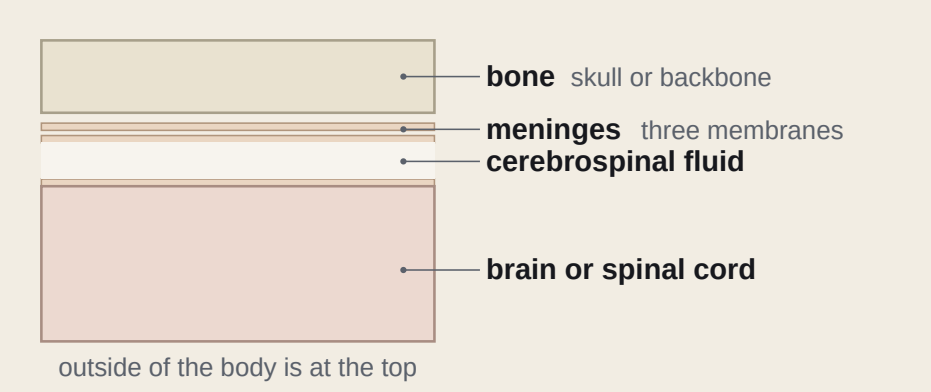
A6 · The spinal cord and the brain · Completed notes

Goals: Name what protects the brain and the spinal cord. Describe the parts of the spinal cord and what they do. Find the cerebrum, cerebellum, pons, medulla oblongata and hypothalamus on a diagram. Describe the cerebral hemispheres and the four lobes, and give their jobs. Give the jobs of the cerebellum, pons, medulla oblongata and hypothalamus. Decide which part of the brain does a given job.

These are the completed notes. The blanks are filled in and each question is worked.

Slide 1 of 7 · Protecting the central nervous system

In lesson A5, the central nervous system was the brain and the spinal cord. Today you look inside both. First, how they are kept safe.



Key ideas

Bone protects the brain and the spinal cord: the **skull** and the backbone.

The **meninges** are three thin membranes that wrap them.

Cerebrospinal fluid cushions the brain against bumps.

Example

Name the three things that protect the brain.

1. Bone: the skull.
2. The meninges.
3. Cerebrospinal fluid.

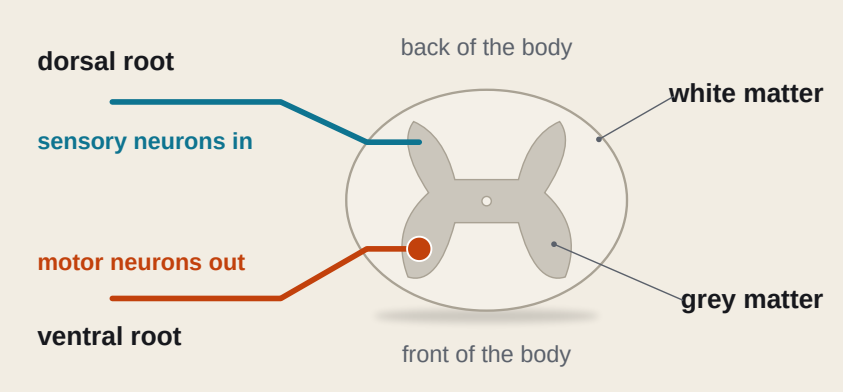
Try it

State two jobs of cerebrospinal fluid.

1. It cushions the brain against bumps.
2. It carries nutrients to the cells and wastes away.

Slide 2 of 7 · The spinal cord

On the last slide, bone, membranes and fluid protected the spinal cord. Now you look at the spinal cord itself, cut across.



Key ideas

White matter is on the outside of the spinal cord. It is axons with a myelin sheath.

Grey matter is in the centre. It holds interneurons.

Sensory neurons enter through the **dorsal root**.

Motor neurons leave through the **ventral root**.

Example

Name the root through which a motor neuron leaves the spinal cord.

1. Motor neurons leave at the front.
2. The root at the front is the ventral root.

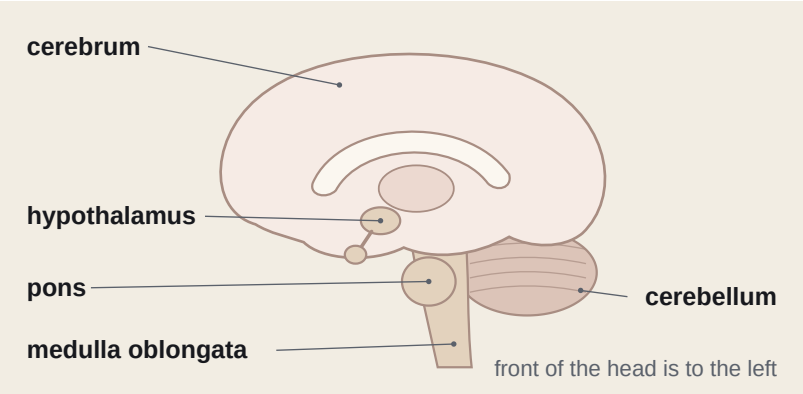
Try it

Explain why an injury in the neck affects more of the body than one in the lower back.

1. Messages cannot pass the injury.
2. Nerves to the arms and the legs join the cord below the neck.
3. So the arms and the legs are both cut off.

Slide 3 of 7 · The main parts of the brain

On the last slide, the spinal cord carried messages up to the brain. Here is the brain, cut down the middle so you can see inside.



Key ideas

The **cerebrum** is the largest part of the brain.

The **cerebellum** is at the back, below the cerebrum.

The pons and the **medulla oblongata** are on the stalk below the cerebrum.

The **hypothalamus** is a small part under the middle of the cerebrum.

Example

Name the part of the brain that joins straight onto the spinal cord.

1. Follow the stalk down.
2. The lowest part is the medulla oblongata.

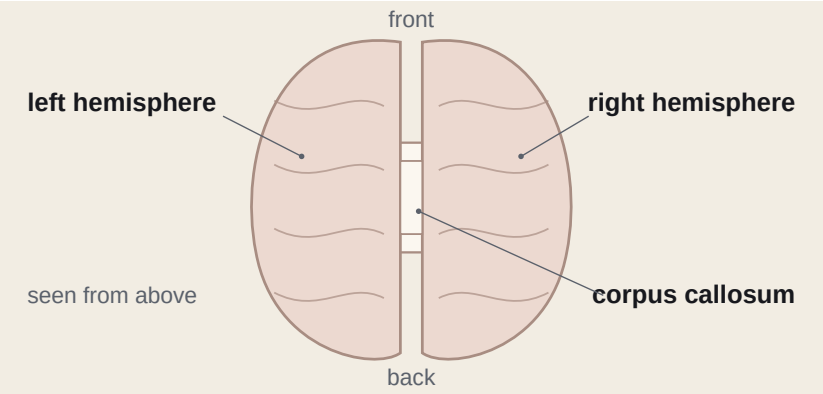
Try it

Name the largest part of the brain, and the part at the back below it.

1. The largest part is the cerebrum.
2. The part at the back below it is the cerebellum.

Slide 4 of 7 · The cerebrum: two hemispheres

On the last slide, the cerebrum was the largest part of the brain. From above, you can see that it is in two halves.



Key ideas

Each half of the cerebrum is a **cerebral hemisphere**.

The right hemisphere controls the **left** side of the body.

The **corpus callosum** joins the two hemispheres.

The folded outer layer of the cerebrum is the **cerebral cortex**.

Example

Name the hemisphere that controls the right hand.

1. Each hemisphere controls the opposite side of the body.
2. The left hemisphere controls the right hand.

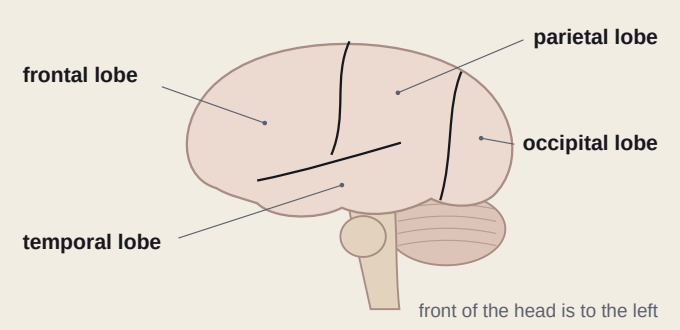
Try it

Explain why the cerebral cortex is folded.

1. Folds give a larger surface.
2. A larger surface has room for more neurons.

Slide 5 of 7 · The four lobes of the cerebrum

On the last slide, the cerebrum had two hemispheres. Each hemisphere is divided again, into four regions with different jobs.



Lobe	Main jobs
frontal	voluntary movement; thinking and personality
parietal	touch and temperature
temporal	hearing; memory
occipital	vision

Key ideas

The **frontal lobe** controls voluntary movement and thinking.

The **parietal lobe** receives touch and temperature.

The **temporal lobe** handles hearing and memory.

The **occipital lobe** handles vision.

Example

A person can no longer feel touch on the skin. Name the lobe most likely damaged.

1. Touch and temperature go to one lobe.
2. It is the parietal lobe.

Try it

Name the lobe at the back of the head, and its main job.

1. The occipital lobe is at the back.
2. Its main job is vision.

Slide 6 of 7 · Below the cerebrum: four more parts

On the last slide, the lobes of the cerebrum handled senses, chosen movement and thinking. The parts below it work without you choosing.

Part	Main jobs
cerebellum	balance and coordinated movement
pons	relays messages: cerebellum and medulla
medulla oblongata	breathing, heart rate, blood vessels
hypothalamus	homeostasis; controls the pituitary gland

Key ideas

The **cerebellum** controls balance and coordinated movement.

The **pons** relays messages between the cerebellum and the medulla oblongata.

The **medulla oblongata** controls breathing and heart rate.

The **hypothalamus** keeps homeostasis and controls the pituitary gland.

Example

Name the part of the brain that controls breathing and heart rate.

1. These actions are involuntary.
2. The medulla oblongata controls them.

Try it

Name the part of the brain that links the nervous system to the endocrine system.

1. The pituitary gland releases hormones.
2. The hypothalamus controls the pituitary gland.

Slide 7 of 7 · Method: which part of the brain does this job?

Questions often describe a job, or an injury, and ask for the part of the brain. These four steps use the two tables from this lesson.

1. **Name** the job that is lost or changed.
2. **Ask** if it is a sense, a chosen movement or thinking.
3. **Pick** the lobe, if the answer is yes.
4. **Pick** another part, if the answer is no. Use the table.



Check: involuntary jobs are not in the cerebrum.

Used again in: this lesson's page

Key ideas

Step 1: name the **job** that is lost or changed.

Step 2: ask if it is a sense, a chosen movement or **thinking**.

Step 3: if yes, pick the **lobe**.

Step 4: if no, pick another part. **Involuntary** jobs are not in the cerebrum.

Example

Use the four steps. After a blow to the back of the head, a person cannot see.

1. The job lost is vision.
2. Vision is a sense, so it is in the cerebrum.
3. The lobe for vision is the occipital lobe.

Try it

Use the four steps. A person cannot keep their balance.

1. The job lost is balance.
2. It is not a sense, a chosen movement or thinking.
3. From the second table: the cerebellum.