

AQA GCSE PHYSICAL EDUCATION

The structure and functions of the musculoskeletal system

Skeletal system provides a framework of bones for movement, in conjunction with the muscular system

- 1) Functions of the skeleton:**
- support
 - protection of vital organs by flat bones
 - movement
 - structural shape and points for attachment
 - mineral storage
 - blood cell production.

- 2) Bone names:**
- Head / neck: cranium and vertebrae
 Shoulder: scapula and humerus
 Chest: ribs and sternum
 Elbow: humerus, radius and ulna
 Hip: pelvis and femur
 Knee: femur, tibia and patella
 Ankle: tibia, fibula and talus.

- 3) The bone shape and type determines the amount of movement:**
- short bones enable finer controlled movement.
 - long bones enable gross movement

- 4) Movement at a joint**
- flexion**
decrease in the angle of the bones at a joint
- extension**
increasing the angle of bones at a joint
- abduction**
movement away from the body midline
- adduction**
movement towards the body midline

- 5) Freely movable joints allow different movements:**
- Hinge joint: elbow, knee, ankle.
 - Ball and socket: hip, shoulder.

- rotation**
movement around an axis
- plantar flexion**
pointing the toes at the ankle/increasing the ankle angle
- dorsi flexion**
toes up at the ankle/decreasing the ankle angle.

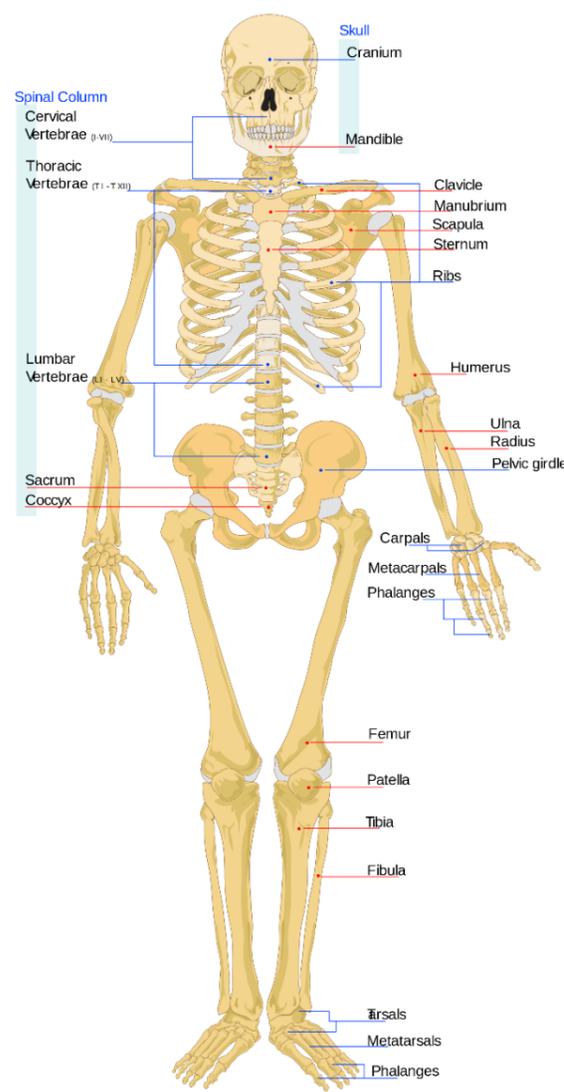
- 6) Different joints, different types of movement:**
- rotation of the shoulder flexion and extension at the shoulder, elbow, hip and knee.
 - adduction and abduction at the shoulder
 - plantar flexion and plantar dorsiflexion at the ankle.

- 7) Synovial joint**
Where two or more bones meet (articulate) to allow a range of movements. The ends of the bones are covered in articular cartilage and are enclosed in a capsule filled with fluid.

- 8) Articulating bones:** Where two or more bones meet to allow movement at a joint.
- 9) Synovial membrane:** secretes synovial fluid
- 10) Synovial fluid:** provides lubrication
- 11) Joint capsule:** encloses/supports
- 12) Bursae:** sacks of fluid to reduce friction
- 13) Cartilage:** prevents friction/bones rubbing together
- 14) Ligaments:** attach bone to bone.

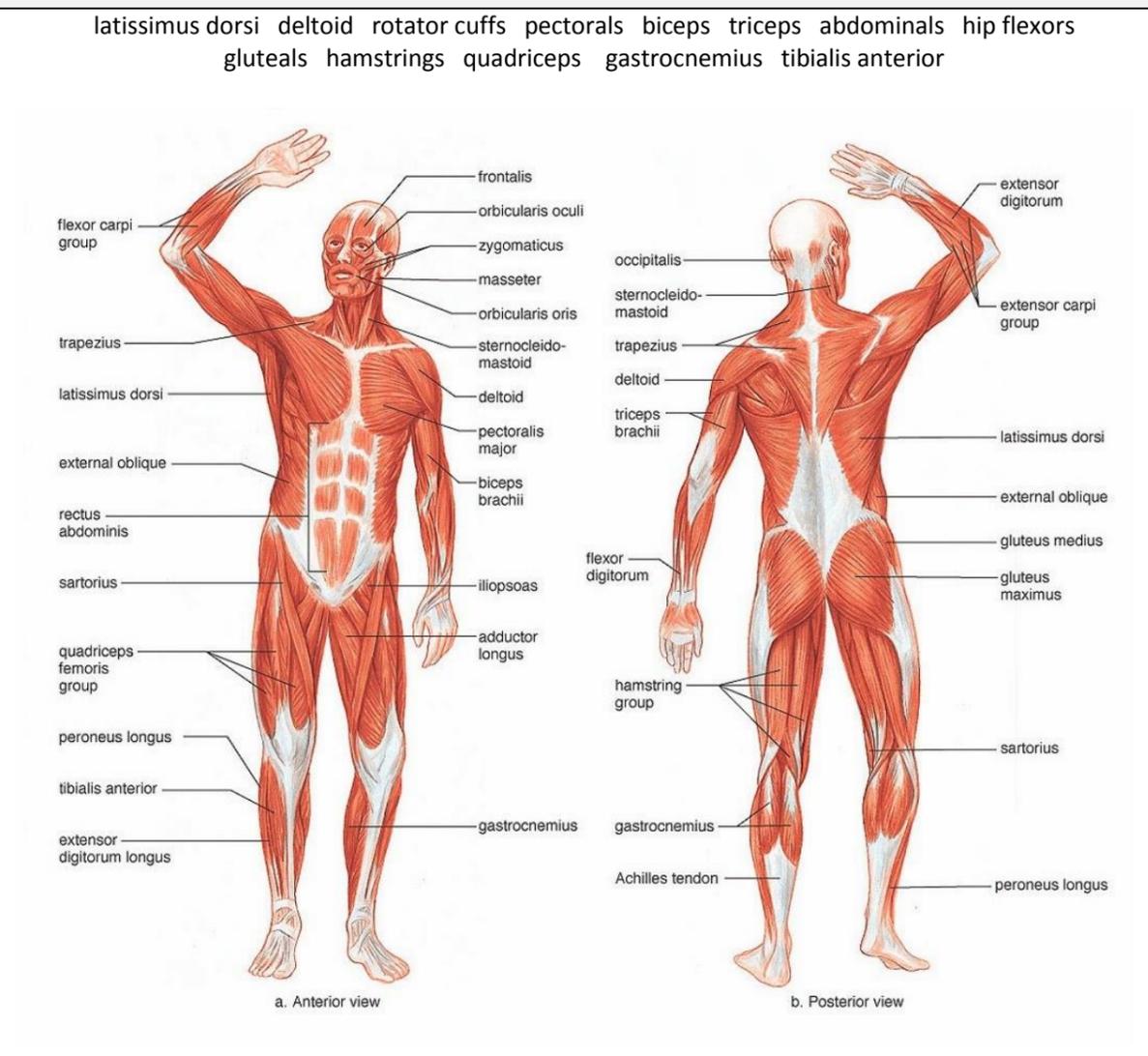
- 16) Suppleness / Flexibility:**
The range of movement possible at a joint.
- 17) Lever**
A rigid bar (bone) that turns about an axis to create movement. The force to move the lever comes from the muscle(s). Each lever contains a fulcrum - fixed point, effort (from the muscle(s) to move it) and a load/resistance (from gravity).

15) Major bones



- 19) The body work antagonistically on the major joints**
of the skeleton to affect movement in physical activity at the major movable joints
- 20) Agonist (prime mover)**
Muscle or group responsible for the movement.
- 21) Antagonist**
Acts to produce the opposite action to the agonist. They work in antagonistic pairs.
- 22) Prime mover (agonist)**
Muscle or muscle group responsible for the movement.

18) Main muscles



- 23) Isometric contraction**
Muscle contraction where the length of the muscle does not alter. The contraction is constant, ie pushing against a load.
- 24) Isotonic contraction**
Muscle contraction that results in limb movement:
- concentric contraction - shortening of the muscle
 - eccentric contraction - lengthening of the muscle.

- 19) The body work antagonistically on the major joints**
of the skeleton to affect movement in physical activity at the major movable joints
- 20) Agonist (prime mover)**
Muscle or group responsible for the movement.
- 21) Antagonist**
Acts to produce the opposite action to the agonist. They work in antagonistic pairs.
- 22) Prime mover (agonist)**
Muscle or muscle group responsible for the movement.

