

Aim

The aim of the revision activity is to provide support for students who need to progress from *Know* to *Apply* for the AQA syllabus goals.

The aim of the extension activity is to provide extension for students who have already achieved *Apply*. The activity is also suitable for higher ability or older students in need of further extension work.

Revision activity notes

It is recommended that students achieving less than 72% complete the revision activity.

The revision activity asks students to work through a number of tasks to help them move towards demonstrating a secure grasp of the key concepts from this chapter. Suggestions are given in the Teacher Handbook of how you can support students in making progress for each outcome.

This revision activity is largely focussed on improving knowledge and understanding of cells and the muscular skeletal system, and developing the ability to explain how the parts work.

The activities are varied and include sentence completion, labelling diagrams, linking lines, and interpretation of a diagram of the joint.

Additional notes

- You can review students' answers to questions in the Checkpoint assessment in Kerboodle. You may decide not to cover all tasks in the revision activity, based on students' performance on specific questions.
- An index of which task covers which outcome is given in the Teacher handbook.
- This revision activity could also be used as a revision sheet for all students.

Revision activity answers

Task 1

Cells are very small so we have to **magnify** them to make them visible.

The microscope has two types of lens, the **eyepiece** and the objective lens.

A **high** power objective lens is needed to see the smaller cell structures.

Usually we look at several similar cells at the same time so we are looking at a **tissue**.

Leaf cells can be seen with a microscope.

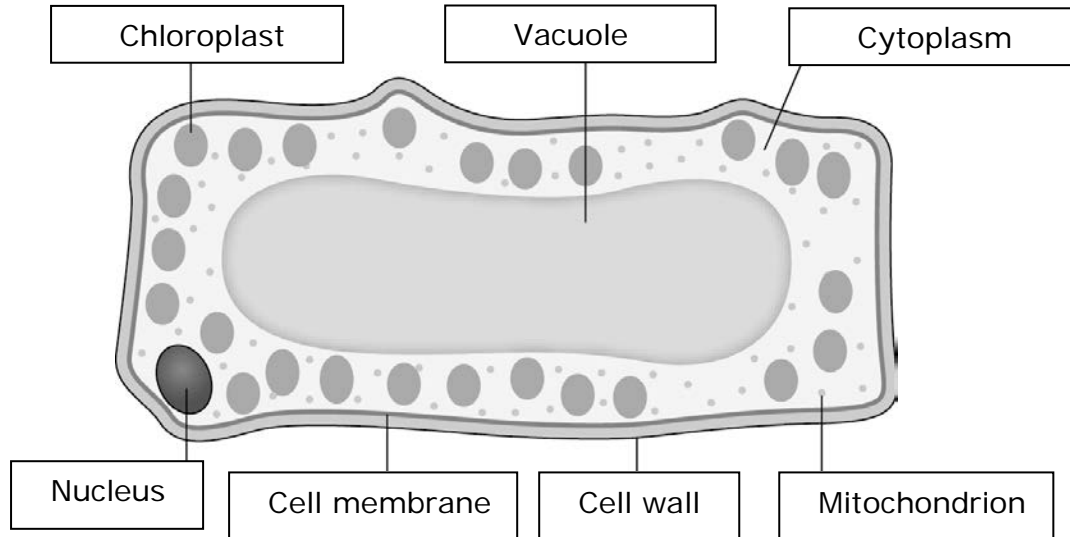
On the outside of a leaf cell is a **cell wall**. This stops the cell from bursting when it fills with water by the process of **diffusion**.

Inside the leaf cell is **nucleus** which controls cell activities.

Leaf cells also have **chloroplasts** which contain green chlorophyll.

Task 2

1



2

Name of component	Function
chloroplast	where photosynthesis happens
vacuole	keeps the cell firm (contains sap)
cytoplasm	'jelly-like' substance where chemical reactions take place
mitochondrion	where respiration happens/where energy is released from food molecules
cell wall	strengthens the cell and provides support
cell membrane	a barrier around the cell that controls what can come in and out of the cell
nucleus	controls the cell and contains genetic material

3 Chloroplasts, cell wall, and vacuole are not found in animal cell.

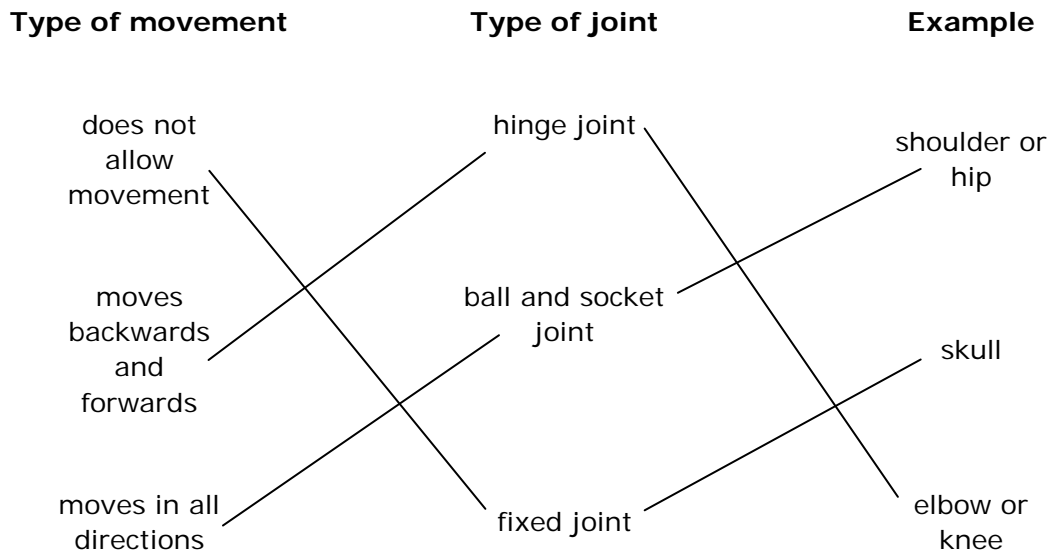
Task 3

1

Structure	Description	Function
bone	hard, to allow movement	support for muscles, tendons, ligaments
ligament	slightly elastic to allow movement	holds two bones together

cartilage	smooth so bones can move easily	covers ends of bones
tendon	strong and not elastic so it can pull on bone	connects muscle to bone

2

**Task 4**

- 1 Ligament, cartilage, a tendon, a bone, fluid correctly labelled on diagram.
- 2 The fluid lubricates / oils the joint, which allows the cartilage to slide easily during movement.
- 3 The bottom bone will move to the right.
- 4 Muscles work in (antagonistic) pairs. When one contracts the other relaxes. The second muscle contracts to move the bone back to its original position and the first muscle relaxes. Two muscles are needed because muscles can only pull not push.

Extension activity notes

Students work through a series of tasks to answer the question 'What happens when runners get injured?'

They are supplied with information about sprains and strains and a bar chart to show the incidence of these and other injuries in one group of runners. They also have a worked example to show how to calculate the raw number from a percentage.

Additional notes

- The maths in the activity is heavily supported using a step-by-step method.
- Students will need to use their literacy skills to extract information from the given text.
- Students need to calculate a numerical value from the percentages read from the bar chart.

- Students should produce a detailed answer and a diagram of a joint to answer the question. N.B. The diagram provided in the Revision activity (task 4) could be supplied for those not confident doing their own drawing.

Extension activity answers

Task 1

- Muscle cells need a lot of mitochondria because contraction/movement needs a lot of energy, which is made from respiration.
- The genetic material is in the nucleus.
- When muscle cells contract they get shorter and fatter.

N.B. The cell drawn is a cardiac muscle cell for simplicity.

Task 2

- Total number of runners without a fall = 50
Number with sprains and strains = $(50 \div 100) \times 60 = 30$
Total number of runners with a fall = 40
Number with sprains and strains = $(40 \div 100) \times 34 = 13.6 = 14$
Decrease = $30 - 14 = 16$
Percentage decrease = $(16 \div 40) \times 100 = 40\%$
- The bar chart shows that 60% of the runners who didn't have a fall had sprains and strains, whereas only 34% of runners who did fall had sprains and strains. This shows that runners who didn't fall were more likely to have sprains and strains than runners who fell.
- Total number of runners who suffered sprains and strains = 44

Task 3

Bones are very hard. They have to be hard to protect and support other parts of the body. Therefore bones cannot stretch or tear.

Task 4

Students should write a detailed account of the structure and functions of ligaments and tendons.

They should realise that movement around the knee is impaired by a sprain due to ligament damage.

If the muscle had been strained it would be difficult to bend the leg. The written account could be supported by a diagram of the joint.