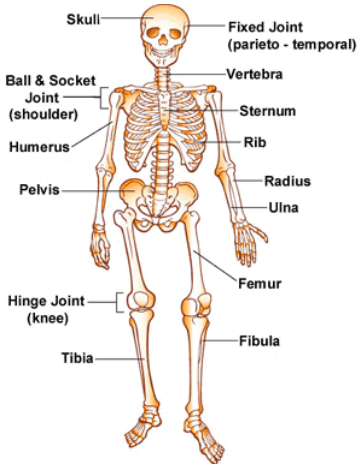
ATHERTON HIGH SCHOOL

Tissues and Organs **Knowledge Organiser**

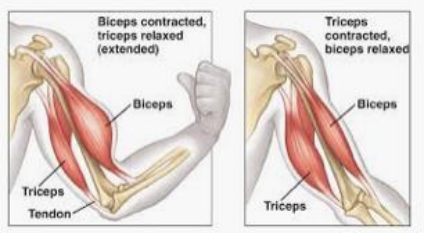
## The Musculoskeletal System

1. The musculoskeletal system is made up of bones, muscles and other connective tissue.

2. The skeleton is made up of bones. It has 4 important functions:
    - to **support** the body and give it shape
    - to **protect** the internal organs
    - to allow body **movements**
    - to produce **blood cells**



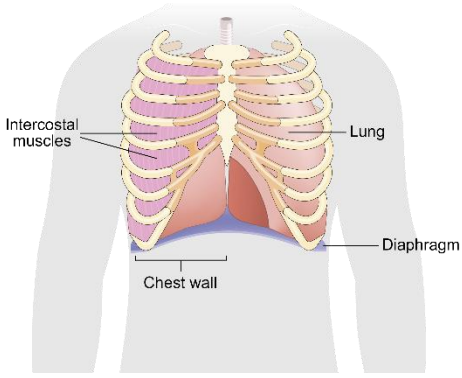

3. Red and white blood cells are produced in the bone marrow of flat bones such as the **pelvis**.
4. The skeleton and muscles interact to allow movement.
5. The function of muscles is to allow movement by **contracting**
6. **Antagonistic muscles** work in pairs.
7. An example of antagonistic muscles is the **biceps** and **triceps.**
8. **Joints** occur where two or more bones join together.




9. **Cartilage** in joints prevents bones rubbing together.
10. An **organ** is made up of different tissues that work together to perform a certain function.

11. We can use the **force applied** as a measurement of **muscle strength.**
12. A **Newtonmeter** can be used to measure the force exerted by a muscle.

## Gas Exchange and Breathing




13. **The respiratory system** is made of the organs involved in gas exchange.
14. Breathing occurs through the action of muscles in the **ribcage** and **diaphragm**.
15. The lungs are surrounded by the **ribcage.**
16. The ribs have **intercostal muscles** between them. These can contract and relax to move the ribcage, changing the size of the **chest cavity.**
17. Below the lungs sits a layer of muscle called the **diaphragm.**
18. The **diaphragm** can contract and relax to change the size of the **chest cavity** where the lungs are**.**
19. Our respiratory system allows **air** to move into and out of the lungs through the nose and mouth.
20. Air enters the body through the **nose** and **mouth.** It then travels down the **windpipe** (**trachea**), through a **bronchus** then a **bronchiole** into an **alveolus.** Oxygen diffuses into the blood at the alveoli.

21. The **trachea** is the rigid tube that connects the mouth and nose to the lungs.
22. The **bronchi (singular: bronchus)** are rigid tubes that allow air to pass into each of the two lungs. These divide into smaller branches called **bronchioles.**
23. The **alveoli** are microscopic air pockets in the lungs lined with cells that form a **very thin membrane**. These surround the ends of bronchioles.

24. The alveoli provide an efficient exchange surface because:
    - The walls are thin, made of just one layer of **epithelial cells**
    - They have a **large surface area**: There are lots of them and they are spherical in shape
    - They have a **good blood supply**: There are lots of blood capillaries wrapped around them.
    - They are **moist**, which helps gases to diffuse across more easily.
25. **Gas exchange** is the transfer of gases between an organism and its environment
26. In gas exchange, oxygen and carbon dioxide move between alveoli and the blood.
27. The amount of oxygen required by body cells determines the **rate of breathing**.
28. Exercise, smoking and asthma can all affect the gas exchange system
29. Parts of the gas exchange system are adapted to their function.
30. The bell jar can be used to model the lungs. There are limitations to the bell jar model.
31. Changes in volume and pressure inside the chest move gases in and out of the lungs.
32. Asthma is a common condition where the airways (bronchi and bronchioles) become **narrower.**
33. Asthma can be treated by **inhaling** a drug (Ventolin) that widens the airways to allow more air to move in and out of the lungs.

## Drugs

34. A drug is any substance that has an **effect** on the body
35. A drug taken to treat an illness is called a **medicine.**
36. Recreational drugs are taken by people for **enjoyment.** They can often be **addictive**
37. Drugs are classified as illegal if they cause serious harm to the body.
38. **Stimulants** increase alertness and activity.
39. **Depressants** relax the nervous system and slow down reflexes.
40. **Opium-related** painkillers cause feelings of pleasure and trance state.
41. **Hallucinogens** cause 'out of body' experiences and mood swings

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