



## Make a neuron

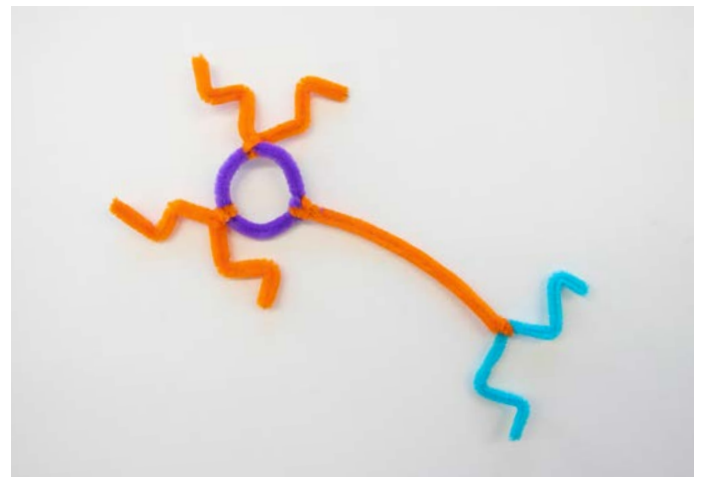
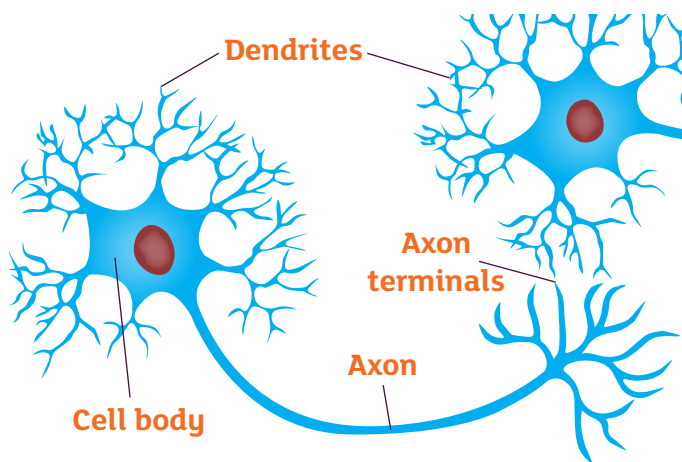
A neuron is another name for a nerve cell. A neuron has four main parts:

**The cell body** – the centre of the neuron, also called the soma. The cell body is the control centre of the cell. It instructs the rest of the neuron how to work. It contains all the 'factories' that produce the molecules a neuron needs to stay healthy.

**The dendrites** – small branches that come out of the cell body and bring in electrical signals from neighbouring neurons.

**The axon** – a long tail-like part of the neuron that carries electrical signals away from the cell body.

**The axon terminals** – where the axon branches into lots of endings that pass signals onto other neurons.



### What to do?

You can use pipe cleaners to make your own neuron.

1. Take one pipe cleaner and make it into a circle. This is the cell body.
2. Wind some other pipe cleaners around the cell body and splay them out from one side of the cell body. These are the dendrites.
3. Wind one end of a pipe cleaner around the cell body to make a long tail on your cell. This is the axon of the neuron.
4. Wind a pipe cleaner around the end of the axon, splaying out the ends. These are the axon terminals.

### Next steps

You can make a neuron network artwork by sticking everyone's neurons on a wall. Why not write your earliest or favourite memory on a piece of paper and attach it to your neuron in the network?

## What is a neuron?

Neurons are the nerve cells in your brain and body. You have around 90 billion neurons in your brain and about another 100 billion neurons in the rest of your body. Luckily they are tiny so we can fit them all in — about 30,000 neurons could fit on a pinhead.

Millions of electrical and chemical signals are passed through your body by neurons every second. They take signals from your body to your brain and from your brain to your body. Neurons pass the signal from cell to cell, a little bit like pass the parcel. Your ears, nose, eyes and the nerves that sense touch and taste all send signals to your brain to tell it what is going on. The brain also needs to give the body signals telling it to move and function. Neurons do this job too.

Giraffes have the longest neurons of any animal; they can be up to 5m (16ft) long!

### How do neurons help the brain store information?

The point at which one neuron connects with another is called a synapse. There are around 100 trillion synapses in the average human brain, which is more than the number of stars in our galaxy, the Milky Way. These connections allow your neurons to form networks, and it's these networks that store information and memories in your brain.

When you remember a particular event, a network of neurons send signals, bringing together information from different parts of your brain. For example, if you remember something happy like a birthday celebration, your memory will include information about the people who were there, the music that was played, the smell of any food that was there, the emotions you felt, and other details specific to that event. The more times you think of a memory or a piece of information, the stronger the connections get. This is how the brain stores information, by creating new connections for new information and strengthening the connections that get used a lot.

### Neurons and dementia

Neurons become damaged by the diseases that cause dementia.

Alzheimer's disease is the most common type of dementia. In this disease, two proteins called amyloid and tau build up in the brain. Amyloid forms clumps, called plaques, in between neurons and tau tangles build up inside neurons. Scientists think these proteins stop neurons from doing their jobs properly. Damaged neurons can't send signals to each other, stopping the brain from working in its normal way. This is what causes memory loss and other symptoms of the disease.

