SUBJECT and GRADE	Life Sciences Grade 11
TERM 3	Week 4
TOPIC	Excretion in humans – excretion in various organs
AIMS OF LESSON	At the end of this lesson you should be able to: • Know the role of the following excretory organs i.e. the lungs, kidneys, bladder, liver, alimentary canal and the skin in excretion • Know the substances excreted by the excretory organs above and the origins of these substances
RESOURCES	***Paper based resources***
	Refer to your textbook section on: • The organs involved in excretion
INTRODUCTION	Refer to the following sections for background information: • the excretory system in Grade 9 • structure of the ventilation system in humans • Cellular respiration
CONCEPTS AND SKILLS	**Below are definitions of some of the terms that you will study under this section. Use your textbook and underline all the new terms/words that you encounter while studying through this section. Use the glossary in your textbook to define these new terms/words** (Note: At least 2 marks are awarded if you can define a term correctly in a test or examination) **Excretion** – The removal of metabolic waste from the body **Metabolism–** all chemical reactions that take place in a cell **Urea** – The metabolic waste product that is formed in the liver from deamination of excess amino acids **<u>Study the content below on:</u>** • the role of the various excretory organs and the • substances excreted by these organs as well as the • origins of these substances:

The necessity for excretion:

- **Excretion is the removal of metabolic waste products from the body.**
- **Metabolism includes all the constructive (anabolic) and destructive (catabolic) chemical processes in the body.**
- **Metabolic waste products include carbon dioxide, water, urea, uric acid etc.**
- **If these metabolic products accumulate, the balance of the body fluids will be disturbed and the waste products will interfere with the functioning of the cells.**
- **In humans the metabolic waste products diffuse out of the cells and move into the blood in the blood vessels.**
- **The waste products are transported in the blood to the excretory organs.**
- **The excretory organs have the ability to remove the waste products from the bloodstream and release them out of the body.**

Study the different excretory organs, the substances that they excrete and the origin of these substances:

Excretory organ	Substances that they excrete	Origin of these substances
Lungs	Carbon dioxide and water vapour are excreted in exhaled air during breathing	• Carbon dioxide if formed as a product of cellular respiration • Excess water is formed as a product of cellular respiration as well as from the intake of fluids and food
Kidneys and bladder	Urine. Urine consists of excess water, mineral salts and nitrogenous waste e.g. urea and uric acid. The bladder temporarily stores the urine that was formed by the kidneys. Urine passes out of the body when we urinate.	• Excess water is formed as a product of cellular respiration as well as from the intake of fluids and food • Urea is formed in the liver from deamination of excess amino acids. The urea is transported by the blood to the kidneys. • Uric acid is the end product of metabolism of nucleic acids
Liver	Bile pigments and urea	• Bile pigments are formed in the liver during breakdown of haemoglobin • Urea is formed in the liver from deamination of excess amino acids. The urea is transported by the blood to the kidneys.

Alimentary canal	Bile pigments	• Bile pigments are formed in the liver during breakdown of haemoglobin. The bile pigments from the liver enters the alimentary canal and are excreted as bile salts in the faeces.
Skin	Sweat. Sweat consists of excess water, salts and a small amount of urea. Sweat is excreted through sweat glands in the skin.	• Excess water is formed as a product of cellular respiration as well as from the intake of fluids and food

Know the meaning of instructional verbs in test and examination questions e.g.

Instructional verb	Meaning
Name	**Give the name of something**
Differentiate	**Use differences to qualify between two or more categories**
Tabulate	**Draw a table and indicate the answers as direct pairs.**
Describe	**State in sentences the main points of a process**
Explain	**Give your answer in a cause-effect or statement and reason sequence**

<u>Answer the following questions:</u>

<u>Question 1</u>

1. The removal of metabolic waste from the body is known as…

A. filtration

B. secretion

C. sweat

D. excretion

<u>Question 2</u>

2. Excessive amino acids are broken down to urea in the …

A. small intestine

B. liver

C. kidneys

D. bladder

	<u>Question 3</u> 3. Where do each of the following substances originate in the body. (a) Carbon dioxide (b) Urea (c) Bile pigments **Common errors made by learners in examinations:** • **Do not understand instructional verb/s in a question e.g. the difference between *describe* and *explain.*** • **Not able to state the substances and origins of these substances excreted by excretory organs.**
ACTIVITIES/ASSESSMENT	• Complete the activities/questions on excretory organs in your textbook.
CONSOLIDATION	• Define all the terminology relevant to the topic/s covered in this lesson **Note:** The knowledge and skills gained in this section will help you to have a better understanding of the following section that you still need to deal with • The urinary system • Homeostatic control of water and salts
VALUES	By studying and learning about the excretion in humans you will understand the importance of maintaining a healthy lifestyle.