Year 7
Subject: Biology
Topic/Unit: Cells, Tissues and Organs
When: Half Term 1

Huntington School
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Overview: Why this? Why now?
This unit establishes that **cells are the fundamental structural and functional building blocks of all living things**. Delivering this unit early in Year 7 equips pupils with **essential microscopy skills and histological knowledge**, providing the conceptual foundation necessary to understand complex human anatomy, physiological systems, and public healthcare in subsequent terms.

Building on...building to:
This unit builds on primary school exposure to basic biological classification and the **seven life processes: movement, respiration, sensitivity, growth, reproduction, excretion, and nutrition (MRS GREN)**. It directly **paves the way for GCSE-level biology**, including cellular respiration, plant photosynthesis, genetic inheritance, and immunology.

Sequence summary:
- **Microscope Skills.** Students identify the **components of a light microscope** and calculate **total magnification**. They observe prepared slides and master **scientific drawing rules**, focusing on clear continuous lines, realistic proportions, and omitting shading.
- **Cell Structure.** Students prepare **onion epidermis slides using iodine stain** and **cheek epithelial cell slides using methylene blue**. They identify and compare **key plant and animal organelles**—including the nucleus, cytoplasm, cell membrane, cell wall, permanent vacuole, chloroplasts, mitochondria, and ribosomes.
- **Cellular Specialisation.** Pupils investigate how structure relates to function in **specialised animal cells** (red blood cells, sperm, ova, ciliated cells, and nerve cells) and **plant cells** (palisade and root hair cells). They evaluate the **anomalous structure of *Euglena***.
- **Hierarchical Organisation.** Students map how **cells group to form tissues**, which build **functional organs** (the brain, heart, lungs, stomach, liver, and intestines) to compose a **multicellular organism**.
- **Microorganisms.** Pupils distinguish between **bacteria, viruses, and fungi**. They perform **environmental swabbing** to safely culture microbes on **nutrient agar petri dishes**.
- **Pathology and Hygiene.** Pupils investigate how pathogens spread and explore historical medicine, focusing on **Florence Nightingale's sanitation reforms**.
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Key Vocabulary:
Organelle, nucleus, mitochondria, ribosome, chloroplast, vacuole, tissue, magnification, pathogen, aseptic, *Euglena*, flagellum, turgid.

Assessments:
- **Formative**: Drawing checklists, microscope competency checks, and matching activities linking organs to functions.
- **Summative**: A quiet **30-minute written "Cells DFT" test** evaluating slide preparation steps and organelle functions, followed by a **green-pen peer-marking review**.

Able and interested:
Highly able pupils will **plot bar charts depicting organelle percentages of cell volume**. They can explore career avenues in bioscience, such as **veterinary animal nutritionists**.

Inclusion, Personal Development and Wider Skills: Scaffolded worksheets and targeted keyword glossaries support learners with diverse literacy levels. Practical tasks foster **teamwork, safety, and personal responsibility**—enforcing protocols such as safety goggles, tied-back hair, and slide disinfection using Virkon. Investigating Nightingale highlights **applied mathematics and ethics in science**.

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.