

كلية المستقبل الجامعة

قسم تقنيات بصرية

Medical Terminolog

المرحلة الاولى

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Lecture 7-The blood and lymphatic system

The musculoskeletal system

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Lecture objectives

- Realise what are the blood and lymphatic system terms
- Understand what are the terms of the musculoskeletal system

The blood and lymphatic system

Blood

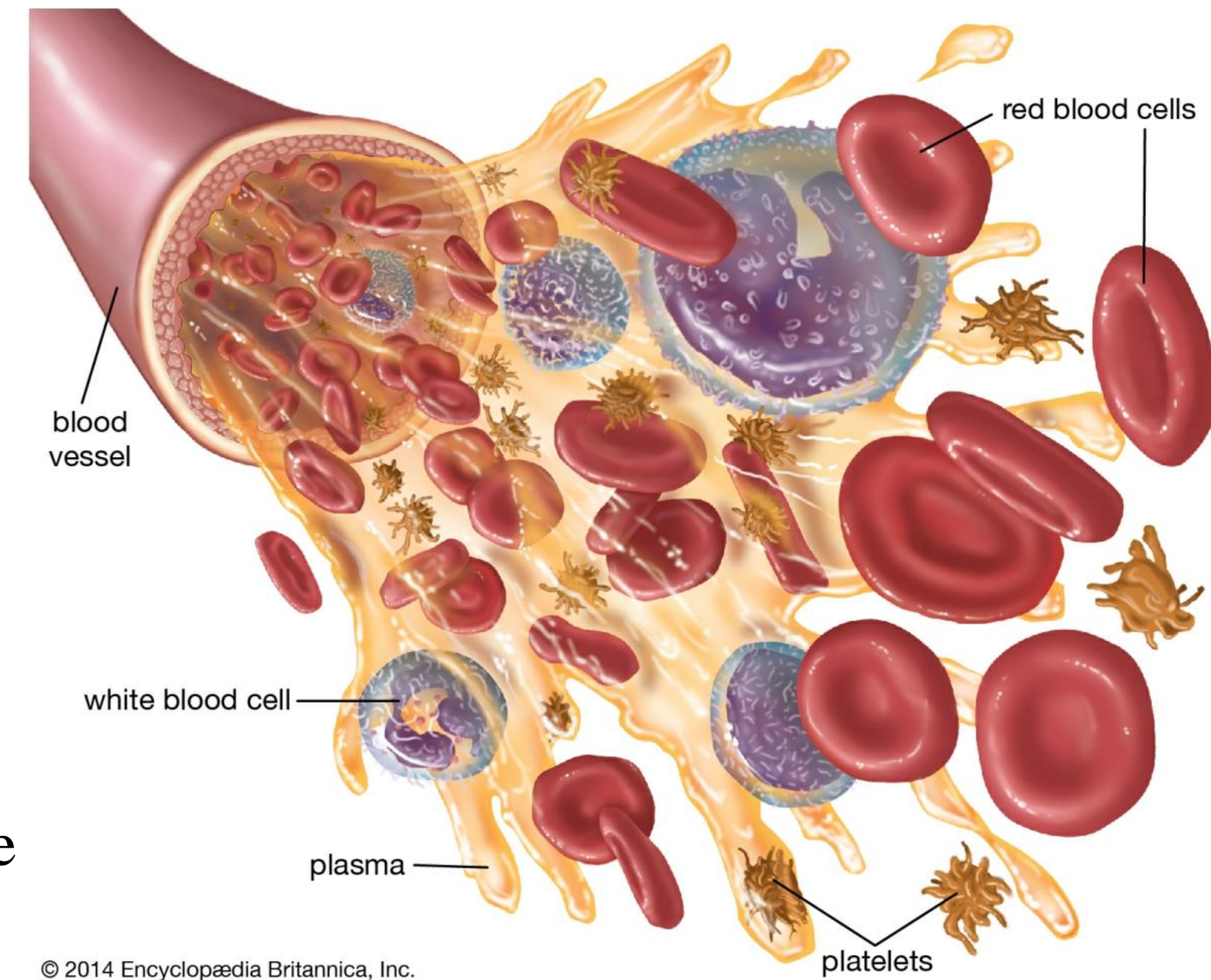
Blood is made up of (cells & plasma). The plasma is largely water, containing proteins, nutrients, hormones, **antibodies**, and dissolved waste products.

Erythrocytes

Red cells are small red disk shaped cells. They contain haemoglobin, which combines with oxygen in the lungs and it transport to the body's cells.

Leukocytes

White cells help the body **fight bacteria and infection**. When a tissue is damaged or has an infection the number of **leukocytes increases**. Leukocytes are formed in the small ends of bones. Leukocytes can be classed as **granular** or **non granular**. There are three types of granular leukocytes (eosinophils, neutrophils, and basophils), and three types of non-granular (monocytes, T-cell lymphocytes, and B-cell lymphocytes).



The blood and lymphatic system

Immune system

Immunity is the body's defense system against **infection** and **disease**. **White blood** cells play a key role.

Some rush to attack any **harmful microbes** that invade the body. Other white blood cells become **specialists**, adapted to fight particular pathogens. All of them work to keep the body as healthy as possible.

Functions of the lymphatic system

- **Drains excess fluids and proteins** from tissues in the body
- **Removes waste products** produced by cells.
- **Fights infections.**
- **Absorbs fats and fat-soluble** vitamins from the digestive system

The blood and lymphatic system

Components of the lymphatic system

Lymph

Lymph is a fluid that circulates throughout the body in **the lymphatic system**. It forms when **tissue fluids/blood plasma** drain into the lymphatic system. It contains a high number of **lymphocytes** (**white cells** that fight infection).

Lymph vessels

Walled, valved structures that carry lymph around the body

Lymph nodes

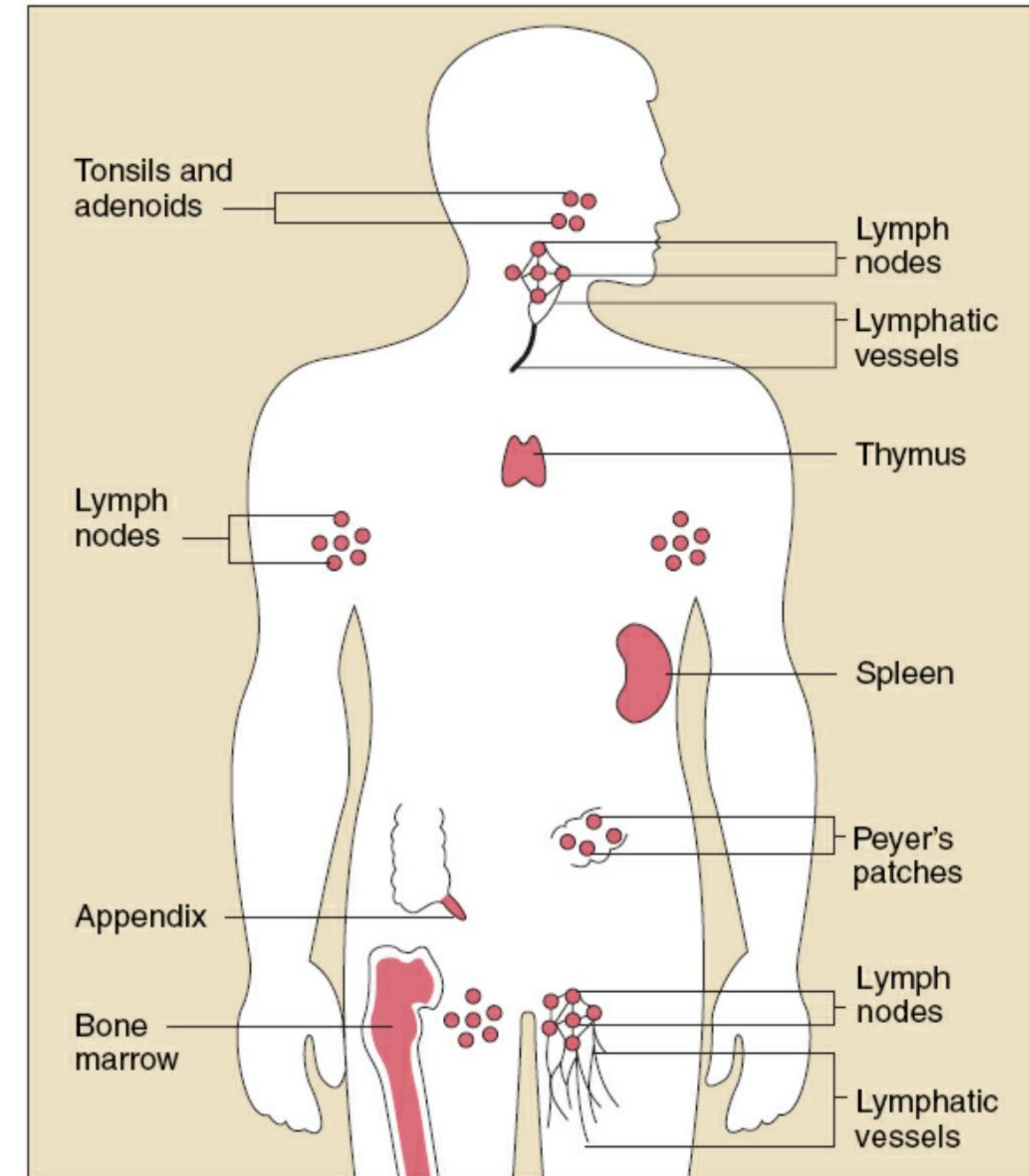
Small bean-shaped glands that **produce lymphocytes**, **filter** harmful substances from the tissues, and contain **macrophages**, which are cells that digest cellular debris, pathogens and other foreign substances. Major groups of lymph nodes are located in the **tonsils, adenoids, armpits, neck, groin**.

Thymus

it is a specialized organ of the immune system, located between the breast bone and heart. It **produces lymphocytes**.

Spleen

The spleen is an organ in the upper left abdomen, which **filters blood**, disposes of **worn-out red blood cells**, and provides a '**reserve supply**' of blood.



The musculoskeletal system

The musculoskeletal system is made up of **bones, cartilage, ligaments, tendons** and **muscles**, which form a framework for the body.

There are about 206 **bones** in the human body, they have the function of **protecting** and **preserving** the shape of soft tissues. The skeleton provides a framework for the muscles. bones are moved by the skeletal muscles.

Thorax (**ribs, sternum** and **thoracic vertebrae**) form a cage which protects many of the body's vital organs.

The Axial skeleton (This is the main body including the **pelvis, thorax, and skull**)

The Proximal skeleton (The femur and humerus)

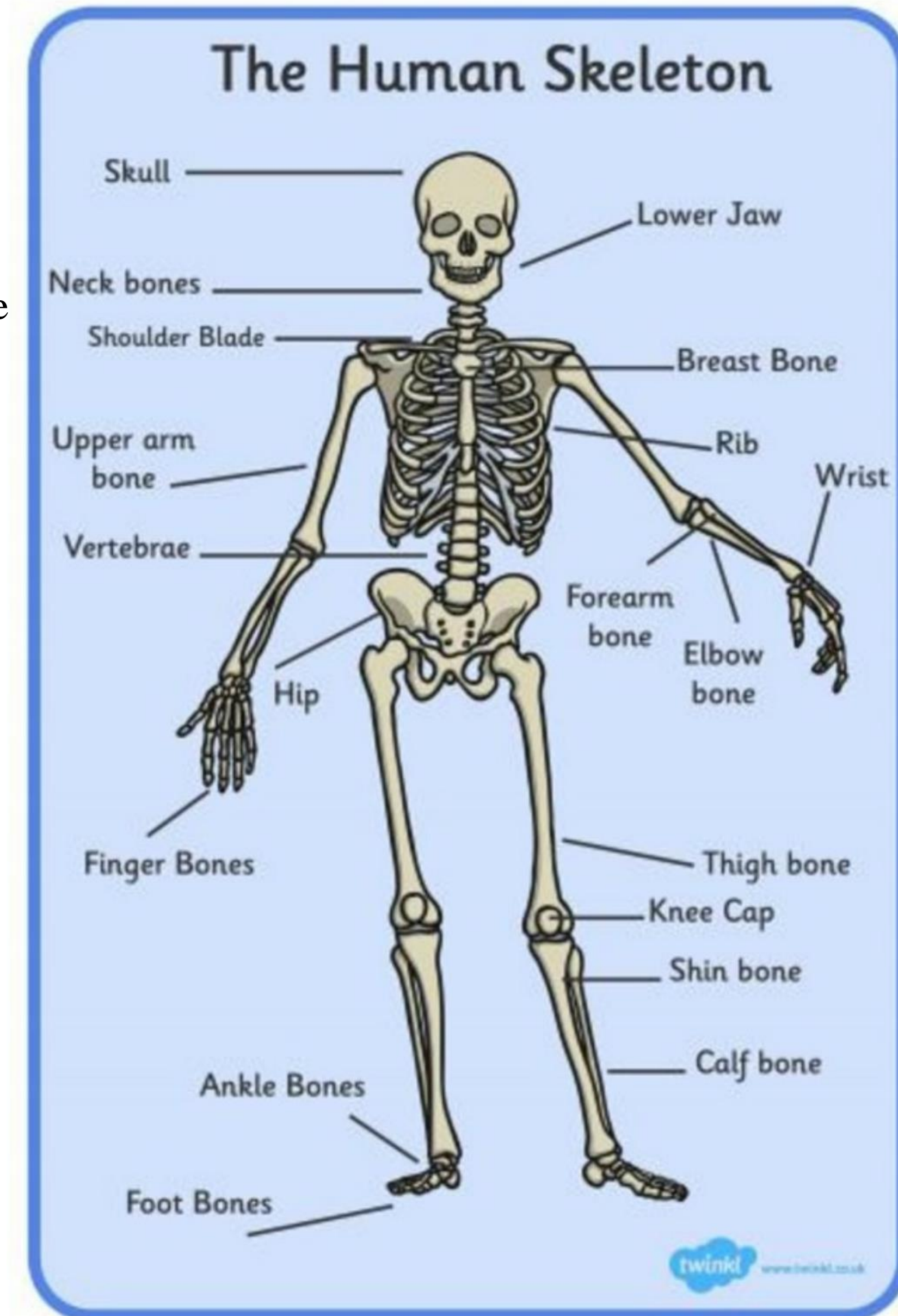
The Distal skeleton (The lower legs (feet bones) and lower arm (bones of the hand)).

The joints (are the articulating surfaces between two bones)

The spine (The spine is divided into 5 main areas and each bone (vertebrae) has a letter and number)

Cartilage :Tough connective tissue covering the ends of the bone. The cartilage reduce friction and acts as a shock absorber.

Ligament: Fibrous tissue that connects bones or cartilage to strengthen and support joints.



The musculoskeletal system

<i>component</i>	<i>meaning</i>	<i>example</i>
ARTHR-	joint	arthritis = inflammation of the bone
CHONDR-	cartilage	chondrocyte = a cartilage cell
COST-	rib	costalgia = pain in the ribs
OSTEO-	bone	osteosarcoma = a type of bone tumour
SCOLIO-	curved / crooked	scoliosis = curvature of the spine
-LYSIS	disintegration	osteomyelitis = inflammation of the bone
-OSIS	disease	osteoporosis = reduced bone mass-fracture prone
-TOMY	incision into	thoracotomy = incision into chest/thorax

The musculoskeletal system

The main function of muscles is for motion. Many muscles work in groups but some may work alone e.g. the diaphragm for breathing, and the heart for circulating blood.

Characteristics of muscle tissue

Irritability : (excitability) muscles receive and respond to stimulation.

Contractability: allows muscles to change shape to become shorter and thicker.

Extendibility: living muscle cells can be stretched and extended; longer and thinner.

Elasticity: once the stretching force is removed a living muscle cell retains it's original shape.

Types of muscles

Skeletal muscles

are *striated* (have distinct bands) made up of *fibres* (long cells). The cells are multinucleated (many cell nuclei) and contract and relax quickly. These are *voluntary* muscles attached to the skeleton that help to move the bones. There are nearly 700 skeletal muscles spread all over the body.

Visceral muscles

are smooth and without banding. They have short fibres and single cell nuclei. These are involuntary muscles e.g. found in walls of blood vessels and viscera (organs in the abdominal cavity).

Cardiac muscles

are *striated* (but less distinct than skeletal muscles), and are *involuntary*.

The musculoskeletal system

<i>component</i>	<i>meaning</i>	<i>example</i>
SARC-	tissue	sarcoma = tumour of supportive tissues (muscle, bone etc.)
INTRA-	into	intramuscular injection = injection into a muscle
MYO-	muscle	myocardium = heart muscle
BI-	two	biceps = muscles with two heads
TRI-	three	triceps = muscles with three heads