

# Cells and Organisms Study Guide 5.5

## Characteristics of Living Things:

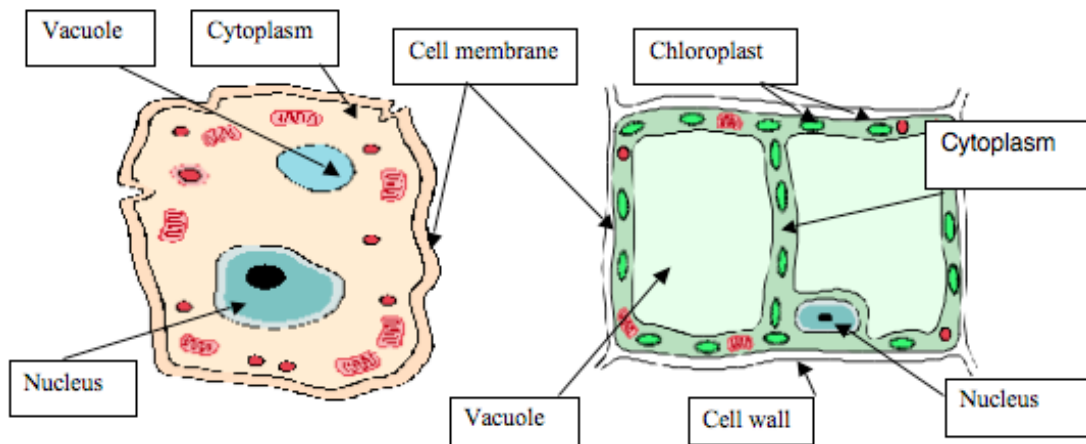
- Living things grow and develop.
- Living things use energy. They get energy by eating or making food.
- Living things reproduce.
- Living things respond to their environment. (ex. animal fur grows thicker in the winter)
- Living things get rid of waste.

Scientists refer to all living things as **organisms**. Living things are made of **cells**! These cells carry out all life processes. New cells come from existing cells. **The smallest unit within a living thing is a cell.**

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## Cell Structures

- **Animal Cells:** cell membrane, nucleus, mitochondria, cytoplasm, vacuole
- **Plant Cells:** cell membrane, nucleus, mitochondria, cytoplasm, vacuole, cell wall, chloroplast



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## Vocabulary

**Animal-** many celled; mobile; feeds on other organisms; reproduces by eggs or live birth

**Cell-** the smallest unit within a living thing in which life functions occur

**Cell membrane-** the thin, bag-like structure that allows certain materials to pass in and out of cells (it surrounds animal cells, and is surrounded by the cell wall of plant cells)

**Cell wall-** the sturdy, outermost structure surrounding plant cells that protects the cell and hold up the plant (*plant cells only*)

**Chloroplast-** the structure in a plant cell, containing chlorophyll, where photosynthesis takes place (*plant cells only*)

**Classify** – to group or sort things based on their characteristics

**Cytoplasm**- the clear, jelly-like substance inside a cell that keeps the cell organelles in place

**Invertebrate**- an animal without a backbone (sponges, worms, cnidarians, mollusks, arthropods, echinoderms)

**nonvascular plant**- a plant without tubular tissues to carry nutrients throughout (liverworts and moss)

**nucleus**- the part of the cell containing information to control the cells activities. This is the "brain" of the cell.

**plant**- many celled; makes its own food; reproduces by seeds or spores (daisy and moss)

**vacuole**- a storage sack in a cell used to store food or nutrients

**vascular plant**- a plant with tubular tissues that move nutrients up and down the stem (grass, trees, and flowers)

**vertebrate**- an animal with a backbone (birds, fish, reptiles, amphibians, and mammals)

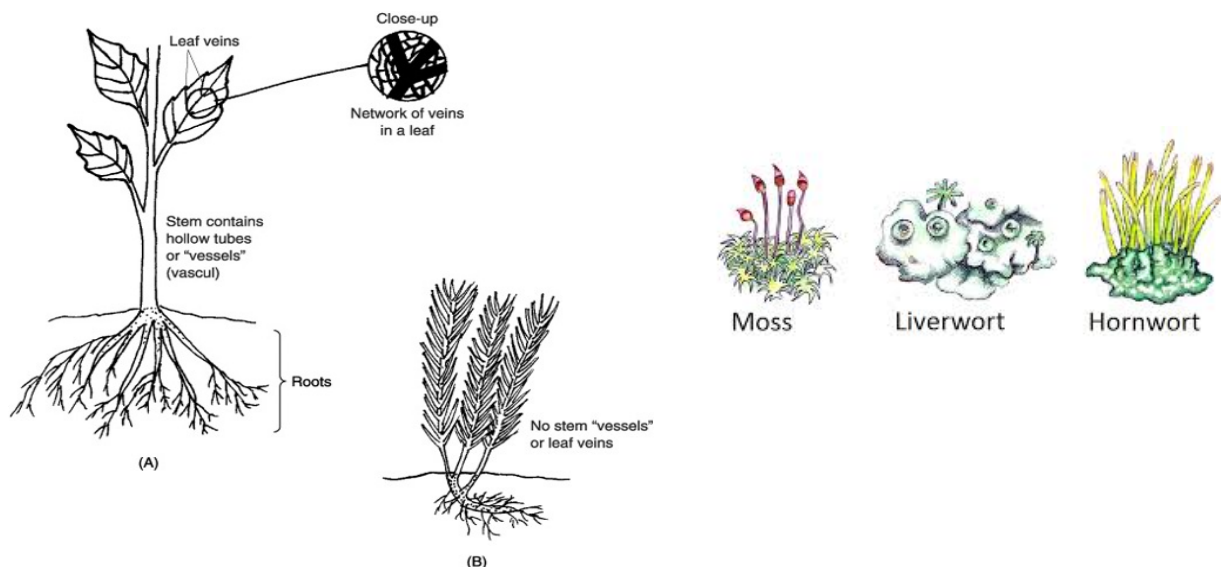
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Living things can be grouped into categories (**CLASSIFIED**) based on their characteristics.

**Plants** (vascular and nonvascular)

A. Vascular plants have tubes to carry the nutrients to all parts of the plant. These plants may grow very tall. Most plants are vascular. Examples: Trees, flowering plants

B. Nonvascular plants do not have tubes to carry nutrients to all parts of the plant. They do not have true stems, roots, or leaves. Examples: moss, liverworts, hornworts



**Animals** (vertebrates and non-vertebrates)

A. Vertebrates – animals with backbones. Vertebrates can be classified into 5 groups: Fish, Amphibians, Reptiles, Birds, Mammals



B. Invertebrates- animals without backbones. Invertebrates can be classified into 6 groups. Since these are not as common as the vertebrates, I included a description as well as 2 picture examples.

<p>1. <b>Mollusks</b>- there are over 100,000 species of mollusks! Examples: Snails, slugs, clams, octopus</p>		
<p>2. <b>Sponges</b> – these animals live in water and are very simple organisms with no digestive systems, no circulatory systems, or nervous systems!</p>		
<p>3. <b>Cnidarians</b> – this group includes jellyfish, coral, and sea anemones. They have radial symmetry.</p>		
<p>4. <b>Worms</b> – these animals have soft bodies and include many types of worms. Examples: earthworms, leeches</p>		
<p>5. <b>Arthropods</b> – this group of animals have an exoskeleton and are the largest group of invertebrates. Examples include spiders, centipedes, insects, and crustaceans.</p>		
<p>6. <b>Echinoderms</b> – these animals have an endoskeleton and radial symmetry. Examples include the starfish, sea urchins, and sand dollars.</p>		

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## Big Idea Questions

- What are cells? How do cells work together?
- Name the essential structures of an animal cell. Discuss the function of each structure: nucleus, cell membrane, vacuole, and cytoplasm.
- Name the essential structures of a plant cell. Discuss the function of each structure: cell wall, nucleus, cell membrane, vacuole, chloroplasts, and cytoplasm.
- If you were looking under a microscope at a cell, how could you tell if you were looking at a plant cell or an animal cell?
- Which cell structures are in both an animal cell and a plant cell?
- What are some ways in which you could classify plants? animals?
- If you were asked to classify 50 different species of birds, which characteristics could you use to classify them?
- What is the difference between vascular and nonvascular plants? Give an example of each.

**Extension topics:** (these are the remaining 3 Kingdoms - for enrichment purposes)

**fungus-** one or many celled; mostly immobile; absorbs food from others (mushrooms, yeast, and mold)

**moneran-** once celled organism without a cell wall; no nucleus (bacteria and blue green algae)

**protist-** once celled or multicellular organisms with a nucleus (paramecium, kelp, and amoeba)

