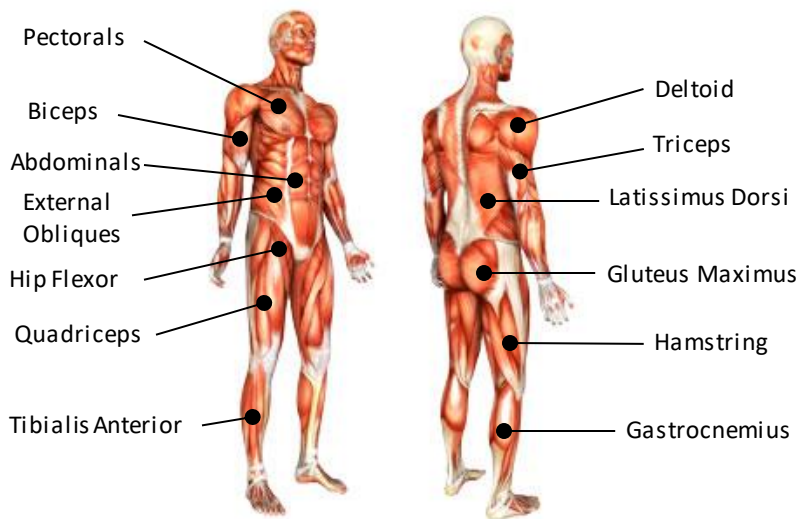
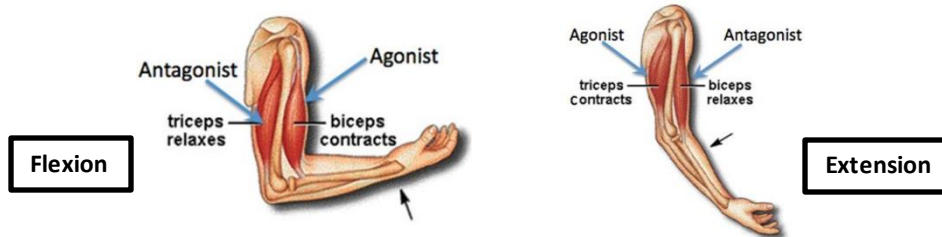


# NCFE Health and Fitness Level 1/2 – The structure and functions of the muscular system

## Structure of the muscular system



**Antagonistic pairs** - Muscles are arranged in antagonistic pairs. As one muscle contracts (shortens) its partner relaxes (lengthens) *i.e.* **Biceps and Triceps**.



**Agonist = the muscle that contracts to produce movement.**  
**Antagonist = the muscle that relaxes to allow the movement to occur.**

### Examples in the body:

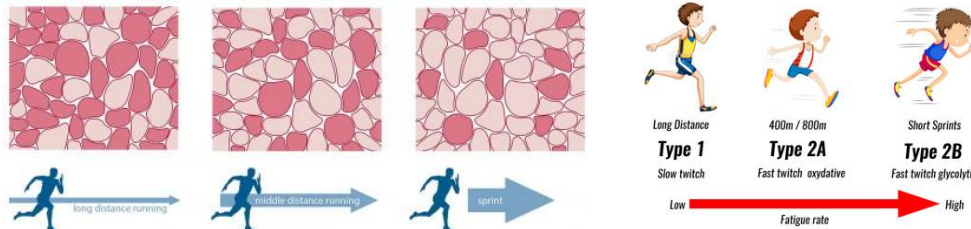
- Biceps & Triceps
- Quadriceps & Hamstring
- Hip Flexor & Gluteus Maximus
- Tibialis Anterior & Gastrocnemius

## Types of muscle

<b>Voluntary muscles</b> enable movement throughout the body.	<b>Involuntary muscles</b> are essential in maintaining healthy body systems.	<b>Cardiac muscle</b> is vital in sport because it makes the heart pump. Fitness training will strengthen cardiac muscle making the heart more efficient at pumping blood around the body.

## Muscle fibre types

Slow twitch muscle fibres (Type I)	Fast twitch muscle fibres (Type IIa)	Fast twitch muscle fibres (Type IIx/b)
<ol style="list-style-type: none"> <li>1. Smaller in size.</li> <li>2. Work aerobically with high fatigue resistance.</li> <li>3. Have a good oxygen supply = deep red in colour.</li> <li>4. They contract slowly, but can work for long periods.</li> </ol> <p><b>Marathon runner</b></p>	<ol style="list-style-type: none"> <li>1. Larger in size</li> <li>2. Work anaerobically &amp; linked to high intensity activities.</li> <li>3. Are paler in colour and have limited oxygen supply.</li> <li>4. They contract quickly and powerfully, but tire easily.</li> </ol> <p><b>400/800m runner</b></p>	<ol style="list-style-type: none"> <li>1. Large in size</li> <li>2. Work anaerobically &amp; linked to extreme high intensity activities.</li> <li>3. Very high speed of contraction but low fatigue resistance.</li> </ol> <p><b>100m Sprinter</b></p>



### The short term effects of exercise on the muscles:

1. Working muscles produce heat
2. Increased muscle fatigue due to lactate accumulation
3. Blood is re-distributed to working muscles (Shunting)

**Link of the muscular and skeletal system** – both systems work together to produce movement. *i.e.* a contracting muscle pulls on a bone which changes the angle at a joint.

# GCSE Physical Education – The structure and functions of the muscular system

Term	Definition/notes/concept

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Keywords: