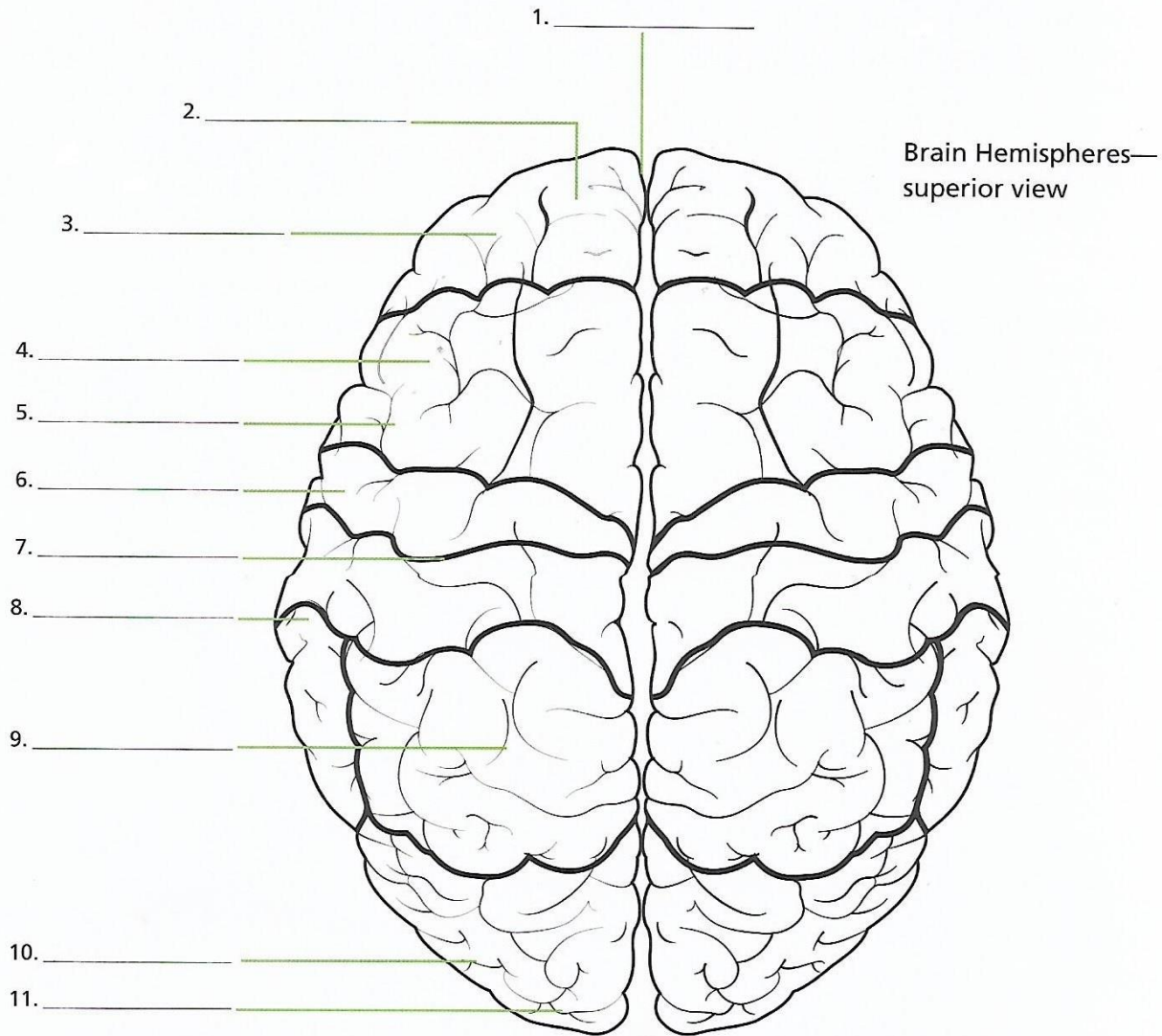


Hemispheres of the Brain (Left, Right)



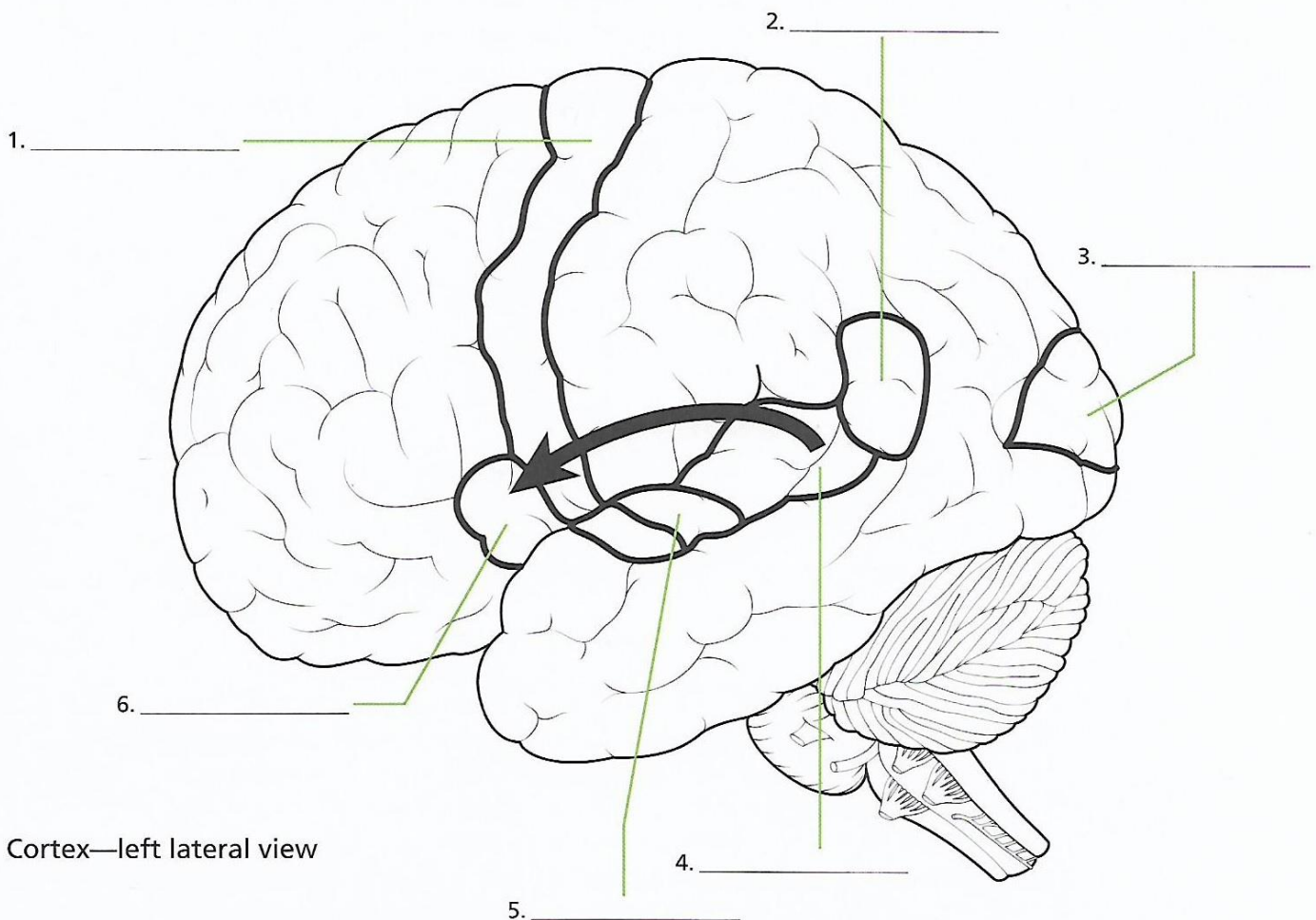
The human brain is separated into two cerebral hemispheres by a deep groove called the medial longitudinal fissure, which runs along the sagittal plane. The hemispheres are connected by a large white matter structure called the corpus callosum. The surface of each hemisphere is covered by gyri (ridges) and sulci (furrows) of the cerebral cortex. Overall, the macroscopic structure and organization of the hemispheres are relatively similar; however, notable differences do exist. For example, two cortical areas important for language (Broca's and Wernicke's areas) are typically located only on the left hemisphere, and indeed in most individuals the left hemisphere exhibits dominance for language processing and production. That said, most cognitive functions are performed bilaterally in both hemispheres.

Answers

1. medial longitudinal fissure, 2. frontal lobe, 3. superior frontal sulcus, 4. middle frontal gyrus, 5. precentral sulcus, 6. central sulcus, 7. postcentral gyrus, 8. postcentral sulcus, 9. parietal lobe, 10. lunate sulcus, 11. occipital lobe

Language Areas of the Cerebral Cortex

Broca's and Wernicke's areas, along with the primary auditory cortex, make up a network called the arcuate fasciculi. This network allows people to hear, process, and execute language. Pierre Paul Broca discovered the area of the brain involved in producing coherent speech through a series of case studies, the first—and most famous—being "Tan," a man who was capable of saying only one word, which was "tan." Broca's area is also referred to as the inferior frontal gyrus, as it is located in the bottom half of the frontal cortex. Recent evidence suggests that the role of Broca's area is more dynamic than once believed; a study from Flinker and associates in 2015 indicated that speech production prior to articulation, but not single-word production, activates Broca's area.



Wernicke's area is located partially in the temporal lobe and partially in the parietal lobe. It is made up of two different anatomical structures: the supramarginal gyrus and the angular gyrus. Wernicke's area is related to the processing of both written and spoken speech. Individuals who have damage to Wernicke's area are usually unable to produce coherent sentences. Their speech will have proper syntax, grammar, and prosody, but the content of the sentence will have little to no meaning.

Answers

1. primary visual cortex, 2. motor cortex, 3. primary auditory cortex, 4. Wernicke's area, 5. Broca's area, 6. arcuate fasciculus