

## AC Human Body Systems Interactions Study Guide

For each comparison, determine the matching level of organization in the human body – cell, tissue, organ, organ system, and organism.

Analogy – U.S. Monetary System	Human Body Level of Organization
1. Penny	Cell
2. Nickel	Tissue
3. Dime	Organ
4. Quarter	Organ System
5. Dollar	Organism

Analogy – Trees	Human Body Level of Organization
1. One tree	Cell
2. Cluster of trees	Tissue
3. Small park	Organ
4. Reserve	Organ System
5. Parks System	Organism

Analogy – Local Government	Human Body Level of Organization
1. voter	Cell
2. community of voters	Tissue
3. mayor's or local official	Organ
4. mayor's office or city government	Organ System
5. local policy making or laws	Organism

### **Human Body System Matching**

1. ___G___ Nervous System	A. The major organs of this system are the lungs. This system allows the body to breathe.
2. ___E___ Integumentary System	B. The major organs of this systems are glands that produce chemicals to help control body functions such as growth and development.
3. ___K___ Digestive System	C. White blood cells in this system fight pathogens (germs).
4. ___J___ Skeletal System	D. The major organs of this system include the tonsils, the spleen, and other lymph nodes that help remove dead pathogens (germs) and other wastes from the body by contracting of skeletal muscles.
5. ___L___ Excretory System	E. The major organ of this system is the skin. This system covers and protects the body.
6. ___D___ Lymphatic System	F. The 3 types of tissue in this system include smooth, striated, and cardiac. This system provide shape, support, and movement for the body.
7. A___ Respiratory System	G. The major organs of this system include the brain and spinal cord. This system controls the body.
8. ___B___ Endocrine System	H. The major organs of this system include the kidneys and the bladder. The kidneys filter the blood and produce urine that is stored in the bladder until the body is ready to release the waste.
9. ___F___ Muscular System	I. The major organs of this system are the heart and the blood vessels. This system provides transportation for nutrients, oxygen, and other substances throughout the body.

10. __I__ Cardiovascular System	J. The human body has 206 bones that help protect the internal organs and a variety of joints that allow movement. This system also produces red blood cells in the marrow of the bones.
11. __H__ Urinary System	K. This system has many organs including the stomach and the intestines. This system is responsible for breaking down food for the body.
12. __C__ Immune System	L. This system consists of 4 other systems that help the body removes wastes. These systems include the integumentary (sweating), respiratory (exhaling carbon dioxide), urinary (releasing urine), and digestive systems (releasing feces).

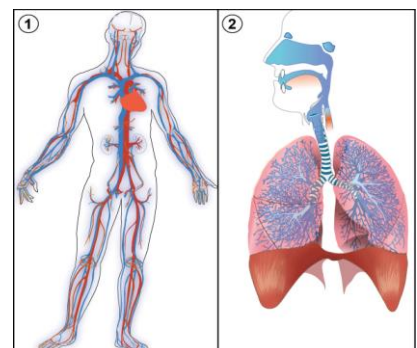
**Systems Interactions**

Action	Which body systems are in use during this action?	How do you know these systems are part of this action?
Brushing your teeth	Skeletal Muscular Nervous Respiration Cardiovascular	Respiratory and cardiovascular systems give you energy to move your muscles; the muscles are moving the bones to lift and maneuver the toothbrush to clean the teeth which are also bones; the nervous system is directing the action using information from the senses (eyes, touch, taste)
Scoring a touchdown	Nervous Cardiovascular Endocrine Skeletal Muscular Respiratory Excretory Integumentary	Nervous receives and interprets stimuli, Respiratory gives cells needed gases for cell processes. Cardiovascular transports needed materials (macromolecules and gases) to cells, Digestive takes those materials (macromolecules) and breaks them down for cells "energy." Integumentary protective covering of body; Endocrine send chemical messages of "happiness", skeletal and muscular aid in movement of materials into digestive system. Excretory works with Integumentary for sweating and removing waste, cooling body for homeostasis.
Typing a paper on your laptop	Nervous Cardiovascular Integumentary Skeletal Muscular Respiratory	Nervous receives and interprets stimuli, Respiratory gives cells needed gases for cell processes. Cardiovascular transports needed materials (macromolecules and gases) to cells, Digestive provided materials cells to use "energy" Integumentary protective covering skeletal and muscular aid in movement of materials into digestive system.
Eating breakfast	Nervous Cardiovascular Digestive Integumentary Endocrine Skeletal Muscular Respiratory	Nervous receives and interprets stimuli, Respiratory gives cells needed gases for cell processes. Cardiovascular transports needed materials (macromolecules and gases) to cells, Digestive takes those materials (macromolecules) and breaks them down for cells to use. Integumentary protective covering of organ (mouth) and body, Endocrine send chemical messages of "happiness", skeletal and muscular aid in movement of materials into digestive system.
Playing the flute	Nervous Cardiovascular Digestive Integumentary Endocrine Skeletal Muscular Respiratory	<b>Nervous</b> receives and interprets stimuli (sound), <b>Respiratory</b> gives cells needed gases for cell processes. <b>Cardiovascular</b> transports needed materials (macromolecules and gases) to cells, <b>Digestive</b> takes those materials (macromolecules) and breaks them down for cells to use. <b>Integumentary</b> protective covering of organs (mouth) and body, Endocrine send chemical messages of "happiness", skeletal and muscular aid in movement of instrument

What 2 systems are pictured in the diagram and how do they work together?

Circulatory and Respiratory system bring oxygen to the body and removes waste

CO<sub>2</sub>, Circulatory distributes and collect both gases to and from cells



1. Define homeostasis- maintain a stable internal condition.

2. When you are running the bases at a baseball game, you are sweating, and you feel thirsty. What body systems are interacting in this case?

**Nervous and Endocrine systems** send signals to react from being becoming overheated; the body needs more water (**endocrine systems** send signal) nervous system feel heat; excretory system releasing water with integumentary system. **Skeletal and muscular system** responding by (running), wiping sweat. Muscular and skeletal get water and add to digestive system, the **circulatory system** delivers water to cells and increase water levels for excretory system to cool skin.

3. How does the body react when the outside temperature gets too hot? (potential answers)

**Nervous system** receives and responds to stimuli by sending signal to both **integumentary and respiratory system**; releasing water to cool skin; Integumentary system; releases heat from pores. **Cardiovascular system** allows arteries to rise to release heat, skeletal and muscular systems fan to reduce heat and wipe sweat

4. How might disruption of the respiratory system affect homeostasis of the body? (potential answers)

Disruption of respiratory will cause a decrease in oxygen levels; which can have a **great impact on all systems**. The “stable internal environment” will be changed by the systems response to lack of essential resource to cells. Cells can die, tissues can die, organ failure or death to the organism. **Circulatory system** can not deliver oxygen effectively to all cells; hinders function **Nervous system** can cause lack of function of all other systems

5. When you burn yourself after touching something hot, you pull your hand away quickly. How do your skeletal, muscular, circulatory, endocrine, and nervous systems interact to make you react and to start healing your burn? (potential answers)

Reaction: **Nervous System** (sensory neurons receive stimuli from the heat); deliver signal to brain and brain sends signal to body to react (motor neurons). **Circulatory system**; reaction (pain) increases blood pressure, heart/circulatory system speed up in response to; sends blood to part of the body (swelling). **Endocrine systems** pituitary gland (master gland) sends chemical signal to adrenal gland for quick reactions. Chemical signal is sent through the **circulatory system**. **Muscular system** gets signal to give response to pain and **skeletal systems** works all systems to provide a response.

Healing: circulatory system delivers blood to the location of injury; platelets help repair and provide protection from wound; Endocrine systems helps provide chemical that help manage pain,