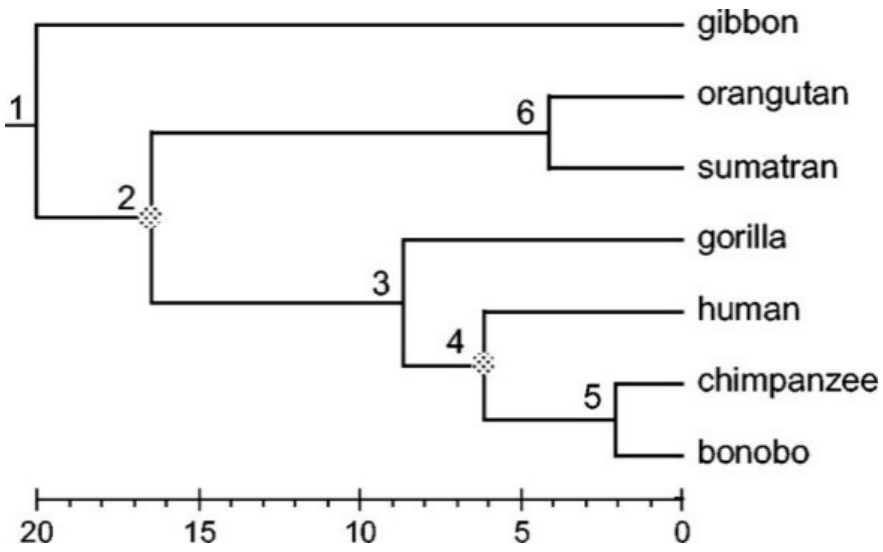
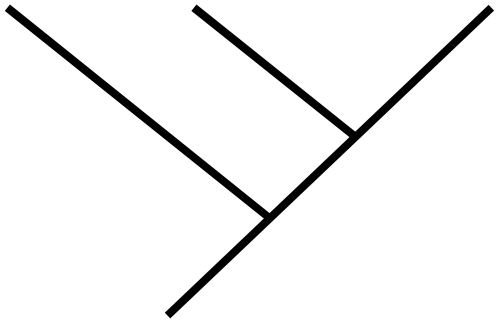
Life Sciences 11
Picturing Relationships

1. Molecular clocks
   - used to estimate how long ago a divergence or mutation in an ancestral species resulted in the formation of new species by comparing DNA sequences from two different species
   - counts how many mutations have accumulated → more mutations equal more time passed since divergence



2. Cladograms
   - also called phylogenetic reconstruction
   - uses cladistics – a modern method of classifying organisms
   - branching diagram that proposes the evolutionary history of a species or group
   - relates organisms based on how they diverged from a common ancestor using morphological and biochemical characteristics
   - traits are classified as:
     i. Ancestral Characteristics
        - characteristic found within the entire line of descent
        - reptiles and birds both have backbones
     ii. Derived Characteristics
        - characteristics found within only one group, but not in the entire line of descent
        - birds have feathers but reptiles do not
   - primary assumption – the greater the number of shared derived characteristics, the more recently those organisms shared a common ancestor

Example: Students pick three animals.



Homework

Create a cladogram using the following organisms: shark, bird, reptile, amphibian (frog), bony fish (salmon), rabbit, human. Hint: the first divergence from a common ancestor is the shark.