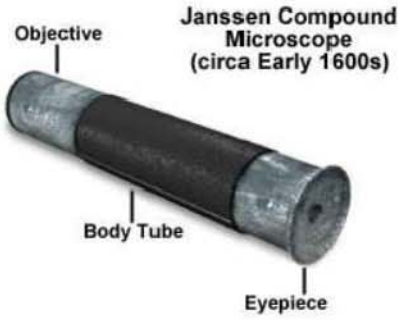
Name: _____ Unit 5: Cellular Biology NOTES 5.01

FOCUS: The Cell Theory

EQ: Can you state and explain the three parts of the Cell Theory?

How do we know what we know about the cell?

- Many scientists over time have contributed to the development of The Cell Theory and our understanding of the cell.
- It took over 300 years for us to learn all that we now know about the cell and we are still learning new information all the time.
  - ***Why?***
    - They are so small!
    - Average = 100,000 cells/cm^2
    - That's about 32 cells on a standard 12-pt. type period.
  - Humans could not know about cells, much less study them until we had the technology to magnify them using a microscope.
  - The first simple microscopes were not used until the 1590's.



What is a cell?

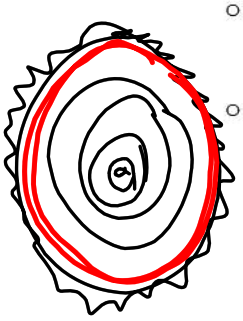
- What do YOU think?

Name: _____ Unit 5: Cellular Biology NOTES 5.01

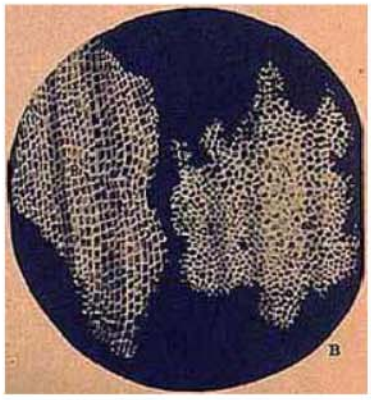
- A cell is the smallest unit that makes up living things that can perform all of life's processes.
  - Processes such as...
    - respiration
    - digestion
    - Growth
    - reproduction
    - Homeostasis (maintaining an internal balance by responding to changes in the external environment)

The "Founding Fathers" of Cytology

- *Robert Hooke*
  - Born: July 18, 1635
  - Died: March 3, 1703
  - Worked at Oxford University designing experiments and building scientific equipment, including microscopes.
  - Observed many specimens with microscopes he built himself, including insects, bird feathers, and fossils.



  - Most famous observation = thin slice of cork, of which he said, *"I could...plainly perceive it to be....* porous, *much like a honeycomb...These pores, or* cells *...were indeed the first microscopic pores I ever saw..."*



  - ***Claim to Fame:*** He was the first person ever to use the word cell and he used it because he said the boxes inside the cork reminded him of the small rooms (called cells) found in monasteries.
  - Published all of his drawings in a book called Micrographia in 1665.

Name: _____ Unit 5: Cellular Biology NOTES 5.01

- *Anton von Leeuwenhoek*
  - Born: October 24, 1632
  - Died: August 30, 1733
  - Dutch businessman & inventor who worked most of his life as a cloth merchant. Never attended college. Never had any formal Scientific training.
  - Was inspired to start building his own microscopes after seeing the drawings in Robert Hooke's book, *Micrographia*.
  - Built some of the best Compound microscopes of the day.
    - Magnified 200x when most of the scopes used at the time couldn't magnify more than 20-30x.
    - How? – Exceptionally skillful at grinding lenses, extremely patient in adjusting lighting and focus.
  - ***Claim to Fame:*** Discovered the existence of microscopic living things
    - Observed protists in pond water and bacteria in plaque from his teeth.
    - Also, was the first to observe blood cells and microscopic species of worms.
    - Helped other scientists realize that there were microscopic living organisms all around them, all the time, that they never knew existed.

The Contributors to the Cell Theory

- *Matthias Schleiden*
  - Born: April 5, 1804
  - Died: June 23, 1881
  - German botanist (plant scientist)
  - ***Claim to Fame:*** Concluded that "all plants are made of cells".

Name: _____ Unit 5: Cellular Biology NOTES 5.01

- *Theodor Schwann*
  - Born: December 7, 1810
  - Died: January 11, 1882
  - German zoologist (animal scientist)
  - Spent many years studying the tissues of animals, including humans.
  - ***Claim to Fame:*** Concluded that "all animals are made of cells".
- *Rudolph Virchow*
  - Born: October 13, 1821
  - Died: September 5, 1902
  - German pathologist (disease scientist)
  - Studied the spread of disease through human body cells.
  - ***Claim to Fame:*** Concluded that "all cells come from other cells."

The Cell Theory

- Schleiden, Schwann, & Virchow combined their research to develop the Cell Theory.
- The Cell Theory has 3 parts:
  1) All living things are composed of cells.
  2) Cells are the basic unit of structure and function in all living things.
  3) All cells come from other cells.

M.J. Schleiden

Theodor Schwann

Rudolph Virchow