CHAPTER 12

BIRDS

MAMMALS
Section 1: BIRDS

- Endothermic vertebrate
- Feathers and a 4-chamber heart
- Lay eggs
- Adaptations for FLIGHT include:
  - Hollow bones
  - Forelimbs form wings
  - Large chest muscles
  - Feathers
Contour Feathers

- Large and give bird its shape
- Flight feathers on the wings and tail
  - Help to balance and steer
- Consists of:
  - Central shaft
  - Barbs - projections
  - Hooks - hold barbs together
Down Feathers

- Short, fluffy, soft and flexible feathers
- Trap heat and keep bird warm
- Right next to bird’s skin
- At the base of contour feathers
Obtaining Oxygen

- System of air sacs that connect to lungs
  - Maximizes oxygen consumption

- Circulatory System:
  - 4-chamber heart- 2 atria and 2 ventricles
  - No mixing of $O_2$ poor w/ $O_2$ rich blood
Obtaining Food

- **Bills (no teeth)**
  - Capture, grip, handle food
  - Shaped for quick and efficient feeding

- **Crop = internal food storage tank**
  - Connected to the stomach

- **Stomach - two parts**
  - Food is bathed in chemicals for breakdown
  - **Gizzard - thick-walled, muscular part**
    - Squeezes and grinds partially digested food
Section 2: Physics of Bird Flight

- **Lift** - upward force that allows birds to fly
  - Fast air above bird = low pressure
    - Caused by wing beats, angle/shape of the wings
  - Slow air below bird = high pressure

- **Three types of Flight:**
  - Flapping
  - Soaring and gliding
  - Diving
Types of Flight

- **Flapping** - requires lots of energy
  - Needed to get birds off the ground
  - Used for long distance flying

- **Soaring and gliding**
  - Involves very little wing movement
  - Use warm air currents for soaring upward
  - Use cold air currents for gliding downward

- **Diving** - does not use LIFT
  - Used for hunting prey
Section 3: Mammals

- 4,000 species of Endothermic vertebrates
- 4-chamber heart
- Skin covered with hair or fur
- Young are fed with milk from mother
  - Milk is produced in mammary glands
Obtaining Food

- 4 types of teeth:
  - Canines- pointed for stabbing and tearing
  - Incisors- flat-edged for biting and cutting
  - Pre-Molars – grinding and shredding
  - Molars- behind the pre-molars

- Canines for carnivores
- Molars for herbivores
Obtaining Oxygen

- Breathe in and out with lungs
- Aided by:
  - Rib muscles
  - Diaphragm - large muscle under rib cage
  - 4-chambered heart and 2-loop circulatory system
Adaptations

- For keeping conditions stable:
  - Fur/hair
  - Layer of fat under skin

- For movement:
  - Walk/run on 4 limbs
  - Hopping, climbing, swimming

- Nervous system:
  - Learn and remember
  - Highly specialized sense organs
Diversity of Mammals

3 main groups:

- **Monotremes** - spiny anteaters/duck-billed platypus
  - egg-laying mammals

- **Marsupials** - Koalas, kanagarooos, opossums
  - Young born during early stages and grow in pouch
  - Gestation Period is very short (13 days for opossums)
    - Time between fertilization and birth

- **Placental mammals** - all other mammals
  - Young develop inside mother until all systems are able to function independently of mother
  - Development inside placenta
    - Allows for gas and food exchange between mother and embryo