**Human Body: An Orientation**

1. What is anatomical position?
2. Describe the following directional terms:
   - caudal, cranial, distal, dorsal (posterior), lateral, medial, palmar, plantar, proximal
3. Describe the body plans.
   - frontal plane, sagittal plane, transverse plane
4. Which cavities are found within the dorsal body cavity?
5. Which cavities are found within the ventral body cavity?
6. Which cavities are found within the abdominopelvic body cavity?
7. Which organs are found in the following cavities?
   - abdominal, cranial, pelvic, pericardial, thoracic
8. Overview of the Body Systems:
   - Endocrine, Immune, Lymphatic, Urinary, Reproductive
   a. What is the function of each?
   b. What are the main organs found within each system?
9. What are the nine abdominopelvic regions and where are they located?
10. regional vs. systemic anatomy; gross vs. microscopic anatomy
11. correct sequence of structural organization?
12. terms related to physiology/terms related to anatomy

**Diagrams:** Body Directions, Planes, Body Cavities, Abdominopelvic Regions

**Cells: The Living Units**

10. Discuss the function of each of the following:
    - Centrioles: a pair of bar-like organelles that assist animal cells with cell division
    - Golgi apparatus: post office of the cell; aids in packaging proteins and other substances for export out of the cell
    - Ribosome: site of protein synthesis
    - Cytoplasm: gel-like substance inside the cell membrane that the organelles rest in
    - Microvilli: tiny finger-like projections that aid in absorption
    - Mitochondrion: powerhouse of cell; site of ATP production
11. List important characteristics about the plasma membrane. Cell membranes are selectively permeable, letting certain substances in and keeping others out. They are a bi-phospholipid structure, that is there are 2 layers of lipid molecules that create the structure
12. Define diffusion and osmosis. Diffusion is the movement of a substance from an area of high concentration to an area of low concentration. Osmosis is the diffusion of water.
13. What is the difference between simple diffusion and facilitated diffusion? Simple diffusion requires no energy; facilitated diffusion uses carrier molecules to aid in diffusion.
14. Explain what the concentration gradient is? Moving from high to low or low to high concentrations
15. Discuss the difference between isotonic (balanced solution, same inside cell and outside cell) hypertonic (higher concentration of solute and lower concentration of water outside the cell, water will leave the cell (high to low) and cell will shrink), and hypotonic (lower concentration of solute and higher concentration of water outside the cell, water will enter the cell (high to low) and cell will swell.
16. Why is drinking salt water dangerous to humans? Salt water is hypertonic to human cells, in the presence of salt water in the gut our cells will shrivel and die.

17. Be able to discuss: a semipermeable sac containing 10% glucose and 25% albumin is suspended in a solution with the following composition: 30% glucose and 5% albumin. Assume the sac is permeable to albumin but not glucose. What is going to happen? Albumin will leave the sac and enter the solution. Water will also leave the sac and enter the solution in order to reduce concentration of the glucose.

18. List the meaning for each of the following prefixes/suffixes:
   - Micro (very tiny)
   - Hydro (water)
   - Hyper (over)
   - Hypo (under)
   - Cyto (cell)
   - Logy (study of)
   - Lysis (burst or swell)

Diagram: Cell w/organelles, hypertonic, hypotonic, isotonic cells vs. environment

**Tissues: The Living Fabric**

1. Epithelium tissue is what type of tissue? (its function)covering and lining of the body and the body cavities
2. Epithelial tissues are classified based on what? Shape and layers
3. List and describe the 3 different classifications? Squamous (flat, fried-egg like), cuboidal (cube), columnar (tall and thin)
4. List and discuss the description, location, and function of the 8 types of ET. (cards)
5. Compare and contrast endocrine and exocrine glands. Endocrine glands do not have ducts and instead secrete directly into the blood stream. Exocrine glands secrete to the outer skin or body cavity through ducts
6. List and discuss 3 types of exocrine glands (and common names). Holocrine (secrete dead cells along with product); merocrine (secrete product only); apocrine (secrete top parts of cells and products)
7. Compare and contrast epithelium tissue and connective tissue. Connective tissue is the most widely distributed and most abundant tissue in the body. CT has 3 parts – ground substance, fibers, and cells – which ET does not.
8. What is the most common form of cartilage? Hyaline
9. What types of fibers are found in connective tissue? Reticular, elastic, collagen
10. What is the function for each of the following types of CT?
   - Adipose tissue (cushion, protect, insulate), bone tissue (support and protect), dense fibrous tissue (tendons and ligaments with a little stretch), fibrocartilage (cushioning, intervertebral discs)

Diagrams: Epithelium tissues, Glands, Connective tissues (all from cards)

**The Integumentary System**

1. What is the function of the sebaceous glands? A structure that produces an oily secretion that helps keep the epidermis flexible and waterproof
2. Which skin layer is the origin for the ridges that make up fingerprints? Dermis – papillary layer
3. What important functions does the skin perform? It is waterproof, slightly acidic to keep bacteria out, and helps to regulate body temperature.
4. Erector pili muscles are associated with? Hair follicles
5. Which layer of the skin in nonvascular? Epidermis
6. What is the difference between flexure lines and lines of cleavage?
   - Dermal folds are obvious on the wrists, palms, soles of the feet, fingers, and toes are Flexure lines
   - Lines of cleavage are longitudinal lines in the long limbs and circular lines in the torso.
7. What are the ways the body prevents over-heating? Sweating, vasodilation
   - Over-cooling? Vasoconstriction, shivering, fat tissues, and erection of body hair
8. Which layer is considered the “growing layer”? Stratum germinativum
9. What provides the nutrient supply for growing hair? Hair root papillae
10. Burns: Which degree?
    - Regeneration possible and there is epidermal and some dermal damage? 2nd degree burn
-Can heal in 2 to 3 days without special attention? 1st degree burn
-Is pain absent and epidermal and dermal layers destroyed? 3rd degree

11. What is responsible for nail growth? nail matrix
12. Long thin canal from which the hair grows? hair follicle
13. Surrounds the medulla of the hair region, several layers of flattened cells? cortex
14. Discuss function and distribution of free nerve ending.
* Free nerve ending - Most widely distributed touch receptors; involved in light touch as well as pain and heat

Diagrams: Cross section of Skin, Layers of the epidermis, Fingernail

**Muscular System:**

1. List the three types of muscle tissue and discuss characteristics of each.
   - Skeletal – striated, fast contractions, attached to long bones to enable movement
   - Smooth – nonstriated, slow contractions, lines alimentary canal and blood vessels
   - Cardiac – striated, branching, intermediate contractions, heart
2. Explain what is meant by an antagonist pair. A pair of muscles that work in opposite directions to move long bones
3. Compare and contrast the appearance of actin and myosin fibers. Actin fibers are thin, and filament like, myosin fibers are thicker and bumpy
4. Where are actin and myosin fibers located? In the sarcomere
5. Compare and contrast characteristics of slow-twitch to fast-twitch fibers. Slow twitch fibers are aerobic, non-fatiguable, have lots of mitochondria; fast twitch fibers are fatiguable, anaerobic
6. Describe the appearance of a muscle when it contracts as opposed to when it is relaxed. When a muscle contracts it shortens and bulges.
7. What is the point of origin? The muscle end attached to the non-moving bone.
8. What is the point of insertion? The muscle end attached to the moving bone
9. List the function of the following muscles:
   - Biceps brachii – flexes and supinates, deltoid, masseter, orbicularis oculi, orbicularis oris, rectus abdominis, sternocleidomastoid, trapezius, triceps brachii  **SEE MUSCLE MAN**

Diagrams: label muscle tissue types, actin/myosin fibers, muscles: biceps brachii, deltoid, external oblique, gluteus maximus, latissimus dorsi, sternocleidomastoid, trapezius, triceps brachii  **SEE MUSCLE MAN**

**Skeleton/Joint**

1. Which bones of the skeleton make up the appendicular region? Long bones of arms and legs, pelvic and pectoral girdles. Axial region? Skull vertebral column, ribcage Further classified? By shape
2. Describe the two types of girdles. Pectoral girdle includes the scapula and clavicles that the long bones of arms hang from. The pelvic girdle contains the bones of the pelvis from which the long bones of the legs hang from
3. What are the functions of the skeleton? Protect, movement, storage of minerals and nutrients, formation of red blood cells
4. What are the four classifications of bones? Long, short, flat, irregular
5. Facts about the healing of fractures. Fractures must be reduced (broken ends brought back together) and then immobilized for healing – 6-8 weeks for most, longer for larger bones and the elderly
6. What is the difference between a simple and compound fracture? A simple fracture does not penetrate the skin, a compound fracture does.
7. Types of fractures Greenstick (incomplete break), tranverse (across long axis of bone), spiral (twisting break), compression (lots of broken pieces), depression (bone pushed into soft tissue)
8. Where are the atlas and axis located, and what are their functions? Atlas and axis are the 1st two bones in the vertebral column. They allow the head to nod
9. Which bone is the strongest bone in the body? Femur
10. List the sections of the spine and number/description of each. Cervical (7), thoracic (12) lumbar (5), sacral (5 fused) coccyx (4 fused)
11. What term refers to the shaft of the bone? Diaphysis
12. Where in the bone is fat stored in an adult? In the medullary canal of the long bones in the form of yellow marrow
13. Define the following terms as they pertain to the anatomy of the long bone:
   Sharpey’s fibers (tough fibers that connect the periosteum to underlying bone), trabeculae (small beams in spongy bone that help it absorb stress), endosteum (internal covering in bone structures), periosteum (outer membrane covering bone), epiphyseal plate (site of growth in long bones), medullary cavity (yellow marrow)
14. Why is it important to know about the xiphoid process. It is the small process of the sternum that often breaks during CPR
15. Type of joints – define and give an example: pivot, condyloid, hinge, saddle, ball and socket see worksheet
16. Function of joints movement and joining of skeleton parts
17. Synovial joint – It is Diarthrosis. Degree of movement? Freely moving
18. Identify extension/flexion, circumduction, abduction/adduction, pronation/supination, depression/elevation, inversion/eversion,
19. Give examples of diarthrosis joints. Wrist, shoulder, knee

Diagrams: Skull, Skeleton, Vertebrae, Long bone, joint movements, types of joints (real and mechanical)

**Digestive System:**

1. What is the function of the digestive system? To break down food into molecules that can be absorbed into the bloodstream and passed to the cells for use.
2. Discuss the difference between mechanical and chemical digestion. Mechanical digestion is the physical breaking up of food by teeth, tongue and muscle contractions of the stomach. Chemical digestion is the addition of enzymes and acids to break apart the food molecules into smaller, more easily absorbed molecules.
3. The major building blocks of body tissues are supplied by foods containing? proteins
4. Most of the body’s energy needs are supplied by? carbohydrates
5. Vitamins are organic compounds that do what? Help enzymes work in the body
6. The hormone that regulates the synthesis of HCl acid in the stomach is? gastrin
7. The digestive enzyme in saliva begins the chemical digestion of what? carbohydrates
8. The secretion of saliva is under the control of what system? Autonomic nervous system
9. What two enzymes help to neutralize food that passes from the stomach to the small intestine? Pancreatic juices and bile
10. Define peristalsis. The muscular contractions of the esophagus and other parts of the alimentary canal.
11. Describe the esophagus. A muscular tube about 14 inches long that connects the pharynx and the mouth with the stomach.

Function of: epiglottis, stomach, small intestine, large intestine, Liver
   Epiglottis – keeps food from going down the windpipe
   Stomach – does both mechanical and chemical digestion of food
   Small intestine – absorption of nutrients takes place here
   Large intestine – indigestible waste is dried and packed
   Liver – secretes bile to the small intestine, detoxifies alcohol and drugs, stores glycogen for energy, produces vitamins like A and K
13. List and describe the parts of the stomach. Cardia region – where food enters the stomach; Fundus – expanded part of stomach that bluges superolaterally to the cardia; Body – mid-portion of stomach; pylorus – terminus of stomach, is continuous with the duodenum through the pyloric sphincter
14. What is considered to be the main acid in our stomach? HCL
15. List the correct order for substances to leave the stomach? Carbs, proteins, fats
16. List the parts of the small intestine. **Duodenum:** first section, fairly immovable, curves around head of pancreas, ducts delivering bile and pancreatic juice empty in here; **ileum:** last section of small intestine, joins large intestine at iliocecal valve; **jejunum:** middle section of small intestine

17. What is the function of the villi of the small intestine? To increase surface area for nutrient absorption

18. Bile – where is it produced, stored, and what is its function? Bile is produced in the liver, stored in the gall bladder, and helps to emulsify fats as well as reduce acid content in small intestine.

19. What are the five subdivisions of the large intestine? **Ascending colon**, **transverse colon**, **descending colon**, **sigmoid colon**, **rectum**, **anal canal**

20. List the correct sequence for the passage of food through the digestive tract? **Mouth**, pharynx, esophagus, stomach, small intestine, large intestine

21. What causes an ulcer? A break in the stomach mucosal wall that allows stomach acid to damage the cells.