

SC.912. L.14.52 AA	Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.	Moderate
-----------------------------------	--	----------

The immune system is a system of biological structures and processes within an organism that protects against disease. To function properly, an immune system must detect a wide variety of agents, from viruses to parasitic worms, and distinguish them from the organism's own healthy tissue.

Pathogens can rapidly evolve and adapt to avoid detection and neutralization by the immune system. As a result, multiple defense mechanisms have also evolved to recognize and neutralize pathogens. Even simple unicellular organisms such as bacteria possess a rudimentary immune system, in the form of enzymes that protect against bacteriophage infections.

Other basic immune mechanisms evolved in ancient eukaryotes and remain in their modern descendants, such as plants and insects. These mechanisms include phagocytosis, antimicrobial peptides called defensins, and the complement system. Jawed vertebrates, including humans, have even more sophisticated defense mechanisms, including the ability to adapt over time to recognize specific pathogens more efficiently. Adaptive (or acquired) immunity creates immunological memory after an initial response to a specific pathogen, leading to an enhanced response to subsequent encounters with that same pathogen. This process of acquired immunity is the basis of vaccination.

A vaccine is a biological preparation that improves immunity to a particular disease. A vaccine typically contains an agent that resembles a disease-causing microorganism, and is often made from weakened or killed forms of the microbe, its toxins or one of its surface proteins. The agent stimulates the body's immune system to recognize the agent as foreign, destroy it, and "remember" it, so that the immune system can more easily recognize and destroy any of these microorganisms that it later encounters.

An antibacterial is an agent that inhibits bacterial growth or kills bacteria. The term is often used synonymously with the term *antibiotic(s)*. Today, however, with increased knowledge of the causative agents of various infectious diseases, *antibiotic(s)* has come to denote a broader range of antimicrobial compounds, including anti-fungal and other compounds.

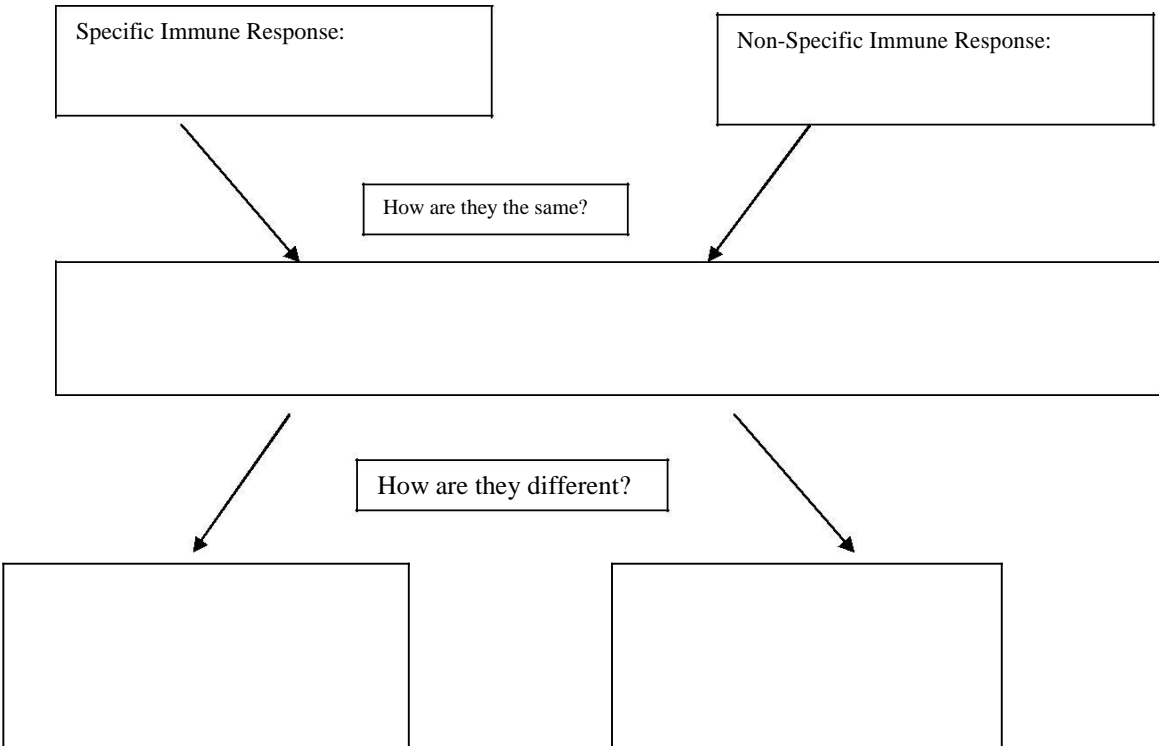
(Source: www.wikipedia.com).

SC.912.L.14.52 AA	Explain the basic functions of the human immune system, including specific and nonspecific immune response, vaccines, and antibiotics.	Moderate
--------------------------	--	----------

1. What is the function of the human immune system?
2. What is the first line of defense against pathogens? Explain how this works.
3. The 3rd line of defense in the human immune system kills and removes pathogens. It consists of six types of white blood cells found in our blood system. In each box describe each type of white blood cell and their function.

White Blood Cell					
------------------	--	--	--	--	--

4. Make a compare contrast chart for —Specific Immune Response and —Non Specific Immune Response. Remember to define the terms at the top in your own words.



5. Describe the basic function of a vaccine. How do they work in the human body?
6. What are antibiotics? How do they work in the human body? What is antibiotic resistance?
7. In the immune system's specific response, white blood cells can target specific types of disease-causing microbes. How do white blood cells recognize invading microbes?
 - A. Receptor proteins on their surfaces bind to specific antigens.
 - B. Helper T cells release antibodies that bind with the antigens.
 - C. Natural killer cells puncture and destroy the infected body cells.
 - D. Plasma cells bind to the viral antigens and mark them for destruction.