Human Anatomy and Physiology
Summer Assignment

2026-2027
Mrs. Lamphron

Welcome to Human Anatomy and Physiology!!

The following assignment can be worked on over the summer break if you would like to get ahead for the start of the school year. Working on this assignment over the summer is OPTIONAL. This packet will be officially assigned at the start of the school year. The outline will be broken up into portions that will be due weekly starting in September. Your first unit test will be open note and you will be able to use this packet to help you on the test.

On the back of this sheet you will find the instructions on how to get the online textbook. You should use this textbook to complete the assignment. You will be held to the terminology in the textbook, please do NOT look up anything on the internet.

The assignment:

- **On the outline provided:**
  - Fill in the outline
    - Bullet points are best.
    - Be brief, yet specific and add details whenever possible
    - Try not to write full sentences unless needed
    - Adding in quick drawings or sketches are helpful.
  - Note the section number(s)/page numbers you find the information from in the left margin of the outline. This will help you get back to the correct page when needed.
    - If you would like to sign out a hard copy of the text please contact Mrs. Lamphron before 6/22/26. Copies will also be available again in September.

Please e-mail me (slamphron@clarenceschools.org) if you have any issues or questions.

Have a great summer and I look forward to seeing you the first day of school!!

-Mrs. Lamphron

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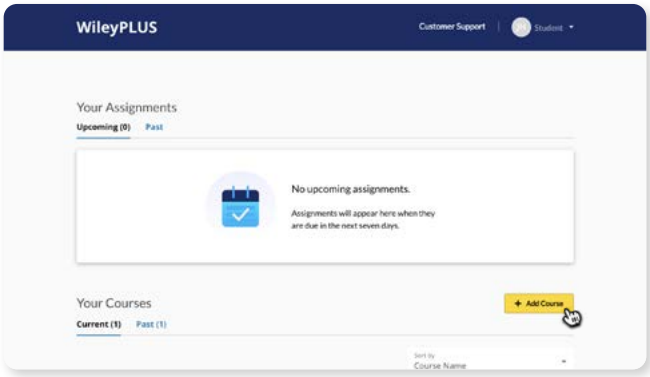
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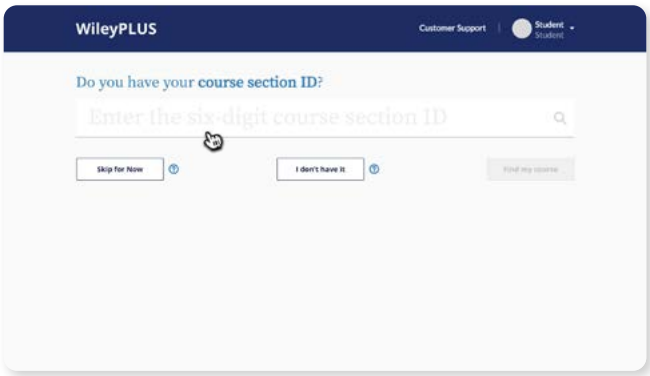
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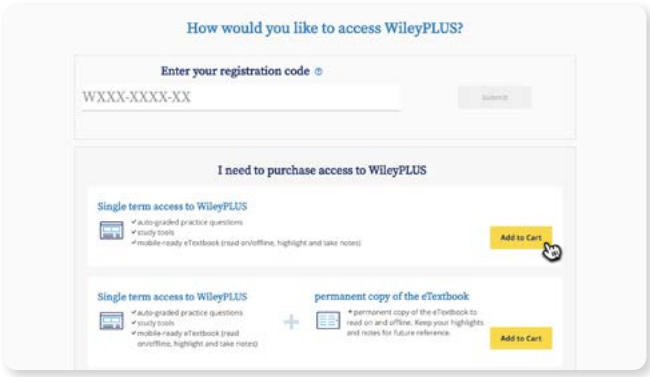
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Introduction to the Human Body (1)

I. Definitions

Anatomy

Physiology

II. Branches of Anatomy and Physiology

A.

Branch of Anatomy	Study of
Histology	
Gross Anatomy	
Pathological Anatomy	

Branch of Physiology	Study of
Molecular Physiology	
Exercise Physiology	
Pathophysiology	

B. _____ of a part of the body often reflects its _____.

III. Levels of Structural Organization and Body Systems

A. Chemical Level
   1. atoms

      a. examples:

   2. molecules

      b. examples:

B. Cellular level
   1. cells

      a. examples:

C. Tissue level
   1. tissues

      a. examples (give at least two with details about each tissue):

D. Organ level
1. organ

a. example: Stomach (give the types of tissues and their functions that make up this organ)

E. System level
1. system

a. example: Digestive System (give function of this system and organs and their functions that make up this system)

F. Organismal level
1. organism

G. Systems of the Human Body

System Name	Components	Functions
Integumentary		
Skeletal		
Muscular		
Nervous		
Endocrine		
Cardiovascular		

System Name	Components	Functions
Lymphoid (Lymphatic) and Immunity		
Respiratory		
Digestive		
Urinary		
Reproductive		

H. Noninvasive Diagnostic Techniques
1. Noninvasive diagnostic technique

a. inspection

b. palpation

c. auscultation

d. percussion

IV. Characteristics of the Living Human Organism
A. Life processes of the human body
a. metabolism

b. responsiveness

c. movement

d. growth

e. differentiation

f. reproduction

B. When any one of the life process ceases to occur properly,

C. Clinically, loss of heartbeat,

D. Autopsy

V. Homeostasis

A. Homeostasis

B. Homeostasis and body fluids

1. An important part of maintaining homeostasis is maintaining the

a. intracellular fluid (ICF)/cytosol

b. extracellular fluid (ECF)

1. interstital fluid

2. blood plasma

3. lymph plasma

4. cerebrospinal fluid

5. synovial fluid

C. Control of homeostasis

1. Feedback Systems

a. feedback system/feedback loop

1. controlled condition/variable

a. examples

2. stimulus

b. Three basic components
   1. receptor

      a. afferent pathway

      b. input

   2. control center

      a. set point

      b. output

      c. efferent pathway

   3. effector

      a. response

2. Negative feedback systems
   a. a negative feedback system

      1. example: regulation of blood pressure
         a. blood pressure

         b. what happens when blood pressure increases because the heart is beating faster/harder (from the textbook)

3. Positive feedback systems
   a. positive feedback system

      1. how different from negative feedback

      2. example: normal childbirth (from the textbook)

3. If the action of a positive feedback system is not stopped, it can "_____ _____" and may even produce _____-_____ conditions in the body. The action of a negative feedback system, by contrast, _____ and then _____ as the controlled condition returns to its _____ _____. Usually, _____ feedback systems reinforce conditions that _____ _____ happen very often, and _____ feedback systems regulate conditions in the body that remain _____ over _____ periods.

D. Homeostatic Imbalances
1. disorder
2. disease
   a. local
   b. systemic
3. symptoms
4. signs
5. epidemiology
6. pharmacology
7. Diagnosis of disease
   a. diagnosis
   b. factors that go into a diagnosis

VI. Basic Anatomical Terminology
A. Body Positions
1. anatomical position
   a. position the body is in
   b. why do scientists and health-care professionals use this?
2. prone
3. supine

B. Regional Names

Region	Information about Region
Head	
Neck	
Trunk	
Upper limbs	
Lower limbs	

C. Planes and sections

1. planes

a .

Plane	Meaning
Sagittal plane	
Midsagittal/median plane	
Midline	
Para sagittal plane	
Frontal/coronal plane	
Transverse plane	
Oblique plane	

2. Sections

3. It is important to know the plane of the section so you can

   a. For example: three different sections of the brain provide

D. Directional Terms

1. used to describe

2.

Directional Term	Definition
Superior (cephalic/cranial)	
Inferior (caudal)	
Anterior (ventral)	
Posterior (dorsal)	
Medial	
Lateral	
Intermediate	
Ipsilateral	
Contralateral	
Proximal	
Distal	
Superficial (external)	
Deep (internal)	

E. Body Cavities

1. what they are

2.

Cavity	Comments
Cranial cavity	
Vertebral canal	
Thoracic cavity	
Pleural cavity	

Cavity	Comments
Pericardial cavity	
Mediastinum	
Abdominopelvic cavity	
Abdominal cavity	
Pelvic cavity	

3. Thoracic and Abdominal Cavity Membranes
   a. membrane

      1. serous membrane

         a. parietal layer

         b. visceral layer

         c, serous fluid

         d. examples:
            1. pleura

               a. visceral pleura

               b. parietal pleura

               c. pleural cavity

            2. pericardium

               a. visceral pericardium

               b. parietal pericardium

c. pericardial cavity

3. peritoneum

a. visceral peritoneum

b. parietal peritoneum

c. peritoneal cavity

** retroperitoneal

VI. Aging and Homeostasis

A. aging

B. what aging produces –

1. examples:

VII. Medical Imaging

A. medical imaging refers to

B. Various types of medical imaging allow

C. Common medical imaging procedures

Name	Procedure	Comments/Details
Radiography/X-ray		

Name	Procedure	Comments/Details
Magnetic Resonance Imaging (MRI)		
Computed Tomography (CT)		
Ultrasound scanning		
Coronary (cardiac) computed tomography angiography (CCTA) scan		

Name	Procedure	Comments/Details
Positron emission tomography (PET)		
Endoscopy		
Radionucleotide scanning		

Chemistry and Homeostasis:

I. How Matter is Organized

a. Chemical Elements

Chemical Element	% of Total body Mass	Significance
Oxygen		
Carbon		
Hydrogen		
Nitrogen		
Calcium		
Phosphorus		
Potassium		
Sulfur		
Sodium		
Chlorine		
Magnesium		
Iron		

II. Overview of Organic Compounds

a. Carbon skeleton

b. Macromolecules

c. Polymers

d. Monomers

III. Carbohydrates

a. Monosaccharides and Disaccharides (include sketch)

b. Polysaccharides (include sketch)

i. Artificial Sweeteners

IV. Lipids

Types of lipids in the body

Type	Summary of Function
Fatty Acids	
Triglycerides	
Phospholipids	
Steroids	
Eicosanoids	
Other	

i. Fats in health and Disease

V. Proteins

a. Amino Acids and Polypeptides

Functions of Proteins

Type of Protein	Function
Structural	
Regulatory	
Contractile	
Immunological	
Transport	
Catalytic	

b. Fibrous Protein

c. Globular Protein

d. Enzymes

i. Three important Properties of enzymes

VI. Nucleic Acids

a. DNA vs RNA

i. DNA Fingerprinting

VII. Adenosine Triphosphate

Ch. 3

The Cellular Level of Organization

Cells and Homeostasis

I. Parts of a Cell

a. Plasma membrane

b. Cytoplasm

c. Nucleus

II. The Plasma Membrane

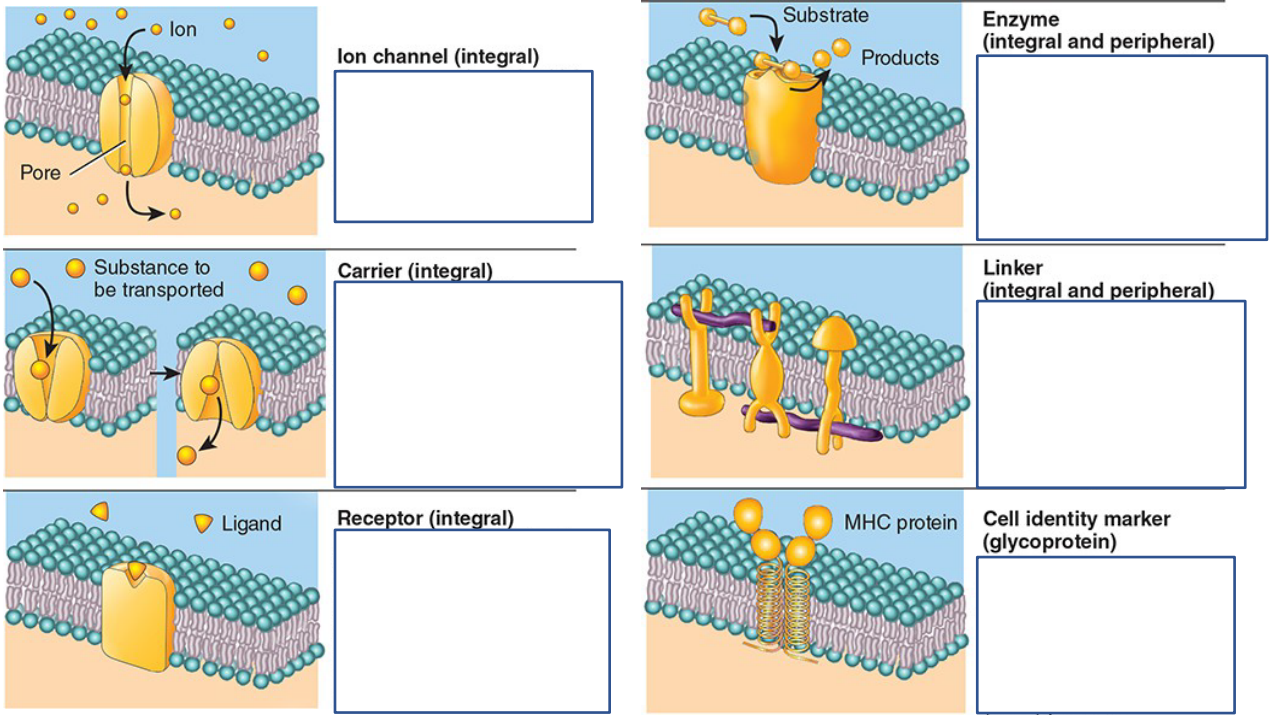
a. Structure of the Plasma Membrane

i. The lipid Bilayer

a. Function

b. Amphipathic

b. Functions of Membrane Proteins



c. Membrane Fluidity

d. Membrane Permeability

e. Gradients Across the Plasma Membrane

i. Concentration Gradient

ii. Electrical gradient

iii. Electrochemical gradient

III. Transport across the Plasma Membrane

a. Passive processes

i. Channel-Mediated Facilitated Diffusion

ii. Carrier-Mediated Facilitated Diffusion

iii. Aquaporins

iv. Hydrostatic pressure

v. Osmotic pressure

vi. Hypotonic solution

vii. Hemolysis

viii. Hypertonic solution

ix. Medical uses of Isotonic, Hypertonic, and Hypotonic Solutions

b. Active Process

i. Sodium-Potassium pump

ii. Digitalis & Ca^{2+}

iii. Viruses and Receptor-Mediated Endocytosis

Transport of Materials into an out of Cells

Transport Process	Description	Substances Transported
PASSIVE PROCESSES		
Diffusion Simple Diffusion		
Facilitated Diffusion		
Osmosis		
ACTIVE PROCESSES		
Active Transport		
Primary Active Transport		
Secondary active transport		

Transport in Vesicles		
Endocytosis		
Receptor-Mediated endocytosis		
Phagocytosis		
Bulk-Phase endocytosis		
Exocytosis		
Transcytosis		

IV. Cellular Diversity

V. Aging and Cells

a. Telomeres

b. Free Radicals and Antioxidants

a. Disorders: Homeostatic Imbalances
    i. Cancer

    ii. Types
        1. Carcinomas

        2. Melanomas

        3. Sarcoma

        4. Osteogenic sarcoma

        5. Leukemia

        6. Lymphoma

    iii. Growth and spread

        1. Angiogenesis

    iv. Causes
        1. Carcinogens

        2. Oncogenes

        3. Oncogenic Viruses

    v. Carcinogenesis

    vi. Treatment of Cancer