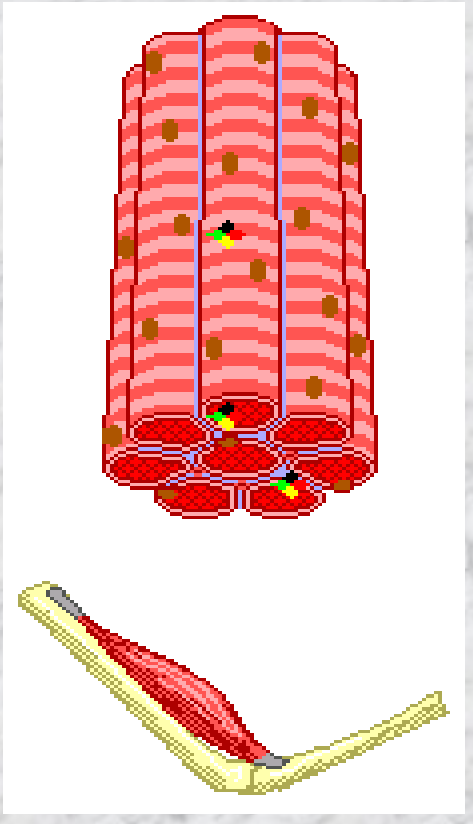
The Muscular System

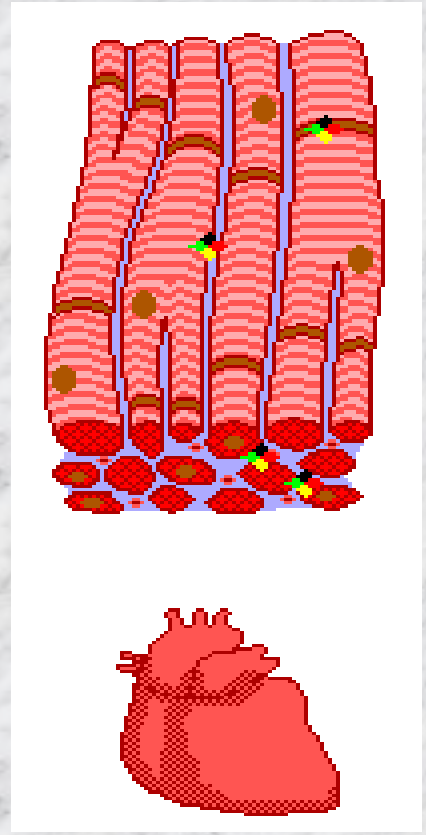
Did you know that ?

- more than 50% of body weight is muscle !

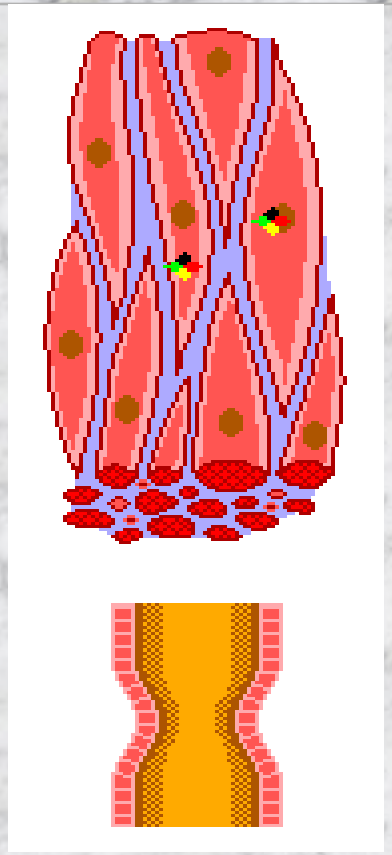
Three types of muscle



Skeletal



Cardiac



Smooth

Classification of muscle

Voluntary	Involuntary	
Skeletal	Cardiac	Smooth
Limbs	Heart	Viscera
Striated		Non-striated

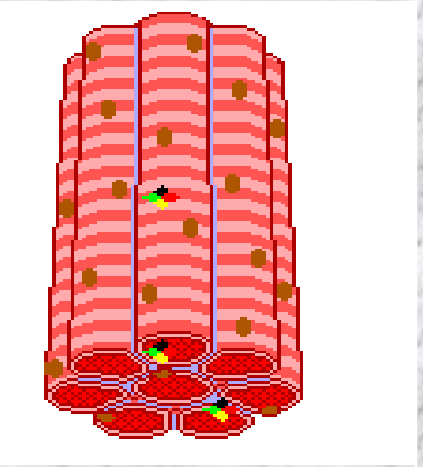
Skeletal muscle

- Large muscles
- Maintain posture
- Facilitate locomotion
- Move jointed bones
- Found in antagonistic pairs
- Joined to bones by tendons

Structure of skeletal muscle

- Each cell fibre is long and cylindrical
- Muscle fibres are multi-nucleated
- The contractile elements of skeletal muscle cells are called myofibrils

- **How do muscles contract?**

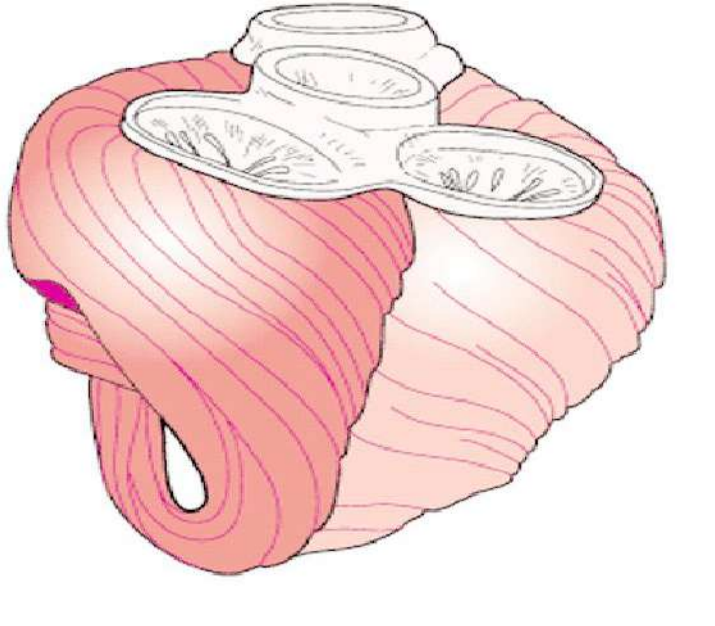


Skeletal muscle - Summary

- Voluntary movement of skeletal parts
- Spans joints and attached to skeleton
- Multi-nucleated, striated, cylindrical fibres

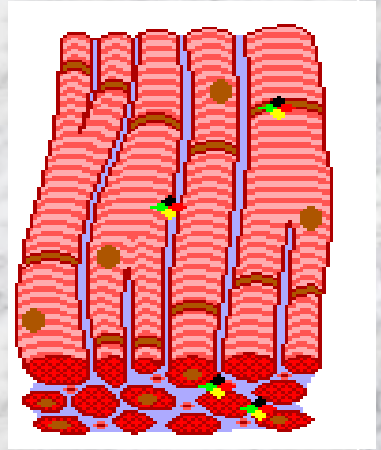
Cardiac muscle

- Main muscle of heart
- Pumping mass of heart
- Heart muscle cells
  behave as one unit
- Heart always contracts
  extent



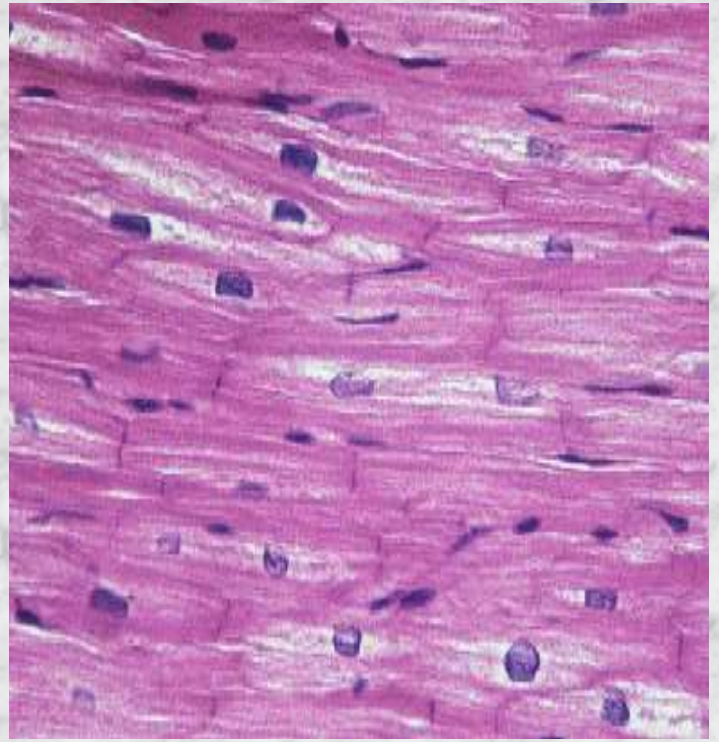
Structure of cardiac muscle

- Cardiac muscle cells are short, branched and interconnected
- Cells are striated & multi-nucleated
- Adjacent cardiac cells joined via electrical synapses (gap junctions)
- These gap junctions appear as dark lines when viewed under a microscope and are called intercalated discs



Cardiac muscle - Summary

- Found in the heart
- Involuntary rhythmic contraction
- Branched, striated fibres with intercalated discs

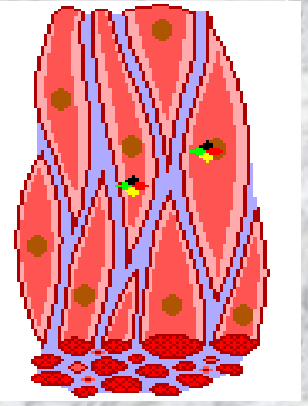


Smooth muscle

- Lines walls of viscera
- Found in longitudinal or circular arrangement
- Alternate contraction of circular & longitudinal muscle in the intestine leads to peristalsis

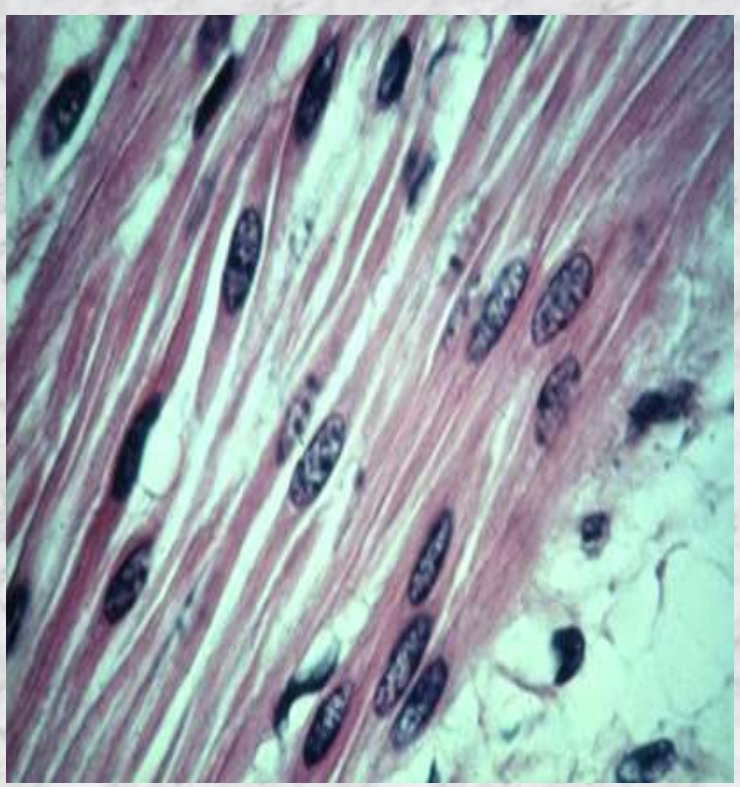
Structure of smooth muscle

- Spindle shaped uni-nucleated cells
- Striations not observed
- Actin and myosin filaments are present
- Myosin filaments are attached to dense bodies at the end of each cell



Smooth muscle - Summary

- Found in walls of hollow internal organs
- Involuntary movement of internal organs
- Elongated, spindle shaped fibres with single nucleus



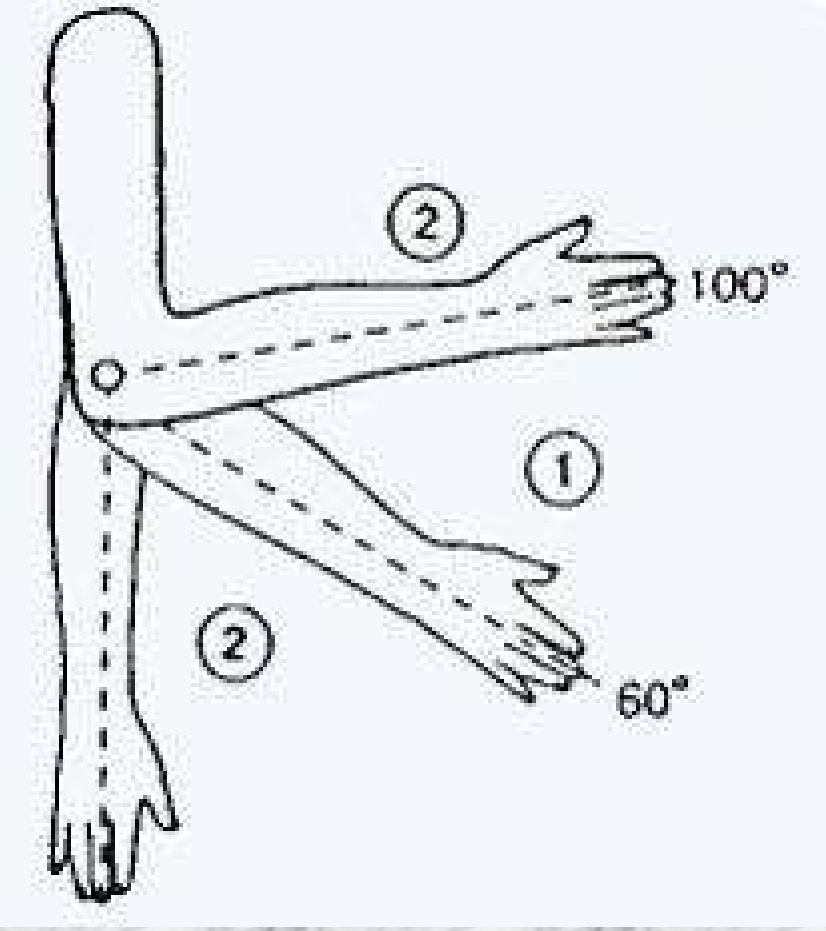
Muscle Control

Type of muscle	Nervous control	Type of control	Example
Skeletal	Controlled by CNS	Voluntary	Lifting a glass
Cardiac	Regulated by ANS	Involuntary	Heart beating
Smooth	Controlled by ANS	Involuntary	Peristalsis

Stop Day One Notes ☺

Muscular System Vocabulary

- Flexion – Movement that decreases angle between 2 bones.

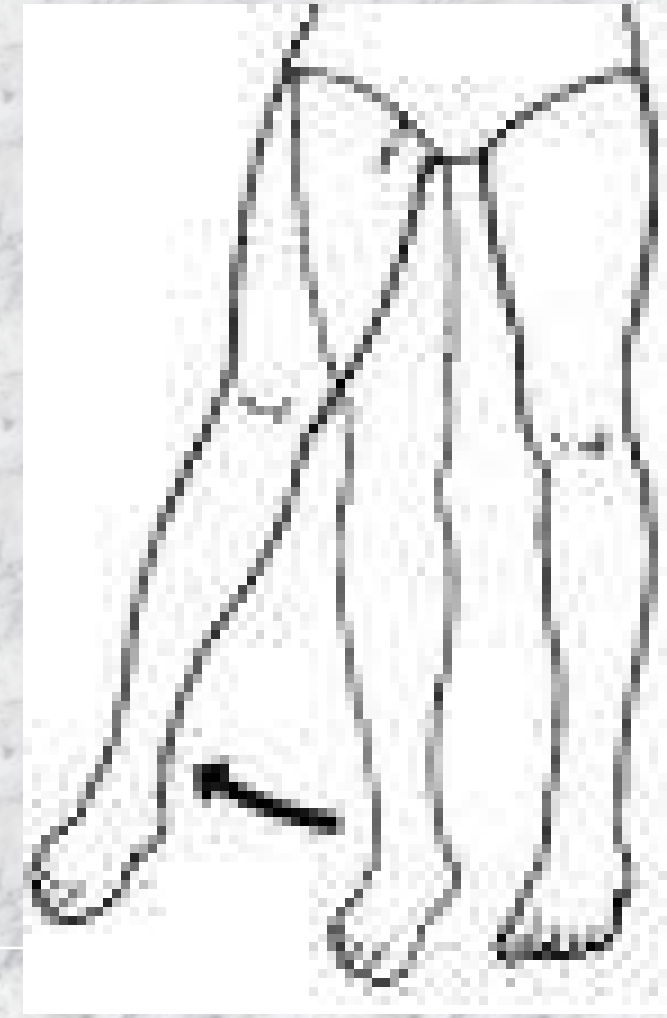


Muscular System

- Extension – movement that increases angle between 2 bones

Muscular System

- Abduction – movement away from the midline of the body

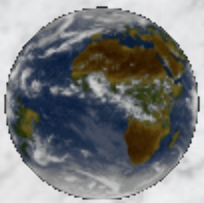


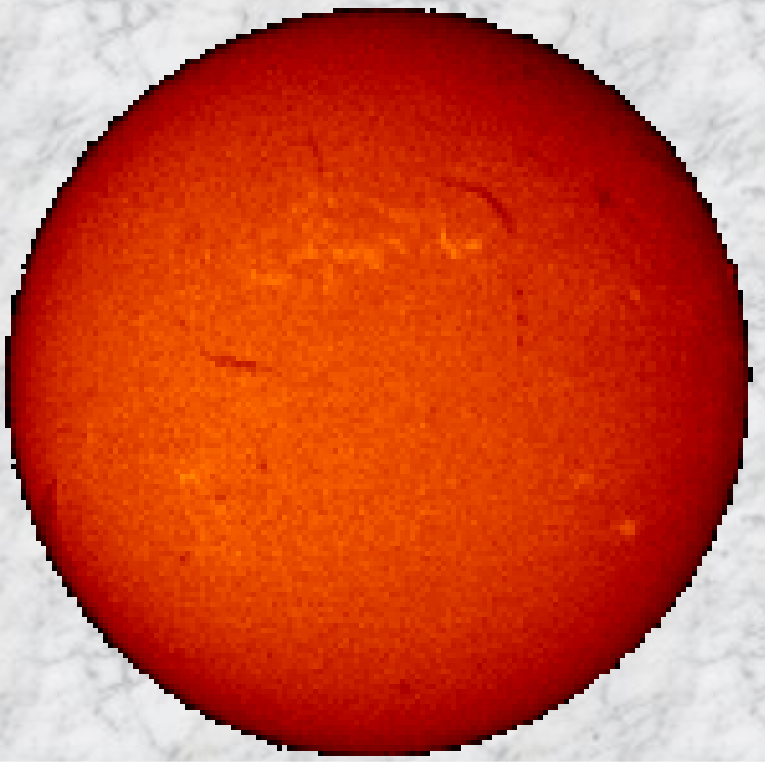
Muscular System

- Adduction – movement towards the midline of the body

Muscular System

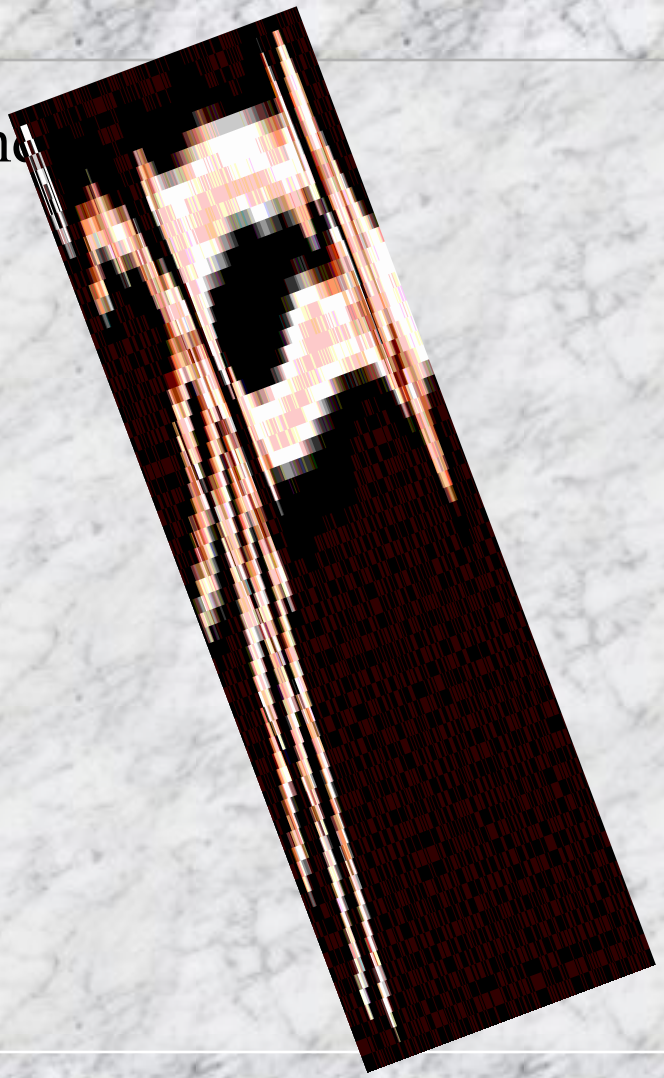
- Rotation – movement around a longitudinal axis





Muscular System

- Supination – Hand turned upward



Muscular System

- Pronation – occurs when palms rotate downward or posteriorly

Muscular System

- Dorsiflexion – elevation of the top of the foot
- Plantar flexion – bottom of foot is directed downward