1.2 - The Muscular System

1.2.1 - Outline the general characteristics common to muscle tissue

4 MAIN FUNCTIONS

• Movement occurs through the interaction of bones, skeletal muscles and joints
  o When skeletal muscles contract, they exert forces on tendons which then pull on bones causing joint movement

• Muscles move substances within the body
  o Smooth muscles help move food through the gastrointestinal tract
  o The cardiac muscle

• When postural muscles contract they help to stabilize and maintain body positions
  o Posterior neck muscles contract to keep the head in an upright position otherwise it would fall backwards
    ▪ Muscles can be active even if there seems to be no movement in the joint

• Muscles contract either voluntarily or involuntarily
  o They can generate up to 85% of body heat

PROPERTIES OF MUSCLE TISSUE

• Contractibility is the ability of a muscle to contract and generate force when it is stimulated by a nerve
  o Muscle tissue is the only tissue in the body that has this property
    ▪ Muscles are usually arranged in pairs so that when one muscle is contracted or shortened, the opposing muscle is stretched

• The ability of muscle to be stretched beyond its normal resting length is called extensibility

• Elasticity is the muscles ability to return to its original resting length after the stretch is removed
1.2.2 - Distinguish between the different types of muscle

3 TYPES OF MUSCLE

- **Skeletal**
  - Voluntary control
  - Striated appearance
  - Alternating dark and light bands
  - Tendons that attach mostly to bone
  - Main function of this type of muscle is to move the skeleton

- **Cardic**
  - Also known as the heart muscle
  - Involuntary control
    - Contracts without having to consciously think about it

- **Smooth**
  - Lines the walls of blood vessels
    - Hollow organs like the stomach and intestines
1.2.3 - Annotate the structure of a skeletal muscle

**STRUCTURE OF A MUSCLE**

![Diagram of skeletal muscle structure]

**SKELETAL MUSCLES**

- Skeletal muscles work together in groups to carry out specific actions rather than working independently.
- They are divided into compartments that contain groups of muscles which have the same function.
  - Each compartment is surrounded by fascia and the same nerve innervates all of the muscles in the compartments.
- There are 3 layers of fascia in each individual skeletal muscle:
  - **Epimysium**
    - The outer layer which covers the entire muscle.
  - **Perimysium**
    - Bundles of muscle fibers or fascicles (long, cylindrical, vary in length and width depending on the muscle).
• **Endomysium**
  ▪ Layer of fascia that surrounds the individual fibres

**FASCIA**
- A type of connective tissue that is located in-between and surrounding other tissues of the body (muscle and bones)
- Made up of fibrous tissue, adipose (fatty) tissue and fluid
1.2.4 - Define the terms origin and intersection of muscles

- The 2 ends of a muscle (the attachment points) are called the origin and the intersection.

- The **origin**:
  - Proximal attachment
    - The end that is closest to the centre of the body
    - Usually the bone that stays still

- The **intersection**:
  - Distal attachment
    - The end that is furthest away from the centre of the body
    - Usually the moveable bone
1.2.5 - Identify the location of skeletal muscles in various regions of the body