Grade 9 Criterion A Cell Exam Topics

Traffic Light: Use the colors red, yellow and green to identify how you feel about the following topics. Highlight topics in **GREEN** if you feel comfortable with it, **YELLOW** if you have some doubts about it and **RED** if you have no idea and need to seek help.

**Organization of Life (Kognity 1.1, 1.3, 2.2)**
- Anton van Leeuwenhoek
- Robert Hooke
- Cell Theory
- Functions of life: Mrs. Nerg
- Levels of organization
- Homeostasis: Cell’s surface area to volume ratio
- Cellular Respiration (Catabolic) vs. Photosynthesis (Anabolic)
- Heterotroph vs. autotroph
- Multicellular and unicellular
- Prokaryotic vs. Eukaryotic
- Phylogenetic tree: evolution
- **Cell Specialization**: palisade mesophyll, root hair, xylem, nerve cell, egg, red blood cell
- **Cellular evolution theory** (endosymbiosis)
- Viruses: living or nonliving?

**Organelles**
- Animals vs Plant Cell Organelles
- Cytoskeleton
- Centrioles
- Peroxisomes
- Ribosomes
- Smooth ER and Rough ER
- Nucleus and Nucleolus
- Cell membrane and Cell wall
- Chloroplast and chlorophyll
- Vacuoles
- Cytoplasm
- Microtubules
- Golgi apparatus
- Mitochondria

**Microscope (Kognity 2.1):**
- Light vs. Electron microscopes
- Ocular lens (eyepiece)
- 4X, 10X, 40X objective lenses
- Arm and base
- Stage and stage clips
- Coarse adjustment knob
- Fine adjustment knob
- Mechanical knobs
- Diaphragm
- Total Magnification

**Cell Membrane**
- Homeostasis role
- Phospholipids form bilayers
- Selective Permeability
- Fluid mosaic
- Hydrophobic, hydrophilic, amphiphilic
- Polar and nonpolar
- Peripheral proteins
- Transmembrane and Integral proteins

**Central Dogma**
- Protein synthesis
- DNA -> RNA -> Proteins
- mRNA (codon), tRNA (anticodon), rRNA
- Transcription and translation
- ATP: adenine, ribose, 3 phosphate
- 20 essential and non-essential amino acids
- Functions of Proteins: structural, defensive, transport, catalyst

**Size of Specimen (Kognity 2.3)**
- Micrograph
- Magnification = Image size / actual size
- Micrometers