I. Living Characteristics
- A. Made of Cells: A membrane-covered structure
- B. Respond to environment
  1. Stimulus & Homeostasis is a stable environment
- C. Reproduce
  1. Sexual & Asexual
  2. DNA: Deoxyribonucleic acid
- D. Energy use: Need energy to carry out activities (allows organism to break down or make food, move material in and out of the cell, and build cell..)
- E. Grow and Mature (2 terms)

II. What they need to survive
- A. Water, air, food, and shelter

III. Darwin's Voyage (he was the naturalist of the *HMS Beagle*)
- A. Evolution: The process by which a population changes over time
- B. Differences among species
- C. Artificial Selection: The practice by which humans select organisms for breeding based on desired traits

IV. Four Parts Natural Selection
- A. Overproduction: Too much offspring environment can't support
- B. Genetic Variation: Natural differences occur in a population
- C. Selection
  1. Only some animals will survive
- D. Adaptation:
  1. An inherited trait helps an organism survive and reproduce in an environment

V. Species Changing Over Time
- A. Adaptations
- B. Genetic: Genetic difference add up

VI. Surviving Environment Changes
- A. Adaptations
- B. Extinction

VII. How Fossils Form
- A. Fossils: Remains & Imprint of living thing
- B. Organisms change over time
- C. Form from sedimentary Rock
- D. Fossil Record: All fossils

VIII. Classifying Living things
- A. Physical Characteristics
  1. Skeletal Structure
- B. Chemical Characteristics
  1. Genetic Material
- C. Naming Living Things
  1. DKPCOFGS
     a) Domain
     b) Kingdom
     c) Phylum
     d) Class
     e) Order
     f) Family
     g) Genus
     h) Species

IX. The Three Domains
- A. Bacteria-Prokaryotes
- B. Archaea-Prokaryotes
- C. Eukarya-Eukaryotes
  1. Plantae
     a) Make food through photosynthesis
  2. Protista
     a) "Junk Drawer Kingdom"
  3. Fungi
     a) Gets energy from absorbing materials from environment
  4. Animalia
     a) Gets nutrients by consuming others

X. Prokaryotes: No Nucleus, Single-celled

XI. Eukaryotes: Multi-celled, nucleus, membrane-bound organelles

XII. Dichotomous Keys

*** Unit 2 Ahead ***

XIII. Prokaryotes (Classification of cell)
- A. Characteristics
  1. Doesn't have nucleus or membrane-bound organelles
  2. Almost all are single-celled
- B. Bacteria
  1. Characteristics
     a) Most are individuals
     b) Round, Spiral, or Rod-shaped
     c) Live everywhere
  2. Reproduction
     a) Binary Fission
- C. Archaea
  1. Chemical differences
     a) Cell walls
     b) Molecules in Archaea aren't found anywhere else

XIV. Virus: Microscopic particle that can't reproduce on its own
- A. Contain genetic material and protein
- B. Don't carry out life functions which means it's not living

XV. Eukaryotes
- A. Protists: Group of organisms that cannot be classified as fungi, plants, or animals ("Junk Drawer")
  1. Single-celled or multi-celled
  2. Membrane-bound organelles
  3. Complex structures for movement
     a) Flagellum
        (1) Whip
     b) Cilia
        (1) Hair
  4. Reproduction
     a) Fission
     b) Fragmentation
     c) Gametes
     d) Spores
  5. Animal-like Protists
  6. Fungus-like protists
  7. Plant-like protists
- B. Fungi: Spore producing organisms that absorb nutrients from the environment
  1. Most are multi-celled
  2. Reproduction
     a) Fragmentation
     b) Spores
     c) 2 individuals join together
  3. Zygote Fungi
     a) Produce zygotes inside capsule
  4. Sac Fungi
     a) The largest group of fungi
     b) Spores develop in microscopic sac
  5. Club Fungi
     a) Mushrooms, Bracket Fungi, Puffballs, Smuts, andRusts

XVI. Plants
- A. Multicellular Eukaryotes
- B. Two-stage life cycle
  1. Sporophyte
  2. Gametophyte
- C. Have cell walls and vacuoles
- D. Photosynthesis
  1. $6H_2O + 6CO_2$ +light energy-> $C_6H_{12}O_6 + 6O_2$
- E. Non-Vascular Plants
  1. No Stem
  2. Very short
- F. Vascular Plants
  1. Can grow very tall
  2. Stems transfer nutrients
- G. Gymnosperms
  1. Plant that produces seeds not encased in a fruit
- H. Angiosperms
  1. Plants that produce flowers and fruits
- I. Parts of a flower
  1. Sepals: Specialized leaves that enclose and protect
  2. Stamen: Male reproductive structure of flowers
  3. Pistil: The female reproductive structure of flowers
  4. Stigma: top of the pistil
  5. Anther: The top of the stamen, produces pollen
  6. Filament: The part of the stamen that supports the anther
  7. Petals: Specialized leaves that attract pollinators

XVII. Cellular Respiration
- A. $C_6H_{12}O_6 + 6O_2$ -> $6CO_2 + 6H_2O$ + energy

XVIII. Seedless plants reproduction
- A. Sperm swim in water to fertilize eggs

XIX. Seed Plants reproduction
- A. Pollination
- B. Pollen needs to reach female gametophyte

XX. Plants reproducing asexually
- A. Plantlets
  1. Tiny plants that grow along the edges of a leaf.
- B. Tubers
  1. Underground stems, store nutrients, grow into na ew plant
- C. Runners
  1. Above-ground stems that grow into new plants

XXI. Stimulus
- A. Transpiration: Loss of water from leaves
- B. Wilting prevents further water loss

XXII. Animals
- A. Characteristics
  1. Many cells (multi-cellular)
  2. Specialized Parts (cells have specialized roles)
  3. Movement
     a) Running
     b) Flying
     c) Swimming
  4. Reproduction
  5. Consume Food
     a) consumers
  6. Maintain Body Temperature
- B. Symmetry
  1. Asymmetry (None)
  2. Bilateral Symmetry (Half)
  3. Radial Symmetry (Everywhere)
- C. Invertebrates: Animal w/out backbone
  1. Exoskeleton: Support body from outside
- D. Vertebrates: Animals w/ backbone
  1. Endoskeleton: Internal skeleton
  2. Have
- E. Different types of vertebrates
  1. Amphibians
     a) Live in land and water
  2. Reptiles
     a) Have bodies covered w/ scales or plates
  3. Birds
     a) Hollow bones, feathers, and wings
  4. Mammals
     a) Monotremes (Lay eggs)
     b) Marsupials (Develop in pouch)
     c) Placental (Develop inside)
  5. Fish
     a) Live in water
     b) Lay eggs

XXIII. Animal Behavior: Behavior is a set of actions taken by an organism in response to stimuli. Stimuli can be internal or external.

1. Animals have innate (born with) and learned behavior.
2. Behavior that can help animals survive include
   a. Finding food
   b. Marking territories (this signals to others of the same species, not to enter the area
   c. Defending resources (animals defend food, mates, and offspring from competition. Animals may fight or try to intimidate their competition.
   d. Avoiding danger (Animals avoid danger by running, releasing chemicals, and Camouflage etc.
3. Animals reproduce successfully by:
4. Courtship (attempting to attract a potential mate)
5. Parenting (raising and caring for offspring)
6. Animals Survive Through Seasonal change by:
7. Migration (seasonal movement from one place to another)
8. Hibernation (period of inactivity during winter)
9. Estivation (period of inactivity during summer)

5. Biological clock- internal control of an animal's natural cycles.