

Practical Biology Evolution Notes:

EVOLUTION: (Change over time – Generally a LONGGGGG TIME!)

Scientists have attempted for a long time to scientifically explain changes that have occurred in living things.

- **Fossils** provide much information about evolution.
 - Fossil evidence shows a long history of life on Earth. The history of life is one of constant change and a tremendous diversity of life-forms.

SIGNIFICANT SCIENTISTS TO THEORIES OF EVOLUTION:

Jean Baptiste de Lamarck (1744-1829): (Acquired Traits) (Acquire over lifetime)

Alfred Wallace (1823-1913): (Natural Selection) (Born with traits)

Charles Darwin (1809-1882) (HMS Beagle): (Natural Selection) (Born with traits)

- “Origin of Species”
- Galapagos Islands (Islands close to each other but isolated by water)

-- It should be understood that an organism is born with a set of genes that determine certain traits. If those traits prove to help that organism survive then because that organism survived they may pass those traits onto offspring.

NATURAL SELECTION & EXAMPLES: (DARWIN'S EXPLANATION)

-- Adaptations are inherited – they do not just appear!

- Describe each step in your own words; in some cases it may be easier to give examples.

1. Living things produce more offspring than can survive.

2. There is variation among the offspring.

3. There is a struggle to survive among offspring.

4. The more fit offspring survive and reproduce.

MUTATIONS:

Mutation: A change in DNA. Mutations can be harmful, beneficial or have no affect.

- **Harmful – The organism does not survive (Genes are not passed to offspring)**
- **Beneficial – The organism survives (Genes are passed to offspring)**
-

SPECIES FORMATION: (What may cause evolution & formation of a species?)

1. **Divergent Evolution** (pp. 610-612)

a. **Geographical Isolation**

b. **Reproductive Isolation**

2. **Convergent Evolution**

3. **Coevolution**

- **Species Definition: A group of organisms of a single type that are capable of producing fertile offspring in the natural environment.**

Examples:

1. **Finches (beaks):**

2. **Rabbits (fur):**

3. **Horse (hooves):**

4. **Tortoise (neck):**

5. **Cactus (leaves/flower):**

6. **Bacteria (antibiotics):**

7. **Peppered Moth (pollution):**

EVIDENCE OF EVOLUTION:

- **Scientists use a variety of forms of evidence to try to explain the changes of life over time.**
- **Fossil records use the “law of superposition” (relative age) and radioactive dating (absolute age) to help piece together transitions of living things.**

- 1. Fossils**
- 2. Homologous Structures**
- 3. Analogous Structures**
- 4. Vestigial Structures**
- 5. Embryological Comparison**
- 6. DNA Comparison**

HUMAN EVOLUTION:

- **Humans are “Primates”. Other Primates include monkeys, gorillas, baboons and apes. Primates characteristics include: eyes that face forward, well-developed cerebrum and thumbs used for grasping.**
- **List and compare traits of “Old-world monkeys” to “New-world monkeys”.**

Old-world monkey traits –

New-world monkey traits –

List and compare traits of “Neanderthal man” to humans today.

Neanderthal man –

Modern humans –