

## CLASSROOM CLADOGRAM OF VERTEBRATE/HUMAN EVOLUTION

### KEY: TEAM ASSIGNMENTS & ASSOCIATED TRAITS

One animal group assigned per team.

<p>NAME OF GROUP 1 Cephalochordates: Extinct: <i>Pikaia</i> sp.? Today: Amphioxus: <i>Branchiostoma</i> sp.</p>	<p>FIRST APPEARED: 530 mya</p>	<p>GROUP TRAITS ("BLUE") head end, tail notochord myotomes (muscle bundles) dorsal nerve cord gill basket, with "gill slits"</p>
<p>NAME OF GROUP 2 Agnatha (jawless fishes) Extinct: Heterostracans (e.g. <i>Pteraspis</i>) Today: typical Cyclostomes: lampreys and hagfishes</p>	<p>FIRST APPEARED: 500 mya</p>	<p>GROUP TRAITS ("YELLOW") dermal (skin) bones skull paired lateral eyes pineal ("third") eye lung</p>
<p>NAME OF GROUP 3 Gnathostomes (jawed fishes) Extinct: Acanthodians: <i>Climatius</i> Paleoniscoids: <i>Cheirolepis</i> Today (typical): salmon, perch, trout, goldfish, etc.</p>	<p>FIRST APPEARED: 430 mya</p>	<p>GROUP TRAITS ("GREEN") jaws teeth internal skeleton gill arches paired appendages</p>
<p>NAME OF GROUP 4 Crossopterygians (lobe-finned fishes) Extinct: <i>Osteolepis</i> <i>Eusthenopteron</i> Today: Coelacanth (<i>Latimeria</i>)</p>	<p>FIRST APPEARED: 400 mya</p>	<p>GROUP TRAITS ("ORANGE") paired front and hind limbs with internal bones</p>
<p>NAME OF GROUP 5 Amphibians Extinct: <i>Acanthostega</i> <i>Ichthyostega</i> Anthracosaurs (e.g. <i>Seymouria</i>) Today (typical): salamanders, frogs</p>	<p>FIRST APPEARED: 360 mya</p>	<p>GROUP TRAITS ("PURPLE") walking legs shoulder and pelvic girdles five fingers and toes neck</p>
<p>NAME OF GROUP 6 Reptiles Extinct (cotylosaurs): <i>Hylonomus</i> <i>Paleothyris</i> Today (typical): lizards, crocodiles, tortoises, birds</p>	<p>FIRST APPEARED: 300 mya</p>	<p>GROUP TRAITS ("RED") tooth differentiation embryonic membranes (amnion, etc.)</p>

NAME OF GROUP 7 Mammal-like Reptiles (Synapsids) Extinct: Therapsids (e.g. <i>Cynognathus</i> ) Pelycosaurs (e.g. <i>Dimetrodon</i> )	FIRST APPEARED: 250 mya	GROUP TRAITS ("BROWN") incisor-canine-cheek teeth sequence legs under body body temperature regulation
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NAME OF GROUP 8 Mammals: Extinct: <i>Sinoconodon</i> <i>Kuehneotherium</i> Today (typical): cats, dogs, bears, cows, horses, etc.	FIRST APPEARED: 200 mya	GROUP TRAITS ("BLACK") complete bony palate cheek teeth crowned teeth replaced only once molars double-rooted three ear bones lumbar region rib-free double occipital condyle
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NAME OF GROUP 9 Primates: Extinct: Plesiadapids (e.g. <i>Palaechthon</i> ) <i>Cantius</i> Today: typical Prosimians: tree shrews, lemurs	FIRST APPEARED: 65 mya	GROUP TRAITS ("WHITE") grasping hands collar bone closed eye socket nails (fingers and toes) eyes in front muzzle reduction
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NAME OF GROUP 10 Hominoids ("Pre-Apes"): Extinct: <i>Aegyptopithecus</i> <i>Proconsul</i> Today: Apes: chimpanzees, gorillas, orangutans	FIRST APPEARED: 30 mya	GROUP TRAITS ("TAN") 2123 dental formula (upper and lower) no tail
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NAME OF GROUP 11 Hominins (formerly "Hominids") Extinct: <i>Australopithecus</i> spp. <i>Homo habilis</i> , <i>H. erectus</i> , et al Today: <i>Homo sapiens</i>	FIRST APPEARED: 4 mya	GROUP TRAITS ("OLIVE") small canine teeth long arms simple tool making, butchering precision grip bipedal (erect posture) foramen magnum more forward
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