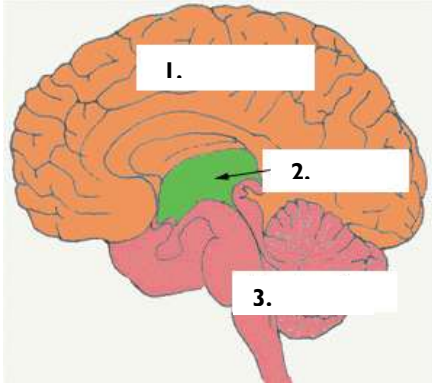


The Specialized Brain Worksheet

Section I: Major Regions of the Brain

Using the image below, label each of the three white boxes with its appropriate brain region then briefly summarize the structures and functions that occur in these regions.



Forebrain:

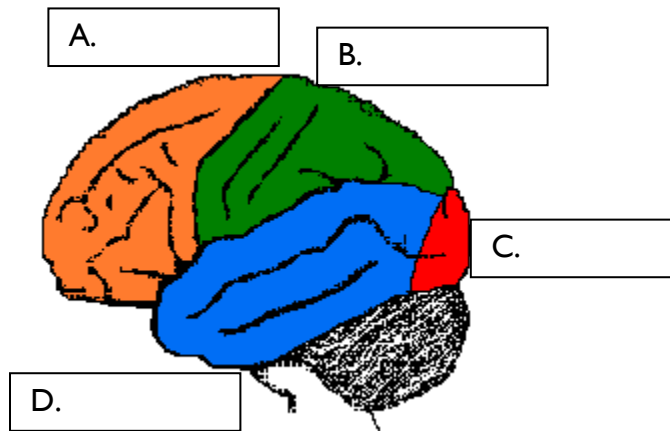
Midbrain:

Hindbrain:

The Specialized Brain Worksheet

Section 2: The Cerebral Cortex

Using the image below, label the lobes of the brain (frontal, occipital, temporal, and parietal).



Functions: In which lobe are these functions localized? Circle the answer.

1. Primary visual cortex (frontal / parietal / temporal / occipital)
2. Primary auditory cortex (frontal / parietal / temporal / occipital)
3. Primary motor cortex (frontal / parietal / temporal / occipital)
4. Somatosensory cortex (frontal / parietal / temporal / occipital)
5. Plans and initiates voluntary movement (frontal / parietal / temporal / occipital)
6. Integrates sensory and motor info (frontal / parietal / temporal / occipital)

True or False.

The corpus callosum is part of the midbrain. (T / F)

White matter is composed primarily of myelinated axons, connecting the cerebral cortex to other brain regions. (T / F)

Sensory information from the left side of the body is processed in the right hemisphere, what is called contralateral organization. (T / F)

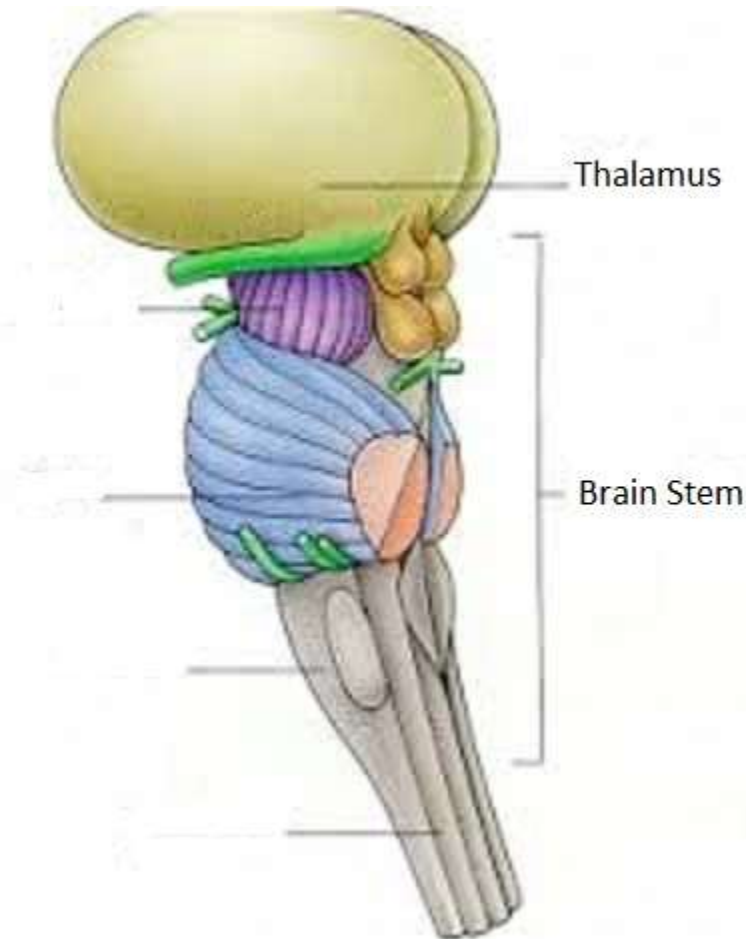
Phineas Gage experienced personality changes because of damage to his frontal lobe. (T / F)

Association areas are involved in processing and integrating sensory and motor information. (T / F)

The Specialized Brain Worksheet

Section 3: The Brainstem

Identify the midbrain and structures of the hindbrain (pons, medulla, reticular formation); you will have to draw in the cerebellum in its appropriate location, which is part of the hindbrain. Then match these structures with their corresponding function.

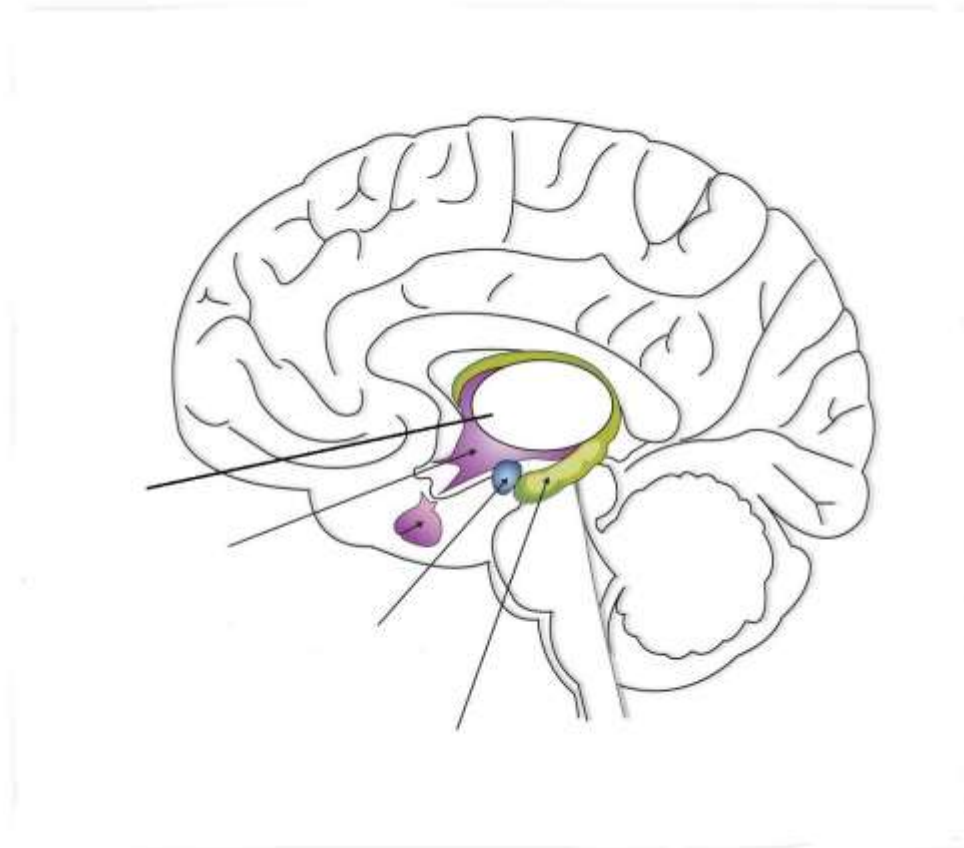


Structure	Function
Midbrain	a. regulates autonomic functions such as heart rate and breathing
Pons	b. relays info to the cerebellum, helps to coordinate movement
Cerebellum	c. regulates attention and alertness
Medulla	d. coordinates movement, balance, and posture
Reticular Formation	e. Processes visual and auditory information

The Specialized Brain Worksheet

Section 3: The Limbic System

Identify the structures of the limbic system then match them with their corresponding function.



Structure	Function
1. Thalamus	a. Regulates levels of awareness, attention, and motivation
2. Hypothalamus	b. Involved in emotional responses, and forming memories with emotional component.
3. Hippocampus	c. regulates autonomic nervous system
4. Amygdala	d. Involved in the formation of new memories and information
	e. Process and distributes information to and from the cortex
	f. Controls the secretion of endocrine hormones, also known as the “brain within the brain”

The Specialized Brain Worksheet

Section 4: Neuroplasticity

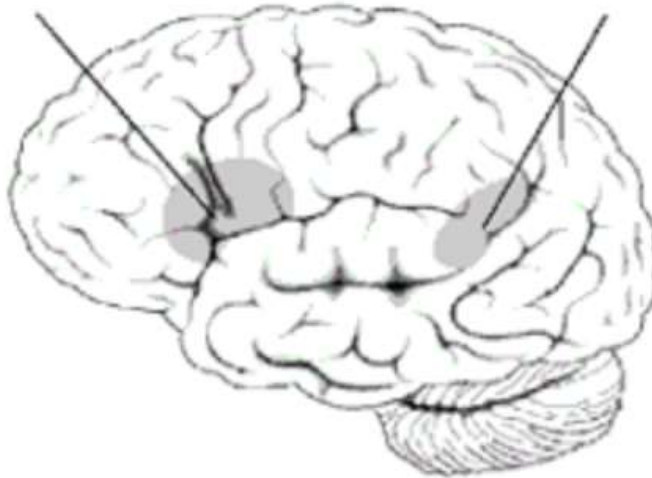
Answer the following questions about neuroplasticity.

1. What are some examples of structural plasticity?
2. What are some examples of functional plasticity?
3. What were the results of the juggling research and how do they demonstrate structural plasticity?
4. How does the research on impoverished and enriched environments demonstrate structural and functional plasticity?
5. How does exercise improve cognitive functioning in mice and humans?

The Specialized Brain Worksheet

Section 5: Specialization in the Cerebral Hemispheres

1. What is cortical localization?
2. Use the image below to identify the language centers of the brain: Broca's and Wernicke's Areas



3. Which area is involved in the production of speech? (Broca / Wernicke)
4. Which area is involved in the understanding spoken and written language? (Broca / Wernicke)

The Specialized Brain Worksheet

Section 5: The Integrated Brain

1. Why was the corpus callosum split in patients with seizures?
2. What effects did this procedure have on these patients?
3. What contributions did Sperry's research have on our understanding of the brain?
4. What did you learn about the research on left-brained and right-brained people? Be sure to read the article [The Truth About the Left Brain Right Brain Relationship](#) on Slate.com.
5. Which concept do the following studies demonstrate – Neuroplasticity, Localization of Function, or the Integrated Brain? Circle the correct answer.

Juggling and Brain Plasticity (page 63) – Neuroplasticity / Localized Function / Integrated Brain

Neurogenesis (page 64) – Neuroplasticity / Localized Function / Integrated Brain

The Story of Phineas Gage (page 68) – Neuroplasticity / Localized Function / Integrated Brain

Broca and Wernicke's Areas (page 73) – Neuroplasticity / Localized Function / Integrated Brain

The Split Brain (page 74 - 76) – Neuroplasticity / Localized Function / Integrated Brain

Left-Brained Right-Brained Research (page 77) - – Neuroplasticity / Localized Function / Integrated Brain