

Anatomy and Physiology

Musculoskeletal system

One function of the skeleton is **MOVEMENT**

Muscles are attached to bones by tendons.

Bones in the arm (How are you?)

Humerus Radius Ulna

Bones in the leg

Femur Fibula Tibia



Antagonistic Muscles:

Work in pairs

Eg 1 Biceps and triceps

Bend arm (flex) - bicep contracts, tricep relaxes.

Straighten arm (extend) tricep contracts, bicep relaxes.

Eg 2 Hamstring and quadriceps to flex and extend the leg at the knee

Cardiovascular System

Includes heart and blood vessels

The heart is a muscle that contracts and relaxes to pump blood around the body

Arteries - blood vessels that carry oxygenated blood away from the heart to the muscles.

Veins - blood vessels that carry deoxygenated blood back to the heart.

Heart rate (beats per minute) increases with exercise as the muscles demand more oxygen.

Cardiac output - blood pumped per minute

Stroke volume - blood pumped in one contraction

Respiratory System

Includes mouth, nose, trachea (windpipe) and lungs

Gaseous exchange in the lungs - oxygen in (O₂), carbon dioxide out (CO₂)

Inspiration (breathing in)

The intercostal muscles contract to allow the ribcage to expand, moving up and out.

Diaphragm flattens out - larger space for lungs to expand

Expiration (breathing out)

The intercostal muscles relax to allow the ribs to move down and in, diaphragm moves up - smaller space so air is forced out.

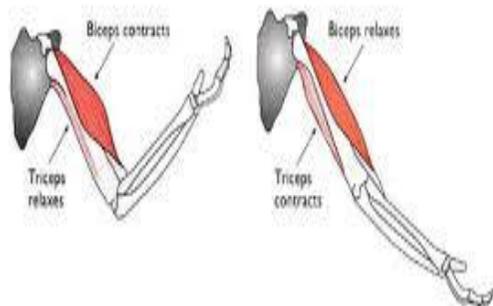
Breathing rate increases with exercise as the muscles demand more oxygen.

Aerobic system - with oxygen

Anaerobic system - without oxygen.

Very high intensity for short periods, eg sprint down the pitch

MUSCLES WORK IN PAIRS TO MOVE A BONE



Short Term Effects of exercise

Increased breathing rate

Increased heart rate

Increased body heat - sweating

Feeling tired/fatigue

Long term Benefits of exercise

Increased fitness eg cardio-vascular fitness, muscular endurance, strength

Weight loss

Reduced blood pressure/stress

Reduced risk of heart disease and Type 2 diabetes

Joints

'A joint is a place where two or more bones meet' Movement occurs at the synovial joints in the body.

Hinge joint eg elbow, knee. Allow 180 degrees movement.

Ball and socket joint eg shoulder, hip. Allow 360 degrees movement.

Both are synovial joints.