

# THE BODY AND PHYSICAL ACTIVITIES

The learning outcomes;

1. Analyze the role of the various body systems in effective performance of physical activities, understanding abilities and limitations regarding fitness
2. Interpret the changes on the body in response to physical activities and relate them to the various body systems
3. Understand ways that prevent non – communicable diseases.
4. Understand the meaning and types of motivation.
5. Understand how performance is affected by encouragement and the physiological responses.
6. Analyse the relevance of goal setting in performance.

## KEY WORDS

- FITNESS
- NON-COMMUNICABLE DISEASES
- MOTIVATION
- BALANCED DIET
- GOAL
- GOAL SETTING
- BODY SYSTEM

## Role of the body systems in performance of physical activity

Our body is made up of various body systems which serve different functions.

For the systems to function properly, specific nutrients are required for optimum performance

## The skeletal System

The skeletal system is composed of bones and cartilages.

There are two parts of the skeleton; axial and appendicular.

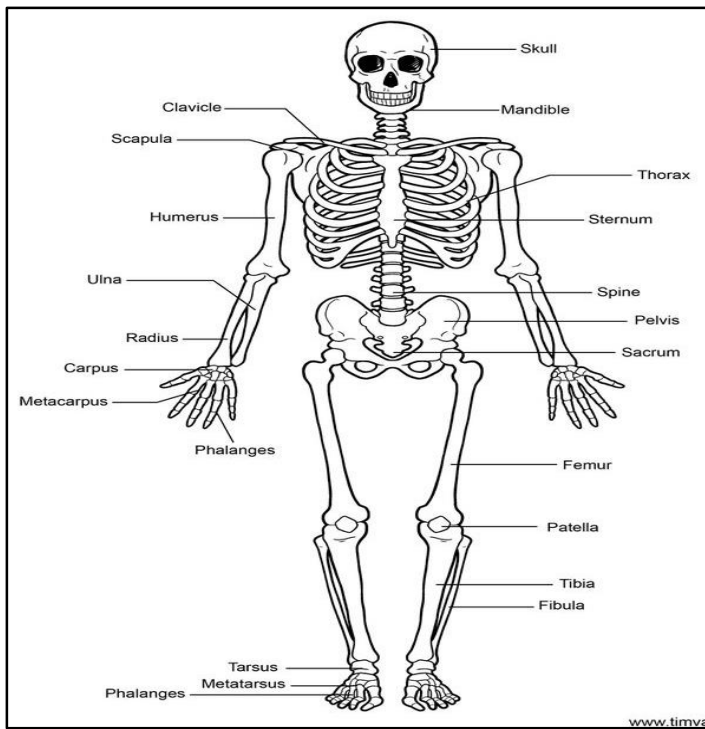
The axial skeleton consists of the bones of the head and trunk.

The appendicular skeleton consists of the bones within the limbs, as well as supporting pectoral and pelvic girdles.

There are 206 bones in an adult human body

## Role of skeletal system in Sports performance

1. Movement – the skeleton allows movement of the body as a whole and its individual parts. The bones act as levers and also form joints that allow muscles to pull on them and produce joint movements.
2. Support – the skeleton keeps the body upright and provides a framework for muscle and tissue attachment.
3. Protection – the bones of the skeleton protect the internal organs and reduce the risk of injury on impact. For example, the cranium protects the brain, the ribs offer protection to the heart and lungs, the vertebrae protect the spinal cord and the pelvis offers protection to the sensitive reproductive organs.
4. Production of blood cells – certain bones in the skeleton contain red bone marrow and the bone marrow produces red blood cells, white blood cells and platelets. Examples of bones that contain marrow are the pelvis, sternum, vertebrae and clavicle.
5. Mineral storage – the bones themselves are made of minerals and act as a mineral store for calcium and phosphorous, which can be given up if the body requires the minerals for other functions.
6. Structural shape – the skeleton provides the human shape and determines the height of a person.



## Types of Joints

### Synovial joint

A synovial joint, also known as diarthrosis, joins bones or cartilage

### Saddle joint

A saddle joint is a type of synovial joint in which the opposing surfaces are reciprocally concave and convex. It is found in the thumb, the thorax, the middle ear, and the heel

### Ball-and-socket joint

The ball-and-socket joint is a type of synovial joint in which the ball-shaped surface of one rounded bone fits into the cup-like depression of another bone. E.g shoulder joint

### Hinge joint

A hinge joint is a bone joint in which the articular surfaces are molded to each other in such a manner as to permit motion only in one plane e.g elbow and knee joints

### Cartilaginous joint

Cartilaginous joints are connected entirely by cartilage. E.g symphysis pubis between the right and left pubic bones.

The **pivot joint**, also called the rotary joint or trochoid joint, e.g pivot joints in the neck, that allows the head to rotate and the pivot joints between radius and ulna help in rotating the forearm

A **fibrous** joint is where the bones are bound by a tough, **fibrous** tissue. E.g the skull

## The Muscular System

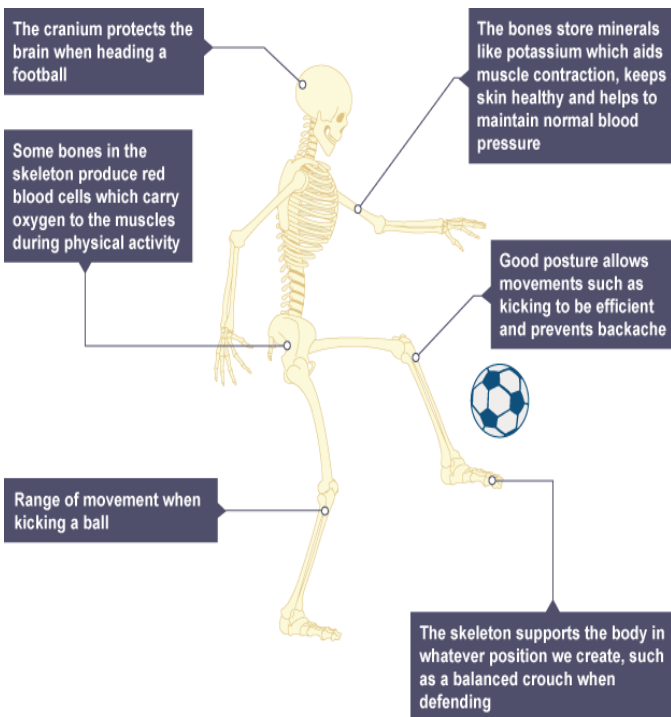
The muscular system consists of all the body muscles.

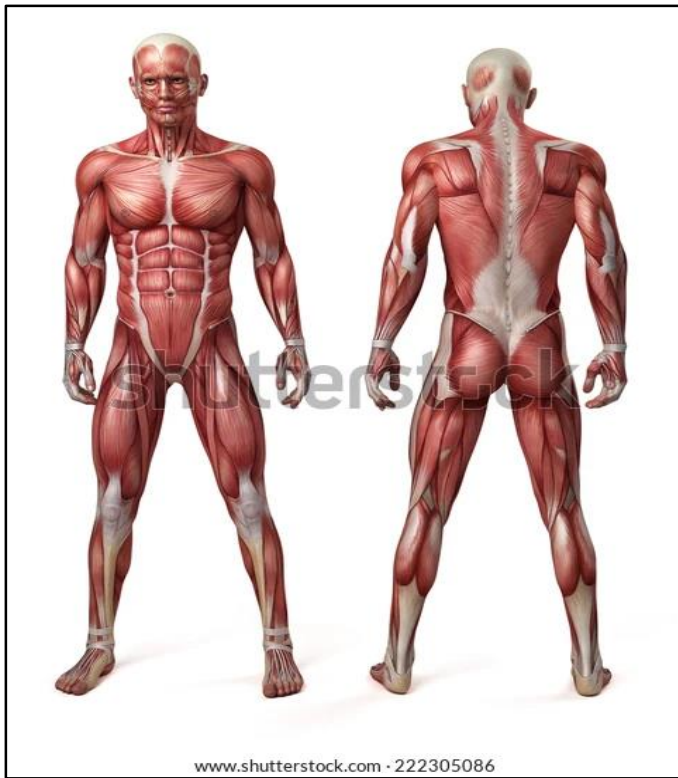
There are three muscle types; smooth, cardiac and skeletal muscles.

Smooth muscle is found within walls of blood vessels and hollow organs such as the stomach or intestines.

Cardiac muscle cells form the heart muscle, also called the false.

Skeletal muscles attach to the bones of the body.





## Role of Muscular Body system

### 1. Movement

- Skeletal muscles pull on the bones causing movements at the joints.
- Skeletal muscles pull on the soft tissues of the face causing facial expressions.

### 2. Support

- Muscles of the body wall support the internal organs.

### 3. Protection

- Skeletal muscles, particularly of the body wall, cushion the body's internal organs (abdominal [cavity](#)) from force applied to the exterior of the body.

### 4. Heat generation

- Heat is a waste product of muscle metabolism, which helps maintain an internal body temperature

### 5. Blood circulation

- Cardiac muscles aid pumping action of the [heart](#) by aiding blood circulation.

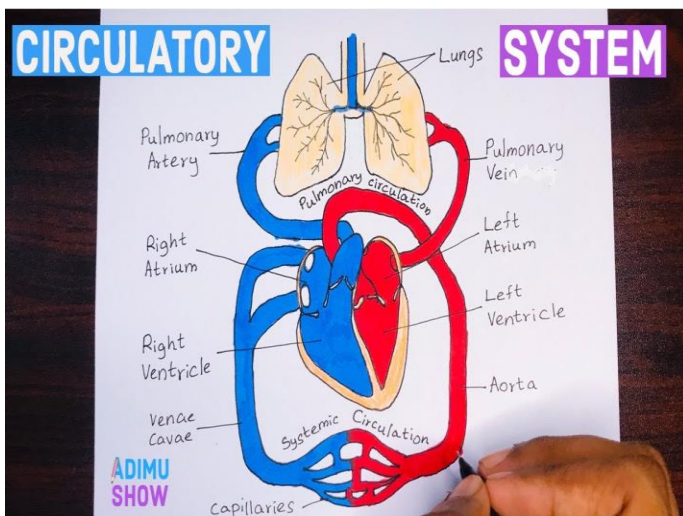
## The Circulatory System (cardiovascular system)

The system that contains the heart and the blood vessels and moves blood throughout the body.

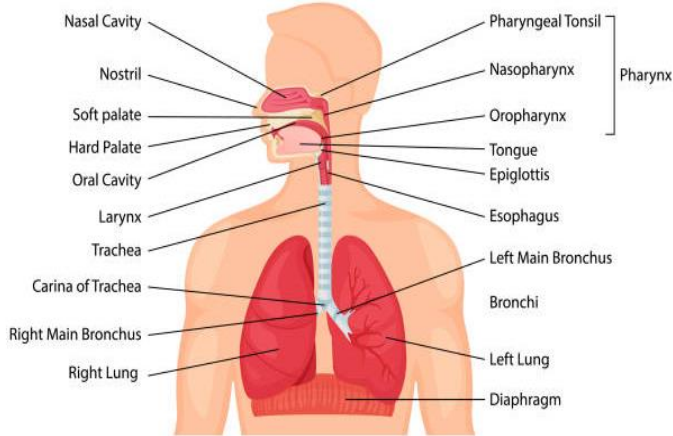
The circulatory system (cardiovascular system) pumps blood from the heart to the lungs to get oxygen.

The heart then sends oxygenated blood through arteries to the rest of the body.

The veins carry oxygen-poor blood back to the heart to start the circulation process over



# Respiratory System



## Role of respiratory system

1. The lungs and respiratory system allow us to breathe.
2. They bring oxygen into our bodies (called inspiration, or inhalation) and send carbon dioxide out (called expiration, or exhalation).

## Other body systems

### Immune system

A complex network of cells, tissues, organs, and the substances they make that helps the body fight infections and other diseases.

### Nervous system

The organized network of nerve tissue in the body. It includes the central nervous system (the brain and spinal cord), the peripheral nervous system (nerves that extend from the spinal cord to the rest of the body)

### Digestive system

The organs that take in food and liquids and break them down into substances that the body can use for energy, growth, and tissue repair.

### Excretory System

Organs which remove metabolic wastes and toxins from the body

### Endocrine system

The glands and organs that make hormones and release them directly into the blood so they can travel to tissues and organs all over the body

## Balanced Diet

Balanced diet is a diet consisting of adequate amounts of all the necessary nutrients recommended for healthy growth.

### Components of Balanced diet

1. **Proteins**
2. **Carbohydrates**
3. **Vitamins**
4. **Dietary fibre**
5. **Fats**
6. **Mineral salts**
7. **Water**

### Importance of food nutrients

**1. Carbohydrates;** Posho, Sweet potatoes, cassava, Rice

They provide the body with glucose which is converted to energy to support body functions

**2. Vitamins;** Carrots, Oranges, Cabbages, Broccoli

- ✓ Keeps our bones strong
- ✓ Improves eye sight
- ✓ Promotes healthier skin and hair
- ✓ Aids brain function

**3. Proteins;** Fish, Chicken, beans, meat, Eggs, ground nuts

- ✓ acting as enzymes and hormones
- ✓ maintaining proper fluid and acid-base balance

- ✓ providing nutrient transport
- ✓ making antibodies
- ✓ enabling wound healing and tissue regeneration
- ✓ providing energy when carbohydrate and fat intake is inadequate

#### **4. Dietary minerals; Ovacado, Eggs, Beans, Fish**

- ✓ Keep bones healthy
- ✓ Muscles
- ✓ Heart
- ✓ Helps brain work properly

#### **5. Dietary fibers; Mangoes, Cabbages, Ovacado, Carrot**

- ✓ Increases the weight and size of stool and softens it.
- ✓ Lowers cholesterol(fats) levels

#### **6. Fats; Chicken Skin, Milk Meat**

- ✓ Stores energy
- ✓ Solvent for the fat – soluble vitamins
- ✓ Against rapid heat skin loss

#### **7. Water**

- ✓ Regulates body temperature
- ✓ Moistens tissues in the eyes, nose and mouth
- ✓ Protects body organs and tissues
- ✓ Lubricates joints

#### **Deficiency of Nutrients**

Lack of nutrients in the body may lead to;

1. A carbohydrate – deficient may cause headache, fatigue, weakness, constipation
2. Low in take of proteins may cause muscle wasting and increase the risk of bone fractures
3. Lack of fats may lead to depression
4. Lack of water; constipation, blood sugar fluctuations

5. Mineral deficiency; Leads to variety of health problems e.g weak bones, fatigue

#### **NON – COMMUNICABLE DISEASES**

##### **Meaning;**

This is a disease that is not transmissible directly from one person to another

**Examples;** Parkinson’s disease, stroke, diabetes

##### **Prevention**

1. Do regular physical exercises
2. Eat healthy food
3. Avoid drug abuse

##### **Causes of Non – communicable diseases**

Tobacco use, genetics, physical inactivity, unhealthy diets, alcohol

##### **Effects of Non- communicable diseases**

1. Tremendous healthcare costs
2. Reduced productivity
3. Low social and economic development

##### **Physical Activities to prevent Non- communicable diseases**

- Jogging, walking, running, skipping the rope, swimming, aerobics, gardening etc

## **Motivation**

##### **Meaning.**

This is the state within an individual that drives behaviour towards some goal

##### **Intrinsic motivation**

This comes from within the individual. You engage in an activity solely because you enjoy it and get personal satisfaction

##### **Extrinsic motivation**

This motivation arises from outside. You do something in order to gain an external reward.

# Importance of Increasing motivation

1. Allows positive change in behaviour
2. Develop competencies
3. Be creative
4. Set Goals
5. Grow interests
6. Make plans
7. Develop talents
8. Boost engagement

# Scenario Question

"Imagine a person is preparing for a marathon. Describe how the respiratory, circulatory, and muscular systems collaborate to support the individual during both training and the actual marathon event. Highlight the specific roles each system plays and the interdependencies between them in optimizing oxygen delivery and energy production for peak performance."

## Goal Setting

This is a training technique that can be used to increase an individual's commitment towards achieving a personal target.

### SMART APPROACH



This **SMART** acronym aims to break down five key aspects to achieving goals. This is to help ensure all areas are focused on the individual making them effective. Using a football example the article highlights how athletes can benefit from an approach that is

- **Specific** – A defensive player to win over 90% of their challenges throughout a 90-minute match. An attacking player to make 10-15 runs or attempts on goal throughout a 90-minute match.
- **Measurable** – How many goals / assists scored throughout the season, How many saves or challenges a GK or defender has made.
- **Achievable** – Ensuring the goal which is set for the athlete is attainable/ achievable, starting with small tasks which are achievable to help gain confidence in the process and then start to make larger goals.
- **Realistic** – This is key and very important to discuss with the athlete individually. Each athlete is different and has varied strengths and weaknesses in different areas. The athlete will need to decide which on these goals and agree that they are realistic targets set for themselves to achieve.
- **Time based** – Goals should be set for a time period of a season, but you can set smaller time frames within that specific to the athlete. Again athletes are individual, so some may prefer every month, or others could possibly do it over a three-month period.