Chapter One Science Study Guide
Classifying Living Things

Lesson One

How are organisms classified
- -Organisms-living things
- -Around 350 B.C. Aristotle classified organisms into living and nonliving
- -About 1735 Carolus Linnaeus developed a naming system for organisms

Organization system for organisms
- -Kingdom-the largest group used to classify living things into smaller groups
- -Phyla-division of each kingdom
  - -all members of a phylum share at least one important structure or other characteristic
- -Classes-division of phyla
- -Order-division of a class
- -Family-division of an order
- -Genus-division of a family
- -Species-smallest group and is a division of a genus

Scientific Names-all organisms are given scientific names based on their classification
- -A scientific name is made up of its genus and species.
- -Latin is the universal language used in scientific names so that each organism is called the same thing by scientists around the world.

Characteristics of animals
- -They are multicolor organisms
- -They eat and digest other organisms
- -Most can move from place to place
- -They have tissues organized into organs and organ systems

Characteristics of plants (grouped into divisions rather than phyla)
- -They are multicolor organisms
- -They use sunlight to make their own food (and produce oxygen)
- -Roots or root like structures anchor the plant and absorb water

Characteristics of fungi (grouped into divisions rather than phyla)
- -They are mostly multicolor organisms
- -They cannot make their own food
- -They absorb and digest food

Fungi includes **microbes**-living things that are so small they can be seen only with microscopes
- -examples include mold and mushrooms

Characteristics of protists
- -They are one-celled and multicelled organisms
- -Plantlike protests make their own food
- -Animal-like protests take in food from their surroundings

Protists are mostly microbes but do include some larger organisms
- -examples include euglena, protozoa, parameciums, algae

Two kingdoms of bacteria
- -Eubacteria or “true bacteria” includes bacteria that cause disease and decay matter in soil
- -Archaebacteria or “ancient bacteria” includes bacteria suited to survive in conditions that were found on Earth long ago

Bacteria

-can be spiral-shaped, sphere shaped, or rod shaped

Characteristics of bacteria
-Most are one-celled organisms
-They do not have a cell nucleus
-Most do not make their own food but break down or decompose other living or once-living things
-Some bacteria (cyanobacteria) make their own food

What are viruses
-not a part of the kingdoms
-not made up of cells
-are much smaller than cells
-basically made up of hereditary material
-do not grow, eat, or respond to stimuli
-can reproduce but only inside a living cell
-some diseases caused by viruses include: mumps, influenza, West Nile, and polio

Lesson Two

What are the division of plants
-Vascular Plants-plants that have veins, roots, stems, and leaves
-many vascular plants reproduce by seeds (some in cones; others have flowers or fruit)
-Veins or tubes carry water and dissolved nutrients to all parts of the plant
-Nonvascular Plants-plants that do not have veins
-water and nutrients pass directly from outside the plants into their cells and from one cell to the next
-This is the reason that most nonvascular plants are very short

Moss Reproduction
-Sexual reproduction-produce two kinds of branches male and female (reproduction requires two parents)
-female branches produce eggs on a sac on the branch
-male branches produce sperm that can swim to the female branches
-When the sperm and egg meet fertilization occurs
-Asexual reproduction -reproduction involving only one parent
-When a fertilized moss plant grows it is a stalk
-At the top of the stalk is a capsule or spore case
-Inside the spore cases are spores; in time spores are released and grow into the leafy moss

What is a vascular plant?
-Have tubes or veins that carry water and dissolve nutrients to all parts of the plant
-tubes run through roots, stems, and leaves
-Water enters roots and is carried to the stems and leaves
-Stems support leaves so that plants can grow taller and absorb more sunlight

What kinds of plants have seeds?
-Gymnosperms-bears seeds but doesn't have fruit or flowers
-includes conifers or plants with cones; also includes some without cones like cycads, ginkos, and gnetophytes
-Angiosperms-contain seeds from fruit; if a plant has flowers

How do flowers help plants to reproduce?
-Flowers have male and female sex cells
-Pollen contains male sex cells
-Female sex cells are in the ovary of the pistil
-Pollen is transferred from the stigma into the ovary

-At the ovary the sperm cell fertilizes the egg which becomes a plant

-Plants initially relied on wind to carry out this process but this was very ineffective
-Over time animals began carrying the grains of pollen and rubbing them off on the flower
-Pollinators-animals that carry pollen from plant to plant

Lesson Three

What is an invertebrate?

-Invertebrates-animals without backbones
-can live in water or on land
-more than 1 million different kinds of invertebrates; include 12 phyla
-Vertebrates-animals with backbones

Simplest invertebrates

-live in water; some even look like plants such as sponges and some cnidarian
-Sponges and cnidarians
-often brightly colors and are unable to move (they do move around but not as adults)
-Sponges gather food through their pores
-cnidarians have tentacles around their mouths that push prey inside (don't have a brain)
-Flatworms and roundworms
-Worms have a head, tail, and body that contains organ systems

Complex invertebrates

-mollusks-found on land or in water; covered by mantle (usually a hard shell); get food by moving it around
-include snails, clams, slugs, oysters, scallops, octopus, and squid
-segmented worms-bodies made up of segments or rings and have digestive system, nervous system
-echinoderms-include starfish and sea urchin

What are the most complex invertebrates like?

-Arthropods-2/3 of all species on Earth; have jointed limbs, some have jointed wings, and sectioned bodies; also have an exoskeleton (outer skeleton)

How do invertebrates affect people?

-pollinate plants, attack crops, transmit diseases, provide food, clothing thread

Lesson Four

What do vertebrates have in common?

-groups of vertebrates
-have internal skeleton called an endoskeleton
-most have two sets of limbs
-grouped into 7 classes

-chordates-any animal that at some time in its life has a large nerve cord running down its back

How do cartilaginous and bony fish compare?

-Cartilage-body tissue that is not as hard as bone or as soft as flesh
-sharks, rays and skates
-these animals have to stay in motion to keep a depth in the water
-Bony fish have a skeleton made of bones; bony fish have a swim bladder that helps a fish stay at the depth that it wants
-All skeletons start off as cartilage

Amphibians

-invertebrates that can walk
-tetra pods-four footed vertebrates

-apodans-have no legs
-amphibians live two lives; first in the water and then on land

Reptiles

-4 major groups on Earth (snakes, turtles, lizards, and crocodilians)
-have lungs and breathe air
-have hard scales that are waterproof
-most lay eggs on land; some give birth to live offspring
-eggs have shells that are soft and leathery
-cold-blooded-cannot automatically keep its body temperature steady

Birds

-have feathers
-have wings
-have very lightweight bones
-have beaks and no teeth
-born from an egg
-warm-blooded-automatically able to maintain a constant body temperature

Mammals

-mothers have mammary glands that produce milk
-covered with hair or fur to keep them warm in cold weather
-have sweat glands to cool in hot weather
-part of brain responsible for intelligence is more developed
-can live on land or water depending on the organism and some can fly
-come in a variety of sizes (bumblebee bat is smallest and the blue whale is the largest)

Endangered species

-Earth loses species everyday; when a species no longer exists it is extinct
-species can become extinct naturally because they can no longer survive their changing environment
-Most species become extinct due to humans
-Habitat loss is a major cause of species becoming endangered
-Overhunting
-pollution
-extotic species-species not from an area that are introduced by humans can overcome the native species of an area

What can people do?

-Build parks and reserves so animals can live safely
-Pass laws so habitats can't be destroyed
-Restore destroyed lands
-Breed and raise endangered species in zoos and aquariums
-Outlaw or limit the use of pesticides that poison useful or harmless species