

First semester review Chapter 1-6
Part I

1. List the things *all* cells require. *Energy*
2. The specific reactants that an enzyme acts on are called: *substrates*
3. Which features are unique to plant cells? *chloroplasts, cell wall, (central vacuole)*
4. Knowledge of biology can promote advances by helping all people make what? *informed choices*
5. Chemical reactions change substances into different substances by breaking and forming what? *Bonds*
6. What is the main function of the Golgi apparatus? *Packaging proteins*
7. Specialized structures that work together inside a cell are called what? *organelles*
8. Which organelles contain enzymes that break down old cell parts? *Lysosomes*
9. Write a phrase that describes rough ER? *studded with ribosomes*
10. Describe an acid with respect to pH and the concentration of H⁺ ions. *acid → low pH → High H⁺ conc.*
11. Unlike a eukaryotic cell, a prokaryotic cell does not have what? *membrane bound organelles (a nucleus)*
12. Changes in temperature and pH out of normal range do what to an enzyme's activity level? *lower activity level*
13. Which aspect of a chemical reaction is affected by enzymes? *reaction rate / lowers activation energy*
14. Which word best describes a scientific hypothesis? *an educated guess*
15. Scientists use observations and data to form and test what? *hypothesis*
16. During which phase of mitosis do sister chromatids separate from each other? *anaphase*
17. What cannot be broken down by ordinary chemical means? *atom*
18. What is a compound? *2 or more molecules bonded together*
19. Which category of carbon-based molecules includes sugars and starches? *carbohydrates*
20. All the chemical processes used to build up or break down materials are called what? *metabolism*
21. What characteristics are shared by all living things? *made of cells, respond to environment, grow & develop, reproduce,*
22. What limits the maximum size of a cell? *volume to surface area / cell membrane*
23. Why is water necessary to your body? *many compounds dissolve in water*
24. Where does the chemical energy to produce ATP come from? *Sunlight or breakdown of food*
25. Which organelle contains enzymes that break down damaged cell parts? *lysosome*
26. The difference in the concentration of dissolved particles from one location to another is called what? *concentration gradient*
27. Which phrase best describes the function of the ATP molecule? *energy carrier*
28. Identify the reactants in the following chemical reaction: $6\text{H}_2\text{O} + 6\text{CO}_2 \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$

29. Cells use active transport proteins to do what? *carry substances across the cell membrane*
30. Describe the process of photosynthesis? *CO₂ and water and sunlight energy → glucose and O₂*
31. Which model did scientists develop to describe the cell membrane? *Fluid Mosaic model*
32. Describe a scientific theory. *Many tests, can't be proven but accepted as true*
33. What are the major principles upon which cell theory is based? *all organisms made of cells, come from other cells, basic unit of life*
34. What is the term for the diffusion of water across a semipermeable membrane? *Osmosis*
35. Water moves into a cell when the solution surrounding the cell is what? *Hypotonic*
36. Explain where Hydrogen bonds can form between regions of polar molecules. *δ⁺ Hydrogen δ⁻ other atom of molecule*
37. An individual living thing is called a(n). *organism*
38. State the cell theory. *all organisms made of cells, all cells come from other cells, basic unit of life*
39. Unlike passive transport, active transport requires what? *energy*
40. What is a membrane-bound sac used to transport substances into and out of cells. *Vesicles*
41. The term *biosphere* refers to the parts of Earth that contain what? *life*
42. Describes an atom. *nucleus with Neutron & Proton outside with e⁻*
43. Energy is released from an ATP molecule for cellular processes when what happens? *when it loses a Phosphorus (breaks bonds)*
44. Which organelles can be found in the cytoplasm and on the surface of the endoplasmic reticulum? *Ribosomes*
45. Which process breaks down sugars to make ATP when oxygen is present? *~~Photosynthesis~~*
46. Describe cellular respiration. *glucose and oxygen → CO₂ + H₂O + energy*
47. At which stage of scientific inquiry would scientists find out if their hypotheses were supported by their data? *testing*
48. What is the source of energy used in chemosynthesis? *chemicals*
49. Describe Earth's biodiversity. *4D connected & diverse*
50. Both animal fats and plant oils are made up of glycerol and what? *Fatty acids*
51. Atoms connected by covalent bonds share what? *electrons*
52. Which types of solutions have the highest H⁺ ion concentration? *Acids*
53. List the reactants in photosynthesis. *CO₂ & H₂O*
54. What are the main differences between plant and animal cells? *cell walls, chloroplasts, mitochondrion*
55. Mitochondria and chloroplasts are both sites where what happens? *energy ~~transformation~~ transformation*
56. The basic unit of life is what? *cells / basic unit of matter - Atom*
57. Which process of movement through the cell membrane requires no energy from the cell? *passive transport*

Part II

58. What is wrong with the surface area to volume ratio if a cell cannot move enough material through its membrane to survive? *The surface area is too small*
59. Describe the function of the mitochondria. *energy conversion*
60. The movement of molecules down a concentration gradient through transport proteins in the cell membrane is a definition for what? *facilitated diffusion*
61. What is the term for the jellylike substance that is contained inside the cell membrane? *cytoplasm*
62. Fats, oils, and cholesterol are all types of what? *lipids*
63. In an experiment, what is the condition that is manipulated by a scientist? *independent variable*
64. List the important characteristics of a scientific theory. *proposed explanation, supported by much evidence, can change with new evidence*
65. Atoms in molecules share pairs of electrons when they make what types of bonds? *covalent bonds*
66. What molecule carries chemical energy that cells use for their functions? *ATP*
67. What is a network of proteins that supports and gives shape to a cell? *cytoskeleton*
68. Which organelle is the storehouse for most of a cell's genetic information? *Nucleus*
69. Define a species. *living things that can reproduce by interbreeding*
70. The four main types of carbon-based molecules in organisms are carbohydrates, lipids, nucleic acids, and what? *proteins*
71. The main light-absorbing molecules found in plant leaves are called what? *chlorophyll*
72. Which types of organisms use cellular respiration for their cellular energy needs? *All organisms (plants & animals)*
73. Substances are changed into different substances when bonds break and form during chemical reactions.
74. Proteins are composed of which molecules? *amino acids*
75. What is a phospholipid composed of? *phosphate and a lipid [cell membrane is phospholipid bilayer]*
76. Describe passive transport. *Helps molecules cross cell membrane, does not require energy*
77. During an experiment, which factors are observed and measured? *Data, both qualitative and quantitative*
78. Which organelles are involved in the process called endocytosis? *cell membrane, vesicles*
79. The variety of life across the biosphere is called what? *connected and diverse*
80. A physical environment with different species that interact with one another and with nonliving things is called what? *ecosystem*
81. Only individuals belonging to the same species are able to do what? *reproduce*
82. Which of the following is formed when an atom gains or loses electrons? *ionic bond*
83. What is unique about carbon? *its bonding properties, it can make 4 bonds*

Part III

103. What is the definition of cancer? *uncontrolled cell growth*
104. What is the name of the substances that cause cancer? *carcinogens*
105. What is the sequence that shows the complexity of structures within living things? *cells → tissues → organs → organ systems → organism*
106. What phrase best describes an organ system? *organs that carry out similar functions*
107. Which type of stem cell can grow into any type of cell? *totipotent*
108. What happens during interphase? *DNA replication, growth, organelles increase in number*
109. At which point is the cell cycle complete? *At the end of telophase, but begins again in each daughter cell*
110. What is the definition of malignant tumors? *Cancer cells can break away and form new tumors*
111. What are the main differences between regular cells and cancer cells? *growth factors don't work in cancer cells*
112. How do cells in an embryo differentiate? *based on location*
113. What happens during the synthesis stage of interphase? *DNA replication*
114. What are the three parts of interphase? *G₁, S, G₂*
115. What is a malignant tumor? *Cancer cells break away & can spread, hard to remove*
116. What type of cell is a kidney cell? *Somatic cell*
117. How many chromosomes are in a human gamete? *23*
118. What is the definition of meiosis? *nuclear division that divides a diploid cell into haploid cells*
119. What are homologous chromosomes? *Same length, same appearance, same genes*
120. What happens during meiosis I? *Homologous chromosomes are split*
121. What happens during meiosis II? *Sister chromatids are split*
122. What is an example of a biological trait? *hair color, eye color, height, leaf size*
123. Why did Mendel use purebred pea plants? *so he knew it was his crossings that caused the effect*
124. What is an example of a phenotype for a trait? *what the trait looks like*
125. What is an example of a genotype for a trait? *what genes are on your chromosomes*
126. What is the definition of heterozygous? *one dominant gene and one recessive gene on homologous chromosomes*