Diversity of Organisms and Classification
Essential Vocabulary

DNA

- **Prokaryotic**: a cell that lacks a nucleus
- **Eukaryotic**: a cell that has a nucleus and other complex structures

Feeding

- **Autotrophic**: an organism that makes its own food from solar energy or chemicals
- **Heterotrophic**: an organism that must eat other organisms to obtain its energy
All organisms can be classified and named according to this system; based on shared traits and a common origin.
Five Kingdom System

- Bacteria
- Protists
- Fungi
- Plants
- Animals
1. **Why Classify?**
   - To study the diversity of life
   - To organize and name organisms

2. **Why give scientific names?**
   - Common names are misleading

None of these animals are fish!
Bacteria Kingdom

- Unicellular, microscopic
- Motile (Moves)
- No nucleus
  - Prokaryotic
- No chlorophyll
  - Decomposers (Saprophytic)
    - Sapro "rotten"
    - Phytic "plants"
- Parasitic
  - E. Coli: food poisoning (deadly)
    - Normally found in intestines
- Beneficial
  - Lactobacillus: yogurt and cheese
Protist kingdom

- Unicellular; microscopic
- Nucleus present
  - Eukaryotic
- Autotrophic or heterotrophic
- Classified by how they move
- Plant like: Phytoplankton
  - Provide most of world's oxygen
- Animal like: Zooplankton
  - Their remains are used in cleansers such as toothpaste and comet
Fungus kingdom

- Eukaryotic
- Non-motile (don’t move)
- No root, stem and leaf
- No chlorophyll
  - Decomposers
  - Saprophytic or parasitic
- Reproduce by forming spores
- Most are multicellular: mushrooms, bread mold etc..
- Unicellular: yeasts
Plant Kingdom

- Eukaryotic
- Non-motile (don’t move)
- Most plants contain pigments (chlorophyll) for photosynthesis
  - Autotrophic
- Can be divided into two groups:
  - Non-flowering plants
  - Flowering plants
Animal Kingdom

- Eukaryotic

- Divided into two groups according to the presence or absence of backbone:
  - Invertebrates: without backbone
    - Sponges, Cnidarians, Flatworms, Round worms, Mollusks, Segmented Worms, Arthropods, Echinoderms,
  - Vertebrates: with backbone
    - Fish, Amphibians, Reptiles, Birds, Mammals
Animals are separated into groups or categories so that they are more easily studied and discussed by scientists and others.

Use the following slides to fill in the “Classification Quest” Worksheet
Important Invertebrates: Arthropods

- Most diverse group of invertebrates
- Segmented body
- Hard exoskeleton
- Several pairs of jointed legs
- Divided into 3 groups:
  1. Crustaceans
  2. Arachnids
  3. Insects
Diversity

Insects
- Body with 3 segments
- 6 legs
  - Moths, Butterflies, Bees, Praying Mantis

Arachnids
- Body with 2 segments
- 8 legs
  - Spiders, Scorpions, Ticks

Crustaceans
- 2 antennae
- Body with 3 segments
- 7 or more pairs of legs
- Gills
- Aquatic and Land Forms
  - Lobsters, Rollie Pollies, Shrimp
Vertebrate Groups:

- Fish
- Amphibians
- Reptiles
- Birds
- Mammals
Fish

- Live in water (Aquatic)
- Cold-blooded
- Body covered with wet and slimy scales
- Streamline body for easy movement through water
- Fins for balance and to control movement
- Gills for breathing, must keep moving to breathe
- External fertilization
- Most fish lay large numbers of eggs, but some have live birth
Amphibians

- Cold-blooded
- Moist, scaleless skin
  - Must stay close to water
- Amphibian means "two lives, (metamorphosis)
- Limbs present
  - Tetrapods (walk on four legs)
- Larvae (tadpoles) use gills for breathing; adults use lungs
- External fertilization
- Lay eggs in water
Reptiles

- Cold-blooded
- Body covered with dry, hard scales
- Lives on land
- Breathe with lungs, and sometimes absorb oxygen through their mouth
- Internal fertilization (mating)
- Lay shelled eggs (hard or leathery)
- Closely related to birds
Birds

- Warm-blooded
- With feathers and wings
- Have bodies and hollow bones that are adapted for flight
- Beak for feeding
- Lungs for breathing
- Internal fertilization; lay hard shelled eggs
- Live in almost every habitat on earth
Mammals

- Warm-blooded
- Specialized Teeth based on food preferences
- Single Jaw bone
- Hair on skin
- Females have mammary glands for producing milk
- Lungs for breathing with a diaphragm
- Internal fertilization
- Embryos develop inside mothers body
Mammal Subgroups

1. **Monotremes**
   - egg-laying mammals
   - duckbilled platypus, echidna

2. **Marsupials**
   - pouched mammals
   - short-lived placenta
   - koala, kangaroo, opossum

3. **Placental**
   - true placenta
   - shrews, bats, whales, humans