

Unit 2 Study Guide

Topics: Classification and Taxonomy, Microscopy, Cells & Organelles, Levels of Cellular Organization

Directions: Use the following as a **guide** when you are studying. Be sure to reference class notes, the textbook, distributed worksheets and handouts, labs, notes from lecture, etc. as you study.

Relevant Vocabulary:

You should be familiar with the following vocabulary terms taken from the textbook, from worksheets, and from lecture for this unit. All or some of these terms may end up on your exam. There may be some terms covered in class or in the textbook that are not listed below that may also show up on your exam. Add vocabulary to this list as needed as we progress through the unit.

Cell	Structure	Function	Microscope
Robert Hooke	Anton van Leewenhoek	Microbiology	Schleiden
Schwann	Virchow	Cell Theory	Simple Microscope
Compound Microscope	Light Microscope	Electron Microscope	Transmission Electron Microscope
Scanning Electron Microscope	Scanning Tunneling Microscope	Electromagnetic radiation	Magnification
Resolution	Contrast	Wavelength	Objective lens
Ocular lens	Diaphragm	Condenser	Coarse focus knob
Fine focus knob	Stage	Base	Body
Illuminator	Cell Wall	Cell membrane	Classification
Taxonomy	Binomial Nomenclature	Genus	Species
Prokaryote	Nucleus	Eukaryote	Dichotomous Key
Phospholipid	Ribosomes	Deoxyribonucleic acid	Nuclear envelope
Nuclear pores	Rough endoplasmic reticulum	Smooth endoplasmic reticulum	Golgi body
Lysosomes	Vacuole	Mitochondria	Chloroplast
Centrioles	Cytoskeleton	Nucleoli	RNA
Chromatin	chromosomes	Endosymbiosis	Photosynthesis
Cellular respiration	vesicle	Tissue	Organ
Organ system			

Objectives:

You should be able to answer the following questions covered in the textbook, on worksheets, and in lecture for this unit. **Do not forget to review previous quizzes, handouts, classwork, labs, etc. for practice problems when studying.**

1. Be able to describe how Biologists use classification to organize living things.
2. What is binomial nomenclature? Be able to identify what the two parts of the name represent.
3. Know the levels of classification: domain → kingdom → phylum → class → order → family → genus → species and be able to work with examples and compare how related two organisms are based on their taxonomic classification.
4. How are organisms placed into domains and kingdoms?
5. Compare and contrast the three domains.
6. Be able to use a dichotomous key.
7. How are structure and function related in cells? Give examples i.e. neurons vs red blood cells
8. What did the advent of the microscope allow for? How did it contribute to the process of disproving the theory of spontaneous generation in the late 1600s – 1800s?
9. Who is the father of microscopy?

10. What concepts did Schleiden, Schwann and Virchow contribute to our understanding of cells?
11. What is the cell theory?
12. Compare and contrast light and electron microscopes. How do they work?
 - a. What is the different between a simple and compound light microscope?
 - b. What wavelength of visible light would help produce the best image in light microscopes? Why?
13. Understand the electromagnetic spectrum and what trends are associated with it regarding microscopy.
14. What are the four general principles of light and electron microscopy? How can we produce a “good” and clear image?
15. How do convex lenses magnify an image?
16. Which types of microscopes can you use to view **living** specimen?
17. Know how to label a monocular or binocular light microscope as well as the functions of each of the parts.
18. Be able to calculate total magnification for a light microscope.
19. Compare and contrast transmission electron microscopes, scanning electron microscopes, and scanning tunneling microscopes. How they are used to observe specimen? What features are best observed by each type? What kind of image does each produce?
20. Why are cells so small?
 - a. How do they maximize surface area and minimize volume, and why is this advantageous?
21. What structures are common to all cells?
22. What characteristics are found in plant cells but NOT in animal cells?
23. Compare and contrast prokaryotes and eukaryotes.
24. Be able to label organelles and/or structures in a prokaryotic cell, animal cell, and plant cell and be able to describe the functions of each of the structures.
25. What is the purpose of the plasma membrane? What is it made of? How does the chemical composition of the plasma membrane contribute to its function? What is the fluid mosaic model?
26. Distinguish between membrane-derived organelles and bacteria-derived organelles and describe their functions.
27. Describe the endomembrane system. i.e. Describe how a protein would be produced, modified and distributed in cells.
28. Describe the theory of endosymbiosis.