VERTEBRATES: ACCUMULATION OF TRAITS OVER TIME

Dates for Earliest Fossils of Each Dated Group (mya)

Red for New/Modified Traits Added to Those in Gray (below)

Arrows Show Continued Diversification Within Each Group to the Present

NOW									
150 mya									Birds (150) fused clavicles feathers
220 mya							Mammals (220) full bony palate molars w/ 2 roots 3 ear bones no lumbar ribs single-bone jaw		
310 mya 320 mya						PreMammals(320) amniotic: embryo membranes; tooth differences legs under body temp. regulation	amniotic: embryo membranes tooth differences legs under body temp. regulation	Reptiles (310) scaly skin amniotic: embryoic membranes	scaly skin amniotic: embryoic membranes
365 mya					Amphibians walking legs, shoulder & pelvic girdles 5-fingers, toes	walking legs, shoulder & pelvic girdles 5-fingers, toes	walking legs, shoulder & pelvic girdles 5-fingers, toes	walking legs, shoulder & pelvic girdles 5-fingers, toes	walking legs, shoulder & pelvic girdles 5-fingers, toes
400 mya				LobeFin Fishes appendages with internal bones	appendages w/ internal bones	appendages w/ internal bones	appendages w/ internal bones	appendages w/ internal bones	appendages w/ internal bones
440 mya			Jawed Fishes jaws, teeth bony skeleton gill arches paired append.	jaws, teeth bony skeleton gill arches paired append.	jaws, teeth bony skeleton gill arches prd append.	jaws, teeth bony skeleton gill arches paired appendages	jaws, teeth bony skeleton gill arches paired append.	jaws, teeth bony skeleton gill arches paired append.	jaws, teeth bony skeleton gill arches paired append.
500 mya		JawlessFishes dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs	dermal bones skull; lungs
530 mya	Ceph-chords head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches	head/tail ends muscle bundles dorsal nerve cord; notochord gill arches