

# Answers to selected activities

## Chapter 1

### Neurons and the neural pathway (page 6)

- A** The correct order following the neural pathway is: dendrites, cell body, nucleus, axon, myelin sheath, axon terminals, synapse, synaptic vesicles, synaptic cleft. The nerve impulse travels from the dendrites, along the axon to the axon terminals where neurochemicals are released from synaptic vesicles and travel across the synapse to the dendrites of the next nerve cell.

### Neurons and the neural pathway (continued) (page 8)

- A** dendrites—the gap between the earpiece and your ear  
cell body—cord leading from the wall to the phone  
nucleus—computer chip in the casing  
axon—junction where the earpiece and your ear meet  
myelin sheath—sound waves of your friend’s voice  
axon terminals—earpiece of the handset  
synapse—casing of the phone  
neurotransmitter—plastic coating on the cord leading to the handset
- B** (in order of direction of neural impulse)  
**c** dendrites and **8** the branching projections of a cell which receive messages from other cells  
**h** cell body and **5** substance within and including the membrane of the cell  
**d** nucleus and **3** the body which contains chromosomes  
**a** axon and **6** the extension of a nerve cell, conducts messages away from cell body  
**e** myelin sheath and **7** the fatty substance which wraps a nerve fibre  
**g** axon terminal and **1** the ending of the extension of the nerve cell that conducts messages away from the cell body  
**b** synapse and **4** the junction between one neuron and the next  
**f** neurotransmitter and **2** chemical which travels across the synapse and has an effect on the next neuron

### The functions of the lobes of the cortex (page 23)

- The occipital lobes are responsible for processing visual information.
  - The frontal lobes are responsible for a number of functions, most notably that of abstract thought—problem solving, planning, the ability to make judgments, and higher level intellectual processes occur here.
  - The frontal lobes also contain the area of motor cortex and the left lobe is the site of Broca’s area which is concerned with the production of language.
  - The motor cortex responsible for the voluntary control of movement is situated towards the back of the frontal lobes.
  - The parietal lobes are responsible for processing sensory information. The somatosensory area (at the front of these lobes) receives information about what the body is touching and feeling.
  - The temporal lobes are mainly responsible for the processing of auditory information. The centre for auditory association is within these lobes. These lobes are also important for some memory functions. The left temporal lobe is also the site of Wernicke’s area, which for most people, is where language comprehension occurs. (Some left-handers appear to process language in the right, as well as the left hemispheres.)
- C** 1i, 2c, 3f, 4h, 5b, 6g, 7e, 8d, 9a.

### A reflex arc (page 32)

The drawing pin acts as a stimulus, a sensory neuron in foot sense pain and relays a message to an interneuron in the spinal column. Direct action is initiated via the message to withdraw foot being sent to a motor neuron and then to muscles of Fred's leg and foot.

The sensory neuron is the efferent neuron as it carries the message towards the spinal column. The motor neuron is the afferent neuron as it carries the message away from the spinal column (that is, 'affects' a response).

### Empirical research activity (page 36)

*Left Brain Test 1 (page 38)*

- 1 'stomach' is the odd word out; all the rest are sports words
- 2 'ick', as in sick, slick, trick, lick, brick
- 3 False
- 4 **a** False **b** False **c** True
- 5 Press

*Left Brain Test 2 (page 38)*

- 1 48 (Add 2, 4, 8, and finally 16)
- 2 Kate
- 3 5 (arms pointing upwards are added and arms pointing downwards are subtracted to give the number on the head of the figure)
- 4 60 km; the trains meet in 1 hour and the bird flies at 60 km/hour
- 5 3 (take the difference between numbers in the first two columns and divide by 2)