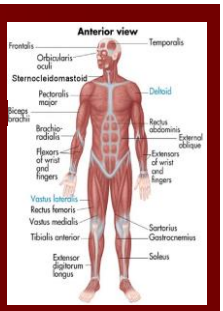
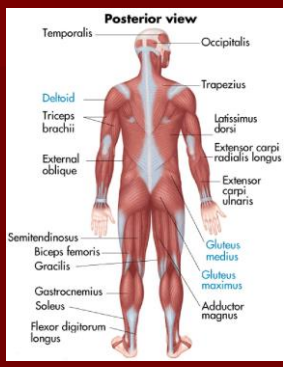
The Muscular System



- The ability to move is an essential activity of the human body
- ½ our body weight comes from muscles
- Consists of over 600 individual muscles.
- 3 purposes:
  - Body movement
  - Body shape
  - Body heat (maintain temp.)

The Muscular System

- Body movements are determined by three types of muscles
  - Smooth (involuntary) – cannot be controlled by will.
  - Cardiac – control the contractions of the heart.
  - Skeletal (Voluntary) – can be controlled by will.



Function of Skeletal muscles

- Attach to bones to provide voluntary movement
  - Tendons: strong, tough connective cords
  - Fascia: tough, sheet-like membrane
- Produce heat and energy for the body
- Help maintain posture
- Protect internal organs
- Called striated (striped) because they have striations of alternating light and dark band

Functions cont'd.

- Provide movements to the limbs, but contract quickly, fatigue easily and lack the ability to maintain contraction for long periods
  - Blinking eyes, talking, breathing, eating, dancing and writing all produced by these muscles

Function of Smooth Muscle

- Called smooth muscle because they are unmarked by striations, small spindle shaped
- Unattached to bones, act slowly, do not tire easily and can remain contracted for a long time
- Not under conscious control so they are also called involuntary muscles
- Found in walls of internal organs (intestines, bladder, stomach, uterus, blood vessels)

Function of cardiac muscle

- Found only in the heart
- Involuntary muscle
- Requires a continuous supply of oxygen to function
- Cardiac muscle cells begin to die after 30 seconds of oxygen cut-off
- Striated and branched

Special muscles

- Sphincter (dilator) muscles are openings between
  - the esophagus and stomach
  - The stomach and small intestines
  - Walls of the anus, urethra and mouth
- Open and close to control passage of substances

Characteristics of Muscles

- *All muscles have 4 common characteristics*
  - Excitability – ability to respond to a stimulus (ie: nerve impulse)
  - Contractibility – muscle fibers that are stimulated by nerves contract (become shorter) and causes movement
  - Extensibility – ability to be stretched
  - Elasticity – allows the muscle to return to its original shape after it has been stretched

Sources of heat/energy

- When muscles work, they produce heat that our body needs to function properly
- Major source of this energy is ATP – a compound found in muscle cells
- ATP requires muscle cells to have oxygen, glucose and other materials circulated by the blood
- When the muscle is stimulated, ATP is released, thus producing heat