

Knowledge organiser for KS3 Science Biology Structure & function of body systems at Saint Ambrose College 2020+

What is covered in this unit?

The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. The structure and functions of the gas exchange system in humans, including adaptations to function. The mechanism of breathing to move air in and out of the lungs, using a pressure model to explain the movement of gases, including simple measurements of lung volume.

The impact of exercise, asthma, and smoking on the human gas exchange system. The structure and functions of the human skeleton, to include support, protection, movement, and making blood cells. Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles. The function of muscles and examples of antagonistic muscles.

Key vocabulary Respiratory- inhale, exhale, system, diaphragm. Movement-musculoskeletal, pivot, hinge, cartilage, synovial.

Key facts-

The Respiratory System

	Inhalation	Exhalation
Diaphragm	Flattens	Moves up
Rib muscle	Contract	Relax
Ribs move	Up and out	Down and in
Chest volume	Increases	Decreases
Pressure	Decreases	Increases
Air moves	In	Out

The skeleton has 4 main functions:

- Protection:** bone is hard and tough so it can protect the softer organs. For example the **skull** protects the brain and the **ribs** protect the lungs and the heart.
- Support:** The skeleton provides a rigid frame for the rest of the body to hang off. The softer tissues are supported which allows us to stand up.
- Movement:** Muscles are attached to our bones via **tendons**. Muscular contraction around our **joints** allows our bones to move.
- Production of blood cells:** Inside our larger bones, such as the **femur**, there is a soft tissue called bone marrow. This is where our red and white blood cells are made.

Joints – When two or more bones come together it is called a joint. Although most can move a few cannot. At joints where the bones can move, they are typically covered in smooth **Cartilage** and a layer of **Synovial fluid**. These make the action smooth and prevent the bones rubbing against each other. There are four types of joint...

<p>1: Fixed Joints eg. The plates of the skull fuse together and no longer move.</p>	<p>2: Hinge Joints eg. The elbow / knee</p> <p>These joints work like a lever and allow movement of 180°.</p>	<p>1: Ball and Socket Joints eg. Shoulder / Hip</p> <p>Allow 360° movement in any direction.</p>	<p>1: Pivot Joints eg. Neck</p> <p>These allow 360° movement in one direction.</p> <p>Our necks do not move the whole way because our muscles prevent it</p>
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Skeleton – There are 206 bones in the human body

Possible homework tasks

H/W: including project, Kerboodle, Kahoot. Oxford Uni H/W

Stretch & challenge (wider reading/independent work)

Stretch: modelling tasks, Biological Science Review research.