

Chapter One Study Guide Answers

- I. Aids to Understanding Words
 - Append – to hang something
 - Cardi – heart
 - Cran – helmet – pertaining to the part of the skull that surrounds the brain.
 - Dors – back
 - Homeo – same
 - logy - study of
 - meta – change
 - pariet – wall
 - pelv – basin
 - peri – around
 - pleur – rib
 - stasis – standing still
 - tomy – cutting

- II. Introduction
 - A. Ancient healers began their study of the human body as illness and injury interrupted individual's ability to function. In a world in which survival depended upon one's ability to provide food and shelter in an ongoing basis, return to normal function was imperative.
 - B. Science began when people began to believe that understanding and controlling natural events was possible. They began to move away from a passive stance in beliefs that magical or supernatural forces controlled their world and began careful observation of the world around them, asking questions such as what if I did x and seeking answers to such questions.

- III. Anatomy and Physiology
 - A. Anatomy (structure) is related to Physiology (function). A good example is the fingers of the hand. The function of the hand is to grasp and manipulate objects of various sizes. The fingers have three joints including the phalangeal metacarpal joint which allow flexion and extension. This allows the fingers to wrap around an object to grasp it. The thumb also has three joints including the phalangeal metacarpal joint. The joints of the thumb allow rotation as well as flexion and extension. This permits the thumb to oppose the other four fingers allowing a pincer grasp.
 - B. New discoveries are more likely in anatomy than in physiology. Knowledge of anatomy began with observation of the body parts whereas development of a science of physiology was more dependent

on such disciplines as chemistry, biochemistry and molecular science this required more sophisticated techniques of observation to be developed.

IV. Levels of organization

Arrange the following structures in increasing levels of complexity: atoms, molecules, macromolecules, organelles, cells, tissues, organs, organ systems, organism.

V. Characteristics of Life

A. Movement – Change in the position of the body or of a body part; motion of an internal organ.

Responsiveness – Reaction to a change taking place inside or outside the body.

Growth – Increase in body size without change in shape.

Reproduction – to produce new organisms and cells.

Respiration – to obtain oxygen, to remove carbon dioxide, and to release energy from foods.

Digestion – to break down food substances into simpler forms that can be absorbed and used.

Absorption – to move substances through membranes and into body fluids.

Circulation – to move substances from place to place in body fluids.

Assimilation – to change absorbed substances into chemically different forms.

Excretion – remove wastes produced by metabolic reactions.

B. Metabolism is the sum total of chemical reactions in the body. This includes reactions that break down substances (catabolism) and those that build substances (anabolism). These metabolic reactions supply the energy needed to carry on life processes.

VI. Maintenance of Life

A. 1. a

2. e

3. d

4. b

5. c

B. Vital signs, temperature, pulse, respiration, and blood pressure, indicate that a person is alive. They are the observable result of various metabolic functions.

C. Homeostasis

1. Homeostasis is the maintenance of a stable internal environment. This stability is vital for cellular function. This stability depends on receptors that provide information about the internal environment, a set point that is the value to be maintained, and effectors that produce the changes necessary to maintain the set point value.

2. The set point for body temperature is 37°C or 98.6° F. If that temperature falls, as it will in a cold environment, body heat is lost, receptors sense the drop in temperature from the set point, metabolic processes are increased, more heat is produced, the temperature is returned to the set point. When the body temperature increases from the set point, receptors sense the change and stimulate effectors to increase vasodilation, more heat is lost, and the temperature falls. In addition, sweat glands are stimulated to produce sweat, and the evaporation of the sweat from the body surface causes an additional fall in temperature.
3. In a negative feedback system, the deviation from the set point causes a response which leads to a return to the set point. A positive feed back system causes the deviation to increase. An example is milk production in which a loss of milk to a nursing infant leads to an increase in milk production. Negative feedback systems are more common in normal human physiology.

VII. Organization of the Human Body

- A. The axial portion of the body contains the cranial portion containing the skull, the vertebral cavity containing the spinal cord and vertebrae, the thoracic cavity and the abdominopelvic cavity which contain viscera or organs.
- B.
 1. The thoracic cavity contains the mediastinum that divides the cavity into right and left cavities in which the right and left lungs are located. The mediastinum contains the heart, esophagus, trachea and thymus gland. The thoracic cavity is separated from the abdominal cavity by the diaphragm.
 2. The abdominopelvic cavity has an upper abdominal cavity and a lower pelvic cavity. The viscera of the abdomen are the stomach, liver, gallbladder, kidneys, and most of the small and large intestine. The pelvic cavity contains the terminal portion of the large intestine, the internal reproductive organs, and the urinary bladder. It is enclosed by the hipbones.
- C. The smaller cavities of the body are the oral cavity, nasal cavity, orbital cavities, and the middle ear cavities.
- D.
 1.
 - a. parietal pleura
 - b. visceral pleura
 - c. The pleural membrane covers the surface of the lung and then folds back to cover the inner surface of the thorax. This space is a potential space and contains a thin layer of fluid which can increase in such pathologic conditions as pleurisy.
 2. The pericardial membranes cover the heart. The thin membrane covering the surface of the heart is the visceral pericardium and is

separated from the thicker parietal pericardium by a thin layer of fluid.

3. Parietal peritoneum, visceral peritoneum

E. Structure and function of organ systems

Function	Organ system	Functions
Support & movement	Skeletal system Muscular system	Bones support and move body parts, ligaments and tendons bind bones together and bind muscles to bone, store inorganic salts, manufacture, blood cells. Cause movement, main source of body heat.
Integration & coordination	Nervous system Endocrine system	Conduct impulses that sense changes in the internal and external environment and respond to changes. Secrete chemical messengers called hormones that alter the metabolism of target cells.
Transport	Cardiovascular system Lymphatic system	Includes heart and blood vessels that carry materials to and from cells. Consists of lymph vessels, lymph nodes, thymus gland and spleen that help protect the body from pathogens.
Absorption and Excretion	Digestive system Respiratory system	Break down molecules of food into simpler forms and excrete materials that are not used. Includes the mouth, esophagus, stomach, pancreas, liver, gallbladder, small and large intestines. Consists of lungs and respiratory passages, nose and pharynx. Exchange of gasses

	Urinary system	takes place in this system Includes Kidneys ureters, urethra and bladder. Removes nitrogenous wastes among other things and maintains fluid and electrolyte balances.
Reproduction	Organs of the male and female reproductive systems.	Male – scrotum testes, epididymides, vasa deferentia, seminal vesicles, prostate gland, bulbourethral glands, penis and urethra. Female reproductive system consists of ovaries, uterine tubes, uterus, vagina, clitoris and vulva. The system is responsible for reproduction of the species.

VIII. Anatomical Terminology
Drawing to label.

1. Superior
2. Proximal, superior
3. Medial, superior
4. Distal, inferior
5. Lateral, inferior
6. Inferior