Name: .....

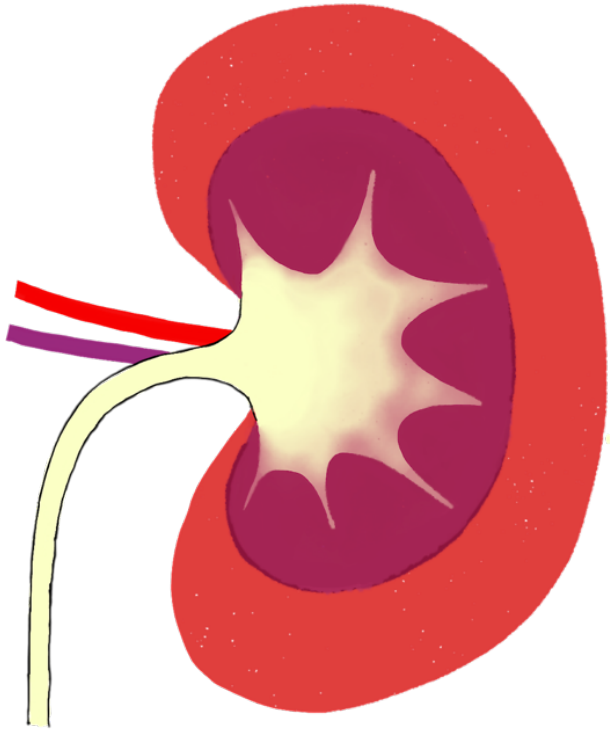
Date: .....

Class: .....

IGCSE BIOLOGY EDEXCEL 9-1

CHAPTER WORKBOOK

Excretion



Excretion in Plants

1. Define excretion.

.....

.....

.....

2. In the table below give the source of excretory products in plants and state how those products are excreted.

Excretory product	Source	How it is excreted
Carbon Dioxide		
Oxygen		

Excretion in Humans

1. Fill in the table below to summarise excretion in humans.

Excretory product	Source	How it is excreted
Carbon Dioxide		
Urea		
		Via sweat from the skin

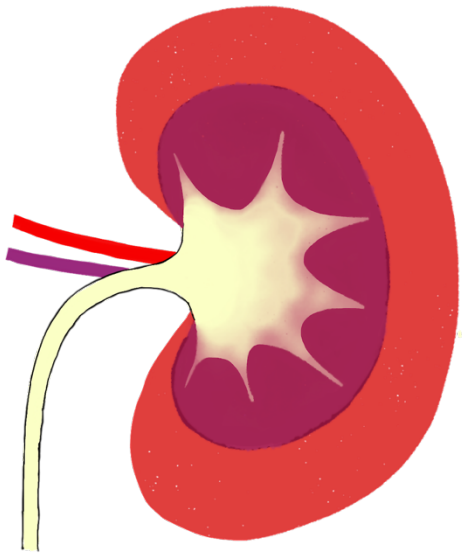
Triple Award

Kidneys and Excretion

1. Draw a labeled diagram of the urinary system including the kidneys, ureters, bladder and urethra.

2. Label the diagram of a kidney cross section using the words in the box. Add arrows to indicate the direction of blood flow.

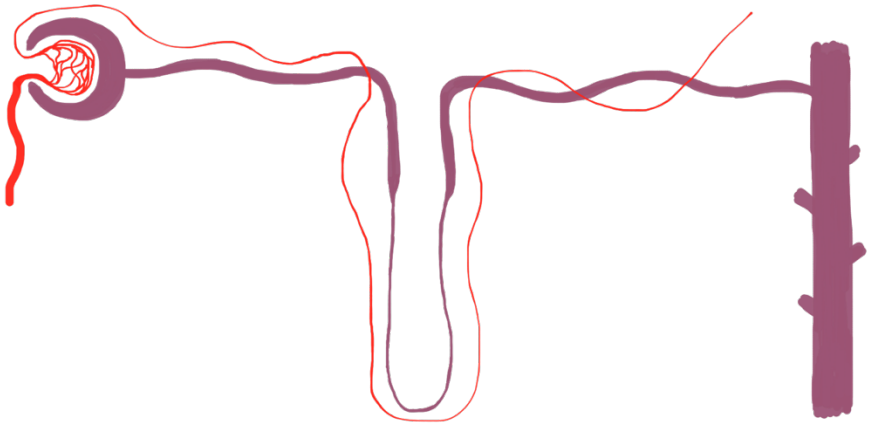
Renal vein	*Renal artery*	*Medulla*
Cortex	*Renal pelvis*	*Ureter*



Triple Award

3. Label the diagram of the nephron using the word/phrases in the box.

Distal convoluted tubule	
Proximal convoluted tubule	*Loop of Henle*
Collecting duct	*Capillary*
Bowman's capsule	*Glomerulus*



4. Materials enter the nephron via the Bowman's capsule. Fill in the spaces using words in the box.

proteins	*ultrafiltration*	*narrower*
blood cells	*glomerular filtrate*	
basement membrane	*filter*	*small*
glomerulus	*pressure*	

Blood flows into a capillary network called the ..... inside the C-shaped cup of the Bowman's capsule. The blood vessel that exits the Bowman's capsule is ..... than the one that enters it. This resists blood flow causing high ..... flow in the glomerulus. Because of the pressure, material from the blood is forced through the capillary wall and into the Bowman's capsule.

Between the blood and the Bowman's capsule are three layers; the capillary wall, the ....., and the Bowman's capsule wall. These layers act as a ..... and only allow ..... materials such as water, mineral ions, glucose, and urea to pass into the Bowman's capsule. Larger things like ..... and ..... cannot pass through and instead remain in the blood flowing through the glomerulus.

The material that passes into the Bowman's capsule is called ..... . This process is known as ..... .

5. Glomerular filtrate that enters the Bowman's capsule moves into the tubule. Some materials are taken from the tubule back into the blood while other materials remain (and may eventually exit the body in urine).

a) Name the process by which some materials (but not others) are taken from the tubule to the blood.

……

b) Name the section of the nephron from which glucose is reabsorbed.

……

c) Name the method of transport by which glucose is transferred from the nephron.

……

d) State why it is important that glucose is reabsorbed.

……

e) Fill in the blanks to state the relative amounts of material present in the tubule by the time the fluid reaches the collecting duct

- Most of the u…….. remains in the filtrate
- A portion of the s…….. i…… remain (a percentage has been reabsorbed, but not all)
- Some of the w…….. remains (a percentage has been reabsorbed, but not all)
- None of the g…….. remains (it has all been reabsorbed)

Triple Award

6. Some water remains in the glomerular filtrate at the collecting duct. Some of this water will exit the body as urine.

Complete the sentences below using words in the box.

decreases	*antidiuretic*	*pituitary*
impermeable		*homeostasis*
negative	*secreting*	*permeable*
osmoregulation		*collecting duct*
	reabsorbed	

Water can exit the ..... and re-enter the blood. The walls of the collecting duct are generally ..... to water unless a hormone called ..... hormone is present. If the amount of water in the blood ....., the ..... gland detects the increased ion concentration of the blood. In response, it releases ADH. ADH causes the collecting duct to become more ..... to water. This increases the amount of water that is ..... into the blood. The pituitary gland detects this change and stops ..... ADH, reducing water reabsorption. This is an example of ..... feedback (where the change, such as a decrease in water level, causes the opposite – an increase in water concentration).

..... (the control of blood water levels) is an example of maintaining a constant internal environment. This is known as ..... .

Triple Award

7. The remaining material in the collecting duct is now referred to as urine.

a) Describe the route through which urine is transferred from the kidney out of the body.

.....

.....

b) Circle **three** materials that are present in urine.

Proteins **White blood cells**

Ions **Glucose** **Urea**

Water **Red blood cells**