specification. Each homework contains a variety of questions and activities presented in specification order and enables students to learn all of the content in preparation for their exam.

Remember!
Always check the exam board website for new information, including changes to the specification and sample assessment material.

The resource is fully differentiated, with homeworks available at two levels:

Lower ability: ●

Higher ability: ■

This resource aims to consolidate and reinforce the learning of theory content taught to students in class and provide an opportunity to learn, revise and practise key content. Activities provide opportunity for application of content to real examples in the food industry, while the inclusion of extension tasks enables students to be stretched and challenged and to delve deeper into the topics of the specification. Extension tasks are designed to be differentiated by outcome, where all students undertake the same task, but variety in results is expected.

The teacher is able to decide which homework (lower or higher ability) is most appropriate for each student on a given topic. This will allow students to cover the same content but with lower-ability students receiving more support and guidance through the carefully structured activities.

In order to save time for the teachers when marking, answers have been provided. Where the students are required to provide their own examples or a range of possible answers are appropriate, guidance is offered for marking.

September 2018

Specification cross-reference

Activity	Activity Title
1. Principles of nutrition	
1.	Macronutrients: Proteins, fats and carbohydrates
2.	Micronutrients: Vitamins and minerals
3.	Nutrients: Water and dietary fibre
2. Diet and good health	
4.	Energy requirement
5.	Planning balanced diets: Guidelines for a healthy diet, nutritiona
6.	Planning balanced diets: Nutritional needs of individuals with sp nutritional deficiencies
7.	Planning balanced diets: Nutritional needs of individuals with sp moral beliefs
3. The science of food	
8.	The effect of cooking on food: Why food is cooked, how heat is t affect food
9.	The effect of cooking on food: carbohydrates, fats, protein, fruit
10.	The effect of cooking on food: The positive use of microorganism
11.	Food spoilage: The growth conditions for microorganisms and th
12.	Food spoilage: Buying and storing food (how to store foods corre date marks)
13.	Food spoilage: Preparing and cooking food (the types of bacteria preservation methods, signs and symptoms of food poisoning)
4. Where food comes from	
14.	Food provenance: Food origins
15.	Food provenance: The impact of food production on the environ
16.	Food manufacturing: British and international cuisines
17.	Food manufacturing: Primary and secondary processing of food
18.	Food manufacturing: Technological developments that claim to s food production
5. Cooking and food preparation	
19.	Factors affecting food choice: Sensory testing
20.	Factors affecting food choice: The range of factors that influence
21.	Factors affecting food choice: Food labelling and marketing

Note to teacher:

- **Area 1: Food commodities**, **Area 3: Calculate energy and nutritional values of re**
  Preparation and cooking techniques and **Area 6: Developing recipes and meals**
  as extension tasks where appropriate for students to practise these skills at home
  not all skills are covered.
- Some spec points have been covered in other areas where it was deemed more a
  - Food choice (portion sizes and cost) is covered in Homework 5 alongside pla
  - Food choice (food choices dependent on religious beliefs) is covered in Hom
    diets

1. Macronutrients: Proteins, fats and ca

1) Fill in the gaps in the text below using the keywords to help.

Words to use:

bowel	plant	starch	unsatur...	carbohydrates	

Macronutrients include p...teins, fats and _____.

bec... ec... require them in _____ quantities

found in both animal and _____ derived foods. F

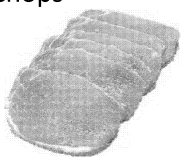
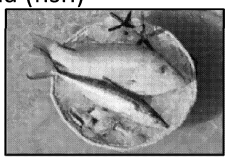
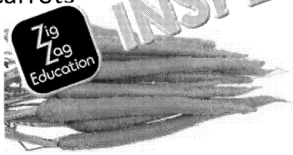
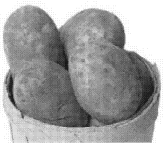
groups – ones that have single only bonds in the fatty acid chains are calle

and those which contain double or triple bonds are called _____

consist of _____, _____ a

proper functioning of the _____.

2) Identify whether the following foods given below are a main source of fat

Cheese 	Bread rolls 	Butter 
Grapes 	Pork chops 	Pasta 
Tuna (fish) 	Hazelnuts 	Cottage cheese 
Carrots 	Potatoes 	Oranges 

3) Match up the functions below to each of the different macronutrients (*fa*

Proteins	Help build hormones and
Fats	Provide protection of the
Carbohydrates	Provide the main source
	Dietary fibre supports bow
	Help develop antibodies and keep us healthy
	Increase satiety
	Building material of body
	Help dissolve and absorb
	Provide insulation from the

4) i) Using the keywords (provided), explain the difference between low b biological value protein

Amino acids	Quantity	Quality	

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ii) Describe what is meant by 'protein complementation' and give an ex

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iii) Some individuals cannot, or do not, eat protein from meat sources. l
alternatives.

1. .....

2. .....

5) i) Mark sources of saturated (S) and unsatu[illegible] (US) fats by marking w

Avocado		Salmon	Chocolate
Olive Oil	Cheese	Butter	Nuts

ii) What is the difference between monounsaturated fats and polyunsat

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6) Complete the table to explain the differences between the different types

Type of carbohydrate		Description
Starch	Polysaccharides	
Sugars	Monosaccharides	Group of carbohydrates built from one molecule of sugar only
	Disaccharides	
Dietary fibre		

7) Complete the table below to explain the effects of deficiency and excess c
identify the dietary reference values for healthy adults.

	Proteins	Fats
Effects of deficiency		• Loss of body mass • Vitamin deficiency • Hormonal disorders
Effects of excess		
Dietary reference value in % or grams for an average diet of 2000 kcal	10–15% (50–75 g)	

8) i) Describe the difference between essential amino acids and non-esse

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ii) From the amino acids h[illegible] ose and colour-code the essential a

hist[illegible]	alanine	glutamic acid	t
[illegible]enylalanine	serine	isoleucine	
glycine	lysine	proline	
aspartic acid	arginine	tryptophan	a

Exam-style Question

Essential fatty acids are an important part of a healthy, balanced diet.
Name **two** sources of essential fatty acids.

Extension Task

Design and/or modify a recipe that me[illegible] th[illegible] llowing criteria:

- is suitable for a vegetari[illegible]
- has reduced fa[illegible] m[illegible]
- ha[illegible] h f[illegible] ntent

When [illegible]g your recipe, try to apply various skills. For example:

- Knife skills – to cut meat, fish or protein alternative products
- Use of various cooking and preparation methods
- Use of starch to set a mixture

Use the Exte[illegible]

Extension Task worksheet

	What ingredients and cooking methods I CAN use	W
Vegetarian		
Reduce[d] co[nt]		
High fibre content		

Name of my dish: .....

Ingredients of my dish and why I chose them:

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My recipe – how to pr[epare] [d]ish:

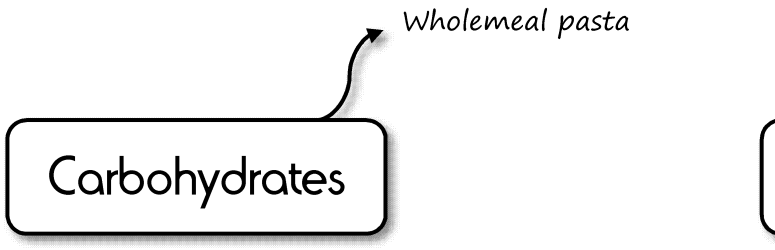
1. Macronutrients: Proteins, fats and ca

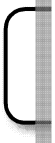
1) Using the keywords to help, describe what is meant by 'macronutrients'.

Words to use:

bowel	[illegible]nt	starch
carbohydrates	large	saturated

2) On e[illegible] the spider diagrams below, identify as many foods as you can f[illegible] protein or carbohydrate.





3) Identify the functions of each macronutrient (*fats, carbohydrates* and *pro*

Fats	Proteins

4) i) Explain the difference between low biological value proteins and hig

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ii) Describe what is meant by 'protein complementation' and give an ex

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iii) Some individuals cannot / do not, eat protein from meat sources. Id alternatives.

1. .....

2. .....

3. .....

4. .....

5) There are two types of fats that can be consumed in the diet. Describe th
found in the diet and give examples in your answers.

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6) Complete the table to explain the differences between the different types

Type of carbohydrate		Description
Sta	charides	
Sugars	Monosaccharides	
	Disaccharides	
Dietary fibre		

7) Macronutrients should be consumed in relative proportions as too much
health consequences. Provide the Dietary Reference Values for an averag
health consequences of a deficiency and excess of each macronutrient.

Proteins: .....

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Fats: .....

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Carbohydrates: .....

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8) i) Describe the difference between essential amino acids and non-esse

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ii) Name five essential amino acids.

1. .....

2. .....

3. .....

4. .....

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Exam-style Question

Describe a lunchbox for a teenager that would provide the macronutrients n
them energy throughout their school day. Justify your answer.

Extension Task

Your task is to [illegible] and make a three-course meal for a group of people
diet. [illegible] of the individuals are vegetarian, so remember to take account
maki[illegible] meal, see if you can identify any of the following processes or

Process:

- How acids denature/coagulate proteins

Skills:

- Knife skills – to cut protein sources
- Use alternative methods of cooking fat sources – grilling/baking
- Use starch to set a mixture

2. Micronutrients: Vitamins and minera

1) i) Colour code the fat-soluble vitamins given below with four different c
their *functions*, *sources*, *effects of deficiency* and *effects of excess* giv
some may require more than one colour).

Vitamin A	Vi[illegible]	Vitami

Functions		
[illegible]res proper growth of sperm cells	Lowers the risk of type 2 diabetes and cancer	Maintains healt nails and hair
Crucial for good eyesight	Prevents haemorrhages	Necessary for p bone and teeth and developme
Necessary for proper blood clotting	Antioxidant	
Effects of deficiency		
Tiredness	Dry and flaky ski[illegible]	Depression
Osteoporosis	W[illegible]d, [illegible]n skin	Brittle hair and
Excessive ble[illegible]	Muscle degeneration	Decreased imm
Effects of excess		
[illegible]daches	Jaundice	Degradation of blood cells
Stomach problems	Feeling weak	Itchiness
Swelling of the liver and spleen	Diarrhoea	Hair loss
Sources		
Fish and fish oil	Broccoli	Carrots
Cheese	Liver	Kale
Sunflower oil	Blueberries	Egg yolk

Note: *Vitamins E and K are not required by your specification, but hav
your knowledge on the four fat-soluble vi[illegible]s.*

ii) Complete the table below to identify the different types of water-sol and sources of micronutrients in the human body, effects of excess a

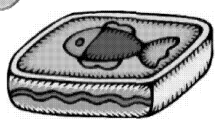
Name	Function	Effects of deficiency	
Vitamin B1 (thiamine)			
Vitamin B2 (riboflavin)	Important part of enzymes, takes part in creating haemoglobin		
Vitamin B3 (niacin)		4D syndrome – dermatitis (inflammation of skin), diarrhoea, dementia (loss of memory), death Low concentration (inability to focus), irritability Increased sensitivity of the skin to sunlight	
Folate / folic acid (Vitamin B9)	Important in the process of DNA synthesis, takes part in creating red blood cells, reduces the risk of spinal cord diseases in newborns		
Vitamin B12 (cobalamin)			
Vitamin C (ascorbic acid)	Takes part in collagen synthesis, helps with ingestion of iron, increases immunity, strengthens blood vessels		

2) i) Put a symbol next to the functions, effects of deficiency, effects of ex
them to each of the given minerals: calcium (Ca), iron (Fe), potassium
magnesium (Mg). Some of them may be used more than once.

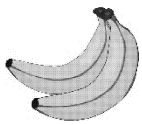
Functions		Effects of excess		Effects of defi
Helps build red blood cells		Demineralisation of bones		Muscle cramps, poor memory
Balances fluids in the body, keeps the blood pre… stable		…hoea, abdominal cramps		Nausea, diarrho… goitre
…s build strong bones and teeth		Constipation, feeling sick, stomach pain		Rickets and osteoporosis
Builds the thyroid gland hormones and coordinates metabolic rate		Chest pain, palpitations		Arrhythmia, hypertension
Builds tooth enamel, prevents tooth decay		Brittle tooth enamel, staining of teeth		Soft enamel, too… decay, improper… growth of teeth
Necessary to build DNA, controls muscle functions		Brain immaturity in foetus, can lead to weight gain		Tiredness, pale complexion, anaemia

ii) Identify which main mineral is provided by the sources below.

…ilk



sardines



bananas

red meat

3) Some nutrients work together to ensure the proper functioning of the hu…
which complement each other's actions in the body. Note that each nutri…
once or not at all.

- vitamin C
- …
- vitamin D
- magnesium
- folic acid

Exam-style Question

Many people follow a vegan diet.

a) Name **one** B vitamin which does not naturally occur in plant foods and may

b) Plants are rich in non-haem iron. Name **one** vitamin which improves iron a

Extension Task

Excessive sodium consumption can cause hypertension (abnormally high bl
doctors recommend to limit sodium intake to less than 6 g a day.

1) List herbs and spices that could replace salt in recipes.
2) Research the Reference Nutrient Intake for all of the fat-soluble and w
teenagers. Use the British Nutrition Foundation website as a source. C
values for girls and boys differ?

Use E

Extension Task worksheet

Herbs which could substitute salt:

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Spices which could substitute sal

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Reference Nutrition Intake for vitamins (highlight the higher values in red for e

	Teenage boys (14–16-year-olds)	Tee
Vitamin A		
Vitamin D		
Vitamin E		
Vitamin K		
Thiamine		
Riboflavin		
Niacin		
Folic acid		
Vita 2		
Vitamin C		

Why do the RNI values for boys and girls differ?

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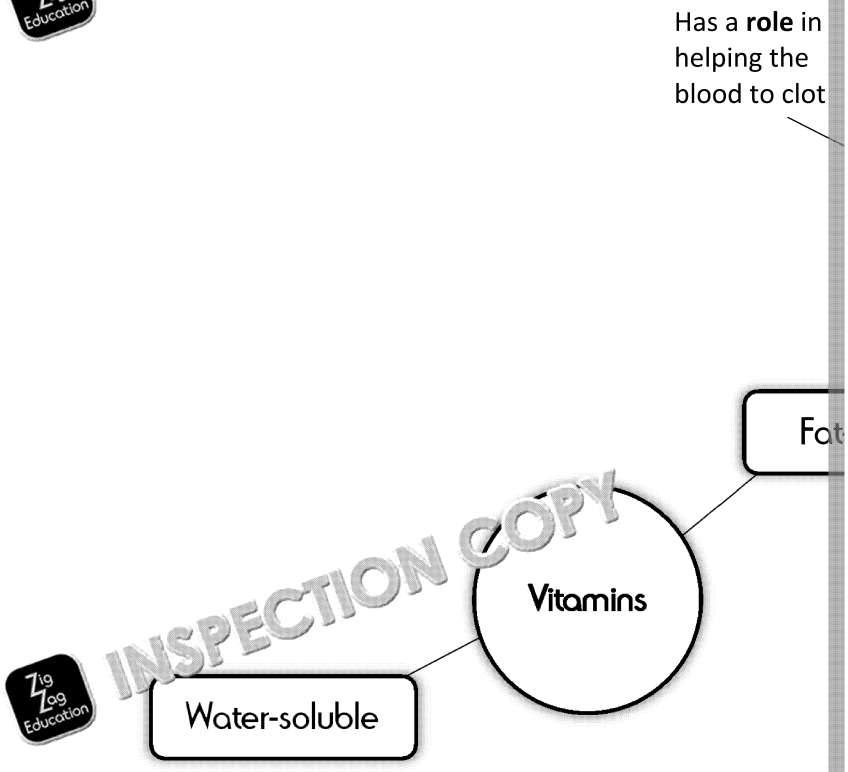
2. Micronutrients: Vitamins and minera

1) Complete the spider diagram to identify the different types of vitamins, th excess and deficiency, and sources in the human body. (One has been giv



Note: Vitamins E and K are not required by your specification, but have be your knowledge on the four fat-soluble vitamins.

2) i) Discuss the *functions* of the different minerals found in our body and of each, stating their *Dietary Reference Values*.

Calcium: .....

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Fluoride: .....

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Potassium: .....

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Iodine: .....

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Iron: .....

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Magnesium: .....

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ii) Identify one source of each of the minerals listed below.

Calcium	Potassium	Fluoride	Magnesium

3) Some nutrients work together in the body to ensure its proper functioning. Some of nutrients complement each other's actions.

i) calcium and vitamin D

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ii) iron and vitamin C

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Exam-style Question

Explain the reasons why a teenager should try to consume more micronutrie
Refer to three reasons in your response.

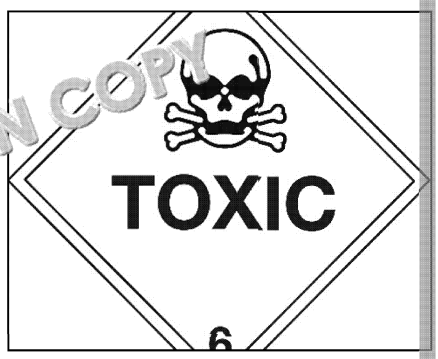
Extensi… Task

Excess…dium consumption can cause hypertension (abnormally high bl
doctors recommend to limit sodium intake to less than 6 g a day.

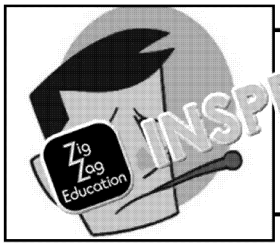
1) Research and list various herbs and spices which could substitute salt i
2) Research Reference Nutrient Intake values for all vitamins and mineral
Write an essay in which you explain potential discrepancies between v

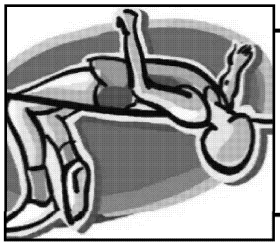
3. **Nutrients:** Water and dietary fibre

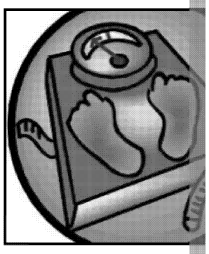
1) Complete the diagram to describe the functions of water and the importa



2) Look at the pictures and identify situations when extra fluids are needed.







3) Explain how water is lost from the body via:

i) lungs .....

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ii) kidneys .....

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iii) .....

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4) For each of the given effects of dehydration explain why it happens.

Feeling thirsty: .....

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Dark urine: .....

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A la nergy: .....

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Increased heart rate: .....

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5) i) Using the keywords below, fill in the gaps in the text to explain the r
diet.

soluble	fruit	cancer	
wholegrain products		constipation	
digestive	insoluble	sugars	

Dietary _____ is an important part of a _____

be found in _____, _____

_____. It plays a crucial role for the proper w

_____ tract. It can be divided into two group

_____. Pectin slows down ingestion of _____

therefore, prevents _____ blood sugar levels.

of the _____ and prevents _____

risk of diseases such as _____ and _____

ii) Colour-code the conditions in which a high-fibre diet may be of bene

tooth decay	hypertension	coronary heart disease	
osteoporosis	type 2 diabetes	scurvy	

Exam-style Question

Following a high-fibre diet can bring multiple health benefits.
a) Name **two** sources of dietary fibre in a diet.

b) State **two** reasons why people may choose to follow a high-fibre diet.

Extension Task

Hydration is very important for maintaining health. Every person needs diffe
depending on his or her activity levels, the weather, health, etc.

Design a poster to explain how water is lost from the body and how much a
to keep balanced.

3. Micronutrients: Water and dietary fi

1) i) Explain why water is necessary for health.

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ii) Give an example of a situation where dehydration may occur.

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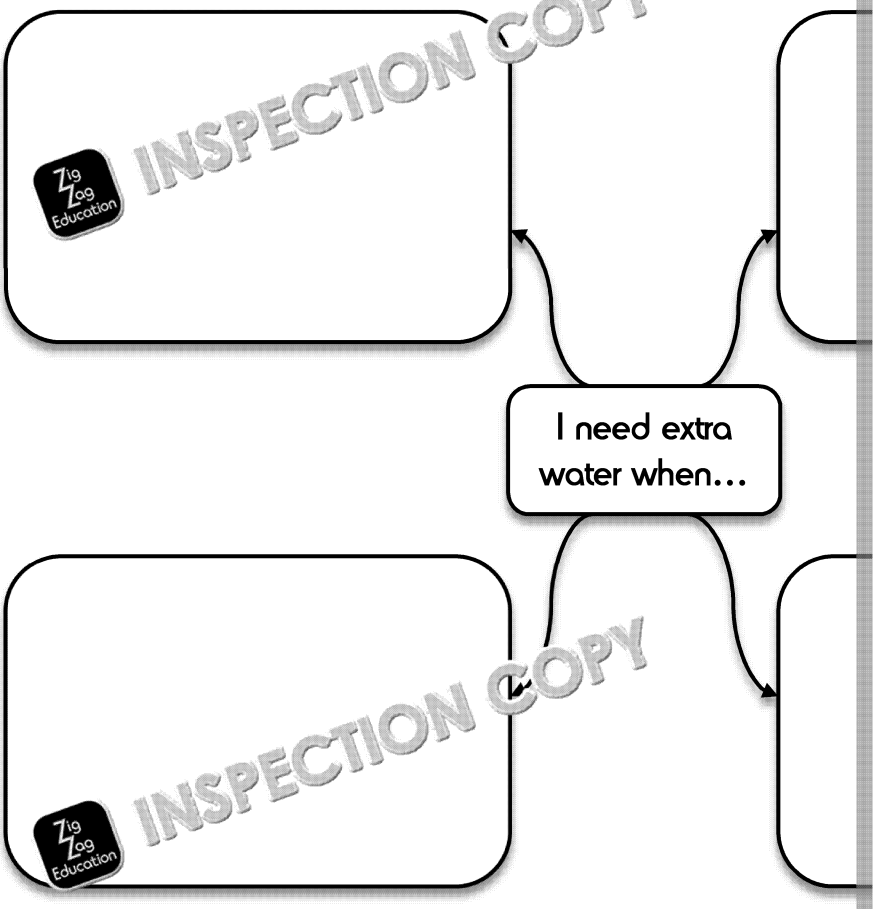
2) Complete the diagram about situations where extra fluid is needed.



3) List and explain at least three ways in which water is lost from the body.

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4) Identify four symptoms of dehydration and explain why they occur.

1. .....

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2. .....

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3. .....

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4. .....

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5) i) Explain the role of dietary fibre in the human diet and for health, usi

cancer	balanced	fruits	digestive	fibre
bowel	constipation	diabetes	vegetables	insolu fibre

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ii) Explain how a high-fibre diet helps to maintain a healthy body weigh

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Exam-style question

Follow igh-fibre diet can bring multiple health benefits.

a) Ide ify **three** health implications of a lack of fibre in the diet.

b) Identify **two** reasons why large amounts of water should be drunk whil

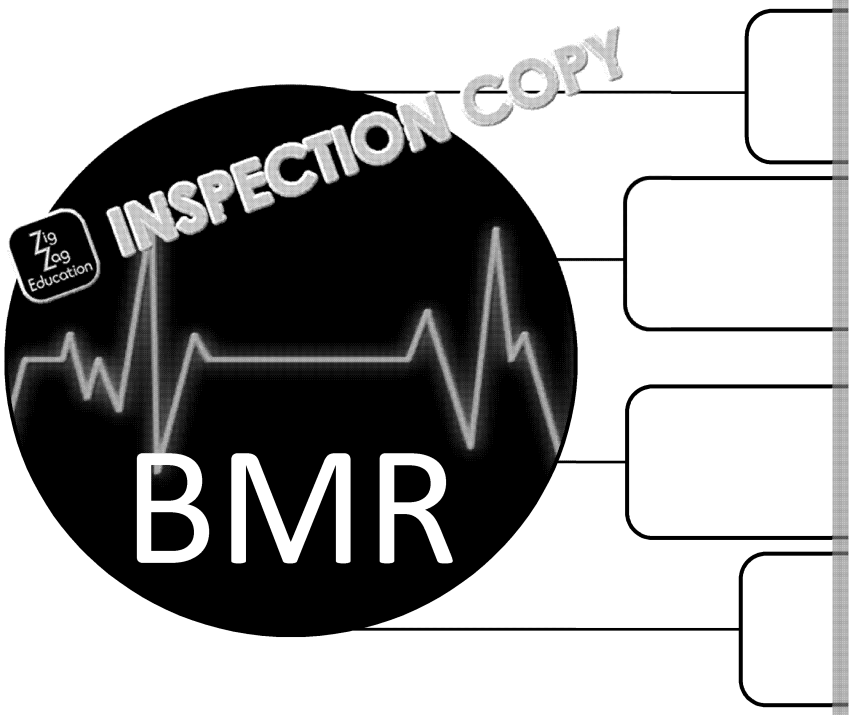
Extension Task

Hydration is very important for maintaining health. Create a leaflet that incl

1) three functions of water in the human body
2) how water is lost from the body
3) how much water is needed by a hea th , m erately active person
4) how much water is needed by a m thon runner on a hot day

4. Energy requirements

1) i) Indicate four factors which affect basal metabolic rate.



ii) Physical activity level (PAL) is the amount of energy needed to conduct *working, running, etc.* Explain how PAL affects energy needs of an in

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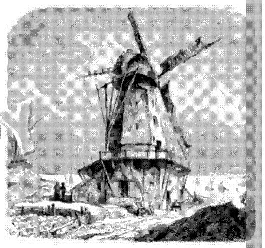
2) Match the macronutrients with the recommended percentage of energy t balanced diet.

Fats	Carbohydrates	Proteins
50%	15%	Up to 35%

3) Indicate what dietary changes might help maintain healthy body weight t
help you.



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4) Some individuals have higher energy needs due to their occupation and p
where the extra energy should come from in the diet for:

a) a marathon runner

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b) a weightlifter

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Exam-style Question

State **two** health effects of eating a high-calorie diet for a 50-year-old indivi
lifestyle.

Extension Task

Create a fact file to identify the main sources of energy in a balanced diet. I
- indicate the nutrients which provide energy in the diet
- identify how much energy they should provide every day (in %)
- list/draw food sources of those nutrients

Use the Exte

Extension Task worksheet

_____ fact file	_____
Provides _____ kcal in 1 gram	Provide
____% of energy in a ba[illegible] diet should come from it!	____% of energy in a
You can find it in:	Y
_____ fact file	_____
Provides _____ kcal in 1 gram	Provide
____% of energy in a balanced diet should come from it!	____% of energy in a
You can find it in:	Y

4. Energy requirements

1) i) Explain what 'BMR' and 'PAL' are.

BMR stands for .....

It is .....

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PAL sta .....

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ii) Explain how BMR and PAL affect the total energy needs of an individ

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2) Co th able to indicate the recommended percentage of energy i bala iet.

Macronutrient	Percentage
Fats	
Carbohydrates	
of which sugars	
Proteins	

3) Indicate three factors that can help maintain healthy body weight through explanation for your answers.

1. .....

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2. .....

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3. .....

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4) Some individuals have higher energy needs due to their occupation and p examples of when an individual is likely to need more energy and indicate this energy from.

i) .....

.....

ii) .....

.....

Exam Style Question

Explain how **three** different factors can affect the energy needs of individuals

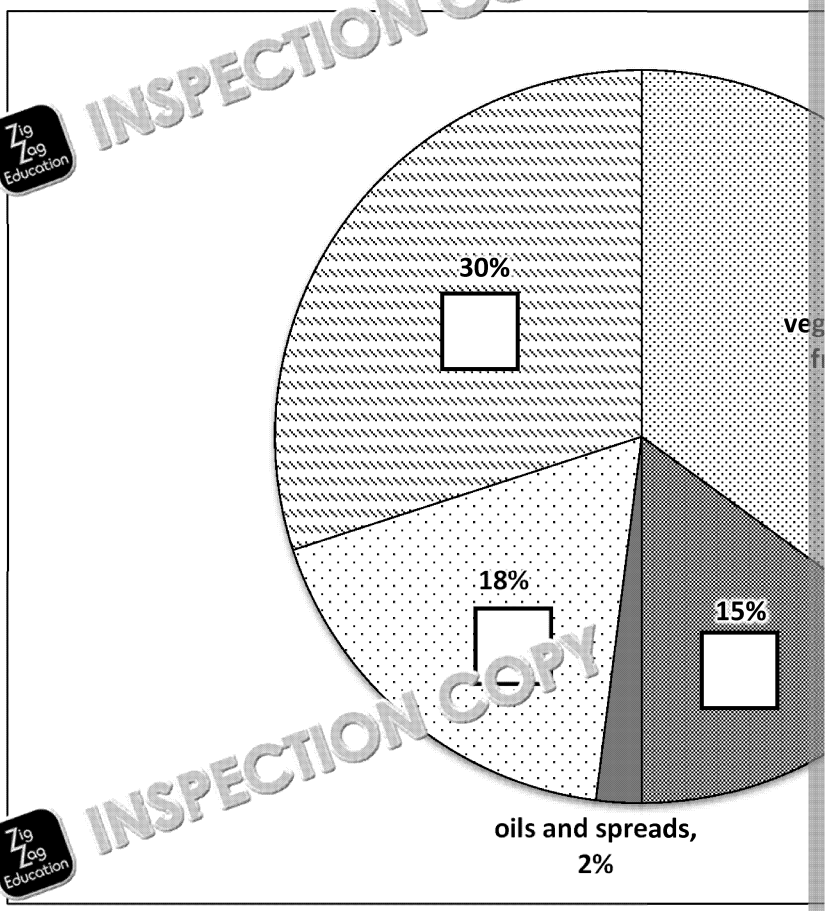
Extension Task

Write a journal article about the main factors that influence an individual's e In your article, you can refer to one or more factors, from: sex, life stage, bo lifestyle, health state or genetic factors.

5. Planning balanced diets: Guidelines diet, nutritional needs in different life s

1) The Eatwell Guide is a pictorial representation of the proportions of differ

i) Complete the diagram below to illustrate the different foods contrib



A. Potatoes, bread, rice, pasta and other starchy foods	B. Meat, fish, pulses and other protein-rich foods

ii) Explain why the Eatwell Guide indicates that only 2% of the plate is ma

.....

.....

.....

2) What dietary changes should be implemented at different stages of life, a
provided. Some of them might be used more than once. You can also use

More milk	Less salt	Less fat	Few an
Eat more fish	Cut down on fast foods	Increase physical activity	More le
Drink water	To prevent obesity	Increase variety of foods	To pre
To provide protein for proper growth	To prevent constipation	To prevent anaemia	More a

Group	Dietary changes	
Teenagers		
Adults		
Elderly		

3) i) Rachel wants to eggs, 10 g of butter, 100 g of ham and 50 g of chee
Calculate how much her meal will cost if:

- 10 free-range eggs cost £1.00
- 250 g of butter costs £1.70
- 150 g of ham costs £3.00
- 500 g of cheese costs £2.50

Food portion	Cost
2 eggs	
10 g butter	
100 g ham	
50 g cheese	
Total	

ii) Assess whether each meal is appropriate if:

Rachel is 5 years old	yes	no
Rachel is 15 years old	yes	no
Rachel is 65 years old with coronary heart disease	yes	no

4) The British Nutrition Foundation recommends that diets for toddlers and
'5532' guide. Match the number of portions with the foods they refer to.

5	
5	
3	p
2	

Exam Style Question

The Eatwell Guide is a graphic representation of how to balance your meals t
Give **two** reasons why the Eatwell Guide recommends that more beans and p

Extension Task

Using the calculator on ***zzed.uk/8906-recipe-calc*** design and assess a recipe
for a 15-year-old in terms of macro- and micronutrient intake.
Justify your choice.

Use the Exten

Extension Task worksheet

Step 1: dietary needs of a 15-year-old person

What macronutrients do he or she need? In what amounts?

.....

.....

What micronutrients do he or she need the most? In what amounts?

.....

.....

Step 2:

My meal's name: .....

Ingredients of my meal and why I chose them:

.....

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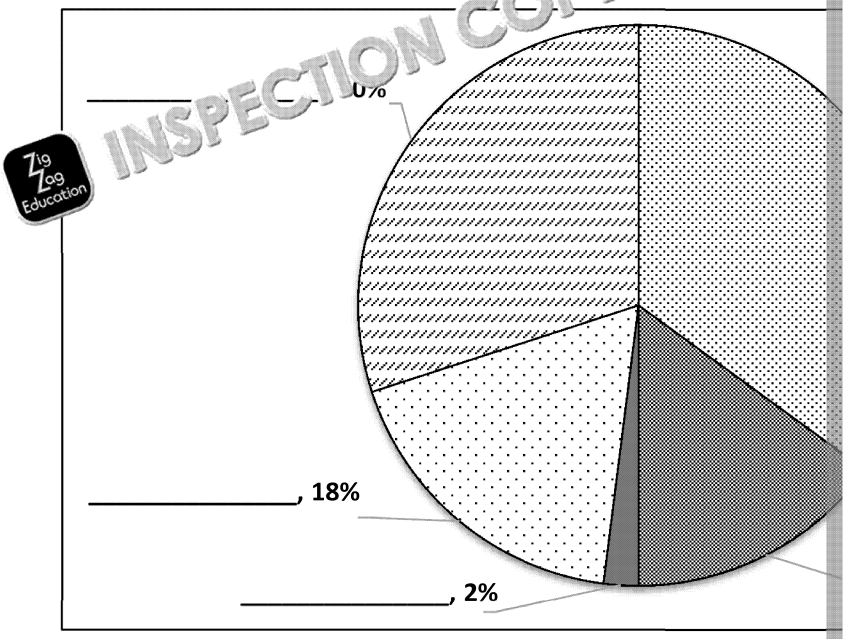
Step 3:
Nutritional value of my meal:

5. Planning balanced diets: Guidelines diet, nutritional needs in different life s

1) The Eatwell Guide is a pictorial representation of the proportions of differ

i) Complete the diagram below to illustrate ho[illegible]ferent foods contrib



ii) Explain why fats such as oil and butter ma[illegible]nly the percentage

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2) Complete the table below to explain what dietary changes have to be imp
and give a reason for such changes.

Group	Should eat less…	Should eat more…
Small children		
[illegible]		
Adults		
Elderly		

3) i) Rachel has to prepare her breakfast. He[illegible]er choose which option is

- 10 free-range eggs c[illegible]s £[illegible]
- 250 g butter [illegible]s £[illegible]0
- 150 [illegible] costs £3.00
- 200 g Cheddar cheese costs £2.50
- Toast bread (approximately 20 slices) costs £1.00
- Can of baked beans (400 g) costs £0.86

Meal A: An omelette made with 2 eggs, 10 g butter, 100 g ham and
Meal B: A sandwich made from two slices of bread with 10 g butter
baked beans

ii) Assess whether the omelette mentioned above is appropriate for the

5 years old .....

15 years old .....

65 years old with coronary heart disease .....

4) The British Nutrition Foundation recommends that diets for toddlers and ... '5532' guide. Explain what the numbers in the recommendation mean.

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Exam-style Question

Discuss reasons why individuals should decrease consumption of free sugar... In your answer, include a reference to the current dietary guidelines in the ...

Extension Task

Using the calculator at ... ***906-recipe-calc*** design and assess a meal ... year-old, and ... your choice.

Then ... te how you would modify it so it could be suitable for:

- an elderly person
- a vegan
- a person on a high-fibre diet

6. Planning balanced diets: Nutritiona individuals with specific dietary needs deficiencies

1) Sugar consumption in the United Kingdom has been growing rapidly since

i) From the options below, tick which healt[illegible]ditions may be caused

obesity		[illegible]steoporosis		anaemia	
coronary [illegible]ease		type 2 diabetes		overweig	

ii) [illegible]an example of one action that might help lower sugar intake of

.....

.....

.....

2) Colour code the diseases with their dietary causes, outcomes, and potenti have to be made. Note that some of the options can be used multiple tim

Diseases		
Osteoporosis	Coronary heart disease	Type 2 diabetes
Dietary causes		
Lack of iron	Too much saturated fat	Overeating
Excess of phosphorus	Low physical acti[illegible]	Folic acid deficiency
Too much sugar	Too m[illegible]h	
Health outcomes		
Heart failure	[illegible]mb amputation	Tiredness
Brit[illegible]ons	Tooth loss	Trouble during child
Bl[illegible]	Joint and spine problems	Easy bone fractures
Changes in diet and lifestyle		
Eat more fish	Cut down on sugar	Cut down on fats
Lose weight (reduce energy intake)	Cut down on saturated fats	Drink more milk
Eat more vitamin C	Eat liver	Eat regularly

3) Explain the difference between food intolerance and a food allergy, using

immune system	digestive system	reaction

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4) From the list below, choose products that will be suitable for:

A 70-year-old man suffering from obesity .....

.....

.....

A 50-year-old woman suffering from [illegible] blood tissue .....

.....

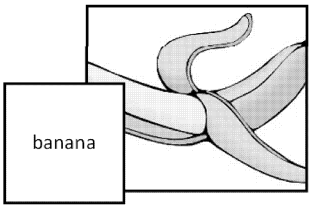
.....

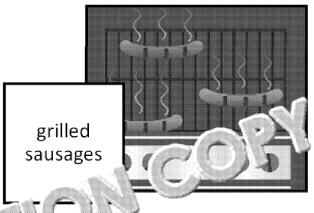
A 14-year-old girl suffering from bad tooth decay .....

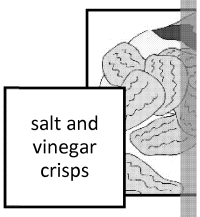
.....

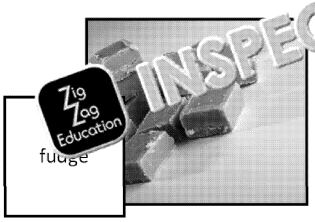
.....

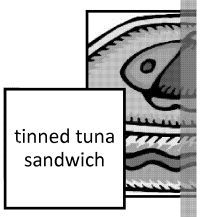
Product list:

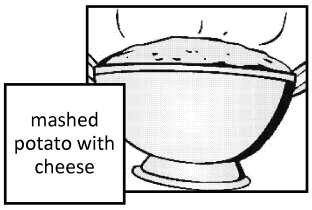


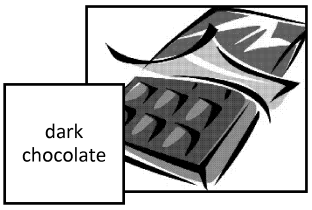


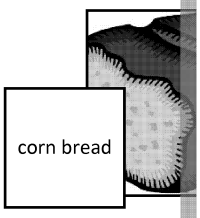












5) Complete the table below to identify some foods which different dietary [illegible] their health conditions.

	Do not eat...	
[illegible]		
Lactose intolerant		

6) Jim is a 55-year-old man suffering from type 2 diabetes and obesity. He's chips with mayonnaise and half a bar of milk chocolate for lunch. Conside him. How would you adapt the cooking methods and/or ingredients to m

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7) Liver disease can develop as a result of various diet-related factors. List tw

i) .....

ii) .....

8) High blood cholesterol levels are associated with increased risk of coronar fractions of cholesterol found in the blood.

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Exam-style Question

The following is a list of ingredients for leek and potato soup.

- 1 tbsp butter
- 1 onion
- 225 g potatoes
- 2 leeks
- 1.5 l chicken stock
- 150 ml double cream
- salt and pepper

Justify **two** modifications that could be made to the ingredients to make the soup suitable for someone suffering from coronary heart disease.

Extension Task

Design a poster in which you explain how diet affects a person's health. In your poster:

- Identify a diet-related condition (such as: type 2 diabetes, obesity, cardiovascular disease, bone health, liver disease)
- Indicate causes of the condition/disease (those related and unrelated to diet)
- Identify symptoms of the condition/disease
- Explain about potential outcomes and health effects
- Explain how a person can change their diet to improve the situation

6. Planning balanced diets: Nutritiona individuals with specific dietary needs deficiencies

1) Sugar consumption in the United Kingdom has in[illegible]ed by nearly 700% s century – from 8 kg per person in 1840 to [illegible] g[illegible] person in 1980.

i) List three health conditi[illegible] ha[illegible]ight be caused by high sugar intake

1. .....
2. .....
3. .....

ii) Give one example of an action that the government could take to hel UK population.

.....

.....

2) Complete the table to indicate dietary causes, outcomes, and dietary and made to improve the health of individuals suffering from the given conditi

Health condition	Cause	Symptoms and outcom
Osteoporosis		
C[illegible]y heart disease		
Type 2 diabetes		
Anaemia		

3) Explain the difference between a food allergy and food intolerance.

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4) List at least three products that should be avoided in the given health con

A 70-year-old man suffering from obesity

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.....

.....

A 50-year-old woman suffering from hypertension

.....

.....

.....

.....

A 14-year-old girl suffering from bad tooth decay

.....

.....

5) Suggest how you would modify the recipes for the meals and groups sho

Group	Meal	Sug
Coeliac	Macaroni cheese	
Lactose intolerance	Strawb[illegible]hake	

6) Jim is a 55-year-old man suffering from type 2 diabetes and obesity. Desi
appropriate for his conditions, taking into consideration cooking methods
your choices.

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7) Liver disease often requires a special diet to alleviate symptoms. Describe
recommended in liver disease.

i) .....

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.....

.....

ii) .....

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8) High blood cholesterol levels (hypercholesterolemia) are associated with i
disease and stroke. Explain how you could modify the diet for a person suffering fro

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Exam-style Question

An unhealthy diet has caused an increase in the number of related health co
Assess the relationship between diet, nutrition and health, and review ways
health can be improved.

Extension Task

Plan a daily diet for the following individuals in order to improve their he
your meal choices.

1) A teenage girl suffering from obesity
2) A 70-year-old man suffering from osteoporosis and type 2 diabetes

7. Planning balanced diets: Nutritiona individuals with specific lifestyle, religi beliefs

1) Religion is an important factor on which people b[illegible] heir food choices. U religion and then indicate the main dietar[illegible] tr[illegible]ons (such as allowed fo periods, etc.) for each of them.

MILSA.....

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DHUIINSM.....

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MUIJADS.....

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2) Fron[illegible]e list below, identify products which are suitable for vegetarians, b your choice.

cauliflower cheese	wholemeal bread tuna sandwich	tea with honey	coffe
tomato and onion salad	beetroot and raspberry chutney	cheesecake	so

..... is not suitable for vegans because.....

..... is not suitable for vega[illegible]ecause.....

..... is not [illegible]e [illegible]vegans because.....

..... [illegible] not suitable for vegans because.....

..... is not suitable for vegans because.....

..... is not suitable for vegans because.....

3) There are various groups of vegetarians. Match each specific dietary grou

lacto-vegetarians	eat eggs, but n
ovo-vegetarians	eat milk, dairy
lacto-ovo-vegetarians	do not eat a
vega	eat milk and d

4) Frenc cuisine is very popular in the UK. Inspect the list of ingredients for

3 tsp goose fat
600 g beef shin
100 g streaky bacon
350 g shallots
250 g chestnut mushrooms
2 garlic cloves
1 tbsp tomato puree
750 ml red wine

i) Indicate two ingredients which are not suitable f r a vegetarian.

.....

.....

ii) te one ingredient which is not suitable for a Hindu.

.....

iii) Explain why the dish is not suitable for a Muslim.

.....

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Exam-style Question

Traditional cottage pie includes minced beef, beef stock, vegetables, and a pc
with butter and milk.
Suggest **two** different modifications that could be made to this recipe to mak
a) a Hindu
b) a vegan

tension Task

Select a traditional British recipe (e.g. for a cottage pie) and adapt it to the n
- a gluten intolerant person
- a Muslim

Use the Exter

Extension Task worksheet

Traditional British meal: .....

Ingredients:

.....

.....

.....

.....

Gluten intolerant person	
Changes I have to make:	Changes I have t
Why th o:	Why this is so:

7. **Planning balanced diets:** Nutritiona individuals with specific lifestyle, religi beliefs

1) Religion is one of the factors influencing humans' f choices. Describe foods they eat, and then identify some of the tary laws' or restrictio

Religion	Food beliefs	
m		
Hinduism		
Judaism		

2) List five products or meals which are suitable for vegetarians, but not for

1. .....
   .....
2. .....
   .....
3. .....
   .....
4. .....
   .....
5. .....
   .....

3) There are various groups of vegetarians. For each group, list **foods of ani** to eat.

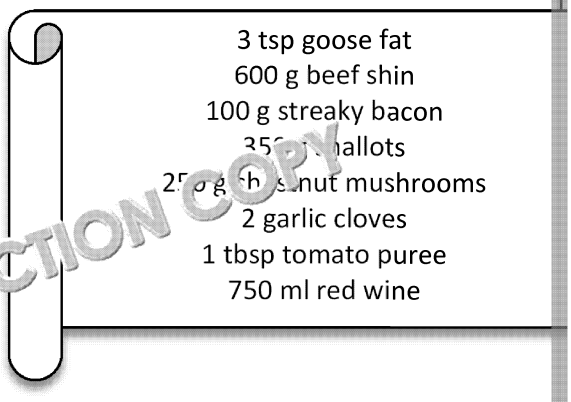
lacto-vegetarians .....

ovo-vegetarians .....

lacto-ovo-ve s .....

vega .....

4) French cuisine is very popular in the UK. Inspect the list of ingredients for



i) Explain why the recipe is not suitable for:

a Muslim .....

.....

a Hindu .....

.....

ii) Describe how the recipe could be modified to make it suitable for a v

.....

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Exam-style Question

Evaluate the advantages and disadvantages of becoming a vegan.

Extension Task

Select a traditional British recipe and adapt it to the needs of:

- a gluten intolerant person
- a Muslim
- someone allergic to milk

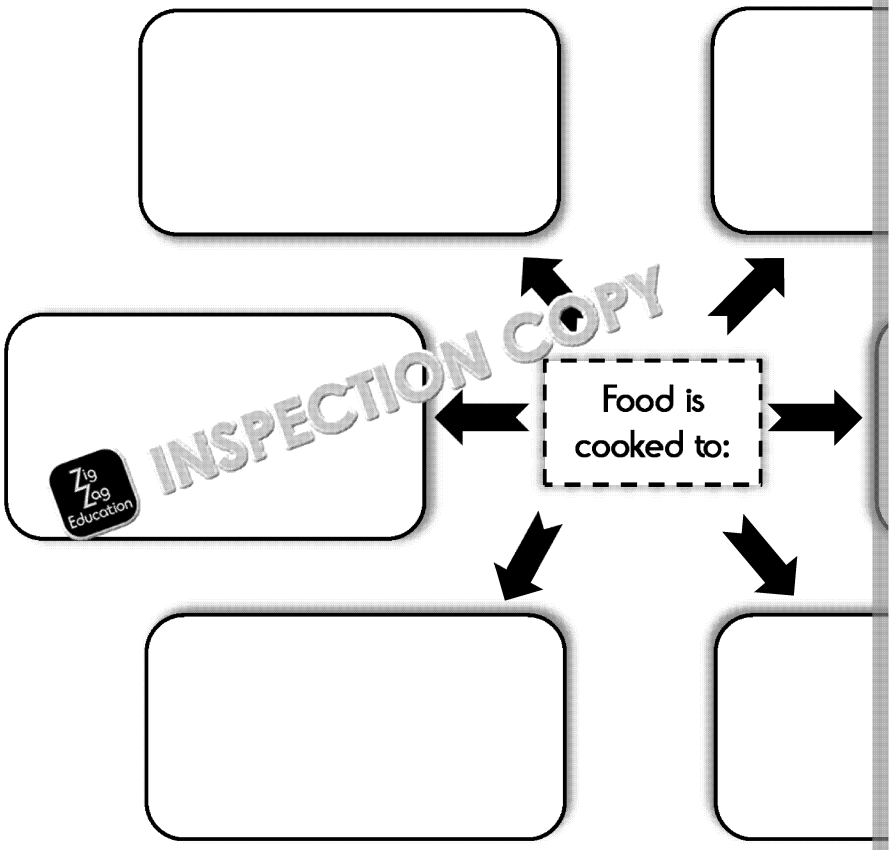
Explain why the changes have to be made.

8. The effect of cooking on food: Why how heat is transferred, how cooking food

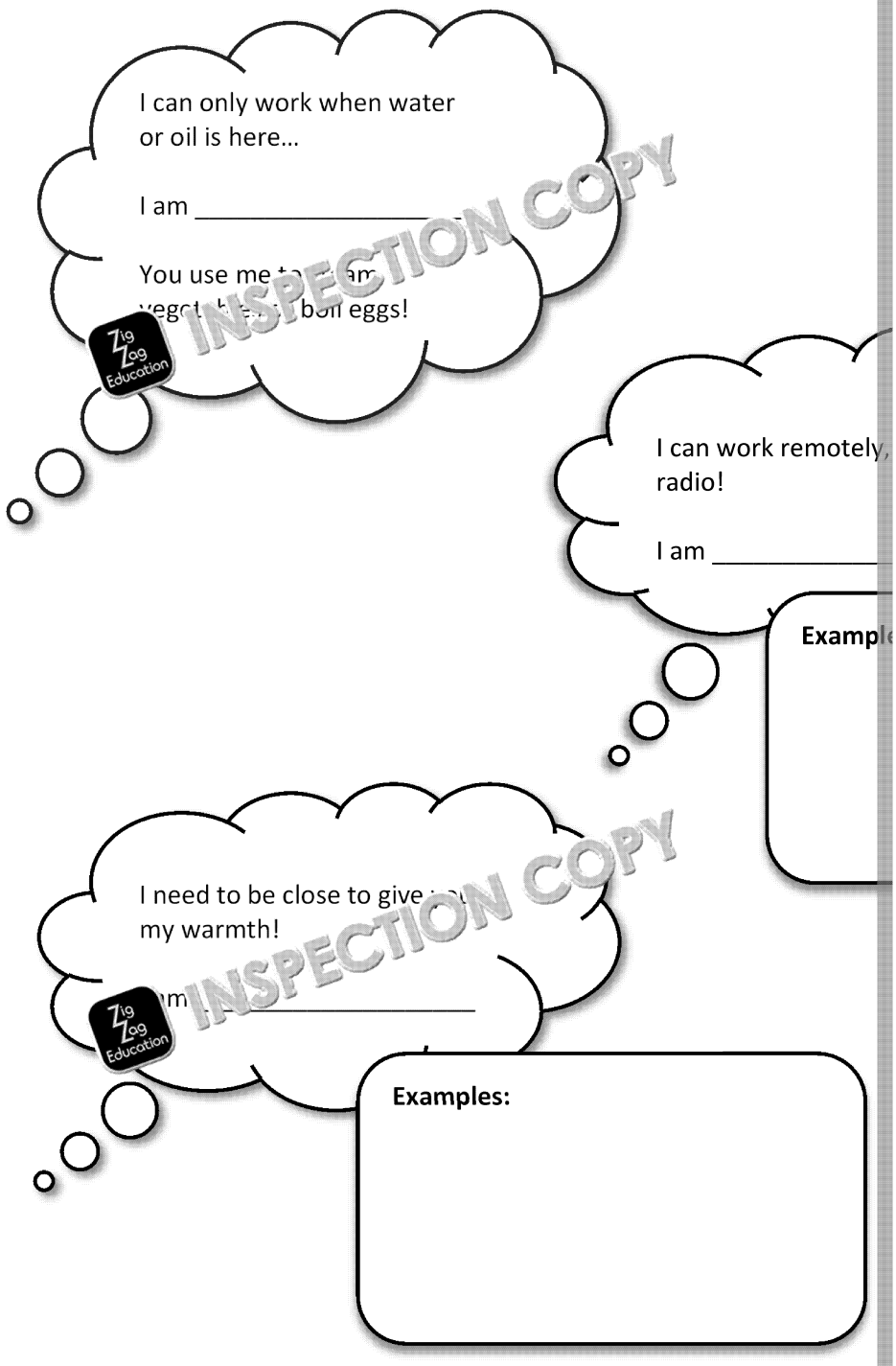
1) Complete the diagram below to show the reasons for cooking food. help you.

Hints:

- Salmonella and Clostridium botulinum
- Use by, best before dates
- Mash, gratin or jacket?
- Mmmm! What smells so nice?
- This bread is so crispy!
- Look how these muffins grow!



2) i) Identify the processes in which heat is transferred to food, and give a
is applied.



ii) Identify three dishes that use more than one heat transfer method to

.....

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.....

3) Complete the table below to explain how cooking and preparation metho
provided below (you can use them multiple times). You can also use your

prevents vitamin loss	leads to vitamin loss	allows c
low in calories	high in calories	good for
can lead to obesity	leads to enzymatic browning	
is quick	time-consuming	
slows down oxidation	prevents enzymatic browning	
makes the food easier to chew	creates a crunchy top	
softens texture	can't be us	

	Is good because...	
Steaming (cooking)		Can't b
Boiling (cooking)		
Shredding (preparation)	Makes the food easier to chew, alters texture	
Deep-frying (cooking)		
Poaching (cooking)		Can't b
Blanching (cooking and preparation)		
Baking (cooking)		
Braising (cooking)		
Marinating (preparation)		

4) Below you can see various cooking methods.

Cooking methods:

braising	simmering	roasting	grilling	dry-fryi

Choose those which:

i) Lower the amount of fat in f...

.....

.....

ii) Increase the amount of fat in foods

.....

.....

iii) Decrease the nutritional value of foods

.....

.....

iv) Preserve the nutritional value of foods

.....

.....

(You can use a... et...od more than once, and you can also give your ov...

Exam-style Question

Sponge cake is made with plain flour, eggs, butter and sugar.
Explain **two** reasons why the sponge cake has to be cooked.

Extension Task

Take three potatoes and cook them using three di...rent methods, e.g. b...

1) Measure the time needed to cook t...e, ot...oes.
2) Put them on a paper towe... ... do you observe?
3) Assess the appea...ce, c...r, flavour and texture of each of the p...

M...re ...e potatoes are the same size.

Use the Extensio...

Extension Task worksheet

	Potato 1	Potato 2
Cooking method		
Cookin		
Paper towel experiment observations		
Appearance		
Colour		
Flavour		
Texture		
Conclusions		

8. The effect of cooking on food: Why f
how heat is transferred, how cooking me

1) Complete the table to explain why people cook food and give examples w

People cook food to…	An

2) i) Explain the difference between convection, conduction and radiation

.....

.....

.....

.....

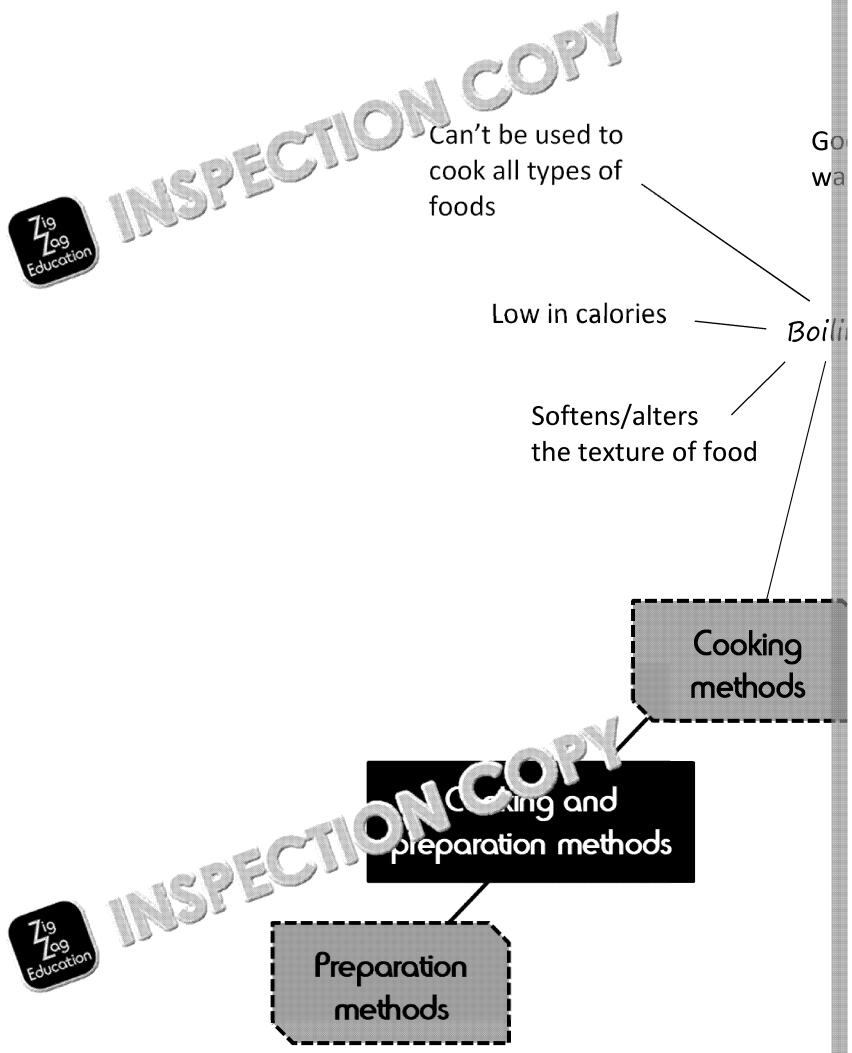
.....

.....

ii) Identify which ... take place during the following cooking met
ex...ain ... it occurs.

...king method	Heat transfer method	
Baking an apple pie	Convection ☐	
	Conduction ☐	
	Radiation ☐	
Cooking soup	Convection ☐	
	Conduction ☐	
	Radiation ☐	
Frying chicken	Convection ☐	
	Conduction ☐	
	Radiation ☐	
Steaming ...	C...vection ☐	
	Conduction ☐	
	Radiation ☐	
Grilling steak	Convection ☐	
	Conduction ☐	
	Radiation ☐	

3) Complete the diagram to explain how cooking and preparation methods a



4) Explain how different cooking methods alter the nutritional value and fat

Simmering: .....

.....

.....

Braising: .....

.....

Roa .....

.....

.....

Grilling: .....

.....

Dry-frying: .....

.....

.....

Stir-frying: .....

.....

Sha ving: .....

.....

.....

Exam-style Question

Fat-based cooking methods are very popular in the UK.
Describe how **three** fat-based cooking methods affect the nutritional value of

Extension Task

Take five po prepare them using steaming, boiling, microwavi
ar in

- notes on how the cooking methods affect their appearance, c
- How could you check the fat content of each of the potatoes?

9. The effect of cooking on food: carb
protein, fruit and vegetables

1) Fill in the gaps in the text to explain what happens to proteins during coo

air	gliadin	acid	gluten
amino acids	foam	heat	coagulation

Proteins are larg[illegible] built from _____. They ar

_____, which then twist and curl up to form specific pr

_____ or _____, proteins _____

_____ is a process in which proteins aggregate and for

plain flour, contain _____ and _____

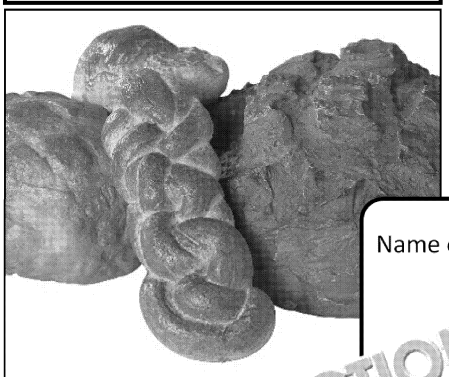
glue together and form _____. It has long elastic fibres

_____. If you whisk an egg white, you incorporate ___

mixture and _____ is created.

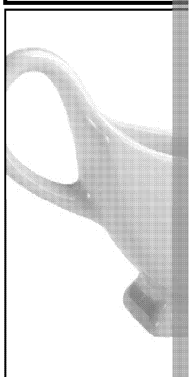
2) i) Identify the main proces[illegible]ffect carbohydrates during cooki

Starch in bread



Name of process:

Starc



ii) Explain the difference between gelatinisation and dextrinisation.

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3) Complete the sentences below to explain how fats act during cooking. Us

aeration	cream	water	spread and reshaped	
emulsion	melting point	mayonnaise	batter	shortbread bis

i) Fat mixed with flour leads to .....

.....

This is used to prepare .....

ii) Fat mixed with sugar a[illegible] .....

.....

.....

iii) Fats do not dissolve in .....

.....

.....

iv) Plasticity of fat means that it can be easily .....

have different .....

.....

4) Give an example of one dish i[illegible] .....

Dextrinisation t[illegible]s place: .....

Gel[illegible]ion of starch occurs: .....

5) Fill in the gaps in the text below using the keywords provided.

bananas	damage	enzymes
colour	enzymatic browning	nutritional val

_____ is a process which tak_ place when plant ce

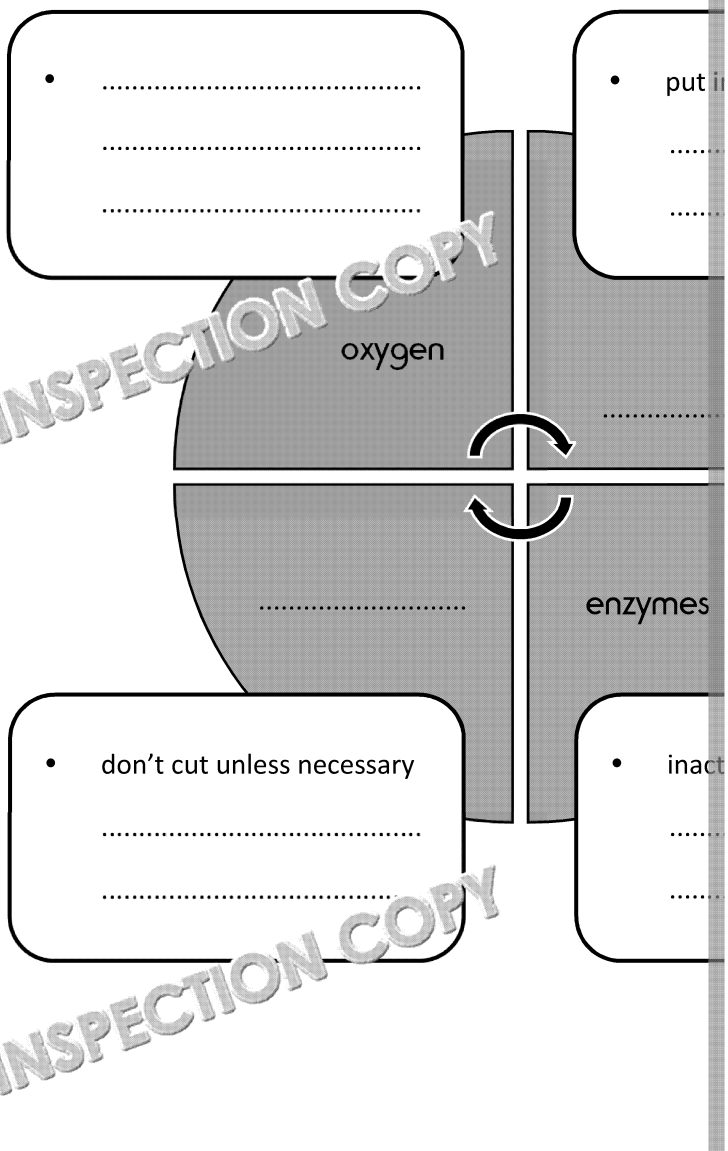
_____ from t_ ce_ leak out and cause _____

surrounding tissu_ s_ th_ leads to a change of _____

_____ of the food. Some fruit and vegetables are

These include _____, _____

6) i) Complete the diagram below to indicate the main factors that speed browning and ways to prevent them.



7) Oxidation is a process which affects foods that are exposed to air. Indicat
food from oxidation.

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.....

8) Improper proportions or lack of cooking skills can lead to a failure. Ident
situations could have happened in the test kitchen.

the top of a sponge cake has cracked	
shortcrust pastry is sticky and difficult to handle	

Exam-style Question

Crème brûlée is a classic dessert made from milk or cream, eggs and sugar.

Explain how the chemical changes in the proteins and sugars help to produce

Extension Task

Prepare a béchamel sauce and then explain:

a) How conduction and convection are applied to cook it

b) Where is the need for agitation (stirring)

Use the Exter

Extension Task worksheet

Béchamel sauce ingredients:

.....

.....

.....

Cooking of béchamel sauce step by step:

.....

.....

.....

.....

.....

.....

Which step of cooking uses conduction?

.....

Which step of cooking uses convection?

.....

What happens to the flour in the sauce?

.....

.....

.....

.....

Why do I have to stir the sauce, and what would happen if I didn't?

.....

.....

.....

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.....

9. The effect of cooking on food: carb
protein, fruit and vegetables

1) Explain what happens to proteins during the cooking and preparation of f

plasticity	foam	[illegible]d	gliadin
high temperature	polyca[illegible]	coagulation	glutenin

.....

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2) Com[illegible]he table below to explain how different methods of heat trans

The process	Molecules affected	Conditions needed
Caramelisation		
Gelatinisation		
Dextrinisation		

3) Explain how the chemical structure of fats defines their use in cooking.

.....

.....

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4) Explain why:

Bread turns brown when ba.....

.....

Egg.....ring boiling.....

.....

Sauce thickens during simmering .....

5) i) Explain what enzymatic browning is.

.....

.....

.....

.....

.....

.....

ii) List three fruits and three vegetables that are especially prone to enz

Fruits:

1. .....

2. .....

3. .....

Vegetables:

1 .....

.....

3. .....

6) Complete the table below to indicate why enzymatic browning takes plac

Factors causing and accelerating enzymatic browning	W

7) i) Explain what oxidation is.

.....

.....

.....

.....

.....

ii) Indicate two ways of preventing oxidation in foods.

.....

.....

.....

.....

.....

8) i) Improper proportions and lack of cooking skills can lead to a failure. [prevent a bread from rising.

.....

.....

.....

.....

.....

.....

ii) Identify two ways in which you can prevent the bread from failing.

a) .....

.....

b) .....

.....

Exam-style Question

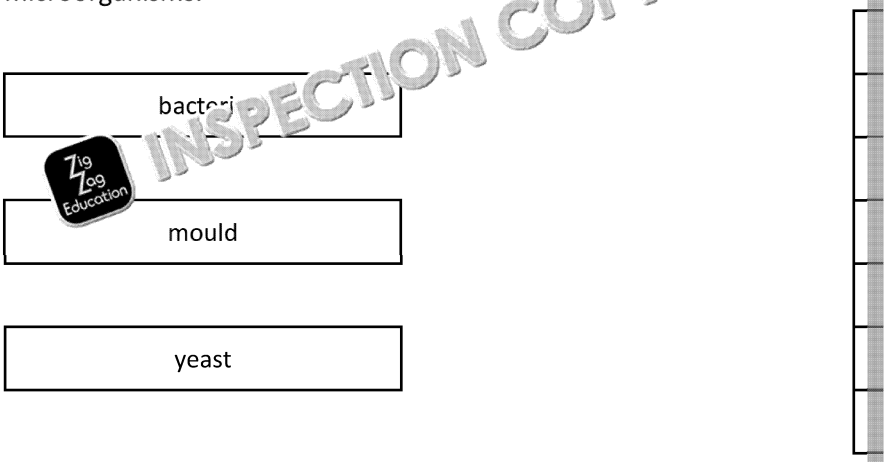
Explain **three** functions of fats when cooking and preparing foods.

Extension Task

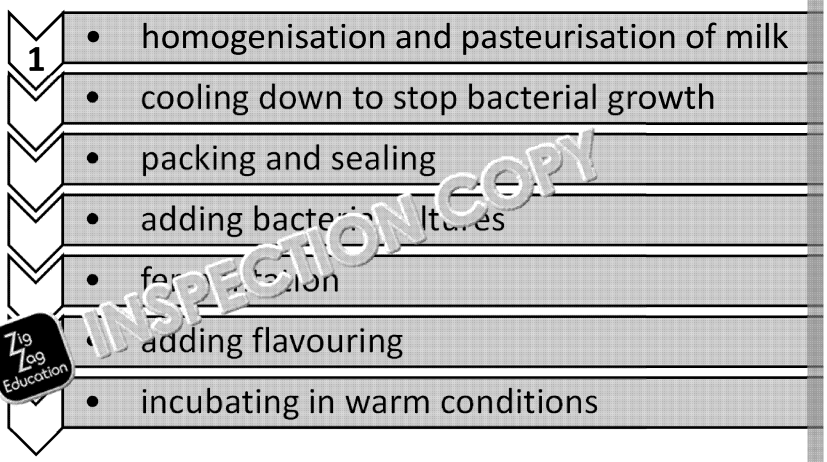
Research information on food additives at ***zzed.uk/8906-gov-additives*** and them in production of mayonnaise.

10. The effect of cooking on food: Th
microorganisms

1) Various microorganisms are used in production of food products worldwi
below with foods they are used to produce. Rememb r that some of then
microorganisms.



2) i) Order the stages of yoghurt production.

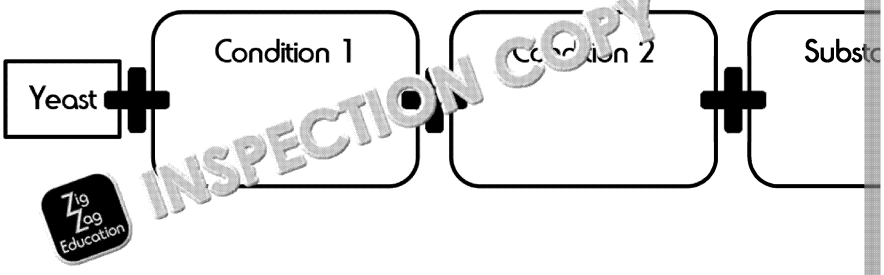


ii) Identify two characteristics of milk which are affected by bacteria du

.....

.....

3) Complete the equation below to explain the conditions needed for yeast t
of bread.



4) i) During production of salami, microorganisms produce acid. What is t
undergo in the presence of acid?

.....

ii) The same process happens to proteins due to enzymic action. What i
cheese production?

.....

Ext[illegible]n Task

Set up a taste panel for different types of yoghurt. Choose up to five differe
probiotic yoghurt, 0% fat yoghurt, Greek yoghurt, skyr). Code the samples a
them from the least liked to the most liked (this is called a rating test).

Then try to answer whether the percentage of fat in yoghurt decided which

Use the Exten

Extension Task worksheet

Step 1

Prepare up to five different kinds of plain, unflavoured yoghurt and code them identify which yoghurt is which.

	Yoghurt 1	Yoghurt 2	Yoghurt 3	
	.....	.....	.....	...
Sample code, e.g. XYZ ... ZY				

Step 2

Prepare the samples. Take five plastic cups or bowls and pour a different kind plastic spoons for the testers, and cups with clean water to clear their palate a

Step 3

Ask up to 10 people to assess the samples. Use a 1–5 scale, where 1 means 'th means 'the best / like very much'.

Dislike very much / the worst	Dislike	Neither like nor dislike	L
1	2	3	

Step 4

Record your findings in the table below by indicating the rank each tester gave row, sum up the ranks each yoghurt obtained.

	Yoghurt 1	Yoghurt 2	Yoghurt 3	
Tester 1				
Tester 2				
Tester 3				
Tester 4				
Tester 5				
Tester 6				
Tester 7				
Tester 8				
Tester 9				
Tester 10				
SUM				

Step 5

Did the amount of fat in the yoghurt determine which yoghurt was assessed as

.....

10. The effect of cooking on food: Th
microorganisms

1) Various microorganisms are used in production of food products worldwi
are used in production of the following foods.

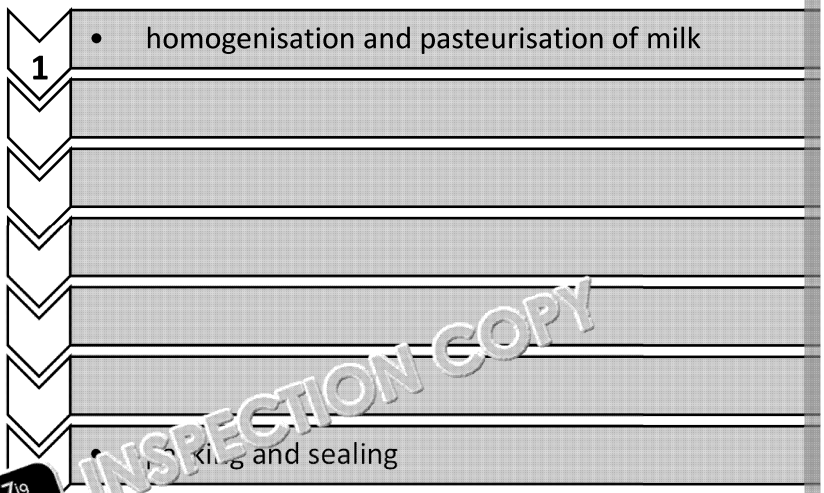
i) Stilton cheese .....

ii) Panettone cak .....

iii) uce .....

iv) Probiotic yoghurt.....

2) i) Complete the chart to indicate the main stages of yoghurt productio



ii) Explain how bacteria work to transform milk into yoghurt.

.....

.....

.....

.....

.....

.....

3) Indicate the conditions that enab t g wth during production of bre

.....

.....

.....

4) i) During production of wine, microorganisms transform sugar from gra
process called?

.....

ii) The same process is used in production of sausages such as salami an
efficient method of producing sausages.

.....

.....

.....

.....

Extension Task

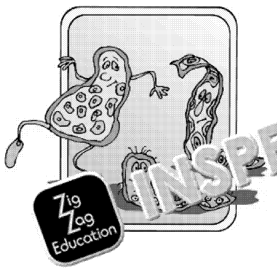
Set up a taste panel for different types of bread. Choose up to five kinds of
choose white soft bread made by different brands or different types of bre
When preparing the taste panel:

- decide what type of taste test you want to carry out
- decide what scale you need to use
- decide how many people need to assess your samples
- decide how to code your samples
- choose what characteristics of bread you want to assess

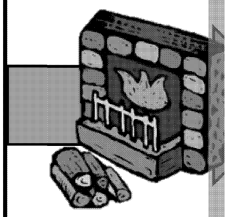
Remember to consider any special conditions you may need to control duri

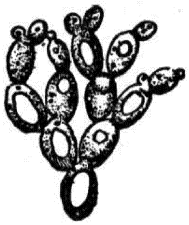
11. Food spoilage: The growth conditio microorganisms and the signs of foo

1) Complete the diagram below to indicate conditions for microorganisms' g

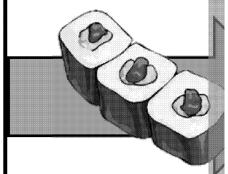


Micro[illegible]ms require the f[illegible]wing conditions to grow:





Examples of high-risk foods include:



2) Enzymes are biological catalysts usually made from protein.

i) Explain why the use of vinegar or lemon juice helps to prevent enzym

.....

.....

ii) E[illegible]n[illegible]anching vegetables helps to prevent enzymatic action.

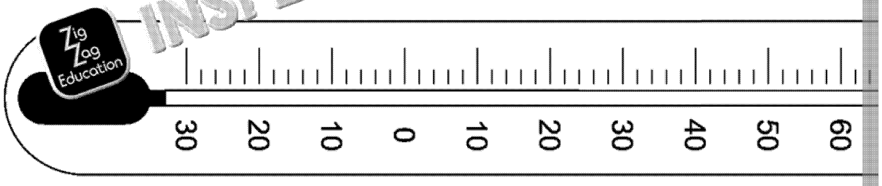
.....

.....

3) There are different signs of food spoilage depending on the factors causin spoilage signs it can cause.

Enzymes	green or white fur
Mould	sour flavour, foam
Yeast	browning of food,

4) Appropriate temperature is crucial for mi[illegible]nisms' growth. Indicate t microorganisms grow the fas[illegible]



Exam-style Question

Enzymes can cause food spoilage. Describe **two** methods that can help to con

Extensi[illegible]

Investig[illegible] influence of diminution (cutting into smaller pieces), time and
enzymatic browning of apples and potatoes. Use the Extension Task workshe
experiment. You can take pictures at every stage to help you assess the chan

Use the Extens

Extension Task worksheet

	Freshly cut	After 30 minu
Apple, peeled and cut in halves, room temperature		
Apple, peeled and cut in halves, in the frid		
Apple, p and shredded, room temperature		
Apple, peeled and shredded, in the fridge		
Potato, peeled and cut in halves, room temperature		
Potato, peeled and cut in halves, in the fridge		
Potato, peeled and shredded, room temperature		
Potato d and shredde he fridge		

How does temperature affect the rate of enzymatic browning?

.....

.....

How does time affect the rate of enzymatic browning?

.....

.....

How does diminution (cutting i s er pieces) affect the rate of enzymatic

.....

.....

11. Food spoilage: The growth conditio microorganisms and the signs of foo

1) Complete the table below to indicate the risk factors that allow bacteria t that may be affected by bacteria.

Factors needed for microorganisms' g… (M…	
	Foods that are re…
Hi… ein content	

2) i) Explain what enzymes are, using the keyword: 'catalyst'.

.....

.....

ii) Give two ways of controlling enzymatic action in foods.

1. .....

.....

2. .....

.....

3) Complete the table … to explain how microorganisms cause food spoi…

M… za… n:	Sign of spoilage caused by given microorganism	
…ymes		
Mould		
Yeast		

4) Appropriate temperature is crucial for microorganisms' growth. Indicate t… microorganisms grow the fastest.

.....

Exam-style Question

State two reasons why uncooked meat is tra… sp… d in controlled temperat…

E… …n Task

Investigate how various factors affect the rate of enzymatic browning and o… food products.

- What foods can you use in your experiment?
- What factors can you measure?
- How could you record your findings?

12. Food spoilage: Buying and storing
store foods correctly, the importance

1) Complete the table to explain why proper storage conditions are importa
and poisoning.

Storage conditions	Is impo
Keeping food covered	
Choosing th… t temperature	
Ke… he storage dry and mould – free	
Choosing the correct light	

2) Using the keywords provided, explain the difference between a 'use by' a

Quality	Safety	Fish	Dairy	Dry

.....

.....

.....

.....

.....

3) Place the products lis… n th… oxes below in the correct areas in the fri
storing food … …g temperature and spoilage of food.

n… ghurt and dairy	eggs	cold cuts	fruit and vegeta
soup	cottage cheese	oil	frozen peas

Top shelf:
Middle shelf:
Bottom shelf:
Drawers:
F…

4) i) Match the storage conditions with the correct temperatures.

Freezing
Chilling
Cooking and reheating food
Boiling water

ii) What is the range of 'd[illegible] temperatures'?

.....

iii) [illegible]ent storage means that food is stored at _____

the temperature between _____. This falls in the [illegible]

5) Fill in the gaps to explain the need for appropriate temperature control d[illegible] food, using the keywords below.

increases (x2)	never	moisture	[illegible]
bacteria	defrosted	75°C	

In most cases, frozen food should be _____ before cookin[illegible]

_____ the time of cook[illegible] and all the _____

defrosted, food should _____ be frozen again because it _____

bac[illegible]

Reheating food is a major cause of food _____. This is bec[illegible]

the conditions needed for growth – _____, _____

reheating should be done thoroughly at temperatures above _____°C. Re[illegible]

_____ the risk of food poisoning.

Exam-style Question

Many food products are labelled with the recommended storage conditions.
State *one* example of a food which would be labelled with each of the follow
a) refrigerate after opening
b) store in a cool, dry place.

Extension Task

Go to a supermarket and investigate the labels of various food products. Ch
- display a use by date
- display a best before date
- do not display any date mark
- include storage conditions
- include instructions for preparation

Then try to assess why food products are labelled (or not) with each piece

Use the Extens

Extension Task worksheet

Foods which display use by date mark	Foods which display best before date mark	F

Foods which display storage conditions	What

Foods which display instructions for preparation	Are these instructio to prepare

Why are food products labelled with:

- a use by date mark?

  .....

  .....

- a best before date mark?

  .....

  .....

- storage conditions?

  .....

  .....

- instructions for preparation?

  .....

  .....

Why are some products not labelled with date marks at all?

.....

.....

12. Food spoilage: Buying and storing f
store foods correctly, the importance

1) i) List five conditions that have to be met to ensure proper food storag

1. .....
2. .....
3. .....
4. .....
5. .....

ii) Explain how the conditions you identified in part i) help to avoid cross-co

.....

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.....

.....

.....

.....

2) Explain the difference between '[illegible] and 'best before' date marks.

.....

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.....

.....

.....

3) Give an example of food that can be stored:

On the top shelf of the fridge .....

On the bottom shelf of the fridge .....

In the fridge door .....

In the freezer .....

4) i) Indicate the correct temperatures for:

Freezing .....

Chilling .....

Cooking and reheating food .....

Boiling water .....

ii) Explain the term 'danger zone' in relation to food safety. What is the danger zone?

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iii) Explain what 'ambient storage' is. What is the temperature range of

.....

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5) Explain how appropriate temperature control during defrosting and reheati

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Exam-style Question

Many food products are labelled with the recommended storage conditions.
State **two** reasons why food labels include this information.

Extension Task

Go to [illegible] and investigate the food labels of various foods. Choos
for a [illegible] months or years away. Then try to explain how different processi
help to obtain such long shelf life of food.

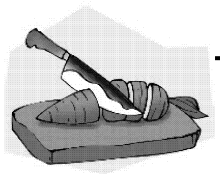
Also, find five products which include instructions for preparation on their l
instructions are necessary for these foods.

13. **Food spoilage:** Preparing and cook
of bacterial cross-contamination, pre
methods, signs and symptoms of foo

1) From the names below, underline the pathog[illegible]hat cause food poisc

Salmonella	[illegible] trachomatis	Fusobacteri
Haemophilus in[illegible]	Helicobacter pylori	Staphyloco
[illegible]ngitidis	Lactobacillus	Campylobac

2) i) Indicate the main sources of bacterial contamination. Use the pictur



Bacterial contamination

ii) Provide an example of how to prevent food contamination and food

.....

.....

.....

.....

iii) List three symptoms of food poisoning.

1. .....

.....

3. .....

3) i) Identify high-risk kitchen activities which require you to wash your ha

ii) Explain the role of hygiene in preventing food poisoning and cross-co
keywords below.

hands	clean	risk	
work surface	raw	utensils	

.....

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.....

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.....

.....

.....

.....

4) Colour coding kitchen utensils helps to prevent cross-contamination of fo
chopping boards and utensils with the foods they should be used to prepa

BLUE	
RED	
YELLOW	
BROWN	
GREEN	
WHITE	

5) Corr cooking time and temperature are important in preventing food p
cooking time helps to prevent food poisoning.

.....

.....

.....

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6) Using the keywords below, describe two effects food waste has on the en

landfill	fossil fuel	methane	tra

.....

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.....

7) Various preservation methods help to keep foods for longer. For each of t helps to extend the shelf life of food.

Preservation method	Extends the shelf life b
jam making	
pickling	
freezing	
bottling	
vacuum packing	

Exam-style Question

State **two** reasons why defrosted food should not be frozen again.

Extension Ta

Design fl[illegible]itchen workers to help them prevent food poisoning.

In you[illegible]et:

- Explain what food poisoning is and what the main symptoms are
- State the main causes of food poisoning
- Outline the main hygiene and safety rules necessary to prevent food p

You can use your textbook or ***zzed.uk/8906-gov-safety*** website for help.

13. **Food spoilage:** Preparing and cooki of bacterial cross-contamination, pre methods, signs and symptoms of foo

1) List three pathogens that occur in food and ca[illegible]ood poisoning.

1. .....
2. .....
3. .....

2) i) Indicate the main sources of bacterial contamination of foods.

.....

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.....

.....

ii) Explain how food contamination and food poisoning can be prevente

.....

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.....

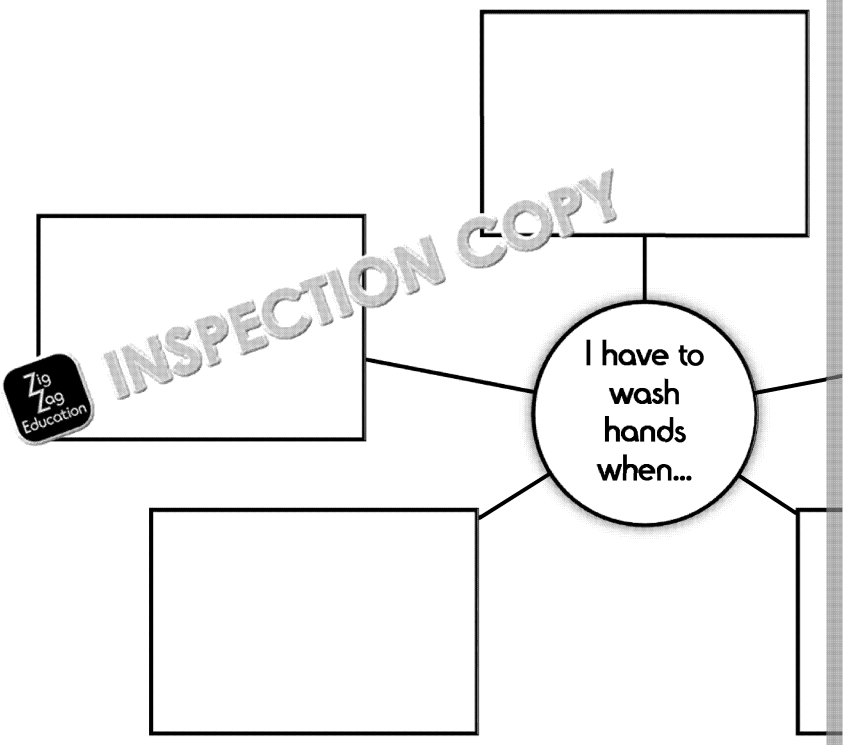
.....

.....

iii) List three symptoms of food poisoning.

1. .....
2. .....
3. .....

3) i) Identify high-risk kitchen activities which require you to wash your h



ii) Explain the role of hygiene in preventing food poisoning and cross-co

.....

.....

.....

.....

.....

4) Colour coding kitchen utensils helps to prevent cross-contamination of fo designated for:

Salads and fruit .....

Raw fish .....

Vegetables .....

Raw meat .....

Dairy .....

Cooked meat .....

5) i) Explain how correct cooking time he s t revent food poisoning.

.....

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.....

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.....

6) Mishandling food can lead to food wastage. Describe the effects of food w

.....

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7) Various preservation methods help to keep foods for longer. Explain how extend the shelf life of food.

i) jam making

.....

.....

.....

.....

ii) vacuum packing

.....

.....

.....

.....

Exam-style Question

Food poisoning in the United Kingdom is one of the most neglected health issu

Describe **three** ways of preventing food poisoning when preparing and cookin

Extension Task

Research information on food poisoning a[illegible] ***3906-gov-safety***

Then, design a poster to sh[illegible] the occurrence and main causes of food poison

14. Food provenance: Food origins

1) Match the food sources with the way they are obtained. Remember that s
multiple ways!

Venison	Reared
Mushrooms	
Beef	
[illegible]	
[illegible]nging nettles	Grown
Pork	
Carrots	
Sunflowers	
Thyme	Gathered
Lamb	
Olives	
Pumpkin	
Salmon	Caught
Oysters	

2) Using the words below, explain the differe[illegible]b[illegible]veen organic farming a

pesticide	[illegible]	genetically modified	

3) Fill in the gaps in the passage below using the keywords provided.

organic (x2)	cage	barn (x2)	free-range (x3)

Eggs can be produced in various ways. The most popular method of egg f

_____ production, where hens are kept in tight __

on top of each other.

The second most popular method is _____ produc

arou _____.

Animal welfare activists claim that _____ egg prod

and consumers. _____ hens are allowed outside a

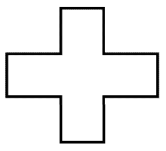
have much more room than the hens in _____ or _

production. _____ eggs are labelled as 1.

_____ eggs come from hens which are fed _____

labelled as 0.

4) Complete the graph to list the advantages and disadvantages of intensive



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Exam Style Question

State two benefits of buying fish from sustainable fish farms.

Extension Task

For three consecutive days, note everything that you and your family eat.

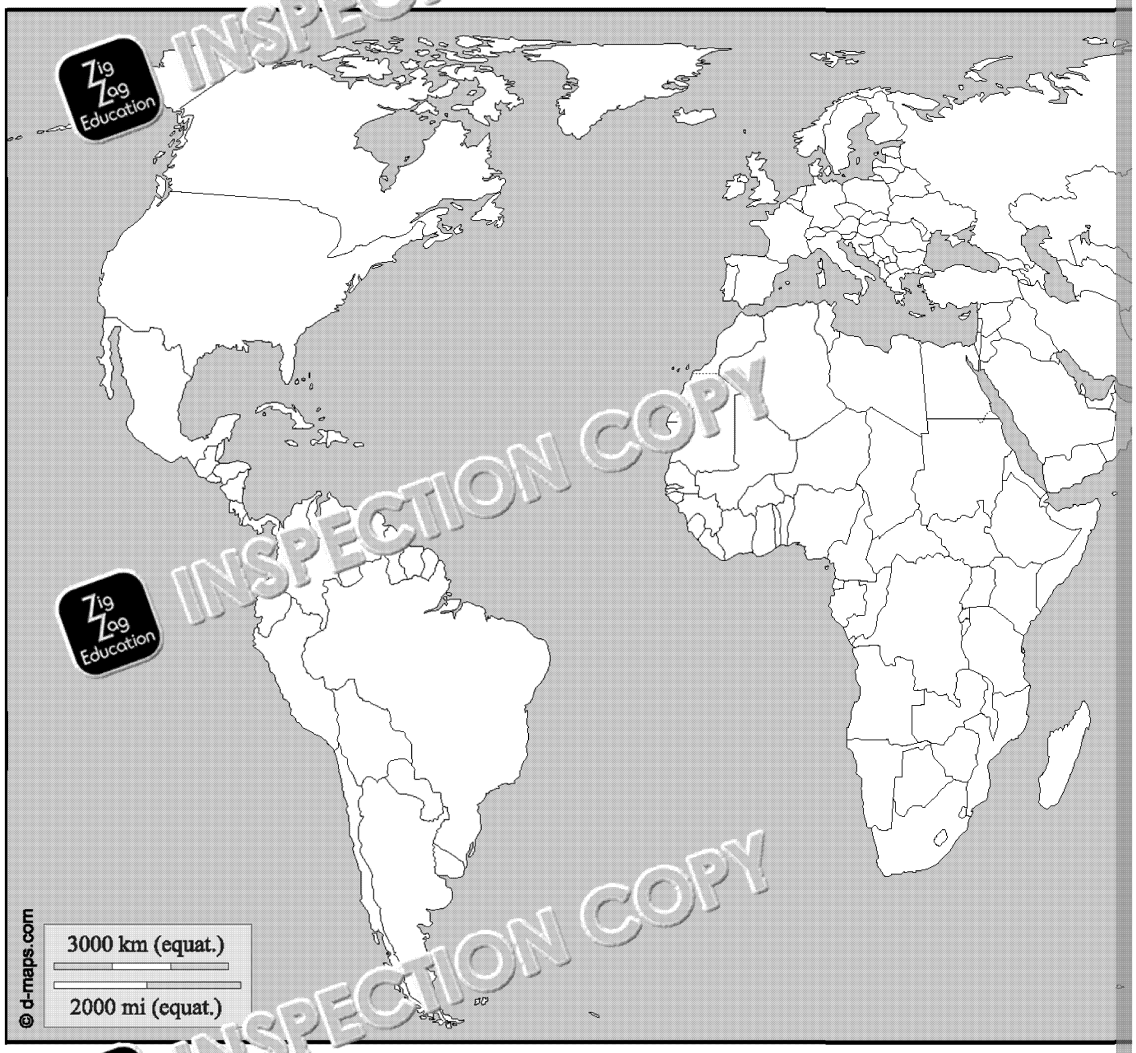
i) Mark on the map on the following page where these foods came from.

ii) Using the Internet, calculate the total food miles for each of these food

iii) Suggest some ways of reducing your total carbon footprint / food miles

Use the Exten

Extension Task worksheet



Remember to own the distance of each marked food from your home!

14. Food provenance: Food origins

1) List three food ingredients that are:

Reared .....

Grown .....

Gathered .....

Caught .....

2) Explain the difference between organic farming and conventional farming

.....

.....

.....

.....

3) Describe different methods of egg production in the table below.

Label	Method name	Descrip
3		
2		
1		
0		

4) Discuss the advantages and disadvantages of intensive farming.

.....

.....

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.....

.....

Exam-style Question

Evaluate the advantages and disadvantages of fish farms in maintaining sustai

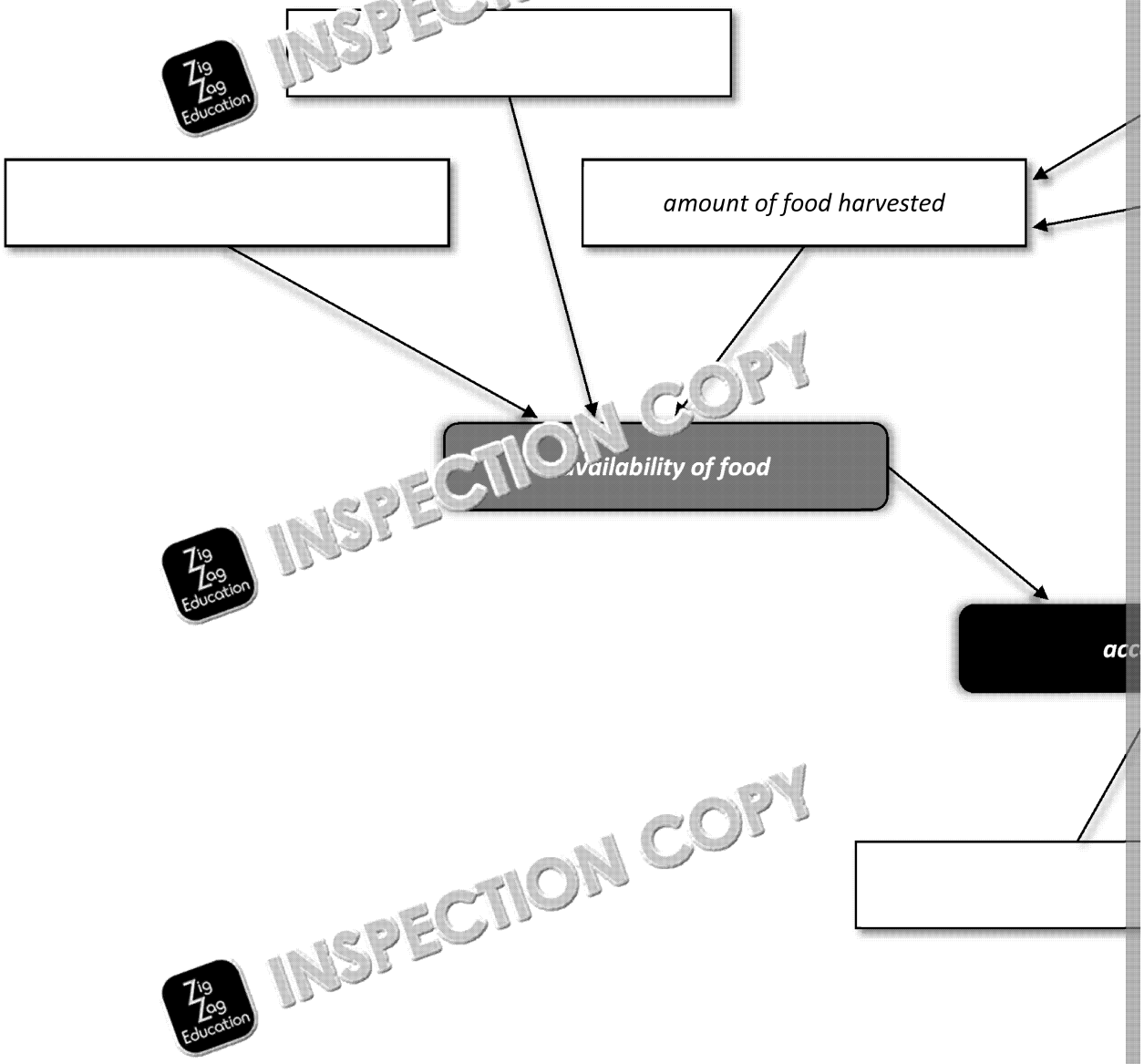
Extension Task

Crea[illegible]ions map to indicate various factors which affect the availa
world

To do this, put 'availability of food' in the centre and then draw lines to vari
from those factors to other factors which might influence them, and so on.

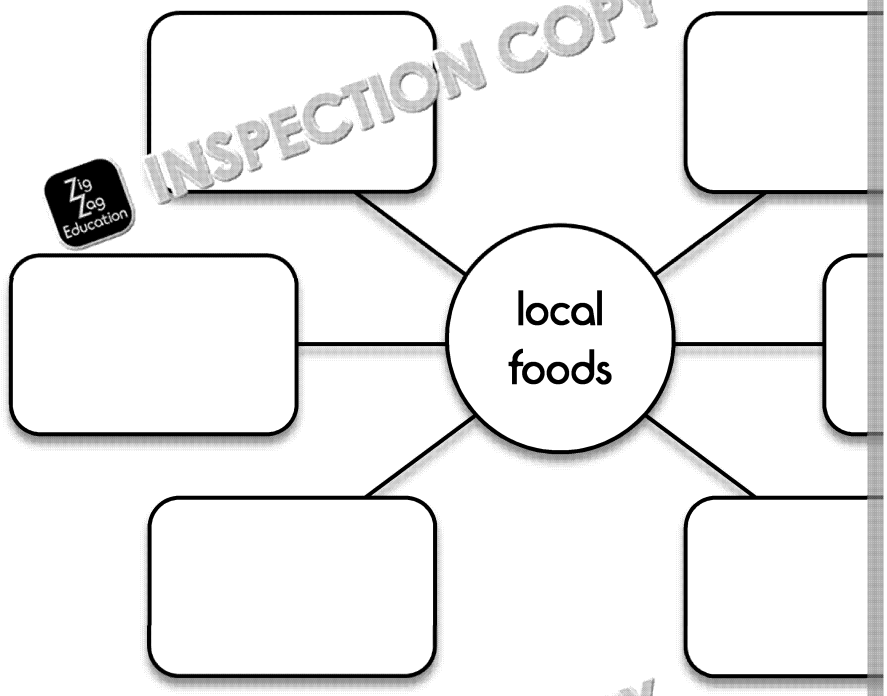
You can use the template connections map on the next page or create your

Connections map template



15. Food provenance: The impact of fo on the environment

1) Complete the diagram below to indicate the advantages of buying season



2) Unjumble the words to discover v[illegible] a[illegible]cts of food production which

WTEFODOAS	GINCKPAA	NTRBACOTOFC
_____	_____	_____
FSSFLIOEUL	EGEEHGARNUOSSES	PRNOANATTSR
_____	_____	_____

3) Put these stages of climate change into the correct order.

1
- greenhouse gases are released into the atmospher
- crops are damaged and people suffer famine
- glaciers melt while oceans, seas and lakes evaporat
- the surface of the earth warms up
- [illegible]sc[illegible]ions suffer from drought while others are

4) i) Fill in the gaps in the text below, using the keywords provided.

dispose	extend	pollute	decompose	infor

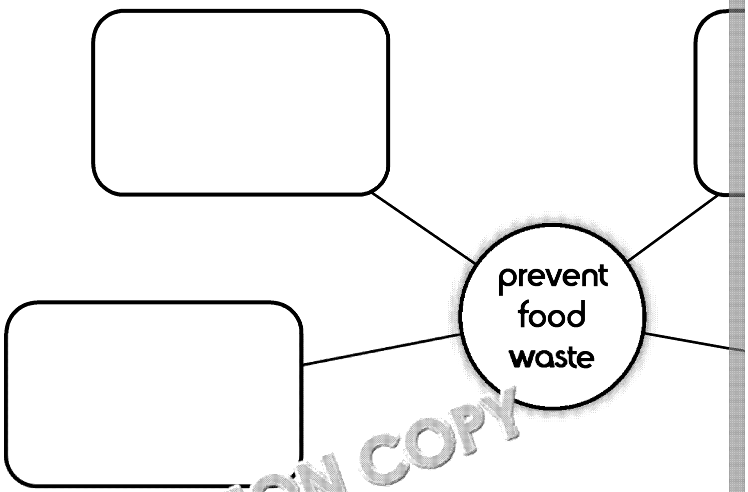
Food packaging is designed to _______________ consumers about t

the food from external factors and _______________ its shelf life. I

_______________ of food packaging and _______________ if poss

not _______________ and instead will _______________ the envi

ii) According to Eurostat, households are responsible for producing 42%
Provide four ways of preventing food waste in your home.



5) Access to safe, sufficient food helps to prevent food poverty. Complete th
poverty may lead to malnutrition.

Factor	
	can lead to loss of
	can cause kwashio
	can lead to poor b

Exam-style Question

Emission of greenhouse gases is one of the main causes of global warming.
Identify **two** ways of tackling the emission of greenhouse gases in the food in

Extension Task

Consider what food products are characteristic of winter, and design a three
these seasonal foods.

Use the Exten

Extension Task worksheet

Food products characteristic of winter:

Vegetables	Fruit	Meat a

My seasonal meal: .....

Ingredients of my meal:

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Preparation and cooking instructions:

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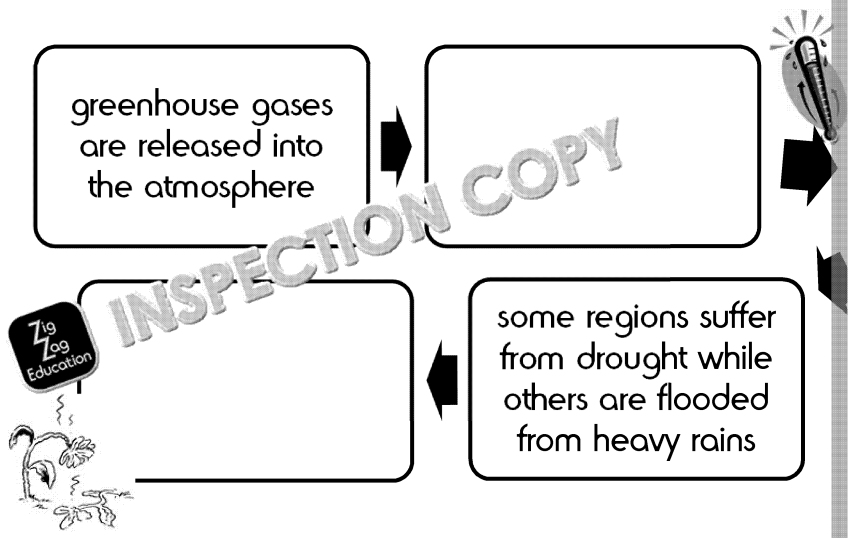
15. Food provenance: The impact of fo on the environment

1) Indicate how buying seasonal, locally produced food is advantageous for i

2) Explain how food production affects the environment. Use the keywords

transportation	carbon footprint	food miles	greer

3) Complete the chart to indicate the different stages of climate change.



4) i) Indicate three reasons why food is packaged and explain the need fo

1. .....

2. .....

3. .....

Recycling is needed because .....

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ii) According to Eurostat, households are responsible for producing 42% food and drink manufacturing produces another 39%. Discuss differe in the food industry AND in households.

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5) Access to safe, sufficient food helps to prevent food poverty. Identify thre

a.
b.
c.

Exam-style Question

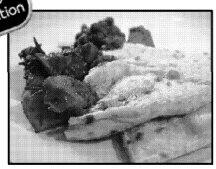
Explain **three** factors that influ[illegible] availability of food around the world.

Extension Task

List some examples of seasonal foods and design three meals characteristic

16. Food manufacturing: British and cuisines

1) Indicate the country of origin for the following meals and dishes.

Fish and chips 	Sushi 
Pizza 	Dumplings 
Paella 	Quiche 
N ac 	Tacos 

2) Fill in the gaps to define 'cuisine'. You can use some of the keywords belo

country	region	county
meal	dish	cooking

Cuisine is a style of cookin a t ristic of a particular _____

wher ec _____, preparation and _____

or se ng techniques are used.

3) Using the definition from question 2), provide one feature or eating patte

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4) British cuisine is very rich and varied. Colour-code the regions below and t characteristic for each of them.

Wales	England	N. Ireland
clotted cream	kippers	Cumberland [illegible]sage
boxty	cawl	champ
bara brith	[illegible]akes	Dunlop cheese

Exam-style Question

Identify two modifications to full English breakfast to make it suitable for a pe lead a healthier lifestyle.

Extension Task

Select a traditional dish from a distant count[illegible] (e.g. Brazil or South Africa) an using British ingredients, if possible.

Are there any ingredien[illegible]ich cannot be substituted? Why?

Use the Extens

Extension Task worksheet

Traditional dish name: ..... Country

Traditional ingredients	Available in the UK?	If not, how
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	
	☐	

Is it possible to cook the dish? Yes ☐ No (too many

Why some ingredients cannot be substituted:

.....

.....

.....

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.....

16. Food manufacturing: British and cuisines

1) Colour code the map to indicate where the following meals come from.

fish and chips	sushi	pizza	dumplings
naan bread	spring rolls	tacos	doughnuts

2) Define 'cuisine'

.....

.....

3) Using the definition from question 2), describe the features and eating pa

.....

.....

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.....

4) British cuisine is very rich and varied. For each country below, identify at l or foods.

Wales .....

England .....

Northern Ireland .....

Scotland .....

Exam-style Question

The ingredients below are for traditional Glamorgan sausages.

1 leek
1 garlic clove
50 g butter
140 g cheddar cheese
140 g fresh breadcrumbs
20 g parsley leaves
1 tsp English m[illegible]
1 wh[illegible]
100 m[illegible] frying
salt and pepper to taste

Justify **two** modifications that could be made to the recipe above to meet th
a) vegans
b) people suffering from obesity

Extension Task

Select a traditional dish from **two** distant countries (e.g. Japan and America
combining the two cuisines. *You could try a sushi bu[illegible]!*

Write down your new list of ingredients and recipe instructions.

17. Food manufacturing: Primary and processing of food

1) Match the methods of production to the stages of processing, by writing t

sorting	fermenting	ng colourants	
freezing		milling	
trussing	drying	gutting	

PRIMARY PROCESSING:	SECONDARY PR

2) Mat e keywords with the correct descriptions.

Homogenisation	Pressing the milk through ver bacteria
Pasteurisation	Heating the milk to over 110 bacteria and spores
Sterilisation	Process in which fresh milk is up fat particles and prevent i
Microfiltration	Process in which milk is heate rapidly cooled, conducted to

3) Fill in the gaps using some of the keywords below:

sweetener	preser ative	pectin	fibre	sugar

Sug ac are necessary in jam production. _____ hel from the fruit and speeds up the gelling process. _____ act protects the jam from bacterial growth.

4) Explain how the following processes affect the nutritional and sensory val

Sterilisation of milk	
Baking bread	
Drying milk	
Turning milk into che	
Si ng	
Juicing	

Exam-style Question

State two ways curing affects the sensory qualities of meat.

Extension Task

Investigate the amount of pectin in diffe nt ds of fruits. To do that, y

- 200 g cooking apples
- 200 g currants
- 200 g s ies
- b ckberries
- g grapes.
- 250 g white sugar

You can also choose other kinds of fruit.

Step 1: Prepare the fruit. Wash all fruit, remove inedible parts (e.g. remo green stalks and leaves from sour cherries) and carefully weigh 200 g of e fruit.

Step 2: Weigh five portions of sugar, 50 g each. Add one portion of sugar

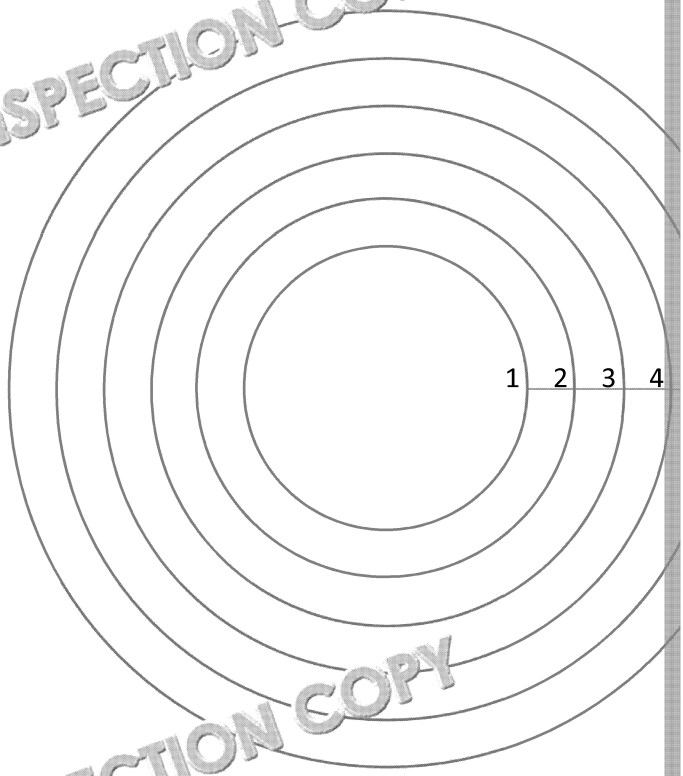
Step 3: Place each portion of fruit and sugar in a tall cup and blend until s one minute. Repeat for each kind of fruit.

Step 4: Let all samples cool down. After all sam ve reached room te viscosity using the chart on the next pag

Use the Extensi

Extension Task worksheet

Viscosity chart (ask your teacher to copy and laminate it for you)



Record h[illegible]our samples behaved (simply put in the table below what numbe

Apples	Currants	Sour cherries	Blac

Pectin is a natural gelling agent in fruit. This means that fruits which are natura viscous (thicker) than those which don't contain much pectin. In other words, f not spread much and their record should be low (1 or 2), while those which are will spread further from the centre.

Can you tell which fruits are rich in pectin?

.....

.....

17. Food manufacturing: Primary and processing of food

1) List five examples of primary and secondary processing of foods.

Primary processing	Se

2) Create your own glossary by defining the following terms.

homogenisation	
pasteurisation	
sterilisation	
microfiltration	

3) Explain the role of acid and sugar in food production.

.....

.....

.....

.....

4) Indicate how three different methods of primary and secondary processin value of foods.

1. .....

.....

2. .....

.....

3. .....

.....

Exam-style Question

Flour is the main ingredient in bread.

Describe the function of flour in bread and explain how different flours can ch
the bread.

Extension Task

Investig[illegible]e amount of pectin in different kinds of fruit. When preparing f

- what kinds of fruits you can investigate
- how you can check the amount of pectin in them
- how you can record your findings

18. **Food manufacturing:** Technological c
that claim to support better health and

1) Underline the products which are fortified by law.

breakfast cereals wheat flour m[illegible]in[illegible] soy milk

2) Match the beginning of the st[illegible]m[illegible]ith the end to indicate the health

The addition of plant sterols to margarine	prev
The addition of iron to cereals	help
The addition of folic acid to bread	help
Fortification with vitamin B1	help
The addition of vitamin D	help
The addition of vitamin B12 to soy milk	help

3) Complete the table below to identify some of the advantages and disadva
or food production. For each, identify one example. You can use the keyw

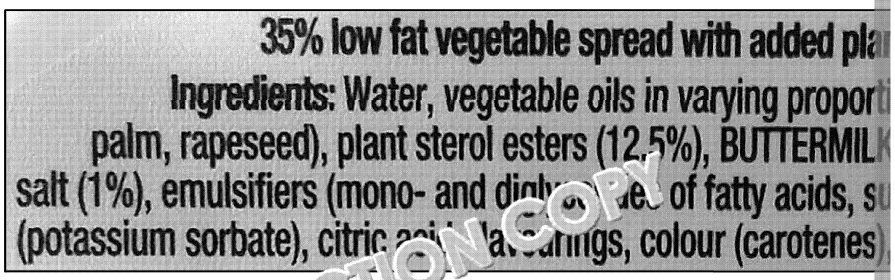
weight gain	asthma	itching	phenylketonuria	qu
natural	artificial	cancer	allergy	tex

Group	Advantages	Disadvantages
Col[illegible]nts		
Emulsifiers, stabilisers, gelling agents and thickeners		
Flavour enhancers and sweeteners		
Pres[illegible]tiv[illegible] an[illegible]nts		

4) Computer-aided manufacturing (CAM) is used worldwide to improve and
Indicate how CAM can be used in the process of cheese production show

Step no.	Process	How
Step 1	Milk is transported to the factory	
Step 2	Milk is pas[illegible]	
St[illegible]	Milk is cooled down	
Step 4	Starter cultures are added	
Step 5	Milk is incubated at 32°C	
Step 6	Rennet is added	
Step 7	Curd is cut and heated to 38°C	
Step 8	Whey is drai[illegible]	
St[illegible]	[illegible]eese undergoes *cheddaring* (the process in which curds are piled on top of each other and periodically flipped over)	
Step 10	The cheese is immersed in brine	
Step 11	The cheese is formed into blocks	
Step 12	The cheese is stored and aged	

5) Below you can see the label of a food product.



i) List two food additives used in this product.

.....

.....

ii) List two substances with which this product was fortified.

.....

.....

Exam-style Question

State two reasons why wheat flour has to be fortified.

Extension Task

Food modification can take place at any stage of food production – even be
plants or rearing animals. This is possible due to genetic modifications – pro
plants and animals to obtain the desired effect. The most often modified fo
beans and maize.

In the UK, it is mandatory to include suitable information on a food label if a
use of, genetically modified organisms.

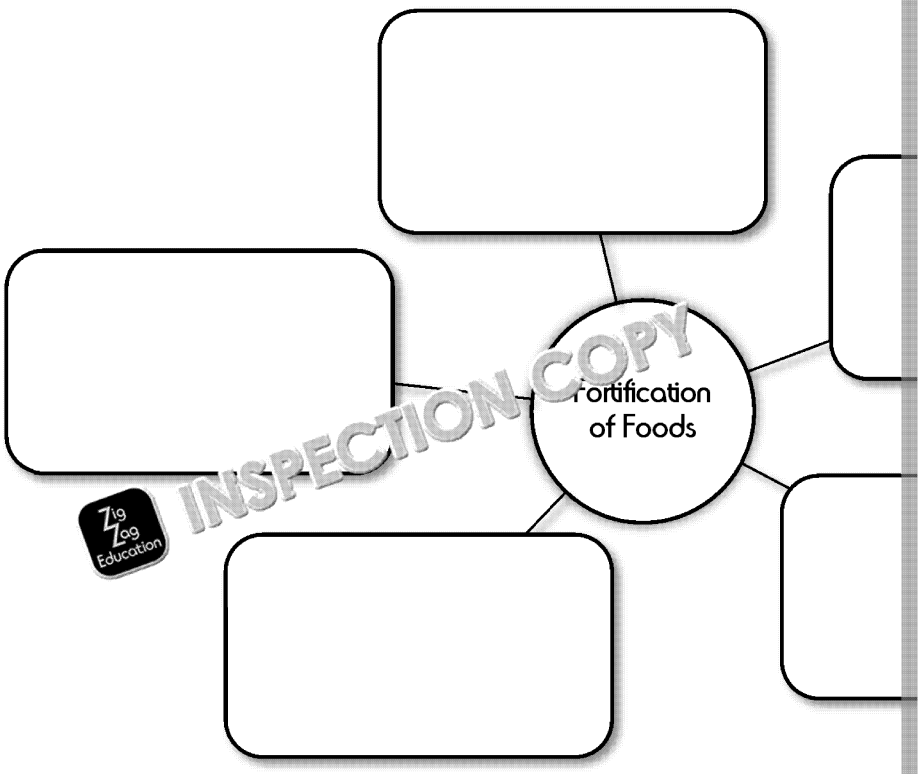
Go to a supermarket and inspect the labels of various food products. List th
genetically modified (hint: start at the shelves with soy products, such as so
Compare them with similar, non-GM products (e.g. soy milk labelled as GM-
differences (e.g. in colour, size, shelf life, etc.)

18. **Food manufacturing:** Technological c that claim to support better health and

1) Identify the three products that are obligatorily fortified in Great Britain, a added to them.

Product	Substance

2) Indicate the health benefits of food fortification.



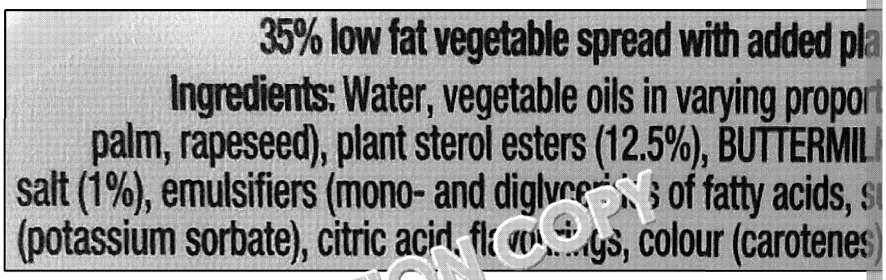
3) Complete the table to identify the advantages and disadvantages of using
indicate two examples.

Group	Advantages	Disadvantages
Colourants		
Emulsifiers, stabilisers, gelli ag nd eners		
Flavour enhancers and sweeteners		
Preservatives and antioxidants		

4) Computer-aided manufacturing (CAM) is used worldwide to improve the
Explain how CAM can be used during production of pasta.

Step	Process	How CA
1.		
2.		
3.		
4.		
5.		
6.		
7.		

5) Below you can see the label of a food product.



i) State the fu ttermilk in this product.

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ii) Explain why emulsifiers are used in this product.

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Exam-style Question

Evaluate the advant isadvantages of using food additives in the food

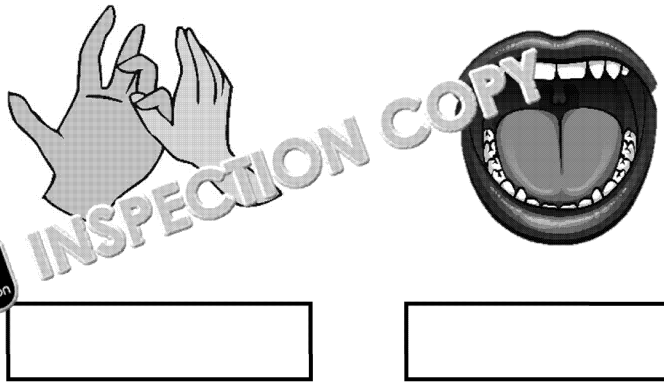
Extension Task

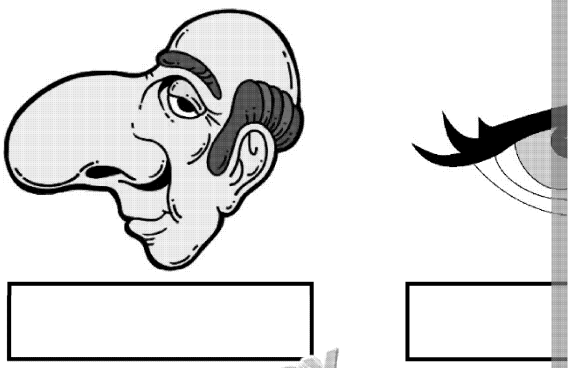
Food modification can take place at any stage of food production – even bef
plants or rearing animals. This is possible due to genetic modifications – pro
plants and animals to obtain the desired effect. The most often modified foo
beans and maize.

Go to ***zzed.uk/8906-gm-foods*** and read about food labelling rules which app
(GM) foods.
Then, go to a supermarket and try to find five fo ls labelled as genetically m
similar GM-free food products in terms of s e, appearance, aroma, taste, sh

19. Factors affecting food choice: Se

1) i) Identify the five senses.





ii) Explain why controlled conditions ha e t e assured for sensory test has to be controlled.

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2) Below are listed various food products/substances. Identify what taste ea

honey.....

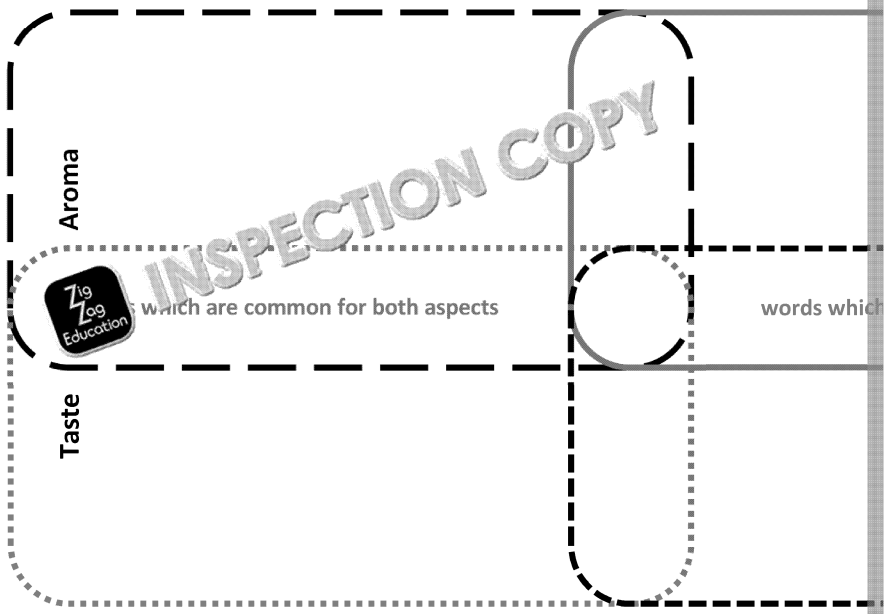
pretzels .....

lemon.....

coffee.....

parm n c e.....

3) Complete the diagram below to identify three terms used to describe the
during a taste panel. Note that some words can be used to describe two o
(e.g. zesty can describe both aroma and taste).



4) Explain why a person with a blocked nose or catarrh cannot take part in ta

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Exam Style Question

State **two** qualities of cooked shortcrust pastry.

Extension Task

Prepare five samples of tomato soup containing different amounts of salt. S
family or friends and ask them to assess the sample[illegible]ng various sensory t

- What tests can you use?
- What features, other than sal[illegible]an you test?

Use the Exter

Extension Task worksheet

Sensory evaluation 1

Method: ranking test (ask your testers to order the samples from the least salt

the table below to record their answers)

Feature tested: saltiness

Results:

	t… least salty	**second least salty**	**medium saltiness**	
Tes…				
Tester 2				
Tester 3				
Tester 4				
Tester 5				

Sensory evaluation 2

Method: .....

Feature tested: .....

Results:

Sensory evaluation 3

Method: .....

Feature tested: .....

Results:

19. Factors affecting food choice: Se

1) i) Identify the five senses.

1. .....
2. .....
3. .....
4. .....
5. .....

ii) Explain how to set up a taste panel.

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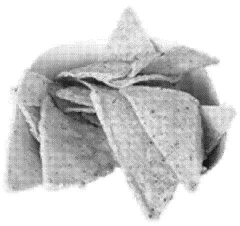
2) List the five tastes and provide a food source of each.

Taste 1	• Source:
Taste 2	• Source:
Taste 3	• Source:
Taste 4	• Source:
Taste 5	• Source:

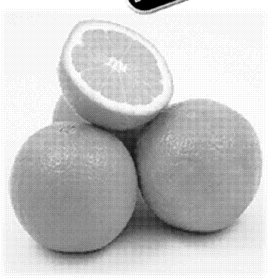
3) What words would you use to describe these foods? List at least five word characteristics.

carbonated beverage



maize nachos

Filled milk chocolate



oranges

4) Explain how the olfactory system works.

Exam-style Question

A food manufacturer is looking forward to performing a taste test for three ki
tomato soup.

a) Name **one** type of sensory test the manufacturer is most likely to carry

b) State **three** conditions that have to be controlled when carrying out a ta
instant soups.

Extension Task

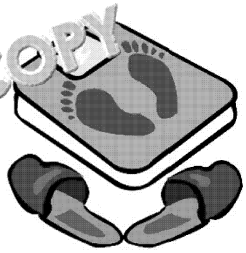
Prepare five samples of a dish of your choice differing in the amount of salt,

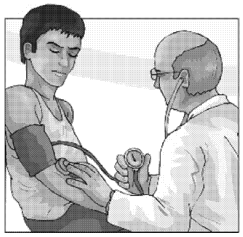
Set up a taste panel for your family or friends and ask them to assess the sa
sensory tests.

Change the taste and aroma by replacing salt with herbs and spices, and co
Write an article on how salt can be replaced in meals and what the health b

20. Factors affecting food choice: Th
factors that influence food choices

1) Using the images below, identify the various factors that influence food c





2) i) Using the information in the table, calculate the cost of making a thym

Product	Price per pack	
Olive oil	£6.50 / 1 litre	
Salmon, fresh fillet	£15.00 / 1 kg	
Arborio rice	£4.50 / 1 kg	
White wine	£15.00 / 1 litre	
Fresh thyme	£1.25 / 70 g	
Pink H[illegible] salt	£35.00 / 1 kg	
[illegible]uka honey	£50.00 / 1 kg	

ii) Suggest cheaper substitutes for the products listed below.

Olive oil can be exchanged for .....

Salmon can be exchanged for .....

Arborio rice can be exchanged for .....

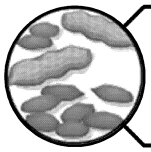
White wine can be exchanged for .....

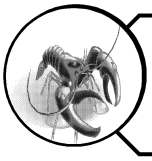
Fresh thyme can be exchanged for .....

Pink Himalayan salt can be exchanged for .....

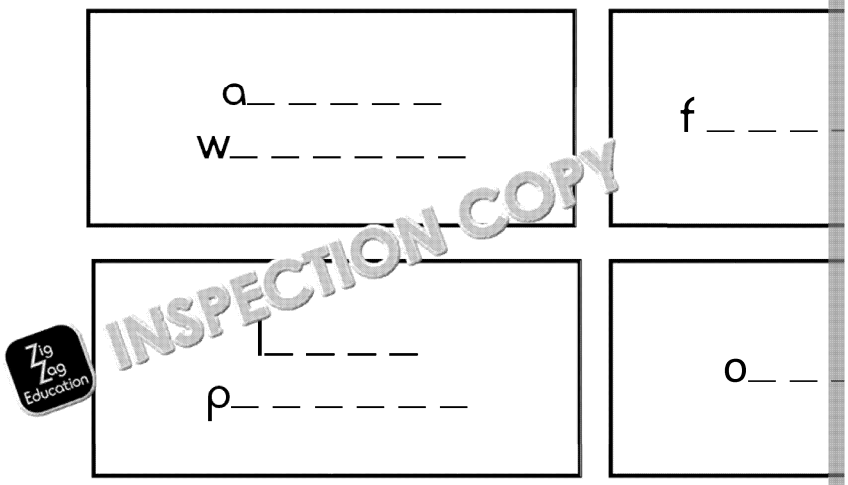
Manuka honey can be exchanged for .....

3) Look at the pictures below and identify five of the most common food allergens





4) i) Indicate the four ethical beliefs which may influence a human's food



ii) In the table below, list three advantages and three disadvantages of

+ Advantages	

Exam-style Question

1. S... reasons why individual food preferences may differ.

2. Identify **two** factors that can impact on the availability of food.

Extension Task

Your task is to plan a dinner for a family of four. In the family:

- one person is lactose intolerant
- one person is allergic to nuts

Remember to justify your choi... of ...redients.

As the family is ... have a large disposable income, you also need to c... tota... do... not exceed £4.00 per person. Make sure the quantity you ... four ...e.

Use the Exten...

Extension Task worksheet

Ingredients I CAN use	Ingred

Main meal: .....

Dessert: .....

Ingredient	Why I use this ingredient	

Divide the total price by four to calculate how much your meal costs per perso

.....

Is it cheaper than £4.00 per pe[illegible]? Yes ☐ No

If not, how can you m[illegible] recipe to decrease the price?

.....

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.....

.....

20. Factors affecting food choice: Th
factors that influence food choices

1) There are many factors which influence food choices. For each factor liste
the food choice of an individual.

Money .....

Time .....

Seas .....

Occ .....

PAL .....

2) i) Using the information below, calculate the price of a portion of thym

Product	Price per pack	
Olive oil	£6.50 / 1 litre	
Salmon, fresh fillet	£15.00 / 1 kg	
Arborio rice	£4.50 / 1 kg	
White wine	£15.00 / 1 litre	
Fresh thyme	£1.25 / 70 g	
Pink Himalayan salt	£35.00 / 1 kg	
M...	£50.00 / 1 kg	

ii) Assess whether the meal would be suitable for a low-income family c

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3) Identify five out of the 14 most common food allergens.

1. .....
2. .....
3. .....
4. .....
5. .....

4) i) Create your own glossary of terms referring to the ethical and moral

animal welfare	
fairtrade	
local produce	
organic	

ii) Discuss the advantages and disadvantages of genetically modified foo

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Exam-style Question

Explain how an individual's lifestyle may influence their food choices. Refer to
your answer.

Extension Task

Plan a dinner for a family of four, in which one member is lactose intolerant,

Remember to:

- justify your choice of ingredients
- consider different factors which will affect your meal choices

Use an online price comparison tool to cost your dish and, subsequently, cho
chosen ingredients. The price limit is £2.00 per person.

21. Factors affecting food choice: Foo marketing

1) i) Complete the diagram by labelling four pieces of mandatory informat food packaging.

ii) Identify four other pieces of information that are included on a food

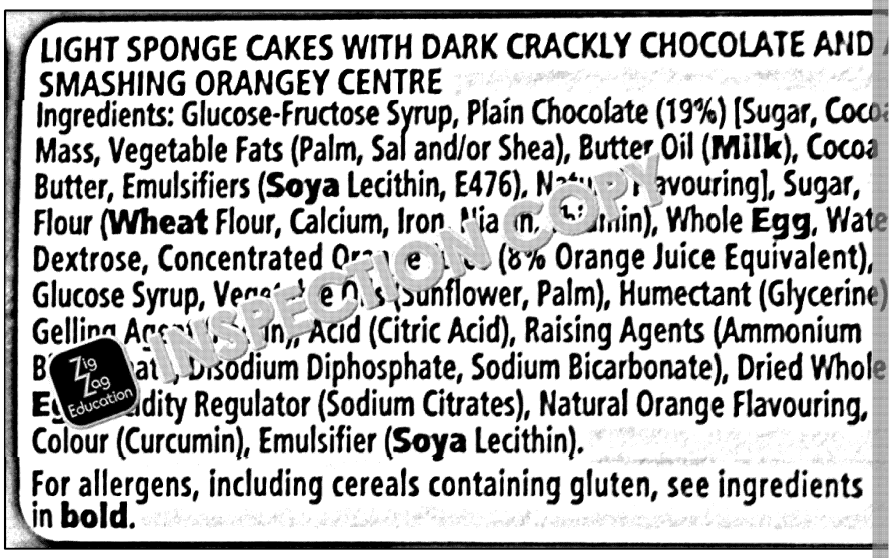
a) .....

b) .....

c) .....

.....

2) Read the label carefully and answer the questions below.



LIGHT SPONGE CAKES WITH DARK CRACKLY CHOCOLATE AND A SMASHING ORANGEY CENTRE

Ingredients: Glucose-Fructose Syrup, Plain Chocolate (19%) [Sugar, Cocoa Mass, Vegetable Fats (Palm, Sal and/or Shea), Butter Oil (**Milk**), Cocoa Butter, Emulsifiers (**Soya** Lecithin, E476), Natural Flavouring], Sugar, Flour (**Wheat** Flour, Calcium, Iron, Niacin, Thiamin), Whole **Egg**, Water, Dextrose, Concentrated Orange Juice (8% Orange Juice Equivalent), Glucose Syrup, Vegetable Oils (Sunflower, Palm), Humectant (Glycerine), Gelling Agent (Pectin), Acid (Citric Acid), Raising Agents (Ammonium Bicarbonate, Disodium Diphosphate, Sodium Bicarbonate), Dried Whole **Egg**, Acidity Regulator (Sodium Citrates), Natural Orange Flavouring, Colour (Curcumin), Emulsifier (**Soya** Lecithin).

For allergens, including cereals containing gluten, see ingredients in **bold**.

i) List the allergens present in the cakes.

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.....

.....

.....

ii) Are these cakes suitable for vegetarians? Justify your answer.

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iii) Explain why these cakes might be unsuitable for children.

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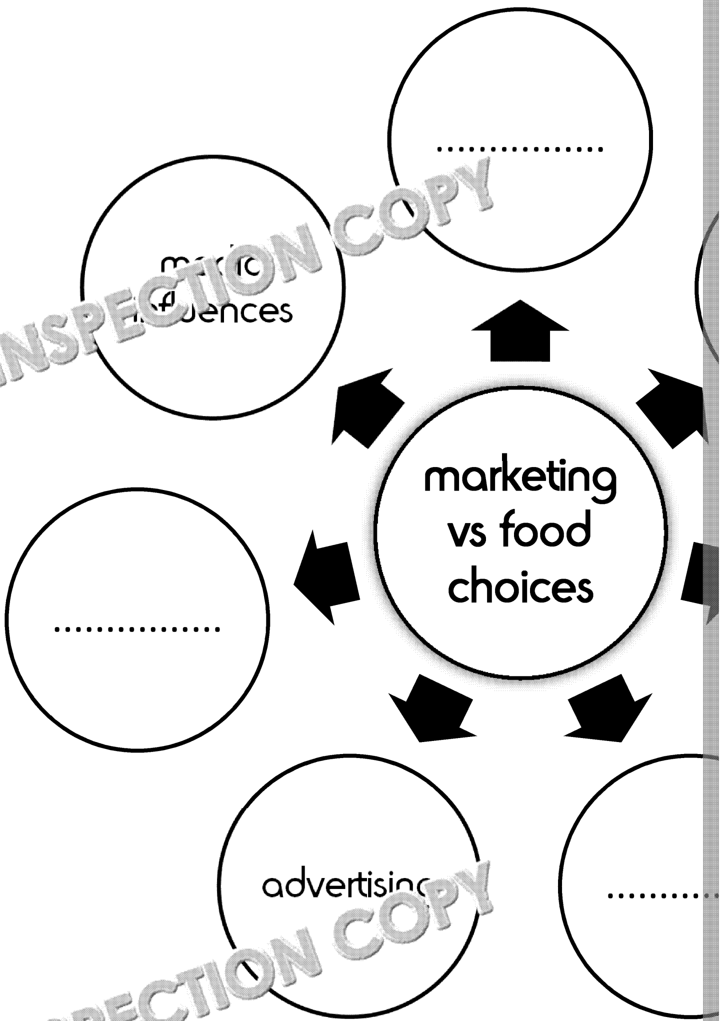
3) i) Complete the diagram below to indicate marketing techniques which



ii) Explain what ‘star power’ is.

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Exam-style Question

State three allergens that are mandatorily indicated on a food label.

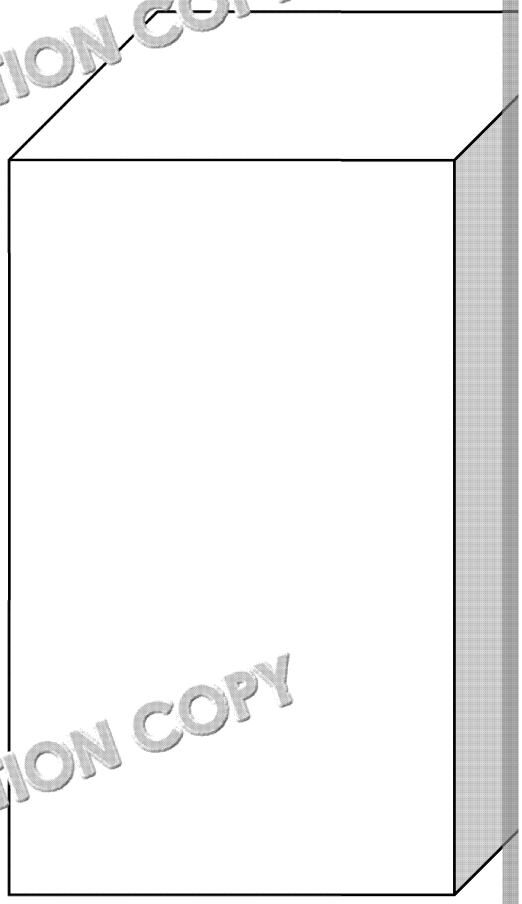
Extension Task

Design a label for a chosen food product. In your label, remember to:

- include all mandatory information required by law (you can use the Inte value and the percentage of recommended intake in a portion; rememb embolden the allergens!)
- include some non-mandatory information
- include some information for marketing purposes

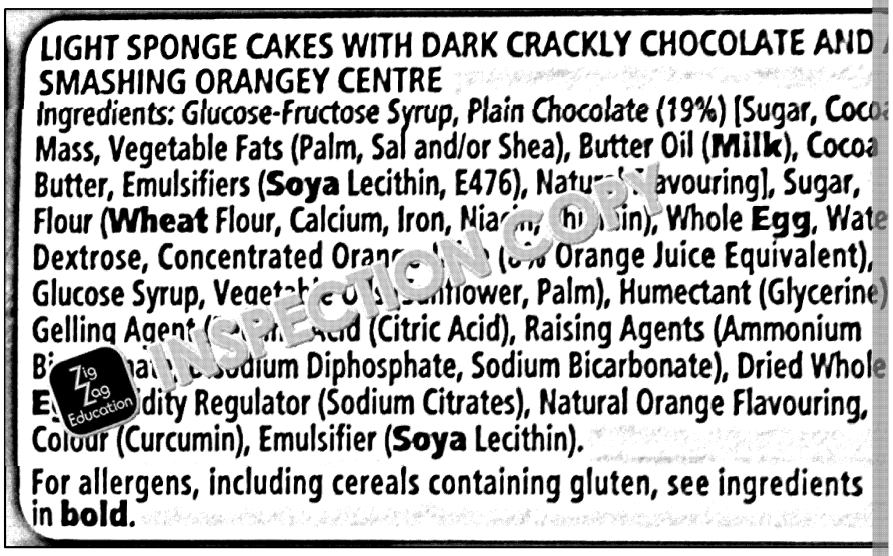
21. Factors affecting food choice: Foo marketing

1) Design your own food package to include at least five pieces of mandatory important to include this information on a food label.



Mandatory information	Why it is i

2) Inspect the label and answer the following questions.



LIGHT SPONGE CAKES WITH DARK CRACKLY CHOCOLATE AND A SMASHING ORANGEY CENTRE

*Ingredients: Glucose-Fructose Syrup, Plain Chocolate (19%) [Sugar, Cocoa Mass, Vegetable Fats (Palm, Sal and/or Shea), Butter Oil (**Milk**), Cocoa Butter, Emulsifiers (**Soya** Lecithin, E476), Natural Flavouring], Sugar, Flour (**Wheat** Flour, Calcium, Iron, Niacin, Thiamin), Whole **Egg**, Water, Dextrose, Concentrated Orange Juice (5% Orange Juice Equivalent), Glucose Syrup, Vegetable Oil (Sunflower, Palm), Humectant (Glycerine), Gelling Agent (Pectin), Acid (Citric Acid), Raising Agents (Ammonium Bicarbonate of Soda, Sodium Diphosphate, Sodium Bicarbonate), Dried Whole **Egg**, Acidity Regulator (Sodium Citrates), Natural Orange Flavouring, Colour (Curcumin), Emulsifier (**Soya** Lecithin).*

*For allergens, including cereals containing gluten, see ingredients in **bold**.*

i) List the allergens present in the cakes. Indicate in which health cond

.....

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ii) Assess whether the product is suitable for vegans. Justify your answe

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iii) Describe how the list of ingredients is constructed.

.....

.....

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.....

.....

3) i) Explain what 'pester power' is.

.....

.....

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.....

.....

ii) ...te three marketing techniques which influence food choices.

1. .....

2. .....

3. .....

Exam-style Question

Explain how marketing and advertisements can affect food choices. Refer t
techniques in your answer.

Extensi... ...k

Plan a... ...k a traditional British dish of your choice. Then, design a packag

- W...t kind of packaging will you use? What should it be made of? How
  microwaveable?
- Design the label to include all mandatory information required by law f
- What non-mandatory information can you include on the label?

Once the package is ready, design an advertisement for your product. Who
marketing techniques can you use? Can the package help you to increase th

Answers

1. Macronutrients: Proteins, fats and carbohydrates

1) ●■ Higher ability to provide similar answer to lower-ability worksheet

Macronutrients include proteins, fats and **carbohydrates**. They are called ma
them in **large** quantities to remain healthy. Pro[illegible] can be found in both ani
can be divided into two main groups – ones that have single only bonds in the
saturated, and those which co[illegible]e or triple bonds are called **unsatu**
starch, **sugars** and fibre. Fibre is necessary for the proper functioning of the

2) ●■ [illegible] provide similar sources to ones given below, on their spi

[illegible]	Cheese, butter, avocados, pork chops, doughnut
Proteins	Hazelnuts (nuts and seeds), tuna (fish), eggs, pork chops, c
Carbohydrates	Grapes (berries), pasta, carrots, potatoes, oranges, bread r

3) ●■ Higher ability to provide similar functions

	Functions
Fats	• Provide protection of the vital organs • Help dissolve and absorb vitamins in the body • Provide insulation from the cold to maintain body hea
Proteins	• Help build hormones and enzymes • Help develop antibodies to fight bacteria and viruses a • Building material of body cells such as muscle
Carbohydrates	• Provide the main source of energy • Increase satiety • Dietary fibre supports bowel movements

4) i) ●■

- Low biological value (LBV) [illegible] and high biological value (HBV)
quantity of amino a[illegible]he contain.
- LBV protei[illegible]t contain enough essential amino acids or contain
usu[illegible] plant sources.
- HB[illegible]roteins contain all the essential amino acids and are usually t

ii) ●■

- Protein complementation is a process in which low biological value
form a high biological value protein meal.
- An example of this is beans on toast, when lysine-low bread is balan

iii) ●■ Lower ability to provide two alternatives, higher ability to provide fo
Protein alternatives include:

- Soy beans and all soy-derived products such as tofu, tempeh, soy ch
- Quinoa
- Quorn™ (mycoprotein)
- Various legume-based meals such as hummus which is made of chi

5) i) ●

Avocado (US)	Cod (US)	Sal[illegible]	Chocolate (S)
Olive Oil (US)	Cheese (S)	[illegible] (S)	Nuts (US)

ii) ●

- Monou[illegible]ated fats have only one double bond in the fatty acid c
cha[illegible] than two of them.
- Monounsaturated fats begin to solidify at low temperatures while p

5) ■

- Depending on the chemical structure, we can differentiate two kinds of f
- Unsaturated fats may be further split into monounsaturated and polyun
- In saturated fats all the chemical bonds in fatty acid chains are single. A
- In monounsaturated fats there is one double bond in the fatty acid chain
- there is more than one double bond in the fatty acid chain. An example
- The other way of categorising fats is by dividing them into visible and no
- Visible fats include lard, suet, butter, cream an white visible fatty ti
- Non-visible fats include fats which are food products, but can'
- olives, milk and cheese, meat and (other than the white visible

6) ●■

Type of carbohydrate		Description	Sou
Starch	Polysaccharides	**Is built from many sugar molecules bound together into long chains; can be broken down by enzymes in the human digestive tract. Also known as complex carbohydrates.**	Wholeg brown Bread c
Sugars	Monosaccharides	Group of sugars built from one molecule of sugar only	**Fruit a fructos** **Honey mono-**
	Disaccharides	**Group of sugars built from two sugar molecules**	**Table s contai disacch** **Cereals**
Dietary fibre		**Is built from many sugar molecules bound together into long chains; cannot be broken down by the human digestive tract**	Wholeg insolubl Fruit, ve contain Cereals, insolubl

Acc er suitable answers.

7) ●■ Higher ability to provide similar information in their explanations.

	Proteins	Fats
Effects of deficiency	**Swelling** – proteins are responsible for maintaining the so-called oncotic blood pressure, so if there is too little protein, the water will be retained in the body and this will cause swelling. Hormonal disorders – many hormones are made of protein, so if there is not enough, the hormones could not be built **Growth arrest** – protein is necessary to build all cells around the body, so if there is no protein, the body cannot build new cells and cannot grow or develop **Kwashiorkor** – this is the effect of long-term, chronic protein deficiency. Lack of protein will lead to retention of water in the tissues, and this will cause them to swell, so the stomach will look big and swollen. **Hair thinning** – when there is not enough protein, the body reserves it to carry out the most important functions for survival; therefore, the skin, nails and hair will become thinner, brittle or more prone to damage.	**Loss of body mas** fat is used to buil walls and forms fa tissue around the to insulate it and energy for later. there is not enou the body will use reserve and in eff you will lose weig **Vitamin deficien** fat is a solvent of vitamins, so not e enough fat means you are also eatin few vitamins, and may cause further health problems. **Hormonal disor** many hormones require fat to be b so lack of fat mea that they could n built.

	Proteins	Fats
Effects of excess	**Depression, low mood –** proteins are needed to build hormones which are responsible for improving mood (e.g. serotonin), so deficiency will lead to low levels of these hormones, and effectively will result in a lower mood or even depression. **Kidney and liver disorders** – the protein is processed in the liver which breaks it down into urea, so too much protein will overburden the liver. The kidneys filter the blood to form urine, and if there is too much protein they will be overburdened, and won't filter the blood properly, which might cause them to fail. **Weight gain** – protein is a secondary source of energy; eating an excess amount of protein may lead to a situation where the extra amount will be turned into fat and cause weight gain as the body won't [illegible] process all of it.	**Overweight and obesity –** excess fat is stored in the body fatty tissue. This accumulates around your internal organs, in the hips, arms and thighs, so eating too much fat will lead to weight gain. **Coronary heart disease** – fat, especially saturated fat, increases the LDL cholesterol level in blood. This can bond with calcium and accumulate in blood vessels as plaque. The plaque may build up and block the vessels around the body and in the heart, and may increase the risk of a heart attack or stroke. **Hypertension** – excessive consumption of fat, especially saturated fat, causes the plaque to accumulate in blood vessels. The more plaque, the less room in the vessels for blood, so the pressure will rise, as the amount of blood remains stable. **Type 2 diabetes** – obesity increases the risk of type 2 diabetes. Type 2 diabetes occurs more often in obese people than in people with healthy body weight.
Daily recommended value in % or grams for an average diet of 2,000 kcal	10–15% (50–75 g)	25–35% (55–77 g)

Accept other suitable answers.

8) i) ●■ Essential amino acids cannot be built by the human body from scratch a healthy balanced diet. Non-essential amino acids can be built by the human

ii) ●■ Higher ability to provide five from:
Essential amino acids include: histidine, isoleucine, lysine, leucine, methionine, tryptophan, valine.

Exam-style Question

1) Any two from [illegible] marks)
- [illegible]sh / fish oil (any from salmon, herring, mackerel, tuna, etc.)
- [illegible]oil
- egg yolk
- nuts (any from walnuts, almonds, hazelnuts, etc.)
- seeds (any from pumpkin, poppy seed, linseed, etc.)

or any other suitable answer.

■ 6 marks

The answer shows excellent knowledge and understanding of the topic. Stu macronutrients and provide relevant, detailed food sources. Students identi adolescence energy needs may be increased. Subject-specific vocabulary is u
The answer shows good knowledge and understanding of the topic. Student sources of energy in the diet. Correct food sources for each macronutrient a specific vocabulary is used throughout, with few mistakes.
The answer shows limited knowledge and unde[illegible]g of the topic. Stude more of the macronutrients, but the food s[illegible]s are not indicated or incorr may be generic and simplistic.
Students don't provide a[illegible] answer.

Indic[illegible] co[illegible]:

- [illegible]hydrates – carbohydrates are the primary source of energy and, th[illegible] Students should indicate that carbohydrates consist of both polysa for each should be indicated in detail, i.e. 'wholemeal or white bread' ins juice' instead of 'juice'.
- Fats – students identify the two types of fats – saturated and unsaturated are more desired in the diet. Students indicate a relevant, detailed sourc 'mature low-fat cheddar cheese' instead of 'cheese'.
- Proteins – students indicate that proteins are a secondary source of ener used only if there are no carbohydrates or fats available. Students indica is growth and repair. Students indicate two types of proteins – high biol Students indicate a detailed, relevant source of proteins, i.e. 'lean beef' in with pumpkin seeds' instead of 'bread with seeds'. If students choose LB provide another complementary source of protein.
- Other correct responses may be accepted.

2. Micronutrients: Vitamins and Minerals

1) i) ●

	Functions	
E: Ensures pro[illegible] growth [illegible] cells	D: Lowers the risk of type 2 diabetes and cancer	A: Maintains hea skin, nails and h
[illegible]crucial for good eyesight	K: Prevents haemorrhages	D: Necessary fo bone and teeth g and developme
K: Necessary for proper blood clotting	A and E: Antioxidant	
	Effects of deficiency	
E: Tiredness	A: Dry and flaky skin	D: Depression
D: Osteoporosis	E: Wrinkled, thin skin	A; Brittle hair a
K: Excessive bleeding	E: Muscle degeneration	A, E and K: Decr immunity
	Effects of excess	
A and E: Headaches	K: Jaundice	K: Degradation blood cells
E: Stomach problems	D: Feeling [illegible]k	D: Itchiness
A: Swelling of the liver and spleen	[illegible]iarrhoea	A: Hair loss
	Sources	
[illegible]d [illegible]l and fish oil	A and K: Broccoli	A: Carrots
[illegible]eese	A: Liver	K: Kale
E: Sunflower oil	A and E: Blueberries	A and D: Egg yo

1) i) ■

Fat soluble vitamins A, D, E and K

Name	Function	Effects of deficiency	Effe
Vitamin A (retinol and beta carotene)	• Maintains healthy skin, nails and hair • Crucial for good eyesight • Antic...	• Night blindness • Brittle hair and nails • D... and flaky skin • ...ecreased immunity	• Sw... liv... • He... • Ha... • Da... th...
Vitamin D (cholecalciferol)	...ecessary for proper bone and teeth growth and development • Prevents depression • Lowers the risk of type 2 diabetes and cancer	• Rickets • Osteoporosis • Depression • Decreased immunity	• Na... • Di... • Ito... • Fe...
Vitamin E (tocopherol)	• Antioxidant • Necessary for proper growth and development of the foetus during pregnancy • Ensures proper ... ...h ... ...rm cells	• Tiredness • Wrinkled, thin skin • Muscle de... ...eration • ...w immunity	• He... • St... pr... • Ey...
...min K	• Necessary for proper blood clotting • Prevents haemorrhages	• Excessive bleeding • Slow wound healing • Decreased immunity	• De... re... • ja...

1) ii) ●■

Water soluble vitamins B group and C

Name	Function	Effects of deficiency	Effe
Vitamin B1 (thiamine)	Takes part in carbohydrate metabolism; is an important part of numerous enzymes	Beriberi disease, which shows as nerve and muscle cell degeneration	Practi impos overd taking amou vitam
[illegible] flavin)	important part of enzymes; takes part in creating haemoglobin	Cracked and dry lips (especially in the corners of the mouth), dry skin	No kn effect
Vitamin B3 (niacin)	Helps release energy from food, takes part in red blood cells production, has a positive effect on the performance of the nervous system, extends blood vessels which helps deliver oxygen to the tissues	4D syndrome – dermatitis (inflammation of skin), diarrhoea, dementia (loss of memory), death Low concentration (inability to focus), irritability Increased sensitivity of the skin to sunlight	Redde itchin of ski Nause
Folate / folic acid	Important in the process of DNA synthesis, takes part in creating red blood cells, reduces the risk of spinal cord diseases in the newborns	A disease called spina bifida in newborns Anaemia (lack of red blood cells)	No kn effect
Vitamin B12 (cobalamin)	Together with folic acid takes part in creating red blood cells	Anaemia (lack of red blood cells) might occur in vegans if not supplemented	No kn effect
Vitamin C (ascorbic acid)	Takes part in collagen synthesis, helps with the ingestion of iron, increases immunity, stopping blood [illegible]	Decrease in immunity A disease called scurvy, which shows as bleeding, [illegible], weak [illegible] leading to the loss of teeth Anaemia (due to impaired iron ingestion) Slow wound healing, excessive bleeding	Occur but m nause diarrh

*Effects of excess of water-soluble vitamins can be observed very rarely body easily with urine, but answers are provided to indicate what high d

2) i) ● Lower ability to match up

i) ■ Higher ability to construct sentences with main points included.

Mineral	Functions	Effects of excess
Calcium (Ca)	Helps build strong bones and teeth	Demineralisation of bones
Fluoride (F)	Builds tooth enamel, prevents tooth de[illegible]	[illegible]tt[illegible] tooth enamel, staining of teeth
Potassium (K)	Bal[illegible] fl[illegible]ds in the body keeps the blood pressure stable	Chest pain, palpitations
Iodine (I)	Builds the thyroid gland hormones and coordinates metabolic rate	• Brain immaturity in foetus • Difficulties when focusing • Can lead to weight gain
Iron (Fe)	Helps build red blood cells	Constipation, feeling sick, stomach pain
Magnesium (Mg)	Necessary to build DNA, controls muscle functions	Diarrhoea, abdominal cramps

ii) ● ■ Any of the following sources or suitable alternatives:

- Calcium – milk, sardines
- Fluoride – sardines
- Potassium – bananas
- Iodine – salmon and seafood, kitchen salt
- Iron – red meat, salmon and seafood
- Magnesium – nuts and seeds

3) ●

- vitamin D a[illegible] c[illegible]
- [illegible]in [illegible] iron
- [illegible]cid and vitamin B12
- Magnesium and calcium
- folic acid and iron
- niacin and tryptophan
- vitamin D and fluoride

3) ■

i) calcium and vitamin D

Vitamin D is necessary for calcium absorption. Without vitamin D, calciu intestine (even if there are large amounts of it in the food). Therefore, de lead to deficiency of calcium.

ii) iron and vitamin C

Vitamin C increases absorption of iron in the intestine. Iron occurs in foo absorbed by the body, and non-haem, which is [illegible]bsorbed as well. Vita haem iron, helping to prevent iron def[illegible]ae[illegible]w[illegible]aemia. Vitamin C also is such as that which builds blo[illegible]els, so supports the cardiovascular s production of haemo[illegible] iron, and by strengthening the walls of

Exam-style Ques[illegible]

● ([illegible] for each correct, max. 2 marks)

a) [illegible]in B12 (cobalamin)

b) Vitamin C (ascorbic acid)

■

The answer shows excellent knowledge and understanding of the topic. Stu knowledge and thorough understanding of nutrition. Students identify at le micronutrients and explain in detail why these micronutrients are needed i this age group. Subject-specific vocabulary is used throughout.
The answer shows good knowledge and understanding of the topic. Student knowledge and understanding of nutrition. Students identify at least two m in higher amounts by teenagers and provide some explanations behind the increa Subject-specific vocabulary is used throughout with few mistakes.
The answer shows limited knowledge and understanding of the topic. Stude micronutrient needed in higher amounts by teenagers, and the reasons behi requirements may be missing or incorrect. The language used may be gener
Students do not provide any relevant answer.

Individual content:

- Teenagers need more calcium, vitamin D, iron and magnesium than adul
- Calcium and vitamin D are necessary in larger amounts because teenage
- During growth spurt, the skeleton (bones) grows rapidly until the teena
- Vitamin D is necessary to improve calcium absorption, and calcium direc
- Iron is needed in larger amounts by teenage girls than teenage boys or a women up to the age of 50),
- This is because they begin to menstruate.
- Extra iron is necessary to prevent anaemia.
- Magnesium is needed in larger amounts by teenagers because their body
- Magnesium is needed to build the bones and muscle tissue.
- Magnesium is also an important electrolyte, which is necessary to condu

Or any other relevant answer.

3. Nutrients: *Water and dietary fibre*

1) ●■ Higher ability to provide similar answer to lower-ability worksheet
Water is necessary for:

- Maintaining stable body temperature, preventing the body from overhea sweating
- Digestion and bowel movements, e.g. by dissolving substances, be (or stomach acid), making swallowing easier, bulking up the food w ation easier, helping to transport nutrients around the body by mal
- Elimination of waste products and toxins, e.g. by excretion of stools and
- Keeping the mucous membranes moist, allowing them to function prope lungs, in the mouth and stomach)
- Taking part in many chemical reactions in the cells around the body
- ■ Dehydration may occur, e.g. after a marathon, where runners are swea enough. Other relevant responses possible.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet
Extra fluid has to be provided:

- During diseases with high fever or when you are ill and lose water, e.g. d
- During sport and high physical activity – to replace water lost as sweat
- When it's very hot weather – to replace water lost as sweat
- When somebody wants to lose weight – water helps to bulk up the fibre, satiety and, therefore, a person needs to eat

3) ●■ Higher ability to provide similar answer to lower-ability worksheet
Water is lost from the body via:

- Lungs – during breathing air is breathed out as vapour
- Kidneys (and bowel) – water is lost with urine and stools
- Skin – water is lost with sweat

Higher-ability students may also indicate other possible ways in which water
- Eyes – water is lost with tears
- Mouth – water is lost with saliva
- Wounds – water is lost with blood when bleeding occurs

4) ●■ Higher ability to provide similar answer to lower-ability worksheet

- Feeling thirsty – this is the first symptom of dehydration. Lack of water r available water for the most important processes. This leads to less wat so a person will have a dry mouth and feel thirsty.
- Dark urine – this is because water dissolves the waste products filtered i available, the more water will be retained by the body, so the urine will b colour.
- Lack of energy – water makes up a large part of the brain (around 75%) brain cannot work properly, and, as a result, you might feel tired, have le with concentration and headaches.
- Increased heart rate – water makes up approximately 90% of the blood v the blood becomes thicker and the heart needs to work harder to pump i

Higher-ability students may also indicate other symptoms of dehydration, suc

- Passing urine less often – as there is less water in the body, it will retain use a toilet.
- Constipation – water helps to bulk up the food waste in the intestine and there is no moisture, and the food waste is not bulked up, the bowel will result constipation may occur.
- Dry, inelastic skin – water makes up a large part of body fluids, including little water, it will move from the cells to the blood to equal their concent cells – will be less moist and become inelastic and dry.
- Fever – water helps to cool the body, so, if there is not enough water, the eventually will raise its temperature, which may be fatal.
- Low blood pressure – water makes up around 90% of the blood volume, vessels will not be 'filled', and the blood pressure will drop, leading to fai

Other relevant responses possible.

5) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) Dietary **fibre** is an important part of a **balanced** diet. It can be found in **products**. It plays a crucial role for the proper working of the **digestive** groups: **soluble** and **insoluble**. Pectin slows down ingestion of **sugars** a sugar levels. Cellulose controls the movements of the **bowel** and preven the risk of diseases such as type 2 **diabetes** and **cancer**.

ii) ● Hypertension, coronary heart disease, obesity, type 2 diabetes, irritabl

ii) Dietary fibre swells up in the stomach, increasing the feeling of satiety. B their overall consumption and eat less (because they don't feel hungry a those who wish to lose weight as their bodies will begin to use the energ eventually leading to weight loss.

Exam-style Question

●

a) Any two from: (max. 2 marks)

- wholemeal bread / cereals / cereal products
- fruit and vegetables
- dried fruit
- beans and pulses
- oatmeal and porridge

or any other relevant answer.

b) Any two from: (max. 2 marks)

- to prevent constipation / diarrhoea
- to decrease the risk of bowel cancer
- to increase satiety
- to lose weight
- to alleviate symptoms of disease (e.g. irritable bowel syndrome)

or any other relevant answer.

■

a) Any three from: (1 mark for each correct, max. 3 marks)
- constipation
- bloating
- feeling hungry more often
- eating more for each meal, resulting in overconsumption and weigh
- increased risk of obesity
- increased risk of developing bowel can
- increased risk of developing brea
- increased risk of develo
- increased risk of

Accept other

b) Any two from: (1 mark for each correct, max. 2 marks)
- to allow the fibre to swell and increase satiety
- to allow the fibre to swell and accelerate bowel moevements
- to avoid constipation
- to allow the fibre to dissolve and control sugar absorption in the int
- to allow the fibre to dissolve and control cholesterol/fat absorption

Accept other suitable answers.

4. Energy requirements

1) ● i) gender/sex, age, height, weight

ii) The higher the PAL, the more energy a person needs. The lower the

1) ■ i)
- BMR – basal metabolic rate – the amount of energy needed to
- PAL – physical activity level – an ind of how active a pers

lifestyle, type of work perfor sp ts, etc.

ii) BMR multiplied by PA qu tal energy expenditure (TEE) whic individual; TE am nt of energy necessary to perform all action and h

2) ●■ ability to provide similar answer to lower-ability worksheet
- s should provide up to 35% of energy
- Proteins 15%
- Carbohydrates 50%
- of which sugars 5%

3) ●■ Higher ability to also provide explanation
- Physical activity helps burn fat tissue, preventing overweight and obesit
- Drinking sufficient amounts of water gives the feeling of satiety, decreas
- Eating fresh vegetables provides micronutrients and fibre
- Choosing wholegrain products such as bread, pasta or rice to provide st

Other relevant responses possible.

4) ●

i) complex carbohydrates / starch

ii) protein

4) ■ Any two from:
- when ca t physical activity (e.g. professional athletes), e.g. traini th g, the extra energy is required for the movement, increased b sed amount of red blood cells and repair damaged tissues such as likely depend on the type of physical activity; for example, marathon run carbohydrates while weightlifters would source it from proteins
- during a disease, such as cystic fibrosis, cancer or any disease with high fev the damaged tissues and improve the immunity; the extra energy would lik
- when suffering from extensive burns or scalds; this is to enable the body underlying tissue; the energy would likely come from proteins and fats

- when carrying out physical work, e.g. builders, road workers; this is to e
  carry out their duties throughout the day; the energy should come from
  carbohydrates (up to 50%) and fats (up to 35%)
- during adolescence; this is to ensure the body has enough energy to gro
  activity and increased brain activity (the brain uses up to 25% of TEE!);
  balanced diet (i.e. up to 50% from carbohydrates, up to 35% from fats a

Accept other suitable answers.

Exam-style Question

● Any two from: (max. 2 marks)

- the person can become overw[illegible]obese
- the person can develo[illegible] heart disease
- the person ca[illegible]ypertension
- th[illegible]er[illegible]velop type 2 diabetes
- [illegible]rs[illegible] can develop atherosclerosis
- [illegible]rson can develop depression

or any other relevant answer.

■ Any three from: (1 mark for each **factor** and 1 mark for a relevant descripti

- **energy needs differ depending on age of a person** – children and you
  more energy than adults due to the growth processes
- **energy needs also differ depending on the physical activity of a pers**
  lifestyle have higher energy needs than people leading a sedentary lifest
- **energy needs will differ depending on the body composition** – peopl
  higher energy needs than people who have more fatty tissue
- for the same reason, **men usually have higher energy needs than wo**
  have more muscle tissue than women, and, therefore, need more energy
- **energy needs will also depend on the health state of a person** – som
  coeliac disease, cystic fibrosis, some forms of cancer or extensive burns,
  regeneration of the body
- **energy needs also differ depending on one's occupation** – people wh
  instructors, builders, have higher energy needs [illegible] people who work b
- or any other relevant answer.

5. Planning balanced diets: [illegible]s for a healthy diet, nutritional needs

1) ●■ Higher abilit[illegible] similar answer to lower-ability worksheet

i) [illegible]Eat[illegible]de states that:

- [illegible]5% of daily intake should be made up of vegetables and fruits
- [illegible]0% of it should be wholegrains and starchy foods [●A]
- 18% is meat and other protein-rich foods [●B]
- 15% is dairy and alternatives [●C]
- 2% is fats

ii) Free (visible) fats make up only 2% of the chart because there are alread
such as fish, dairy and meat.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

Group	Dietary changes	
Small children ■ only	Increase variety of foods, increase physical activity, drink milk, eat fish, cut down on sugars and sweets	To pre prev
Teenagers	Eat more fish, increase physical activity, more meat and legumes, drink water, i[illegible]ase variety of foods, drink more mil[illegible]er sweets and sugar, eat more fru[illegible]n[illegible]ables	To pre prev protei anaem
Adults	Cut down [illegible]st [illegible]ds, drink milk, eat more fish, eat [illegible] salt [illegible]ss fat, fewer sweets and sugar, [illegible]e physical activity, drink water, more fruit and vegetables Cut down on alcohol	To pre obesit consti To pre or hea
Elderly	Cut down on fast foods, drink milk, eat more fish, eat less salt, less fat, fewer sweets and sugar, increase physical activity, drink water, more fruit and vegetables	To pre obesit consti

3) i) ●■ Higher ability to provide similar answer to lower-ability worksheet
- An omelette will cost: 20p for eggs, 68p for butter, £2.00 for ham a
- The sandwich will cost: 10p for bread, 68p for butter, 43p for bean
- The omelette is cheaper than the sandwich.

ii) ●
- no (the portion is too large)
- yes
- no (the omelette is likely to provid[illegible]ch saturated fats and so

ii) ■
- 5 years old – [illegible]ecause the portion is too large
- 15 ye[illegible]s, there is enough protein and calcium (from chees
- de[illegible]ent during adolescence
- 5 years old – no, there is too much salt (from ham and cheese) and
- for an older person, who should cut down on these ingredients

4) ●■ Higher ability to provide similar answer to lower-ability worksheet
- 5 starchy foods a day
- 5 portions of fruit and vegetables
- 3 portions of milk and/or dairy
- 2 portions of protein-rich foods

Exam-style Question

● Any two from: (max. 2 marks)
- beans and pulses are a good source of protein
- mixing beans and pulses with other foods helps to provide whole protei
- beans and pulses are a source of dietary fibre
- beans and pulses provide group B vitamins
- beans and pulses are a good source of potassium
- beans and pulses provide folic acid
- beans and pulses are low in fat
- beans and pulses are low in s[illegible]
- beans and pulses con[illegible]esterol
- beans and pu[illegible]y low in saturated fats

or any other [illegible]answer.

■

The answer shows excellent knowledge and understanding of the topic. Res structured and shows thorough understanding of the topic. The answer inclu reasons why people should decrease consumption of free sugars and saturat includes examples of foods consumption of which should be limited. Subject is used throughout.
The answer shows good knowledge and understanding of the topic. Respons and shows good understanding of the topic. The answer includes at least tw should decrease consumption of free sugars and saturated fats. The answer examples. Subject-specific vocabulary is used throughout, with few mistakes
The answer shows limited knowledge and understanding of the topic. Respo knowledge of the topic. The answer includes a maximum of two reasons wh decrease consumption of free sugars and saturated fats. No examples are giv answer. The language used may be generic and simplistic.
No answer provided or answer incorrect.

Indicative content:
- to prevent/avoid [illegible]nt g[illegible] / overweight / obesity
- to prevent [illegible]d[illegible]vascular diseases
- [illegible]eve[illegible]ronary heart disease (condition in which cholesterol plaque
- prevent hypercholesterolemia (high blood cholesterol levels)
- to prevent hypertension (high blood pressure)
- to prevent type 2 diabetes
- to prevent atherosclerosis (condition in which cholesterol plaque accumul
- to prevent tooth decay
- to prevent other diseases, such as arthritis (inflammation of the joints)

The current dietary guidelines include:

- the Eatwell guide
- the eight tips for healthy eating
- five a day
- all dietary guidelines recommend to limit consumption of sweets, which
  fats
- dietary guidelines also recommend to limit consumption of saturated fat
  alternatives of food products
- the Eatwell guide recommends that oil and other fats should constitute
  recommended fats comes from foods, such as dairy, fish, nuts and

Examples may be used to exemplify points made:

- sources of saturated fats include: meat, poultry, milk and dairy (especial
  with their use (e.g. sweets, biscuits, puddings, custard, sauce
- sources of sugars include: table sugar, honey, syrups (e.g. golden syrup,
  (e.g. candies, cakes, puddings, custard, ice creams), some condiments an
  fruit juices and squash

Other relevant answers may be accepted.

6. Planning balanced diets: Nutritional needs of individuals with specific d deficiencies

1) ● i) Tooth decay, obesity, overweight, type 2 diabetes

   ii) Exchange sugary drinks for spring water; eat fewer sweets; cook fr to-use foods

1) ■ i) Tooth decay, obesity, overweight, type 2 diabetes

   ii)
   - increase taxes on sugary drinks and snacks
   - promote water and unsweetened juices instead of suga
   - promote and reward manufacturers that don't sweeten their pr

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

Diseases		
Osteoporosis	Coronary heart disease	Type 2 diabetes
Dietary causes		
Lack of vitamin D	Too much saturated fat	Too much saturat
Excess of phosphorus	Overeating	Overeating
Too little calcium	Low physical activity	Low physical acti
Low physical activity	Too much sugar	Too much sugar
	Too much fat	Too much fat
Health outcomes		
Brittle bones	Heart failure	Limb amputation
Tooth loss	Chest pain	Kidney failure
Joint and spine problems		Blindness
Easy bone fractures		
Changes to diet and lifestyle		
Eat more fish	Cut down on sugar	Cut down on suga
Consume more vitamin D	Cut down on fats	Cut down on fats
Drink more milk	Lose weight (reduce energy intake)	Lose weight (redu energy intake)
Increase physical activity	Cut down on saturated fats	Cut down on satu
	Increase physical activity	Increase physical
		Eat regularly

3) ●■ Higher ability to provide similar answer to lower-ability worksheet
   Food allergy is **a reaction of the immune system** to a food ingredient, v
   of the digestive tract to the food ingredient.

4) ●

- 70-year-old obese man: banana, brown rice cakes, tomato and onion sal
  lettuce
- 50-year-old woman with hypertension: banana, brown rice cakes, tomat
  corn bread, lettuce
- 14-year-old girl with bad tooth decay: grilled sausage, salt and vinegar c
  onion salad, mashed potato with cheese, corn bread, lettuce

4) ■

- 70-year-old obese man should avoid sweets, sweetened beverages, high
  fast foods
- 50-year-old woman with hypertension should avoid: salt, salty snacks, s
- 14-year-old girl with bad tooth decay should avoid: sweets, chocolate, su
  juices (because of high content of fructose)

Or another relevant answer.

5) ● (Other correct responses possible)

	Does not eat...	
Coeliac	Gluten, wheat, rye, barley, oat products, bread, pasta, dumplings, pancakes, breaded fish, ham	Corn and corn rice, quinoa, bu vegetables, me
Lactose intolerant	Milk and dairy, pancakes, some meats, sauces which contain milk or added lactose	All foods that c fruit and veget

5) ■

Group	Meal	Suggeste
Coeliac	Macaroni cheese	Exchange pasta to a gluten-fr Make the cheese sauce witho
Lactose intolerant	Strawberry milkshake	Exchange milk for a plant mil

Or any other relevant answer.

6) ●

- Frying and deep-frying increases the amount of fat in the food, which is n
  and deep-frying should be replaced with other cooking methods,
  grilling.
- Milk chocolate is not suitable because of high amount of sugar, not suitab
  replace it with fresh fruit or a piece of dark chocolate.

6) ■

- Students must apply their knowledge of healthy eating and cooking meth
  which will be suitable for a person suffering from type 2 diabetes and ob
- Exemplary meal would include a source of polysaccharides (e.g. wholegr
  fibre (e.g. vegetables, preferably raw), source of unsaturated fats (e.g. oli
  (lean meat or soy) or two sources of LBV proteins complementing each o
- The ingredients should be described in detail, i.e. 'wholegrain rye bread'
- Some cooking techniques should be indicated, such as steaming, dry fryi
  which produce low fat, healthier meals than other cooking methods.

7) ●

- diet high in total fats / saturated fats
- diet high in simple sugars / free
- obesity
- excess alcohol consumption
- consumption of foods contaminated with hepatitis virus

or another suitable answer.

7) ■
- stop drinking alcohol
- base the diet on starchy carbohydrates
- limit consumption of total fats, and especially saturated fats
- lower consumption of protein
- avoid potentially poisonous foods, such as mushrooms
- eat regular, small meals
- limit consumption of salt

or any other suitable answer.

8) ●
HDL (high-density lipoprotein) and LDL (low-density lipoprotein)

8) ■
- increase the amount of dietary fibre
- increase consumption of fresh vegetables and fruit
- lower consumption of total fats, and especially of saturated fats
- include products high in phytosterols, such as margarines with added pl
- increase consumption of omega-3 fatty acids

or any other suitable answer.

Exam-style Question

● (4 marks)

Any two from: (1 mark for indicating the ingredient that needs to be changed, necessary/beneficial; max. 4 marks)
- exchange butter for vegetable oil – butter is a source of saturated fats, w worsen the condition, while vegetable oils are rich in unsaturated fats, w and prevent the disease
- use vegetable stock instead of chicken stock – chicken used for stock is a cholesterol, both of which can worsen the condi ; vegetable stock doe saturated fats
- use single cream, milk or yogh te of double cream – double crea contribute to the risk of si e cream has less than half the amount yoghurt are ver n th m
- limit the s lt, use herbs and spices instead – high salt consumptio te on, which also affects cardiovascular health and increases the

■

The answer shows excellent knowledge and understanding of the topic, clea question. The answer shows ability to analyse, explain and assess the relatio diet, nutrition and health. Response shows excellent evaluation and applicat relation to 5–6 points from the indicative content. Subject-specific vocabula throughout.
The answer shows good knowledge and understanding of the topic. The ans ability to analyse, explain and assess the relationship between diet, nutritio Response shows good evaluation and application of knowledge in relation t the indicative content. Subject-specific vocabulary is used throughout, with
The answer shows limited knowledge and understanding of the topic. The a ability to analyse, explain and assess the relationship between diet, nutritio Response shows limited evaluation and applicatio nowledge in relation the indicative content. The language used eneric and simplistic.
No answer given or answer incor nt.

Indicative content:
Diet (what an individual usually eats throughout the day) has a great impact o
therefore, may determine the health (total physical, mental and social well-be
Students analyse how diet impacts on nutrition, and, therefore, health, in both
example:

- eating a lot of processed foods -> high saturated fats / trans fats intake ->
  obesity, coronary heart disease, type 2 diabetes
- low intake of vegetables and fruits -> low intake of vitamins and mineral
  to, for example, anaemia, scurvy, spina bifida
- low intake of wholemeal products and vegetables -> low intake of dietary
  constipation/diarrhoea, bowel cancer (and other types of cancer), obesit
  blood sugar levels, type 2 diabetes, coronary heart disease
- high consumption of vegetables and fruits -> higher intake of antioxidan
  stopping certain types of cancer (e.g. bowel cancer, breast cancer)
- eating a lot of sugary foods and drinking carbonated beverages -> high ri
  of developing tooth decay, obesity, type 2 diabetes
- eating a lot of salty snacks such as pretzels, crisps -> high intake of salt/s
  developing high blood pressure (hypertension)
- eating more food than required -> too high energy intake -> increased ris
  related conditions
- eating an unbalanced vegetarian/vegan diet -> low intake of iron -> iron
- eating an unbalanced vegetarian/vegan diet -> low intake of protein -> g
  issues

Students indicate various methods of improving the public health:

- sugar levy to make sugary foods and drinks less appealing / less affordal
- increased tax on high-fat foods to make them less appealing for people /
- improving access to fresh fruit and vegetables (e.g. by lowering prices or
  the nutritional value of everyday diet and increase the consumption of d
- implementing physical activity programmes to lower the risk of obesity,
- implementing healthy nutrition in schools to teach proper eating habits a
  fibre, polyunsaturated fats and complex carbohydrates

Other relevant answers may be accepted.

7. Planning a balanced diets: Nutritional needs of individuals with specific lifes

1) ●■ Suitability to provide similar answer to lower-ability worksheet

Religion	Food beliefs (■ only)	
Islam	• Animals must be killed in a certain way to be called *halal* • Dairy cannot contain enzymes of animal origin • Believe that pigs are 'impure', 'unclean'	• Don't • Have a Ramad • Eat on
Hinduism	• Cows are sacred • Can't cause pain or violence against any living creature • Some foods, such as onion or garlic, are believed to excite the body and are forbidden • Dairy is believed to enhance spiritual purity	• Do not will dr • Mostly • Don't • Some
Judaism	• The animals must be killed in a certain way to be called *kosher* • Fish have to have scales and fins to be considered kosher • No work can be done on Saturdays, including cooking, so food is made in advance	• Don't • don't e • will or

Or any other relevant answer.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet
Vegetarian (but not vegan) are:
- Cauliflower cheese, because it contains cheese (from milk)
- Tuna sandwich, because it contains tuna (fish)
- Tea with honey, because honey is made by bees (animals) and vegans d animals
- Scrambled eggs, because vegans don't eat eggs
- Cheesecake, because it contains cream cheese (f milk)
- Quorn™ hot dog, because Quorn™ ofte nut s egg white
- The other products (coffee with sugar, tomato and onion salad, beetroot latte) are suitable for both (u) s vegetarians and vegans – as they co

Or any other suitable food and explanation.

3) ●■ Higher a provide similar answer to lower-ability worksheet
- vegetarians – eat milk and dairy, but not other animal-derived pro
- vegetarians – eat eggs, but not other animal-derived products
- lacto-ovo-vegetarians – eat milk, dairy and eggs, but not meat or fish
- vegans – do not eat any products of animal origin, to include honey

4) ●

i) goose fat, beef shin, streaky bacon

ii) beef shin, streaky bacon, shallots, garlic, wine

iii) because it contains bacon (from pork) and wine (alcohol), both of which

4) ■

i)
- it is not suitable for a Muslim due to the presence of pork (bacon) and al
- it is not suitable for a Hindu due to the presence of beef, or meat in gene alcohol (wine), shallots and garlic (many Hindus avoid eating these)

ii)
- goose fat – could be replaced with a pl nt-d r ved oil, e.g. olive oil
- beef shin – could be replaced w fu, TVP, Quorn™ or another suitable
- bacon – could be repl w vegetarian alternative (facon)

Exam-style Questi

● 1 for each correct answer, max. 2 marks

a)
- replace beef mince with another source of protein, e.g. fish, chicken
- replace beef stock with another liquid, e.g. chicken stock, vegetable

b) as above plus:
- exchange butter for a vegetable oil or vegetable fat spread
- exchange milk for a vegan alternative, e.g. soy milk, rice milk, almo

1) ■

Band	AO4
3	**Award 5–6 marks** The answer shows excellent knowledge and understanding of the t ability to analyse and evaluate the advantages and disadvantages reference to 3–4 points from the indicative content, with relevant vocabulary is used throughout. For 6 marks the answer must inc de a erence to both advantag
2	**Award 3–4 marks** The answer sh w g d knowledge and understanding of the topi ability t e a d evaluate the advantages and disadvantages r f n 2–3 points from the indicative content, with relevant vo bulary is used throughout, with few mistakes.
1	**Award 1–2 marks** The answer shows limited knowledge and understanding of the to some ability to analyse and evaluate the advantages and disadvant reference to 1–2 points from the indicative content. No examples a be generic and simplistic.
0	No answer given or answer incorrect.

Indicative content:
Advantages:

- as a vegan diet is based solely on plant foods, it is usually very high in di
  healthy body mass, control blood sugar and cholesterol level, prevent ca
- vegan diets are usually very high in water-soluble vitamins (except for B
  all plant foods
- often very high in antioxidants such as vitamin A (beta-carotene), C (asc
  people to remain healthy for a longer time and prevent certain condition
- may be low in calories and promote weight loss as plant foods are usual
  such as nuts, seeds, avocadoes, olives)
- may be cheaper as vegetables and fruits are often cheaper than meat, ch
- may help prevent deficiencies, e.g. of folate, which is present in cereals, l
- supports sustainability as less resources are needed to grow plants than
- help lower the carbon footprint / food miles as many foods may be

Disadvantages:

- unbalanced vegan diet may lead to protein deficiency, causing health iss
  issues, hair loss; this is because most plant foods only contain low biolog
  how to apply protein complementation may lead to deficiency in certain
- unbalanced vegan diet may lead to iron deficiency anaemia; this is becau
  haem iron, which is poorly absorbed in the body; in addition, iron absorp
  dietary fibre intake
- unbalanced vegan diet may lead to vitamin B12 (cobalamine) deficiency;
  occurs in animal-derived foods; deficiency may lead to anaemia
- unbalanced vegan diet may lead to vitamin D deficiency, and osteoporos
  vitamin D is only present in animal-derived foods (and in small amounts
  prevented by moderate sunshine exposure (but then, there may be not e
  to stimulate the skin to produce the vitamin)
- unbalanced vegan diet may lead to weight gain; that's because many veg
  vegetable oils, nuts, seeds, avocadoes, olives
- vegan diet may be very costly, especially if choosing organic foods (whic
  exotic ingredients (such as chia seeds), also, plant-based milk is more ex
  home-made
- unbalanced vegan diet may cause constipation due to very high dietary f
- may require a lot of time to prepare the meals
- require a high level of creativity to ensure the diet is varied and bal

Acce r suitable answers.

8. The effect of cooking on food: Why food is cooked, how heat is transferre

1) ●■ Higher ability to provide similar answer to lower-ability worksheet

People cook food to...	■ An example o
Avoid diseases and make food safe to eat	Heat kills salmonella and inactivates harmfu solanine in potatoes
Make food tastier and better smelling	In a stew, water evaporates and the flavour i dextrinises giving the bread a sweet flavour
To improve or alter texture	Baking makes foods crunchy and crispy, boil chew
To improve shelf life	Heat kills bacteria and mould so they cannot can be safely stored for longer
To increase food variety	One ingredient, e.g. potatoes or eggs, can be variety of dishes
To improve appearance	the use of raising agents in cakes, the use of su caramelisation), the use of egg wash on top of

2) ●

i) only work when water or oil is here – I am **convection**. Used to ste

I can work remotely, like a radio – I am **radiation**. You use me to cook r **baked dishes**

I need to be close to give you my warmth – I am **conduction**. You use m **stew**, etc.

Other relevant responses possible.

ii) Examples could include:
- braised meat (uses conduction to seal the meat and then convectio
- quiche Lorraine (uses conduction and radiation as it is baked, and c
- grilled meat (uses primarily radiation, but also conduction, which g
- tuna pasta bake (uses conduction and convection to boil pasta, and dish)

Accept other suitable answers.

2) ■

i)
- Radiation is a process in which heat is transferred to food through happen **remotely**.
- Convection is a process in which heat is transferred to food **throug** vibrate and then transfer the energy to food. This is an **in**
- Conduction is a process in which heat is transferred **directly from** particles of the pan. The food and the pan have to be in **direct** cont process.

Or any other relevant answer including keywords (bold).

ii)

Cooking method	Heat transfer method	Explan
Baking an apple pie	Radiation Convection Conduction	Sending heat waves from the oven to Transferring heat from water particle Transferring heat directly from the ho
Cooking soup	Convection Conduction	Transferring heat from water to foods Transferring heat from the hob to the
Frying chicken	Radiation Convection Conduction	Sending heat waves from the oven to Transferring heat from water and oil p Transferring heat from the pot to the
Steaming vegetables	Convection Conduction	Transferring heat from vapour to the Transferring heat from the hob to the inside
Grilling steak	Radiation Conduction	Sending heat waves to the food Transferring heat from the hot grill di

3) ●■ Higher ability to produce similar answer to lower-ability worksheet

	Is good because…	
ng (cooking)	Prevents vitamin loss, allows cooking of delicate ingredients, low in calories, good for people who want to lose weight, is quick, makes the food easier to chew, alters texture	Can't be u
Boiling (cooking)	Low in calories, good for people who want to lose weight, is quick, softens the proteins, makes the food easier to chew, alter texture, softens texture	Leads to v prepare c
Shredding (preparation)	Makes the food easier to chew, alters texture	Leads to v browning to prepar
Deep-frying (cooking)	Creates a crunchy surface / outer layer, is quick	Leads to v lead to ob
Poaching (cooking)	Prevents vitamin loss, allows cooking of delicate ingredients, low in calories, good for people who want to lose weight	Can't be u
Blanching (cooking and preparation)	Slows down oxidation, prevents enzymatic browning, makes peeling easier, prevents vitamin loss	Doesn't ch
Baking (cooking)	Makes the food easier to chew, alters texture	Is time-co certain fo
ng (cooking)	Seals the surface of food and keeps it moist, softens the food and makes it easier to chew, develops flavour and aroma	Is time-co
Marinating (preparation)	Softens the proteins, prevents vitamin loss	Is time-co

Other correct responses are possible.

4) ●

i) Simmering, grilling, dry-frying, stir-frying, steaming

ii) Braising, roasting

iii) Braising, simmering, roasting, grilling

iv) Dry-frying, stir-frying, steaming

4) ■

- Simmering increases amount of fat, causes vitamin loss
- Braising increases amount of fat, causes vitamin loss
- Roasting increases amount of fat, causes vitamin loss
- Grilling decreases amount of fat, vitamin loss occurs
- Dry-frying increases amount of fat, vitamin loss occurs
- Stir-frying decreases amount of fat, preserves vitamin value
- Shallow-frying increases amount of fat, vitamin loss occurs

Exam-style Question

● (1 mark for a reason, 1 mark for a suitable explanation, max. 4 marks)
Any two from:

- to make the cake safe to eat (raw eggs can contain salmonella and cause
- to make the cake more digestible ('raw' flour is rich in complex carbohyd baking and are more digestible for the human digestive tract)
- to obtain the desired texture (during baking the air in the batter expands texture; also during baking the proteins from the eggs set, and the cake c
- to improve appearance (during baking the cake rises and obtains a golde

or any other relevant answer.

■ 1 mark for each fat-based cooking method identified, 1 mark for explanatio value of food.
Do NOT credit answers which indicate other aspect[s] [of] how the method affe
Indicative content:
Method: shallow-frying
How it affects nutritional [value] of food: increases the amount of fat; increas very high temperatu[re] decreases the amount of vitamins in the food (especial very unstable [and] not-heat-resistant)
Me[thod]: stir-[fry]
How [it] affects nutritional value of food: helps to maintain the nutritional va foods with low calorific value
Method: deep-frying
How it affects nutritional value of food; increases the amount of fat; increas very high temperature decreases the amount of vitamin in the food; due to th relatively long time of cooking, poses a risk of introducing harmful substance or any other relevant answer.

9. The effect of cooking on food: Carbohydrates, fats, protein, fruit and veg

1) ●■ Higher ability to provide similar answer to lower-ability worksheet

Proteins are large molecules built from **amino acids.** They are bound togethe which then twist and curl up to form specific proteins. If treated with **acid** or

Coagulation is a process in which proteins aggregate and form lumps. Protei contain **gliadin** and **glutenin**. When mixed with water, they glue together an fibres which give the dough **plasticity**. When you whisk an egg white, you incorpo created.

2) ●

i) Starch in bread: dextrinisation
Starch in sauce: gelatinisation

ii) Gelatinisation takes place when starch is heated in the **presence of wat** break, thickening the mixture. Dextrinisation takes place when starch is chains break down into shorter ones, changing the look and flavour of th

Other correct responses possible, with the use of keywords (bold).

2) ■

The process	Molecules affected	Conditions needed	Ex
Caramelisation	sugars	High temperature	
Gelatinisation	starch	High temperature and water	
Dextrinisation	starch	High temperature	

3) ● i) Fat mixed with flour leads to **shortening** because it prevents gluten lengthening. This is used to prepare **shortbread biscuits**, shortcrust

ii) Fat mixed with sugar creates **cream** due to the process called **aeration**. **ice creams**, **sponge** cakes, etc.

iii) Fats do not dissolve in **water**. Instead, they create an **emulsion**. Examples **mayonnaise**, hollandaise sauce, etc.

iv) Plasticity of fat means that it can be easily **spread and reshaped** at **melting points**. This is used to cook various types of **pastry**, such as shortcrust, etc.

3) ■ Students may indicate that:

- Fats are built of a **hydrophilic** glycerol 'head' and a **hydrophobic** fatty acid molecules **immiscible**. Due to this they will not **dissolve** in water and, usually with the use of an emulsifier to prevent the mixture from separating
- Fats which have single bonds only in the fatty acid chain are saturated and Examples of this are lard and butter. Lard is better used in shortcrust pastry pastry will be more crumbly. Butter contains little water so the shortcrust than when made with lard only as some gluten will develop in it.
- Fats which have one double bond only (monounsaturated) are better for they are less prone to turning into trans fats than polyunsaturated fats.
- Polyunsaturated fats from raw oils, such as extra virgin olive oil, are best high temperatures may cause them to turn into harmful trans fats.
- The length of the fatty acid chain is also important as it defines their melting

Other correct responses are possible.

4) ●

- Dextrinisation: baking bread
- Gelatinisation: thickening sauce with starch, cooking rice or potatoes

Other correct responses are possible.

4) ■

- Bread turns brown when baked due to the caramelisation of sugars, dextrinisation reaction
- Eggs set during boiling due to protein denaturation and coagulation
- Sauce thickens due to the gelatinisation of starch and the evaporation of water

5) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) **Enzymatic browning** is a process which takes place when plant cells are damaged from the cells leak out and cause **damage** to the surrounding tissues, which affects the **nutritional value** of the food. Some fruit and vegetables are affected. These include **bananas**, **apples** and **potatoes**.

ii) Any three fruits and three vegetables from:

- Fruits susceptible to enzymatic browning include apples, pears, bananas
- Vegetables susceptible to enzymatic browning include potatoes, lettuce

6) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) Oxygen: cover the food to protect from air, use lemon juice or dressing to
Temperature: put in the fridge to slow down the process
Enzymes: inactivate by blanching
Diminution (cutting or shredding into smaller pieces) (especially with iron necessary

7) ● Oxidation can be prevented by:
- covering the food
- using lemon juice

7) ■
i) Oxidation is a process in which oxygen affects molecules in food (oxidise
of nutritional value, and the development of a bad smell and flavour in fo
ii) Oxidation can be prevented by:
- covering the food
- using lemon/lime juice or vinegar

8) ● Any one reason fr

the top of a sponge cake has cracked	• too much batter • the oven was too the middle, whic expanding and p • the cake was pu surface was too baked too early
shortcrust pastry is sticky and difficult to handle	• the dough was t too warm • the fat used was straight from th • the dough was k vigorously, poss warm • the pastry is too water used, plac in it started to m

8) ■
i) There are multiple reasons fo d to fail:
- too cold temper not temperature – yeast require warmth
will not ri s not or too cold (e.g. ice-cold or boiling water i
- th s old – the yeast used could have been old and dead, an
ais the dough
wrong type of flour was used – bread requires gluten to rise, as it fo
trapped; lack of gluten will cause the bread to be dense and not rise
- too much salt was added – salt inhibits yeast growth
- too little salt was added – salt strengthens gluten, so too little of it n
to hold all the gas produced by the yeast, and the bread will be dens

or any other relevant answer.

ii) Any two from:
- carefully measure the temperature of the water used with a food te
- check the use by date on the yeast / how long they have been store
stored in (they should be refrigerated)
- check the type of flour available / check the best before date of the
be used
- calculate and weigh the amount of salt nee (its proportion to th
- measure the temperature of the ro th read is left to prove in
- measure the time of proving
- ensure that the br as doubled in size before putting it in
- ensure the s too hot as it could burn the surface of the bre
bread s continue to rise while the oven warms up)

or any other relevant answer.

Exam-style Question

● 1 mark for identifying the processes (denaturation, caramelisation), 1 mar
obtain the dish. Max. 2 marks for each.

Changes in proteins:

- Proteins from milk and eggs undergo denaturation and coagulation due
- Protein denaturation and coagulation causes the mixture to thicken and
- Denaturation damages the structure of protein and the protein uncoils.
- Coagulation leads the protein molecules to ag[illegible]e and trap water, so

Changes in sugars:

- Sugar undergoes caramel[illegible]on due to high heat treatment.
- Caramelisation ch[illegible]es th[illegible]lavour of the meal and creates a crunchy, go
- During ca[illegible]l[illegible]ation, molecules of sugar break down and release wate
- [illegible]he[illegible]while the water evaporates, only the sweet brown residue is le

1) ■ A[illegible]e from: (1 mark for each function and 1 mark for a relevant explan

- help to obtain a short/crumbly texture of food – when fat is rubbed into prevents them from accessing water, meaning that gluten strands canno becomes crumbly after cooking
- help to obtain a layered texture – when fat is rolled between sheets of pa it melts and creates water vapour which expands and rises, creating spac the pastry has the specific flaky texture after cooking
- help to obtain airy texture – during aeration fats create a very thin film w mixture; the protein-fat structure can extend to a great level and trap bu increase the volume of the mixture
- adding moisture and flavour – fats are important for the correct mouthfe during cooking and provide moisture to the food, e.g. beef steaks (lean cu after cooking), butter on toast
- adding nutritional value – fats are solvents for vitamins A, D, E and K and such as salads to enable and improve their absorption in the human bod

Accept other suitable answers.

10. The effect of cooking on food: The p[illegible]ti[illegible]e u[illegible]of microorganisms

1) ●

- camembert – b[illegible]m[illegible]ould
- br[illegible]d - [illegible]a
- [illegible]uc[illegible] yeast, mould
- [illegible]ants – yeast
- yoghurt – bacteria
- cheddar cheese – bacteria
- blue cheese – bacteria, mould

1) ■

- Stilton cheese – mould, bacteria
- Pannettone cake – yeast
- Soy sauce – yeast, mould
- Probiotic yoghurt – bacteria

2) i) ●■ Higher ability to provide similar answer to lower-ability worksheet

1. Homogenisation and pasteurisation of milk
2. Adding bacteria cultures
3. Incubating in warm conditions
4. Fermentation
5. Cooling down to stop [illegible]te[illegible]growth
6. Adding flavou[illegible]g
7. Packin[illegible]s[illegible]ling

ii) [illegible](becomes sour)
texture (becomes thick)

ii) ■
Milk contains lactose (sugar). Bacteria **ferment** the sugar and produce la
the milk, making it **acidic**. In an acidic environment, the proteins from m
thickens into yoghurt.

3) ●■ Higher ability to provide similar answer to lower-ability worksheet
warmth, moisture, sugar (food)

4) ●
i) Denaturation

ii) Rennet

4) ■
i) [illegible]ion

ii) During **fermentation**, bacteria produce **acid**. Acid causes the protein in
changes the taste and texture of the meat, turning it into a sausage.

11. Food spoilage: The growth conditions for microorganisms and the signs

1) ● To grow, Microorganisms require: warmth, moisture, protein, time
Examples of high-risk foods include: raw meats, raw eggs, raw fish, foods
been defrosted and frozen again (other correct responses possible)

1) ■

Factors needed for microorganisms' growth	High-ris
Warmth	Foods that are reheated; foods that h again; foods that were incorrectly co
Time	Foods that are reheated repeatedly
High protein content	Raw chicken, eggs, fish
Moisture	Foods rich in water such as raw chic

2) ● i) Vinegar or [illegible]ance contain acid. Proteins (such as enzymes) d

[illegible]lanching means that the vegetable is put into boiling water. High t
proteins (such as enzymes).

2) ■ i) Enzymes are biological catalysts usually made from protein. (Other

ii) Enzymatic action can be controlled by the addition of acid or by app
because proteins denature and inactivate in acidic and/or hot envir

3) ●
- Enzymes – browning of food, ripening of bananas
- Mould – green or white furry coating formed on the surface
- Yeast – sour flavour, foam on top, air bubbles in the food

3) ■

Microorganism	Sign of spoilage caused by given microorganism
Enzymes	Browning, ripening
Mould	Growth of green, white or black 'furry' coat on the surf
Yeast	Sour, [illegible] foam on top, bubbles

Other correct responses possible

4) ●■ Higher ability to provide similar answer to lower-ability worksheet
From 63°C (and especially between 20 and 40°C)

Exam-style Question

●

(1 mark for the method, 1 mark for the correct description of why it is effecti

Method: blanching

Why it is effective: enzymes are built of protein; in high temperatures (such denature and become inactive

Method: using acid

Why it is effective: enzymes are built of pr tei i acidic pH (after adding a inactive

■

Any tw fro k for each correct, max. 2 marks)

- se uncooked meat is high in protein, which may boost the growth
- se uncooked meat is high in water, which can be used by microorg
- because low temperatures halt the growth and development of microorg spoiling the food
- because the time of transport may be affected by various factors such as the meat is at low temperature as the more time, the higher probability t multiply
- because the chemical changes in uncooked meat break it down and prov microorganisms

Accept other suitable answers.

12. Food spoilage: Buying and storing food (how to store foods correctly, th

1) ●

	Is impo
Keeping food covered	It shields the food from oxy m d insects) or pets
Choosing correct temperature	r vents microorganism gr
Keeping the storage dry d – free	Prevents growth of bacteri
Cl or t ght	Light that is too strong will needed to spot any possible removed as soon as possibl other foods)

1) ■ i) Any five from:

- Keep food covered
- Ensure dry conditions
- Keep the storage clean
- Keep the storage mould-free
- Choose correct temperature
- Protect from light and choose correct lighting
- Keep the food off the floor

ii)

- Maintaining dry and clean storage helps avoid growth of micr
- Choosing the correct temperature prevents bacteria growth.
- Protecting food from light helps mai its nutritional value.
- Correct lightning helps you t possible spoilage.
- Keeping food off the fl he protect it from insects and ver

2) ●■ Higher ability to e similar answer to lower-ability worksheet

Use te or **fresh** foods such as **dairy and fish**. It helps ensure fo sho be eaten after that date.

Best before is used for **dry and long-lasting** foods such as pasta, and applies date may be eaten, but its nutritional value or quality may be affected.

3) ●■ Higher ability to provide similar answer to lower-ability worksheet

- Top shelf: milk, yoghurt and dairy; cottage cheese
- Middle shelf: cold cuts, soup
- Bottom shelf: raw meat
- Drawers: fruit and vegetables
- Door: eggs, juice, oil, ketchup
- Freezer: ice cream, frozen peas

Other correct responses are possible.

4) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) • Freezing: -3 °C
Chilling: 0 to 5 °C
Cooking and reheating: 75 °C
Boiling water: 100 °C

ii) The range of danger zone temperatures is from **5 °C to 63 °C**. It is tempe
microorganisms grow the fastest and the risk of food spoilage is therefor

iii) Ambient storage means that food is stored at **room** temperature. This is
18 °C and 22 °C. This falls in the range of **danger zone temperatures**.

5) ●■ Higher ability to provide similar answer to lower-ability worksheet

In most cases, frozen food should be **defrosted** before cooking. This is necess
and kill all the **bacteria** inside of the food. Once defrosted, food should **neve**
increases the risk of bacterial growth.

Reheating food is a major cause of food **poisoning**. This is because the micro
needed for growth – **warmth**, **moisture** and food. For that reason, reheating
temperatures above **75**°C. Repeatedly reheating food **increases** the risk of f

Exam-style Question

1) ● 1 mark for each correct answer, max. 2 marks
a) any pre-packed food which becomes high-risk after opening, e.g. UHT mil
dressings, condiments and sauces (such as mayonnaise)
b) any dry, non-high-risk food, e.g. dried pasta, rice, cereals, peanut butter
Other suitable examples may be accepted.

1) ■
Any two from: (max. 2 marks)
- to help prevent food spoilage
- to help keep the best quality (sensory characteristics) of the food
- to help preserve the best nutritional value of the food
- to protect the food from external factors which could deteriorate it
- to extend the shelf life of the food
- to help the customers make their choices (e.g. when choosing food which consider not to buy it if they don't have a freezer)
- to help retailers plan their stock orders

or any other suitable answer.

13. Food spoilage: Preparing and cooking food (the types of bacterial cross-methods, signs and symptoms of food poisoning

1) ●■ Higher ability to provide similar answer to lower-ability worksheet
Salmonella, Staphylococcus aureus, E. coli, Campylobacter

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) Sources of bacterial cross-contamination include:
- Contact with other contaminated foods
- Contact with contaminated surfaces and equipment
- Dirty hands of people cooking/preparing the food
- Pests (insects) having contact with the food
- Waste food and rubbish

ii) Cross-contamination and food poisoning can be prevented by:
- Dealing with foods separately
- Using specific, dedicated equipment
- Maintaining personal and work hygiene
- Protecting kitchen and storage from pests

iii) Main symptoms of food poisoning include:
- Vomiting and nausea
- Diarrhoea
- Fever
- Shivers
- Stomach cramps
- Headache

3) ●■ Higher ability to provide similar answer to lower-ability worksheet

i) High-risk activities include:
- handling high-risk food such as raw eggs
- using the toilet
- handling raw meat
- eating
- touching the face or hair
- cleaning or putting rubbish into the bin

Higher-ability students may provide other relevant responses.

ii) **Bacteria** can be found everywhere – from **hands**, through clothing, to w
before and after handling high-**risk** foods such as **raw** meat or eggs help
contamination. Other hygiene rules include changing clothes when start
outdoors, using separate **utensils** for **raw** and **cooked** products and ke

4) ●■ Higher ability to provide similar answer to lower-ability worksheet
Blue – raw fish
Red – raw meat
Yellow – cooked meat
Brown – vegetables
Green – salads and fruit
White – dairy

5) ●■ Higher ability to provide similar answer to lower-ability worksheet

Correct cooking time helps to kill bacteria and other microorganisms, which c
temperatures above 65 °C. Cooking helps to prevent food poisoning by killing
microorganisms, and by deactivating toxins and enzymes with the use of high

6) ●■ Higher ability to provide similar answer to lower-ability worksheet
Food waste has a huge effect on the environment:

- to produce food, a lot of **fossil fuels** are used, so wasting food means wa
- once the food is disposed of, it has to be picked up and **transported** to la fuels (e.g. gas or oil) and produces exhaust gases, which pollute earth, w **warming**
- food waste left in landfills decomposes and produces large amounts of m and leads to global warming

Or any other relevant answer.

7) ●■ Higher ability to also p[illegible] explanation/description of the process.

Preservation [illegible]	Extends the shelf life [illegible]
m[illegible]ing ■	high percentage of sugar (draws water from the spoilage microorganisms)
pickling	high percentage of acid (most microorganisms d
freezing	very low temperature (most microorganisms be
bottling	very hot temperature (most microorganisms die
vacuum packing ■	lack of oxygen (stops aerobic microorganisms fr anaerobic microorganisms)

Exam-style Question

●

Any two from: (1 mark for each correct statement, max. 2 marks)

- to prevent bacterial growth in defrosted food
- to limit the number of bacteria in the food
- to prevent food spoilage
- to prevent food poisoning
- to prevent freezer burn if defrosted food has co[illegible]t with oxygen

Other relevant answers may be accepted

■

Any three from: (1 [illegible] dicating a method, 1 mark for explaining why it

- **k[illegible]pin[illegible]rsonal and workplace hygiene** – this prevents the sp a[illegible] clothing of personnel, as well as from the working surface to t
- **[illegible] separate tools to deal with high-risk foods** – this is useful as it k safer foods and prevents contamination from chopping boards, knives o
- **cleaning and disinfecting utensils before and after use** – hot water w to kill bacteria and other microorganisms and lowers the risk of contami use of the same utensil
- **using correct cooking times** – this helps to cook food thoroughly and a microorganisms could be present
- **storing foods correctly** – storing food in covered or sealed containers p with other foods and contaminating them; storing food at low temperatu the possibility of bacterial growth as the temperature scope is beyond th
- **not using foods beyond their 'use by' date** – foods have a stated 'use b safe to eat up to that date; microorganisms require time to grow, which r stored, the higher the risk of bacterial growth in it. Also, the chemical st creating more optimal conditions for bacterial gro[illegible]th.

Other correct responses may be accepted.

14. Food provenance: Food origins

1) ●■ Higher ability to provide similar answer to lower-ability worksheet

Reared – beef, pork, lamb, salmon and oysters in fish farms
Grown – lettuce, carrots, sunflowers, olives, pumpkin, thyme, mushrooms
Gathered – mushrooms, stinging nettles, thyme
Caught – venison, wild salmon and oysters
Or any other relevant examples.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

Organic farming d[illegible] the use of **pesticides**, **antibiotics**, **fertilisers** (such [illegible]). They can be used in conventional farming in order to o

3) ●■ [illegible] ability to provide similar answer to lower-ability worksheet

Eggs can be produced in various ways. The most popular method of egg farm **enriched cage** production, where hens are kept in tight **cages**, placed on top popular method is **barn** production, in which hens can move freely around th claim that **free-range** egg production is better both for the birds and consum outside at least for a part of the day and have much more room than the hens **range** eggs are labelled as 1. **Organic** eggs come from hens which are fed **or**g

4) ●■ Higher ability to provide similar answer to lower-ability worksheet

Advantages:
- It is cheaper to rear large numbers of animals in one place than it is to re
- Less land is used (which helps maintain sustainability)
- Fewer people are needed to run the farm
- The price of food is lower and more affordable

Disadvantages:
- Need to invest a lot of m[illegible] to [illegible] a farm
- Increased risk of [illegible]
- Animal w[illegible] standards are not met
- [illegible] injury among animals are possible

Or a[illegible] relevant answer.

Exam-style Question

● Any two from: (1 mark for each correct, max. 2 marks)
- Sustainable fish farms care about animal welfare so the fish are treated bette
- The consumer knows how the fish were reared, fed and caught
- It is easier to control diseases and fish feed and avoid accidental eating of fish
- Sustainable fish farms help to protect the natural environment
- Sustainable fishing helps to protect wild species
- Sustainable fishing prevents species extinction
- Sustainable fishing helps to cease overfishing of natural fisheries
- Sustainable fish farms provide jobs for many people around the world

More healthy or better quality **should not** be accepted d[illegible]e to lack of reliable

Any other suitable answer may be accepted

■

Band	AO4
3	**Award 5–6 marks** The answer shows excellent application of knowledge, and ability to an advantages and disadvantages of fish farms for sustainability of food. T 3–4 points from the indicative content. Subject-specific vocabulary is u For 6 marks the answer must include a reference to both advantages a
2	**Award 3–4 marks** The answer shows good applica[illegible]nowledge, and ability to analys advantages and disadva[illegible]es of fish farms for sustainability of food. T 2–3 points from the indicative content. Subject-specific vocabulary is u
1	**Award 1–2 marks** The answer shows limited application of knowledge, and ability to anal [illegible]ntages and disadvantages of fish farms for sustainability of food. T 1–2 points from the indicative content. The vocabulary used may be ge
0	**Award 0 marks** No answer given or answer incorrect.

Indicative content:

Advantages of sustainable farming:

- Health of the stock is controlled and maintained, leading to production of bet amounts and helping to rebuild the stock (i.e. not leading to extinction of a sp
- Positive impact on the ecosystem as only limited resources are used (e.g. less the ecosystem or habitat, no by-catch of other species)
- The resources are used more responsibly, helping to avoid waste
- Enables fair wages and prices for fish farm workers, leading to improvement off unemployment and poverty, and helping to prevent human trafficking / sl
- Fish farms may produce as much fish as is needed to feed the growing popula
- The number of fish may be easily controlled and adjusted
- The quality of fish is better controlled, so the fish people eat is safe and health
- Fish farms are environmentally friendly so don't affect the availability of othe
- Fish farms require only limited space, so there is more room to grow plants o
- Fish farms only use the necessary resources, so there are more resources left
- The waste produced is disposed of in a controlled way, so create no pollutio

Argume[illegible]nin[illegible]ish farms:

- Only [illegible]h fish species can be reared, i.e. not all species are suitable for rear
- Low variety in diet as only limited number of species may be produced
- The fish are fed synthetic feed, which affects their flavour and nutritional valu
- Fish farms may be overcrowded, which could affect animal welfare and healt
- Animals can be treated with antibiotics as a prevention, and traces of antibiot
- The fish tanks may be dirty and polluted from too much feed, excrement and
- Nutritional value of the fish may be lower than that of those which live in the

Other correct responses may be accepted.

15. Food provenance: The impact of food production on the environment

1) ●■ Higher ability to provide similar answer to lower-ability worksheet

Locally produced foods are usually:

- Cheaper (individual)
- Fresher (individual)
- Nutrient rich
- Sold unpac[illegible]s[illegible]t[illegible]waste amount is smaller (both individual and com
- [illegible]ort[illegible]mpower local farmers (community)
- [illegible] the need for transportation and lower the carbon footprint (com

2) ● Food waste, packaging, carbon footprint, food miles, fossil fuel, greenhou change

2) ■ During food production and transportation, **fossil fuels** are used in orde
large amounts of **greenhouse gases** are released into the atmosphere. T
other gases released as a result of production of one item is called the **ca**
transported to its destination, and the larger the distance, the larger the
the farm to the consumer's plate is called **food miles**. The amount of gas
climate change, because they create a coat around the globe and prever

3) ●■ Higher ability to provide similar answer to lower ability worksheet
1. **greenhouse** gases are released into the atmosphere
2. the surface of the earth **warms up**
3. glaciers **melt** while ocean levels rise as lakes **evaporate**
4. some regions suffer from **drought** while others are **flooded** from heavy
5. **crops** are damaged and people suffer **famine**

4) i) Food packaging is designed to **inform** consumers about the produc
factors and **extend** its shelf life. It is important to properly **dispose**
possible, because some materials will not **decompose** and instead

i) ■ Students indicate three from:
- Packaging protects the food from external factors, e.g. dirty ha
- It helps to extend the shelf life of the food
- It gives space for consumer information, e.g. about the origin o
amount or volume
- It is easier to carry home
- It protects the food from vermin and pests
- It protects the food from oxygen, light or moisture
- It helps to pack foods into smaller or larger portions, which ar
(smaller – singles, couples, small families; larger – large famili

Students indicate at least one from:
- Recycling is needed to safely dispose of the many packaging m
- To protect the environment
- To avoid pollution
- To lower the use of natural resources by reusing the existing p
- To lower the carbon footprint
- To slow down the rate of global warming

Other relevant responses possible.

ii) Students to indicate **four** from:
reuse uneaten food, e.g. in pies, soups or salads, stale bread ca
- cook and serve only the amount you need
- store food properly to avoid spoilage
- plan meals and write a shopping list
- check the use by dates and eat the foods that have the shortest
- freeze uneaten leftovers for later use
- if inedible, turn into compost and use to fertilise plants in the g

ii) ■ Students to indicate some of the methods in part ii) ● AND some of
- Use smaller packages with individual serving portions wrappe
- Use smaller, 'ugly' looking vegetables and fruit to produce juic
throwing them away
- Discount foods which are soon to expire
- Give away foods to food banks or charity

Other relevant answers may be accepted.

5) ●

Factor	
Lack of carbohydrates and fibre in place of macronutrients	Can lead to loss of b
Chronic lack of protein	Can cause kwashior
Ca and vitamin D deficiency	Can lead to poor bo

5) ■ Health effects of food poverty include:
- hunger and uncontrollable loss of body mass
- loss of muscle tissue, weakness
- loss of immunity
- vitamin and mineral deficiencies
- protein deficiency, often leading to kwashiorkor
- inability to focus and learn
- poor bone and dental health
- increased risk of heart disease, obesity, type 2 diabetes, as low-quality fo
- stress and social exclusion
- depression

or any other relevant answer.

Exam-style question

● Any two from: (1 mark for each correct, max. 2 marks)
- Buy food locally to reduce the food miles and the amount of greenhouse transportation
- Choose organic food to reduce the amount of fertilisers used
- Limit food waste to reduce the amount of resources used to produce foo
- Limit the use of packaging to reduce the need to use resources to produc

or any other suitable answer.

■

Any three from: (1 mark for each factor and 1 mark for a relevant description
- **Global warming and climate change**, leading to droughts and floods a
- **Less land available to grow food** leading to less food being produced
- **Growing population** means more food is needed to feed everybody
- **Fewer resources are available** (water, good-quality soil or fossil fuels)
- **Environmental damage from pollution and human activities** leading able to pollinate plants and decrease in birds which would eat pests and pr
- **Extreme weather conditions** (flooding and drought) which affect the g limit the land area suitable for grazing, leading to less food production
- **Wars and conflicts** which destroy resources (e.g. money) needed to pr which otherwise could be used for growing plants / grazing animals
- **Ability to transport foods to distant countries** as some foods are imp countries, or lack of money to pay for transport, or lack of petrol to fu
- **Lack of money (low income)** which makes the food unaffordable for pe
- **Distance to the nearest shop/farmer**, e.g. in Africa this can be measur difficult for people to go and buy the food even if they have the money
- **Crop failures** caused by weather conditions, overexploitation of soil, pe

Other relevant answers may be accepted.

16. Food manufacturing: British and international cuisines

1) ● Fish and chips – Great Britain
Sushi – Japan
Eton mess – Great Britain
Pizza – Italy
Dumplings – Poland
Croissant – France
Paella – Spain
Quiche – France
Scones – Great Britain
Naan bread – India
Tacos – Mexico
Doughnuts – USA

1) ■ Fish and chips – Great Britain
Sushi – Japan
Pizza – Italy
Dumplings – Poland
Croissants – France
Paella – Spain
Naan bread – India
Spring rolls – China
Tacos – Mexico
Donuts – USA
Tagine – Morocco
Empanadas – Argentina

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

Cuisine is a style of cooking characteristic of a particular **country** or **region**, v preparation and **cooking** methods, and presentation or serving techniques ar

3) ●■ Higher ability to provide similar answer to lower-ability worksheet

Features of British cuisine include **traditional foods** such as lamb, cheeses ar
popular cooking methods. **Breakfast** is usually very **substantial**. Breakfast
a **brunch**. **Afternoon tea** is a meal specific to the country. **Pies and puddin**

Or any other relevant answer.

4) ●■ Higher ability to provide similar answer to lower-ability worksheet
- Wales: bara brith, cawl, rarebit, Glamorgan
- England: Cumberland sausage, Cornish
- N. Ireland: boxty, Ulster fry, soda bread
- Scotland: kippers, Dunlop cheese, oatcakes

or any other relev

Exam-st estion

1) ● Any two from (1 mark for each correct, max 2 marks)
- poach the egg rather than fry it (to limit consumption of total fats)
- grill the sausages rather than fry them (to limit the amount of total fat)
- reduce the amount of bacon used or exclude it from the recipe (to limit t
consumed)
- add more vegetables instead of bacon (to increase the amount of fibre)
- use low-sodium, low-sugar baked beans (to limit consumption of sodiu
- swap white bread for wholemeal bread (to increase the amount of dieta

Other suitable answers can be accepted.

2) ■

a) Any two from: (1 mark for each correct and 1 mark for a suitable explan
- swap cheddar cheese for a vegan cheese, tofu, TVP or vegan (egg-fr
and is not considered vegan
- use soy milk or creamy tofu to coat the sa s instead of the egg
not eaten by vegans
- swap butter for a vegeta as butter is made from milk
by vegans

b) Any two fr k for each correct and 1 mark for a suitable explan
ch w-fat cheese instead of the full-fat variety to lower the cal
se wholemeal breadcrumbs to increase the amount of dietary fibr
lower the amount of butter used to limit the amount of saturated fa
- bake the sausages rather than fry them to lower the calorific value

Accept other suitable answers.

17. Food manufacturing: Primary and secondary processing of food

1) ●■ Higher ability to provide similar answer to lower-ability worksheet
- Primary processing: sorting, trimming, washing, waxing, milling, skinni
- Secondary processing: fermenting, adding colourants, freezing, smoking,

For higher ability, other relevant responses may be accepted.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet

Homogenisation	Process in which fresh milk is pressed through tiny hole prevent it from separating
Pasteurisation	Process in which milk is h at to 72 °C for 15 seconds pathogenic bacte
Sterilisation	Heating milk to over 110 °C for 30 minutes to kill all
Microfiltration	P ng the milk through very fine membranes to remo

3) ●■ Higher ability to provide similar answer to lower-ability worksheet
Sug cid are necessary in jam production. **Acid** helps to release **pectin**
gelling process. **Sugar** acts as a **preservative** and protects the jam from bact

4) ●■ Higher ability to provide similar answer to lower-ability worksheet

Sterilisation of milk	Denatures the proteins in milk, damages vitami of the milk
Baking bread	Adding yeast increases the amount of B group v amount decreases; the protein in flour creates g springy and soft; the polysaccharides in flour de flavour
Drying milk	During drying, little a[illegible]unts of water-soluble v so their amou[illegible]milk powder may be decr affec[illegible]
Turning milk int[illegible]	[illegible]ermentation, lactose is turned into lacti cheese; lower pH leads to denaturation of prote cheese is not affected
[illegible]nering jam	During simmering, high temperature is applied, has a lower amount of vitamins than fresh fruit
Juicing	During juicing, the juice is separated from the pu amount of dietary fibre in the juice. Many juices cause a minor decrease in vitamin content (espe C).

For higher ability, other relevant answers may be accepted (e.g. curing of mea

Exam-style Question

● Any two from: (1 mark for each correct, max. 2 marks)

- taste – the meat becomes salty
- colour – the colour stays bright red / pink (not grey)
- the aroma of the meat changes (usually depending on the spices and herbs us
- the texture of meat may become affected, e.g. the meat becomes softer and ea

Accept other suitable answers.

Do NOT accept answers referring to the nutritional value[illegible]eat.

■

Band	AO2
3	**Award 7–8 [illegible]** [illegible]ows excellent knowledge and understanding of the funct[illegible]ning for quality of the final product. The answer explains in detail t[illegible]ntifies changes to bread if various types of flour were used, includin indicative content. Subject-specific vocabulary is used throughout.
2	**Award 4–6 marks** The answer shows good knowledge and understanding of the function quality of the final product. The answer explains some of the functions some changes to bread if various types of flour were used, including a r indicative content. Subject-specific vocabulary is used throughout, with
1	**Award 1–3 marks** The answer shows limited knowledge and understanding of the functio for quality of the final product. The answer describes some of the funct identify changes to bread if various types of flour were used, including indicative content. Vocabulary used may be generic and simplistic.
0	**Award 0 marks** No answer given or answer incorrect.

Indicative content:

Function of flour in bread:

- providing bul[illegible]r is the main ingredient in bread
- pro[illegible]nu[illegible]ional value, as flour is a source of complex carbohydrates (sta grou[illegible]amins such as B1 (thiamine), B2 (riboflavin) and B9 (folic acid)
- source of proteins which, after mixing with water, form an elastic gluten netw dioxide produced by the yeast and provides the bread with its open, sponge-li
- strong bread flour helps to obtain an elastic, easy-to-slice loaf which is not cru

Changes to bread if different types of flour were used:

- strong wheat flour – is rich in protein and will produce a strong gluten netwo
- plain soft flour / cake flour – has less protein, so less gluten may be formed, p crumbly bread
- all-purpose flour – has less protein than strong flour, but more than plain soft medium quality (not as crumbly as the one made with plain soft flour, but also strong flour)
- wholemeal flour – may contain pieces of unmilled bran or cereals, which may may produce a less open loaf, possibly with uneven texture (some small and s gluten network has been disturbed)
- rye flour – as it is very nutrient-dense, will produce a dark, heavy loaf (may
- corn flour – is gluten free, will produce a very crumbly loaf with no volume, baked (similar effects may be obtained with other gluten-free flours such as ric

Other suitable answers may be accepted.

18. Food manufacturing: Technological developments that claim to support

1) ●■ Higher ability to also provide the substances which foods have been fortif
   - Wheat flour – iron, vitamin B1 (thiamine), vitamin B3 (niacin), calcium
   - Margarine – vitamin A and vitamin D
   - Skimmed and semi-skimmed milk – vitamin A

2) ●■ Higher ability to provide similar answer to lower-ability worksheet
   - The addition of plant sterols to margarine helps lower blood cholesterol
   - The addition of iron to cereals helps prevent anaemia.
   - The addition of folic acid to bread prevents spina bifida in newborns.
   - Fortification with vitamin B1 helps prevent beriberi disease.
   - The addition of vitamin D helps prevent osteoporosis.
   - The addition of vitamin B12 to soy milk helps prevent anaemia in vegans

   Higher-ability students may provide other relevant examples.

3) ●■ Higher ability to provide similar answer to lower-ability worksheet

Group	Advantages	Disadvantages
Artificial colours	Enhance the colour Change the colour Make food more appealing Make food more appetising Improve appearance of food Some of them are natural	Can be used to hide poor qu ingredients Can increase consumption, l obesity Tartrazine is linked to lethal attacks and other allergic re such as skin rashes, thyroid and ADHD Some of them are artificial
Emulsifiers, stabilisers, gelling agents and thickeners	Prevent mixtures from separating Keep emulsions and other mixtures stable Prevent crystallisation of mixtures	Can be used to hide poor qu ingredients Can damage the lining of the and cause bloating and flatu Some emulsifiers are linked leaky gut syndrome
Flavour enhancers and sweeteners	Substitute for sugar Have a lower calorific value than sugar Enhance the flavour Change the flavour Add new flavour to a food Make food more appealing and appetising	May increase consumption, obesity MSG can cause allergic symp as itching or sweating Aspartame is a source of phenylalanine, so can't be ea people suffering from pheny
Preservatives and antioxidants	Enhance shelf life Prevent bacterial growth Prevent growth of moulds and yeast Prevent food spoilage Lower food waste	Sulfites can cause allergic re including anaphylactic shoc Nitrates used in cold cuts ca stomach cancer Benzoates can cause asthma rashes and other allergic rea Sorbates can cause dermatit inflammation)

or any other relevant answer.

4) ●

Step no	Process	How CA
Step 1	Milk is transported to the factory	Using CAM, the factory worke acidity (pH), fat content and t It can also be used to quickly i and note the time of delivery
Step 2	Milk is pasteurised	CAM h lps to control the te
Step 3	Milk is cooled down	CAM h lps to control the te ensure microbiological safe
Step 4	Starter cultures are added	CAM helps to control the am that they are spread evenly
Step 5	Milk is incubated at 32°C	CAM controls the temperatu process, to that rennet can b
Step 6	Rennet is added	CAM controls the amount of it is spread evenly throughou
Step 7	Curd is cut and heated to 38°C	CAM controls the temperatu
Step 8	Whey is drained off	CAM helps to control how m much cheese curd is left
Step 9	The cheese undergoes *cheddaring* (the process in which curds are piled on top of each other and periodically flipped over)	CAM can help to control the room; it also helps to monit last flipped over
Step 10	The cheese is immersed in brine	CAM helps to control the am concentration)
Step 11	The cheese is formed into blocks	CAM helps to ensure that eac
Step 12	The cheese is stored and aged	CAM helps to control storag temperature)

or any other relevant answer.

4) ■

Step	Process	How CA
1.	Raw ingredients (butter, flour, and sometimes other ingredients such as food colourings) are measured	CAM helps to measure the exa CAM can also help to measure adjust the amount of water ac
2.	The ingredients are combined together and kneaded	CAM controls the speed and ti
3.	Dough is left to rest	CAM can be used to control th
4.	Dough is rolled out	CAM helps to control how thi
5.	Dough is cut into shapes	CAM helps to control whether shape; it also identifies faulty the production line
6.	Pasta is dried	CAM helps to control the mois safe to store in ambient condi
7.	Pasta is cooked	CAM helps to control the temp ensure the pasta is cooked co

Or any other relevant answer.

5) ●

i) Any two from:
modified waxy corn starch, monoglycerides of fatty acids, diglycerides of
potassium sorbate, citric acid, calcium
Do NOT accept general answers such as 'preservatives', 'flavours' or 'colo

ii) Any two from:
sterol esters, vitamin A, vitamin D

5) ■

i) Buttermilk is used to:
improve the flavour of the product
increase attractiveness of the product for consumers
make the product more similar in flavour to butter

ii) Since the product is made mainly of water and vegetable oils, emulsifiers
from layering and separating.

Exam-style Question

- Any two from: (1 mark for each correct, max. 2 marks)
- because during milling the bran is separated from flour, decreasing the n
- to help prevent conditions and diseases caused by deficiency of micronu calcium and iron
- to ensure the correct intake of chosen micronutrients within the diet
- to help prevent deficiencies in certain groups of people, e.g. those who d
- Accept other suitable answers.

1) ■

Band	AO4
	Award 5–6 marks The answer shows excellent analysis and evaluation of the advanta food additives, including a reference to 3–4 points from the indicat vocabulary is used throughout. For 6 marks, the answer must include a reference to both advantag
2	**Award 3–4 marks** The answer shows good analysis and evaluation of the advantages additives, including a reference to 2–3 points from the indicative c is used throughout, with few mistakes.
1	**Award 1–2 marks** The answer shows limited analysis and evaluation of the advantag additives, including a reference to 1–2 points from the indicative c generic and simplistic.
0	**Award 0 marks** No answer given or answer incorrect.

Indicative content:
Advantages:

- Colourings are used to alter the colour of the food – either to enhance or appealing and appetising.
- Emulsifiers and stabilisers are used to obtain a desired texture and prev
- Flavourings – help to obtain or enhance the flavour and aroma of the foo appetising.
- Preservatives – help to extend the shelf life of the product and prevent s producers and customers.
- Sweeteners – help to obtain the desired level of sweetness, help lower ca preferred by people on a low-calorie diet. May be used to help tackle the Currently (after introducing the sugar tax) beverages containing sweeter containing sugar, which may make them more appealing to the customer producers.

Disadvantages:

- Colourings may be used to hide low quality of food, e.g. curcumin is used hide the fact that it's mostly made of water, not vegetables.
- Emulsifiers may be used to hide low quality of food and lower the cost of is used to thicken a product instead of using proper amounts of more exp
- Flavourings may be used to hide low quality of ingredients used and low sugar is used instead of real vanilla extract
- Preservatives may cause allergic reactions, skin rashes or swelling, e.g. s
- Sweeteners may have a laxative effect, e.g. xylitol, aspartame.
- Some food additives, e.g. colourings, are believed to cause hyperactivity i
- Some food additives may cause various adverse reactions, thereby limiti food producer who uses them.

Other relevant answers may be accepted.

19. Factors affecting food choice: Sensory testing

1) ●■ Higher ability to provide similar answer to lower-ability worksheet
   i) Touch, taste, hearing, smell, sight

   ii) ● Controlled conditions are necessary **to obtain reliable results**. Fo that all the food samples are the same size, and that the testers are i distraction or being influenced. Or any other relevant answer.

   ii) ■ The taste panel has to be set in controlled conditions in order to obt should be isolated from each other to avoid distraction, and all othe to be removed. The lighting has to be adjusted, and the food sample carrier if used has to be neutral in flavour. Water should be prov samples. Testers should receive sheets of paper on which they can ... other relevant answer.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet
- honey – sweet
- pretzels – salty
- lemon – sour
- coffee – bitter
- parmesan cheese – umami (and salty)

For higher-ability students other relevant responses may be accepted.

3) ●

Some descriptive words could include:
- Aroma: floral, scented, pungent, rotten, acrid, bland, tart, rancid, citrus, s
- Taste: sweet, bitter, savoury, salty, tangy, sour, rich, sharp, bland, tart, ra
- Appearance: stringy, heavy, flat, fizzy, wet, crystalline, firm, flaky, crisp, l
- Texture: bubbly, tacky, close, brittle, rubbery, ... soft, firm, flaky, crisp

Other suitable answers may be accepted.

3) ■ (exemplary answers)
- glass of soda ... wn, liquid, cold, refreshing, aromatic, sweet, sou
- ...ps ... crunchy, hard, fresh, oily, salty, yellow, bland
- ...late – sweet, bitter, soft, melt in the mouth, aromatic, chocolatey, d
- ...ges – sweet, sour, juicy, soft, aromatic, zesty, citrus, tangy, fresh

Other suitable answers can be accepted.

4) ●

This is because the nose (olfactory system) and the mouth (taste buds) work t aromas (flavours) of foods. For this reason a person with a blocked nose is no therefore, would not provide valuable results in a taste panel.

4) ■

The olfactory system is the sense of smell, which is localised in the nose. Whe evaporate, they fill the air and are inhaled into the nose cavity. There they are send signals to the brain, which 'recognises' and 'names' the aroma for us.

Exam-style Question

●

Any two from:
rich, crumbly, buttery, short, ... r, crisp, sandy, golden
Other suitable answers may be accepted.
Do NOT accept anything which is unusual for shortcrust, e.g. well risen (typica coo... ot

■

a) Preference test (1 mark)

b) Any three from: (1 mark for each correct, max. 3 marks)
- the samples must be served hot
- the samples should be served in small cups or bowls
- the lightening should be adjusted so that the colour of the soup doe
- the temperature of the room should be comfortable (not too cold or
- each tester should perform the test individually (either in turns or i
- the testers can be both trained and untrained
- the samples must be encoded with ran[illegible]mbers or letters
- the samples must be identical in s[illegible]ze and shape
- each tester should try al[illegible]amples
- a cup of clean w[illegible] h[illegible]be provided to each tester
- clear in[illegible]ust be given to each tester

Other s[illegible]answer may be accepted.

20. Factors affecting food choices: The range of factors that influence food ch

1) ● Time available for cooking or eating (clock), lifestyle and healthy eating (up), health conditions (doctor measuring blood pressure), celebrations/ activity level (PAL)(man jumping), money – income (purse), money – pri trolley), season (time of the year)(snowman)

1) ■ **Money –** a **family's budget**, **income** and the **price** of food determines w an individual or not, and how much a person can buy
Time – depending on the **time of the day**, people will tend to choose dif and a sandwich for lunch; if the **time for cooking** is limited, a person wil and easy to cook, or a fast food rather than cooking something more com will be faster than making a stew
Season – some people may choose to eat only seasonal foods; also, the s are available in the shops
Occasion – on big celebrations, such a[illegible]on[illegible]ays and anniversaries, peo which results in them consu[illegible]re sugars and fats than usual
PAL – physical activit[illegible]e[illegible]important for judging how much food a pe amount of fo[illegible]g[illegible]erson to maintain a healthy weight, while eating a[illegible]obe[illegible]eating too little may lead to losing weight and associate

Other correct answers are possible.

2) ●■ Higher ability to provide similar answer to lower-ability worksheet
i)

Product	Price per pack
Olive oil	£6.50 / 1 litre
Salmon, fresh fillet	£15.00 / 1 kg
Arborio rice	£4.50 / 1 kg
White wine	£15.00 / 1 litre
Fresh thyme	£1.25 / 70 g
Pink Himalayan salt	£35.00 / 1 kg
Manuka honey	£50.00 / 1 kg

ii) ●
- Olive oil can be exchanged for rap[illegible]se[illegible]l or sunflower oil
- Salmon can be exchang[illegible]cheaper fish, like cod or trout
- Arborio rice can[illegible]e[illegible]ged for long-grain rice
- White wi[illegible]e[illegible]xchanged for cheaper wine or white wine vineg
- Fr[illegible]y[illegible] can be exchanged for dried thyme
- Pin[illegible]Himalayan salt can be exchanged for kitchen salt
- Manuka honey can be exchanged for mixed honey or even artificial

Or any other relevant answer.

ii) ■ Students to indicate that the meal would be too costly for the family exchanged, along with possible substitutes (as in point ii) ●)

3) ●■ Higher ability to provide similar answer to lower-ability worksheet
- Nut allergy
- Wheat allergy
- Milk allergy
- Egg allergy
- Fish and shellfish allergy

Higher-ability students can also provide other answers from: cereals containi
soya, tree nuts, peanuts, molluscs, crustaceans, sulfi[illegible], sulfur dioxide, celery,

4) ●■ Higher ability to also provide definition / description

i)
- **animal welfare** – [illegible]iew in which animal rearing is conduc
  being, incl[illegible] **treatment** and **living conditions**
- **fair[illegible]** – an ethically positive way of trading in which **fair prices**
  [illegible] **workers**, especially in the **third world** and **developing** countr
  ocal produce – products which are produced by the nearby farme
  help **decrease carbon footprint**, lower prices and better quality fo
- **organic** – a way of growing or rearing foods where **no chemicals**, h
  GM components are used, either in the form of fertiliser, or in the fo

Or any other relevant answer.

ii)

Advantages	
More food can be produced	Unknown long-ter
The use of pesticides or herbicides is lower	May be responsibl overweight and ob
Nutritional value of foods can be increased	May cause other di
High-yield crops and industrial farming are possible, because immunity of plants and animals is increased	No long-term stud outcomes of eating

Or any other relevant answer.

Exam-style Question

1) ●

Any two from: (1 ma[illegible]ach correct, max. 2 marks)
- All peop[illegible]ologically programmed to prefer a sweet taste as this us
  [illegible] e[illegible] and some people end up preferring sweet foods for the rest o
  [illegible]erence for more savoury foods, e.g. salty, sour or spicy (**genetic re**
- The way the taste is perceived by a person will determine what kind of f
  people with low threshold for salt will not like very salty foods (**percept**
- It is important to eat a varied diet from early childhood as that's when ta
  various flavours, so people end up liking more foods (rather than just a v
  (exposition)
- The more new tastes/foods a person tries, the more possible that he or s
  choices in the future **(novelty)**
- People will more often choose foods which they like or which make them
  which they associate with childhood or enjoyment **(safety)**
- It is important not to treat sweets or snacks as a prize as it may create a
  cause people to choose these foods more often than healthier options **(p**
- Living in a partnership or family may lead to choosing foods preferred by
  healthiest option **(external influences)**
- Food preferences may also be affected by expectations – if something loo
  try it, even if the taste is good **(expectations)**

Accept other suitable answers.

2) ● Any two from: (1 mark for each correct, max. 2 marks)
- ability to produce food (e.g. method of farming, quality of soil, weather c
- ability to use GM seeds and feed (as they have the potential to produce h
- availability of transport modes (either to import food from other countri shopping home)
- prices of food and income (if prices are too high, the food becomes unaff
- ability to cook (if someone doesn't know how to cook they won't be able sufficient amount to themselves or their famili
- availability of fuel (e.g. petrol) as high prices/scarce resources may limi
- availability of water and other resources (as lack of water will decrease t animals)
- climate change (e.g. higher temperatures will affect the ability of plants grows)

Accept other suitable answers.

1) ■

Any three from: (1 mark for each factor and 1 mark for a relevant explanation
- **working long hours** – will limit the time available to cook, which mean may be preferred;
- **working long hours** – will limit the time available for shopping, which m be poor;
- **shift working** will affect the ability to cook and eat at home, or to eat wi to-cook or ready-to-eat foods;
- **high levels of physical activity** will require larger amounts of energy ar consumed; some people may also choose to buy specific foods to boost th protein, foods low in fats, energy drinks, etc.
- **working long hours** may cause people to buy more takeaway food, or o have no time for cooking
- some people may choose to lead a **vegan lifestyle**, so their food choices v food outlets) to plant-based foods only
- people may choose to **eat out more often** (e.g. with family or friends, l will be influenced by the group and limited by the menu on offer in a give
- **business meetings and functions** will cause people to eat out more oft dependent on what is on offer in a given food outlet)

Accept other suitable answers.

21. Factors affecting food choice: Food labelling and marketing

1) ● i) 1. Name of the product
2. Volume / net weight
3. Date marks (use by or best before date)
4. Nutritional value per portion

ii) Any four from:
- quantity/amount
- list of ingredients
- allergens
- name and contact details of the manufacturer/importer
- lot number
- storage conditions
- cooking instructions
- country of origin (where required)
- warning (e.g. that a food has been made with the use of GM cr
- packaged in a protective atmosphere)

1) ■ Students should draw/write information on the food box and then indica
given is important.

Information	Why it is impo
Date marks	To check freshness of the product and avoid fo
List of ingredients	To check what it is made from and avoid foods
List of allergens	To warn that the product is not suitable for pe
Name of the product	To indicate what the given product is and avoi least 80% of milk in milk spreads that contain
Nutritional information	To indicate the product's impact on the daily d
Country of origin	To indicate where the food comes from, and m
Address of the producer	In case of mass food poisoning or a physical/c food, it is easier to trace the whole series by co him identify the batch
Quantity/amount	To be able to compare the prices of various pr
Lot number	To be able to identify products coming from th e.g. finding pieces of glass in a jar of pickles
Storage conditions	To help maintain the quality of the food and pr
Cooking instructions	To help people use the product in the way it sh getting the best quality and nutritional value o
Warnings	To help people make choices about food

Or any other relevant answer.

2) ● i) **Milk** from butter, **wheat** from flour, **egg** whole and dried, **soya** lecit

ii) **Yes**, the cakes are suitable for vegetarians because they contain no ingredients include butter and eggs, eaten by most vegetarians.

iii) The cakes are **not** suitable for children due to the high sugar conten of sugars in these cakes. One cake provides 6.4 g of sugars, which is World Health Organization with consumption of sugar may cause t

2) ■ i) The allergens in the product include milk, wheat, egg and soy. The or people with gluten intolerance and wheat allergy, people with la and people with egg or soy allergies.

ii) The product is **not** suitable for vegans because it contains milk and of animal origin.

iii) The ingredients on the list are in **descending order**, from those use small amounts only.

3) ● i) Buy one, get one free (BOGOF); meal deals; special offers; point of s

ii) Pester power is the ability of children to pressurise parents into buy

3) ■ i) Pester power is the ability of children to pressurise parents into buy

ii) Students to indicate **three** from: buy one, get one free, meal deals; s advertisements; tastings; media influences; product placement; or a

Exam-style Question

●

Any three from:

– cereals containing gluten (to include wheat, barley, rye and oats)
– crustaceans (e.g. prawns, crab, lobster)
– molluscs (e.g. squid, mussels, cockles, snails)
– fish
– milk
– eggs
– celery
– lupin
– mustard
– tree nuts (e.g. almonds, hazelnuts, walnuts, Brazil nuts, cashew nuts, pistachio
– peanuts
– sesame
– soya
– sulfur dioxide / sulfites

■

Any three from: (1 mark for each marketing technique and 1 mark for a relevant ex

- buy one, get one free – prompts people to buy more products than they need; (if people end up eating all the extra food) or food waste (if they don't manage
- special offers – may prompt people to buy foods which they normally wouldn more expensive
- free gifts – encourages people to buy products which they normally wouldn't quantities; may lead to weight gain / tooth decay (if they eat all the extra food
- meal deals – may prompt people to eat more balanced meals as they usually i snack; may lead to less healthy choices as foods included in meal deals are oft nutritional value
- product placement / celebrity endorsement – make food more desirable/ex encourage people to buy promoted foods (or certain brands) or new foods
- points of sale – encourage impulse buying; these are usually placed next to th sweets, so people may end up buying (and eating) more sugar than they have
- billboards, leaflets, brochures – may encourage people to try new things if the food types are on offer) leading to less-balanced food choices (e.g. people chea and less of the other, even if they didn't plan to initially)
- mailing, newsletters – may introduce new foods to people and encourage ther
- packaging design – draws attention to certain food products, e.g. those high in end up buying more of these products; often aimed at children, who may pest these products, ending up eating more sweets and consuming more energy th obesity, tooth decay)
- vouchers – may prompt people to try new foods (if advertising new products) offering a discount for it)
- marketing terms (e.g. pure, natural, fresh) – may prompt people to buy foods actual content, may encourage people to try less-processed foods

Accept other suitable answers.