

Characteristics of Classification

1. How Organisms Get Energy

Autotrophs

Organisms that make their own food are called **autotrophs**. **Auto-** means “self”, and **-troph** means “feeder.” Therefore, an **autotroph** is a self-feeder. They use the food they make as an energy source to carry out their life functions. Examples are plants that make their own food by transforming the radiant energy from the Sun to chemical energy through the process of photosynthesis. **Autotrophs** are also known as **producers**. Some bacteria are **autotrophs**. They use chemicals in their environment to make their own food. Some Protists, such as Euglena, can make their own food. They contain a structure called a chloroplast, and they use sunlight for photosynthesis.



Heterotrophs

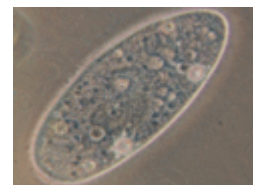
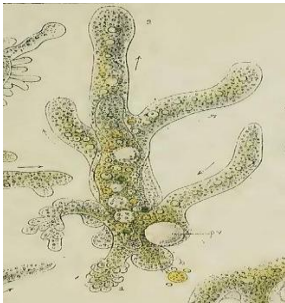
Organisms that cannot make their own food are called **heterotrophs**. **Hetero-** means “other” and **-troph** means “feeder”. A **heterotroph** must feed off of others. They get their energy from eating autotrophs (plants) or eating other heterotrophs. Examples are animals, mushrooms, and molds. Euglena are able to consume food when light is not present. Heterotrophs are also known as **consumers**. **Heterotrophs** transfer the chemical energy from food into other forms of energy they can use.



2. Number of Cells

Unicellular Organisms

All organisms are composed of cells. **Unicellular** organisms are single-celled (one). **Uni** = “one”. This one cell carries out all of the functions necessary to keep the organism alive. Bacteria are examples of unicellular organisms. Many Protists are **unicellular** as well.



Multicellular Organisms

All organisms are composed of cells. **Multicellular** organisms are made of many cells. **Multi** = “many”. All of the different cells are specialized to do certain tasks. Humans have skin cells, brain cells, and blood cells, just to name a few. Animals and plants are examples of **multicellular** organisms. Most Fungi are **multicellular**, and a few Protists are as well.



3. Presence of a Nucleus

Prokaryotic Cells

All organisms are made of cells which carry on the functions necessary to sustain life. A cell is the basic unit of structure and function in an organism. Just as our bodies are made up of many structures (parts) that work together, cells have many structures (parts) that do the same. The structure is the parts it is made of and how it is put together. The function is the job each structure performs. Organisms called **Prokaryotes** do **not** have an organized structure called a **nucleus** that contains genetic material and controls the cell. The genetic material just floats around inside of the cell. **Pro** = “before” and **karyote** = “nucleus”, no nucleus. You can remember that *Pro* rhymes with *No* for “NO” nucleus. Bacteria are examples of **prokaryotes**.



Eukaryotic Cells

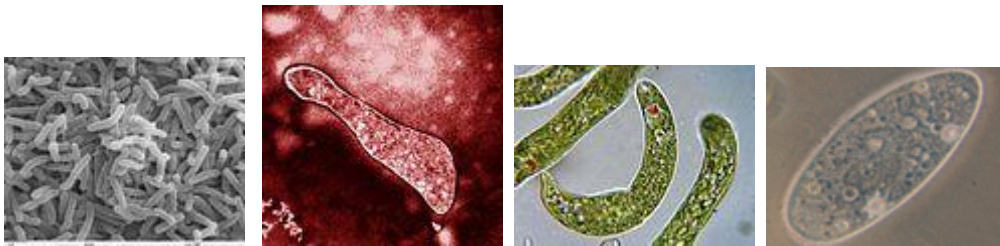
All organisms are made of cells which carry on the functions necessary to sustain life. A cell is the basic unit of structure and function in an organism. Just as our bodies are made up of many structures (parts) that work together, cells have many structures (parts) that do the same. The structure is the parts it is made of and how it is put together. The function is the job each structure performs. Organisms called **Eukaryotes** do have an organized structure called a **nucleus** that contains genetic material and controls the cell. **Eu** = “true” and **karyote** = “nucleus”, true nucleus. You can remember that *Eu* rhymes with *true* and *nu*. Animals, plants, Fungi, and Protists are examples of **eukaryotes**.



4. How an Organism Reproduces

Asexual Reproduction

Genetic material is passed from parents to offspring (babies) during reproduction. **Asexual reproduction** is a process that only involves one parent, not two. **A** = “not”, **not** sexual. The offspring will be identical to their parent. The genes of the offspring are exactly like the parent’s genes. Bacteria are examples of organisms that reproduce **asexually**. Bacteria will divide in half to form two cells identical to the original cell. This is called fission. Some plants, Fungi, and Protists can reproduce **asexually**. In rare instances, there are animals such as the sea anemone that can reproduce **asexually**.



Sexual Reproduction

Genetic material is passed from parents to offspring (babies) during reproduction. In **sexual** reproduction, offspring result from the combination of genetic material from two parents- a male and a female. They get half of the genetic material from each parent. The sperm from the male contains half of the genetic material, and the egg from the female contains half of the genetic material. Because offspring inherit a combination of genetic material from both parents, they are not exactly like either parent. Animals and most plants reproduce **sexually**. Some Fungi and Protists can reproduce **sexually**. A Paramecium is an example of an organism that can produce sexually or asexually.

