

Anatomy and Physiology

Musculoskeletal system

Functions of the Skeleton;

1. Shape
2. Structure
3. Production of blood cells
4. Protection

Movement

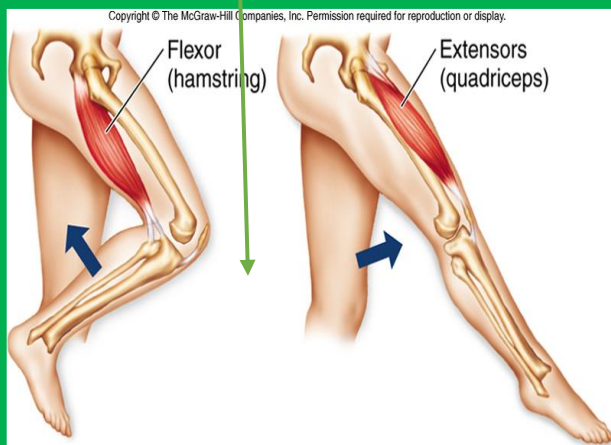
Muscles are attached to bones by tendons.



Antagonistic Muscles:

Muscles work in pairs

For example in rugby hamstrings and quadriceps work together when kicking the ball (see diagram below)

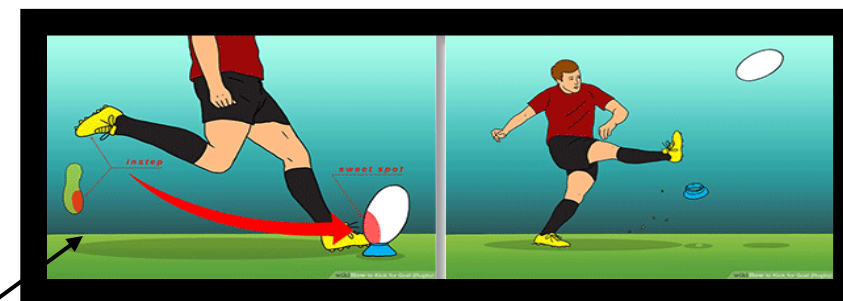


Cardiovascular System

- 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 increases with exercise as the muscles demand more oxygen.**

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.**



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.



Hinge Joint

A hinge joint only allows this bending movement

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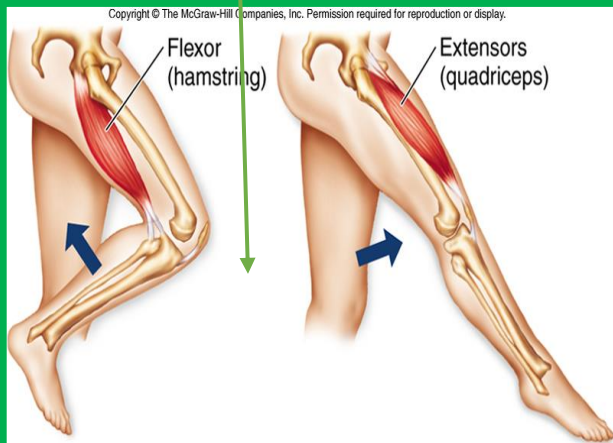
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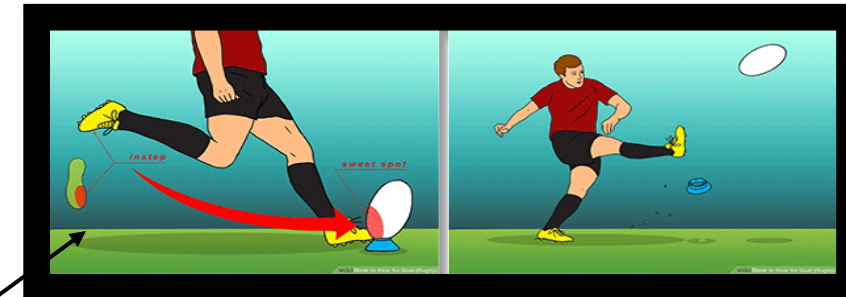


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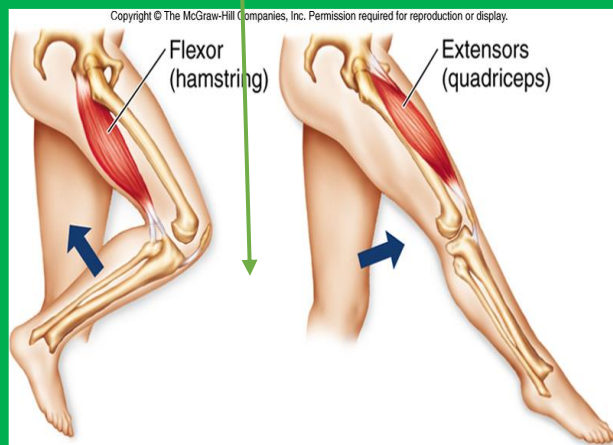
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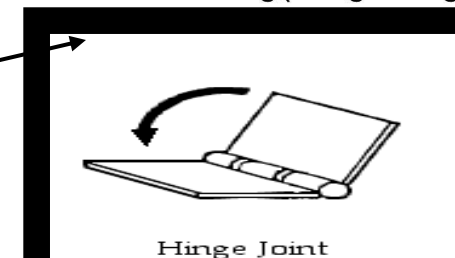
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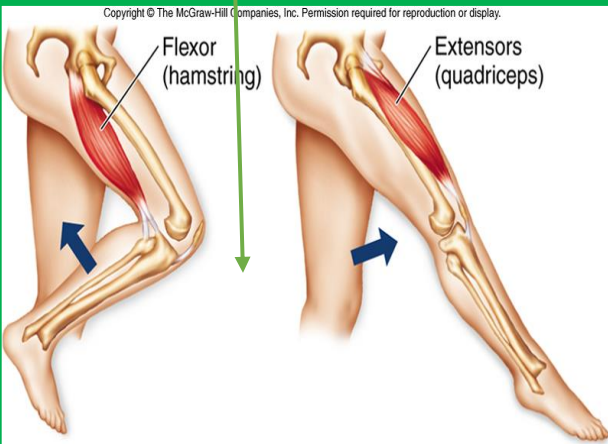
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