Biology 1 Review

Chapter 1: Science of Biology

1. State the goal of science.
2. List and explain the steps of the scientific method.
3. Distinguish between independent and dependent variables.
4. Construct an experiment that tests one variable and includes a control.
5. State the metric units for mass, length, volume, weight and temperature.
6. State the metric prefixes and state their value.
7. List and describe the characteristics of living things.
8. Distinguish between anabolism, catabolism and metabolism.
9. Describe the different types of microscopes and their limits of resolution.

Chapter 2: Chemistry of Life

10. Distinguish between physical and chemical properties.
11. Describe the structure of an atom using protons, neutrons and electrons.
12. Explain ionic and covalent bonds.
13. Using atomic and mass number, find the number of parts and diagram atoms.
14. Identify the products, reactants and describe the role of energy in chemical reactions.
15. List important properties of water, including its molecular structure.
16. Distinguish between mixtures, solutions and suspensions.
17. Describe the structure and properties of acids, bases and the pH scale.
18. List the four most abundant elements in most living things.
19. Describe the structure and function of four organic molecules in most living things.

Chapter 7: Cells

20. State three parts of the cell theory.
21. Identify and give the function of three basic structures of most cells.
22. Distinguish between plant and animal cells.
23. Distinguish between prokaryotes and eukaryotes.
24. Describe the functions of the cytoplasmic organelles.
25. Explain the processes of diffusion and osmosis.
26. Compare active and passive transport.
27. Describe endocytosis, phagocytosis, pinocytosis and exocytosis.
28. Define cell specialization and give examples of specialized cells.
29. Describe the levels of organization in a multicellular organism.

Chapter 8: Photosynthesis

30. Define photosynthesis, write a balanced equation and explain each molecule's role.
31. Distinguish between autotrophs and heterotrophs.
32. Name and describe the molecules that make up ATP, ADP and AMP.
33. Discuss the light reactions. Explain what goes in, and what comes out.
34. Discuss the Calvin Cycle. (dark reactions) Explain what goes in and what comes out.

Chapter 9: Respiration

35. Discuss glycolysis. State the location and explain what goes in and what comes out.
36. Discuss respiration. State the location and explain what goes in and what comes out.
37. Define fermentation and compare and contrast alcoholic with lactic acid fermentation.
38. Describe the electron transport chain and explain its function.

Chapter 10: Cell Growth and Division

39. Distinguish between cell growth and cell division.
40. Explain why cells have a size limit.
41. Describe the cell cycle including, interphase (G_1, S, G_2), mitosis and cytokinesis.
42. Discuss the events and the significance of mitosis including each phase.

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Biology 2 Review

Chapter 11: Introduction to Genetics

1. Define, genetics, traits, alleles, dominant, recessive, haploid and diploid.
2. Find the genotype and phenotype of parents given alleles for a trait.
3. Find the gametes, draw a Punnett square, and predict phenotypes of offspring.
4. Discuss the events, the products and the significance of meiosis.
5. Define heterozygous, homozygous, pure, and hybrid.
6. Solve genetics problems using a Punnett square.
7. How many chromosomes are in a human haploid (N) cell? Diploid (2N)?
8. Distinguish between sex chromosomes and autosomes.
9. Define gamete and zygote

Chapter 12: DNA-Replication and RNA-Protein Synthesis

10. Describe the contributions of Griffith, Avery, Hershey/Chase, Franklin/Watson/Crick.
11. Describe the structure and the function of DNA.
12. Explain the process of DNA replication including base structure and pairing.
13. Describe the 3 kinds, the structure and the function of RNA.
14. Explain protein synthesis including; locations, structures and processes.

Chapter 35: Nervous System

15. List the levels of organization in the human body.
16. List and give the function of the 11 human body systems.
17. Describe the structure and function of a neuron.
18. Compare and contrast the central nervous system and peripheral nervous system.
19. Compare and contrast the somatic nervous system and autonomic nervous system.
20. Describe the 5 senses and explain the structures used to sense our surroundings.

CHAPTER 36: Skeletal, Muscular and Integumentary Systems

21. List the parts and functions of the skeletal system.
22. Describe the structure and development of bone.
23. Know human bones and parts of each.
24. Know the structure and function of cartilage.
25. Identify the three classes of joint, describe motion and give examples.
26. Describe the parts and the mechanisms of muscle contraction.
27. List and describe three types of muscle tissue.
28. Identify the parts of the integumentary system.
29. Describe and list the structure of skin.

CHAPTER 37: Circulatory and Respiratory Systems

30. List the parts and functions of the circulatory system.
31. Describe the flow of blood through the heart.
32. List the vessels in the pathway of blood through the human body.
33. Practice the path taken by blood through the human body.
34. Compare internal and external respiration.
35. Describe the structures (organs) and functions of the respiratory system.
36. Compare levels of gases with inhalation and exhalation.
37. Practice the path of an air molecule through the respiratory system.

CHAPTER 38: Digestion and Excretory Systems

38. List four organic macromolecules essential for living things.
39. Compare mechanical and chemical digestion
40. Trace the path of, the digestion of, and the changes to food in the GI tract.
41. List the organs, the glands, the secretions and the products of the GI tract.
42. Practice the path of a Big Mac Essays
43. Review the parts and the function of the kidneys.

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Biology 3 Review

CHAPTER 18: Classification Systems

1. Discuss the usefulness of classification systems.
2. List the characteristics of a good classification system.
3. Identify scientific names and know what they tell us.
4. List the five kingdoms and list the divisions of classification.

CHAPTER 19: Bacteria and Viruses

5. Describe the distinguishing characteristics of prokaryotes.
6. Name and describe the 3 basic shapes of bacteria.
7. Describe the difference between archaebacteria and eubacteria.
8. Describe the difference between autotrophs and heterotrophs.
9. Describe the prefixes chemo- and photo- as they relate to autotrophs and heterotrophs.
10. Define obligate aerobes, obligate anaerobes, and facultative anaerobes.
11. Name and describe the three components of a virus.
12. Explain the difference between the lytic and the lysogenic infection.
13. Explain why the virus is not considered alive.

CHAPTER 20: Protists

14. Define and list distinguishing characteristics of a protist.
15. Name and describe the movement of the four groups of animal-like protists.
16. Name and describe four groups of unicellular plant-like protists.
17. List three characteristics common to green plants and algae.
18. Name and describe the fungus-like protists.
19. Explain alternation of generations in terms of haploid and diploid.

CHAPTER 21: Fungi

20. Explain the fungi are eukaryotic heterotrophs.
21. Name and describe the three groups of fungi.

CHAPTER 22: Plant Diversity

22. Describe some of the adaptations plants need to survive on land.
23. List characteristics of the two phyla of plants discussed in class.
24. List and describe the functions of each structure in moss and ferns.
25. Describe the alternation of generation cycle in mass and ferns
26. Recognize the importance of vascular tissues in plants.

CHAPTER 23: Roots, Stems and Leaves

27. Explain the function of roots, stems, and leaves.
28. Describe the function of xylem and phloem.
29. Compare monocots to dicots.
30. Describe the composition of soil.
31. Describe the importance of meristematic tissues.
32. List and describe the function of the many kind of plant tissues.
    (cambiums, pericycle, parenchyma, sclerenchyma, tracheids, companion cells)
33. Describe characteristics and the parts of monocot and dicot roots.
24. Describe characteristics and the parts of monocot and dicot stems.
35. Describe characteristics and the parts of monocot and dicot leaves.
36. Explain how water is transported through the plant.

CHAPTER 24: Reproduction of Seed Plants

37. Know the parts and their functions of flowers.
38. Know the parts and their functions of seeds.
39. Explain the growth and development of a bean plant.

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Biology 4 Review

Chapter 26: Sponges and Cnidarians

1. Name three germ layers most animal embryos differentiate into.
2. Explain the difference between protostomes and deuterostomes
3. Describe the method of feeding in sponges.
4. What is the Phylum name of sponges?
5. What type of symmetry do sponges have?
6. Name the large opening at the top of the sponge.
7. What is the Phylum name of the jellyfish?
8. What type of symmetry in jellyfish have?
9. How many embryonic germ layers are present in hydra.
10. Name the two body forms of the cnidarians.
11. What is the name of the stinging cells of a jellyfish.

Chapter 27: Worms and Mollusks

12. What is the simple name for the phylum Platyhelminthes?
13. How many germ cell layers are there in Platyhelminthes?
14. What type of body cavity do platyhelminthes have?
15. Name three animals that are classified as flatworms.
16. What is a scolex?
17. What type of digestive system do planaria have?
18. What type of digestive system do nematodes have?
19. What is the main difference between nematodes and platyhelminthes?
20. Name three animals that are classified as roundworms.
21. What is a pseudocoelomate?
22. What does Hermaphroditic means?
23. What is the main characteristic of annelids?
24. What type of structure found in annelids removes metabolic wastes?
25. Describe the three classes of mollusks.
26. Name three common mollusks - one from each: Gastropoda, Bivalvia, Cephalopoda.
27. What is a radula?
28. Who are the cephalopods?

Chapter 28: Arthropods and Echinoderms

29. What is the exoskeleton of arthropods is made of?
30. Describe two main characteristics of arthropods
31. What are spinnerets?
32. Describe two ways that centipedes are different from millipedes.
33. What are the excretory structures of insects are called?
34. What is a fused head, thorax, and abdomen called?
35. What are spiracles?
36. Are arthropods protostomes or deuterostomes?
37. Describe the circulatory system of arthropods.
38. Distinguish between a crustacean, an insect, and a chelicerate.

Chapter 28: Arthropods and Echinoderms (continued)

39. Describe the symmetry of the echinoderms.
40. The endoskeleton of some echinoderms are formed from bony plates called?
41. What is the opening of the water vascular system is sea stars is called?
42. What structures can be found in the ambulacral grooves?
43. Is it possible to be a chordate but lack a backbone?
44. Name four characteristics that chordates have at one time in their life.
45. Name two invertebrate chordates.

Chapter 30: Fish and Amphibians

46. Name the five classes of vertebrates.
47. What did jaws evolved from?
48. Name and describe three groups of fish.
49. Describe the structures and the flow of blood in the cardiovascular system of fish.
50. Amphibian means double life. Explain why this term describes the life of a frog.
51. Explain three ways that amphibians carry out respiration.
52. What term describes the larval form of a frog or toad?
53. Explain the two terms that refer to types of body temperature.
54. Describe the structures and flow of blood in the cardiovascular system of amphibians.

Chapter 31: Reptiles and Birds

55. Name 4 extraembryonic membranes in an egg. State the general purpose of each.
56. Distinguish between viviparous, oviparous, and ovoviviparous birth.
57. Difference between a crop and a gizzard.
59. How is air flow in a bird's respiratory system different from yours?
60. Do birds still possess scales like a reptile?
61. Describe the structures and flow of blood in the cardiovascular system of reptiles.
62. Describe the structures and the flow of blood in the cardiovascular system of birds.

Chapter 33: Mammals

63. Define placenta, mammary gland, subcutaneous fat and rumen
64. Name two main characteristics of mammals.
65. Describe the structures and flow of blood in the cardiovascular system of mammals.
66. Herbivores can digest it but you cannot. You call it "fiber" in your diet. What is it?
67. Name and describe the muscular sheet that divides the chest from the abdomen.
68. Name and describe three groups of mammals.
69. Describe the phylogeny of the primates.
70. Describe hominid evolution.

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