

Blast-off : Food and Digestion Mark Scheme

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1. energy
2. growth
3. respiration
4. carbohydrates
5. bread
6. protein
7. damaged
8. meat
9. minerals
10. iron
11. oxygen
12. oranges
13. fibre
14. chemical
15. blood

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1. **Missing Food Type:** Vitamins.
2. **Ingredients High in Protein:** Chicken, eggs.
3. **Importance of Fiber:** Fiber helps keep food moving through the digestive system and prevents constipation.
4. **Ingredients High in Fiber:** Brown rice, peas, red peppers.
5. **Sources of Minerals and Vitamins:** Peas, red peppers, eggs.

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6. Table Completion:

- **Carbohydrates:** Provides energy.
- **Proteins:** For growth and repair.
- **Fats:** Stores energy.

7. **Importance of Carbohydrates in the Body:** Carbohydrates are the primary source of energy, fuelling daily activities and bodily functions.

8. **Importance of Water in the Diet:** Water is essential for hydration, helps with digestion, and facilitates chemical reactions in the body.

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1. What are enzymes?

Enzymes are biological catalysts that speed up chemical reactions in the body.

2. What enzyme breaks down starch into glucose?

Amylase.

3. What enzyme would be found in the stomach?

Protease (pepsin specifically digests proteins in the stomach).

4. Why does food need to be digested?

Food needs to be digested to break down large, insoluble molecules into small, soluble molecules that can be absorbed into the bloodstream.

5. What are the two substances that make up lipids?

Fatty acids and glycerol.

Matching Keywords to Descriptions:

- **Ingestion:** the taking in of substances, e.g., food and drink, into the body through the mouth.
- **Mechanical digestion:** the breakdown of food into smaller pieces without chemical change to the food molecules.
- **Chemical digestion:** the breakdown of large, insoluble molecules into small, soluble molecules.
- **Absorption:** the movement of small food molecules and ions through the wall of the intestine into the blood.
- **Egestion:** the passing out of food that has not been digested or absorbed, as faeces, through the anus.

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1. **teeth**
2. **enzymes**
3. **oesophagus**
4. **peristalsis**
5. **acid**
6. **pancreas**
7. **small**
8. **bile**
9. **fats**
10. **villi**
11. **water**
12. **rectum**
13. **anus**

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3.

- (a) (i) **Useful gas from lungs:** Oxygen (1 mark)
 - (ii) **Useful substance from intestine:** Glucose or nutrients (1 mark)
- (b) **Blood clot stops an organ working:** Prevents blood flow, depriving the organ of oxygen and nutrients (1 mark)
- (c) **How a scab protects:** Acts as a barrier to prevent bacteria from entering the body (1 mark)

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4.

- (a) **Does evidence support that all acids cure scurvy?:** No, only oranges and lemons helped; other acids were ineffective (1 mark)
- (b) (i) **Independent variable:** Type of food given (1 mark)
 - (ii) **Dependent variable:** Recovery from scurvy (1 mark)

- (c) **New prediction about scurvy:** Vitamin C or citrus fruits, not acids alone, can cure scurvy (1 mark)
- (d) **Why more than one week is needed:** Scurvy symptoms take time to change, so longer observation is necessary (1 mark)

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10.

- (a) **Why 37°C for the water bath:** Body temperature, optimum for enzyme activity (1 mark)
- (b) **Why gelatin cut in pieces digested faster:** Increased surface area speeds up enzyme action (1 mark)
- (c) **Why boiling stops enzyme function:** Boiling denatures enzymes, altering their shape and preventing function (1 mark)
- (d) (i) **Products of protein digestion:** Amino acids (1 mark)
 - (ii) **Why digest protein for growth and repair:** Proteins need to be broken down into amino acids for absorption and use in cells (1 mark)

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6.

- (a) (i) **Letter for stomach:** C (1 mark)
 - (ii) **Letter for small intestine:** D (1 mark)
 - (iii) **What carries glucose from intestine:** Blood or bloodstream (1 mark)
- (b) **Why athletes take glucose:** Provides quick energy (tick the correct box) (1 mark)
- (c) (i) **Most sugar in lunch:** Clare (1 mark)
 - (ii) **Most fat in lunch:** Nadia (1 mark)
 - (iii) **Why too much fat is bad:** Can lead to heart disease, obesity, or other health issues (1 mark)

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7.

- (a) (i) **Why chips are crisper than boiled potatoes:** Chips contain less water (1 mark)
 - (ii) **Where most fiber is in baked potato:** Skin (1 mark)

- (b) **Vitamin C in 200g servings:**
 - **Chips:** 18 mg (1 mark)
 - **Baked potato:** 28 mg (1 mark)
- (c) **Diet and organs harmed:**
 - Too much fat → Heart
 - Not enough fiber → Intestine
 - Not enough calcium → Bones (3 marks total)

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13.

- (a) (i) **Why football uses up reserves faster than bowling:** Football requires more energy (2260 kJ vs 1030 kJ) due to its higher intensity (1 mark)
 - (ii) **Two effects of alcohol on performance:**
 - Reduces reaction time
 - Impairs coordination and judgment (2 marks)
- (b) **Why glucose is quicker than starch for energy:** Glucose is readily available for absorption, while starch needs to be broken down first (1 mark)

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3.

- (a) **Substance removed in skimmed milk:** Fat (1 mark)
- (b) (i) **Substance for strong bones and teeth:** Calcium (1 mark)
 - (ii) **How substances are carried around the body:** By the bloodstream or circulatory system (1 mark)

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15.

- (a) (i) **Nutrient providing most energy in cheese:** Fat (1 mark)
 - (ii) **Nutrient providing most energy in wholemeal bread:** Carbohydrate (1 mark)
 - (iii) **Nutrient needed for growth and repair:** Protein (1 mark)
- (b) **Amount of cheese for 45g protein:** 200g (tick correct box) (1 mark)

- (c) **Missing nutrient type for balanced diet:** Fiber or water (1 mark)

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- (d) (i) **Calcium for a breast-feeding woman:** 1200 mg (1 mark)
 - (ii) **Why extra calcium is needed:** To support milk production and maintain her own bone health (1 mark)

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16.

- (a) (i) **Reducing plaque to prevent tooth decay:** Plaque contains bacteria that produce acid; reducing it lowers acid production, protecting enamel (1 mark)
 - (ii) **Why alkaline toothpaste helps:** Neutralizes the acid, preventing it from eroding enamel (1 mark)
- (b) **Why boys looked at teeth before and after brushing:** To measure how much plaque was removed by brushing (1 mark)

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- (c) (i) **Why smaller grid squares are better for measuring plaque:** Provides a more accurate measurement (1 mark)
 - (ii) **Estimate area covered by plaque:** Based on grid, answer will vary (1 mark if reasonable estimate based on visible area)