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## TYPES OF ORGANISMS

### From the beginning ...

Let's go back in time ... before Rock n' Roll and everything .....

Consider ... the world began approximately 4.5 billion years ago .....

Life was different then ... but remains much the same now .....

### That is, there were (and still are) ...

- **Prokaryotes**

- **Evolved from 3.5 billion years ago** to the present.
- **Simple** cells **lacking a nuclear envelope** and without genetic material organised within complex chromosomes.
- Prokaryotic cells **may exist in anaerobic conditions**.
- **Bacteria** (and other primitive heterotrophic/autotrophic organisms evolved before 1.5 billion years ago) **are prokaryotic cells**.

- **Eukaryotes**

- **Evolved from 1.5 billion years ago** to the present.
- **Complex** cells with a **nuclear envelope**, complex chromosomes and membrane-bound organelles.
- Eukaryotic cells **exist in aerobic conditions**.
- **All living organisms** except for bacteria **are composed of one or more eukaryotic cells**.

..... but wait ... there's more ...

## Life forms ...

The *fundamental* forms of life on Earth are divided into two groups .....

- **The autotrophs** – the primary providers.
- **The heterotrophs** – the secondary consumers.

Let's consider the differences.

## Autotrophs

- **Organisms with cells able to make their own energy-rich molecules out of simple non-organic materials** are known as **autotrophs** (Gk. autos = “self” + trophos = “feeder”).
  - **An autotrophic organism is one that has evolved a system to make direct use of the sun's energy** – that is, the process of photosynthesis – therefore, they are the “primary providers”.
  - This category of organism includes all living things classified as **plants or phytoplankton and many of the multi-celled organisms (most algae and bryophytes)**.

## Heterotrophs

- **Organisms with cells that satisfy their energy requirements by consuming the organic compounds produced by external sources** are known as **heterotrophs** (Gk. heteros = “other” + trophos = “feeder”).
  - **A heterotrophic organism is one that is dependent on an outside source of organic molecules for its energy** – therefore, they are the “secondary consumers”.
  - This category of organism includes all living things classified as **animals or fungi and many of the one-celled organisms (most bacteria and protists)**.

\* Adapted from Raven *et al.* (1993). Biology of Plants (5th Edition).