Characteristics of Life

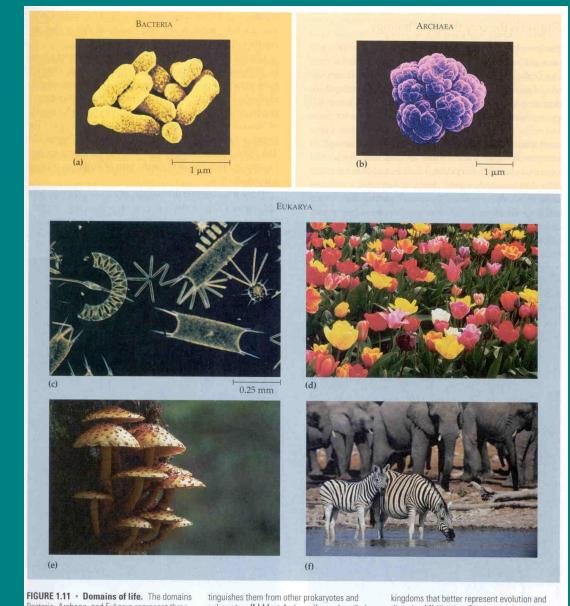
Essential Questions

1. List and explain each of the five characteristics of life.

2. Describe how you could tell if an unknown object is living.

The 5 Characteristics of Life

- If something is living it must have ALL 5 of the following characteristics!!!
 - Cells
 - Homeostasis
 - Reproduction
 - Metabolism
 - DNA/Heredity



CELLS= Basic Unit of Life – Living things have one or more.

- Usually very small
 - Use a microscope to view
- What is the largest single cell?

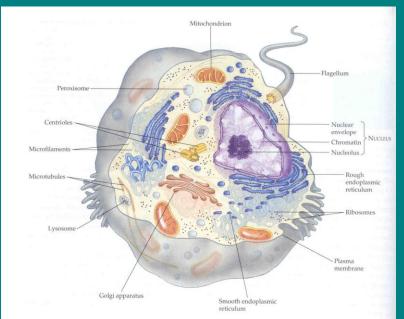


FIGURE 7.7 • Overview of an animal cell. 72 This drawing of a generalized animal cell combines all the most common structures found in animal cells (no cell actually looks just like this). Within the cell are a variety of components called organelles ("little organs"), many of which are bounded by membranes. The most prominent organelle in an animal cell is usually the nucleus The chromatin in the nucleus consists of DNA. which carries genes, along with proteins. Chromatin is actually a collection of separate structures called chromosomes, visible as separate units only in a dividing cell. Adjoining part of the chromatin in the nucleus are one or more nucleoli (singular, nucleolus). Nucleoli are involved in the production of particles called ribosomes, which synthesize proteins. The nucleus is bordered by a porous envelope consisting of two

Most of the cell's metabolic activities occur in the cytoplasm, the entire region between the nucleus and the plasma membrane surrounding the cell. The cytoplasm is full of specialized organelles suspended in a semifluid medium called the cytosol. Pervading much of the cytoplasm is the endoplasmic reticulum (FR), a labyrinth of membranes forming flattened sacs and tubes that segregate the contents of the ER from the cytosol. The ER takes two forms: rough (studded with ribosomes) and smooth. Many types of proteins are made by ribosomes attached to ER membranes, and the ER also plays a major role in assembling the cell's other membranes. The Golgi apparatus, another type of membranous organelle, consists of stacks of flattened sacs active in the synthesis, refinement, storage, sorting, and secretion of a variety of chemical products

Other membrane-enclosed organelles are: lysosomes, which contain mixtures of digestive enzymes that hydrolyze macromolecules, peroxi somes, a diverse group of organelles containing enzymes that perform specialized metabolic processes; and vacuoles, which have a variety es storage and metabolic functions. The mitochondrial singular, mitochondrioni carry out cellular respiration, which generates ATP from organic fuels such as uguar.

Nonmembranous organelles within the cells include microtubules and microfilaments. They help form a framework called the cytoskeleton, which reinforces the cell's shape and functions in cell movement. The cell in the drawing has a flagellum, an organelle of locomotion, which is an assembly of microtubules. Also made of microtubules are centrioles, located near the nucleus These olav a role in cell division.

Homeostasis = The maintenance of a relatively stable internal environment.

 Examples: Body temp., oxygen level, blood sugar level, pH, water level.

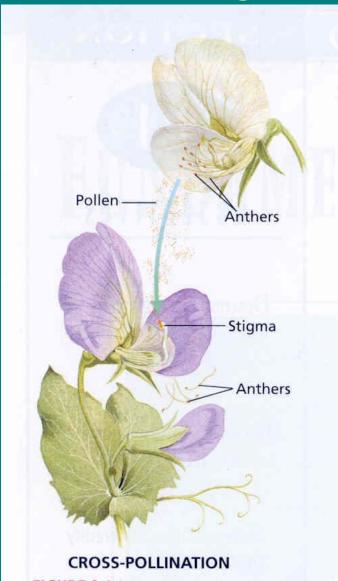


Reproduction = The ability to form a new offspring.

Can be sexual or asexual.

Sexual Reproduction – 2 organisms combining genetic material for new offspring.

Asexual Reproduction – 1 individual providing exact copy of genetic material.

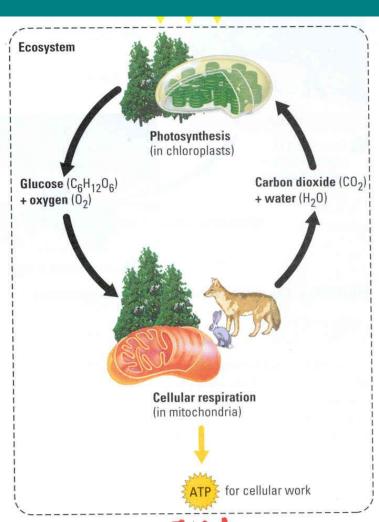


Metabolism = The ability to obtain and use energy for growth and movement

Examples: Cellular Respiration,
Photosynthesis

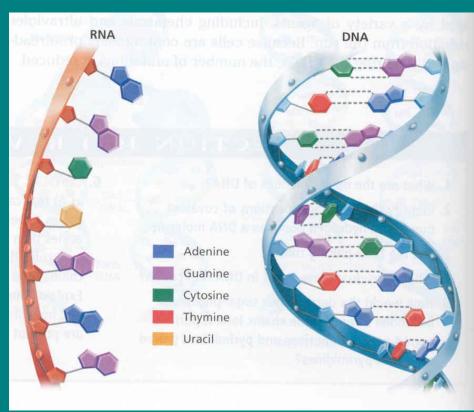
How do you know?

If it grows or causes movement.



DNA/Heredity = Genetic material that is passed on during reproduction.

- DNA & RNA tell each cell what and how to make proteins.
- How do you know if it has DNA?
 - Use a microscope



- 1. **Cells** = Living things have one or more cells.
- **2. Homeostasis** = The maintenance of a relatively stable internal environment.
- 3. Reproduction = The ability to form a new offspring.
- **4. Metabolism** = The ability to obtain and use energy for growth and movement
- **5. DNA/Heredity** = Genetic material that is passed on during reproduction.

Easy way to remember this Essential Skill...

Look at the initials.. Every living thing must be CHRMD (charmed)