

# Bio study guide questions assignment



**ASSIGN  
BUSTER**

In class your group will be asked to answer the following question: The regulatory mechanisms that an organism uses result from an evolutionary process. Some organisms regulate their internal body temperature, and others do not. Make two suggestions as to what the “ evolutionary advantage” might be for each of these two, quite different, lifestyles.

Why this Material? Each of the living organisms on the planet Earth has evolved a distinctive body form (morphology) at a variety of levels: cellular, tissue, organ, whole animal. Yet we never should forget that it is the actual functioning of living matter at these levels that is at the heart of living processes. Thus, it is not possible to separate the analysis of an organism's structure from the functions that those structures carry out. And of course, evolutionary forces work on both structure and function.

In this section we will look at common themes that we find in the structure-function relationships found in animals. Given the short evolutionary times (relative to the age of life on the planet) and the fact that all living things can be traced back to common ancestors, it will not be surprising that the arrangement and functioning of living systems is very similar in most animals. This section will also give us the opportunity to understand the control mechanisms necessary to maintain life and how organisms interact with their surroundings.

While we will focus on animals, you might keep in mind how these principles and ideas will relate to the other large group of multicellular organisms - the plants. We will have a chance to look at those more closely in a few weeks.

Learning Objectives: Upon completion of this learning guide, you should be

able to: 1. Describe relationship between structure and function in an animal.

Anatomy - study of the form of an organism's structures  
Physiology - study of the functions of those structures 2.

Be able to define the terms: tissue, organ, and organ system and understand the hierarchy of animal structure. Tissue - an integrated group of similar cells that perform a common function and structure Organ - made up of two or more types of tissues that together perform a specific task Organ system - consists of multiple organs that together perform a vital body function 3.

Know the major organ systems in the animal by being able to describe its function and the primary organs that make it up. 1) circulatory - delivers O<sub>2</sub>, nutrients to cells, transports CO<sub>2</sub> to lungs & metabolic wastes to kidneys 2)

respiratory - exchanges gases w/ environment, supplies blood w/ O<sub>2</sub> & disposing of CO<sub>2</sub> 3) integumentary - protect body against physical injury,

infection, excessive heat/cold, & drying out 4) Skeletal - supports body, protects organs, provides framework for muscles to produce movements 5)

Urinary- removes waste products from blood and urine; regulates chemical makeup, pH and water balance of blood 6) Digestive - ingests and digests

food, absorbs nutrients, and eliminates undigested material 7) Endocrine - secretes hormones that regulate activities of body, maintains homeostasis 8)

Lymphatic system returns excess body fluid to circulatory and functions as part of immune system 9) Immune - defends your body against infections

and cancer 10) Nervous- coordinates your body's activities by detecting stimuli, integrating information and directing the body's responses 11)

Reproductive - produces gametes and sex hormones. Female system supports a developing embryo and produces milk 4. Understand why an

organism must have organ systems which allow for exchange with the environment, and give several examples of this at the cellular level. Complex animals have specialized internal structures that increase surface area. The blood helps maintain the proper balance of materials in the interstitial fluid surrounding body cells. Example: digestive, respiratory, urinary and circulatory systems. 5. Explain what is meant by the term “homeostasis” and the mechanisms that organisms use to maintain this state.

Homeostasis – “a steady state” Homeostasis mechanisms regulate internal conditions, resulting in much smaller changes in the animal’s internal environment. Homeostasis depends on negative feedback: Control systems detect change and direct responses. Negative-feedback mechanisms keep internal variables fairly constant, with small fluctuations around set points. 6. Understand the meaning and use of the following terms or ideas: CT – computed tomography (x-ray) PET – Positron-emission tomography (glucose) MRI – Magnetic Resonance Imaging (hydrogen atoms) Interstitial fluid – solution that body cells are bathed with; exchange takes place through this fluid