

UNIT: Tissues, Organs, and Systems of Living Things Review

Key Concepts:

- Characteristics of Life
 - Cell theory
 - Organelles
 - Cell cycle
 - Mitosis
 - Cancer
 - Differentiation
 - Stem cells
 - Tissue
 - Organ
 - Organ Systems
- Centromere
 - Spindle fibres
 - Chromosomes
 - Sister Chromatids
 - Daughter Cells

Organs Systems:

Know the **main function** of each organ system and the **specific role** of the organs or structures listed.

- Cardiovascular
(heart, veins, arteries, capillaries, blood)
- Respiratory
(lung, alveoli, diaphragm, cilia)
- Digestive
(esophagus, stomach, small intestine, large intestine, pancreas, gall bladder, liver)
- Excretory
(kidney, bladder)
- Nervous
(brain, spinal cord)
- Lymphatic
(spleen)
- Endocrine
(pancreas, glands)
- Reproductive
(testes, ovaries)

Organelles & Cell Structures:

- Cell membrane
- Cell wall
- Chloroplast
(photosynthesis)
- Chromatin
- Endoplasmic Reticulum
- Golgi Apparatus
- Lysosome
- Mitochondria
(cellular respiration)
- Nuclear Membrane
- Nucleolus
- Nucleus
- Ribosome
- Vacuole

Cancer:

- Carcinogen
- Checkpoints
- Imaging Technologies
- Metastasis
- Mutation
- Symptoms
- Treatments
- Tumor
(benign, malignant)

Differentiation:

- Differentiation/ Specialization
- Genes
- Embryonic stem cells
(totipotent & pluripotent)
- Adult stem cells
(multipotent/tissue)
- Necrosis
- Apoptosis

Key

Diagrams:

- Animal Cells
- Generalized Plant Cells
- Cell Cycle
- Mitosis - Stages
- Cancer vs Healthy Cells
- Animal Tissues
- Animal Organs & Systems

Cell Cycle & Mitosis

- Interphase (G1, S, G2)
- Go
- Prophase
- Metaphase
- Anaphase
- Telophase
- Cytokinesis
- Centrioles

Tissues:

- Muscle
(3 main types)
- Epithelial
(2 main types)
- Nervous
- Connective
(4 main types)

Review Questions:

1. Two basic tasks that every cell must accomplish are to produce energy and remove waste. Explain how cells accomplish this using your knowledge of organelles.

2. a) Classify the cells in Figure 1 plant or animal cells. b) Explain your reasoning.



Figure 1: Cells

3. a) What happens in "S" phase of the cell cycle?
b) Explain why this step in the cell cycle is essential to produce a multicellular organism.

4. Label the following parts of a cell in metaphase on Figure 2: centrioles, sister chromatids, spindle fibres.

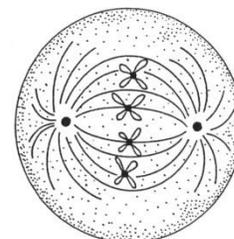


Figure 2: Metaphase

5. Explain how cancer cells differ from normal cells.

6. a) Explain the difference between necrosis and apoptosis.
b) Give a specific example how or where each may occur.

7. a) What type of cells are formed when the zygote (fertilized cell) undergoes mitosis?
b) What is unique about these cells compared to the cells in an adult?

8. How are genes important in cell specialization?

9. a) Rank the following terms from the lowest to highest level of organization in an animal or plant:
tissue, molecule, organelle, organ, cell, organism, organ system

10. What is the difference between a tissue and an organ?

11. The heart is a complex organ of the cardiovascular system. It contains both nervous tissue and muscle tissue. Explain the function of each type of tissue and describe how these cells are specialized to serve each purpose

12. a) What is an organ system?
b) Use an example from an animal or plant to illustrate your definition. Include examples of specific organs in your definition

13. For each of the following organs, name the organ system they belong to and state their function.
a) kidneys b) stomach c) lungs d) testes e) pancreas f) spinal cord g) spleen

14. The alveoli of the lungs and the walls of the intestines are structured to increase their surface area. How would increasing their surface area help these organs carry out their function?

15. Organ systems often interact. Give an example of 2 systems that interact and explain how they work together to perform a function.

16. a) Humans stop growing after puberty and mitosis slows, but it never completely stops in adults. Explain why.
b) What types of tissues are likely to be undergoing mitosis in adults?