3.4 The central nervous system receives information from the peripheral nervous system

Humans are constantly receiving stimuli from their environment through the peripheral nervous system. The neurons use electrical messages that are passed along to neurons in the brain and spinal cord that make up your central nervous system.

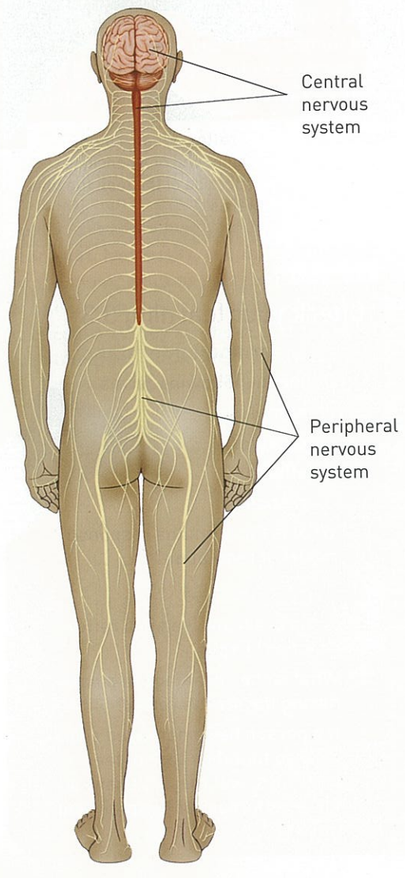

Figure 3.22 The nervous system of the body is made up of the central nervous system and the peripheral nervous system.

Central nervous system

The **central nervous system** is the control centre of the body. All incoming messages from your environment and your responses to them are processed through the central nervous system. The two main features of the central nervous system are the brain and the spinal cord.

Brain

The brain is the processing centre of the body and is mainly concerned with our survival. The brain is a soft, heavy organ that is surrounded by a tough skull. The brain gathers information about what is going on inside and outside the body. It then makes decisions about things such as internal changes and movements. It is also home to your memories, personality and thought processes.

Lobes of the brain

The cerebrum or outer section of your brain is divided into four lobes or sections. These lobes have specific functions.

- The frontal lobe is located at the front of the brain. Its functions include emotions, reasoning, movement and problem solving.
- The parietal lobe manages the perception of senses, including taste, pain, pressure, temperature and touch.
- The temporal lobe is located in the region near your ears. It deals with the recognition of sounds and smells.
- The occipital lobe is at the very back of the brain. It is responsible for various aspects of vision.

SKILLS LAB 3.4: SHEEP BRAIN DISSECTION
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Peripheral nervous system

The **peripheral nervous system** is a large system made up of all the nerves outside the central nervous system. The peripheral nervous system carries information between the central nervous system and the rest of the body, such as the limbs and organs.

The peripheral nervous system is divided into two parts.

- The **somatic nervous system** controls voluntary skeletal muscle movements, such as waving or reaching out to take an object.
- The **autonomic nervous system** controls involuntary actions, which happen without our conscious control. This includes heartbeat, digestion, respiration, salivation and perspiration. The autonomic nervous system maintains your body's internal environment (homeostasis).

The autonomic nervous system also has two parts: the sympathetic division and the parasympathetic division. These two divisions often have opposite effects. For example, the parasympathetic division slows down the heart rate, whereas the sympathetic division speeds up the heart rate. The systems work together to maintain a balance in the body.

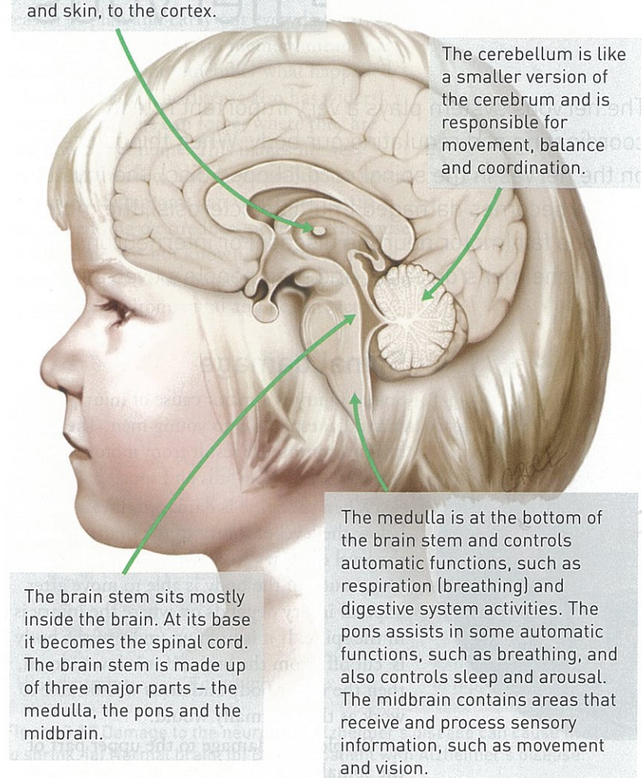

Figure 3.23 Structure of the human brain

Check your learning 3.4

Remember and understand

1. Which two parts make up the central nervous system?
2. What is the peripheral nervous system made up of?

Apply and analyse

3. Draw a scientific diagram of the brain that shows the four lobes. In each of the lobes:
   a. write what functions are carried out in that lobe
   b. draw something to remind you of the functions carried out in that lobe.
4. How do the peripheral nervous system and central nervous system work together? Use an example to illustrate your answer.
5. Explain why, if you slipped and hit the back of your head, everything might go black.
6. What is the difference between the somatic nervous system and the autonomic nervous system?