



# Cells

## KS3 Curriculum Intent:

- This unit covers cells, organisation of the body, body systems and transport in cells. These concepts are fundamental to an understanding of Biology and Health. The unit seeks to give learners the knowledge they need to pursue further study as well as understanding their own body, health, and that of nature around them.

## Sequence 1:

**Lesson 1: The microscope:** To describe how to use a microscope. To calculate magnification

Discussion of how the microscope has helped revolutionise Science. Students to go through and label the basic parts of a light microscope. Students to look at prepared microscope slides. Calculate the combined magnification of the objective and eyepiece lens (**Homework 1**)

**Lesson 2: Animal cells:** To describe the structures found in animal cells. Students to identify parts of an animal cell and state the role of different organelles. Students to look at their cheek cells down microscope.

**Lesson 3: Plant cells:** To describe the structures found in plant cells. Students to identify parts of a plant cell and state the role of different organelles. Students to look at onion cells down microscope.

**Assessment:** baseline (google form), low stakes testing

## Sequence 2:

**Lesson 4: Specialised cells:** To be able to relate the structure of specialised cells to their function. Students to identify different specialised cells and explain their adaptations. Students to compare features of a palisade cell and a root hair cell.

**Lesson 5: Movement of substance – Diffusion:** To understand and describe how substances move by diffusion. Students to define diffusion and name substances that would diffuse in and out of cells.

**Lesson 6: Uni-cellular organisms:** To understand what is meant by unicellular organisms. Students to describe the adaptations that help unicellular organisms to function.

## Sequence 3:

**Lesson 7: Organisation in multicellular organisms:** To understand what is meant by multicellular organisms. To define the terms tissues, organs, and organ systems- **checkpoint**

**Lesson 8: The skeleton and joints** to understand the role of the skeleton and joints.

**Lesson 9: Movement and muscles** to describe how muscles work to produce movement.

**Assessment and Homework:** **Checkpoint** (F or H), low stakes testing, homework (google form)

## Sequence 4:

**Lesson 10: Movement of substance – Diffusion:** To understand and describe how substances move by diffusion.

**Math's for Science activity**

**Lesson 14 End of Unit Assessment** – Cumulative assessment

**Lesson 15 Improvement Time** – complete therapy task

**Formative Assessment:** End of unit assessment

## Big picture

Studying **cells** helps us understand how organisms' function. Cellular components work together to carry out life functions. Cellular processes enable organisms to meet their basic needs.

This unit has several opportunities for practical work and the embedding of mathematic skills.

This unit builds on basic knowledge from KS1 and KS2 whereby students are introduced to basic parts of the human body, the role of muscles and simple function of body systems.

The topic develops understanding beyond the simple model of a cell to a closer understanding of cells and their significance in Biology and Medicine.

## Developing Cultural Capital:

Learning about the skeleton, joints and movement students can link this to sporting examples.

Students will have access to IT to research and further their understanding of body systems.

## Reinforcement and retrieval practice

- All learning sequences are consolidated through a homework, which is reviewed in the next sequence to Space Learning.
- 'Memory joggers' are formally completed as the Do Now, these will be evidenced in the student's books.
- AfL is used regularly to evidence gaps in knowledge and inform planning so that learning is consolidated before being moved on.
- Regular questioning is embedded in all lessons and should be a key feature on learning walks.
- Extended writing answer in lesson 10 will be in depth marked. Students will act on feedback in Lesson 11 as part of their revision and preparation for assessment (L12)
- End of unit assessment will be cumulative involving questions from previous units.

## Progression Model:

- Students will build on and develop practical skills within this topic that will link into further units within science as well as an understanding of the fundamental building block of Biology that allow the higher-level learning to occur later in the GCSE.
- The learning will be revisited throughout the KS3 curriculum and KS4 course through cumulative assessments and memory joggers.
- Also, their metacognitive skills will improve as they use self-assessment, low stakes testing, memory joggers and responding to teacher's feedback to take control of their own learning.



# Particles and separating mixtures

## KS3 Curriculum Intent:

- This unit covers particles, changes of state and separating techniques. The unit seeks to give learners the knowledge they need to pursue further study as well as understanding the world around them.

## Sequence 1:

**Lesson 1: The particle model:** To describe how matter are made up of particles. To describe solids liquids and gases in terms of the particle model Students to explain the properties of different materials based on the arrangement and movement of their particles.

**Lesson 2: Melting and freezing:** To use the particle model to explain changes involving solids and liquids. Students to explain changes of state in terms of energy of the particles.

**Lesson 3: Boiling** To use the particle model to explain boiling. Student to measure the boiling point of a substance using measurements from a graph.

**Lesson 4: More on changes of state** (optional lesson if students require further understanding of how particles behave when changing state)

**Assessment:** baseline (google form), low stakes testing.

## Sequence 2:

**Lesson 5: Diffusion:** to investigate diffusion. **Math's for Science activity**

**Lesson 7: Gas pressure:** To explain gas pressure. Students to draw before and after diagrams of particles to explain observations about gas pressure. Collapsing can practical.

**Lesson 8:** **In-depth marking/ DIRT activity** and consolidation lesson

**Assessment:** in depth marking/ marking of DIRT task.

## Sequence 3:

**Lesson 7: Pure substances and mixtures:** Know what an atom, element and compound is and identify different substances and mixtures.

**Lesson 8: Solutions:** Describe solutions and solubility using keywords and use the particle model to describe dissolving.

**Lesson 9: Evaporation and distillation:** To separate a mixture of sand, salt, and water.

**Lesson 10: Chromatography:** To use chromatography to separate colours in ink Students to explain how paper chromatography works and produce a chromatogram.

**Assessment and Homework:** Revision for the end of unit assessment.

## Sequence 4:

**Lesson 9 End of Unit Assessment** – Cumulative assessment

**Lesson 10 Improvement Time** – complete therapy task

**Formative Assessment:** End of unit assessment

## Big picture

This unit has several opportunities for practical work and the embedding of mathematic skills.

This unit builds on basic knowledge from KS1 and KS2 whereby students are introduced to basic separating techniques.

The topic develops understanding beyond the simple model of a cell to a closer understanding of states of matter.

## Developing Cultural Capital:

This unit provides opportunities for students to develop their self-knowledge, self-esteem and self-confidence through group and paired work and develop their knowledge of how scientists have shaped understanding of the world.

## Reinforcement and retrieval practice

- All learning sequences are consolidated through some homework, which is reviewed in the next sequence to Space Learning.
- 'Memory joggers' are formally completed as the Do Now, these will be evidenced in the student's books.
- AfL is used regularly to evidence gaps in knowledge and inform planning so that learning is consolidated before being moved on.
- Regular questioning is embedded in all lessons and should be a key feature on learning walks.
- End of unit assessment will be cumulative involving questions from previous units.

## Progression Model:

- Students will build on and develop practical skills within this topic that will link into further units within science as well as an understanding of the fundamental building blocks of chemistry that allow the higher-level learning to occur later in the GCSE.
- The learning will be revisited throughout the KS3 curriculum and KS4 course through cumulative assessments and memory joggers.
- Also, their metacognitive skills will improve as they use self-assessment, low stakes testing, memory joggers and responding to teacher's feedback to take control of their own learning.

