

March 20, 2015

Movement

Outline

- Announcements
  - o Quiz 6
    - Due Sunday March 22<sup>nd</sup>
  - o Exam 3
    - Review Guide Available on Webcourses
  - o Critical Thinking Question #4
    - Due Wednesday March 25<sup>th</sup> 11:59 pm
  - o Volunteer Extra Credit
    - Saturday March 28<sup>th</sup> 9 am to 11 am
    - Sign-up on Discussion board
- The Biology of Motion
- Bones and Muscles
- Your Body on Exercise
- Exercise: Fact or Fiction?

The Biology of Motion

- Locomotion: active movement from one place to another
- Uses energy to overcome 2 forces: friction and gravity
  - o Water: Dense medium= high friction
    - Gravity less of a problem because water supports mass
  - o Air: Low Density= Low friction

- high effect of gravity because no support for body mass

### Specialized Types of Motion

- Swimming
  - o Most common for aquatic animals
  - o Form is very streamlined
    - decreases force of friction as they move through the water
- Hopping
  - o really important for legs to be strong
    - to overcome force of gravity
- Crawling
  - o Diverse group of organisms involved in crawling
  - o Distinguished by majority of body being in contact with ground when moving
  - o Snakes have lost all appendages and slide along ground
  - o Caterpillars have mini legs to aide their crawling
- Flying
  - o Most interesting type of locomotion
  - o Select group of organisms
  - o Biggest force to overcome is gravity
    - Have adaptations to decrease force of gravity
- Walking and Running
  - o Cheetah is fastest organism
    - Best example of form=function
      - Best body type for high speed running

- Long flexible spine that expands its stride
- Head never moves, super steady
- Fast twitch fibers in base of hind legs

### Movement

- Skeleton and muscles interact for movement to occur
- Skeletons= support, movement, protection
- Muscles= pulls bones to create motion
- Tendons= connects muscles to bones

### 3 Types of Skeletons

- Hydrostatic Skeleton
  - o Live in aquatic or moist, wet, terrestrial environment
  - o No bones or cartilage
  - o Soft, Fluid Filled Body
    - Pressure in body allows for support and movement
  - o i.e. Jelly fish: move by drawing water in or squirting water out (moved by water current rather than actual ability)
- Exoskeleton
  - o Hard, External Skeleton
  - o Crustaceans and mollusks
- Endoskeleton
  - o Hardened, Internal Skeleton
  - o Soft tissues on the outside
  - o Bone and/or Cartilage