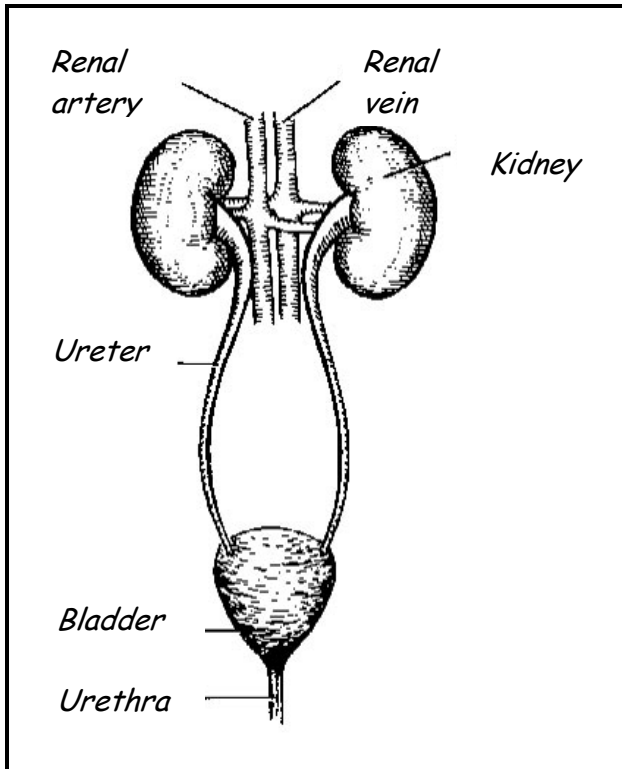
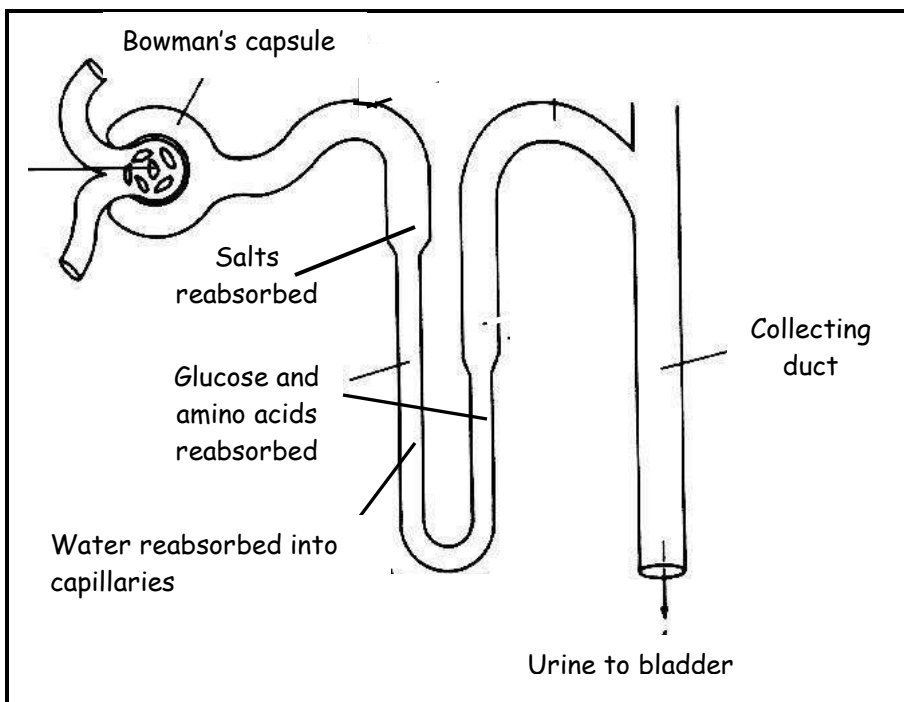


Intermediate 2 Biology - Unit 3: Mammalian Physiology
Chapter 12 - Control of Internal Environment

Human Urinary System



<u>Part of urinary system</u>	<u>Function</u>
Kidney	Filters blood. Glucose and amino acids are reabsorbed back into the bloodstream. Urea, salts and some water are removed from the blood, forming urine.
Renal artery	Carries unfiltered blood to the kidney.
Renal vein	Carries filtered blood back to the heart.
Ureter	Carries urine to the bladder.
Bladder	Stores urine.



Inside the kidney are many tiny filtering units called nephrons.

Nephrons filter the blood by allowing useful substances to be reabsorbed by blood capillaries which will surround the nephron.

Any substances which are not reabsorbed will form urine.

Osmoregulation

The main function of the kidneys is osmoregulation - regulating the water content of the blood. Each day the amount of water we take in should be **equal** to the amount of water we give out. This is summarised in the tables below:

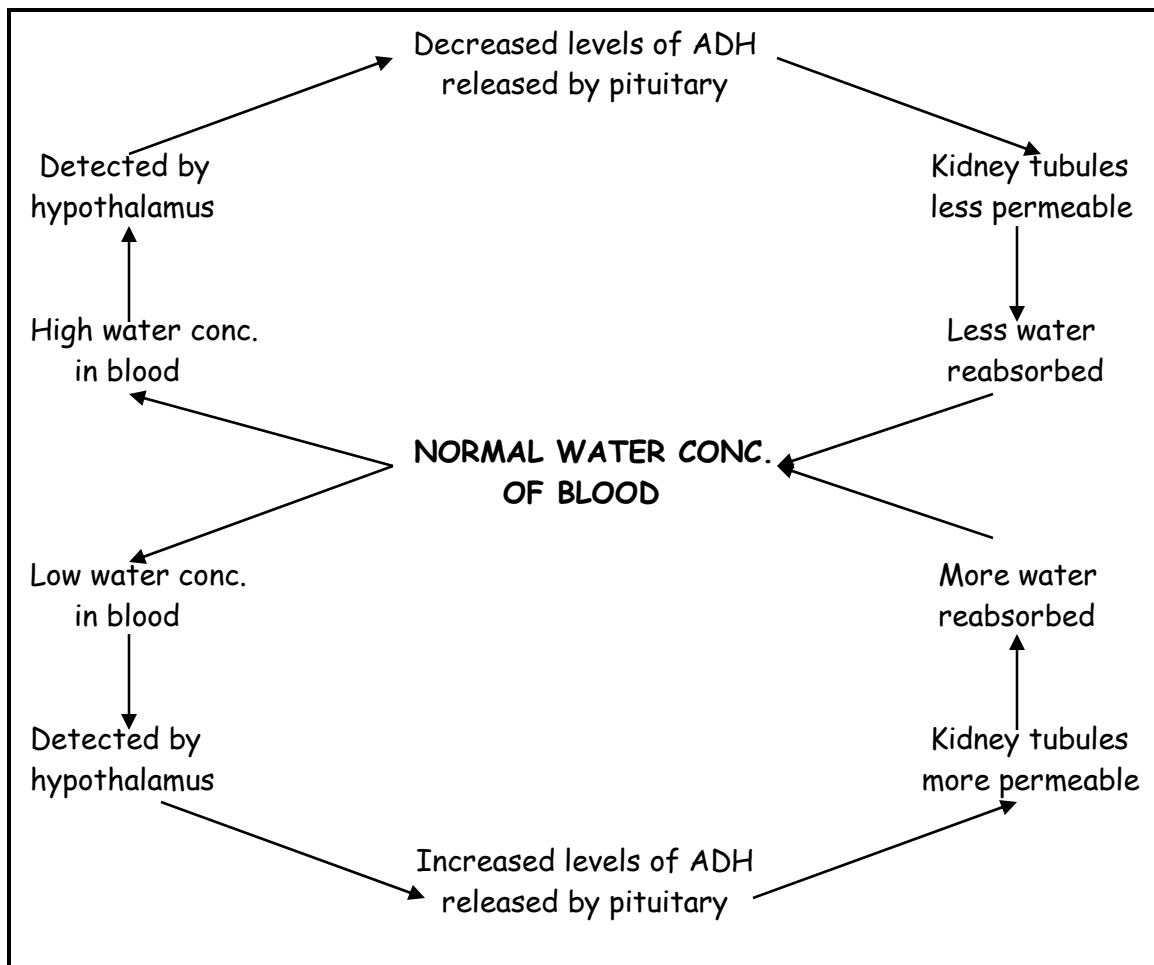
<u>Water gained...</u>	<u>Volume (cm³)</u>
Drinking	700
Eating	800
Chemical reactions	400
TOTAL	1900

<u>Water lost...</u>	<u>Volume (cm³)</u>
Urine	900
Faeces	450
Breathing	200
Sweating	350
TOTAL	1900

REMEMBER -

We can tell that osmoregulation is taking place if the volume of water gained is equal to the volume of water lost.

The volume of water in the blood is regulated by the kidneys by a process called **negative feedback control**. This process is shown below:



Urea

Urea is produced when excess amino acids are broken down in the liver. As urea is toxic it is removed from the blood by the kidneys. Urea, water and salts are the components which make up urine.

Osmoregulation in Fish

Due to fish living in water based environments they have unique problems when it comes to osmoregulation.

Marine (saltwater) fish live in a hypertonic environment. This means that they are constantly losing water by osmosis, whilst gaining a lot of salts. To overcome these problems marine fish drink water and excreting excess salt. They also produce a small volume of concentrated urine.

Freshwater fish live in a hypotonic environment. This means that they are constantly gaining water by osmosis. To overcome this problem they produce large of very dilute urine.

