The Body Systems

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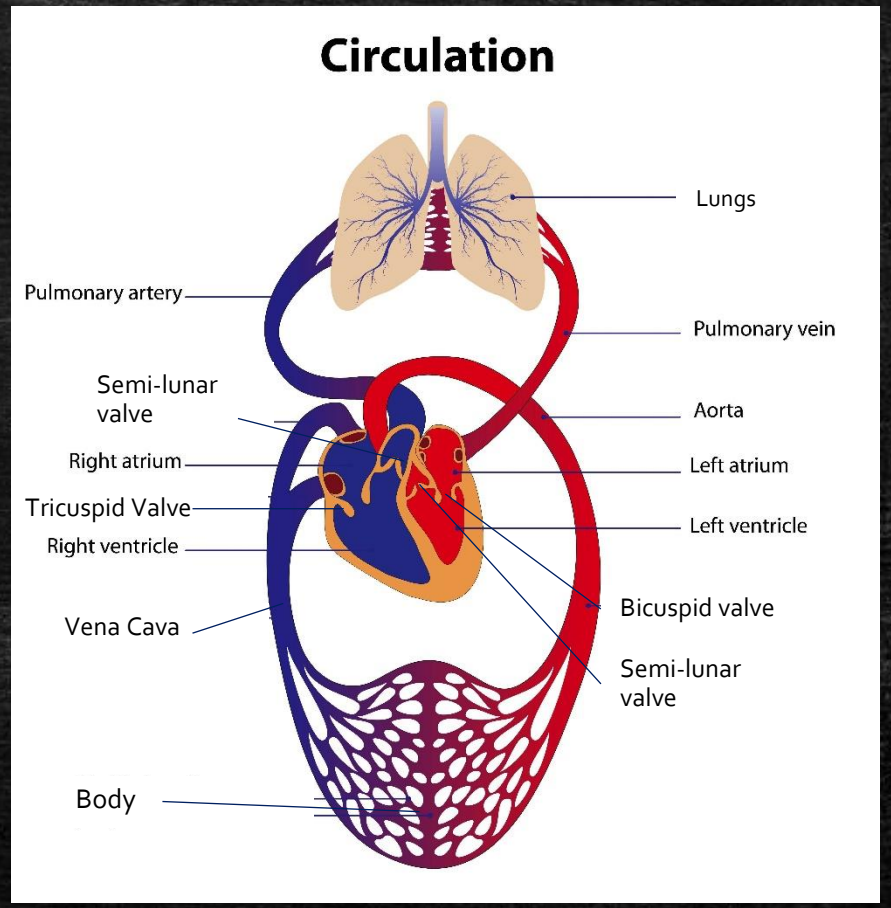
The Structure of the Cardiovascular System

- Pulmonary Artery-Takes deoxygenated blood out from the heart and into the lungs.
- Lungs-Oxygenates blood.
- Pulmonary Vein-Takes the oxygenated blood to the heart.
- Left Atrium-Opens the bicuspid valve to allow blood to travel through into left ventricle.
- Left Ventricle-Pumps blood out of heart and opens semi-lunar valve to the aorta.
- Aorta-Takes oxygenated blood away from the heart to the body.
- Body-Uses the oxygenated blood for energy.
- Vena Cava-Takes deoxygenated blood to the heart.
- Right Atrium-Opens the tricuspid valve to take blood to right ventricle.
- Right Ventricle-Pumps blood out of heart, opening up a semi-lunar valve to the pulmonary artery.



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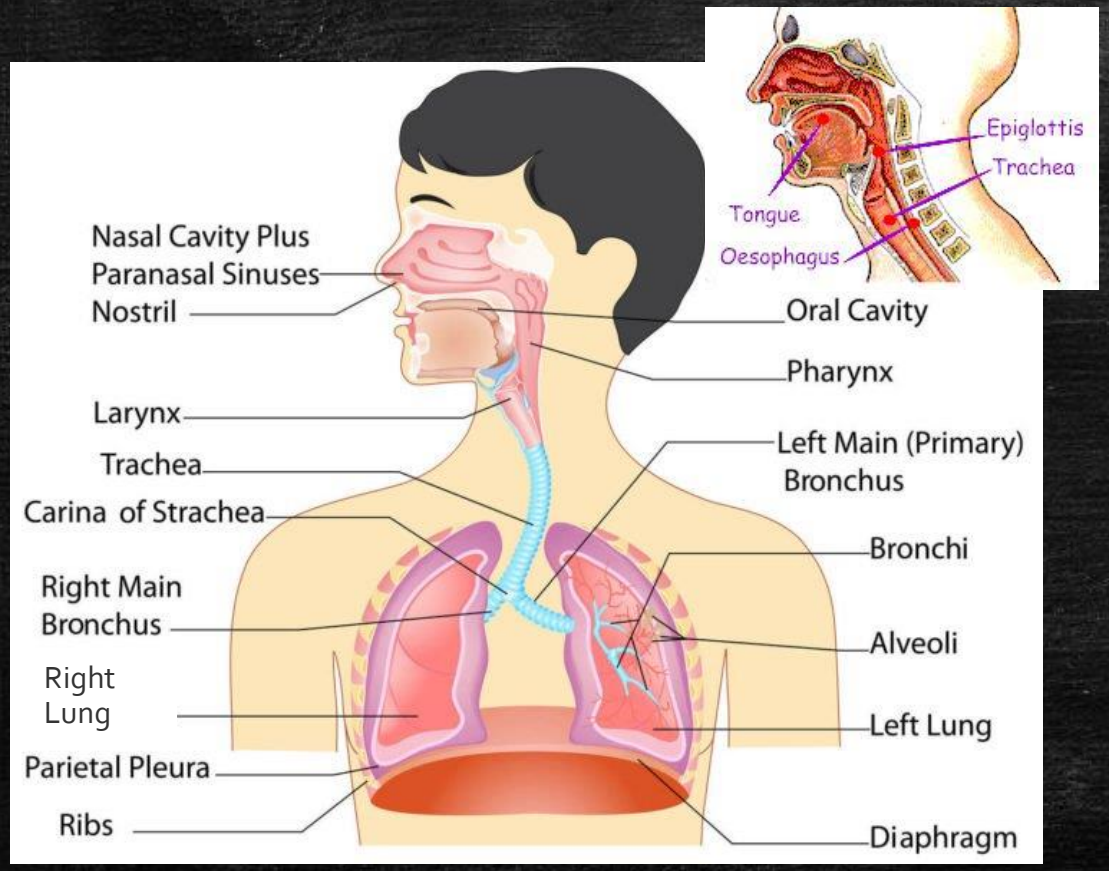
Veins, Arteries and Capillaries

Veins have 3 main layers, theses are the outer, middle and inner layer. Usually they are closer to the skin and contain valves. This is so the blood does not move backwards. Veins have thin walls and a large lumen. The function is to carry blood towards the heart. Typically it is deoxygenated blood with the exception of the pulmonary vein.

Arteries have thick and elastic walls. There are no valves and so blood travels in spurts because it does have a pulse. They carry blood away from the heart, which is usually oxygenated apart from the pulmonary artery which carries deoxygenated blood to the lungs.

Capillaries have walls that are one cell thick this is substances can easily diffuse through it. They are used to bring oxygen and nutrients to various tissues as well as transporting waste products back to the lungs. As part of gaseous exchange, capillaries transport carbon dioxide into the alveoli and oxygen from the alveoli into the capillaries out to the rest of the body.

The Structure of the Respiratory System



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Our respiration system has two main functions, one of these is to breathe in oxygen and the other is to breathe out carbon dioxide. We breathe in oxygen through our nose and mouth which then moves into the trachea. It then goes to the left and right side of our lungs through the bronchi. Both bronchus splits into different bronchioles where the oxygen travels further through. On the end of each of the bronchioles are air sacks that are called alveoli, this is where gaseous exchange takes place(exchanging oxygen with carbon dioxide). Each alveoli is covered by many capillaries(that are one cell thick). The oxygen we originally breathed in gets transported into the bloodstream, similarly this is where carbon dioxide is getting exchanged with oxygen and getting transported back into the alveoli to get breathed out.

The Respiratory System continued...

Muscles help our respiratory system to function. Two of these muscles are the diaphragm and the intercostal muscles.

Diaphragm-

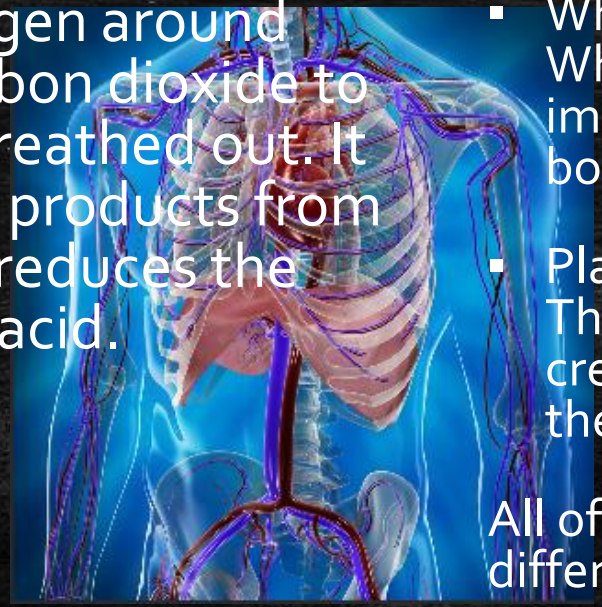
When we breathe in the diaphragm contracts and flattens this allows more air into our lungs. However when we breathe out it relaxes and forms a dome shape, decreasing the space in our lungs and pushing out more carbon dioxide. If our diaphragm is stronger then we can run longer and be fitter.

Intercostal Muscles-

When we breathe in, the muscles contract, forcing our rib cage up and out, which lets in more oxygen. Similarly, when we breathe out our intercostal muscles relax and the rib cage moves in and down.

The functions of the Cardio-Respiratory System

- The cardio-respiratory is the system that works with the blood vessels, heart and the respiratory system (lungs and airways). This system is transporting oxygen around the body and carbon dioxide to the lungs to be breathed out. It transports waste products from the muscles and reduces the build up of lactic acid.



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- Red Blood Cells-
  These blood cells remove carbon dioxide from your body, inside these there are haemoglobins (protein) that carries oxygen.
- White Blood Cells-
  White blood cells are part of the immune system and protects the body against diseases and viruses.
- Platelets-
  These cells react to bleeding by creating blood clots, helping to stop the bleeding.

All of these blood cells are produced in different parts of bone marrow.

Cardio-respiratory System Continued...

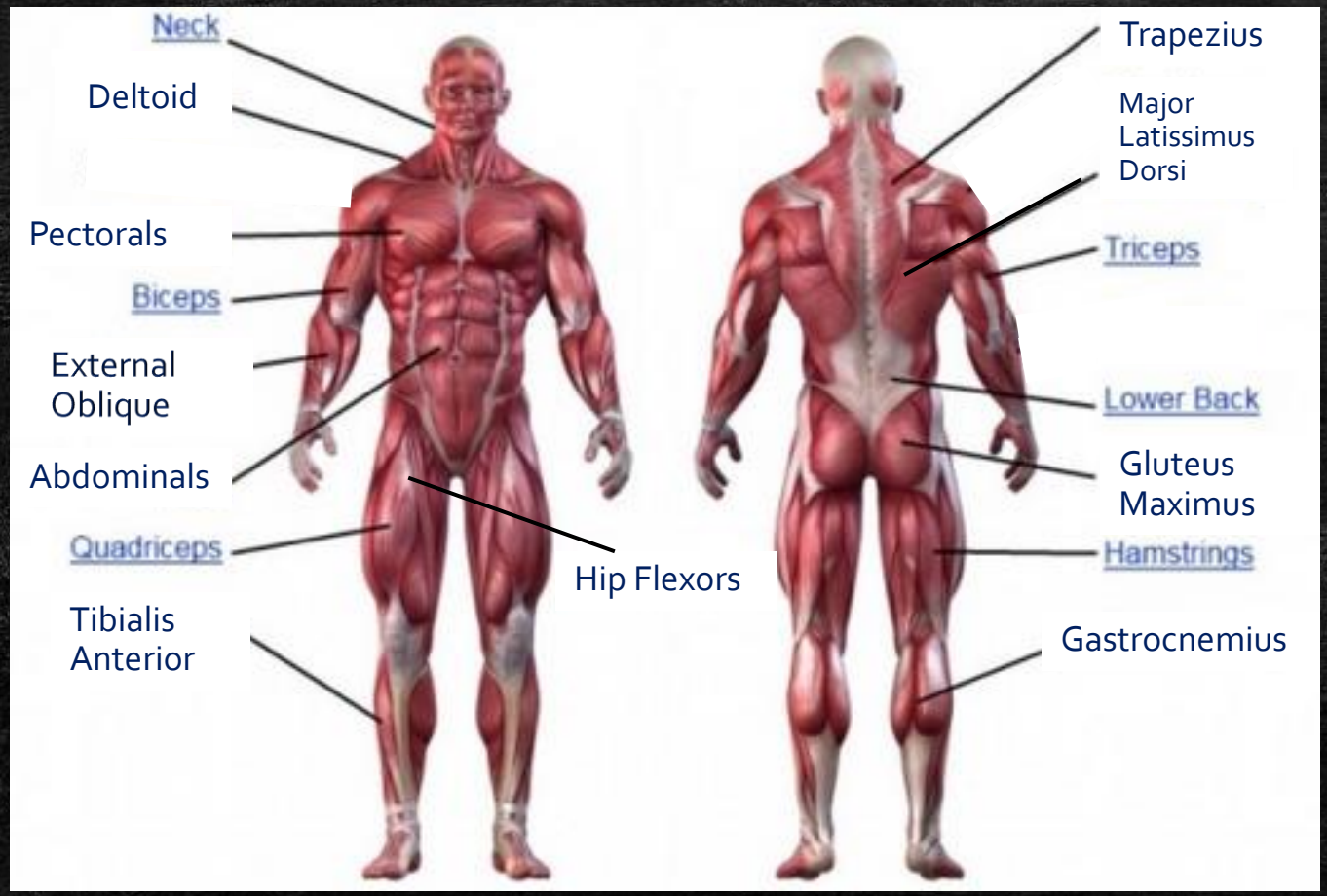
- Transportation-

The cardio-respiratory system is where the respiratory and cardiovascular systems are working together in order to transport oxygen around the body and carbon dioxide to the lungs through the blood stream. It is important it does this because it prevents lactic acid from building up, causing muscle cramps. Whilst doing this, it provides the cells with nutrients.

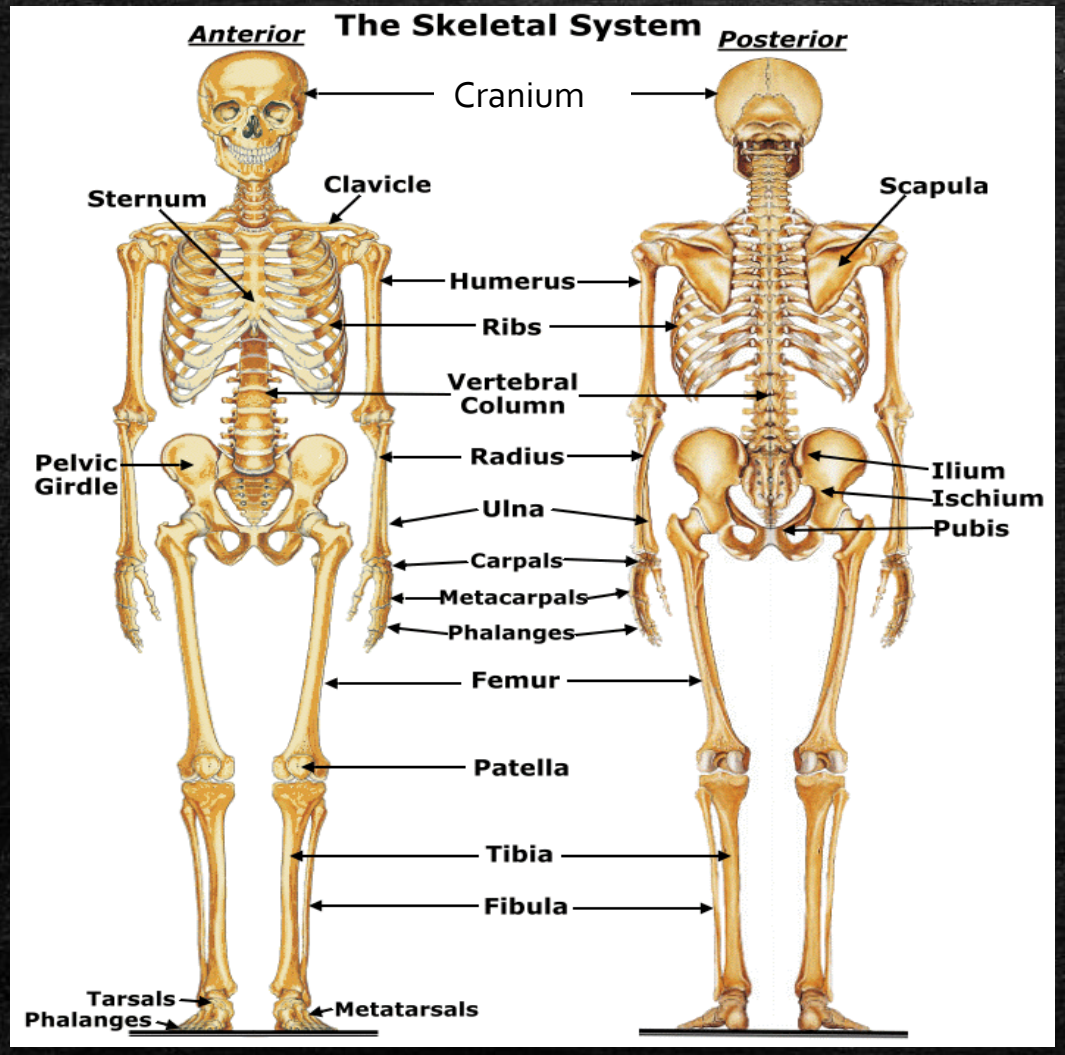
- Regulation-

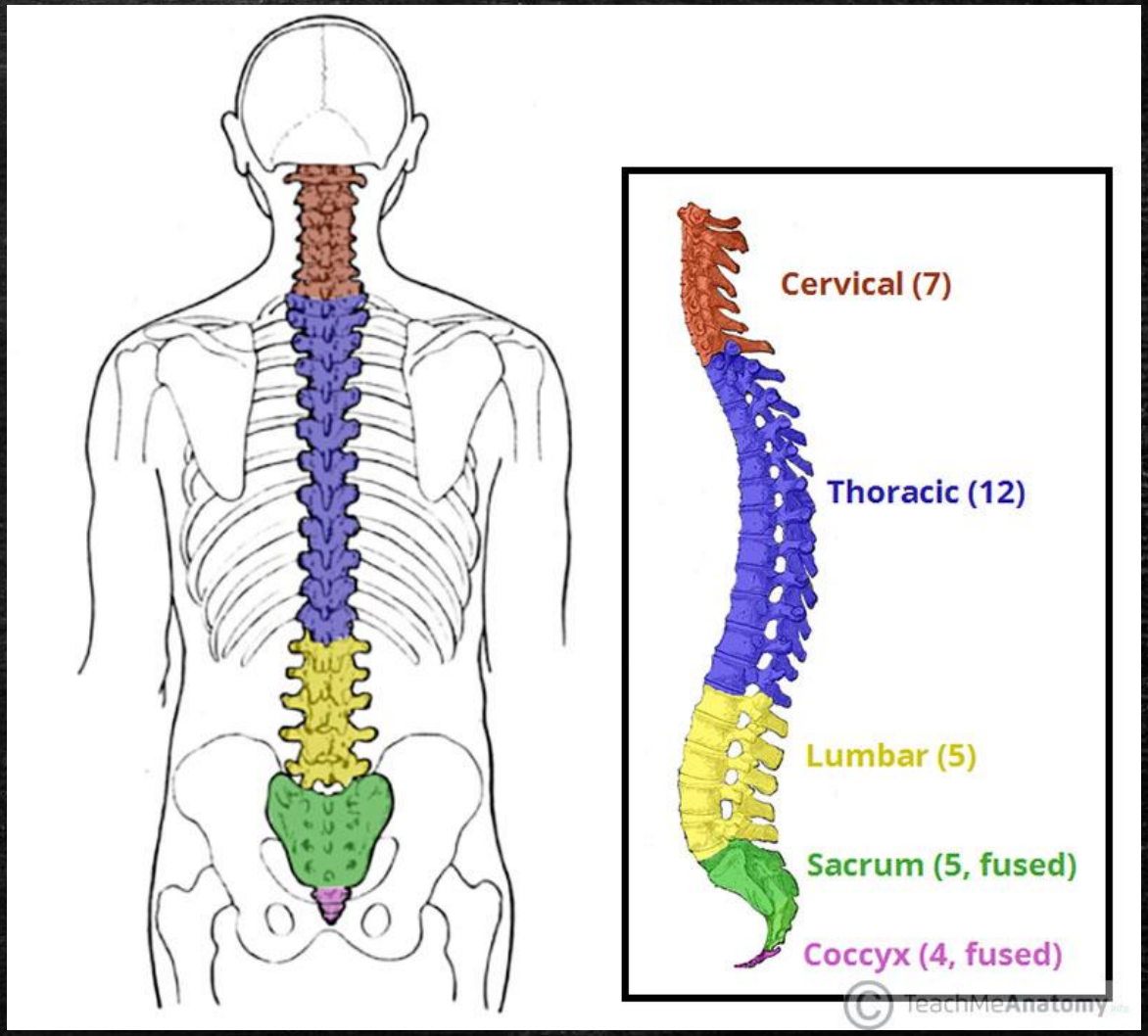
The temperature of the body during sport regulates through vasoconstriction and vasodilation. Vasoconstriction is when the elastic walls enable vessels to decrease in diameter e.g. when we are cold, we shiver and reduce blood flow near to the skin, this way we keep the warmth in. Vasodilation is when elastic walls enable vessels to increase in diameter e.g. blood vessels open so blood becomes closer to the skin to lose heat after exercise. It also regulates pH balance. When there is an increase of carbon dioxide it results in a decrease of blood pH, so haemoglobins release oxygen. However if there is a decrease in carbon dioxide this cause an increase of blood pH and haemoglobins pick up more oxygen.

The Muscular System

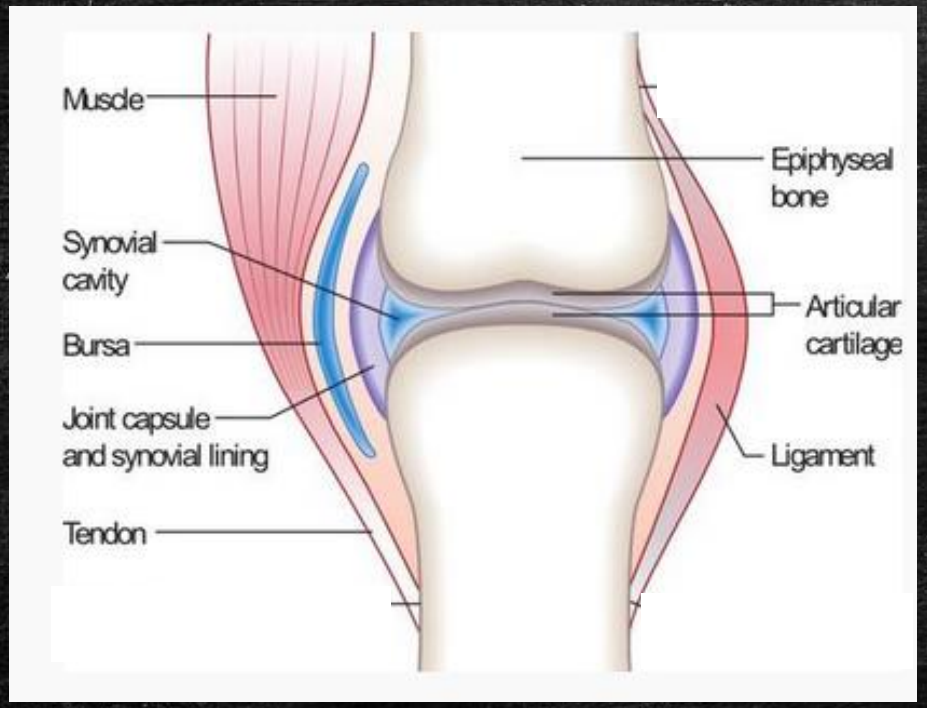


The Skeletal System





Joints



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- A joint is where two bones meet and is typically split into 4 main parts. These are ligaments, tendons, cartilage and synovial fluid. Tendons attach bones to muscle and help with muscle contractions . For example if you were kicking a ball, the muscle would contract, moving the bone it is attached to, to allow us to kick. Ligaments are there to attach bone to bone and are bands of connective tissue. They have to be tough and resilient so that the joints are stable and avoid dislocation. Cartilage is soft tissue and its role is to reduce friction, act as a shock absorber and prevent bones from rubbing together. Synovial fluid surrounds every joint and is a thick fluid that ensures easy body movement by reducing friction. It can also help to evenly share the pressure across a joint.

Functions Of The Musculo-Skeletal System

- Protecting- Organs such as the lungs and heart need to be protected and ribs help do that. If we were to break a rib then it could move inwards and potentially puncture our lungs, if this happened we wouldn't be able to breathe properly. In rugby if I was to get tackled I could fall hard on the floor and I would have my ribs to protects my lungs. Another way of protecting the body is the vertebrae. This protects the spinal cord, if this gets damaged their would be further impact on the rest of the body because of how important it is.

- Blood Production- Blood cells are produced in the bone marrow. The vertebrae are the bones that produce the most blood.

- Support- If we did not have bones then we would have no structure in our body, by having structure it keeps us upright. In gymnastics it is important so that a gymnast can hold a handstand for example.

- Storage-

Movement At The Joints

- To move about, our muscles work with our bones at the joints by contracting which pulls our bones to move because they are attached by tendons. Our muscles work in antagonistic pairs. A good example of this is a bicep curl. When we pull our arm up, our bicep contracts which makes this movement because it is attached to the forearm. While this is happening our triceps relaxes. When we want to straighten our arm again, our triceps now contracts whilst our bicep relaxes.