

1 THE HUMAN BODY: AN ORIENTATION



Nathaniel
Smith

Most of us have a natural curiosity about our bodies, and a study of anatomy and physiology elaborates on this interest. Anatomists have developed a universally acceptable set of reference terms that allows body structures to be located and identified with a high degree of clarity. Initially, students might have difficulties with the language used to describe anatomy and physiology, but without such a special vocabulary, confusion is bound to occur.

The topics in this chapter enable students to test their mastery of terminology commonly used to describe the body and its various parts, and concepts concerning functions vital for life and homeostasis. Body organization from simple to complex levels and an introduction to the organ systems forming the body as a whole are also covered.

AN OVERVIEW OF ANATOMY AND PHYSIOLOGY

1. Match the terms in Column B to the appropriate descriptions provided in Column A. Enter the correct letter or its corresponding term in the answer blanks.

Column A		Column B
<u>D</u>	1. The branch of biological science that studies and describes how body parts work or function	A. Anatomy
<u>A</u>	2. The study of the shape and structure of body parts	B. Homeostasis
<u>B</u>	3. The tendency of the body's systems to maintain a relatively constant or balanced internal environment	C. Metabolism
<u>C</u>	4. The term that indicates <i>all</i> chemical reactions occurring in the body	D. Physiology

2. Circle all the terms or phrases that correctly relate to the study of *physiology*. Use a highlighter to identify those terms or phrases that pertain to the study of *anatomy*.

A. Measuring an organ's size, shape, and weight

H. Dynamic

B. Can be studied in dead specimens

I. Dissection

C. Often studied in living subjects

J. Experimentation

D. Chemistry principles

K. Observation

E. Measuring the acid content of the stomach

L. Directional terms

F. Principles of physics

M. Static

G. Observing a heart in action

LEVELS OF STRUCTURAL ORGANIZATION

3. The structures of the body are organized into successively larger and more complex structures. Fill in the answer blanks with the correct terms for these increasingly larger structures.

Chemicals → Cellular → Tissue → Organ → organ system → Organism

4. Circle the term that does not belong in each of the following groupings.

1. Electron, Cell, Tissue, Alive, Organ

2. Brain, Stomach, Heart, Liver, Epithelium

3. Epithelium, Heart, Muscle tissue, Nervous tissue, Connective tissue

4. Human, Digestive system, Horse, Pine tree, Amoeba

5. Using the key choices, identify the organ systems to which the following organs or functions belong. Insert the correct letter or term in the answer blanks.

Key Choices

~~A. Cardiovascular~~

~~D. Integumentary~~

G. Nervous

~~Skeletal~~

~~B. Digestive~~

E. Lymphatic/Immune

~~H. Reproductive~~

~~Urinary~~

~~C. Endocrine~~

~~F. Muscular~~

~~I. Respiratory~~

- | | |
|----------|---|
| <u>K</u> | 1. Rids the body of nitrogen-containing wastes |
| <u>L</u> | 2. Is affected by the removal of the thyroid gland |
| <u>J</u> | 3. Provides support and levers on which the muscular system can act |
| <u>A</u> | 4. Includes the heart |
| <u>D</u> | 5. Protects underlying organs from drying out and mechanical damage |
| <u>E</u> | 6. Protects the body; destroys bacteria and tumor cells |
| <u>B</u> | 7. Breaks down foodstuffs into small particles that can be absorbed |
| <u>I</u> | 8. Removes carbon dioxide from the blood |
| <u>A</u> | 9. Delivers oxygen and nutrients to the body tissues |
| <u>F</u> | 10. Moves the limbs; allows facial expression |
| <u>K</u> | 11. Conserves body water or eliminates excesses |
| <u>H</u> | 12. Provides for conception and childbearing |
| <u>C</u> | 13. Controls the body with chemicals called hormones |
| <u>D</u> | 14. Is damaged when you cut your finger or get a severe sunburn |

6. Using the key choices from Exercise 5, choose the organ system to which each of the following sets of organs belongs. Enter the correct letter or term in the answer blanks.

- | | |
|----------|---|
| <u>A</u> | 1. Blood vessels, heart |
| <u>C</u> | 2. Pancreas, pituitary, adrenal glands |
| <u>K</u> | 3. Kidneys, bladder, ureters |
| <u>H</u> | 4. Testis, vas deferens, urethra |
| <u>B</u> | 5. Esophagus, large intestine, rectum |
| <u>J</u> | 6. Breast bone, vertebral column, skull |
| <u>G</u> | 7. Brain, nerves, sensory receptors |

7. Figures 1-1 to 1-6, on pages 4-6, represent the various body organ systems. First identify and name each organ system by labeling the organ system under each illustration. Then select a different color for each organ and use it to color the coding circles and corresponding structures in the illustrations.

MAINTAINING LIFE

8. Match the terms pertaining to functional characteristics of organisms in Column B with the appropriate descriptions in Column A. Fill in the answer blanks with the appropriate letter or term.

Column A		Column B
<u>D</u>	1. Keeps the body's internal environment distinct from the external environment	A. Digestion
<u>C</u>	2. Provides new cells for growth and repair	B. Excretion
<u>A</u>	3. Occurs when constructive activities occur at a faster rate than destructive activities	C. Growth
<u>B</u>	4. The tuna sandwich you have just eaten is broken down to its chemical building blocks	D. Maintenance of boundaries
<u>G</u>	5. Elimination of carbon dioxide by the lungs and elimination of nitrogenous wastes by the kidneys	E. Metabolism
<u>F</u>	6. Ability to react to stimuli; a major role of the nervous system	F. Movement
	7. Walking, throwing a ball, riding a bicycle	G. Responsiveness
	8. All chemical reactions occurring in the body	H. Reproduction
	9. At the cellular level, membranes; for the whole organism, the skin	

9. Using the key choices, correctly identify the survival needs that correspond to the following descriptions. Insert the correct letter or term in the answer blanks.

Key Choices

~~A. Appropriate body temperature~~

~~C. Nutrients~~

~~E. Water~~

~~B. Atmospheric pressure~~

~~D. Oxygen~~

<u>C</u>	1. Includes carbohydrates, proteins, fats, and minerals
<u>D</u>	2. Essential for normal operation of the respiratory system and breathing
<u>E</u>	3. Single substance accounting for more than 60% of body weight
<u>C</u>	4. Required for the release of energy from foodstuffs
<u>E</u>	5. Provides the basis for body fluids of all types
<u>A</u>	6. When too high or too low, physiological activities cease, primarily because molecules are destroyed or become nonfunctional

Anatomy & Physiology Coloring Workbook

14. Select the key choices that identify the following body parts or areas.
Enter the appropriate letter or corresponding term in the answer blanks.

Key Choices

- | | | | |
|---------------------------|------------------------|-------------------------|-------------------------|
| A. Abdominal | F. Buccal | I. Inguinal | M. Pubic |
| B. Antecubital | F. Cervical | J. Lumbar | N. Scapular |
| C. Axillary | G. Femoral | K. Occipital | O. Sural |
| D. Brachial | H. Gluteal | L. Popliteal | P. Umbilical |

- | | |
|------------|---------------------------------|
| <u>C</u> | 1. Armpit |
| <u>G</u> | 2. Thigh region |
| <u>H</u> | 3. Buttock area |
| <u>F</u> | 4. Neck region |
| <u>P</u> | 5. "Belly button" area |
| <u>M</u> | 6. Genital area |
| <u>A B</u> | 7. Anterior aspect of elbow |
| <u>K</u> | 8. Posterior aspect of head |
| | 9. Area where trunk meets thigh |
| <u>J</u> | 10. Back area from ribs to hips |
| <u>E</u> | 11. Pertaining to the cheek |

15. Using the key terms from Exercise 14, correctly label all body areas indicated with leader lines on Figure 1-8.

In addition, identify the sections labeled A and B in the figure.

Section A: _____

Section B: _____

16. From the key choices, select the body cavities where the following surgical procedures would occur. Insert the correct letter or term in the answer blanks. Be precise. Also select the name of the cavity subdivision if appropriate.

Key Choices

~~A~~ Abdominal 1 C. Dorsal E. Spinal 4 G. Ventral

~~B~~ Cranial 2 ~~D~~ Pelvic 3 ~~F~~ Thoracic 5

- D 1. Removal of the uterus, or womb
F 2. Coronary bypass surgery (heart surgery)
B 3. Removal of a serious brain tumor
A 4. Removal of a "hot" appendix
A 5. A stomach ulcer operation

17. Complete the following statements by choosing an anatomical term from the key choices. Enter the appropriate letter or term in the answer blanks.

Key Choices

~~A~~ Anterior ~~D~~ Inferior ~~G~~ Posterior ~~J~~ Superior
~~B~~ Distal ~~E~~ Lateral ~~H~~ Proximal ~~K~~ Transverse

~~C~~ Frontal ~~A~~ ~~F~~ Medial

- G 1.
J 2.
F 3.
E 4.
A 5.
F 6.
H 7.
B 8.
G 9.
J 10.
J 11.

In the anatomical position, the face and palms are on the (1) body surface, the buttocks and shoulder blades are on the (2) body surface, and the top of the head is the most (3) part of the body. The ears are (4) to the shoulders and (5) to the nose. The heart is (6) to the spine and (7) to the lungs. The elbow is (8) to the fingers but (9) to the shoulder. In humans, the dorsal surface can also be called the (10) surface; however, in four-legged animals, the dorsal surface is the (11) surface.