

Biology A

Chapter 7-1
pp 190-195
"Life is Cellular"

Objectives

- Relate advances in microscope technology to discoveries about cells and cell structure.
- Compare the operation of a compound light microscope to that of an electron microscope.
- Identify the main ideas of the cell theory

Cells

- **cell:** _____
 - **unicellular organism**- consists of only 1 cell
 - ex) *Paramecium*, *Euglena*, *Amoeba*
 - **multicellular organism**- consists of more than 1 cell

Discovery of the Cell

- Robert Hooke (1635-1703)
 - Invented the _____
 - first to observe and describe cells (1665)
 - Hooke was looking at a cross section of _____, which he compared to cells of a monastery, or jail
 - Hooke made many contributions to all branches of science
- Anton van Leeuwenhoek (1632-1723)
 - Dutch microscope maker
 - first to observe _____ (in pond water, 1675)
 - First to observe blood, sperm, bacteria and protists

Cell Theory

- Developed by Matthias Schleiden (German botanist), Theodor Schwann (German zoologist), and Rudolph Virchow (German physician) (1838-1855)
- Three parts (Know These!!!)
 - _____
 - _____
 - _____

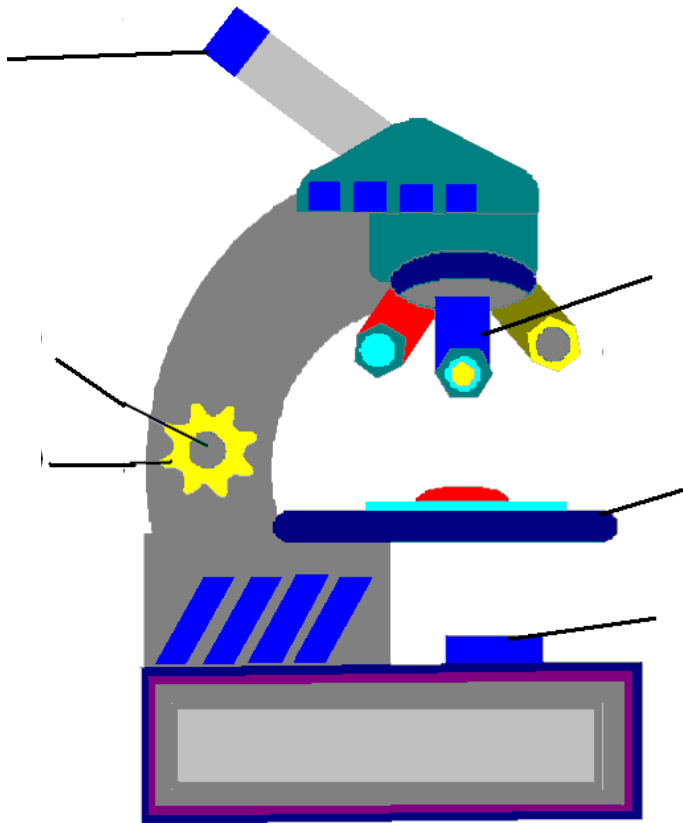
Basic Cell Structures

- Size
 - incredible variety of sizes
 - .2 μm in diameter to 2 m long
 - most visible only through microscope

Microscopes

- **microscope**- _____
- Come in many varieties
 - **simple light microscope**: a magnifying glass (_____)
 - **compound light microscope**: uses more than one lens (_____)
- Light microscopes in our class can magnify up to 400X
- The most powerful light microscopes have a magnification of up to 2000X!
- **electron microscope**: uses a _____ to produce images

Light Microscope



TEM Microscopes

- **transmission electron microscope**- (TEM): passes electrons through specimen
- TEM's have a maximum magnification of 2,000,000X!
- Used to view _____

SEM Microscopes

- **scanning electron microscope**-(SEM): Scans surface of specimen with electrons
- SEM's have a maximum magnification of 60,000X
- Not as high of magnification, but is used to show _____

STM Microscopes

- **scanning tunneling microscope**: a very fine metal probe is brought extremely close to an object, where electrons pass back and forth
- As the probe follows the surface of the object, a three-dimensional image is put together by a computer
- STM's allow scientists to see things at the _____
- max magnification: up to 100,000,000X !!!!!

Basic Cell Structures

- Basic Organelles
 - Cells have **organelles**- _____
 - Organelles common to most cells include:
 - **cell membrane**: _____
(found in ALL cells)
 - **cell wall**: outer barrier of some cells (_____)
 - **nucleus**: contains the _____ of the cell (found in protists, fungi, plants, animals)
 - **cytoplasm**: _____ that fills the cell

Prokaryotes vs Eukaryotes

- Cells classified according to their organelles
 - **eukaryotic cells**- contain a _____ and membrane-bound organelles
 - **prokaryotic cells**- _____ contain a nucleus nor membrane-bound organelles