GreatHearts®

Life Science 7: The Human Body—Immune System and Nervous System

May 4 – May 8

Time Allotment: 30 minutes per day

Student Name: _____

Teacher Name: _____

Packet Overview

Date	Objective(s)	Page Number
Monday, May 4	1. Explain the differences between infectious and noninfectious disease.	2
Tuesday, May 5	1. Assess the importance of the immune systems' three lines of defense. (**Minor Assessment**)	4
Wednesday, May 6	1. Explain the functions of the nervous system 2. Compare the three types of neurons and how they interact.	7
Thursday, May 7	1. Compare the central nervous system and the peripheral nervous system. 2. Assess the differences between reflexes and instinct.	9
Friday, May 8	1. Compare the central nervous system and the peripheral nervous system. 2. Assess the differences between reflexes and instinct.	10

Additional Notes: Welcome to your seventh week of Life Science distance learning. The calendar has flipped to May and nature's wonders are still plentiful outside. We continue our exploration of the human body and begin our discovery of the body's command center…the nervous system! There are so many mysteries that still are waiting to be discovered about the brain and the nervous system! I encourage you all to attend Zoom sessions, so that we can share in your great thoughts and questions together. Be well, my fine Great-Hearted scholars!

Life Science Zoom Guided Instruction Hours:

2nd Period: Monday & Wednesday, 11:00 am to 11:50 am

3rd Period: Monday & Wednesday, 1:00 pm to 1:50 pm

4th Period: Tuesday & Thursday, 10:00 am to 10:50 am

5th Period: Tuesday & Thursday, 11:00 am to 11:50 am

6th Period: Tuesday & Thursday, 1:00 pm to 1:50 pm

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.

Student signature:

_____

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.

Parent signature:

_____

Life Science 7: Immune System and Nervous System
May 4 – May 8

GreatHearts®

Monday, May 4

- Life Science Unit: Human Body—Immune System and Nervous System
- Lesson 1: Immune System and Noninfectious Disease
- Lesson timeline: **15 minutes** to read pages 476 - 480; **15 minutes** to fill out notes and answer discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Explain the differences between infectious and noninfectious disease.

Lesson 1 Socratic Guiding Question: Keep this question in mind as you study
We could not live without our immune system, but sometimes it causes us problems…allergies! The current medical treatment for allergies is to take a drug with antihistamine. How do you think antihistamines work at the cellular level?

I. Read pages 476 - 480 in your textbook (15 minutes).

II. Notes and discussion questions about textbook reading (15 minutes**)**

1. Noninfectious diseases are diseases that are not spread from _____ to person. (page 476)

2. What are the four types of noninfectious disease that the textbook describes? (page 476)
   a. _____
   b. _____
   c. _____
   d. _____

3. What is the textbook's definition of an allergy? (page 476)
_____

4. Describe the immune system's response to allergens. (page 477)
_____
_____

5. Is asthma an allergic response? Why or why not? (page 477)
_____
_____

6. What is diabetes? (Be sure to include the chemical that the body uses to break down glucose) (page 478)
_____
_____

7. There have been many studies that hypothesize that the cause of Type I Diabetes is a result of the body's immune system attacking the body's own cells. This is called an autoimmune response. In your own words, define what you think an autoimmune response is.
_____

8. What is the definition of cancer? (page 478)

_____
_____

9. Describe at least 3 possible causes of cancer. (page 479)

_____
_____
_____

10. How do cancer cells harm the body? (page 479)

_____
_____

Tuesday, May 5

- Life Science Unit: Human Body—Immune System and Nervous System
- Lesson 2: Immune System Minor Assessment
- Lesson timeline: **10 minutes** to review Study Guide on page 481 in textbook and review notes in packet; **20 minutes** to take minor assessment.

Objective(s): Be able to do this by the end of this lesson.
1. Assess the importance of the immune systems' three lines of defense.

I. Read pages 481 in textbook (5 minutes)

II. Review these notes. (5 minutes**)**

- Infectious diseases are caused by pathogens like bacteria, viruses, fungi, and protists. There is a cure for bacterial infections which involves treatment with antibiotics. Viruses have no cure, and the best method to prevent a viral infection is vaccinations. Vaccines use dead or weakened viruses to trigger the body's immune response.
- What are the connections between Florence Nightingale and Joseph Lister?
- What are the connections between Louis Pasteur and Robert Koch?
- Alexander Fleming discovered Penicillin, the first antibiotic.
- As you know the body has three lines of defense: barriers, the inflammatory response, and the immune system.
- Examples of barriers are your skin, nasal passages (mucus and cilia), and stomach acid. The best way to help this first line of defense is to practice good hand washing, avoid contact with your face, and cover your mouth when you cough or sneeze.
- The second line of defense, the inflammatory response is a general defense against many forms of pathogens. The key to the inflammatory response are the white blood cells called phagocytes. A fever is a byproduct of this response.
- The third line of defense is the immune response. The immune response identifies foreign microorganisms and marks them for destruction. The key cells for the immune response are T and B cells. T cells mark the pathogen and B cells produce chemicals that destroy the marked pathogens. A fever is a byproduct of this response.
- Active Immunity occurs when a person's own immune system produces antibodies. This comes from having gotten sick from the pathogen or through the use of vaccines.
- Passive Immunity occurs when antibodies are received from another source, such as a baby's mother or through transfusion of plasma from someone who already has developed the specific antibodies.
- Understand the difference between infectious and noninfectious disease!

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*****Do not turn to page 5 until you are ready to begin the quiz. By signing the academic integrity statement on page 2 of this packet, you are saying that you completed the quiz on your own and without use of your notes.*****

You have 20 minutes to take this quiz. Please begin and good luck!

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Minor Assessment (Quiz) – Human Body: Immune System, Infectious Disease, and Noninfectious Disease

1. Antibodies are produced by
    a. phagocytes.
    b. B Cells.
    c. T Cells.
    d. pathogens.

2. A chemical that kills bacteria or slows their growth without harming body cells is called a(n)
    a. pathogen.
    b. antibiotic.
    c. allergen.
    d. histamine.

3. A carcinogen causes
    a. cancer.
    b. colds.
    c. allergies.
    d. food poisoning.

4. True or False. Bacteria, viruses, fungi, and protists are the major human phagocytes.

5. True or False. Vaccination produces active immunity.

6. Explain the difference between active and passive immunity. Then describe one way in which a person can acquire each type of immunity. (4 points)

_____
_____
_____
_____

7. Who discovered Penicillin in 1928?
    a. Edward Jenner
    b. Joseph Lister
    c. Robert Koch
    d. Alexander Fleming

8. In your own words, describe in as much detail as possible, how the work of Florence Nightingale helped the work of Joseph Lister. (2 points)

_____
_____

9. _____ is a chemical that is responsible for the symptoms of an allergy, such as sneezing and watery eyes.

a. Histamine
b. Allergen.
c. Antihistamine.
d. Insulin.

10. Why do you think the section of noninfectious disease is included in the chapter about the immune system. In other words, do you feel that the immune system is tied to noninfectious disease? Why or why not? (2 points)

_____
_____
_____
_____

Wednesday, May 6

- Life Science Unit: Human Body—Immune System and Nervous System
- Lesson 3: Nervous System
- Lesson timeline: **15 minutes** to read textbook pages 486 - 490; **15 minutes** to complete notes and discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Explain the functions of the nervous system
2. Compare the three types of neurons and how they interact.

Lesson 3 Socratic Guiding Question: Keep this question in mind as you study!
Remember our discussions about the elephants' brain and the explanation that it isn't overall brain size that is the measure of intelligence in humans or animals, but that it's surface area. Surface area is the key because it creates more space for neurons. After reading about neurons in the textbook, think about the question of why neurons are the key to intellect?

I. Read textbook pages 486 – 490. (15 minutes**)**

II. Fill in notes and answer discussion questions. (15 minutes**)**

1. What are the functions of the nervous system? (page 487)

_____
_____
_____

2. How does the nervous system help to maintain internal conditions? List an example of how the nervous system does this. (page 487)

_____
_____

3. What is another name for a neuron? (page 487)

_____

4. Describe the structure of a neuron (please make sure to include the terms axon and dendrite). (page 488)

_____
_____

5. Why do you think neurons have multiple dendrites but only one axon? (page 488)

_____
_____

6. List the three kinds of neurons found in the human body. (page 488)

_____
_____
_____

7. What is a sensory neuron? (page 488)

_____
_____

8. What is an interneuron? (page 488)

_____
_____

9. What is a motor neuron? (page 488)

_____
_____

10. Which of these three types of neurons is most likely to be found in the brain? Why? (page 489)

_____
_____

11. Describe how nerve impulses travel. (page 490) (Include the following terms: dendrite, axon, synapse, and chemicals.)

_____
_____
_____
_____

Thursday, April 30

- Life Science Unit: Human Body—Immune System and Nervous System
- Lesson 4: Nervous System
- Lesson timeline: **22 minutes** to read pages 492 - 498; **8 minutes** to explore your reaction time.

Objective(s): Be able to do this by the end of this lesson.
1. Compare the central nervous system and the peripheral nervous system.
2. Assess the differences between reflexes and instinct.

Lesson 4 Socratic Guiding Question: Keep this question in mind as you study!
How many different organ systems are involved when you react to a stimulus? For example, in today's observation you are going to catch a ruler that someone drops. What organ systems are involved as you react and catch the ruler?

I. Read pages 492 - 498 in your textbook (22 minutes)

II. Ruler Drop experiment—see page 491 of your textbook (8 minutes)

PURPOSE: Observe reaction time to a stimulus (dropped ruler) and hypothesize the organ systems that are involved in your reaction.

MATERIALS: Ruler or meter stick

METHODS:

1. Have a sibling or family member hold a ruler so that the bottom of the ruler is chest high.
2. Place your open hand at the bottom of the ruler. Watch and be ready to catch the ruler with your thumb and first finger.
3. Partner will drop the ruler without warning.
4. Record the distance that the meter stick fell when you caught it.

OBSERVATIONS:
1. What is the stimulus in this experiment (what are you reacting to)?

_____

2. At what measure of distance did you catch the ruler? (1 inch, 1.5 inches, 2 inches, etc)

_____

3. What variables might interfere with your results?

_____

CONCLUSIONS:
Describe the organ systems that are involved for you to react and catch the ruler.

_____
_____
_____
_____

Friday, May 8

- Life Science Unit: Human Body—Immune System and Nervous System
- Lesson 5: Immune System
- Lesson timeline: **30 minutes** to fill out notes and answer discussion questions from yesterday's reading.

Objective(s): Be able to do this by the end of this lesson.
1. Compare the central nervous system and the peripheral nervous system.
2. Assess the differences between reflexes and instinct.

Lesson 5 Socratic Guiding Question: Keep this question in mind as you study!
We have discussed this in class on numerous occasions, but it's time to revisit it. Are reflexes the same as instincts?

I. Fill in notes and answer discussion questions. (30 minutes)

1. What body parts make up the central nervous system? (page 492)

_____

2. What makes up the peripheral nervous system? (page 492)

_____

3. Why is the central nervous system considered the "control center" of the body? (page 493)

_____
_____

4. If we consider the nervous system to be like a tree, describe the parts of the tree that would correspond to the various body parts (page 493)
   a. Spinal cord: _____
   b. Peripheral nerves: _____
   c. Brain: _____

5. Read and think about this section of the text for 1 minute, "Your brain contains about 100 billion neurons, most of which are interneurons. Each of those neurons may receive impulses from up to 10,000 other neurons and may send impulses to about 1,000 more! (page 493)

6. After reading that text and thinking about, please write down 3 questions and/or thoughts that you had after reading it. (page 493)

_____
_____
_____

7. What functions does the cerebrum perform?

_____
_____

8. (This question is looking for your opinion or hypothesis) Why are certain mental activities associated with the right half of the cerebrum (creativity and art) and others associated with the left half of the cerebrum (math, speech, writing, and logic)?

9. What functions does the cerebellum perform? (page 495)

10. What functions does the brainstem perform? (page 495)

11. What part of the nervous system is the connection between the peripheral nervous system and the brain? (page 495)

12. What is the difference between the somatic and autonomic nervous systems? (page 496)

13. What is a reflex? (page 497)

14. Is a reflex the same as instinct? Why or why not? (Your hypothesis)