Taxonomy – the Science of Classifying

<u>Common Names:</u> spider monkey, sea monkey, gray wolf, firefly, mud puppy, horned toad, black bear, jellyfish, ringwork, crayfish, sea horse
> *these names do not always give accurate clues for what the organism is
> * common names can be confusing and names can vary by region

Why Classify?

About 1.5 million species named

2-100 million species yet to be discovered

Taxonomy= science of classifying organisms
> -groups similar organisms together
> -assigns each a name

Naming Organisms:

Organisms have common & scientific name -all organisms have only 1 scientific name
> -usually Latin or Greek
> -developed by Carolus Linnaeus

Binomial Nomenclature
-written in italics (or underlines)
-1st word is Capitalized – Genus
-2nd word is lowercase – species
> Examples: *Felis concolor, Ursus arctos, Homo sapiens, Pathera leo, Pathera tigris*
-Scientific names can be abbreviated by using the capital letter of the genus and a period:
> Example *P. leo* (lion)

Members of the same genus are closely related.

Only members of the same species can interbreed (under natural conditions)

Some hybrids do occur under unnatural conditions: Ligers are crosses between tigers and lions.

Linneaus – devised the current system of classification, which uses the following schema

Kingdom
> Phylum/Division
>> Class
>>> Order
>>>> Family
>>>>> Genus
>>>>>> Species

Examine how these animals are organized into the different groups.

	Human	Cougar	Tiger	Pintail duck
Kingdom	Animalia	Animalia	Animalia	Animalia
Phylum/division	Chordata	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia	Aves
Order	Primate	Carnivora	Carnivora	Anseriformes
Family	Homindae	Felidae	Felidae	Anatidae
Genus	Homo	Felis	Panthera	Anas
Species	sapiens	concolor	tigris	acuta

Modern Evolutionary Classification

-Linnaeus grouped species mainly on visible similarities & differences

-Today, taxonomists group organisms into categories that represent lines of evolutionary descent (phylogeny)

-Evolutionary relationships among a group of organisms can be shown on a cladogram

Similarities in DNA and RNA

-DNA and RNA is similar across all life forms

-Genes of many organisms show important similarities at the molecular level

-DNA shows evolutionary relationships and helps classify organisms.

The Six Kingdoms and Domains

	# of Cells	Energy	Cell Type	Examples
Archaebacteria	Unicellular	Some autotrophic, most chemotrophic	Prokaryote	"extremophiles"
Eubacteria	Unicellular	Autotrophic and heterotrophic	Prokaryote	Bacteria, E. coli
Fungi	Most multicellular	Heterotrophic	Eukaryote	Mushrooms, yeast
Plantae	Multicellular	Autotrophic	Eukaryote	Trees, grass
Animalia	Multicellular	Heterotrophic	Eukaryote	Humans, insects, worms
Protista	Most unicellular	Heterotrophic or autotrophic	Eukaryote	Amoeba, paramecium, algae