



# What is a hormone?

KS3 Ages 11-14 ⌚ 4 min read

You feel tired as the sun sets. You grow taller during adolescence. You feel stressed before an exam. Your heart races when you're frightened. None of these things happen because your brain sends an electrical instruction down a nerve — they happen because your body releases chemicals into your bloodstream that travel to their targets and trigger changes. Those chemicals are hormones.

## What exactly is a hormone?

A hormone is a chemical messenger produced by a gland and released directly into the blood. It travels through the bloodstream until it reaches cells that have the right "receptor" — a kind of docking port — for that specific hormone. When it docks, it triggers a response. The same hormone can travel throughout the entire body, but it only affects cells that have receptors for it.

📧 Think of hormones like letters sent out by the body's post office (the glands). Each letter has a specific address (the receptor on the target cell). Most cells in the body won't open a letter addressed to someone else — but when the right cell receives the right hormone, it reads the message and acts on it. Some hormones are like mass-mailing a whole neighbourhood. Others are addressed to just one house.

## What do they control?

Almost everything. Insulin controls blood sugar. Cortisol manages stress. Adrenaline triggers the fight-or-flight response. Oestrogen and testosterone drive sexual development. Melatonin regulates sleep. Thyroid hormones control metabolism. Growth hormone, as the name suggests, drives growth during childhood and adolescence. Oxytocin is released during bonding and physical contact — sometimes called the "love hormone". Leptin signals to your brain that you've eaten enough. The list goes on.

## What happens when they go wrong?

Hormonal imbalances cause a wide range of health conditions. Too little insulin leads to diabetes. An overactive or underactive thyroid causes weight gain or loss, fatigue,

and mood changes. Too much cortisol (Cushing's syndrome) causes weight gain and weakens the immune system. Polycystic ovary syndrome is driven by hormonal imbalance. Puberty, menopause, and many mental health conditions all involve hormonal shifts. Given that hormones regulate so many systems simultaneously, even small imbalances can have wide-ranging effects.