The Geologic Column and the Evolution of Life
(read from bottom to top)

EON	ERA	PERIOD	EPOCH	AGE (millions years ago = ma)	LIFE FORMS/EVENTS	*GEOLOGIC EVENTS*
Phanerozoic	Cenozoic (age of mammals)	Quaternary	Holocene	0.01	modern humans	*End latest Ice Age*
			Pleistocene	2.5	earliest humans	*Begin latest Ice Age* *Linkage of N & S Americas*
		Tertiary	Pliocene	5.3		*Begin Cascade volcanism* *Begin Antarctic icecaps*
			Miocene	23.7	earliest hominids	
			Oligocene	36.6	Mammals abundant flowering plants abundant	*Collision of India w. Asia*
			Eocene	57.8	earliest grasses mammals, birds, insects abundant	*Separation of Australia & Antarctica*
			Paleocene	65		*Formation of Alps* *Opening Norwegian Sea & Baffin Bay* *Formation of Rockies*
Cretaceous-Tertiary boundary: extinction of dinosaurs and many other species at end of Mesozoic Era (65 million years ago)						
	Mesozoic (age of reptiles)	Cretaceous		144	first flowering plants (115 ma)	
		Jurassic		199	first birds (155 ma) dinosaurs abundant	

			first turtles (210 ma) first mammals (221) first dinosaurs (228 ma)	*Begin breakup of Pangaea*
	Triassic	251	first crocodiles (240 ma)	

Permian-Triassic boundary: greatest mass extinction of all time; 96% all life on Earth perishes at end of Paleozoic Era (251 ma)

Paleozoic (ancient life)	Permian	286	end of Permian= extinction most marine & land animals (age of amphibians)	*S. Hemisphere glaciation* *Finally assembly of supercontinent Pangaea*
	Carboniferous			
	Pennsylvanian	325	large coal swamps	*Formation of coal deposits*
	Mississippian	360	first reptiles (330 ma) amphibians abundant	
	Devonian	408	first seed plants (365 ma) first sharks and bony fish (370 ma) first insect fossils (385 ma)	
	Silurian (age of fishes)	438	first land animals (410 ma) first vascular land plants (430 ma)	
	Ordovician	500	first moss-type land plants (470 ma) first fishes (505 ma) earliest corals marine algae	

			trilobites dominant	
	Cambrian (age of invertebrates)	545	first abundant life (shelled invertebrates) "Cambrian Explosion"	
			first invertebrates (550 ma)	*Breakup of Rodinia (750-600 ma)*
			earliest shelled organisms (600 ma)	*Snowball Earth (700 ma)*
			first fossil of multicellular organism (1200 ma)	*Formation of early supercontinent Rodinia (1200 ma)*
			first fossil of eukaryote cell (1800 ma)	
Pre-Cambrian	Proterozoic	2500	free oxygen in atmosphere (2400 ma)	*Snowball Earth (2200 ma)*
			first evidence of eukaryote byproduct, cholesterol (2700 ma) stromatolites abundant (3500 ma) earliest primitive life (prokaryotes -bacteria) (3800-3500 ma)	
	Archean	4000	oldest surface rocks (4000-3800 ma)	
			oldest single mineral, zircon (4400 ma) oldest Moon rocks (4440 ma)	*Heavy meteorite impacts*
	Hadean	4600	oldest meteorites (4560 ma)	*Formation of Earth*