Year 8
Subject: Biology
Topic/Unit:
When:

Huntington School
Learn and succeed

Overview: Why this? Why now?
Understanding how our bodies obtain and use nutrients is vital for both scientific literacy and personal wellbeing. Having previously mastered basic cellular biology, pupils are now ready to explore how organ systems coordinate to sustain life. This unit bridges the gap between chemical nutrients and physical energy, empowering students to make informed, evidence-based lifestyle choices.

Building on...building to:

- **Building on**: Primary science knowledge of healthy eating and the Year 7 cellular structure unit, where cells and tissues were first introduced.
- **Building to**: GCSE-level human physiology, including enzyme kinetics, the biochemistry of aerobic respiration, and clinical metabolic homeostasis.
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Sequence summary:

- **Diet & Energy**: Exploring the seven food groups (carbohydrates, proteins, lipids, vitamins, minerals, fibre, and water) and their functions. Pupils calculate daily energy requirements based on basal metabolic rate (BMR) and physical activity levels.
- **Biochemical Testing & Deficiencies**: Performing qualitative food assays using iodine (starch), Benedict's solution (sugar), Biuret reagent (protein), and filter paper (lipids). Examining the physiological consequences of dietary imbalances, including obesity and deficiency diseases such as scurvy, rickets, and anaemia.
- **Diabetes & Organisation**: Evaluating clinical diabetes through a urine-testing case study. Recapping the biological hierarchy from cells to tissues, organs, and systems.
- **Anatomy & Enzymes**: Tracing the passage of food through the digestive tract. Investigating how organs are adapted for mechanical breakdown and chemical digestion, introducing amylase, protease, and lipase as biological catalysts.
- **Modelling & Respiration**: Conducting a physical demonstration of the digestive tract. Defining aerobic respiration as a continuous, exothermic chemical reaction occurring in mitochondria to release energy.
- **Gastrointestinal Health & Assessment**: Exploring the role of gut bacteria and common digestive issues (such as coeliac disease and lactose intolerance). Completing the Detailed Feedback Task (DFT) assessment and engaging in peer-assisted redrafting.

Key Vocabulary:
Malnutrition, peristalsis, biological catalyst, villi, respiration, glucose, deficiency, egestion.

Assessments:
Formative assessments include weekly vocabulary retrieval check-ins, practical image observations, and diagnostic white-board quizzes. The summative assessment comprises a structured written test alongside the Detailed Feedback Task (DFT), which challenges pupils to describe and explain the anatomical adaptations of the digestive tract.

Able and interested:
Pupils are stretched through quantitative energy calculations across diverse athletic dietary profiles. They design and conduct a calorimetric investigation (burning food samples) to compare stored chemical energy, systematically defining and controlling operational variables.

Inclusion, Personal Development and Wider Skills: Practical tasks are scaffolded with differentiated worksheets and sensory card-sorts to support all learners. Personal development is fostered through a budgeting exercise, where pupils apply basic maths and financial literacy to plan a balanced meal within a strict £.50 limit.

Homework and Independent Learning: Students will complete a task set on the SPARX online platform. The task is based on the current topic but also includes consolidation on previous topics. It will automatically adjust the level of challenge as the student complete the activities.