

Review...

- The three main ways we see diversity are:
 - 1. Diversity of Species
 - 2. Diversity of Genes
 - 3. Diversity of Ecosystems
- 4. Extinction → since the beginning of earth 4 bya, at least 99% are now extinct. As species become extinct new species that are better adapted appear and replace former ones.

List of ten organisms

- In groups of 3 you will be creating a classification system based on all your species (you should have approximately 20-25 species)
1. As a group, decide on a set of categories into which you will sort or classify your species. Think of underlying rationale for your categories. For example, you might want to distinguish between species used in agriculture and species found in the home.
 2. Sort your species into the different categories with your group members.

Answer these questions:

- a. Was it difficult to decide on different categories? Explain the challenge
 - b. Did some species fit more than one category? Give an example of when this occurred.
 - c. Exchange a list with another group, redo step 3 with their 10 species and compare your results. Did you agree on how to sort the species in a chosen category?
- Submit answers to ensure all group members name are written.

Taxonomy- Developing a classification System

- Classification is an essential for our everyday use and for scientists. But how do you establish a classification system that can incorporate habitat, reproduction, structure, food supply, genes and adaptation and even extinction?



H. melpomene

H. heurippa

H. cydno

Carl Linneaus (1707-1778)



- Swedish Naturalist “father” of taxonomy. Established a naming system that is still used today.
- He based his groupings on shared characteristics amongst the organisms themselves, in a Genus, not external factors (habitat's)
- Before Linneaus, early names and classification systems were extremely variable.
- Fun fact: Linneaus was a staunch advocate for his naming system that he changed his name from Carl von Linne to *Carl Linneaus*

Dichotomous Keys

- Knowing how to classify organisms according to characteristics can be tricky.

Dichotomous Keys: A series of branching two-part statements used to identify organisms based on certain characteristics.



Ibis Heron Spoonbill cardinal eagle

What characteristics can we choose to classify these birds?

Organize the birds according to beak characteristics:

Ibis: long, curved beak

Heron: Long, straight beak

Spoonbill: long, widened at end beak

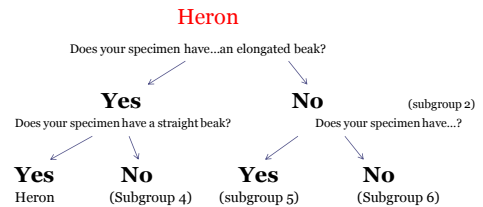
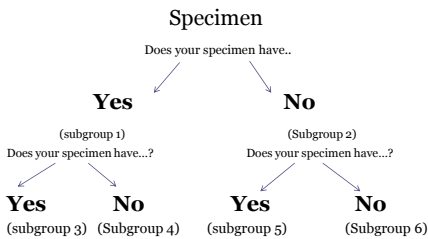
Cardinal: Short beak, straight

Eagle: Short beak, hooked

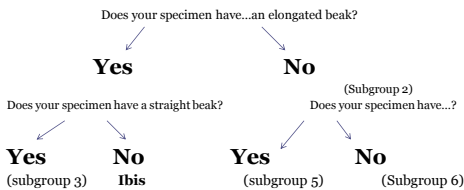
Characteristics:

1. Elongated Beak
2. Short beak
3. Curved beak
4. Hooked Beak
5. Straight beak
6. Widened beak

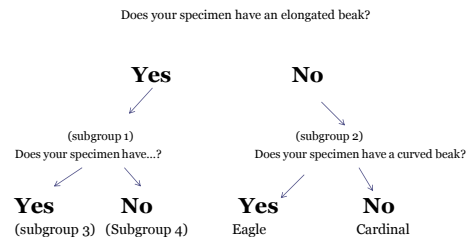
How to start a Dichotomous Key

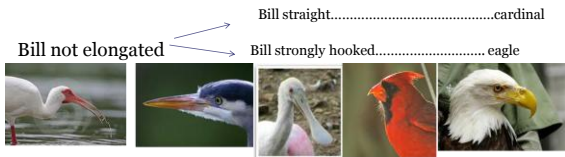
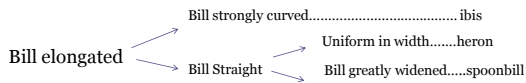


Ibis



Eagle/Cardinal





Rules of Engagement: Dichotomous Keys

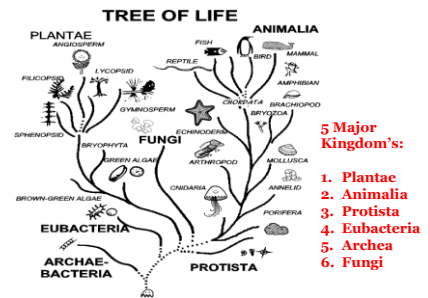
- Each step of the key only has 2 choices
- Start with general choices and move more specific ones
- Each choice must either continue on to another part of the key or end at the name of the taxonomic level
- The key must work.

Traditional Taxonomy

- **Linnaeus:** grouped species into taxonomic ranks based on shared characteristics. Each level is called a taxon (pl: taxa). There are 7 major level's:

Taxon	Human	Bald Eagle	Honey Bee
Kingdom	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Arthropoda
Class	Mammalia	Aves	Insecta
Order	Primates	Carnivora	Hymenoptera
Family	Hominidae	Accipitridae	Apidae
Genus	Homo	Haliaeetus	Apis
Species	<i>Homo sapiens</i>	<i>Haliaeetus leucocephalus</i>	<i>Apis mellifera</i>

Kingdom's of Life



Domains of Life

- Based on genetic research by Carl Woese, instead of 6 Kingdoms, there are 3 domains
- **Domain Eubacteria** contains only the Kingdom Eubacteria
- Eu= True, Eubacteria= true bacteria
- **Domain Archaea** contains only Kingdom Archaea
- **Domain Eukaryotes** contains: Protista, Animalia, Plants and Fungi

In class work:

- Page 369- 376 Question 2, 3, 7, 8 page 376 (hw)
- Dichotomous Key handout (cw)



Homework

- Chapter 11, section 2. page 377 -379
- Investigation 1 page 384