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Cladogram Construction

Step 1: Using your textbook and the explanations below, determine which of the characteristics each animal has. In the Data Table provided (on your Cladogram Worksheet), place an "x" in the box if the animal has the characteristic.

Characteristics:

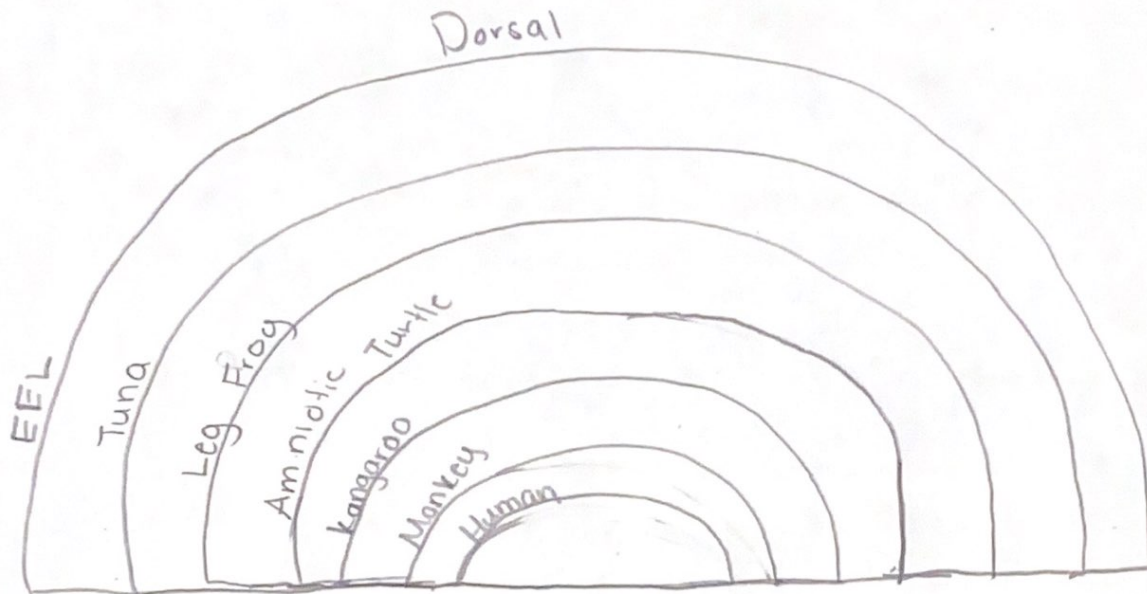
- set #1: Dorsal nerve cord (running along the back or "dorsal" body surface)
Notochord (a flexible but supporting cartilage-like rod running along the back or "dorsal" surface)
- set #2: Paired appendages (legs, arms, wings, fins, flippers, antennae) and Vertebral column ("backbone")
- set #3: Paired legs
- set #4: Amnion (a membrane that holds in the amniotic fluid surrounding the embryo; may or may not be inside an egg shell)
- set #5: Mammary glands (milk-secreting glands that nourish the young)
- set #6: Placenta (structure attached to inside of uterus of mother, and joined to the embryo by the umbilical cord; provides nourishment and oxygen to the embryo)
- set #7: Canine teeth short (same length as other teeth)
Foramen magnum forward (spinal cord opening, located forward, under skull)

DATA TABLE

SETS	TRAITS	Kangaroo	Lamprey	Rhesus Monkey	Bullfrog	Human	Snapping Turtle	Tuna
SET 1	Dorsal Nerve Cord Notochord	✓	✓	✓	✓	✓	✓	✓
SET 2	Paired Appendages Vertebral column	✓		✓	✓	✓	✓	✓
SET 3	Paired legs	✓		✓	✓	✓	✓	
SET 4	Amnion (Amniotic sac)	✓		✓		✓	✓	
SET 5	Mammary Glands	✓		✓		✓		
SET 6	Placenta			✓		✓		
SET 7	Canine teeth short Foramen magnum fwd					✓		
	TOTALS of Xs----->	5	1	6	3	7	4	2

Step 2: Below the Data Table on your Worksheet, make a Venn diagram, placing your seven animals in groups to illustrate those characteristics which different animals have in common. Each circle of the Venn diagram should represent one of the trait sets listed above. The outer most circle should be the trait that all of the organisms possess. The inner-most circle should be the trait that only one of the organisms possess. For each circle, place a '-' by the trait and label that trait with the organism that has that trait but none of the traits inside of that trait. For example, the outermost circle should be: Notochord – Lamprey eal.

Step 2: Venn Diagram



Step 3: Using the Venn diagram of the groupings just completed (as a guide), draw a cladogram on the back of this sheet to illustrate the ancestry of these animals. The diagram should reflect shared characteristics as time proceeds. The different animals should all be at the same time level (across the top) since they all live today. The trait possessed by all animals should be labeled at the base of the stalk. The trait possessed by only the most complex organism should be to right near the top of the stalk.

Step 3: Draw cladogram:

