

Campbell - Chapter 1 - Themes In The Study of Life

Theme 1: Biological Hierarchy

Between the cell and the multicellular organism, there are three levels of biological organization. Name them:

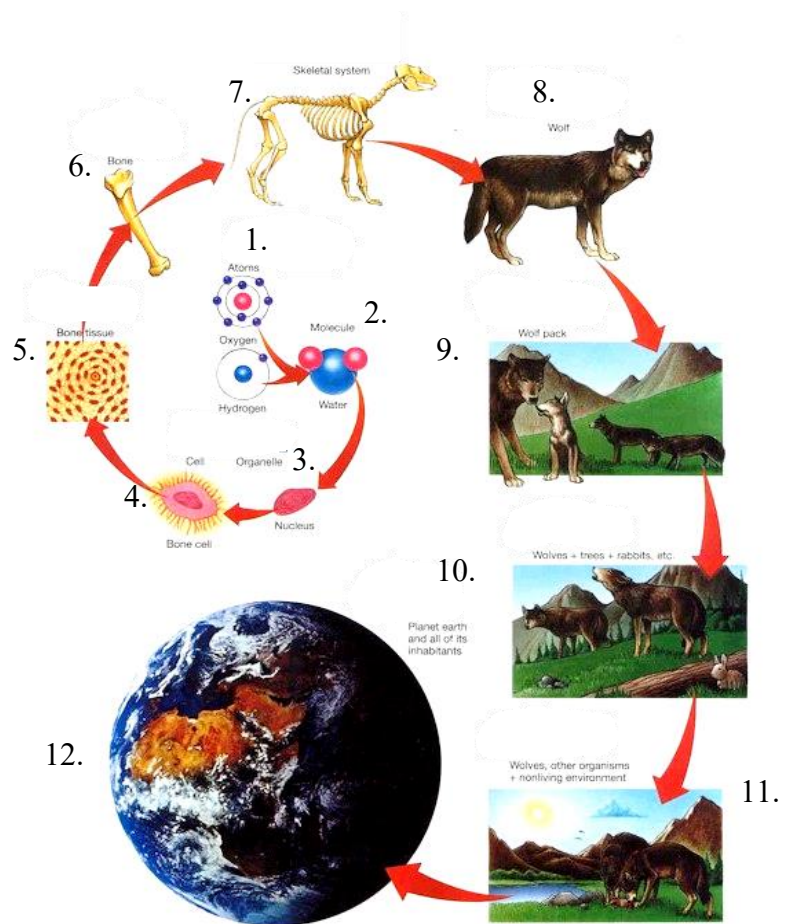
- 1.
- 2.
- 3.

Above the individual organism are additional levels of ecological organization. Name the first two:

- 1.
- 2.

See if you can name the levels of biological organization pictured below:

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.
- 11.
- 12.



What is an emergent property?

Give a non-biological example and a biological example

_____ is reducing complex systems to simpler components that are more manageable to study.

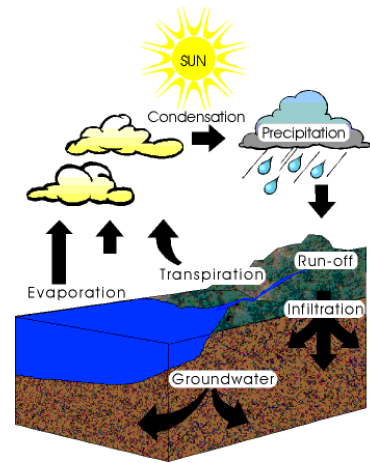
Theme 2&3: Organisms Interact Continuously With Their Environment and Life requires energy transfer and transformation

All organisms are affected by the activities of other o_____.

All organisms are involved with energy exchanges with their e_____.

Most nutrient movements through ecosystems are described as c_____ because they tend to circulate through all of the components of the ecosystem.

What cycle is pictured to the right? _____



The maintenance of life is dependent upon the transfer of e_____ from one organism to another or _____ from the environment to the organism. All transfers are accompanied by the eventual release of _____ (into the environment) as a by-product of organism metabolism.

What sort of energy transfers and transformations are involved with you eating your breakfast?

Theme 4: Form Relates To Function

The job performed by a biological structure relates directly to its _____.

Based upon its form, what would you say the *function* of the device pictured to the left is?



Theme 5: Cells Are The Organism's Basic Units of Structure and Function

Who is credited with the "discovery" and naming of cells? _____

Who is cited as the "discoverer" of microorganisms? _____

What two scientists are generally credited with developing the "Cell Theory"? _____ and _____.

All cells are surrounded by a c_____ m_____.

All cells contain an inheritable material titled ____ _ _ _.

In biology, the two MAIN types of cells are:

- 1.
- 2.

Are you a prokaryote or a eukaryote? _____

One fundamental feature possessed by plant cells but lacking in animal cells is the ____ _ _ _.

Theme 6: DNA and The Continuity of Life

Biological instructions are coded in a molecule named _____.

Found within DNA are inheritable instructions called _____.

The shape of a DNA molecule is generally described using the term "d_____ h_____".

The building blocks of DNA are called _____. How many kinds are there in DNA? _____

Right before cell division, the DNA must _____.

_____ is the entire process of a gene directs the production of a cellular product.

Our _____ represents our entire library of genetic information

Describe three research developments that make genomics possible:

1.

2.

3.

Theme 7: Regulatory Mechanisms Ensure A Dynamic Balance In Living Systems

The regulation of chemical activity in cells occurs as a result of control by a type of protein molecule called a(n) _____.

In a negative feedback system, an increase in one factor leads to a(n) _____ (increase / decrease) in a second, regulatory factor. Homeostasis results from the body's utilization of _____ (*positive / negative*) feedback systems.

Give an example of a positive feedback system.

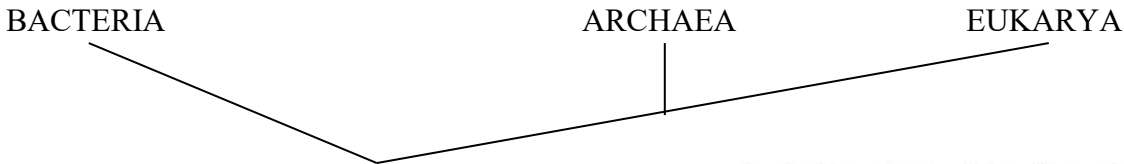
Theme 8 Evolution: Diversity and Unity Are The Dual Faces Of Life On Earth

The branch of biology that names and classifies organisms is named _____.

The largest level, or "taxon" of classification is the _____. In most modern taxonomic systems, there are _____ (#) of them and they are named _____, _____, and _____.

What domain is most closely related to Eukaryota? _____

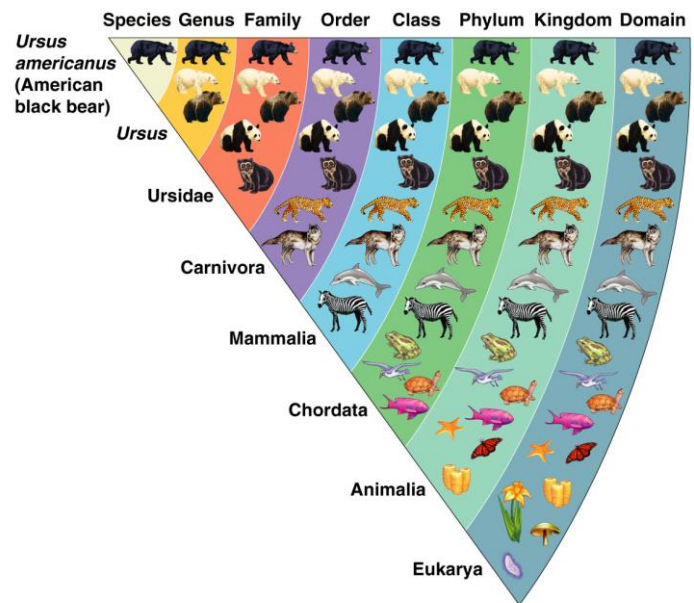
WRITE in the major kingdoms associated with each domain.



Which level contains the greatest diversity?

Which the least?

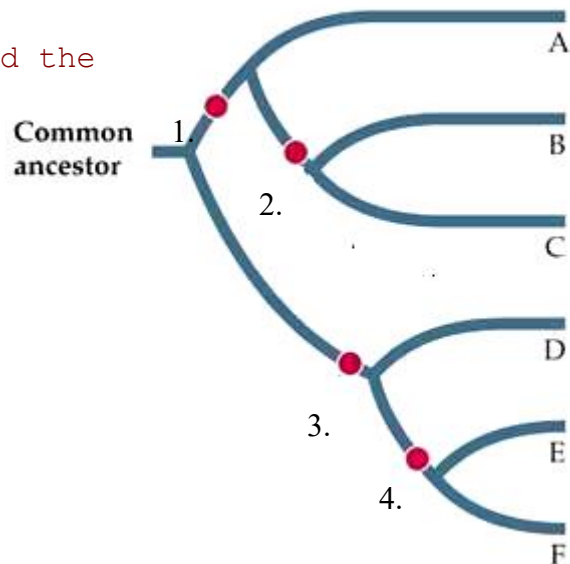
Most people use a mnemonic device to remember these levels. If you have one, write it here.



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Theme 8 Evolution: Natural Selection and the Tree of Life

- _____ What animal group is the common ancestor to B and C?
- _____ What animal group is the common ancestor to A, B, and C?
- _____ What animal group is the common ancestor to E and F?
- _____ What animal group is the common ancestor to D, E, and F?



Charles Darwin did not often use the word "evolution". Instead, he utilized the phrase "_____ with _____", a suitable substitute definition and explanation for evolution.

Darwin's two observations that led him to propose a mechanism for evolution were:

- (1) That within every organism population there is a great deal of _____, and those differences are _____.
- (2) Nearly all populations have the ability to produce _____ (more / fewer) offspring than the environment ("nature") can support.



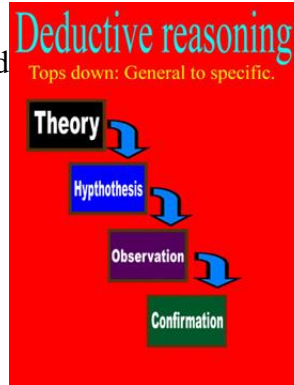
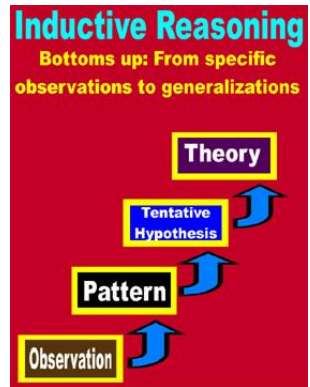
From these two observations, he inferred that the individuals most likely to reproduce were those organisms whose physical qualities "traits" allowed them to survive long enough to reproduce. When they DID reproduce, they passed these same characteristics on to their o _____.

Natural selection does not create adaptations, it s _____ them. Features shared by two species are due to their descent from _____, and differences between the species are due to _____ modifying the ancestral equipment in different environmental contexts. Evolution is the unifying theme that ties together every chapter in your _____.

Theme 9: Scientific Inquiry

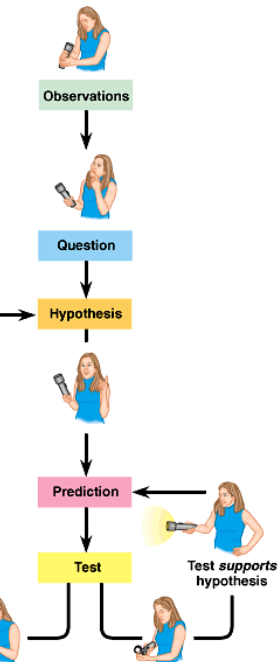
If a number of observations and measurements are used to form a conclusion, the reasoning method is named _____ reasoning. (Bottom up)

If a broadly accepted idea in science gives rise to a greater understanding of the contributing factors, it is termed _____ reasoning. (Top down)



State the six steps utilized during application of THE SCIENTIFIC METHOD.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.



Theme Ten: Science, Technology, and Society

Summarize section 1.4 in 3 sentences Or less.