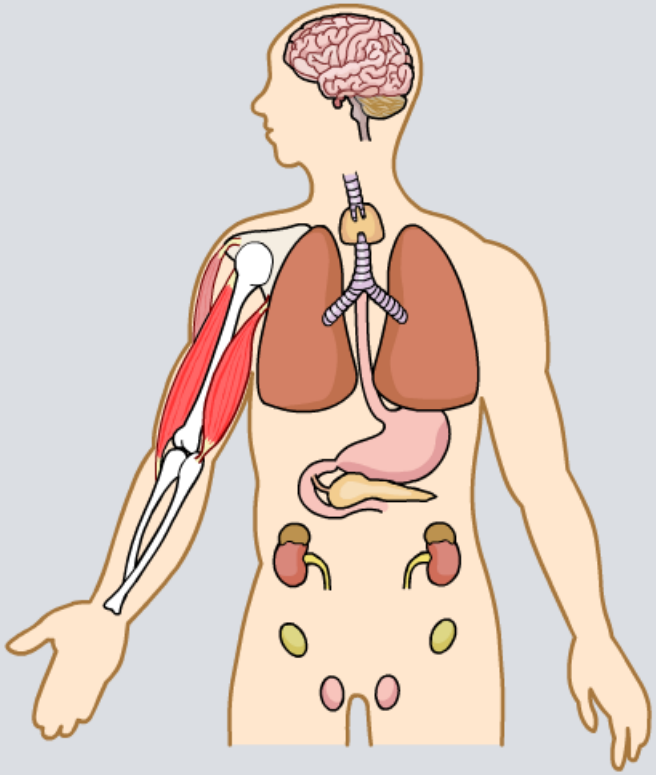
Homeostasis



Saving energy?

Sayid has decided to save energy by staying in bed all day.

How much of his energy do you think this will save?

Surprisingly, the answer is only about 30%.

The other 70% keeps his body temperature at 37 °C (98.6 °F), and the solutions around his cells at just the right concentration.

What is homeostasis?

The body uses so much energy, even during sleep, because it must maintain a constant internal environment.

This process of keeping things the same is called **homeostasis**.

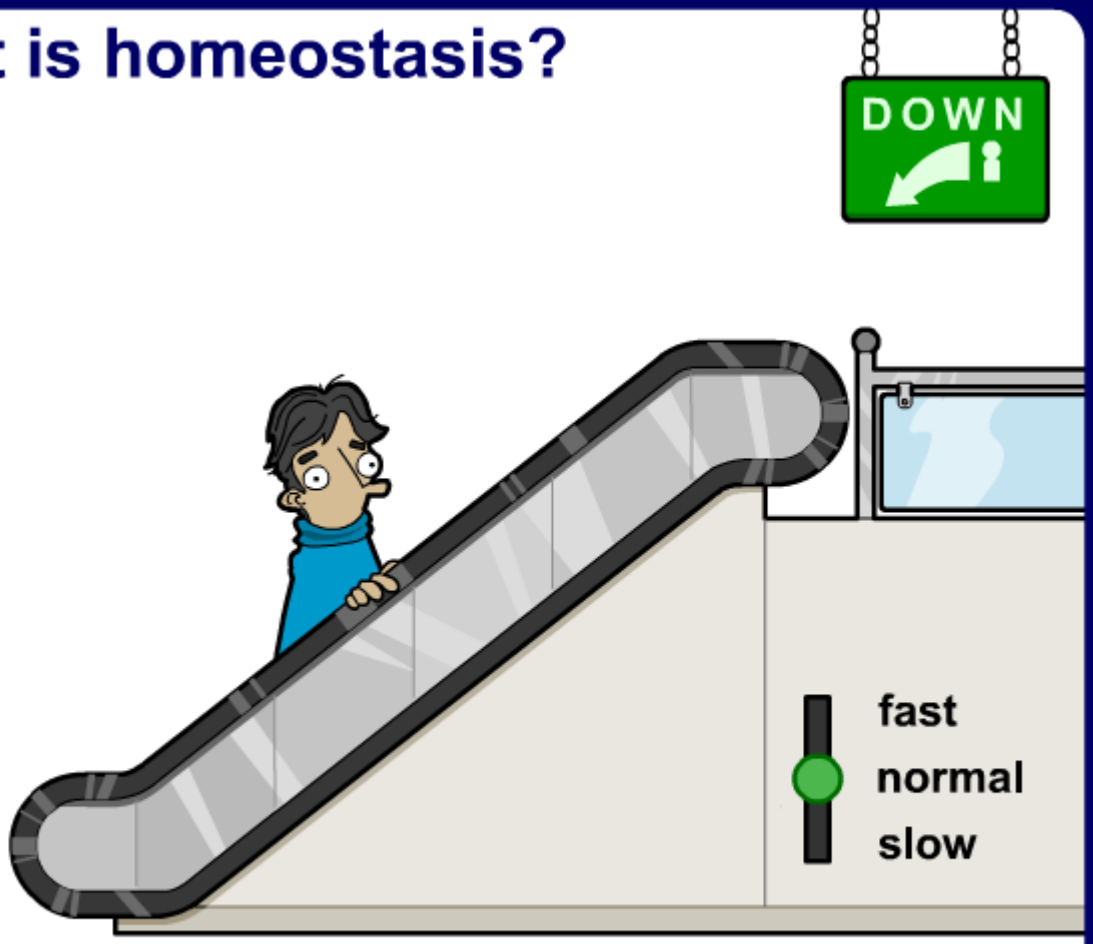
A series of automatic control systems ensures that the body maintains a constant temperature and steady levels of water, ions and blood sugar.

Homeostasis allows the body's cells to work at their optimum.

What is homeostasis?

Keeping the body in order looks easy, but it takes a lot of energy for your body to resist change.

Click "**play**" to find out more.



The organs of homeostasis

Why control temperature?

Environmental temperature is constantly changing. One minute it can be very hot, the next very cold.

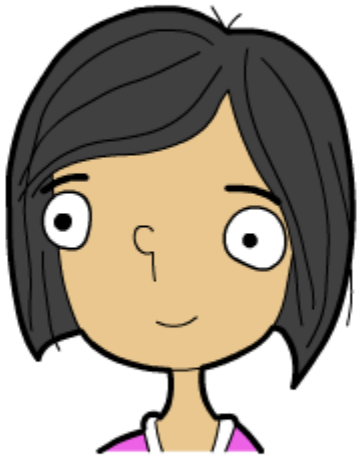
Despite this, the body must be kept at a constant temperature of **98.6 °F**, or **37 °C**. Why?

This is the optimum temperature for the body's enzymes.

Even slight changes in body temperature can have a life-threatening effect on health. If body temperature falls too low, reactions become too slow for cells to survive; too high, and the body's enzymes are at risk of denaturing.

Negative feedback in the body

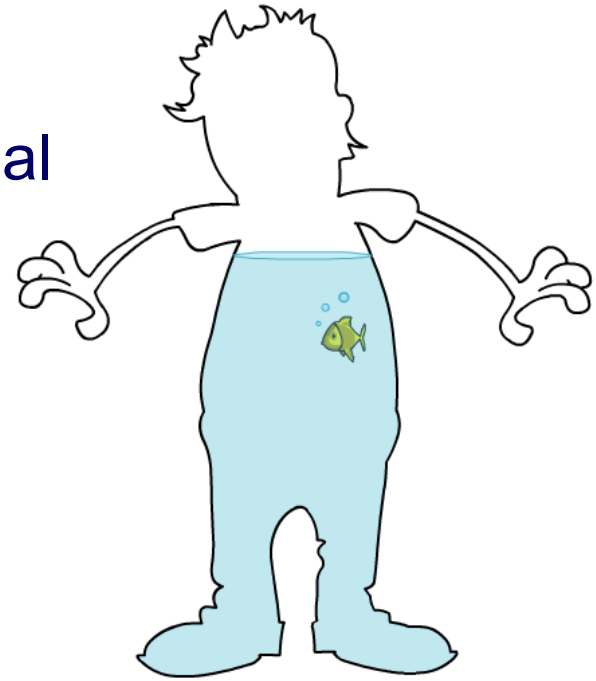
How does negative feedback control body temperature?



Why is water important?

The human body is about 60-70% water.

Water molecules and ions constantly move in and out of cells, and are essential for all life processes.



Dehydration (loss of too much water from the body) damages cells.

How is water gained and lost?

- Water is produced by the body during respiration, and absorbed from food and drink.
- Water is lost from the body in exhaled air, sweat, urine and feces.

Controlling blood glucose

Between meals, blood glucose levels are topped up from stored deposits in the liver and muscles.

After a meal, blood glucose rises but quickly returns to normal. Where does the excess go? Why not leave it in the blood?

Excess glucose makes the blood plasma and tissue fluid around cells too concentrated. This can severely damage cells, for example, causing **crenation** in red blood cells.

However, low blood sugar levels can be equally as dangerous, as it can make cells swell up and burst. This is called **lysis**.