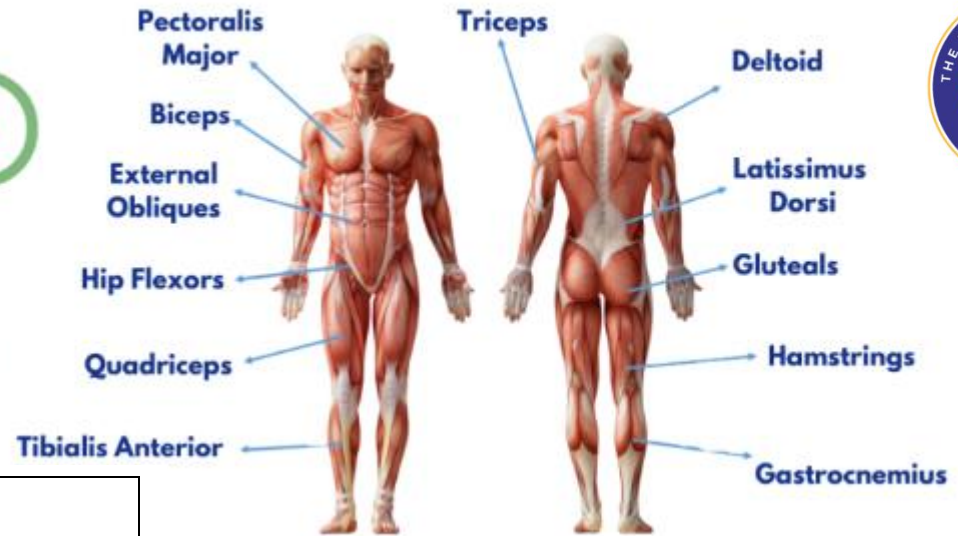


Muscular System

- Classification and characteristics of muscle types
- Location and role of voluntary muscles
- Antagonistic pairs of muscles
- Characteristics of fast and slow twitch muscle fibres
- Role of ligaments and tendons

As one muscle **CONTRACTS**, another muscle will **RELAX**



| Muscle | Function (what movement happens when this muscle contracts) | Sporting example |
|-------------------|-------------------------------------------------------------|------------------------------------|
| Bicep | Flexion of arm at elbow | Upward phase of a bicep curl |
| Tricep | Extension of arm at elbow | Downward phase of a bicep curl |
| Hamstring | Flexion of leg at knee | Leg before kicking a football |
| Quadricep | Extension of leg at knee | Movement of kicking a football |
| Gastrocnemius | Plantar flexion at ankle | Pointing toes in a full twist |
| Tibialis Anterior | Dorsi-flexion at ankle | Downward phase of a squat |
| Gluteus Maximus | Extension of leg at hip | Leg kick in swimming (front crawl) |
| Hip flexors | Flexion of leg at the hip | Lifting leg to clear a hurdle |
| Pectoralis Major | Adducts the arm at the shoulder | Forehand drive in tennis |
| Latissimus Dorsi | Adduct and extend the arm at the shoulder | Butterfly stroke in swimming |

Ligaments (bone to bone): give stability to joints, are tough, white and elastic.

Tendons (muscle to bone): carry the force from muscle contraction to bone, are tough, greyish and inelastic.

The muscles contract to pull on the bones to produce movements.

| Muscle fibre type | Characteristics | Impact on sport |
|-----------------------|-------------------------------------------------------------------------|--------------------------------------------------------------------------------------|
| Type 1 (slow twitch) | Aerobic, high resistance to fatigue, slow contractions | Marathon - Lasts a long time, reduce fatigue. |
| Type 2a (fast twitch) | Faster contractions than slow twitch, fatigue quicker but more powerful | 800m – good resistance to fatigue during race, but explosive in sprint finish |
| Type 2x (fast twitch) | Very fast contractions, powerful, explosive | Tip off in basketball – player can jump high to reach ball |

Voluntary Muscles → A muscle which you can control

Involuntary Muscles → A muscle which you cannot control

Cardiac Muscles → A muscle found in the wall of the heart