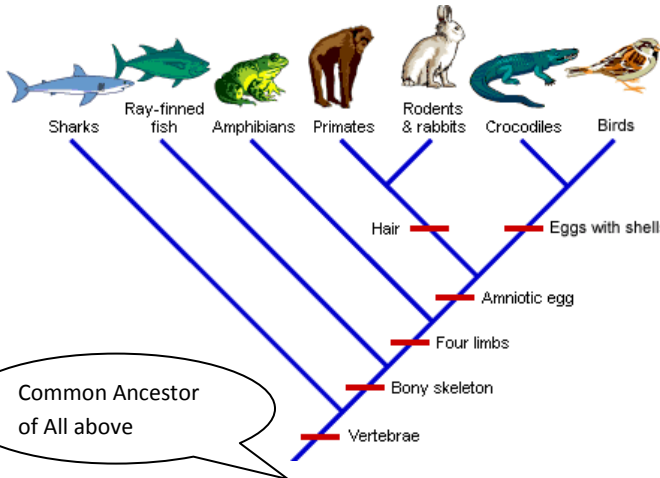


O.G.T. SCIENCE TEST: *Life Science QUICK STUDY GUIDE*

Classification

1. Scientific Name = Two part name for only one organism (**genus + Species**) (Humans = homo Sapiens)
2. Living things are classified according to a system:
Kingdom, Phylum, Class, Order, Family, Genus, Species
3. You can remember this using a Mnemonic Device:
King Phillip Called Out "For Goodness Sakes"!
4. A **Cladogram** is a graph that shows evolutionary relationships between classifications of organisms



Ecology

- Ecology** = The study of organisms in the Biosphere and how they react to each other and their environment
- Biosphere** = Everywhere life is found on Earth
- Biome** = Group of Ecosystems that share similar climates and living organisms
- Ecosystem** = All organisms that live in a particular area and their physical environment
- Community** = All different populations that live near each other
- Population** = group of individuals that belong to the same species and live in the same area
- Species** = group of similar organisms that can breed and reproduce together

Chemistry of Life

- All living things are made of atoms
- Atoms** = made out of **Protons and Neutrons** in the **Nucleus**, and **Electrons** that orbit the Nucleus
- We are made out of these atoms put together in different **organic chemical compounds**
- Organic** = Made with the Element **Carbon**
- We are made out of 4 different Macromolecules:**
- Carbohydrates** = simple sugars, starches
- Lipids** = fats, oils, waxes
- Proteins** = Structure (muscles) and enzymes
- Nucleic Acids** = **DNA or RNA**

Ecology – Energy Transfers

In any ecosystem there are different organisms in the cycle of energy:

- Producers** = Produce own food for energy (Plants)
- Consumers** = Consume other organisms for energy (Animals)
- Food Chain** = Linkage of energy transfers from Primary Producers to all consumers in line:

Tomatoes → Snail → Robin → Hawk

FOOD WEBS & ENERGY PYRAMIDS

FOOD WEBS show the **feeding relationships between plants and animals in an ecosystem.**

Arrows show the relationships. They show the direction of energy transfer. (the organism that the arrow is pointing to eats the organism the arrow is coming from)

ENERGY PYRAMIDS show the **relative amounts of energy at each trophic level.** The amount of energy is greatest at the bottom of the pyramid and lowest at the top of the pyramid.

trophic level – each step in a food web or pyramid

Ecology – Community Interactions

- Competition** – occurs when organisms compete for the same resource at the same place at the same time
- Predation** – an interaction in which one organism captures and feeds on another organism
- Symbiosis** – any relationship in which two species live closely together
- Mutualism** – a type of symbiosis in which both species mutually benefit from the relationship
- Commensalism** – a type of symbiosis in which one organism benefits and other is neither helped nor harmed
- Parasitism** – a type of symbiosis in which one organism lives on or inside the other organism and harms it

Prefixes/Suffixes to know

bio – life (*biology* is the study of life)

geo – earth (*geology* is the study of the earth)

hetero – different (*heterozygous* means different genes)

homo – same (*homozygous* means same/like genes)

a – not (*abiotic* means not living)

thermo – heat/temperature (*thermometer*)

eco – environment/outdoors (*ecology* is study of outdoors)

chemo – chemical (*chemosynthesis* is creating chemicals)

photo – light (*photography* uses light to take pictures)

synthesis – creates (*photosynthesis* uses light to create food)

Cellular Structures

Nucleus – contains genetic material (DNA) and chromosomes

Mitochondria – respiration occurs here; makes energy

Cell membrane – the “skin” of the cell; it encloses the entire cell and food/wastes pass through it

Flagella – is like a long tail used for movement (cilia are little hairs that could also be used for movement)

Plant cells contain a cell wall and chloroplasts. Animal cells do not.

Chloroplasts – where plant cells use chlorophyll to do photosynthesis

Types of Cells

prokaryotes = simple cells that do not have a nucleus; example: bacteria

eukaryotes = complex cells that have a nucleus; example: plants, animals, humans, protists and fungi

Plants and Animals are **BOTH MADE FROM EUKARYOTIC CELLS**

Cellular Energy

Cells have to obtain energy needed for life in order to survive.

Plants are **Autotrophs**, which means they **feed themselves** by making chemical energy inside their bodies (they make food inside them and then digest it later) using Sunlight, CO₂ and H₂O during **Photosynthesis**.

Animals and other consumers are **Heterotrophs**, which means they have a **different food source than their selves**. They consume other living things and break down their compounds in a process called **Cellular Respiration** where food and Oxygen are combined to **produce ATP** (cellular energy) and the waste products CO₂, and H₂O.

Chemical Equations:

Photosynthesis: Sunlight + CO₂ + H₂O → Glucose (sugar) + O₂

Cellular Respiration: Glucose (sugar) + O₂ → ATP + CO₂ + H₂O

Major Events important to life on Earth.

Mya = Million Years Ago

4500-4300mya – **Earth forms** and cools down

4200mya – **Oceans form**

3500mya – Earliest **Prokaryotes** on Earth

3000mya – **Photosynthesis** from blue-green algae forms atmosphere with Oxygen

2200mya – First **Eukaryotes**

600mya – After this point all animal and plant life evolves

5mya – Primitive humanoids present in fossil record

Evolution and Natural Selection

Natural Selection: Organisms with **favorable traits** during their lifetime **will breed and pass on those traits more than** those who do not have them.

Evolution: How organisms change **over many generations** from the **Natural Selection of favorable traits** into their genetic code.

NEVER happens during a single generation (can't acquire traits like big muscles from weight lifting)

First Proposed by **Charles Darwin** in 1800's

Genetics

Genes come in pairs of CHROMOSOMES (half come from your mom and half come from your dad).

The different varieties of genes are called alleles. **Alleles can be dominant or recessive.**

If the dominant allele (represented by a CAPITAL letter) is present, it will always have “control.”

A recessive allele (represented by a lowercase letter) will only be recognized if it is paired with another recessive allele.

HOMOZYGOUS PAIRS can be 2 dominant alleles (EE) paired together or 2 recessive alleles (ee) paired together.

A **HETEROZYGOUS PAIR** is one dominant allele and one recessive allele (Ee).

GENOTYPE is the genetic make-up of an individual (eg. EE or Ee). **PHENOTYPE** is an individual's physical appearance.

PUNNETT SQUARES are useful for finding the probabilities of traits being expressed in potential offspring.

A **PEDIGREE** goes further by tracking the transmission of traits among various generations.

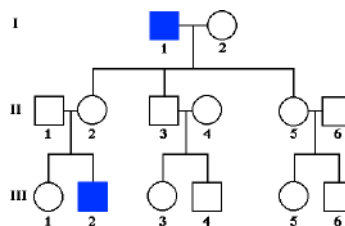


Figure 7 X-linked recessive inheritance.

