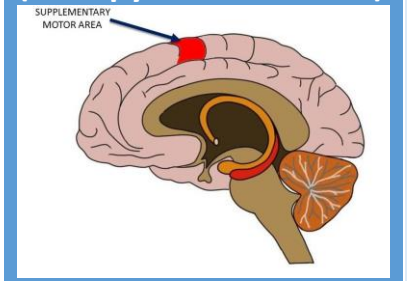
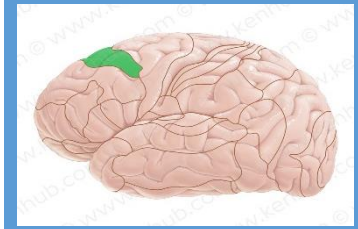
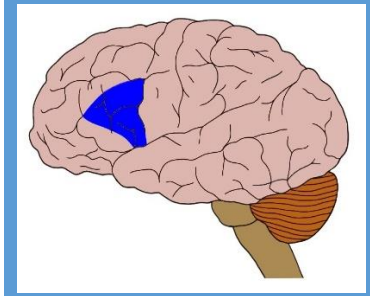
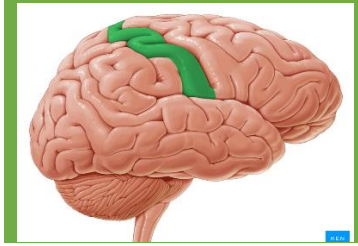
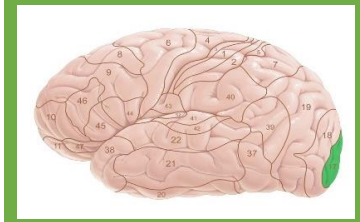
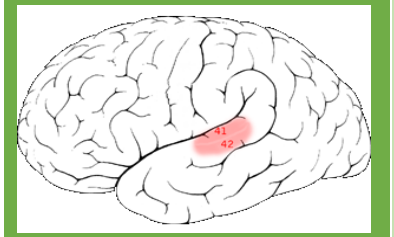
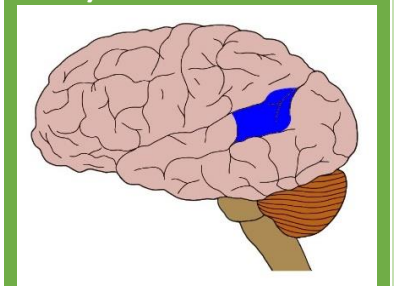
Functional areas of cerebral cortex

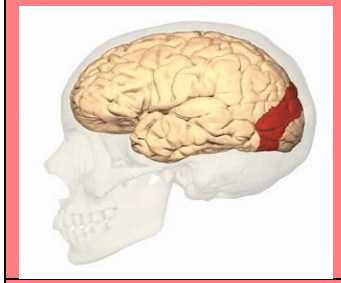
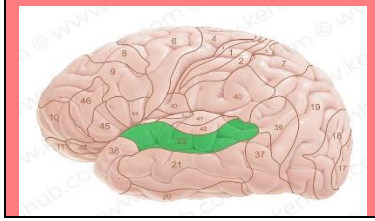
Motor areas				
	Brodmann's area	Site	Function	Lesion
Primary motor area 	4	Precentral gyrus of lateral surface, Anterior part of paracentral lobule	Fine specific discrete movement mainly extremities	Contralateral hemiplegia (UMN syndrome)
Premotor area 	6	In front of area 4 Broad above narrow below	- storing motor programs. - coordination of coarse movement mainly trunk, shoulders and hip muscles. - Inhibitory to muscle tone. - send input to area 4	- motor apraxia - spasticity - loss of postural stability.
Supplementary motor area (extrapyramidal center) 	6	Mostly on the medial frontal gyrus anterior to paracentral lobule	- postural stabilization of the body. - coordination of both sides of the body. - control of sequences of movements.	Not definite

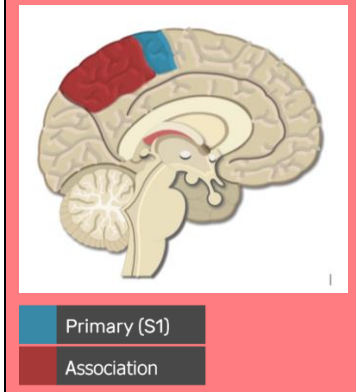
Frontal eye field 	8	In front of premotor area, mainly middle frontal gyrus. Connected to visual area in occipital lobe	Voluntary tracking movement (conjugate movement) to the opposite side.	Deviation of both eyes to same side of lesion.
Broca's area of speech (motor language area) 	44,45	Inferior frontal gyrus Mainly on the left dominant hemisphere	Coordination of muscles of larynx, mouth, tongue and palate. Connected to wernicke's area through arcuate fasciculus	Motor aphasia (non-fluent/ expressive aphasia): Good comprehension, poor speech

Sensory areas				
	Brodmann's area	**Site**	**Function**	**lesion**
Primary sensory area 	3,1,2	Postcentral gyrus, Extends on the paracentral lobule	-Localize, discriminate different sensations. -Gives 20% of pyramidal tracts	Contralateral hemianesthesia

Secondary sensory area		Lowermost part of postcentral gyrus (depth of lateral sulcus)		No marked lesion
Visual area 	17	Around calcarine sulcus lips (cuneus above and lingual below) Receive visual radiation from LGN	Visual perception	Contralateral homonymous hemianopsia with macular sparing
Primary auditory area 	41, 42	Middle of the superior temporal gyrus	Perception and analysis of pitch, intensity of sound	Reduction of hearing acuity on both ears mainly on opposite side.
Vestibular area		Superior temporal gyrus posterior part	Equilibrium	
Gustatory area	43	Inferior end of postcentral gyrus + insula	Taste perception	
Olfactory area		Uncus and adjoining hippocampal gyrus (rhinencephalon) (uncus-piriform area)	Smell perception	

Wernicke's area (sensory language area) 	22,39,40	Superior temporal gyrus of left dominant hemisphere, extending into posterior end of lateral sulcus into parietal lobe Receive fibers from visual and auditory areas	Understanding written and spoken words, enables person to read and understand. Works in coordination with angular gyrus (39) and supramarginal gyrus (40).	Sensory aphasia (fluent/ receptive aphasia)

Association areas				
	Brodmann's area	**Site**	**Function**	**Lesion**
Visual association area 	18, 19	Remainder of cuneus and lingual gyri	Interpretation of visual stimulus with past experience	Visual agnosia and color blindness
Occipital eye field area		Rest of occipital lobe	Reflex conjugate movement of both eyes to opposite side	
Auditory association area 	22	Back of superior temporal gyrus along with wernicke's area	Interpretation of auditory stimulus	Auditory (verbal/ acoustic) agnosia

Posterior parietal (somatosensory) association area 	5,7		Body image, know object by feeling it	Astereognosis (tactile agnosia)
Prefrontal association area 	9,10,11,12	Greater part of frontal cortex	Judgment, foresight, personality	- Alzheimer (amyloid degeneration). - Schizophrenia (low dopamine).

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