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Animal systems biology worksheet

A system is a group of organs that work together and provide an organism with an advantage for survival. It is the most complex organization of your body and the final level of progression from cells to tissues to organs and then systems. The systems work alone and with other systems to allow your body to maintain homeostasis. Homeostasis is a stable internal environment that allows you (and your cells) to survive. While each of your systems is needed to survive, your nervous system is the most important as you continue to read this page. Your eyes and brain are reading these words and remembering all the information about the systems. If you think about it, you're also using your muscle system to help move your eyes, pupils and keep your head up. The organs that work together the organs are part of every system. Your heart is classified as an organ and is part of the circulatory system. Organs can work within different systems of your body. Many organs also have specific cells or tissues that have different functions. Your kidneys are not just a part of your excretory system; they also have specific parts that serve the endocrine system. You, and many advanced mammals, have similar organs and systems. However, there is a wide variety of types of organs found throughout the animal kingdom. Some aquatic animals have organs that remove salts from salt water, and an animal like a cow may have more stomachs in the digestive system. Systems Can't Work Alone We just explained how organs

could be part of different systems. Similarly, systems rarely work alone. All systems of an organism are interconnected. A simple example is the connection between the circulatory and respiratory systems. As blood circulates through your body, it eventually needs fresh oxygen (O2) from the air. When the blood reaches the lungs, part of the respiratory system, the blood is oxygenated again. The stomach, part of the digestive system, constantly interacts with the endocrine system and spreads hormones throughout the body. Examples of systems It is easy to point out some in your body. The two you think the most are probably your respiratory and digestive system. A couple of times a day you may be hungry, sit back and eat well. All that food is broken down into your digestive system so that your body has energy to survive. The stuff your body doesn't need popped up on the other side. Since you breathe all the time, the respiratory system is always at work. You breathe in and out of your nose and mouth while the lungs are the main organs that allow the body to absorb the oxygen you need from the air. There many other systems in your body and systems specialized in other animals around the world. Homeostasis of cells, tissues, organs and nerves (NASA SciFiles Video) | The internal environment | Control systems | Feedback feedback systems Body systems for homeostasis and homeostasis | Connections Animal organs are usually composed of more than one cell type. The organs perform a certain function. Most organs have functions in a single organ system. Organ systems are composed of organs and play an important role for the organism. Homeostasis | Back to Top Homeostasis is the maintenance of a stable indoor environment. Homeostasis is a term conicted in 1959 to describe the physical and chemical parameters that an organism must maintain in order to allow the proper functioning of its cells components, tissues, organs and organ systems. Single-celled organisms are surrounded by their external environment. Most multicellular organisms have most of their cells protected from the external environment, having surrounded them by an aqueous indoor environment. This internal environment must be maintained in a state that allows maximum efficiency. The final control of homeostasis is done by the nervous system. Often this control is in the form of negative feedback loops. Heat control is one of the main functions of homeostatic conditions that involves the integration of skin, muscle, nerve and circulatory systems. Multicellular organisms have a number of organs and organ systems that work in homeostasis. Changes in the external environment can trigger changes in the internal environment as a response. The internal environment | Back to Top There are two tyeps of extracellular fluids in animals: the extracellular fluid surrounding and wetting cell plasma, the liquid component of blood. Internal components of homeostasis: Concentration of oxygen and carbon dioxide pH of the internal environment Concentration of nutrients and waste products Concentration of salt and other electrolytes Volume and pressure of extracellular fluid control systems | Back to Top Open systems are linear and have no feedback, such as a light switch. Closed Systems has two components: a sensor and an effector, such as a thermostat (sensor) and an oven (effector). Most physiological systems in the body use feedback to maintain the body's internal environment. Most homeostatic systems are extrinsic: they are controlled from outside the body. The endocrine and nervous system are the main control systems in higher animals. The nervous system depends on sensors in the skin or sensory organs to receive stimuli and transmit a message to the spinal cord or brain. Sensory input is processed and a signal is sent to a system of effectors, such as muscles or glands, which effects the response to the stimulus. The endocrine system is the second type of extrinsic control and involves a of the reflection. Sensors detect a change within the body and send a message to an endocrine effector (parathyroid), which produces PTH. PTH is released into the blood when blood calcium levels are low. PTH causes bone to release calcium calcium increasing blood calcium levels and closing PTH production. Some reflexes have a combination of nerve and endocrine response. The thyroid gland dies thyroxine (which controls metabolic rate) in the bloodstream. The decrease in thyroxine levels stimulates receptors in the brain to signal the hypothalamus to release a hormone that acts on the pituitary gland to release stimulating thyroid hormone (TSH) into the blood. TSH acts on the thyroid gland, causing it to increase thyroxine production. Local or intrinsic controls usually involve only one organ or tissue. When muscles use more oxygen and also produce more carbon dioxide, intrinsic controls cause blood vessels to dilation allowing more blood in those active areas of the muscles. Eventually the ships will return to normal. Homeostasis Feedback Systems | Top Negative feedback control mechanisms (used by most body systems) are called negative because the information caused by feedback causes the response to be the opposite. TSH is an example: TSH blood levels act as feedback for TSH production. In some cases, positive feedback control is used. Input increases or accelerates the response. During uterine contractions, oxytocin is produced. Oxytocin causes an increase in the frequency and strength of uterine contractions. This in turn causes further production of oxytocin, etc. Homeostasis depends on the action and interaction of a number of body systems to maintain a number of conditions within which the body can operate at its best. Body systems and homeostasis | Major Top Eleven organ systems are present inside animals, although some animals are missing one or more. The vertebrate body has two cavities: the thoracic, which contains the heart and lungs; and the abdominal, which contains digestive organs. The head, or cephalic region, contains four of the five senses and a brain enclosed in the bone skull. These organ systems can be grouped according to their functions. The above image is changed to . The muscular system allows movement and locomotion. The muscle system produces body movements, body heat, maintains posture and supports the body. Muscle fibers are the main cell type. The action of this system is closely linked to that of the skeletal system. The skeletal system provides support and protection and attachment points for muscles. The skeletal system provides a rigid framework for movement. It supports and protects parts of the body and body, produces blood cells and stores minerals. The skin or integument is the outward protective layer. Prevents loss and the invasion of foreign microorganisms and viruses in the body. There are three layers of the skin. The epidermis is the outer and thinner layer of the skin. Basal cells continuously undergo mitosis. The skin is waterproof because keratin, a protein is The next layer is the dermis a layer of fibrous connective tissue. Inside the dermis there are many structures, such as sweat glands, hair follicles and oily glands. The subcutaneous layer is composed of loose connective tissue. Adipose tissue occurs here, mainly serving for insulation. Nerve cells pass through this region, as well as arteries and veins. The above image is changed to . The respiratory system moves oxygen from the environment outside the internal environment; it also removes carbon dioxide. The respiratory system exchanges gases between the lungs (gills in fish) and the external environment. It also maintains the pH of the blood and facilitates the exchange of carbon dioxide and oxygen. The digestive system digests and absorbs food into nutrient molecules by chemical and mechanical breakage; waste in the environment. Digestion is achieved by mechanical and chemical means, breaking food into particles small enough to pass into the bloodstream. The absorption of food molecules takes place in the small intestine and sends them into the circulatory system. The digestive system also recycles water and recovers vitamins from food in the large intestine. The above image is changed to . The circulatory system carries oxygen, carbon dioxide, nutrients, waste products, immune components and hormones. The main organs include the heart, capillaries, arteries and veins. The lymphatic system also carries excess liquids to and from the circulatory system and transports fat to the heart. Immune System protects the internal environment from invading microorganisms and viruses, as well as the growth of cancer cells. The immune system provides cells that help protect the body from the disease through the antigen/antibody response. A number of general responses are also part of this system. The above image is changed to . The excretory system regulates the volume of internal bodily fluids and eliminates metabolic waste from the indoor environment. The excretory system removes organic waste from the blood, accumulating waste such as urea in the kidneys. This waste is then removed as urine. this system is also responsible for maintaining fluid levels. The above image is changed to . The nervous system coordinates and controls the actions of internal organs and body systems. Memory, learning and conscious thinking are some aspects of the functions of the nervous system. The maintenance of autonomic functions such as heartbeat, breathing, control of involuntary muscle actions is performed from some parts of this The endocrine system works with the nervous system to control the activity of internal organs and coordinate the long-range response to external stimuli. The endocrine system secreting hormones that regulate the body body growth and reproduction. These organs are not in contact with each other, even if they communicate with chemical messages downloaded into the circulatory system. The above images are edited . The reproductive system is mostly controlled by the endocrine system and is responsible for the survival and perpetuation of the species. Elements of the reproductive system produce hormones (from endocrine control) that control and help in sexual development. The organs of this system produce gametes that combine in the female system to produce the next generation (embryo). | Back to Top Organ Systems of the Body A vision related to the health of body organ systems. How the body works A Canadian site with very fresh fig leaves! Homeostasis A collection of links dealing with organ systems and homeostasis. The Atlas of the Human Body An online atlas by the American Medical Association. Take a look at the system of your choice. The virtual body This site presents information about the brain, digestive system, heart and skeleton through the use of a series of shockwave animations®. You will need the plugin to view such animations, but you can access it from the Virtual Body site. Human Anatomy Online This site offers some fun Java-assisted activities on the human body. Human Anatomy and Physiology Case Study Project Learn about human anatomy and physiology by studying real cases. 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