SOL 5.5 -- CELLS; VASCULAR & NONVASCULAR PLANTS; VERTEBRATE & INVERTEBRATE ANIMALS

Key Concepts:
a. basic cell structures and functions;
b. classification of organisms using physical characteristics, body structures, and behavior of the organism;
c. traits of organisms that allow them to survive in their environment

Onion cells view through microscope

All living things are made from cells

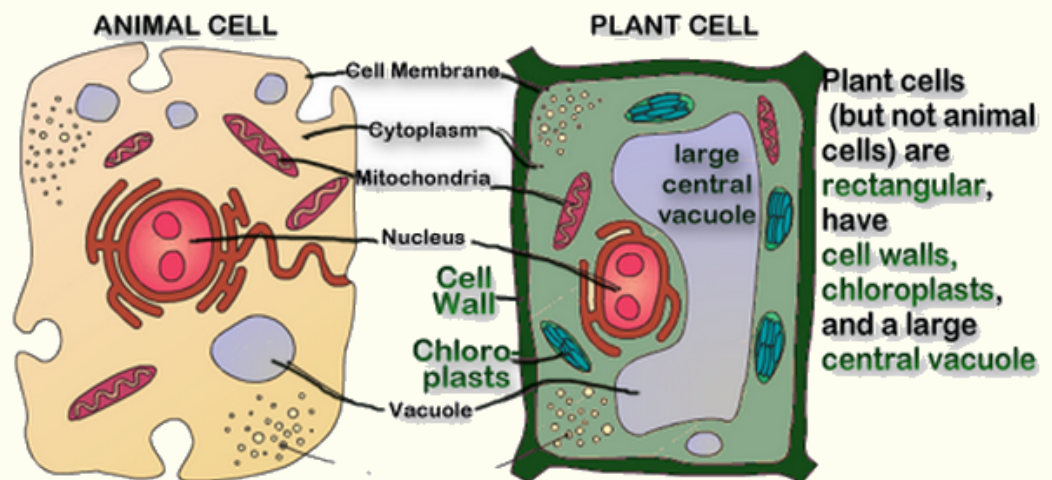New cells come from existing cells

CELLS

- **Living things** are made of **cells**. Cells carry out all life processes.
  - **New** cells come from **existing** cells.
  - Cells are **too small** to be seen with the eye alone. By using a **microscope**, many parts of a cell can be seen.

CELL PARTS

- **For plant and animal cells**, identify the following **structures** and their **functions**
  - For **plants**: the **nucleus, cell wall, cell membrane, vacuole, chloroplasts, cytoplasm**.
  - For **animal:**, the **nucleus, cell membrane, vacuole, cytoplasm**.

PLANT & ANIMAL CELL DIFFERENCES

- Plant cells and animal cells are **similar but different** in shape and some parts.
  - **Plant cells** (but not animal cells) have **cell walls, chloroplasts,** and **a large central vacuole**
  - **Plant** cells tend to be **rectangular**, while **animal** cells tend to be **spherical** or at times **irregular**.

ANIMAL CELL — Cell Membrane, Cytoplasm, Mitochondria, Nucleus, Cell Wall, Chloroplasts, Vacuole

PLANT CELL — large central vacuole

Plant cells (but not animal cells) are rectangular, have cell walls, chloroplasts, and a large central vacuole

Vascular & Nonvascular Plants

- Organisms that share **similar characteristics** can be organized into **groups** in order to help understand similarities and differences.

moss

hornworts

liverworts

NONVASCULAR PLANTS
no stems to transport water so found in humid areas

most plants are
VASCULAR PLANTS
including all flowering plants, trees, ferns

- **Plants** can be categorized as **vascular** or **nonvascular**
- **Vascular** (having special tissues to **transport food** and **water** — for example, **trees** and **flowering plants**)
- **Nonvascular** (not having tissues to transport food and water — for example, **moss, liverworts, hornworts**).
- Most plants are **vascular**.

Vertebrate & Invertebrate Animals

- **Animals** can be categorized as **vertebrates** or **invertebrates**
  - **vertebrates** (having **backbones**) (fish, frogs, reptiles, birds, people)
  - **invertebrates** (not having backbones). (insects, worms, crabs, spiders)

fish, frogs, reptiles, birds, people

insects, worms crabs, spiders

VERTEBRATES (backbone)

INVERTEBRATES (no backbone)