

Meden School Curriculum Planning							
Subject	Biology	Year Group	9	Sequence No.	1	Topic	Cells

Retrieval	Core Knowledge	Student Thinking
What do teachers need retrieve from students before they start teaching new content ?	What specific ambitious knowledge do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'
<p>KS2 Learning Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers Describe the life process of reproduction in some plants - pupils should find out about different types of reproduction, including sexual and asexual reproduction in plants,</p> <p>KS3 Learning</p> <p>Year 7 Organisms & Body Systems topic Basic cells, tissues, organs, organ systems and organisms.</p> <p>Reproduction topic Introduced to the structure of egg and sperm cells.</p> <p>Year 8</p>	<p>L1 - What are cells? Cells have different structures to carry out different functions. Some cells work as a single unit whereas others work together to form tissues. The different types of tissues are: Muscular tissue, glandular tissue and epithelial tissue. An organ is made up of different tissues completing different functions. An organ system is a group of organs working together to perform a function. Examples of the organisation of different cells students learn is the digestive system.</p> <p>L2 – What makes up an animal cell? Animal cells include many structures that carry out different functions these are: Nucleus - Controls all activities of the cell. Contains the genes on chromosomes Cytoplasm - Chemical reactions needed for life occur in this liquid gel. Cell membrane - Controls the movement of substances in and out of the cell. Mitochondria - this is where oxygen is used and most of the energy released during respiration. Ribosomes - all the proteins needed for the cell are synthesised here.</p> <p>L3 – What makes up a plant cell? Plant cells include many structures that carry out different functions. There are additional structures in plant cells that differ from animal cells. Structures in plant cells are: Nucleus - Controls all activities of the cell. Contains the genes on chromosomes Cytoplasm - Chemical reactions needed for life occur in this liquid gel. Cell membrane - Controls the movement of substances in and out of the cell. Mitochondria - this is where oxygen is used and most of the energy released during respiration. Ribosomes - all the proteins needed for the cell are synthesised here. Chloroplasts - these are structures that carry out photosynthesis with the help of chlorophyll. Cellulose Cell Wall – this structure provides additional support and strength for the plant cell.</p>	

Plant Structure and Reproduction topic
Students should know the structure of a **leaf** in **cross section**, identifying the layers of **tissue**

Microbes topic
That a microbe can be a **bacteria, virus or fungus**.

Digestion topic
The Villi structures in the small intestine is only **one cell thick** so there is a **short diffusion pathway**. There are also many **blood capillaries** so a **concentration gradient** is maintained.

Permanent vacuole – this is where the **cell sap** is stored.

L4 – What is the difference between a prokaryotic and a eukaryotic cell?

Eukaryotic cells include animal, plant and fungi cells. **Prokaryotic** cells include bacterial cells. **Prokaryotic** cells do NOT contain a **nucleus** they contain a **nucleoid**. They do contain **ribosomes, cell membrane, cell wall and cytoplasm**. Some Prokaryotic cells also contain other structures called: **plasmids, pilli, flagellum, slime capsules**. Misconception to address – **Bacteria is plural, bacterium is singular, bacterial is caused by bacteria**.

Prokaryotic cells come in many different **shapes and sizes**, and you need **microscopes** to be able to see them.

L5 – How do I convert between biological units?

Scientists use different **units** when **measuring** objects of different sizes. To **convert** between the **units** is a **skill** needed.

(Largest) ----- **(Smallest)**

Meter (m), Millimeter (mm), Micrometer (um) and nanometer (nm)

To get smaller you **x1000** to get larger you **÷1000**

L6 – How do I work out the size of cells?

To work out the size of cells the **formula** for **magnification** must be used.

Magnification = Image size ÷ actual size

A step-by-step method of the formula is to be used and if the image size and actual size are in different units' skills from L5 need to be applied.

L7 – How do I draw and observe cells like a scientist?

Identify and label the parts of a **light microscope**: **objective Lense, eyepiece, stage, stag clips, coarse focus, fine focus, light, arm, tube and base**.

Focus on the eight rules of biological drawing:

1. Draw a square or circle in **PENCIL** to draw your **organism** in.
2. Take up the **whole** box.
3. Draw your **organism** in **PENCIL**.
4. Don't use **'feathery' lines**.
5. Don't **shade**.
6. Add **labels**, but **do not allow lines to cross**.
7. Add a **title**.
8. Add the **magnification** you **viewed** it at.

L8 – How do substances move in and out of cells?

Diffusion is the **net movement** of **particles** from a region of **higher concentration** to a region of **lower concentration**. **Diffusion** is a **passive process**; this means it doesn't require any additional **energy** to take place.

Factors that can affect the rate of diffusion are **Concentration gradient, Surface area, Temperature, Size of particles, Distance**.

The part of the cell controls the **movement** of **substances** into and out of the cell is the **cell membrane**.

L9 – How does water move into and out of cells?

Osmosis is the movement of **water molecules** through a **partially permeable membrane** from an area of **high-water concentration** to an area of **low water concentration**. A **partially permeable membrane** is a **membrane** with tiny holes in it which allows **water** to move in both directions. **Osmosis** is a **passive process**; this means it does not require any additional **energy** to take place.

L10 – What is active transport?

Active transport is an **active** process which means it **requires additional energy** to occur. It involves the movement of **particles** from an area of **low concentration** to an area of **high concentration** against the **concentration gradient**.

Plant cells use **active transport** in their **root hair cells** to allow them to **absorb** the **mineral ions** from the soil **against the concentration gradient**.

L11: EoTT

L12: GPA