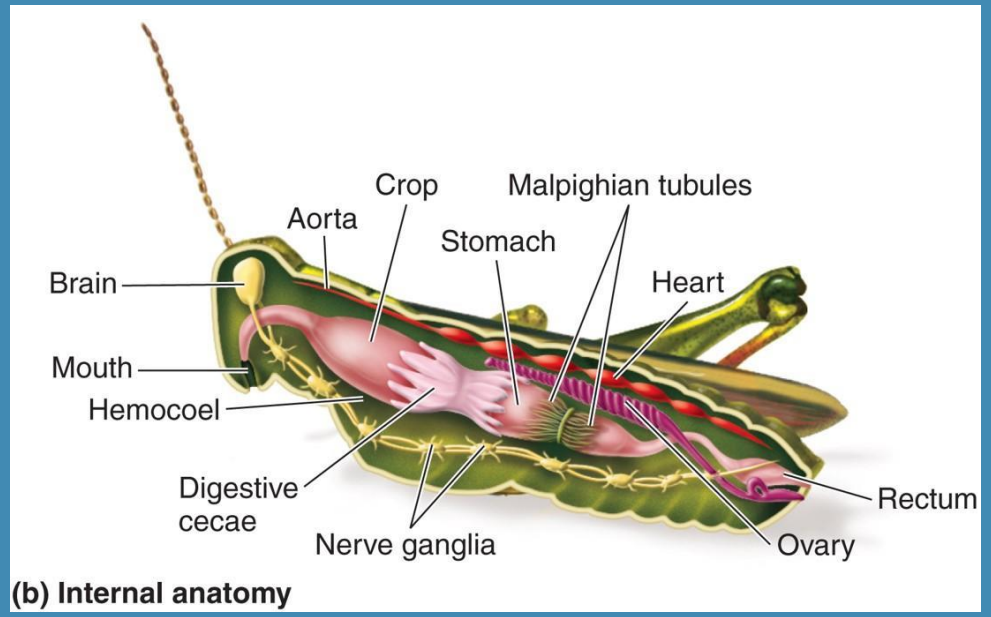
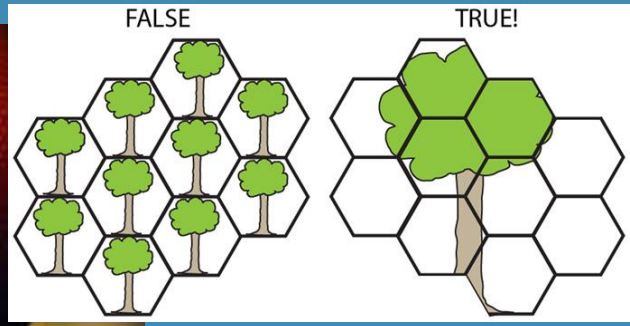
RESPONSE

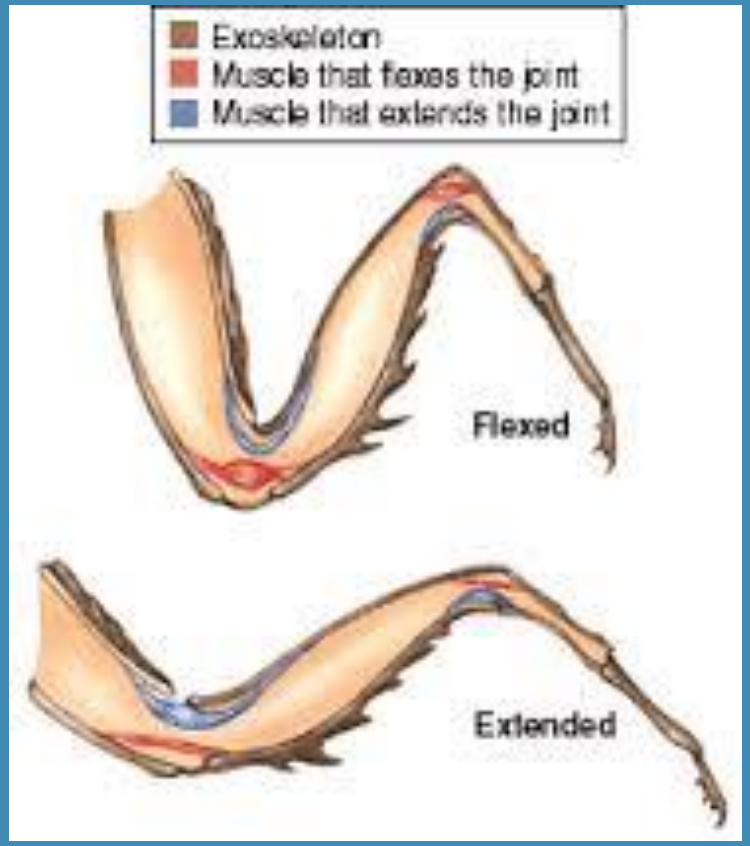
- Well developed nervous system
- Brain
  - Receives incoming information, sends outgoing instructions to muscles
- Two nerves encircle the esophagus
  - Connect brain to ventral nerve cord
    - Along ventral cord are several ganglia (nerve cells)
      - Coordinate movement of individual legs/wings
- Sophisticated sense organs
  - Compound eyes
    - More than 2000 separate lenses that can detect motion and colour
      - spiders





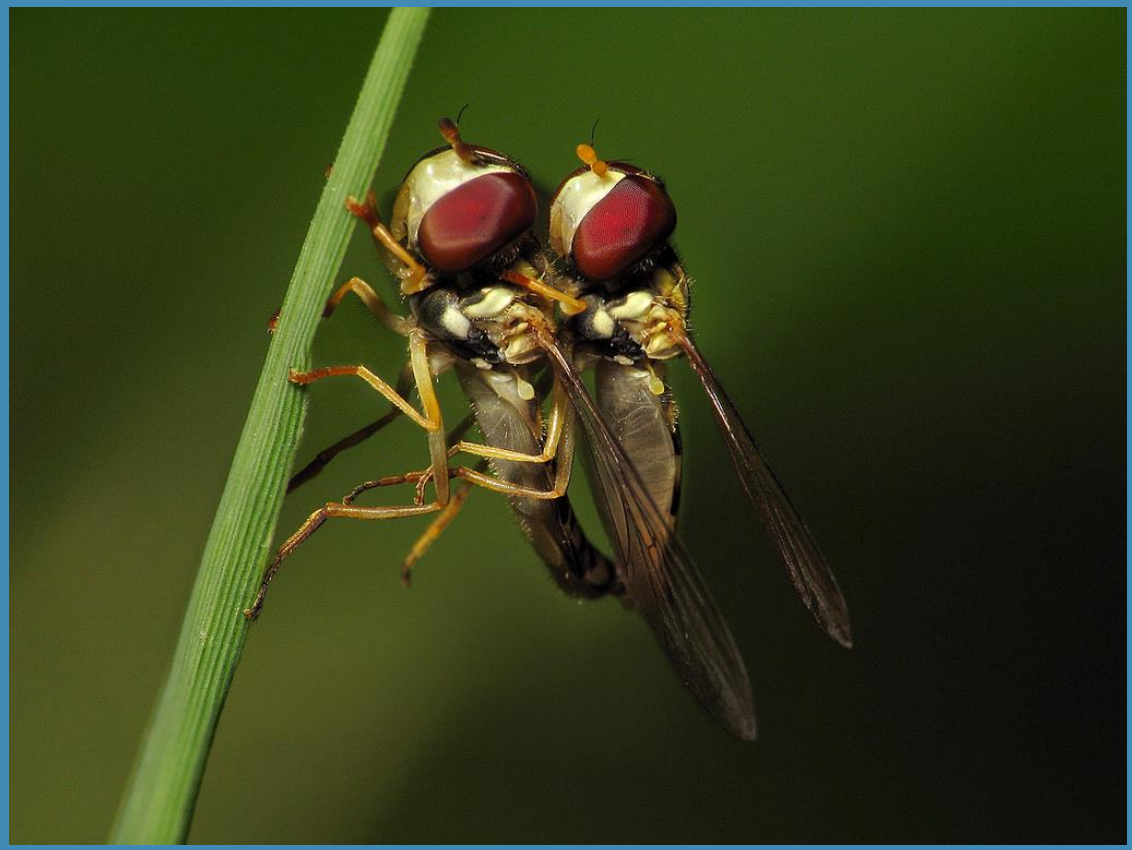
MOVEMENT

- Well developed muscle groups
  - Controlled and coordinated by nervous system
- Some
  - Muscles made up of individual muscle cells
    - Contract to become shorter when stimulated by nerves
- Others
  - Muscles generate force by contracting and pulling on the exoskeleton
  - At each joint different muscles flex/extend the joint
  - Pull of the muscles against the exoskeleton allows arthropods to beat their wings against the air, push legs against ground to walk or use flippers to swim



REPRODUCTION

- Terrestrial
  - Internal fertilization
  - Male places sperm in female or;
  - Male deposits a sperm packet that is picked up
- Aquatic
  - Internal or external fertilization



- Spider
- Praying Mantis

GROWTH AND DEVELOPMENT

- Exoskeleton does not grow as animal grows
  - Undergo process of molting
    - Entire exoskeleton is shed
      - A new one is produced
      - Controlled by endocrine system
        - Regulates body processes by means of chemicals called hormones

MOLTING

- As time to molt approaches
  - Skin glands start to digest inner exoskeleton
  - Other glands secrete a new exoskeleton
  - When new exoskeleton is ready
    - Animal pulls itself out of the old one
- Process takes several hours
- While exoskeleton is still soft
  - Animal fills with air or fluids to allow room for growth before next molting
  - The animal is vulnerable to predators
    - Will complete at night or hide
- Most molt several times between hatching and adulthood

ARTHROPODS

- First appeared in the sea 600 mya
- Evolved into all habitats
- Arthropods are classified based on the number and structure of their body segments and appendages—particularly their mouthparts.
- The three major groups of arthropods are:
  - Crustaceans
  - Spiders and their relatives
  - Insects and their relatives