Localisation of function in the brain

Key Terms

Term	Definition
Localisation of function	
Motor area	
Somatosensory area	
Visual area	
Auditory area	
Broca's area	
Wernicke's area	
Aphasia	
Production / expression aphasia	

Localisation versus holistic theory

Explain the difference between the localisation and holistic theories of brain function. Include Phineas Gage as an example.

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Going further

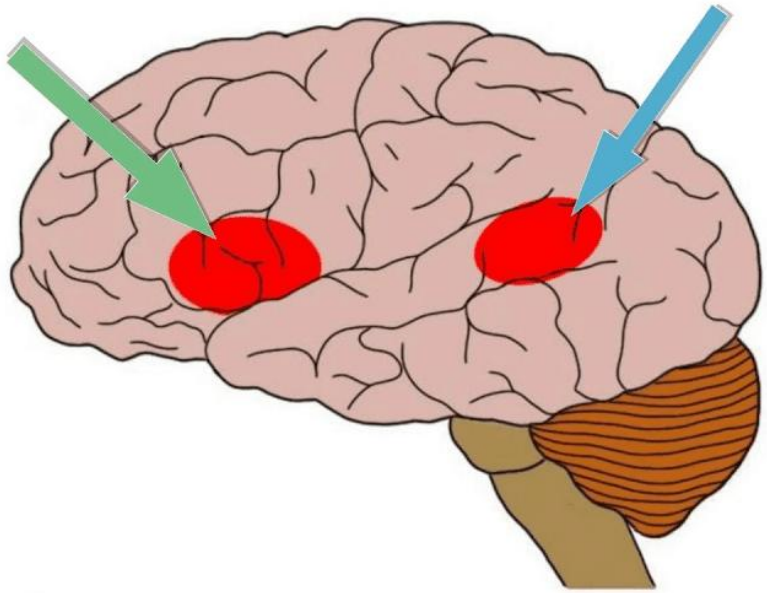
- ✓ All in the Mind - Aphasia - BBC Sounds
- ✓ BBC Four - Speechless - Clips
- ✓ Broca's Aphasia (Non-Fluent Aphasia), Fluent Aphasia (Wernicke's Aphasia)
- ✓ Glimpsed at last – the life of neuropsychology's most important patient | BPS

Hemispheres and brain lobe functions

1. Label the 4 main lobes of the brain.
2. Label the ***motor, somatosensory, visual, auditory areas***.
3. For each area add: **brief location description**, **function**, **what happens when damage occurs**.

Language centres – Wernicke’s and Broca’s areas

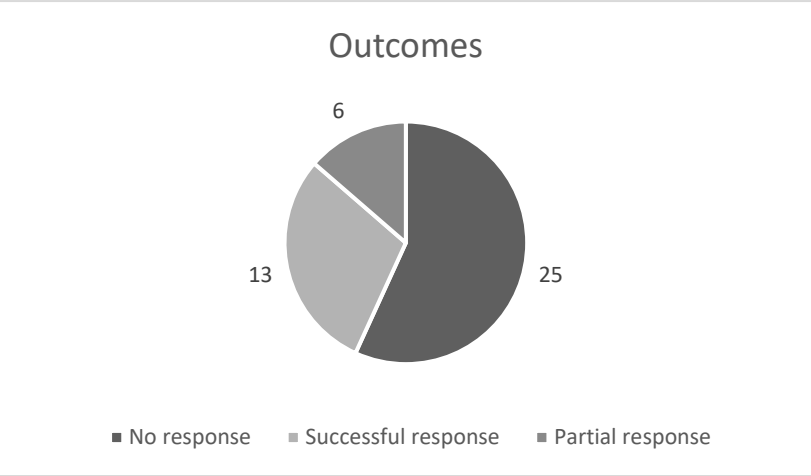
Label Wernicke’s and Broca's areas. Include the function of these areas language and how they were discovered. Ensure you include what happens when these areas are damaged.



Evaluation

Read through the evaluation and make notes using the table below as guidance – remember to use Point Relevance Conclude:

The evaluation is focused on the support/criticism of the theory of localisation of brain function.

Strength	**Weakness**
Evidence from neurosurgery The chart below shows you a visual representation of the Dougherty et al. (2002) study into performing cingulotomy for OCD patients:  	
Brain scan evidence (Peterson et al, 1988 and Buckner and Peterson, 1996)	Counterpoint (Lashley, 1950)
Case study evidence (Phineas Gage)	Problems with case study evidence
Language localisation	
	Language may not just be controlled by Wernicke's and Broca's areas 2016 review, fMRI scanning, language 'streams' in the cortex

Exam Questions on localisation of function

Q1.

Studies have identified Broca's area and Wernicke's area as responsible for language.

Outline the difference in function between Broca's area and Wernicke's area.

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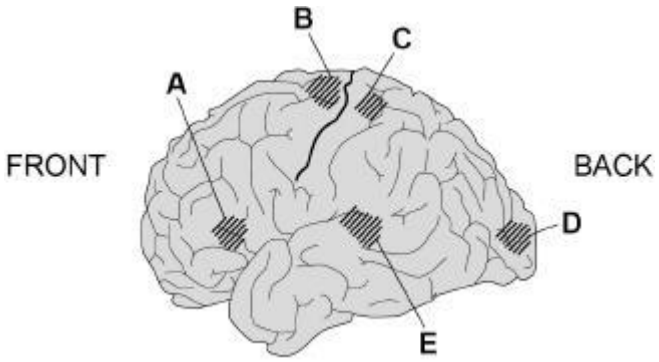
(Total 2 marks)

Q2.

The diagram below shows the left hemisphere of the human brain. Five areas of the brain are labelled A, B, C, D and E.



Using the letters given in the diagram above, correctly identify the areas of the brain to complete the table below.

	Area of brain
Which area is responsible for processing sensations such as pain and pressure?	
Which area processes information such as colour and shape?	
Which area processes information such as pitch and volume?	
Which area is responsible for voluntary movements?	

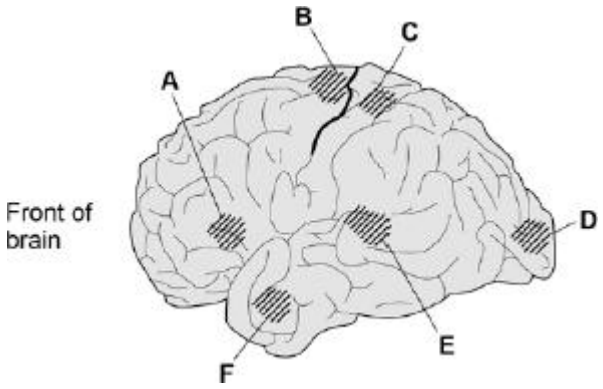
(Total 4 marks)

Q3.

Read the item and then answer the questions that follow.

The image below shows the left hemisphere of the human brain. Six areas of cortical specialisation are labelled **A**, **B**, **C**, **D**, **E** and **F**.

Left hemisphere of the human brain



Using your knowledge of localisation of function in the brain, identify the area of cortical specialisation. Shade **one** box only for each area.

(a) Broca's area

A ○ B ○ C ○ D ○ E ○ F ○

(1)

(b) Somatosensory cortex

A ○ B ○ C ○ D ○ E ○ F ○

(1)

(c) Visual cortex

A ○ B ○ C ○ D ○ E ○ F ○

(1)

(d) Wernicke's area

A ○ B ○ C ○ D ○ E ○ F ○

(1)

(e) Motor cortex

A ○ B ○ C ○ D ○ E ○ F ○

(1)

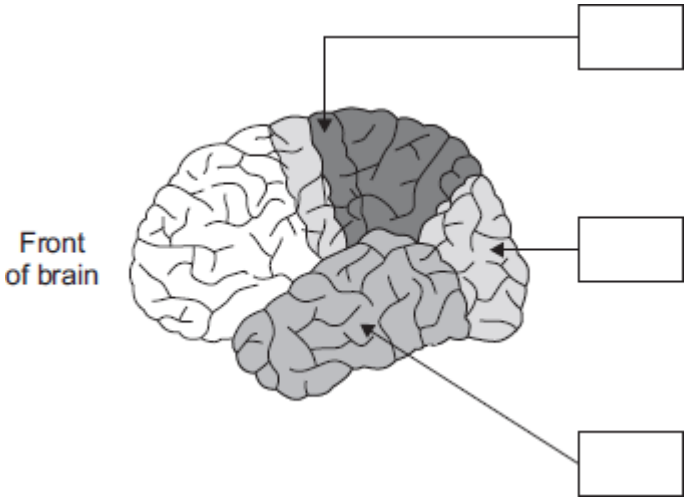
(Total 5 marks)

Q4.

Psychologists have identified many areas of cortical specialisation in the brain.
These include:

A the motor centre
B the auditory centre
C the visual centre
D the somatosensory centre.

Below is a diagram of the human brain. Identify three areas of cortical specialisation by writing **A**, **B**, **C** or **D** in each of the boxes that are provided. Use a different letter for each box.



(Total 3 marks)

Q5.

Robert suffered a stroke at the age of 55. After the stroke he was paralysed down his right side, though he could move his left arm and leg easily. Robert could clearly understand what was said to him but was unable to produce any speech.

Discuss how knowledge of hemispheric lateralisation and language centres in the brain has helped our understanding of cases such as Robert's. Refer to Robert's case in your answer.

(Total 16 marks)