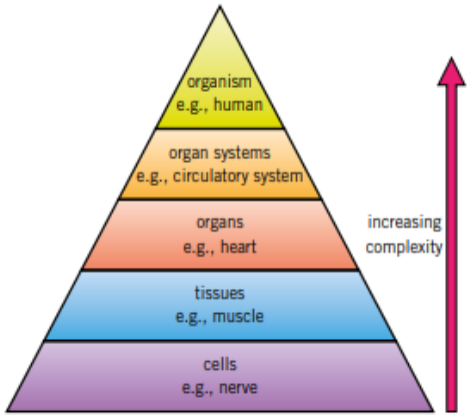
Exmouth Community College
Academy Trust

Levels of organisation



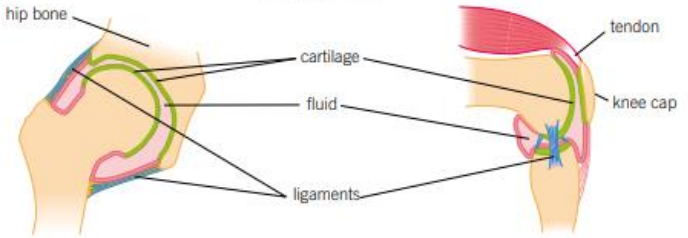
Movement

Joints occur between bones and allow movement, there are three main types of joints

Hinge	Ball and socket	Fixed
For back and forward movement, e.g. knees	*For movement in all directionse.g. hips*	*Do not allow movement, e.g. skull*

Joints have three main types of tissue:

Ligaments	**Cartilage**	**Tendons**
Connect bone to bone	*Coats the end of bones as a protection*	*Connects bone to muscle*



KEY TERMS

(To learn)

Antagonistic muscle pair
Bone
Bone marrow
Cell
Cartilage
Joints
Ligaments
Muscular skeletal system
Organ
Organism
Organ system
Skeleton
Tissue
Tendons

Muscles

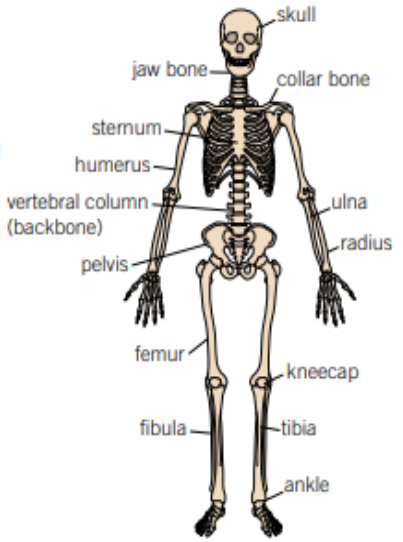
- **Muscles** are a type of tissue which allows movement
- They pull on tendons which in turn pull on bones to allow movement
- Muscles like the triceps and biceps are known as **antagonistic muscle pairs**, they work together –as one contracts, the other will relax

Organs

- An organ is a group of tissues that have the same function
- They can work with other organs in an **organ system**, such as the respiratory system which uses organs like the heart and lungs to transfer oxygen around the body
- Vital organs are the organs that need to keep functioning for an **organism** to stay alive, e.g. the heart

The skeleton

- The **skeleton** is made up of 206 **bones** which are a type of **tissue**
- Bones have a blood supply and are a living tissue
- The skeleton is part of the **muscular-skeletal system**
- The four main functions of the skeleton are:
  - To support the body – to keep you upright and hold **organs** in place
  - Protect organs – such as the skull protecting the brain
  - Movement – by working with muscles to allow you to move
  - Making blood cells – the **bone marrow** produces red and white blood cells



Year 7 – Biology / Movement – HT1 & HT2

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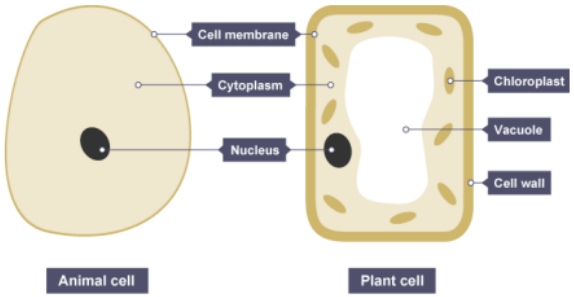
Year 7 – Biology / Cells – HT1 & HT2

Section 1: Key Words

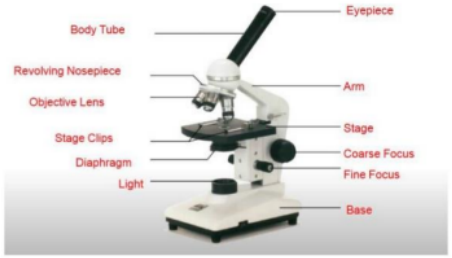
Key Word	Definition
Cell	the smallest structural and functional unit of an organism
Tissue	a group of specialised cells that have a similar structure and function
Organ	part of an organism made up of tissues that has a specific vital function
Microscope	an instrument used for viewing very small objects
Cell membrane	Controls the movement of substances into and out of the cell
Nucleus	Contains genetic material, which controls the activities of the cell
Vacuole	Filled with cell sap to help keep the cell turgid and supports the cell
Chloroplast	Contain chlorophyll, which absorbs light energy for photosynthesis
Cytoplasm	Most chemical processes take place here, controlled by enzymes
Cell wall	Strengthens the cell
Diffusion	The movement of particles from a high concentration to a low concentration until they are evenly spread
Uni-cellular	consisting of a single cell e.g. yeast
Multi-cellular	Consisting of lots of cells e.g. humans
Ribosome	Protein synthesis happens here
Mitochondria	Most energy is released by respiration here

Section 2: Plant and Animal cell



Organelle	Animal	Plant
Nucleus	Yes	Yes
Cytoplasm	Yes	Yes
Cell membrane	Yes	Yes
Cell wall	No	Yes
Chloroplast	No	Yes
Vacuole	No	Yes
Mitochondria	Yes	Yes
ribosome	yes	Yes

Section 3: The Microscope



Part	Role
Eye piece	The part that you
Objective lens	Magnifies the sample so you can see It through the eyepiece
Stage	Provides a solid platform to hold sample
Focusing knob	Turns so that the sample can be focused
Light	Provides the light to see the sample clearly

Section 3: preparing an onion slide

METHOD: Cut out a small piece of onion. Peel off the inner surface (membrane). Put the piece of membrane flat on a slide and add two drops of iodine solution. Gently lower the cover slip onto the slide using the forceps. Place the slide onto the microscope. Focus using focusing knobs and draw **three** or **four** cells in your book and label.

Section 7: Problems with Cells

Disease	Effect on cell	Problem to body
Sickle cell anaemia	Misshapen/ sickle shape: loss of surface area	Not enough oxygen - tiredness
Cancer	Cells divide/multiple uncontrollably	Tumours develop
Multiple Sclerosis (MS)	Damage to nerves cells	Muscle weakness & spasms, numbness of legs/feet

Section 4: Specialised cells

Specialised Cell	Location	Role	Adaption
Red Blood Cell	Animal – blood	Transport oxygen around the body	Biconcave shape and Large surface area to allow oxygen diffusions Haemoglobin to bind with oxygen No nucleus
Sperm Cell	Animal - testes	To join with female egg cells in fertilisation	Long tail for swimming Head containing enzymes to get into egg cell Mitochondria for energy
Egg Cell (Ovum)	Animal - ovary	To join with male sperm cell in fertilisation and then provide food for embryo	Large Contains food store
Nerve Cell	Animal - body	To carry impulses to different parts of the body	Long Connections are each end Can carry electrical signals
Ciliated Epithelial Cell	Animal – respiratory track and fallopian tube	Move mucus from one place to another. In the respiratory tract the move mucus containing microbes and dust out. In the fallopian tube they move the egg	Has a thin layer of tiny moving 'hairs' called cilia
White blood Cell	Animal – blood	Destroys invading pathogens	Releases antibodies and antitoxins. Engulfs and digests pathogen cells
Palisade cell	Plant – leaves	To absorb sunlight for photosynthesis	Large surface area Lots of chloroplast
Root hair cell	Plant - roots	To absorb water and minerals	Long finger like protrusion to provide large surface area

Section 5: Unicellular and Multicellular

Unicellular	Multicellular
Simple organisms	Complex organisms
Small	Large
One type of cell	Lots of different types of cell
Rely on diffusion to exchange substances	Organ systems to allow: Communication between cells Nutrient supply to cells Exchange of substances with the environment

Section 6: Cells to Organ Systems

Cells → tissue → organ → organ system

Cell	Simplest structural and functional unit of an organism
Tissue	A group of similar cells working together to perform a role
Organ	A group of similar tissues working together to perform a job
Organ system	A group of different organs that work together to do a particular job
organism	A living thing that performs the seven life processes