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I spend countless hours writing, researching, editing and generating graphics/charts for each question. I want to continue creating useful content for you to use - however, I also want to ensure my work is fairly compensated.

Therefore, below are the terms and conditions for use of our materials.

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- posting a copy of our content (ie. questions, rubrics) on a password protected site for your students to access and/or complete.
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- Selling our content.
- Repackaging our content in your own materials and then selling it. NOTE: giving credit to us still does not make this okay.
- Distributing and/or posting our content online (for example, on social media or a blog).

Thank you for supporting us. And, we look forward to helping you with your teaching practice. Please feel free to reach out to us if you have any questions or suggestions.

Sincerely,

Kent
REAL Science Challenge Founder
Science Department Head (Burnaby South Secondary)

How to Make a Cladogram

(Adapted from ENSI/SENSI lesson plan: Making Cladograms
<http://www.indiana.edu/~ensiweb/home.html>)

Cladograms are diagrams which depict the relationships between different groups of taxa called “clades”. By depicting these relationships, cladograms reconstruct the evolutionary history (phylogeny) of the taxa. Cladograms can also be called “phylogenies” or “trees”.

Cladograms are constructed by grouping organisms together based on their shared derived characteristics.

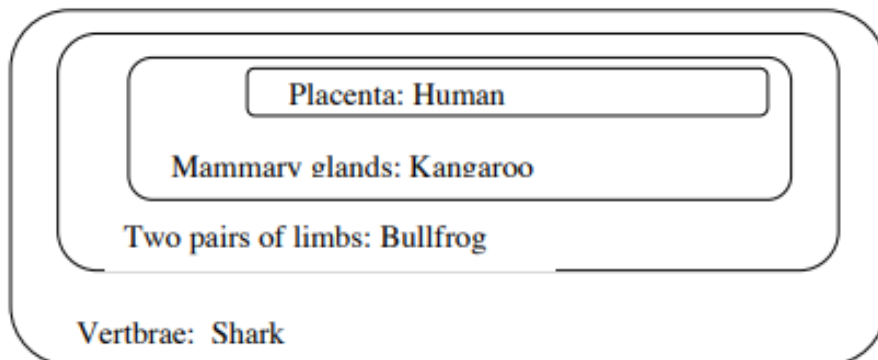
Example:

1. Given these characters and taxa:

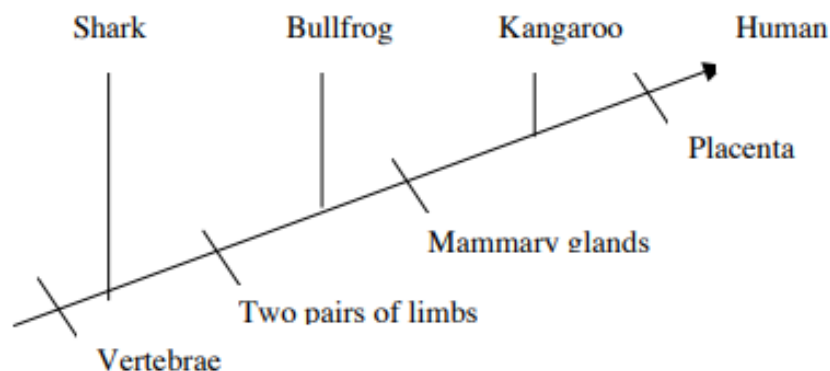
Taxa

Characters	Shark	Bullfrog	Kangaroo	Human
Vertebrae	X	X	X	X
Two pairs of limbs		X	X	X
Mammary glands			X	X
Placenta				X

2. Draw a Venn diagram. Start with the character that is shared by all the taxa on the outside. Inside each box, write the taxa that have only that set of characters.



3. Convert the Venn diagram into a cladogram like so:



Video Game Console Pieces (p1)



Sony Playstation



Nintendo GameBoy



SEGA Master System



Nintendo



Playstation Portable (PSP)



Atari 2600



N64



VR

Video Game Console Pieces (p2)



Nintendo GameBoy 3DS



Nintendo Wii U



Nintendo Wii



Sony Playstation 3



Nintendo Switch



Magnavox Odyssey