Light microscopes magnify up to about x2000, and have a resolving power of about 200 nm.
Electron microscopes magnify up to about x2000000, and have a resolving power of around 0.2nm.
Magnification = size of image / size of real object.

Animal cell features common to all cells - a nucleus, cytoplasm, cell membrane, mitochondria, and ribosomes.
Plant and algal cells contain all the structures seen in animal cells as well as a cellulose cell wall.
Many plant cells also contain chloroplasts and a permanent vacuole filled with sap.

Eukaryotic cells all have a cell membrane, cytoplasm, and genetic materials enclosed in a nucleus.
Prokaryotic cells consist of cytoplasm and a cell membrane surrounded by a cell wall. The genetic material is not in a distinct nucleus. It forms a single DNA loop. Prokaryotes may contain one or more extra small rings of DNA called plasmids.
Bacteria are all prokaryotes.

As an organism develops, cells differentiate to form different types of cells.
As an animal cell differentiates to form a specialised cell it acquires different subcellular structures to enable it to carry out a certain function.
Examples of specialised animal cells are nerve cells, muscle cells, and sperm cells.
Animal cells may be specialised to function within a tissue, an organ, organ systems, or whole organisms.

Plant cells may be specialised to carry out a particular function.
Examples of specialised plant cells are root hair cells, photosynthetic cells, xylem cells, and phloem cells.
Plant cells may be specialised to function within tissues, organs, organ systems, or whole organisms.

Diffusion is the spreading out of particles of any substance, in solution or a gas, resulting in a net movement from an area of higher concentration to an area of lower concentration, down a concentration gradient.
The rate of diffusion is affected by the difference in concentrations, the temperature , and the available surface area.
Dissolved substances such as glucose and urea and gases such as oxygen and carbon dioxide move in and out of cells by diffusion.

Osmosis is a special case of diffusion. It is the movement of water from a dilute to a more concentrated solute solution through a partially permeable membrane that allows water to pass through.
Differences in the concentrations of solutions inside and outside a cell cause water to move into or out of the cell by osmosis.
Animal cells can be damaged if the concentration outside the cell changes dramatically.

Osmosis is important to maintain the turgor in plant cells.