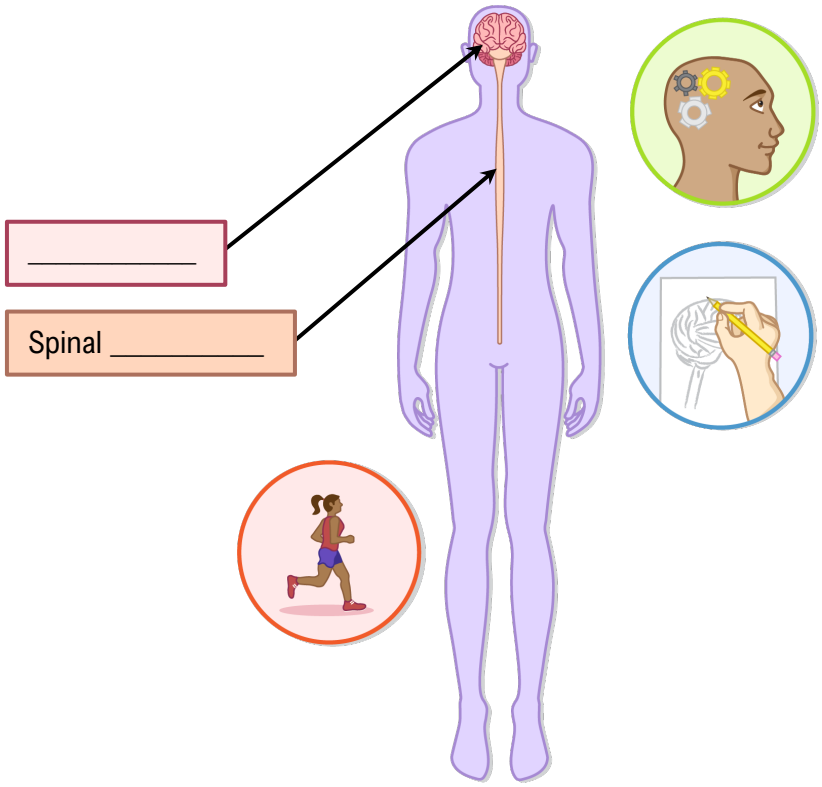
TOPIC: INTRODUCTION TO THE CENTRAL NERVOUS SYSTEM

- The central nervous system (CNS) consists of _____ components:
  1) The _____ 2) The _____ cord
- The CNS functions as the _____ center for the human body.
  - Responsible for almost everything we do, think, and feel.



PRACTICE: Which of the following actions does the central nervous system play a role in?

a) Trying to remember the answer to an anatomy and physiology question.

b) Coordinating your skeletal muscles to catch and throw a ball.

c) Deciding what you want to have for dinner.

d) All of the above.

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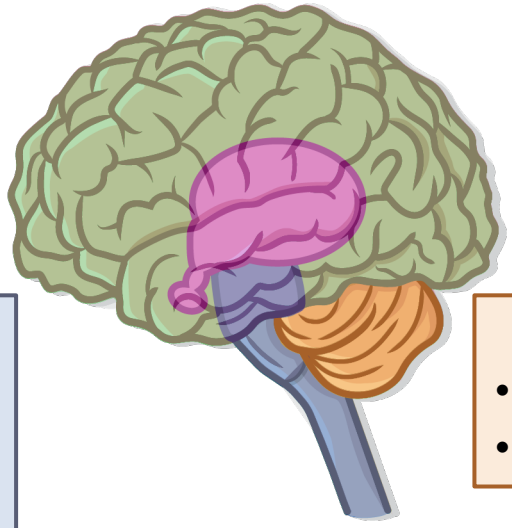
Major Regions of the Brain

- The adult brain can be divided into ____ major regions:

1) _____

- Largest, most anterior part of the brain.



2) Diencephalon

- Central part of the forebrain
- **Consists of** _____, hypothalamus, epithalamus.

3) _____

- Connects cerebrum to _____ cord.
- **Consists of** midbrain, pons, & medulla oblongata.

4) _____

- Structure at the back of the brain.
- Coordinates _____ activity.

EXAMPLE: George just found out that he has a small glioma on his midbrain. In other words, he has a glioma on his _____.

a) Cerebrum.
b) Diencephalon.
c) Brainstem.
d) Cerebellum.

PRACTICE: The diencephalon is _____ to the brainstem and _____ to the cerebellum.

a) Superior, posterior.
b) Superior, anterior.
c) Inferior, anterior.
d) Anterior, posterior.

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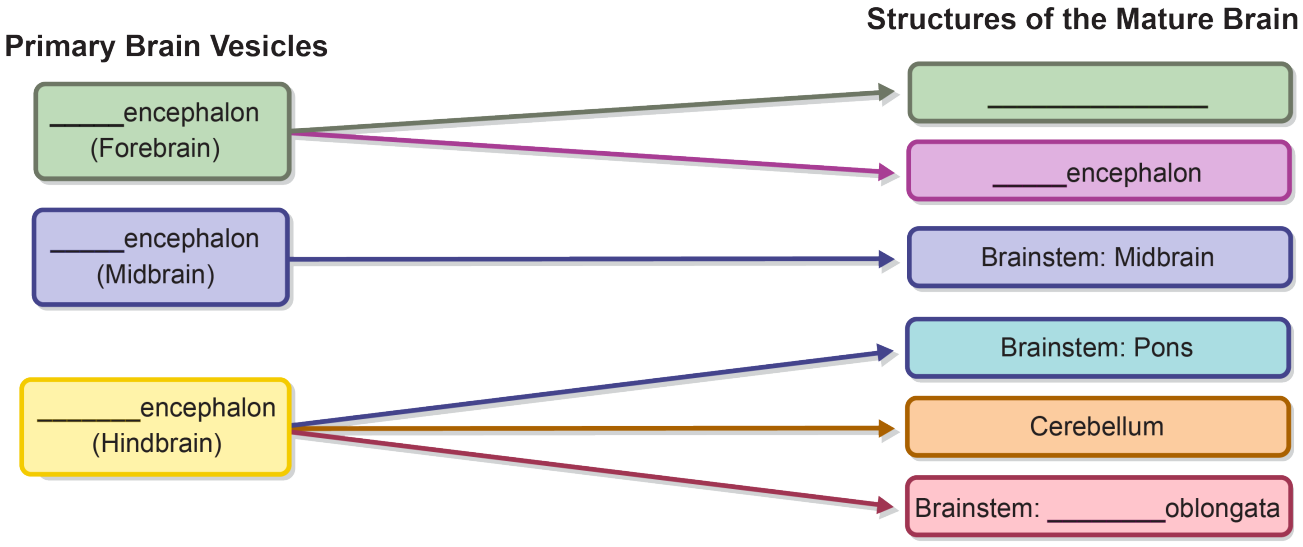
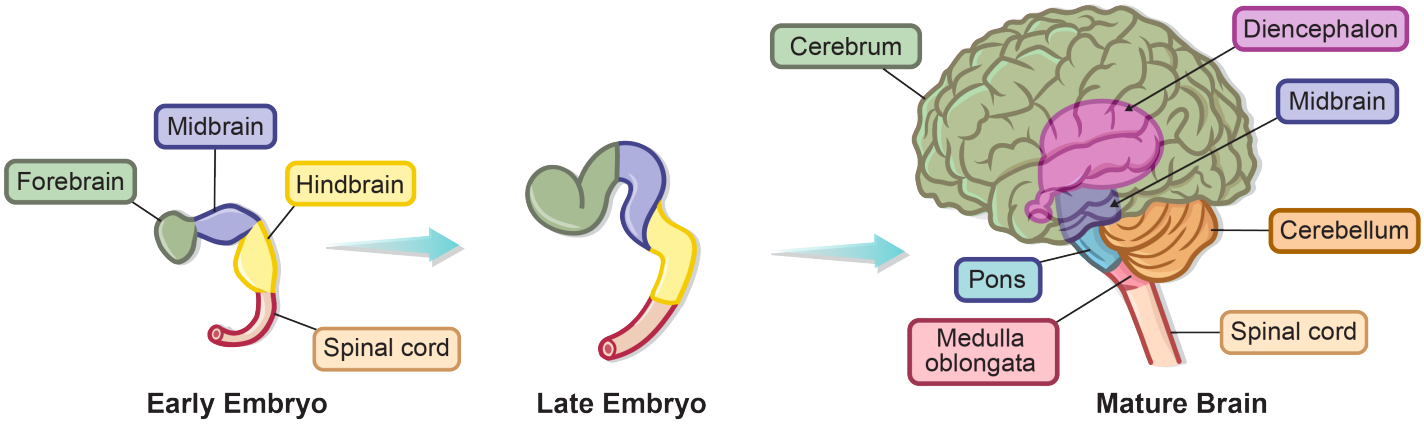
CNS Development

Note: *enchephalo* = brain

- _____ tube: embryonic structure that becomes the CNS.
  - Anterior end expands to form 3 constrictions that mark off the ____ primary brain vesicles.
  - The caudal (inferior) end of the neural tube becomes the _____.





EXAMPLE: Throughout fetal development, the prosencephalon becomes the _____ and the _____.

a) Midbrain and cerebellum

b) Cerebrum and cerebellum

c) Cerebrum and diencephalon

d) Diencephalon and midbrain

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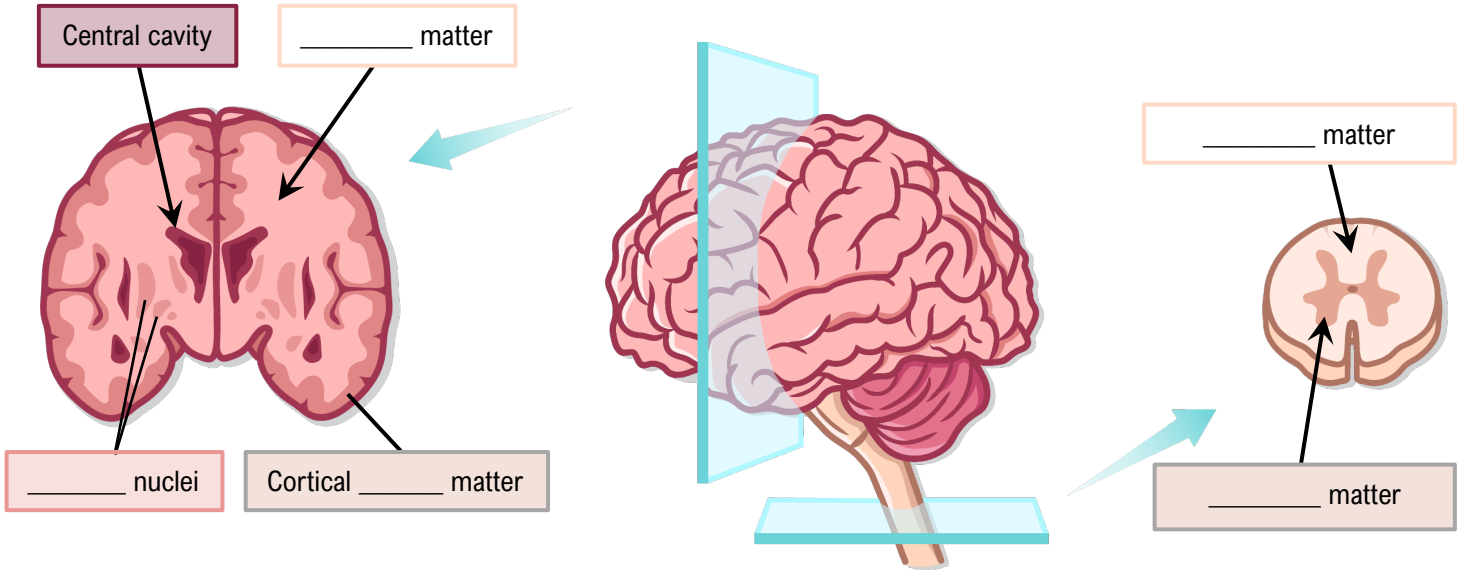
White & Gray Matter

- Nervous tissue making up the brain & spinal cord is composed of ____ types of matter:
  1. **White matter:** mostly myelinated _____.
  2. **Gray matter:** Neuron _____ bodies, dendrites, and nonmyelinated axons.
- **Brain**: Outer layer of gray matter known as the _____; inner layer of white matter.
  - Subcortical clusters of gray matter called _____ nuclei.
- **Spinal Cord**: Outer layer of white matter; inner gray matter.



EXAMPLE: Given that white matter contains more myelinated axons than gray matter, which of these statements about white matter is true?

a) White matter is optimized for transferring signals rapidly throughout the CNS.

b) White matter is optimized for processing incoming visual and auditory signals.

c) White matter is responsible for "decision-making" processes in the brain.

d) White matter is responsible for storing information in the brain.

PRACTICE: Neil says that all cortical areas of the brain are found around the outer edge (or surface) of the brain. Is he correct?

a) No; all cortical areas are found in the central area of the brain.

b) No; some cortical areas are found around the outer edges and some are found in the center of the brain.

c) Yes; the cortex is the brain's outermost layer, composed of gray matter.