# Kidney Water Balance

GCSE Biology · Written to the shared content for AQA, Edexcel and OCR

Name _____ Class _____ Date _____

## 1. Worked example

**Give three ways water leaves the body. Which can be controlled? (2 marks)**

Step 1 · Routes

From the lungs during exhalation; from the skin in sweat; from the kidneys in urine.

Step 2 · Control

Only water lost via the kidneys in urine is controlled to keep the body's water balance.

**Answer: Lungs, skin, kidneys; only urine is controlled**

Check: Ions and urea are also lost in sweat and urine.

## 2. Now try one with the steps

**The kidneys filter 180 $dm^3$ of fluid a day and produce 1.5 $dm^3$ of urine. Calculate the percentage of filtered fluid that is reabsorbed. (2 marks)**

Step 1 · Reabsorbed

Step 2 · Percentage

**Answer:**

## 3. Practice

Show your working. The marks tell you how much is expected.

**1.** Name the organ that produces urea. [1]

**2.** Name the organ that removes urea from the blood. [1]

**3.** Give three substances found in urine. [3]

**4.** Explain why glucose is not normally found in urine. [1]

**5.** Explain why body cells can be damaged if water or ion levels are wrong. [2]

**6.** Describe what happens during filtration in the kidney. [2]

**7.** Explain why dialysis fluid contains glucose at the same concentration blood plasma. [2]

**8.** Explain why dialysis fluid contains no urea. [2]

**9.** The kidneys filter 125 $cm^3$ of fluid per minute and produce 1 $cm^3$ of urine per minute. Calculate the percentage reabsorbed. [2]

**10.** Urea concentration is 0.3 $g/dm^3$ in plasma and 21 $g/dm^3$ in urine. How many times more concentrated is urine? [1]

**11.** Name the hormone that controls water reabsorption, and the gland that releases it. [2]

**12.** Explain how ADH responds when a person is dehydrated. [4]

**13.** Explain why a transplanted kidney may be rejected. [2]

**14.** Suggest why people on dialysis must limit their intake of salt and protein. [2]

## 4. Before you hand it in

**"The kidneys make urea."**
The LIVER makes urea; the KIDNEYS remove it from the blood in urine.

**"ADH makes you produce more urine."**
More ADH → more water reabsorbed → LESS urine, more concentrated.

**"Dialysis fluid contains no glucose so the blood is cleaned."**
Dialysis fluid has the SAME glucose and useful ion concentrations plasma, and NO urea.