Zig Zag Education

Food and Nutrition GCSE (9–1) | AQA | 8585

2016 specification
first exams in 2018

Active Revision Worksheets

For AQA GCSE Food Preparation and Nutrition: Food, Nutrition and Health

zigzageducation.co.uk

POD 12061

Contents

Teacher's Introduction

This resource contains activity worksheets covering the whole of the content for **3.2 Food, Nutrition and Health** of the AQA (9–1) GCSE Food Preparation and Nutrition (8585) specification.

These worksheets provide a systematic structure for revision and ensure that students have covered everything for the topic after working through them. The resource can be used as:

- a comprehensive revision workbook in the run-up to the exam
- homework sheets to consolidate learning
- class exercises or independent practice

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

Each topic follows this structure:

Section A (write-on)	This section is designed to facilitate students to *demonstrate knowledge and understanding*, and contains factual questions and activities based on what they have learned in class, aligned to AO1.
Section B (write-on)	This section supports students to *apply their knowledge and understanding* of nutrition, food, cooking and preparation, aligned to AO2.
Section C (non-write-on)	This section challenges students to *analyse and evaluate* different aspects of nutrition, food, cooking and preparation, aligned to AO4.
Exam-style questions (non-write-on)	This section contains exam-style questions for students to practise for their exams.

Note: AO3 (*Plan, prepare, cook and present dishes combining appropriate techniques)* is not covered in the exam, and is explicitly for the NEA, so has not been included in this revision resource. However, some **extension tasks** have been included throughout to get students to plan dishes linked to different questions and/or activities.

Each topic has a checklist, based on the specification, of everything students need to know for their exams. Students should use this table to track their progress and confidence against each of the given objectives for the topic. The levels are as follows:

- **Bronze** – 'I am not completely confident. I have revised the content, but I don't fully understand it and need to revise this more.'
- **Silver** – 'I am semi-confident. I understand the content, but I need to improve my application and evaluation of knowledge.'
- **Gold** – 'I am confident in my knowledge and application of the content and I feel I can effectively evaluate and analyse the content if required.'

Not every student will need to work through every topic – where students are happy that they understand the theory content, they may wish to progress directly to sections B and C for practice. However, should students fail to score full marks in these sections, it is recommended that they go back and do the knowledge revision activities in Section A.

March 2023

Topic 1: Macronutrien

3.2.1.1–3 Proteins, fats and carbohyd

Knowledge checklist

The **functions** and **main sources** of prot[illegible] [illegible] carbohydrates
The **dietary reference values** of [illegible] [illegible] and carbohydrates
The effects of **deficiency** [illegible] [illegible] of protein, fat and carbohydrate int

Sec[illegible] Demonstrate your knowledge

1. List **three** main sources of protein, fat and carbohydrate.

Protein	i.	ii.
Fat	i.	ii.
Carbohydrate	i.	ii.

2. Match the functions to their corresponding macronutrients.
Either match up with lines or colour-code each macronutrient and function

Building body tissues	
Pr[illegible] p[illegible] source [illegible] energy	**Carbohydrates**
Protecting body from cold	**Proteins**
Maintaining cell structure	
Insulating organs	**Fats**

3. Describe the differences between saturated fats and unsaturated fats.

.....

.....

.....

.....

.....

.....

4. *Vegetarianism is the practice of not eating meat, poultry or game. By-produ*
dairy, might also be avoided.

Name **three** protein alternatives to meat that a vegetarian could use when p

i. .....

ii. .....

iii. .....

EXTENSION: Modify a meat-based dish yo[illegible]e made recently, e
to make it suitable for a vegetaria[illegible]tively, research a rec

5. Carbohydrates are split i[illegible]urs and starches.

Compl[illegible]s[illegible]ences below using the list of terms provided:

galactose	*sweet*	*cellulose*	*molecule*	*glycogen*
monosaccharides	*polysaccharides*	*disaccharides*		

There are two kinds of simple sugar. _____ are

_____, and examples of this are glucose, fructos

_____. The other kind of simple sugars are ____

which are made of _____ [illegible]ar molecules joine

of this sugar are sucrose, lactose [illegible] _____.

Starch[illegible]ar[illegible]ype of carbohydrate which do not taste _____

These complex carbohydrates are called _____,

during _____. Other examples of complex carb

_____ and _____.

6. Using the table below, describe **two** of the effects of excess and deficiency o

Macronutrient	Excess	
Fat	i.	i. .....
	ii.	ii. .....
Carbohydrate	i.	i. .....
	ii.	ii. .....
Protein	i.	i. .....
	ii.	ii. .....

7. Complete the table by labelling each statement as true (T) or false (F) and c

Statement	T / F	Correct
i. 50% of a person's total daily energy intake should come from fat.		
ii. No more than 5% of a person's total carbohydrate intake should come from free sugars.		
iii. 1 g of pure carbohydrate and 1 g of fat each provides 5 kcal of energy.		
iv. 1 g of protein provid[illegible] kcal of energy.		
v. A[illegible]lt [illegible] consume 10 g of [illegible] fibre a day.		
vi. Omega-3 is found in oily fish.		
vii. Babies do not require a lot of protein.		

Section B: Apply Your Knowledge

1. *Iona is 30 years old. She is of average health, participates in regular physical*
Today, she had a chicken and bacon sandwich for lunch.

Ingredients: *malted wheat bread, chicken breast, smoked streaky bacon,*

Annotate the food label below to describe why this was a healthy / an unhe
the sources and **dietary reference value of macronutrients** in the sandwich

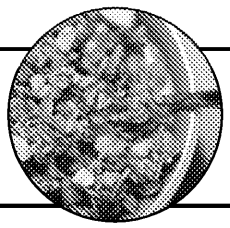
Nutrition Information

Typical values	per 100g	per pack 178g	%R
Energy	1028kJ/245kcal	1830kJ/436kcal	22
Fat	8.6g	15.3g	22
of which saturates	1.7g	3.0g	15
Carbohydrate	24.7g	44.0g	17
of which sugars	2.7g	4.8g	5
Fibre	2.0g	3.6g	
Protein	16.1g	28.7g	57
Salt	1.03g	1.83g	31

*Reference intake of an average adult (8400kJ/2000kcal)

For more information visit **www.lidl.co.uk**
This pack contains 1 serving

2. Describe how the ingredients of each of the dishes below impact dietary fib
impact

	Granola *(oats, dried apricots, dark chocolate, almonds)* 	**Cucumber s** *(white brea cucumber, s*
High fibre or low fibre? (link to specific ingredients)	.....	.....
Impact on health	.....	.....

Extension: Modify the dish above that is low in fibre to increase

Section C: Analyse and evaluate

1. Discuss how effective each breakfast dish listed below is at applying protein
   - Fresh fruit/vegetable smoothie
   - Peanut butter sandwich

2. *James is 58 years old and is classified as obese. He has decided to take on a ... him lose weight. He has also been advised by a friend to research low-fat di...*

   Evaluate the impact of a low-fat diet and a high-protein diet on James's bod...

EXTENSION: Plan a meal that is low in fat and high in protein for J...

Exam-style questions

GCSE Paper 1: 3.2.1.1

1. Which of these foods provides high biological value (HBV) protein?
   a) Chicken
   b) Cherries
   c) Cauliflower
   d) Cabbage

GCSE Paper 1: 3.2.1.3

2. Explain, with examples, the difference between starch and sugars.

GCSE Paper 1: 3.2.1.1/3.2.1.2/3.2.1.3

3. The ketogenic diet is a diet high in fat and low in carbohydrates, with a popu... requirements being 70–80% from fat, 10–20% from protein and 5–10% from...

   Analyse and evaluate the effect that a diet like this would have on health, in... nutritional guidelines.

Topic 2: Micronutrien

3.2.2.1–2 Vitamins and minerals

Knowledge checklist

The **functions** and **main sources** of vitamins and minerals
The **dietary reference values** of vitamins and minerals
The effects of **deficiency** and [illegible] vitamin and mineral intake
The antioxidant prope[illegible]amins
The effect of [illegible] and cooking on the nutritional value of food

Section A: Demonstrate your knowledge

1. Give **two** essential minerals and their main sources in the diet.

   Mineral 1: .....

   Source in the diet: .....

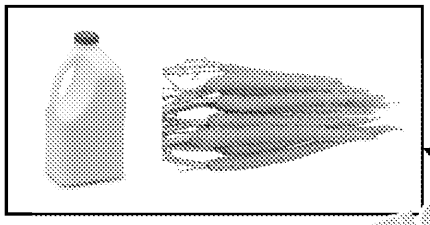
   Mineral 2: .....

   Source in the diet: .....

2. Label each B-group vitamin with its chemical name, and give at least **one** ma[illegible]

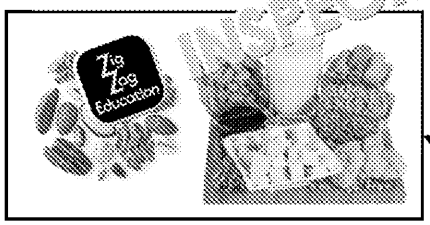
Main source	Chemical name
	Vitamin B1 .....
	Vitamin B2 .....
eggs	Vitamin B3 .....
	Vitamin B9 .....
	Vitamin B12 *Cyanocobalamin*

3. Below are four pictures showing the main sources of vitamins A, D, E and K (th
each picture and identify which fat-soluble vitamin it represents.



i.

i



iii.

iv.

EXTENSION: Make a list of ingredients high in fat-soluble vitamins
made or ate recently, either in class or at home. Make a plan for
different ingredients high in fat-soluble vitamins into this dish.

4. Complete the table to explain all essential minerals alongside their functions, t
deficiency in the body and their dietary reference value (DRV) for adults. Give

Mineral	Function	Effects	Def
	• *Building strong bones and teeth* • *Normal blood clotting* • *Regulating heart rhythm and nerve function*	• *Stomach pain* • *Diarrhoea* • *Decreased kidney function*	
Iron			• *Iron-* *anae* • *Tirec* *dizzi* • *Shor* *brea*
	• *Regulating water levels in the body* • *Muscle and nerve control*		• *Musc*
Iodine	• *Healthy functio* *of the* • *g healthy metabolic rate*		
		• *Reduced amount of calcium in the body* • *Increased risk of bone fractures*	• *Defic* *rare*

5. For each of the following statements about vitamins, label whether it is true
any statements that are false.

Statement	T / F	Correct a
i. A diet deficient in vitamin A could cause night blindness		
ii. Babies can consume as much vitamin A as needed		
iii. Memory and concentration pr[illegible] can be caused by exce[illegible]		
iv. Vitamin D e[illegible] cause [illegible] disorders such as rickets [illegible] eoporosis		
v. Excess vitamin K is very rare and has no known symptoms		
vi. Vitamins A, D, C and K are all antioxidants		
vii. Excess riboflavin can cause urine to become bright yellow		
viii. A diet deficient in vitamin E can cause loss of appetite, nausea and diarrhoea		
ix. The dietary reference value (DRV) for vitamin D is 10 mg daily		
x. The DRV of vitamin C for adults is 40 mg daily		

6. Give **one** reason why fluoride is add[illegible] paste.

.....

.....

7. a) Co[illegible]plete the table to give **two** effects of excess and **two** effects of def
water-soluble vitamins listed.

Water-soluble vitamin	Effect of deficiency	
Vitamin B12	i.	i. ....
	.....	....
	ii.	ii. ....
	.....	....
Folic acid / folate	i.	i. ....
	.....	....
	ii.	ii. ....
	.....	....
Vitamin B3	i.	i. ....
	.....	....
	ii.	ii. ....
	.....	....

EXTENSION: Select a dish you made recently, either in class or a
ways you could prepare and cook it differently to prevent as m

b) Identify the vitamins from their effects of deficiency or excess.

- Deficiency can lead to nerve damage ...
- Deficiency can lead to s e mouth and skin disorders. ...
- Excess ca damage of the liver. ...

8. Match owing vitamins to their daily reference value (DRV) for adults.

Vitamin A

Vitamin B12

Vitamin B3

Vitamin B9

V B2

Vitamin E

Vitamin B1

Vitamin K

Section B: Apply your knowledge

1. Explain why steaming vegetables is a healthier method of cooking than boili

.....

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2. A vegan diet ma[illegible]ovide all of the necessary nutrients for maintaining
Sugge[illegible]mi[illegible]nutrients that may be missing from or deficient in a vega
   a) wi[illegible]iptoms a deficiency of each might cause
   b) their importance for bodily function
   c) how they might be added to a vegan diet

	Micronutrient 1:	Micronut
a) symptoms of deficiency		
b) importance for bodily function		
c) h[illegible]ould be added to a vegan diet		

3. *Agnes has just celebrated her 70th birthday.*

Identify **two** micronutrients that Agnes should increase or decrease her con
healthy diet, explaining the impact each would have on her health.

1. .....

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2. .....

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4. *Jane is concerned about free radicals making her ill, and wants to consume r*

Explain the importance of antioxidants in the body and suggest **three** food s

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Section C: Analyse and evaluate

1. Evaluate the differences in the micronutrient needs of a toddler, a teenage g their nutritional needs can be met.

2. Vitamins and minerals play an important role in a baby's growth. Explain, with examples of sources, the vitamins and minerals that a pregnant woman should consume more of either as part of the diet or as supplements.

Exam-style questions

1. Explain **two** ways in which pr[illegible] cooking food can impact its micronu nutritional value.

2. Describe a packed lunch for a child that would provide good levels of micror immune system in young children. Give reasons for your answer.

3. Using the information in the table, evaluate the micronutrient content of th for a teenage girl. Give justified reasons for your choice.

	Meal 1: Chocolate orange oatmeal	Eggs
Ingredients	*Quick-cook oats (65%), orange chunks (10%), semi-skimmed milk (10%), maple sur[illegible]%), dark chocolate (5%), chia see[illegible]s (2.5%), orange zest, cocoa p[illegible]2.5%), salt*	*Wholemeal br pasteurised eg fortified sprea sriracha, black*

Topic 2: Micronutrien

3.2.2.3 Water

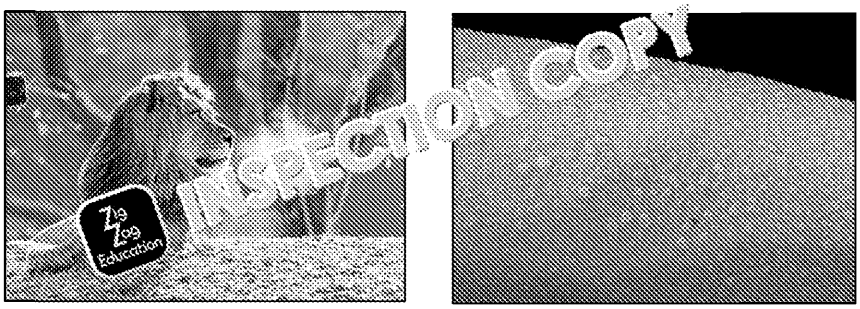
Knowledge checklist

The functions of **water** in the body
How **water** is lost from the body
How much **water** or fluid is nee[illegible] day and in situations where extra fluids are needed

Section 1: Demonstrate your knowledge

1. Label the image below with at least **three** more functions of water in the bo

2. Label the ways by which water is lost from the body, using the images belov



i. ..... ii. .....

3. *Anthony hates the taste of plain tap water.*

Suggest **two** ways that Anthony could increase his fluid intake without drink

1. .....

.....

2. .....

.....

SECTION 2 APPLY YOUR KNOWLEDGE

1. Give **three** symptoms of water deficiency / dehydration and explain why ea

1. .....

.....

.....

2. .....

.....

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3. .....

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2. Explain why toddlers are at higher risk of dehydration than adults.

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3. Explain why each of the following scenarios would require extra fluids.

Breastfeeding

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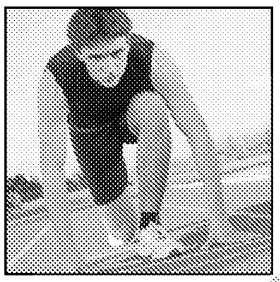
Exercising



Illness

Section C: Analyse and evaluate

1. *Rashid and Jasmine are on holiday in the desert. Jasmine goes for a run whi the shade.*

   Analys valuate how Rashid's and Jasmine's water requirements will c

Exam-style questions

1. According to the Eatwell Guide, how much water should a person drink a da
   a) 1–2 cups/glasses a day
   b) 3–5 cups/glasses a day
   c) 6–8 cups/glasses a day
   d) 8+ cups/glasses a day

2. Explain **two** reasons why a person may need more fluid on any given day.

3. Nine o 0 , in the UK do not drink enough water.
   Analys valuate the reasons for this and the impact on health.

Topic 3: Nutritional needs ar

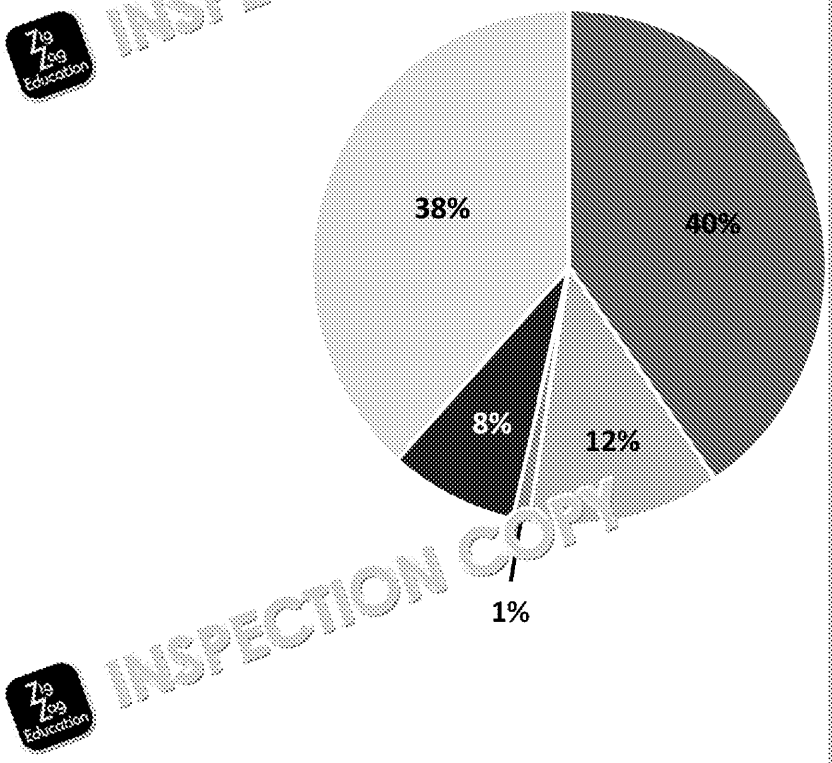
3.2.3.1–3 Informed choices, energy needs and nu

Knowledge checklist

Current **guidelines, portion size** and **costing** [illegible] meal planning
How people's nutritional needs **change** [illegible] to maintain a **healthy body weight**
Planning **balanced meals** [illegible] to **life stages** and **specific dietary grou**
The import[illegible] [illegible]metabolic rate (BMR) and physical activity level (PAL) in d[illegible]ining energy requirements
The recommended **percentage of energy** a diet should provide from **macronutrients**
Planning and **modifying** meals, recipes and diets to meet current nutritional guidelines

Section A: Demonstrate your knowledge

1. a) Below is a representation of the Eatwell Guide. Label each section with The percentage of each food group in a healthy diet has been included



b) Now add to the diagram any additional supporting information you wo Guide. You can either draw or write your annotations.

2. Explain what is meant by portion size.

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3. a) Match each macronutrient to its recommended percentage of d

Carbohydrate	
Fat	

b) The energy we consume from carbohydrates is further broken down. State the percentage of recommended energy sources for each of the b (**Note:** this should total the same percentage you selected for carbohyd

Carbohydrates from starches, lactose in milk and fruit sugars	
Carbohydrates from free sugars	

4. a) Define BMR.

.....

.....

b) D AL.

.....

.....

5. Describe **two** factors that can affect basal metabolic rate (BMR).

1. .....

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2. .....

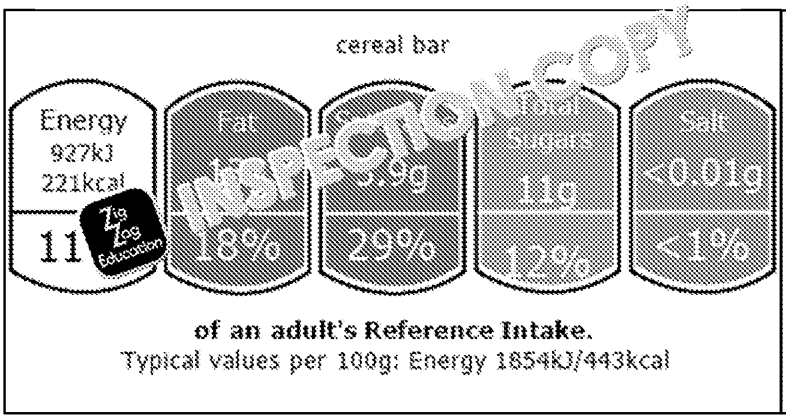
.....

6. Identify the foods that people with t owing conditions / dietary requir

Individual/condit	Foods that cannot be co
Lac olerance	
Coeliac disease	
Vegan	
Vegetarian	

Section B: Apply your knowledge

1. Examine the nutritional label below. Describe how well it meets current nu
how it could be improved.



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2. a) *It i[illegible]'s [illegible]thday. As a treat, she's going out for lunch with her 1*

Usi[illegible]g the tables below and on the next page, design a meal each for Le
their nutritional needs. An example has been given in the first table to

Meal for Leila (76 years)

Ingredient	Reason
Wholewheat pasta	*Has a higher fibre content which healthy, which is important for el*

Meal for Mina (16 years)

Ingredient	Reason

b) Discuss how the cost of your chosen ingredients in part a) could impact Mina's meals.

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SECTION C: ANALYSE AND EVALUATE

1. You are the head chef at a family restaurant. A father and child book a table requirements; the father is a vegetarian and the child is lactose intolerant.

   a) Design a two-course menu for a vegetarian adult considering costing, p

   b) Now, adapt your menu to suit the needs of the lactose-intolerant child

2. Explain how a vegetarian diet can negatively impact health and how it could be a nutritionally sound diet.

Exam-style questions

1. Suggest **two** ways that following a high-fibre diet can help people maintain

2. Assess the impact of coeliac disease on meal pla[illegible] and preparation, and coeliac disease can maintain a healthy [illegible]

3. In rece[illegible]rs, [illegible] people have started taking part in Veganuary – a chal[illegible] vegan [illegible] (i.e. cook and eat only vegan food) throughout the month of [illegible]

   Assess and evaluate the reasons for this increase and the impact a vegan di[illegible]

Topic 3: Nutritional needs ar

3.2.3.4 Diet, nutrition and healt

Knowledge checklist

The **relationship** between diet, nutrition and h[illegible]n
How **diet** can affect health and diet-rel[illegible]m risks
How **nutritional needs** change[illegible]n to diet-related health risks

Section 1: Demonstrate your knowledge

1. State **three** major diet-related health risks.

   1. .....

   2. .....

   3. .....

2. Describe the difference between rickets and osteoporosis.

   .....

   .....

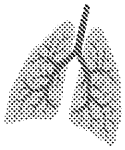
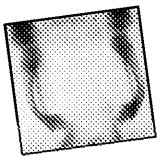
   .....

3. Read the following statements about diet-related health risks and mark whether they are true (T) or false (F). Correct any false statements.

Statement	T / F	Corrections for false statements
Low iron in the blood allows more oxygen to be carried around the body.		
Type 2 diabetes is caused by insulin resistance in cells.		
Excess energy from carbohydrates is stored as fat in body tissues, which can cause weight gain.		
Stress, alcohol consumption and intense exercise can cause coronary heart disease.		
High blood pressure causes weakening and softening of bones.		

Extension: Make a list of ways you could present dishes to make [illegible]rients, e.g. high in calcium. How would you design them to m[illegible] different audiences (e.g. children or the elderly)?

4. For each of the symptoms below, state its associated health risk and sugges
prevented/managed.

Health risk	Symptom	
.....	*Pain when eati[illegible] foods*	.....
.....		.....
.....	*Dizziness and weakness*	.....
.....		.....
.....	*Pressure [illegible]ss in chest*	.....
.....		.....
.....	*Bowed legs*	.....
.....		.....

EXTENSION: Ad[illegible]ur favourite meal or recipe to be suitable for son

Section B: Apply your knowledge

1. Suggest **two** factors that can have a negative impact on the relationship bet
Justify your choices.

1. .....
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2. .....
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2. Describe **two** ways diet impacts dental health.

1. .....
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2. .....
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3. Examin od label below. Explain how you would adapt it to make it m
trying to lose weight.

Ingredients: *potato, single cream, beef, carrot, celery, onion, red* *tomato puree, fortified wheat flour, garlic puree, thyme, rosemar*				
Each 400 g portion contains:				
Energy 1766 kJ 422 kcal	**Fat** 14 g	**Sat fat** 5.8 g	**Sugar** 6.5 g	
21%	20%	30%	7%	
of your daily reference intake				

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4. Explain why high-fat, high-sugar foods should be eaten in moderation.

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Section: Analyse and evaluate

1. *Joan has coronary heart disease (CHD). Her partner, Alex, has high blood pr*

   Plan a meal that is suitable for the nutritional needs of both Joan and Alex, a

2. Analyse and evaluate why children might be more at risk of problems with b

Exam-style questions

1. Anaemia is caused by a lack of:
   a) Iron
   b) Folate
   c) Vitamin B12
   d) All of the above

2. Describ... would provide good amounts of micronutrients need...
   Give re... for your choice.

3. Information on two meals is given below that is needed for the following qu...

With reference to the ingredients, nutrient content and reference intake for each m...
for an individual with type 2 diabetes. Evaluate which meal is the healthier ch...

	Meal 1: Egg-fried rice	Meal
Ingredients	*Cooked rice, pasteurised free-range egg, peas, spring onion, ginger, sesame oil*	*Cooke... skimmed... smoked... pasteurise...*
Energy (kcal)	300 kcal	
Fat		
of which saturates	1.0 g	
Carb... te...	26.7 g	
of which sugars	0.5 g	
Fibre (g)	2.0 g	
Salt (g)	0.5 g	

Answers

Topic 1: Macronutrien

3.2.1.1–3 Proteins, Fats and Carbohyd

Section A

1. **Any two sources** for s... nutrient. *Accept any other suitable answers.*
   - **Prot...** me..., dairy, eggs, fish, nuts, seeds, legumes, soya beans (acce... casi..., cheese)
   - **Fat** – ..., dairy, oil, nuts, seeds, fatty fish (accept specific answers, e.g. macad...
   - **Carbohydrate** – bread, pasta, rice, potatoes, cereals, fruit and vegetables, bean... apples, oranges, baked beans)

2. **Carbohydrates** – providing primary source of energy, maintaining digestive health, ...
   Proteins – building body tissues, repairing body tissues, maintaining cell structure
   Fats – protecting body from cold, absorption of vitamins/minerals, insulating organ...

3. Accept any of the following comparisons:
   - Saturated fats are solid at room temperature; unsaturated fats are liquid
   - Saturated fats are made up of single bonds; unsaturated fats contain one (mo... (polyunsaturated) double bonds
   - Saturated fats are saturated with hydrogen molecules; unsaturated fats break...
   - Saturated fats raise bad low-density lipoprotein (LDL) cholesterol levels; unsat... cholesterol levels
   - Both saturated fats and unsaturated fats raise g... gh density lipoprotein (I... arteries healthy and free of plaque
   - Most saturated fats come from ... rces; most unsaturated fats come fr...

4. Answers could includ... of the following:
   - Te... ve... protein (TVP)
   - M... ein
   - Tof...
   - Seitan
   - Tempeh
   - Jackfruit
   - Legumes
   - Beans

   Accept any other suitable answer.

5. There are two kinds of simple sugar. **Monosaccharides** are made of one sugar **mol...** glucose, fructose and **galactose**. The other kind of simple sugars are **disaccharides**, ... molecules joined together. The three examples of this sugar are sucrose, lactose a...

   Starches are another type of carbohydrate which do not taste **sweet**. These compl... **polysaccharides**, and are produced by plants during **photosynthesis**. Other examp... pectin, **glycogen** and **cellulose**.

6. Answers could include **any two** of the following for each macronutrient. *Accept oth...*
   (Students do not need to explain in detail, only describe a... ct of excess/deficien...

   Fat

   Excess
   - Weight gain / obesity ... o la... amounts of fat being stored in the body
   - Increased ris... ... heart disease for some people due to higher choles...

   Deficie...
   - Easi... bruising and bone damage due to lack of visceral fat providing protecti...
   - Decreased absorption of fat-soluble vitamins, causing other health problems

Carbohydrate

Excess

- Weight gain due to excess energy being converted into fat and stored
- Tooth decay due to sugars in foods breaking down the enamel

Deficiency

- Lack of energy due to low blood sugar levels
- Weakness due to body depleting fat stores and converting proteins to energy
- Constipation due to lack of dietary fibre

Protein

Excess

- Kidney or liver damage due to excess nitrogen needing to be removed
- Weight gain as excess protein is converted into fat to store energy

Deficiency

- Improper growth in children due to protein's importance in building body tissue
- Infections due to immune system lacking protein for important functions

7. i. False – 35% should come from fat
   ii. True
   iii. False – 1 g of carbohydrate provides 3.75 kcal (*accept 4 kcal*), whereas 1 g of fat
   iv. False – 1 g of protein provides 4 kcal
   v. False – adults should consume 30 g of dietary fibre
   vi. True
   vii. False – babies require more protein because they are growing rapidly

   Accept other suitable answers.

Section B

1. Answer could include any of the following points. *Accept other suitable answers.*
   - The sandwich provides 436 kcal per serving
     Approx. 22% of a woman's daily energy needs (2,000 kcal a day)

   Carbohydrate
   - Malted wheat bread provides a source of carbohydrate as a primary source of energy
   - The pack contains 4.8 g of free sugars, which is under the recommended daily amount
   - Pack contains 44 g of carbohydrate, which is 17% of reference intake
   - It contains 3.6 g of fibre to help maintain a healthy digestive system

   Protein
   - Chicken and bacon provides a source of protein that can repair body tissue (e.g.
   - The sandwich provides 28.7 g of protein, approximately 63% of her daily protein
     (accept 57% as given on the pack)

   ** Dietary reference value of protein is 0.75 kg per kg of body weight, approximately weighing 60 kg.*

   Fat
   - Mayonnaise and bacon provides a source of fats as a secondary source of energy
   - The pack contains 15.3 g (22%) of fat, which is approximately one quarter of the
   - The pack contains 3.3 g (15%) of saturated fats, which is more than the amount of saturated fats (11%)

2. **Granola**
   - High in fibre from oats and dried apricots
   - Helps digestive tract; regular bowel movements

   Cucumber sandwich
   - Low fibre, though some may be found in the cucumber and bread
   - Risk of constipation from low fibre intake; increased risk of bowel cancer from

Section C

1. Points discussed may include:

Fresh fruit/vegetable smoothie

- Smoothies often contain more than one fruit, which contain different amino a
- Smoothies can sometimes contain vegetables which contain different amino a
- Smoothies can sometimes contain other LBV ingredients such as nut butter
- Most fruits are not a source of protein (LBV or HBV) however vegetables do c
  or more vegetables are included this could provide protein complementation.

Peanut butter sandwich

- Peanuts are an LBV protein, meaning that peanut butter contains good a
- Different types of bread will contain different types and amounts of amino aci
- Se wholemeal bread will contain more protein and amino acids than w
- Peanut butter and bread are both LBV foods, so provide protein complementa

2. Answers to include any of the positive and negative effects below.

Positive effects

Low-fat diet

- A low-fat diet may lead to weight loss and help James to achieve a healthier B
- A diet low in saturated fats can help reduce bad LDL cholesterol and reduce th
  and hypertension (high blood pressure), which are more prevalent in people w
- Lowering fat in the diet can help to reduce the risk of type 2 diabetes, which is
  are obese

High-fat diet

- A high-protein diet helps prevent muscle breakdown and aids muscle recovery
  building muscle tissues
- A high-protein diet may help build strength due to increased muscle mass, wh
- A high-protein intake can help cuts and injuries to heal more quickly, which m
  age
- A high-protein diet promotes healthy growth and development and limits age-re

Negati s

Fat defici cy

- A diet low in fats can cause a deficiency in important vitamins due to lack of al
  various health issues and a weaker immune system
- Unsaturated fats are required to reduce bad LDL cholesterol and increase goo
  healthy and free of plaque
- A low-fat diet can lead to easier bruising and bone damage due to lack of prot

Protein excess

- A high-protein diet can lead to excess nitrogen in the body, which can put stra
  it, which over time could cause kidney and liver diseases
- Excess protein that is not efficiently used by the body can be stored as fat, wh
  impacting James's goal of losing weight
- A high-protein diet will typically involve sourcing prote from animal sources,
  fats and cholesterol, which will increase risk of cardiovascular diseases, hypert
- A high-protein diet can lead to intestinal discomfort and indigestion as protein
  turn can lead to constipation
- Excess protein can lead to dehydration
- Typically, a high-protein diet contains a lot of red meat, which has been linked
  as

Exam-style questions

GCSE Paper 1

1. **1 × AO1 mark** for:

   a) Chicken

   As an animal protein, chicken contains all the essential amino acids, which give

2. **6 × AO2 marks** for:

5–6 marks	• Thorough knowledge and understanding of the differences betwee • Explanations are detailed and contain examples of both starches • Correct terminology is used.
3–4 marks	• Good knowledge and understanding of the differences between s • Explanations are given, and at least one example is given. • Correct terminology is sometimes used.
1–2 marks	• Basic knowledge and understanding of the differences between s • Explanations are limited and may include no examples. • Use of terminology may be attempted but not correct.
0 marks	No answer or no creditworthy answer given.

Indicative content

- Starches are complex carbohydrates/polysaccharides
- Sugars are simple sugars and may be either monosaccharides or disaccharides
- Monosaccharides are made up of a single molecule of sugar
- Disaccharides are made up of two molecules of sugar bonded together
- Polysaccharides (starches) are made up of many sugar molecules, usually gluc
- Examples of starches include pectin, dextrin and cellulose
- Examples of monosaccharides are glucose, galactose and fructose
- Examples of disaccharides are lactose, sucrose and maltose

Accept any other suitable responses.

3. **8 × AO4 marks** for:

7–8 marks	• Detailed explanations with accurate factual information and ter • At least three points about macronutrient intake are included. • Response shows a good balance between analysis and evaluatio • Analysis is excellent, and evaluation uses sound judgements to
5–6 marks	• Some detailed explanations with accurate factual information a • At least three points about macronutrient intake are included. • Response may favour either analysis or evaluation. • Analysis is good, and evaluation is used for some judgements a
3–4 marks	• Limited explanations with some factual information that shows • At least two points about macronutrient intake are included. • There is an imbalance between analysis and evaluation, with gr • Analysis covers at least two factors, and evaluation is used to m to analysis.
1–2 marks	• Response is very limited with few explanations that are not sup • Only one factor is analysed, and any evaluation is limited.
0 marks	No answer or no creditworthy answer given.

Indicative content

The ketogenic (keto) diet goes against c[illegible]utritional guidelines.

Carbohydrates

- Current guidelines suggest that 50% of energy should come from carbohydrat be from free sugars)
- The keto diet does not match recommendations for carbohydrate intake and is
- The Eatwell Guide suggests that fruit and vegetables should make up to over c day; fruits are carbohydrates and, therefore, would not be included in the ket
- The Eatwell Guide suggests that starchy carbohydrates should make up just ov day, which wouldn't be included in the keto diet
- Carbohydrates are the body's primary source of energy, so cutting their conte lead to health complications such as tiredness, headaches or nausea
- A diet low in carbohydrates can lead to weight loss, which can be beneficial to as coronary heart disease and obesity

Fat

- It is recommended that males consume 2,500 kcal and women consume 2,000 kc its high percentage of fat – would be likely to result in this figure being exceeded, health complications
- Current guidelines suggest that 35% (or less) of energy should come from fat
- The keto diet does not match recommendations for fat intake and is 35–45% f
- The government recommends that men should consume no more than 30 g o more than 20 g of saturated fat a day – the keto diet is likely to result in much
- A diet high in fats can lead to weight gain and an increased risk of medical con disease and obesity

Protein

- Current guidelines suggest that approximately 15% of energy should come fro
- The keto diet does match recommendations for protein intake at 10–20%
- The Eatwell Guide suggests that we should aim for two portions of fish a week is a food suggested as part of the keto diet
- Consuming the recommended amount of protein can help to reduce muscle lo healthy weight

Accept any other suitable responses

Topic 2: Micronutrien

3.2.2.1–2 Vitamins and minerals

Section A

1. **Any two sources** for each mineral from:
   - Calcium – dairy, tofu/soya, fish
   - Iron – red meat, dark green le[illegible] eg[illegible]es
   - Sodium – table salt, ro[illegible] ma[illegible]oods
   - Fluoride – dri[illegible]tu[illegible], toothpaste
   - Ph[illegible]us[illegible]ea meat, dairy, beans and lentils
   - Io[illegible]ea fish, shellfish

   Accept any other suitable answers.

2.
   - B1
     - Chemical name: thiamin(e)
     - Main sources: meat, whole grains, cheese, fresh/dried fruit
     - Function: keeps nervous system healthy, helps release energy from carbo
   - B2
     - Chemical name: riboflavin
     - Main sources: milk, eggs, milk products, rice, mushrooms
     - Function: allows release of energy from carbohydrates/fat/proteins
   - B3
     - Chemical name: niacin
     - Main sources: meat, eggs, milk
     - Functions: allows release of energy from cells durin[illegible] respiration, prevent[illegible] nervous system
   - B9
     - Chemical name: folic acid
     - Main sources: gr[illegible]n leafy vegetables, chickpeas, peas, yeast extract
     - Function: [illegible]ce[illegible]ealthy red blood cells (alongside B12), reduces risk o[illegible] sp[illegible]ifida
   - B1[illegible]
     - Chemical name: cyanocobalamin
     - Main sources: meat, fish, cheese, yeast
     - Function: makes healthy red blood cells, maintains nerve health

   Accept any other suitable answers for sources and functions.

3. Picture sets
   i. Oily fish / sunshine = vitamin D
   ii. Milk (retinol), carrots (beta carotene) = vitamin A
   iii. Spinach / vegetable oil = vitamin K
   iv. Soya beans / pumpkin seeds = vitamin E

4. Accept any suitable answers, or at least one answer in each column from:

Mineral	Function	Excess	De
Calcium	• Building strong bones and teeth • Normal blood clotting • Regulating heart rhythm and nerve function	• Stomach pain • Diarrhoea • Decreased kidney function	• **We bor** • **Rick** • **Ost**
Iron	• **Production of red blood cells** • **Transporting oxygen around the body**	• **Stomach pain** • **Constipation** • **Nausea**	• Iron ana • Tire dizz • Sho bre
Sodium	• Regulating water levels in the body • Muscle and nerve control	• **High blood pressure (hypertension)** • **Increased risk of stroke or heart attack**	• Mu
Iodine	• Healthy functioning of the thyroid gland • Maintaining healthy metabolic rate	• **Thyroid imbalance** • **Weight gain**	• **Goi thy** • **Risk cre bra unb**
Phosphorus	• **Growth, maintenance and repair of all tissues and cells** • **Production of DNA** • **Helps release energy from food**	• Reduced amount of calcium in the body • Increased risk of bone fractures	• Def rare

5. i. True
ii. False – excessive vitamin A is toxic for a baby and can cause a wide range of health
iii. False – these are effects of deficiency, which can cause beriberi
iv. True
v. True
vi. False – vitamins A, C and E are antioxidants, not vitamins D and K
vii. True
viii. False – these are effects of excess; a diet deficient in vitamin E can cause muscu
ix. False – the DRV for vitamin D is 10 µg daily
x. True

6. To help build/protect enamel by strengthening it, preventing decay

7. a)

Water-soluble vitamin	Effect of deficiency	
Vitamin B12	• Pernicious anaemia • Low mood	• •
Folic acid / folate	• Mouth sore • Fatigue and weakness	• •
Vitamin B3	• Pellagra • Swollen mouth / bright red tongue	• •

Accept any other suitable answers.

b) • Vitamin B1 • Vitamin B2 • Vitamin B3

8. The correct dietary reference values are:
- Vitamin A – Men: 700 µg / Women: 600 µg
- Vitamin B12 – 1.5 mg
- Vitamin B3 – Men: 16.5 mg / Women: 13.2 mg
- Vitamin B9 – 200 µg
- Vitamin B2 – Men:
- Vitamin E – Men: 4
- Vitamin B1 – Men:
- Vitamin K – 1 µg/k

Section B

1. B-group vitamins and vitamin C are water-soluble and will dissolve when foods are c
prevents prolonged contact with water as it requires less water than boiling, thereby

2. Answers may include:
   - **Calcium**
     a) Deficiency can lead to weakened bones, rickets or osteoporosis
     b) Calcium is important for bone and tooth h... ...ring that blood clots
     heart muscles
     c) Vegan sources include: to... ..., fortified cereals
   - **Iron**
     a) Deficien... ...aemia, weakness, dizziness and shortness of brea
     b) ... is important for the health of red blood cells and their production of
     c) ...ces include: dark green leafy vegetables, dark chocolate, dried fruit.
     ...d absorption of iron.
   - **Vitamin B12**
     a) Deficiency can cause pernicious anaemia and low energy
     b) B12 is important for the production of red blood cells, which carry oxyge
     c) Vegan sources include: fortified cereals, supplements
   - **Vitamin D**
     a) Deficiency can cause rickets in children or osteoporosis in adults
     b) Vitamin D is important for bone health
     c) Sources include fortified cereals, sunshine

   Accept any other suitable answers.

3. Answers may include:
   - **Decreased sodium intake** – elderly people are at higher risk of increased bloo
   be caused by eating too much salt. Therefore, Agnes should reduce her salt in
   - **Increased calcium intake** – as people age, their bon... ...s decreases and bon
   important for Agnes to increase her calcium ...ake (... eating more dairy/soya
   strengthen her bones.
   - **Increased vitamin A intak...** ...A is important for preventing night blind
   dark. As eyesight ... old age, Agnes should eat more yellow, red and
   vita... A i...
   - **In... vitamin D intake** – as we age, our bones weaken. Vitamin D is impo
   an... ...ity, so Agnes should increase her intake through more exposure to su

   Accept any other suitable answers.

4. Answers may include:
   - Vitamins A, C and E are antioxidants, which help to remove free radicals from
   from the damage they cause, reducing the risk of heart disease and some type
   - Vitamin A can be found in yellow or red vegetables (e.g. peppers, carrots) (Acc
   - Vitamin C can be found in citrus fruits, potatoes and berries (Accept other suit
   - Vitamin E can be found in oil, nuts and seeds (Accept other suitable examples)

Section C

1. Answers may include:

Toddler

- Higher calcium intake, from dairy products or enriched soya products, as bone
  calcium helps strengthen them
- Higher vitamin D intake, from sunlight exposure and oily fish, to support develo
- Good source of phosphorus, from dairy or legumes, to aid mineralisation of te
- Higher intake of vitamin K to aid in blood clotting as young children fall and h
  bleeding can lead to anaemia, dizziness or weakness

Teenage girl

- Higher iron intake from red meat or dark green leafy vegetables, to balance b
  preven
- H an C intake, from citrus fruits and cabbage or broccoli, to help wit
- Inc iacin (B3) intake, from beef and pork or eggs, as teenagers need to
  helps release energy from food

Adult male

- Reduced sodium intake, by reducing salt added to food, as risk of hypertensio
- Largest nutrient needs of the three, as adults are fully grown and men tend to
- Higher vitamin A intake, from red and yellow vegetables, to combat decline of
- Raised calcium intake to prevent loss of bone mass caused by ageing

Accept any other suitable answers.

2. Answers may include:

- Increased intake of all vitamins and minerals to support two bodies
- Iron – increased iron intake is necessary to ensure sufficient oxygen in the blo
- Sources of iron include dark green leafy vegetables and fortified bread
- Vitamin D – important for the development of a foetus's bones
- Vitamin B9 (folic acid) – decreases the risk of brain de developing in the f
- Sources of folic acid include supplements and dark en leafy vegetables
- Iodine – deficient iodine intake can ca cr tinism in a foetus, which is a type
- From sources such as cooked sh shellfish
- Calcium – a foetus ma orb alcium from the mother's bones, weakening t
  needed to su th foetus and mother

Accept ble answers.

Exam-style questions

GCSE Paper 1

1. **1 × AO2 mark** for a basic description
   2 × AO2 marks for a detailed description (max. 4 marks)
   Answers may include:
   - Boiling vegetables can cause loss of water-soluble vitamins (1) due to them lea
   - Deep-frying food will increase the fat content of a dish (1), which will allow more f
   - Steaming vegetables can prevent loss of water-soluble vitamins (1) as contact stops vitamins leaching out (1)
   - Exposing food to high heat can damage vitamin content in foods (1) as some v damaged or destro

   Accept any other valid answers.

2. **6 × AO2** for:

5–6 marks	• Response is excellent with at least three points covered in detail th about the effects of micronutrients on immune health. • Accurate information and terminology are used.
3–4 marks	• Response is good and shows some understanding of the effects of • At least two points are covered in detail. • Information is accurate and some accurate terminology is used.
1–2 marks	• Response is limited and shows basic understanding of the effects o • Only one point is covered. • Some information or terminology used may be inaccurate.
0 marks	No answer or no creditworthy answer given.

Indicative content

Students must apply knowledge and understanding of immune health to select and include micronutrients that support the immune health of a child. Packed lunch ing mark, so generic items, e.g. sandwich, are not worthy of credit in the higher bands.

Micronutrients and reasons for choice should be supporting the immune system m

Vitamin C

- An antioxidant that helps oxidation in cells and the formation of free radica
- Pro ce
- Hu wound healing
- Good sources of vitamin C include citrus fruit, berries, bell peppers and white
- Examples in packed lunch: berries and yoghurt, bell pepper and hummus, tom

Vitamin A

- Keeps skin and mucus membranes healthy
- Ensures proper growth in children
- Beta carotene is an antioxidant
- Good sources include milk, cheese, dark green leafy vegetables and sweet pot
- Examples in packed lunch: adding spinach to sandwiches, sweet potato crisps,

Vitamin D

- Helps absorption of calcium
- Protects against infection
- Good sources include sunlight, oily fish and
- Examples in packed lunch: adding oily fish, e.g. salmon, to sandwiches or pasta egg salad sandwiches

Vitamin E

- A id
- Go ces include soya, olive oil and vegetable-based fat spreads
- Examples in packed lunch: using vegetable spreads in sandwiches, cooking me

Accept any other valid answers.

3. **8 × AO4 mark** for:

Levelled mark scheme

7–8 marks	• Response includes detailed explanations with accurate factual in • At least four points about micronutrient intake are included. • Response includes a good balance between analysis and evaluat • Analysis is excellent, and evaluation uses sound judgements to li
5–6 marks	• Response includes some detailed explanations with accurate fac terminology used. • At least three points about micronutrient intake are included. • Response may focus more on analysis or evaluation. • Analysis is good and evaluation is used for some judgements an
3–4 marks	• Response includes limited explanations with some factual inform understanding. • At least two points about micronutrient intake are included. • There is an imbalance between analysis and evaluation, with gre • Analysis covers at least two factors, and evaluation is used to ma to analysis.
1–2 marks	• Response is very limited with few explanations that are not supp • Only one factor is analysed, and any evaluation is limited.
0 marks	No answer or no creditworthy answer given.

Indicative content

Students should apply their knowledge of the micronutrient content of different in of vitamins and minerals, within the context of a healthy, balanced diet for a teena should come from the two meals given.

Analysis

Meal 1

- Oranges are high in vitamin C, which is an antioxida
- Dark chocolate contains iron
- Chia seeds are high in calcium
- Chia seeds are high in iron
- Oats contain vita in
- Sem high in calcium

Meal 2

- Spinach is high in iron
- Eggs are high in calcium and phosphorus
- Wholemeal bread can be fortified with folic acid and iron
- Margarine/spread is fortified with vitamins A and D
- Pumpkin seeds are high in phosphorus, iron and antioxidants

Evaluation

Both meals are suitable as breakfast for a teenage girl

Conclusions

References should be made to the micronutrient needs of teenage girls

- Iron is important as it can be lost during menstruation
- Calcium is important for continued development of and bones
- Antioxidants are necessary to prevent creation of free radicals

Meal 1

- Higher in calcium seeds and milk
- Lo iron sources usually contain less iron
- H antioxidants as it contains 10% orange chunks; orange is high in vita
- Hig antioxidants as oats contain some vitamin E and the meal is 65% oat

Meal 2

- Higher in iron as there is more in animal sources, i.e. eggs
- Lower in antioxidants; 5% of ingredients (pumpkin seeds coupled with fortifie
- Higher in phosphorus from pumpkin seeds, while Meal 1 contains none

Topic 2: Micronutrien

3.2.2.3 Water

Section A

1. Answers may include:
   - Cooling/regulation of body temperature
   - Digestion
   - Aiding function of internal organs
   - Chemical reactions
   - Preventing dehydration
   - Maintaining concentration o
   - Aiding brain function / conc

   Accept any other suitable answers.

2. i. Br… ii. Sweating iii. Urinating

3. Answers may include:
   - Drinking fruit juice (although this should be limited to one small glass a day)
   - Drinking milk
   - Drinking flavoured water
   - Eating more soup
   - Eating salads
   - Eating more fruit

   Accept any other suita

Section B

1. Answers may include:
   - Thirst – due to the brain detecting dehydration and sending signals to increase
   - Headache – due to blood becoming more concentrated as water levels drop, w through the brain
   - Dry and wrinkled skin – as water is transported to more important areas
   - Feeling weak or sick – as bodily processes and chemical reactions are affected
   - Blood pressure or heart rate changes – as low water intake reduces the volume
   - Dark urine – due to less water being present to dilut

   Accept any other suitable answers.

2. Due to their smaller size, toddlers ha… sm… water stores than adults and their s water to evaporate from, m… ng t… lose more water. Their immune systems ar they're more at risk … illnesses that cause vomiting and/or diarrhoea, whi

3. **Breast…**
   - W… eeded to produce breast milk, so hydration is important to produce
   - As the body's water is being used to produce breast milk, more fluid is needed dehydration in the mother

   Exercising
   - Increases body temperature, which causes sweating and evaporation to cool dow
   - As blood flow is increased, staying hydrated is important for circulation and m during exercise

   Illness
   - Often causes vomiting and/or diarrhoea, which causes loss of water that need
   - Ill people tend not to move around a lot, or they spend a lot of time sleeping, may go for long periods of time without drinking

   Accept any other suitable answers.

Section C

1. Answers may include:
   - Jasmine will need more wat…
   - The hot temperatur… desert will cause her to sweat more
   - The exercise … e… er to sweat more as her body temperature increases
   - In… t… perature causes sweating to cool the body as the sweat evapora
   - Th… nation of high temperature and exercise will cause Jasmine to swea water, which must be replenished
   - Rashid will need less water
   - However, due to the desert environment, he may still need to increase his flui
   - This is because the high temperature and dry environment cause more sweati
   - Water is important for regulating body temperature, so staying hydrated is im

   Accept any other suitable answers.

Exam-style questions

GCSE Paper 1

1. **1 × AO1 mark** for:
   c) 6–8 cups/glasses a day
   6–8 cups is equivalent to 1–2 litres of water, which is the amount recommended by
   drink each day

2. **1 × AO2 mark** for each basic explanation
   2 × AO2 marks for **each** detailed explanation (ma[illegible])

   Reasons may include any two from:
   - High activity levels (1) [illegible] increased water loss through sweating tha
   - High temper[illegible]t [illegible]mate (1) where more water is lost through sweating
   - Br[illegible]di[illegible], as water is needed to produce breast milk and keep the mo
   - Vo[illegible]nd/or diarrhoea (1), which causes increased loss of fluids and may pre
     bod[illegible]

   Accept any other suitable answers.

3. **8 × AO4 marks** for:
   Levelled mark scheme

7–8 marks	• Response includes detailed explanations with accurate factual • At least four points about deficient water intake are included. • Response includes a good balance between analysis and evalua • Analysis is excellent, and evaluation uses sound judgements to
5–6 marks	• Response includes some detailed explanations with accurate fa terminology used. • At least three points about deficient water intake are included • Response may favour either analysis or evaluation. • Analysis is good, and evaluation is used for some judgements a
3–4 marks	• Response includes limited explanations [illegible]h some factual infor basic understanding. • At least two points abo[illegible]t [illegible]ficient water intake are included. • There is an imb[illegible]ce [illegible]tween analysis and evaluation, with g • Analysis [illegible]vers[illegible] least two factors, and evaluation is used to n [illegible]y
1–2 ma[illegible]	• Response is very limited with few explanations that are not sup • Only one factor is analysed, and any evaluation is limited.
0 mar[illegible]	No answer or no creditworthy answer given.

Indicative content
Students should apply their knowledge of the impact of deficient water intake with c
people may not drink enough water. Reference should be made to specific situation

Reasons
- Busy lifestyle
- Consuming other fluids, e.g. coffee, alcohol
- Disliking the taste of plain water
- Not knowing the recommended amount to drink per day
- Not drinking water after physical exertion
- Reduced sense of thirst in old age

Accept any other suitable responses.

Impact on health
- Deficient water intake will ha[illegible] ga[illegible] effects on health
- Headaches will occur d[illegible] to bl[illegible] becoming more concentrated as water leve passes through [illegible]
- W[illegible]e [illegible] to maintain healthy skin, so skin will become dry and wrinkle im[illegible] areas
- Def[illegible]ency may cause weakness or sickness as bodily processes and chemical r
- Deficient water reduces the volume of blood, which can cause low blood pres
- Deficient water reduces the volume of blood, which can cause changes in hea
- Decreased water intake will cause dark urine due to it being more concentrate
- Low water intake will cause dehydration, which can cause dizziness, lethargy a

Accept any other suitable responses.

Topic 3: Nutritional needs ar

3.2.3.1–3 Informed choices, energy needs and nu

Section A

1. a) 40% = fruits and vegetables
   38% = starchy carbohydrates (e.g. rice, potatoes, bread)
   12% = proteins (meat, fish, eggs, plant sources, e.g. beans, pulses)
   8% = dairy and alternatives
   1% = oils and spreads
   (This adds up to 99% due to rounding up.)

   b) Other additional messages:
   - Eat five portions of fruit and vegetables a day
   - Drink 1–2 litres (6–8 cups) of water a day
   - Limit consumption of fruit juice and/or smoothies to 150 ml per day
   - Check food labels for nutritional information
   - Eat foods high in sugar, salt and saturated fat less often and in small amo
   - Eat two portions of fish (one of which is oily) every week
   - Eat less processed or red meat
   - Choose starchy foods made from wholegrains
   - Choose carbohydrates that are higher in fibre
   - Use oils made from unsaturated fats

   Accept any other suitable responses.

2. The amount of food on a plate, which can be controlled to limit intake of certain nu guidelines to ensure the right levels of energy intake and help maintain healthy bod

3. a) Protein – 15%
   Fat – 35% or less
   Carbohydrate – 50%

   b) Starch, lactose in milk and fruit sugars – 45%
   Free sugars – 5%

4. a) BMR is basal metabolic rate, which is the amount of energy the body consume

   b) PAL is physical activity level, which is how active a person is during the day, ra extremely inactive

5. Answers may include any two of the following:
   - Age – as people get older and stop growing, BMR declines
   - PAL – the amount of activity a person does, and how frequently, will affect BM
   - Gender – men tend to have a higher BMR than women, due to size

   Accept any other suitable answers.

6. Examples of foods that need to be avoided include (ac other suitable examples
   - Lactose intolerance – *any foods containing lactose, e.g. milk*
   - Coeliac disease – *any foods containing gluten, e.g. bread, pasta, cakes*
   - Vegan – *any foods containing animal products, e.g. honey, eggs, dairy, meat*
   - Vegetarian – *lacto-vegetarians avoid eggs and meat; ovo-vegetarians avoid da ovo-lacto-vegetarians avoid meat*

Section B

1. Answers may include:
   - Salt is less than 1% of dietary reference value, which is good and should be ke
   - Almost a third of the day's saturated fat intake; this should be lowered
   - Cereal bars often come coated in chocolate, so this could be switched for a yo
   - Overall, fat is almost 20% of daily intake, while calorie content is only 10%, me exceed the daily intake of fat just by continuing to eat regularly
   - Cereal bars often contain nuts and seeds, which are high in unsaturated fa oats or other starchy carbohydrates could reduce fat content
   - Nuts contain high levels of fat; the quantity of the bar could be reduced or re
   - Contains sugar, glucose syrup, fructose and honey, which are all sources of su could be remo
   - Dri it could be added to replace some of the sugars while also adding fibr
   - Co yder can be made lower fat, so could be replaced with a reduced-fat
   - Sun wer oil or vegetable fats could be removed to reduce the fat content

   Accept any other suitable answers.

2. a) Suggestions for ingredients will vary, but students should consider the nutritio (Leila) and a teenage girl (Mina)

   Leila
   - Flavourful ingredients that reduce the need for additional sodium, to pre
   - Complex carbohydrates that are high in dietary fibre for digestive tract h
   - Fruits and vegetables to increase fluid intake or increase fibre content
   - Ingredients containing vitamins A, C and E to provide antioxidants, e.g. b
   - Ingredients high in calcium, e.g. dairy or fortified soya products, to preve
   - More vitamin D, e.g. from eggs, for bone health
   - Ingredients lower in saturated fats, e.g. white meat (such as chicken) vs r risk of coronary heart disease or high cholesterol

   Mina
   - Good sources of iron, e.g. red meat or dark green leafy vegetables, as teen
   - Good source of lean, low fat protein, e.g. chicken, fish or legumes, to sus
   - Carbohydrates to maintain energy and growth spurts
   - Citrus fruits or potatoes for vitamin C
   - g dark leafy vegetables, orange/yellow/red vegetables for beta caro
   - products, eggs or oily fish for retinol
   - Dairy products, chia seeds or fortified soya products for calcium, in order

   Accept any other suitable answers.

   b) Answers may include:
   - Portion sizes for elderly people may be smaller – as elderly people tend t therefore, dishes might cost less or could be offered as part of a meal de
   - Meat tends to cost more, especially if it is organic or free-range, and this containing it
   - Meals in restaurants tend to be larger than the recommended portion siz the cost as fewer ingredients are being used
   - Including 'exotic' ingredients that cost more to import (e.g. pomegranate of a dish

   Accept *any other suitable answers.*

Section C

1. a) Answers may include (acc suitable meals; also accept a starter and a

   Main
   - p made entirely of vegetables and water, making it a good s us vitamins and minerals. Legumes and nuts can be added to increa ent. Cream can be added to enhance flavour and texture.
   - Salad – no animal products needed. Salad vegetables are a good source provide bright colours, fresh tastes and crunchy textures. If he is an ovo- to create a creamy and stable salad dressing.
   - Meat alternatives – e.g. crispy tofu, cauliflower steaks, mushroom and blac macronutrients and micronutrients (e.g. tofu is a good source of protein, c

Dessert

- Cheesecake – not suitable for ovo-vegetarians, who do not eat dairy – in or dairy alternatives, providing an extra source of protein. Baked cheese contain eggs, making it unsuitable for a lacto-vegetarian.
- Ice cream – made with dairy, so contains saturated fat but good levels of offered, presenting a more appealing choice.
- Fruit crumble – fruit content provides vitamins, though some may be lost breaking down of fruits introduces free sugars. [illegible]er in crumble makes

b) Adaptations to consider may include:

- Smaller portion size to [illegible] recommended daily intake
- Removing dairy [illegible] e.g. soup without cream (which reduces satur (lowers fa[illegible] vitamins/minerals), crumble made with oil or dairy-free
- [illegible]ing calcium to replace what was in dairy products (as important for b [illegible]secake or the addition of nuts and seeds that are high in calcium (e.g
- Many desserts can be made with soya / other non-dairy alternatives such taken as these are common allergens

2. Answers may include:

- Due to the lack of animal products in a vegan's diet, they may not consume en impact on growth and development, as well as wound repair. Vegans should e as soya, pulses and legumes, to ensure they're eating enough protein.
- As vegans don't eat dairy or fish, their calcium intake can be deficient. This ca development of teeth and bones, or cause weakening or softening of bones in rickets (in children) and osteoporosis. Many soya products and nut milks are f seeds are good sources of calcium as well, so vegans should make sure to regu

Accept any other suitable answers.

Exam-style questions

GCSE Paper 1

1. **1 × AO1 mark** for each correct answer (max. 2 m[illegible]rks,

- Fibre takes longer to digest, keepi[illegible]le [illegible]er for longer
- Soluble fibres bind to chol[illegible]e [illegible]moting excretion and lowering cholester
- Helps absorb wat[illegible]e[illegible]g water weight

Accept an[illegible]her[illegible]nswers.

2. **Max. 6 [illegible]arks** for:

Levelled mark scheme

5–6 marks	• Answer shows thorough understanding of coeliac disease. • Detailed explanations of impacts on nutrition and how plans and • Related terminology used correctly.
3–4 marks	• Answer shows good knowledge of coeliac disease. • Some reasoning for impacts on nutrition and planning given. • Some correct terminology used.
1–2 marks	• Answer shows basic knowledge of coeliac disease. • Limited explanations of nutritional needs and planning or prepa • Attempts to use correct terminology.
0 marks	No answer or no creditworthy answer given.

Indicative content

Students should apply their knowledge of coeliac disease and its impact on health a for how a healthy diet can be made within th[illegible]se [illegible]mit[illegible]ns.

Nutritional needs

- People with coeli[illegible]s[illegible]annot digest gluten; their small intestine cannot a
- Glut[illegible]lan[illegible]ning of their small intestine, which then cannot absorb c m[illegible]hr[illegible]nt
- Th[illegible]ld avoid all foods containing gluten, which means any cereals that co
- They still need the same amount of energy, 45% of which should still come fro

Impacts on planning and preparation

- Cross-contamination needs to be avoided by thoroughly cleaning hands, equip uses, or by having separate areas to handle ingredients with and without glute
- Ingredients and foods containing gluten should be clearly labelled

Maintaining healthy diet

- All food labels should be read carefully
- People should still get 45% of energy from carbohydrates such as vegetables a
- People should get 35% of daily energy from healthy fats and 20% from lean pr
- It may be beneficial to cook food from scratch to prevent risk of contaminatio
- There has been a rise in free-from ready-made foods, including treats and snacks
- The rise in free-from products also allows more variety in meals, which will he healthy cooking

Accept any other suitable answers.

3. Max. **8 × AO4 marks** for:

Levelled mark sch

7–8 marks	• esponse includes detailed explanations with accurate factual in At least four points about the impacts of a vegan diet are include • Response includes a good balance between analysis and evaluat • Analysis is excellent, and evaluation uses sound judgements to li
5–6 marks	• Response includes some detailed explanations with accurate fac terminology used. • At least three points about the impacts of a vegan diet are inclu • Response may favour either analysis or evaluation. • Analysis is good, and evaluation is used for some judgements an
3–4 marks	• Response includes limited explanations with some factual inform understanding. • At least two points about the impacts of a vegan diet are include • There is an imbalance between analysis and evaluation, with gre • Analysis covers at least two factors, and evaluation is used to ma to analysis.
1–2 marks	• Response is very limited with few explanations that are not supp • Only one factor is analysed, and any ev on is limited.
0 marks	No answer or no creditworthy answ e

Indicative content:

Students should apply th ge of veganism and nutritional content of vega maintainin he Students should also apply their knowledge of the facto choice con xt of veganism.

- A et doesn't contain animal products, so veganism doesn't contribute to animals such as cattle
- Increased awareness from social media and the Internet of environmental issu influences more people to become vegan
- Increased awareness of farming practices and the farming industry has made welfare, which influences more people to become vegan
- Increased understanding of nutrition and how to have a balanced diet as a veg try Veganuary
- Greater variety of foods in supermarkets and availability of foods online make during Veganuary
- A vegan diet contains more fibre due to higher intake of plant-based produce, w
- As animal products can be high in saturated fat, removing them from the diet
- As plant products are lower in saturated and unsaturated fats, removing them loss, which can be beneficial for some people
- As many high-sugar and high-fat products, e.g. nd biscuits, contain anim a vegan diet can reduce fat and sugar co te t in diet
- A diet high in fruit and vegetab s vi ide greater amounts of vitamins su
- Due to the lack of anim rod cts, a vegan diet can be lacking in protein, whic of tissues
- Th of products can lead to a deficiency in iron as animal products co em-iron, which is easier to digest
- The of animal products can lead to a deficiency in calcium, which dairy pr leading to teeth and bone issues such as osteoporosis

Accept any other suitable responses.

Topic 3: Nutritional needs ar

3.2.3.4 Diet, nutrition and healt

Section A

1. Any three from:
   - Type 2 diabetes
   - Obesity
   - Coronary heart disease (CHD)
   - High blood pressure
   - Dental decay / tooth decay / cavities
   - Rickets
   - Osteoporosis

2. Rickets is a disorder that occurs in children, whereas osteoporosis occurs in adults a
   Rickets is caused by bones failing to develop properly, whereas osteoporosis is caus

3. i. False – iron is needed for the production of haemoglobin, the protein that tra
      for proper oxygen transportation
   ii. True
   iii. True
   iv. False – stress and alcohol can cause CHD but intense exercise does not
   v. False – these are symptoms of osteoporosis; symptoms of high blood pressure
      breath and headaches

4. **Pain when eating cold foods**
   Health risk: tooth decay
   Prevention: regular brushing, reducing amount of sugary foods and drinks, more ca

   Dizziness and weakness
   Health risk: anaemia
   Prevention: iron rich foods, eating more red meat / dark green leafy vegetables, increa
   absorp

   Pressure or tightness in chest
   Health risk: coronary heart disease
   Prevention: reducing salt intake, reducing saturated fat intake, regular exercise

   Bowed legs
   Health risk: rickets
   Prevention: increase calcium intake, increase vitamin D intake, vitamin D supplem
   Accept any other suitable answers.

Section B

1. Answers may include any two of the following:
   - Peer pressure to eat certain foods that someone may not like because of taste
   - Self-image as we are pressured to look a certain way, which may prevent peop
     overweight due to fear of ridicule or not eating enough to prevent weight g
     eating disorders
   - Illness may keep someone housebound and prevent them from accessing a healthy
     ea
   Accept other suitable answer.

2. Answers may include any two of the following:
   - Too many sugary foods/drinks can damage and weaken enamel, leading to de
   - Too little calcium in the diet, especially likely in vegans and ovo-vegetarians w
   Accept other suitable answers.

3. Answers may include:
   - Reduce saturated fat content, which could be done by replacing the single cre milk, or by using a leaner meat such as pork or turkey
   - Overall fat content could be reduced by making the dish vegetarian, swapping mushrooms, or using a soya-based alternative such as tofu
   - Potato could be swapped for sweet potatoes as they have a lower glycaemic i particularly vitamin A

   Accept any other suitable answers.

4. Answers may include:
   - High-fat foods can incr[illegible] the r[illegible]k of various health problems, such as obesit heart disease
   - W[illegible]e[illegible] getting sufficient energy from carbohydrates, fats are stored m[illegible]-fat foods increases these stores
   - Fat [illegible]build up in arteries as plaque, blocking blood flow and causing high blo
   - High-sugar foods can also increase risk of health problems such as dental issue
   - When a person is getting sufficient energy from carbohydrates, any extra carb stored in body tissues
   - Sugary foods and drinks, especially when combined with acids, e.g. fizzy drinks and weaken teeth
   - Weakened teeth are more susceptible to cavities and decay

   Accept any other suitable answers.

Section C

1. Suggestions for meals will vary, but students should consider the following:
   - Low-fat options – as excess fat can build up in arteries as plaque, narrowing bl flow; this makes the heart work harder, fatiguing the mu[illegible]les more quickly
   - Low-salt options – as excessive salt intake can ra[illegible]e blood pressure
   - Vegetarian options – as these tend to be lower in fat; cutting out dairy produc even more; plant products also l[illegible]p [illegible] cholesterol levels in blood

   Accept any other suitable answers.

2. Answer[illegible]inc[illegible]
   - Ch[illegible]re more sensitive to strong flavours, especially bitter ones, so they n and[illegible]nt to eat more of them
   - Their bones and teeth are still developing so they need a higher calcium intake levels; this could be because they are lactose-intolerant or because their pare dairy due to it often being high in fat
   - Because their teeth are still developing, the enamel may be softer or weaker a they eat a lot of sugary or acidic foods their teeth will become damaged more
   - The process of brushing their teeth may be unfamiliar or unpleasant (texture a preventing the additional fluoride from toothpaste helping to mineralise their

   Accept any other suitable answers.

Exam-style questions

GCSE Paper 1

1. **1 × AO1 mark** for:
   d) All of the above

2. **Max. 6 × AO2 marks** for:
   Levelled mark scheme

5–6 marks	• Answer shows thorough understanding of anaemia. • Detailed explanations of the impacts on nutrition and how plans are given, and relevant terminology is used correctly.
3–4 marks	• Answer shows good knowledge of anaemia. • Some reasoning for the impacts on nutrition and planning are given. • Some correct terminology is used.
1–2 marks	• Answer shows basic knowledge of anaemia. • Limited explanations of nutritional needs and planning or preparation. • Attempts to use correct terminology.
0 marks	No answer or no creditworthy answer given.

Indicative content

Students must apply knowledge and understanding of anaemia to select and justify micronutrients that support the health of an anaemic person. Dinner ingredients must generic items, e.g. salad, are not worthy of credit in the higher bands. Students must

Micronutrients and reasons for choice related to supporting good health of an indiv

Iron

- Deficiency causes iron-deficient anaemia
- Needed for production of healthy red blood cells
- Dark green leafy vegetables, e.g. spinach or kale in salad
- Edamame in salad
- Animal sources of iron include meat, e.g. steak, and liver, e.g. paté, which
- Meat and vegetable dishes can be used to increase iron intake; for example, a the last minute of cooking, or a side of steamed broccoli or cauliflower
- Adding dried fruit such as sultanas to a stew or curry would increase the iron c

Vitamin C

- Needed for absorption of iron
- Sources include: citrus fruits, berries, tomatoes, cauliflower, broccoli, white po
- Dinners could include mashed potatoes; tomatoes can be added to salads; roa in place of meat

Vitamin B12

- Deficiency causes pernicious anaemia
- Needed for production of healthy red blood cells
- Sources include: meat, fish, dairy products, eggs
- Dinners could include a meat or fish main; boiled eggs in salad; scrambled egg dish containing chicken and egg)

Vitamin B9 (folate)

- Deficiency causes folate deficiency anaemia
- Needed for production of healthy red blood cells
- Sources include dark green leafy vegetables, e.g. Brussel sprouts or asparagus
- Incorporating beans into dishes, e.g. chilli, or adding beans, e.g. cannellini or k
- Adding a side of dark green leafy vegetables to dinners, e.g. steamed broccoli

Accept any other suitable answers.

3. **6 × AO2 marks** and **6 × AO4 marks** for:
Levelled mark scheme

10–12 marks	• Thorough knowledge and understanding of the nutritional need diabetes shown. • At least five points are covered in detail. • Detailed explanations and comparisons are given with good use • Examples given are accurate and extensive
7–9 marks	• Good knowledge and understandi[illegible]e nutritional needs of a • At least four points are co[illegible]ered in detail. • Explanations and comp[illegible]ns are given with some use of corre • Example[illegible]en a[illegible]accurate.
4–6 marks	• S[illegible]nowledge and understanding of the nutritional needs of a • At least three points are covered. • Some explanations and comparisons may be given with attempt • Examples may not be included
1–3 marks	• Limited knowledge and understanding of the nutritional needs o diabetes shown. • One or two points are covered in basic detail. • Points made are generic and not specific to type 2 diabetes. • There is no attempt to use examples or terminology.
0 marks	No answer or no creditworthy answer given.

Indicative content
Students should apply their knowledge and understanding of nutrition and type 2 d
two meals provided.

Analysis
- Type 2 diabetes is a medical condition that means a person's body doesn't pro
blood glucose levels can rise or drop uncontrollably
- Type 2 diabetes can be treated with insulin injections but also through diet ma
insulin sensitivity
- As diabetes can lead to increased risk of various other medical issues, it is imp
balanced diet with [illegible]e sugars, saturated fats and salt

Nutritional requirements
- An [illegible] with diabetes has the same nutritional requirements as an adult with
- Needs 45% of energy from carbohydrates
- No more than 5% of energy from carbohydrates should come from free sugars
- Needs 35% of energy from fats
- Needs 20% of energy from protein

Carbohydrate content
- The carbohydrate content of Meal 1 is much lower
- Meal 1 contains 26.7 g; Meal 2 contains 62 g
- Meal 1 contains 0.5 g sugar; Meal 2 contains 4.3 g sugar
- Meal 1 contains peas; vegetables have a lower glycaemic index
- Meal 2 is a larger portion and provides more energy overall – 500 kcal

Fat content
- Meal 1 is higher in fat and saturated fat than Meal 2
- Meal 1 contains 4.7 g of fat; Meal 2 contains 10.4 g of fat
- Meal 1 contains 1 g of saturated fat; Meal 2 contains 5.1 g of saturated fat

Fibre co[illegible]
- M[illegible]ntains more dietary fibre
- Me[illegible] contains 2 g; Meal 2 contains 3.3 g

Salt content
- Meal 1 contains less salt than Meal 2
- Meal 1 contains 0.5 g; Meal 2 contains 3.3 g

Evaluation
Meal 1 is more suitable than Meal 2 for someone with type 2 diabetes

Conclusions
Reference should be made to the diet of someone with type 2 diabetes needing to
- Lower in sugar
- Lower in saturated fat
- Lower in salt

- The carbohydrate content of Meal 1 is much lower than that of Meal 2, which on the person's blood glucose levels, causing it to rise less and reducing risk of
- Meal 1 is higher in [illegible] saturated fat than Meal 2; therefore, Meal 2 is bett body weight, which impacts production of insulin and blood glucose levels
- Meal 1 contains vegetables, which have a lower glycaemic index and will help ins[illegible] of spiking quickly
- Meal 2 contains more dietary fibre, which is better for maintaining a healthy d excess products such as cholesterol
- Meal 2 is a larger portion and provides more energy, which may keep the pers less likely to snack between meals and disrupt their blood glucose levels

Accept any other suitable answers.