SBI3U Taxonomy Unit Review

1. What are the **Three Domains**? What is one feature of each domain?

   Archaea - ancient prokaryotes, live in very inhospitable environments

   Prokaryota, Eubacteria - more recently evolved bacteria, temperate environments

   Eukaryota, Eukarya - all organisms with nucleate cells

2. How are the Three Domains different from the **Five Kingdoms**?

   Archaea & Eubacteria are essentially their own kingdom; the remaining 4 all fit in Eukaryota

3. Name the Five Kingdoms of life, and give one basic feature of each kingdom.

   Monera - single celled prokaryotes

   Protista - single celled eukaryotes

   Fungi - multicellular, heterotrophic, decomposers or 'saprobes'

   Plantae - multicellular, autotrophic, or photoautotrophs, capable of photosynthesis

   Animalia - multicellular, heterotrophic, advanced organ systems, sensory systems

4. What is the correct way of writing a **scientific name** for a species?

   Genus first, capitalized, then species, lower case. eg. Homo sapiens Genus can be abbreviated, especially when talking about many different species: H. sapiens, H. neanderthalensis

5. What do we mean by the term **'type species'**? How are they distinguished from others?

   A species that defines its genus based on its traits; the one that all others are compared to. In order to show this, they have the same G & S taxa, eg. Tadorna tadorna, common shelduck

6. Which **Phylum** name indicates whether or not an animal has a backbone?

   Chordata w subphylum Vertebrata

7. What are the key features of: **Mammals? Birds? Reptiles? Amphibians?**

   Mammals: hair, homeothermy (regulated body temperature), 4 chambered heart, milk, live birth

   Birds: also homeothermy, 4 chambered heart, feathers, hollow light bones, air sacs, lay eggs

   Reptiles: poikilothermy (unregulated body temp., "cold blooded"), scales, lay eggs

   Amphibians: poikilothermy, thin skin, live on both land and in water, require water for at least one part of their life cycle, external fertilization

8. Describe the basic rules of composing a **dichotomous key.**

   Objective criteria, yes/no questions, continually diverge into two branches until everything is in its own specific category

9. What was the **Scale of Nature**? Why did it not work?

   Aristotle's system, based on psyches (Animate, Vegetative, Rational). No evidence of these existing, criteria were often subjective, anthropocentric, included non-living things.

10. Describe the way St Augustine felt animals and plants should be classified. What flaws did this system demonstrate?

    They were Useful, Harmful, or Superfluous; this is totally subjective & anthropocentric. (But, it didn't include non-living things, and no psyches)

11. Which scientist developed our current system of classification?

    Karl Linne, or Carolus Linnaeus

12. What is meant by *subjective* vs *objective* criteria?

    Subjective are "debatable" eg. chocolate is better than vanilla ice cream. Variable, personal. Objective criteria can't be argued, and are based on factual observations eg. horses have 4 legs

13. What kinds of *criteria* are used by taxonomists to classify living organisms?

    Objective ones such as anatomy, behaviour, reproduction; today, genetics & DNA also.

14. What is meant by the term **biodiversity**? What are the three types of biodiversity?

    A measure of how diverse life is in a given area; how many different species of living organisms exist there. Intraspecific (between individuals, within a species), Interspecific (between different species), Ecological (between biomes or ecosystems)

15. What are the general global trends for biodiversity? What factors influence it?

    As you approach the equator, biodiversity increases. Habitat, climate, resources.

16. What do the following terms mean: **extinct, threatened, extirpated, invasive.**

    Extinct - no longer exists anywhere; dodo, passenger pigeon, baiji

    Extirpated - no longer exists in part of its former range, but still found somewhere; wolves have been extirpated from England but exist on the European continent, North America, Asia.

17. Make a two column table. Label one column **Taxa**, and list the seven taxa below it, one in each row. Label the second column **Analogy**. In the second column, using your home address or the school address as an example, demonstrate how specific each taxon is.

TAXA	ANALOGY
KINGDOM	Earth
PHYLUM	North America
CLASS	Canada

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ORDER	Ontario
FAMILY	Hamilton
GENUS	Main St. East
SPECIES	1715

18. Why is it so difficult for scientists to determine an accurate count of living species?

    Many areas of the world have yet to be explored, species continually evolve, techniques change

19. A scientist is on an annual bird tagging mission. She works with the same migratory population of Kinglets, a tiny songbird, which has two species: yellow crowned (yellow feathers at the top of the head) and red crowned. Over the years that certain individuals are developing markings intermediate to the two types - a yellow band flanked by two red stripes. What will she need to know before any attempt to re-classify any of them? What conclusions might she draw about the original species, and about these new individuals?

    Do they interbreed: is the new type a hybrid, or a mutation? If it is a hybrid, then the previous two species are probably a single species. This may or may not be a new species.

    Behaviour: calls, mating rituals, etc. Are they more similar to the one or the other, or is there something unique? Unique behaviours may argue for a new species.

    Anatomy: external and internal structures should be examined and compared closely.

20. Lake Erie is a shallower lake than Lake Superior. L. Erie reaches 64 m, while L. Superior reaches 400 m. Erie's water temperature over the course of a year ranges from 1C to around 24C, while Superior ranges from 1C to about 18C. Superior is much larger, but has less human impact (larger cities, industry); Erie is surrounded by dense population, and a lot of industry. Knowing all of these facts, explain which lake you feel might have greater biodiversity.

    Superior could have greater biodiversity based on sheer size and depth, and the lack of human impact which might mean less pollution, less habitat destruction. Erie, it could be argued, has better temperatures for sustaining life but too many negative factors to decrease biodiversity.