Taxonomy - the science of classifying

Common Names*

spider monkey	sea monkey
gray wolf	firefly
mud puppy	horned toad
black bear	jellyfish
ringworm	crayfish
sea horse	*These names do not always give accurate clues as to what the organism is.

*Common names can be confusing and names can vary by region.

TAXONOMY

The Science of Classifying Organisms

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

This two-word naming system is called

Binomial Nomenclature

-written in italics (or underlined)
-1st word is Capitalized –Genus
-2nd word is lowercase —species

Examples: *Felis concolor, Ursus arctos, Homo sapiens, Panthera leo, Panthera tigris*

The scientific name is always italicized or underlined. Genus is capitalized. Species is not. 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

18-2 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 (see Fig 17.11, p. 496)

Similarities in DNA and RNA

- DNA & RNA is similar across all life forms
- Genes of many organisms show important similarities at the molecular level
- DNA shows evolutionary relationships & helps classify organisms

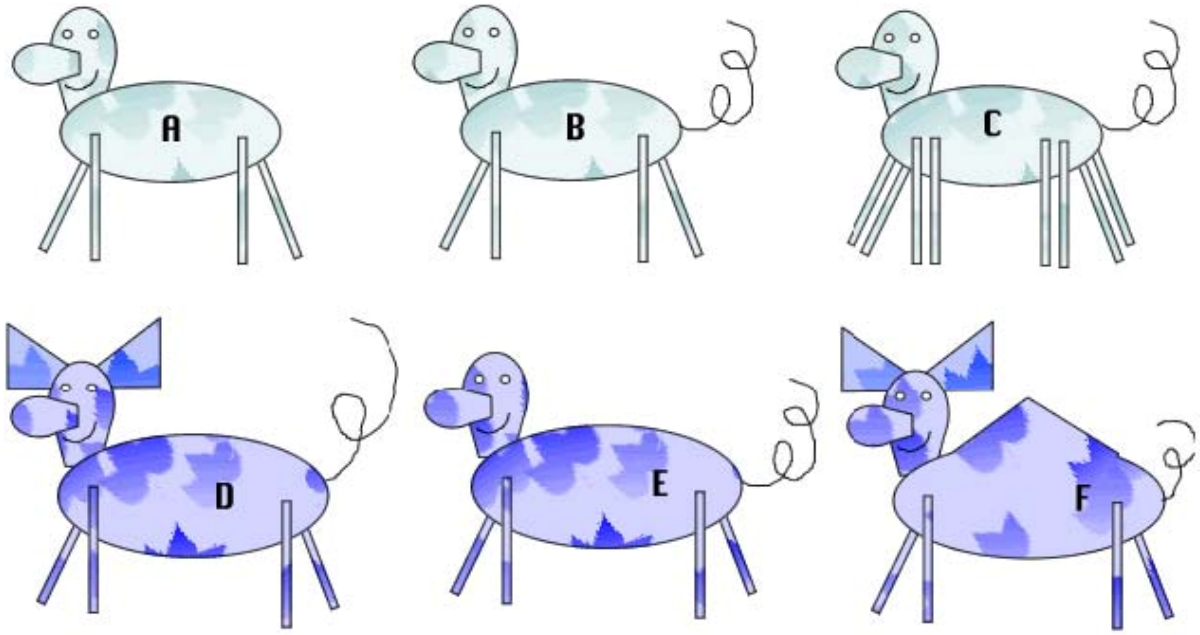
The Six Kingdoms and Domains

	number of Cells	energy	cell type	examples
archaebacteria	unicellular	some autotrophic, most chemotrophic	prokaryote	"extremophiles"
eubacteria	unicellular	autotrophic and heterotrophic	prokaryote	bacteria, E. coli
fungae	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	ameba, paramecium, algae

Using Dichotomous Keys

A dichotomous key is a written set of choices that leads to the name of an organism. Scientists use these to identify unknown organisms.

Consider the following animals. They are all related, but each is a separate species. Use the dichotomous key below to determine the species of each. Note that all these are organisms are in the same genus.



1.	Has green colored body .....go to 2
	Has purple colored body ..... go to 4
2.	Has 4 legs .....go to 3
	Has 8 legs ..... *Deerus octagis*
3.	Has a tail ..... *Deerus pestis*
	Does not have a tail ..... *Deerus magnus*
4.	Has a pointy hump ..... *Deerus humpis*
	Does not have a pointy hump.....go to 5
5.	Has ears .....*Deerus purplinis*
	Does not have ears .....*Deerus deafus*

Answers: A _____ _____, B _____ _____, C _____ _____,

D _____ _____, E _____ _____, F _____ _____