

A & P 1 –Final Review

Mary Stangler Center for Academic Success

This review is meant to highlight basic concepts from the units covered in this course. It does not cover all concepts presented by your instructor. Refer back to your notes, unit objectives, labs, handouts, etc. to further prepare for your exam.

1. **Chemistry** – Define Element :
2. **Chemistry** - List the 6 Major Elements that make up the human body:
3. **Four Classes of Biological Molecules** -four macromolecules make up all living things, list them as polymers and complete the table.

Polymer	Monomer	Major Function(s)
Carbohydrates		
Nucleic Acids		
Proteins		
Lipids		

4. **Ions and Electrolytes** – Define the following:
 - a. Ion:
 - b. Electrolyte:
5. **Types of Bonds** – Define the following:
 - a. Covalent bond:
 - b. Ionic bond:
 - c. Nonpolar covalent bond:
 - d. Covalent polar bond:
 - e. Hydrogen (H) bonds:
6. **Most important inorganic molecule is water** - answer and define:
 - a. Why is it so essential?
 - b. Hydrophilic:
 - c. Hydrophobic:
7. **Acids, Bases, & pH** – Define and answer:
 - a. Acid:
 - b. Base:

8. **Parts of the Cell** – define:
 - a. Cell membrane :
 - b. Cytoplasm:
 - c. Organelles:
 - d. Nucleus:
 - e. Rough Endoplasmic Reticulum (RER):
 - f. Ribosome:
 - g. Smooth Endoplasmic Reticulum (SER) :
 - h. Golgi:
 - i. Mitochondria:
9. **Cellular Respiration (aerobic)** – write the equation:
 - Where does it primarily occur in the cell:
10. **Membrane Transport** = Movement of substances across the cell membrane – compare and contrast passive and active transport. Refer to energy use, concentrations gradient, and the main types for each one.
 - a. Passive transport
 - b. Active transport
11. **Osmosis & Tonicity** - Concentration of solute inside a cell vs. the conc. of water or solution surrounding it – Define the following:
 - a. Isotonic solution:

 - b. Hypertonic solution:

 - c. Hypotonic solution:
12. **Hierarchy of Complexity** – give a brief definition:

<ol style="list-style-type: none"> a. Organism – composed of b. Organ Systems – composed of c. Organs – composed of d. Tissues – composed of 	<ol style="list-style-type: none"> e. Cells – composed of f. Organelles – composed of g. Molecules – composed of h. Atoms – base unit of
--	--
13. **Tissues** – give the major function of each type of tissue:
 - a. Epithelial
 - b. Connective
 - c. Nervous
 - d. Muscular
14. **Identifying Epithelial Tissue (Membranes)** – Epithelial Tissue is named by its class, cell shape, and specialized structures. Name the following epithelial tissues using the clues provided.
 - a. Four Types of Simple Epithelia
 - i. _____ – one layer of flat cells

- ii. _____ – one layer of cube-shaped cells
- iii. _____ – one layer of column-shaped cells
- iv. _____ – looks stratified, but is single layer, not all reach free surface

b. Four Types of Stratified Epithelia

- i. _____ – multiple layers of flat cells
- ii. _____ – multiple layers of cube-shaped cells
- iii. _____ – multiple layers of column-shaped cells
- iv. _____ – changes shape, between squamous and cuboidal

15. **Anatomic Directional Terms** – give the direction for the following:

- a. Anterior or Ventral – toward _____
- b. Posterior or Dorsal – toward _____
- c. Superior – _____
- d. Inferior – _____
- e. Medial – toward _____ plane
- f. Lateral – _____ from median plane
- g. Proximal – _____ point of attachment
- h. Distal – _____ point of attachment
- i. Ipsilateral – on _____ side of body
- j. Contralateral – on _____ side of body
- k. Superficial – _____ body surface
- l. Deep – _____ body surface
- m. Supine – facing _____
- n. Prone – facing _____

16. **Body Regions** – describe the following:

- a. Axial:
- b. Appendicular:

17. **Thoracic Cavity & Membranes** – define the following membranes and determine their position:

- a. Mediastinum:
- b. Pericardium:
 - i. Visceral Pericardium – _____ layer
 - ii. Parietal Pericardium – _____ layer
 - iii. Pericardial Cavity – _____ layers
 - iv. Pericardial Fluid – _____ layers
- c. Pleura
 - i. Visceral Pleura – _____ layer
 - ii. Parietal Pleura – _____ layer
 - iii. Pleural Cavity – _____ layers
 - iv. Pleural Fluid – _____ layers

18. **Abdominopelvic Cavity & Membranes**- Define the following cavities/membranes and determine their position:

- a. Abdominal Cavity:
- b. Pelvic Cavity:
- c. Peritoneum :
 - i. Visceral Peritoneum – _____ layer

- ii. Parietal Peritoneum – _____ layer
- iii. Peritoneal Cavity – _____ layers
- iv. Peritoneal Fluid – _____ layers

19. **Define Homeostasis** – (use temperature as an example):

- Homeostasis:

20. **Negative Feedback** – give a brief explanation of negative feedback (use temperature as an example):

21. **Positive Feedback** - give a brief explanation of positive feedback (use child birth as an example):

22. **Skin: Structures and Functions** – List the distinguishing features of each layer:

- a. Epidermis:
- b. Dermis:
- c. Hypodermis:

23. **Epidermis: Cell Layers** – describe the cells of each layer of the epidermis:

- a. Stratum Corneum :
- b. Stratum Lucidum :
- c. Stratum Granulosum :
- d. Stratum Spinosum:
- e. Stratum Basale (Stratum Germinativum):

24. **Dermis: Cell Layers** – list the distinguishing features of each layer gland type:

- a. Papillary Layer :
- b. Reticular Layer:
- c. Merocrine gland:
- d. Apocrine gland :
- e. Sebaceous gland :
- f. Ceruminous gland :

25. **Hair Types and Functions** - briefly describe the type of hair and where found:

- a. Lanugo:
- b. Vellus :
- c. Terminal :
- d. Functions of hair:

26. **Nail Structure** - answer the following questions and identify the parts of the nail:

- a. What are nails are made up of?
- b. _____ – hard part of nail
- c. _____ – skin underlying nail plate
- d. _____ – growth zone of stratum basale, at proximal end of nail

- e. _____ – white crescent at proximal end of nail
- f. _____ (Cuticle) – narrow zone of dead skin over base of nail
- g. _____ – epidermis at distal portion of nail bed

27. **Inflammation** – Describe why the 4 cardinal signs of inflammation occur:

- a. Redness:
- b. Heat :
- c. Swelling:
- d. Pain:

28. **Healing of Skin Cuts** - explain what happens following a cut

- a. Immediately After Injury: the area bleeds, eventually a _____ will temporarily fill the hole; a scab protects the injury site, _____ (WBC's) clean up cellular debris.
- b. Tissue Regeneration: Production of same type of functional tissue, _____ cells from epidermis migrate to cover the edge of a wound, these cells divide to push out blood clot and scab.
- c. Tissue Replacement (Fibrosis): Production of nonfunctional connective tissue, _____ (type of cells in dermis produce fibrous tissue) to produce a scar, sutures draw the edges of the stratum _____ together.

29. **Types of Bones** - give the function and an example of each:

- a. Long Bones:
- b. Flat Bones:

30. **Anatomy of a Long Bone** – define the following:

- a. Compact (Dense) Bone:
- b. Spongy (Cancellous) Bone:
- c. Marrow (Medullary) Cavity:
- d. Red Bone Marrow:
- e. Yellow Bone Marrow :
- f. Periosteum :
- g. Endosteum :
- h. Epiphysis:
- i. Diaphysis :
- j. Metaphysis :
- k. Epiphyseal Plate (Growth Plate):
- l. Epiphyseal Line:
- m. Nutrient Foramina:
- n. Articular Cartilage:

31. **Bone (Osseous) Cells** – describe the function of each:

- a. Osteoblasts :
- b. Osteocytes :
- c. Osteoclasts :

32. **Bone (Osseous) Tissue** - Osteon (Haversian System) – define of each:

- a. Osteocyte :
- b. Lacunae:
- c. Canaliculi :

33. **Bone Formation & Growth: Endochondral Ossification** : briefly describe the 2 steps:

- a. Long bones develop from a _____ model in fetus
- b. Primary Ossification Center :
- c. Secondary Ossification Centers :

34. **Bone Formation & Growth: Intramembranous Ossification**

- a. bone replaces _____ instead of cartilage in fetus

35. **Calcium Homeostasis** – give the function of each hormone:

- a. Calcitriol :
- b. Calcitonin, Estrogen, Testosterone:
- c. Parathyroid Hormone (PTH)

36. **Healing of Bone Fractures**- list 4 steps of bone healing:

- a. 1.
- b. 2.
- c. 3.
- d. 4.

37. **Joint Movement** – give the movement of the following:

- a. Flexion – _____ to decreases joint angle (hinge joints)
- b. Extension – _____ to increase joint angle
- c. Hyperextension - Further _____ of joint beyond zero position
- d. Abduction - Movement _____ midline of body
- e. Hyperabduction - _____ arm overhead (in frontal plane)
- f. Adduction -Movement _____ midline
- g. Hyperadduction - _____ legs, fingers
- h. Elevation - _____ body part vertically
- i. Depression - _____ body part vertically
- j. Protraction - _____ movement of a body part in horizontal plane
- k. Retraction - _____ movement of a body part in the horizontal plane
- l. Circumduction - One end of an appendage remains stationary, other end makes a circular motion
- m. Rotation - Movement in which body part spins about an axis

38. **Synovial Joints Anatomy** – define the following:

- a. Ligament – attaches _____
- b. Tendon – attaches _____
- c. Bursa – _____ filled with synovial fluid
- d. Articular Disc – _____ between bones

e. Meniscus (pl. Menisci) – fibrocartilage pads at knee joint

39. Types of Synovial Joints – list 6 types:

- a. 1.
- b. 2.
- c. 3.
- d. 4.
- e. 5.
- f. 6.

40. Organelles & Structures of Muscle Cells – define the following

- a. Sarcolemma - _____ membrane of muscle fiber (cell)
- b. Sarcoplasm - _____ of muscle fiber (cell)
- c. Sarcoplasmic Reticulum - _____ of muscle fiber (cell)
- d. Terminal Cisternae - Dilated end-sacs of SR, cross all the way through muscle fiber (cell)
- e. T-tubules - Tube-shaped infoldings of sarcolemma, penetrate all the way through muscle fiber (cell)
- f. Mitochondria - Aerobic respiration of glucose to produce _____
- g. ATP provides energy for muscle movement
- h. Nuclei - _____ nuclei, with DNA for muscle protein production

41. Organization of Muscular Tissue

- a. What surrounds a muscle (bundles of fascicles)?
- b. What surrounds one muscle fascicle (bundle of muscle fibers)?
- c. What surrounds a single muscle fiber (cell)?

42. Sliding Filament Theory – Give a brief summary:

43. Phases of a Muscle Contraction – give a brief explanation of each phase:

- a. Stimulus Phase:
- b. Latent Period:
- c. Contraction Phase:
- d. Relaxation Phase:

44. Phases of Muscle Contractions

- a. Isometric Muscle Contraction (“Same _____”)
- b. Isotonic Muscle Contraction (“Same _____”)

45. Slow-Twitch & Fast-Twitch Muscle Fibers

- a. Slow Twitch – Slow Oxidative
 - i. What type of respiration is this?
 - ii. Is it good for a quick response?
- b. Fast Twitch – Fast Glycolytic
 - i. What type of respiration is this?
 - ii. Is this good for a quick response?

46. Structures of Neurons – define the following:

- a. Dendrites –

- b. Soma (Cell Body) –
- c. Axon –
- d. Myelin Sheath –
- e. Schwann Cells –
- f. Nodes of Ranvier –
- g. Internodes –
- h. Synaptic Knobs & Synaptic Vesicles –

47. **Nerve Signals: Generation & Propagation** - describe what is happening with K⁺ and Na⁺ at each step:

- a. Polarization:
- b. Depolarization:
- c. Repolarization :

48. **Brain: Anatomical Divisions**

- a. Gyri – raised _____ of gray matter
- b. Sulci – _____ between gyri
- c. Longitudinal Fissure – deep _____ that separates hemispheres
- d. Corpus Callosum – thick _____ that connects hemispheres
- e. Cerebral Medulla – inner layer of _____ matter; myelinated
- f. Cerebral Cortex – outer layer of _____ matter; unmyelinated

49. **Lobes of the brain & their functions** - what does each area control?

- a. Frontal Lobe:
- b. Parietal Lobe:
- c. Temporal Lobe:
- d. Occipital Lobe:

50. **Somatic Reflexes: Reflex Arc** – use the following words to explain a simple reflex arc:

- Receptor, Sensory (Afferent) Neuron, Interneuron, Motor (Efferent) Neuron , effector

51. **Components of the Eye** – describe the following:

- a. Iris –
- b. Pupil –
- c. Cornea
- d. Lens
- e. Aqueous Humor
- f. Retina
- g. Optic Disc
- h. Rods
- i. Cones

52. **Components of the Ear (outer & middle and inner)** – Describe the path of a sound wave entering the ear until it is sent to the brain for interpretation: