

## Evolution Notes:

### **BIOGENESIS (Spontaneous Generation):**

Before 1700's it was widely accepted that living things came from nonliving things. This process is known as "biogenesis" (spontaneous generation). Three scientists are noted for attempting to disprove biogenesis.

Briefly describe what each of the following scientists did to disprove spontaneous generation:

### **SIGNIFICANT SCIENTISTS TO DISPROVING BIOGENESIS:**

**Francesco Redi:**

**Lazzaro Spallanzani:**

**Louis Pasteur:**

### **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:**

■ **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.**

### **Examples:**

**1. Horse (hooves):**

**2. Finches (beaks):**

**3. Tortoise (neck):**

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

**5. Bacteria (antibiotics):**

**6. 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**
    - a. **Molds**
    - b. **Casts**
    - c. **Carbonaceous film**
    - d. **Amber**
  2. **Homologous Structures**
  3. **Analogous Structures**
  4. **Vestigial Structures**
  5. **Embryological Comparison**
  6. **DNA Comparison**

**TYPES OF EVOLUTION:**

1. **Coevolution**
  2. **Convergent Evolution**
  3. **Divergent Evolution**
    - a. **Reproductive Isolation**
    - b. **Geographical Isolation**
- **Species Definition: A group of organisms of a single type that are capable of producing fertile offspring in the natural environment.**