

# Chapter 12: Homeostasis in action

## Knowledge organiser

### Homeostasis

**Homeostasis** is the regulation of \_\_\_\_\_ conditions (of a cell or whole organism) in response to internal and external \_\_\_\_\_, to constantly maintain optimum conditions for functioning.

This maintains \_\_\_\_\_ conditions for all cell functions and enzyme action.

In the human body, this includes control of

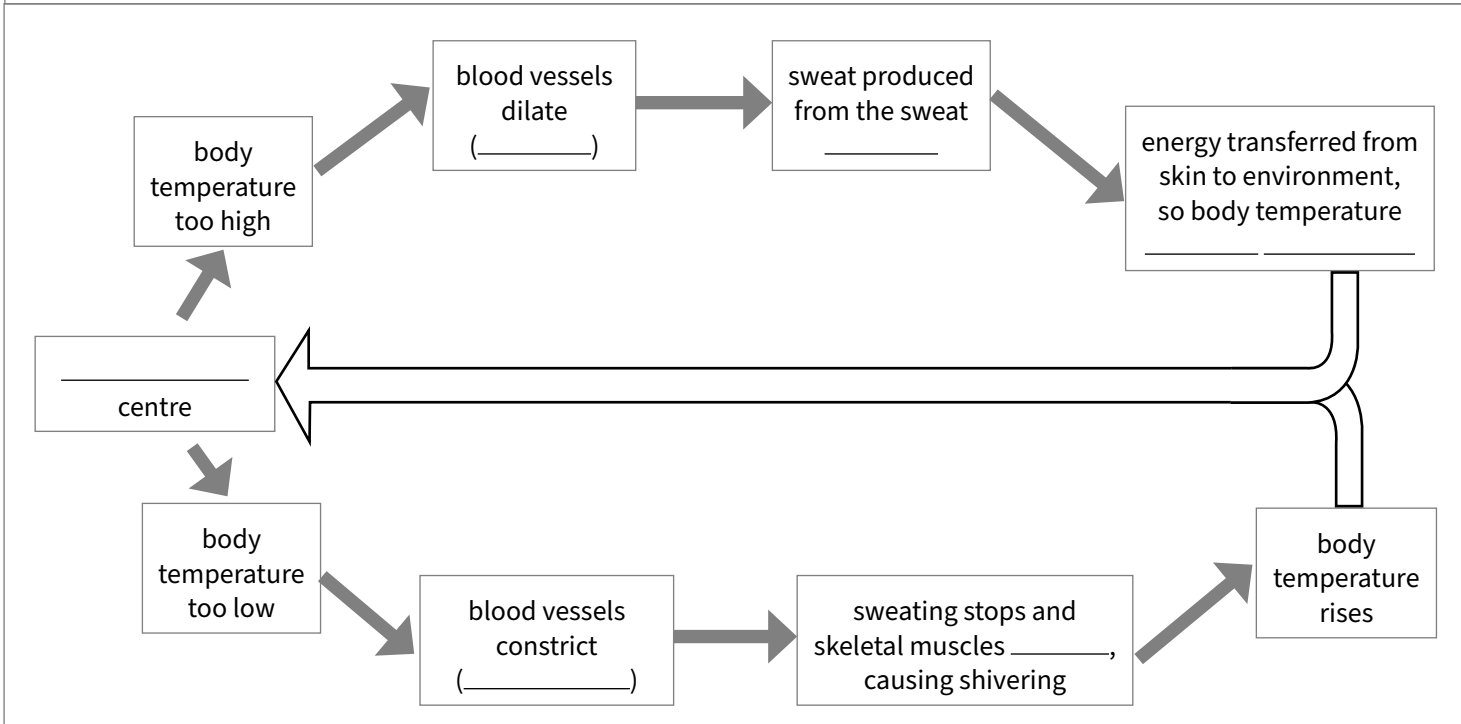
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The automatic control systems of homeostasis may involve nervous responses or chemical responses.

All control systems involve

- \_\_\_\_\_, which detect **stimuli** (changes in the environment)
- \_\_\_\_\_ (such as the brain, spinal cord, and pancreas), which receive and process information from receptors
- \_\_\_\_\_ (muscles or glands), which produce responses to restore optimum conditions.

### Control of body temperature



Body temperature is monitored and controlled by the **thermoregulatory centre** in the \_\_\_\_\_. The centre contains receptors \_\_\_\_\_ to the blood temperature.

The \_\_\_\_\_ also contains temperature receptors and sends nervous impulses to the thermoregulatory centre.

### Maintaining water and nitrogen balance

Water leaves the body through the \_\_\_\_\_ during exhalation, and \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_ are lost from the skin in sweat. The body has no control over these losses.

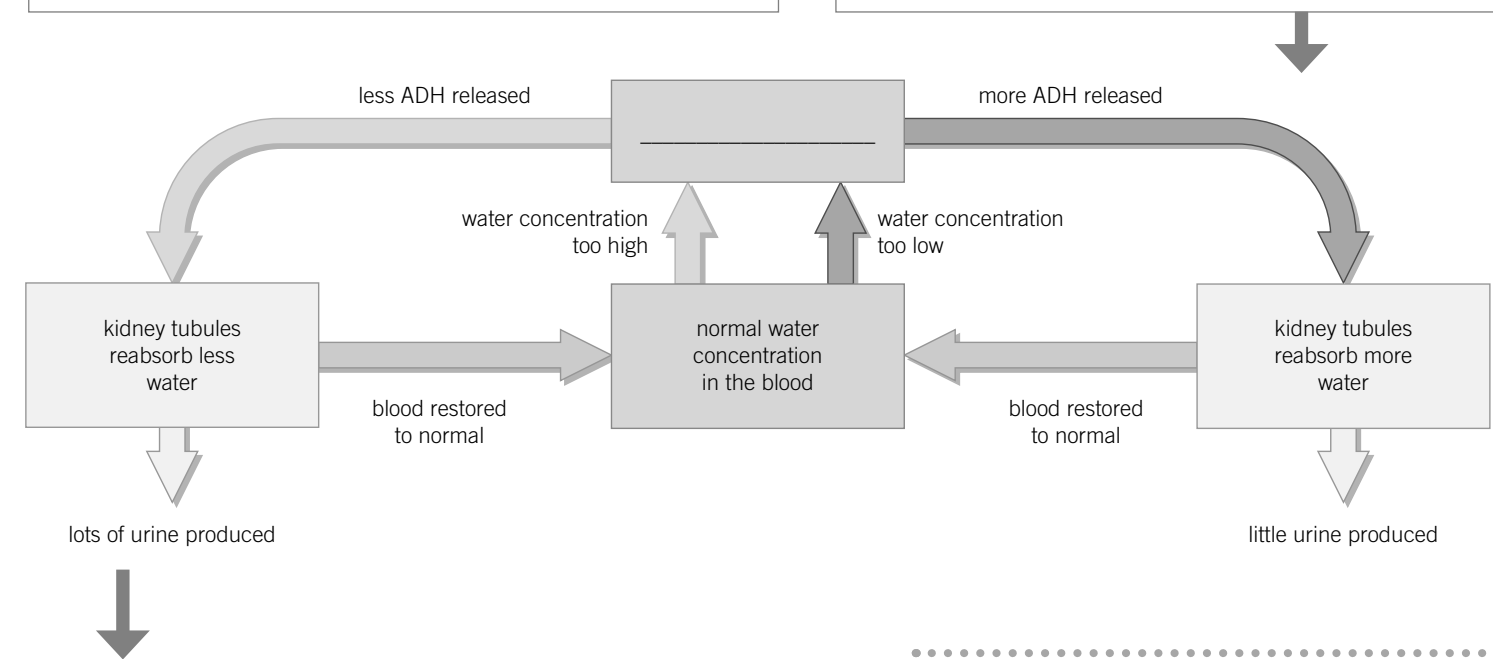
Excess water, ions, and urea are removed by the \_\_\_\_\_ in **urine**.

Levels of water in the body must be \_\_\_\_\_ because cells do not function efficiently if they lose or gain too much water.

The kidneys produce urine by \_\_\_\_\_ of the blood and \_\_\_\_\_ of useful substances such as water, glucose, and some ions.

The water level in the blood is controlled through this process by the hormone \_\_\_\_\_, which affects the amount of water absorbed by the **kidney** \_\_\_\_\_.

This is a \_\_\_\_\_.



People who suffer from kidney \_\_\_\_\_ may be treated by organ transplants or kidney \_\_\_\_\_.

#### Process of kidney dialysis

- blood temporarily removed from patient's body
- filtered through a dialysis \_\_\_\_\_
- patient's blood passes over dialysis \_\_\_\_\_
- dialysis fluid has no urea
- urea and waste products diffuse from \_\_\_\_\_ concentration in patient's blood to \_\_\_\_\_ concentration in dialysis fluid
- patient's blood then returned to their body

### Waste products

The digestion of proteins from food results in excess \_\_\_\_\_, which need to be \_\_\_\_\_ safely.

These amino acids are deaminated in the \_\_\_\_\_ to form ammonia.

Ammonia is \_\_\_\_\_, so it is immediately converted to \_\_\_\_\_ for safe excretion.

### Key terms

Make sure you can write a definition for these key terms.

ADH	adrenal gland	adrenaline	coordination centres	dialysis	effectors	endocrine system	homeostasis	hormone
kidney tubule	metabolic rate	negative feedback	stimuli	thermoregulatory centre	urea	urine	vasoconstriction	vasodilation

# Chapter 12: Homeostasis in action

## Retrieval questions

Answer the following questions using the information from the knowledge organiser.

B12 questions		Answers
1	What is homeostasis?	
2	Give three internal conditions controlled in homeostasis.	
3	Give three things all control systems include.	
4	Where is body temperature monitored and controlled?	
5	What happens if body temperature is too high?	
6	What happens if body temperature is too low?	
7	What is the function of the kidneys?	
8	How are excess amino acids excreted from the body?	
9	Which hormone controls the water level in the body?	
10	How is kidney failure treated?	
11	In kidney dialysis, what fluid is temporarily removed from the patients body?	
12	In kidney dialysis, name one substance that diffuses from the patients blood into the dialysis fluid.	
13	Define diffusion.	
14	What are proteins broken down into?	
15	Amino acids are de-aminated to form ammonia in what organ of the body?	
16	Why does ammonia need to be excreted safely?	
17	State two things controlled by negative feedback in the body.	
18	Where is the hormone adrenaline produced?	
19	What is the function of adrenaline?	
20	Where is the hormone thyroxine produced?	
21	What is the function of thyroxine?	