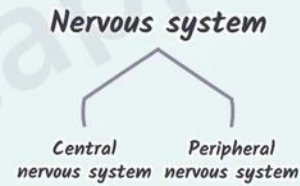


a signal rides an electrical spike down a neuron, then a chemical hop to cross to the next one

## The neuron, one signalling unit \*

- a neuron has three parts: dendrites that receive a signal, a cell body (cyton) that integrates it, and an axon that carries it away
- many axons carry a myelin sheath, laid down by Schwann cells, which speeds up conduction
- gaps in the myelin sheath, called nodes of Ranvier, are where the signal actually jumps from point to point in a myelinated axon

## Divisions of the nervous system



the two-way split every question in this chapter is built on

## What each division covers

### Central nervous system

the brain and the spinal cord, the site of information processing and decision-making

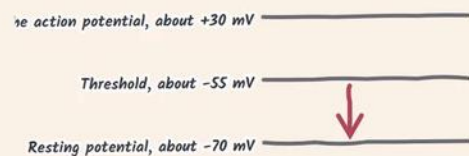
### Peripheral nervous system

all the nerves of the body, carrying signals to and from the central nervous system

## The resting and action potential

- a resting neuron's membrane sits polarised, roughly  $-70$  mV inside relative to outside, maintained by the sodium-potassium pump and by the membrane's much higher permeability to  $K^+$  than to  $Na^+$
- a stimulus that pushes the membrane potential past a threshold triggers a rapid opening of  $Na^+$  channels, and  $Na^+$  rushes in, flipping the membrane briefly positive: this spike is the action potential, or nerve impulse
- $K^+$  channels then open and  $Na^+$  channels close, restoring the negative resting potential, and the pump resets the ion balance for the next impulse

## The membrane potential across an action potential \*



the fall this ladder marks: repolarisation carrying the membrane from threshold back down to resting potential, after the spike

