

Nutritional Needs and the Balanced Plate: A Scientific Investigation

Learning objective: To identify the nutritional requirements of humans, understand the function of different food groups, and justify the importance of a balanced diet for growth and health.

Use your scientific knowledge of nutrients and the Eatwell Guide principles to answer the following questions. Provide detailed explanations where required.

Bea the honeybee is studying human biology! She knows that just as bees need nectar and pollen for energy and growth, humans require a complex variety of nutrients to function correctly. A balanced diet provides the fuel for our daily activities, the building blocks for our bodies, and the essential components to keep our immune systems strong. Understanding what we consume is the first step toward maintaining a healthy, active lifestyle.

Word bank: carbohydrates · proteins · fats · vitamins · minerals · fibre · hydration · glucose · energy · growth · repair

1. Max the monkey is planning his lunch. Explain why it is essential for Max to include both carbohydrates and proteins in his meal to support his active lifestyle. (2 marks)

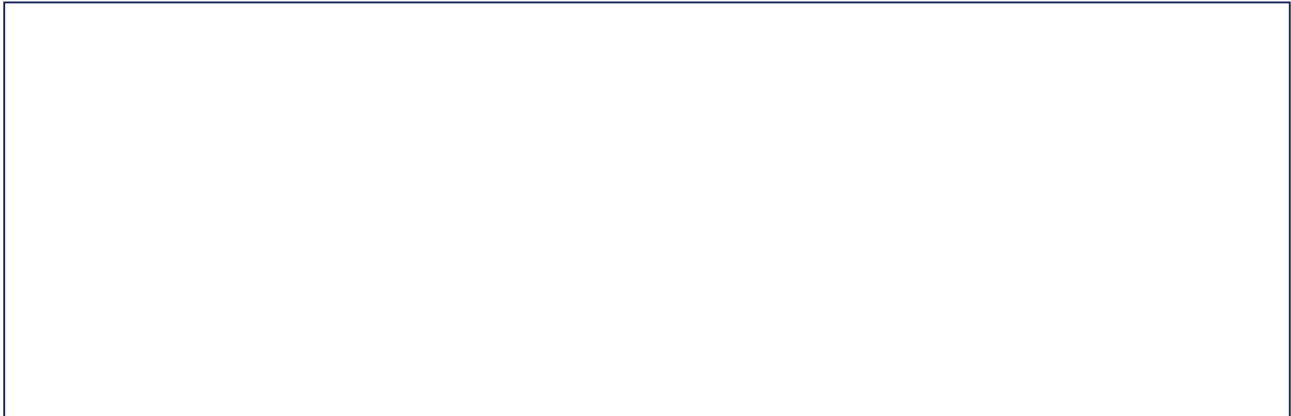
2. Compare and contrast the roles of vitamins and minerals in the human body. Why are they referred to as 'micronutrients'? (3 marks)

3. If a person were to remove all fats from their diet, what might happen to their body's ability to protect vital organs and regulate temperature? Justify your answer. (3 marks)

4. Analyse the importance of fibre in a diet. Why is it often described as 'indigestible' yet vital for human health? (2 marks)

5. Nova the owl is curious about energy. If someone eats a high-sugar snack, they might feel a quick burst of energy, but what happens to their energy levels shortly after? Explain the biological reason for this. (3 marks)

Draw: Draw a 'Balanced Plate' for a person who has a very active day, such as a professional athlete. Label which parts of your drawing represent carbohydrates, proteins, fats, and fruit/vegetables, and explain your choices.



Extension challenge: Design a 3-day menu for a student athlete. Justify why your chosen meals provide the correct balance of energy and nutrients for someone training for a school sports competition. Consider the role of hydration in your plan.