WJEC Wales Biology GCSE

2.6 (a) to (g) - The Kidney

Flashcards

What is osmoregulation?

What is osmoregulation?

The maintenance of constant water levels in the body fluids of an organism

Why is osmoregulation important? (2)

Why is osmoregulation important? (2)

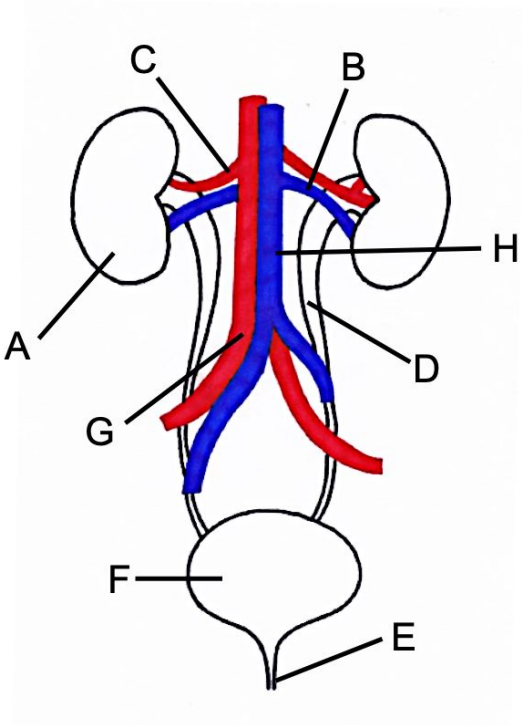
- Prevents cells bursting or shrinking when water enters or leaves by osmosis
- Cellular reactions occur in aqueous solution ∴ water levels affect concentrations and the rate of reactions in cells

Describe the functions of the kidneys

Describe the functions of the kidneys

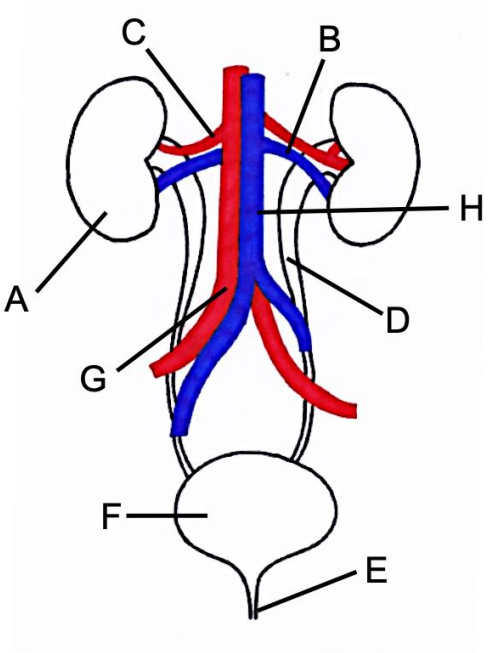
- Removes toxic waste substances from the body
- Maintain the water levels of body fluids
- Control the volume and concentration of urine

Identify the structures of the excretory system labelled in the diagram



Identify the structures of the excretory system labelled in the diagram

A	kidney	**E**	urethra
B	renal vein	**F**	bladder
C	renal artery	**G**	aorta
D	ureter	**H**	vena cava



What is the function of the renal artery?

What is the function of the renal artery?

Supplies blood to the kidneys

What is the function of the renal vein?

What is the function of the renal vein?

Drains blood from the kidneys

What is the function of the ureter?

What is the function of the ureter?

Takes urine to the bladder from the kidneys

What is the function of the urethra?

What is the function of the urethra?

Releases urine from the bladder, out of the body

Describe the structure of the kidneys

Describe the structure of the kidneys

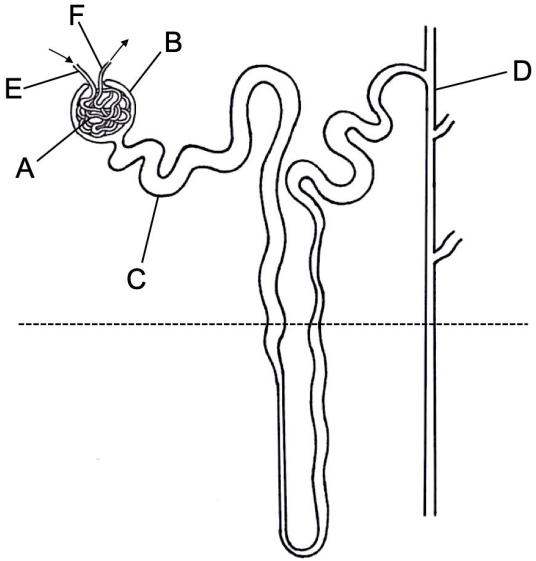
- Outer cortex
- Pelvis (leads to ureter)
- Inner medulla

What is a nephron? (higher)

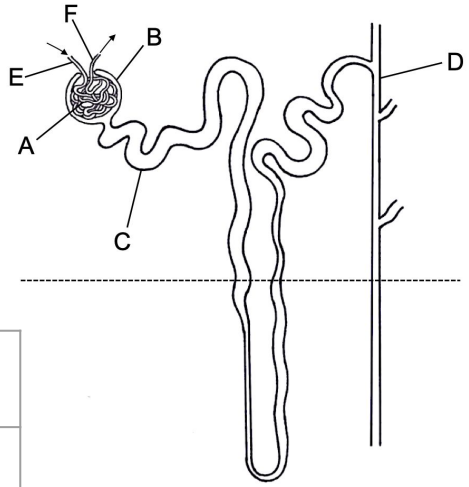
What is a nephron? (higher)

Functional unit of the kidney where filtration and selective reabsorption takes place

Identify the structures of the nephron labelled in the diagram (higher)



Identify the structures of the nephron labelled in the diagram (higher)



A	capillary knot	**D**	collecting duct
B	Bowman's capsule	**E**	Arteriole to capillary knot
C	tubule	**F**	Arteriole from capillary knot

What are the three stages involved in the formation of urine? (higher)

What are the three stages involved in the formation of urine? (higher)

- Filtration
- Selective reabsorption
- Osmoregulation

Describe filtration in the kidneys (higher)

Describe filtration in the kidneys (higher)

- Blood flows through the capillary knot under high pressure
- Small molecules (e.g. urea, glucose), water and salts are filtered out of the blood and into the Bowman's capsule

Why is there a build-up of pressure in the capillary knot? (higher)

Why is there a build-up of pressure in the capillary knot? (higher)

Arteriole leading into the capillary knot is wider than the arteriole taking blood from the capillary knot

Why do large molecules (e.g. RBCs, proteins) remain in the blood? (higher)

Why do large molecules (e.g. RBCs, proteins) remain in the blood? (higher)

They are too large to fit through the pores in the capillary walls

Which substances are selectively reabsorbed from the nephron tubule? (biology only)

Which substances are selectively reabsorbed from the nephron tubule? (biology only)

- All sugars
- Some water
- Some ions

What happens to the molecules not selectively reabsorbed? (biology only)

What happens to the molecules not selectively reabsorbed? (biology only)

They travel down the kidney tubule as urine and are transported to the bladder via the ureter. Here they are stored and eventually excreted.

What is urine?

What is urine?

- Waste product of the kidney
- Contains urea, excess water, excess ions

If blood water levels become too high, the kidney produces more _____ urine

If blood water levels become too high, the kidney produces more _____ urine

Dilute

If blood water levels become too low, the kidney produces more _____ urine

If blood water levels become too low, the kidney produces more _____ urine

Concentrated

How is the concentration and volume of urine controlled? (higher)

How is the concentration and volume of urine controlled? (higher)

Controlled by the secretion of anti-diuretic hormone (ADH)

What produces ADH? (higher)

What produces ADH? (higher)

Pituitary gland

Describe how ADH affects the kidney (higher)

Describe how ADH affects the kidneys (higher)

- ADH causes the kidneys to reabsorb more water into the blood
- More concentrated urine produced

Describe the composition of blood

Describe the composition of blood

Contains:

- Cells
- Proteins
- Water
- Glucose
- Salts
- Urea

Describe the composition of filtrate

Describe the composition of filtrate

Contains:

- Water
- Glucose
- Salts
- Urea

Describe the composition of urine

Describe the composition of urine

Contains:

- Some water
- Some salts
- Urea

What may glucose in the urine indicate?

What may glucose in the urine indicate?

Diabetes

What may blood or cells in the urine indicate?

What may blood or cells in the urine indicate?

Kidney disease