GreatHearts®

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

April 27 – May 1

Time Allotment: 30 minutes per day

Student Name: _____

Teacher Name: _____

Life Science 7: Excretory and Immune Systems
April 27 – May 1

GreatHearts®

Packet Overview

Date	Objective(s)	Page Number
Monday, April 27	1. Explain the function of the excretory system. 2. Analyze what chemical analysis of urine can tell us about human health.	2
Tuesday, April 28	1. Assess the functions and relative importance of the respiratory and excretory systems. (**Minor Assessment**)	4
Wednesday, April 29	1. Explain the causes of infection diseases in humans. 2. Assess the history of the scientific fight against microorganisms.	7
Thursday, April 30	1. Assess the body's defenses against pathogens and judge the most effective ways to assist your body in this fight. 2. Describe the body's cellular immune response.	9
Friday, May 1	1. Compare active and passive immunity. 2. Judge the most relevant historical events in fighting infectious disease	11

Additional Notes: Welcome to your sixth week of Life Science distance learning. I encourage you to focus hard this week…there is one month left of school! While I am saddened that we will not gather in our classroom for vigorous discussions, we can all still dive in deeply to the material as a community. I encourage you all to attend Zoom sessions, even if you don't think you have questions about the material…we've had great discussions to augment the material in the packets! 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: Excretory and Immune Systems
April 27 – May 1

Monday, April 27

- Life Science Unit: Human Body—Respiratory and Excretory Systems
- Lesson 1: Excretory System
- Lesson timeline: **10 minutes** to read pages 449 - 451; **20 minutes** to fill out notes and answer discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Identify other organs involved in the excretory system.
2. Assess the importance of water balance and the excretory systems role in this balance.

Lesson 1 Socratic Guiding Question: Keep this question in mind as you study (Yes, it's the same one as last Thursday, but at the end of today's lesson you'll be answering it!)
The respiratory system and digestive systems also remove waste products from the body, so why do we even consider and separately name another organ system called the excretory system?

I. Read pages 449 - 451 in your textbook (10 minutes): Be sure to read the Study Guide on page 451.

II. Notes and discussion questions about textbook reading (20 minutes**)**

1. How does the excretory system maintain homeostasis through the regulation of water? (page 449 and 450)

_____
_____
_____

2. What are the three other organs of excretion that are not in the excretory system? (page 450)
   a. _____
   b. _____
   c. _____

3. Describe why your answer for 2a is considered to be a part of excretion. (page 450)

_____

4. Describe why your answer for 2b is considered to be a part of excretion. (page 450)

_____

5. Describe why your answer for 2c is considered to be a part of excretion. (page 450)

_____

6. If the walls of the capillary cluster in a nephron were damaged or broken, what substances might you expect to find in urine that are not normally present?

_____
_____

7. The respiratory system and digestive systems also remove waste products from the body, so why do we even consider and separately name another organ system called the excretory system?

_____
_____
_____
_____
_____

Tuesday, April 28

- Life Science Unit: Human Body—Respiratory and Excretory System
- Lesson 2: Conclude Respiratory and Excretory System with Minor Assessment
- Lesson timeline: **10 minutes** to review Study Guide on page 451 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. Explain how humans breathe and what other organ systems are directly involved with the respiratory system.
2. Assess how speech is formed and compare speech in humans to communication in elephants.

I. Read pages 451 in textbook (5 minutes)

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

- The respiratory system moves oxygen into the body and specifically into the blood stream through diffusion from alveoli to capillaries (inhalation). In exchange, the respiratory system receives carbon dioxide and excess water from the blood and removes in from the body (exhalation).
- The path of air from outside into the lungs is as follows: Nose, pharynx, trachea, bronchi, and alveoli. Take a moment to think about each of the parts listed and be able to describe how they help the respiration process. For example, the nose contains blood vessels to warm the air that you bring in. It also contains mucus which helps moisten the air and trap potentially harmful things from entering.
- Remember that respiration is not the same thing as breathing. Breathing is part of respiration in that it brings oxygen into the lungs, but respiration includes the exchange of oxygen and glucose at the cellular level. Oxygen and glucose are the fuel for all cell's actions and energy.
- When air passes over the vocal cords, they vibrate to produce sound. Take a moment to think about the difference in vocal cords in making low frequency sound or high frequency sounds.
- The excretory system's primary organs are the kidneys. The filtering processors of the kidneys' are the nephrons. The kidneys remove wastes like urea and excess water and it leaves the body in urine. In addition to removing wastes, the kidneys also regulate water balance in the body, which is an important part of homeostasis.
- Other organs of excretion include the lungs, skin, and liver.

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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: Respiratory and Excretory Systems

1. The process in which glucose and oxygen react in cells to release energy is called
    a. digestion.
    b. respiration.
    c. breathing.
    d. gas exchange.

2. The trachea divides into two tubes called
    a. bronchi.
    b. alveoli.
    c. windpipes.
    d. diaphragms.

3. Explain the difference between breathing and respiration. (2 points)

_____

_____

4. True or False. When the vocal cords relax and become longer, you speak in a lower voice.

5. Why does air rush into your body when you inhale? (2 points)

_____

_____

6. Pick one of the entry ways for air into the body (nose, pharynx, trachea, bronchi, or alveoli) and describe two things that this specific part does to help the respiratory process. (2 points)

_____

_____

7. (**Circle all that apply**.) The following two waste products are normally found in urine:
    a. Water
    b. Glucose
    c. Protein
    d. Urea

8. Name two other organs that perform functions associated with excretion. (2 points)

_____

_____

9. The primary filtering tissues in the kidney are called _____.
    a. nephrons.
    b. ureters.
    c. capillaries.
    d. urea.

10. Several other systems, besides the excretory system, also remove waste products from the body, so why do we even consider and separately name a system called the excretory system? (2 points) (Hint: Think about the organization of the human body—cells, tissues, organs, and organ systems)

_____
_____
_____
_____

Wednesday, April 29

- Life Science Unit: Human Body—Immune System
- Lesson 3: Infectious Disease
- Lesson timeline: **12 minutes** to read textbook pages 456 - 459; **18 minutes** to complete notes and discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Explain the causes of infection diseases in humans.
2. Assess the history of the scientific fight against microorganisms.

Lesson 3 Socratic Guiding Question: Keep this question in mind as you study!
Does understanding more about the causes of infectious disease help explain the things that the Centers for Disease Control and National Institutes of Health are doing to combat the spread of the coronavirus?

I. Read textbook pages 456 – 459. (12 minutes**)**

II. Fill in notes and answer discussion questions. (18 minutes**)**

1. Joseph Lister, a British surgeon, hypothesized that _____ caused the infections that were so common after surgeries in the 1800s. (page 456)

2. Viruses and other microorganisms such as bacteria that cause disease are called _____. (page 457)

3. What does it mean when the textbook describes a disease as "infectious"? (page 457)
_____

4. List the 4 major groups of human pathogens. (page 457)
_____
_____
_____
_____

5. Which of these 4 pathogens is non-living? (page 457)
_____

6. Give an example of a disease caused by each group of pathogens. (page 457)
_____
_____
_____
_____

7. What is the process named after Louis Pasteur? Describe the process. (page 457)
_____
_____

8. List and then describe the ways in which diseases can spread, according to the textbook (page 458 – 459).

_____
_____
_____
_____

9. Describe your hypothesis about something that we can do to help prevent the spread of infectious diseases.

_____
_____

10. Which of the four ways that diseases can spread would be eliminated by your hypothesis?

_____
_____

Thursday, April 30

- Life Science Unit: Human Body—Excretory and Immune Systems
- Lesson 4: Immune System
- Lesson timeline: **15 minutes** to read pages 460 - 466; **15 minutes** to fill out notes and answer discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Assess the body's defenses against pathogens and judge the most effective ways to assist your body in this fight.
2. Describe the body's cellular immune response.

Lesson 4 Socratic Guiding Question: Keep this question in mind as you study!
Many times, when you get sick, you end up with a fever. Why might one consider a fever a good thing?

I. Read pages 460 - 466 in your textbook (15 minutes)

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

1. The body's defense against pathogens comes in two primary forms, the first line of defense are called _____. (page 461)

2. The first line of defense consists of these four parts of your body (page 461):
_____
_____
_____
_____

3. As described in one of the respiratory system lessons, the nose has two important features to trap and remove most of the pathogens that enter the body. These two features are _____ and _____. (page 461)

4. How does the saliva in your mouth help fight pathogens? (page 461)
_____

5. How does your stomach protect you from pathogens? (page 461)
_____

6. Sometimes pathogens manage to get through the first line of defense and enter your cells. The immune system is now activated! The body's second line of defense is the inflammatory response. What is the inflammatory response? (page 464)
_____
_____

7. The kind of white blood cell involved in the inflammatory response are _____. (page 464)

8. In terms of fighting off a pathogen, what is a fever a good thing? (page 464)

_____

9. The body's third line of defense against pathogens is the immune response. Describe it. (page 465)

_____
_____
_____

10. The type of white blood cells involved in the immune response are called _____. There are two kinds of these cells and they are called __ and __ cells. (page 465)

11. T cells identify the _____ of a pathogen, while B Cells produce chemicals called _____, which mark the pathogen for destruction. (page 465 and 466)

Friday, May 1

- Life Science Unit: Human Body—Excretory and Immune Systems
- Lesson 5: Immune System
- Lesson timeline: **15 minutes** to read pages 469 - 473; **15 minutes** to fill out notes and answer discussion questions.

Objective(s): Be able to do this by the end of this lesson.
1. Compare active and passive immunity.
2. Judge the most relevant historical events in fighting infectious disease.

Lesson 5 Socratic Guiding Question: Keep this question in mind as you study!
The famous scientists shown on page 470 to 471 in your textbook all had significant discoveries that helped society fight against diseases. You can view each step along the timeline as a stepping stone, with one discovery paving the way for the next discovery. How can you relate this to Goethe or Holdrege's philosophy on studying animals?

I. Read page 469 – 473 in your textbook. (15 minutes)

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

1. Define immunity (page 469):
_____

2. What is the difference between active immunity and passive immunity? (page 469 and 472)
_____
_____
_____
_____
_____

3. What are at least two ways in which an individual may receive antibodies through passive immunity? (page 471 and 472)
_____
_____

4. How did Florence Nightingale's work help lead to Joseph Lister's achievement? (page 470)
_____
_____

5. How did Louis Pasteur's and Robert Koch's work help lead to Alexander Fleming's achievement? (page 471)
_____
_____

6. What type of pathogen does an antibiotic treat? (page 473) _____

7. Can a virus be cured by medicine? Why or why not? (page 473)

_____

_____

8. Describe at least two prevention methods against viruses.

_____

_____