What is Science?

What is Biology?

What is life?

**ATTRIBUTES OF LIFE:**

1. **Order ➔ A HIERARCHY OF ORGANIZATION**
   - Biological organization is based on structural levels.

   - **Atoms**
   - **Biological molecules**
   - **Organelles (only eukaryotic cells not prokaryotic)**
   - **Cells**
   - **Tissues**
   - **Organs**
   - **Organs systems**
   - **Organism**

   Organization beyond the level of the organism:

   - **Population**
   - **Community**
   - **Ecosystem**
   - **Biosphere**
b. **Reproduction**

   Biogenesis

c. **Growth and Development**

d. **Energy utilization & processing:**
   **Metabolism:**

   Anabolism:

   Catabolism:

e. **Respond to environmental stimuli**

f. **Regulation:**
   **Homeostasis:**

   a) Negative Feedback

   b) Positive Feedback

g. **Evolutionary Adaptations**

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**THE CELLULAR BASIS OF LIFE**

1)

2)

3)

4)

5)
Two major cell types:
1. Prokaryotic
2. Eukaryotic

UNITY IN DIVERSITY
Estimated:
1.7 million species identified, of which:
- 290,000 plant species
- 59,000 vertebrates
- 1,200,000 insects

Taxonomy:
Taxonomic categories are ranked into a hierarchy form most to least inclusive.

General
DOMAIN Eukarya
KINGDOM Animalia
PHYLUM Chordata
CLASS Mammalia
ORDER Carnivora
FAMILY Canidae
GENUS Canis
SPECIES C. latrans

Specific

Specific

Whittaker’s Classical 5 Kingdoms scheme
Monera, Protista, Fungi, Plantae & Animalia

Today:
3 Domains => Archaea, Bacteria and Eukarya

Human Features

1)

2)

3)

4)
Scientific Method

- Observation

- Question(s)

- Hypothesis
  - Null hypothesis
  - Alternative hypothesis

- Predictions

- Experimentation

- Analysis (Statistics)

- Interpretation/Conclusion

- Presentation

Graphing

- Bar
- Line
- Scatter plots

- Dependent variable (X-axis)
- Independent variable (Y-axis)

- Axis labels and units
- Figure caption