



BRAINS!

AND OTHER STUFF

PRIMARY OBJECTIVES:

- To fall in love with your brain and nervous system
- To get some ideas how to use brain science to your advantage
- Gain knowledge that will translate to better artistic work and pedagogy planning
- Totally nerd out

MOST BRAINS FOLLOW THE SAME ORGANIZATIONAL STRUCTURE

Two hemispheres

Forebrain

Midbrain

Brain Stem

Spinal Cord

All of this is the Central Nervous System
(CNS)

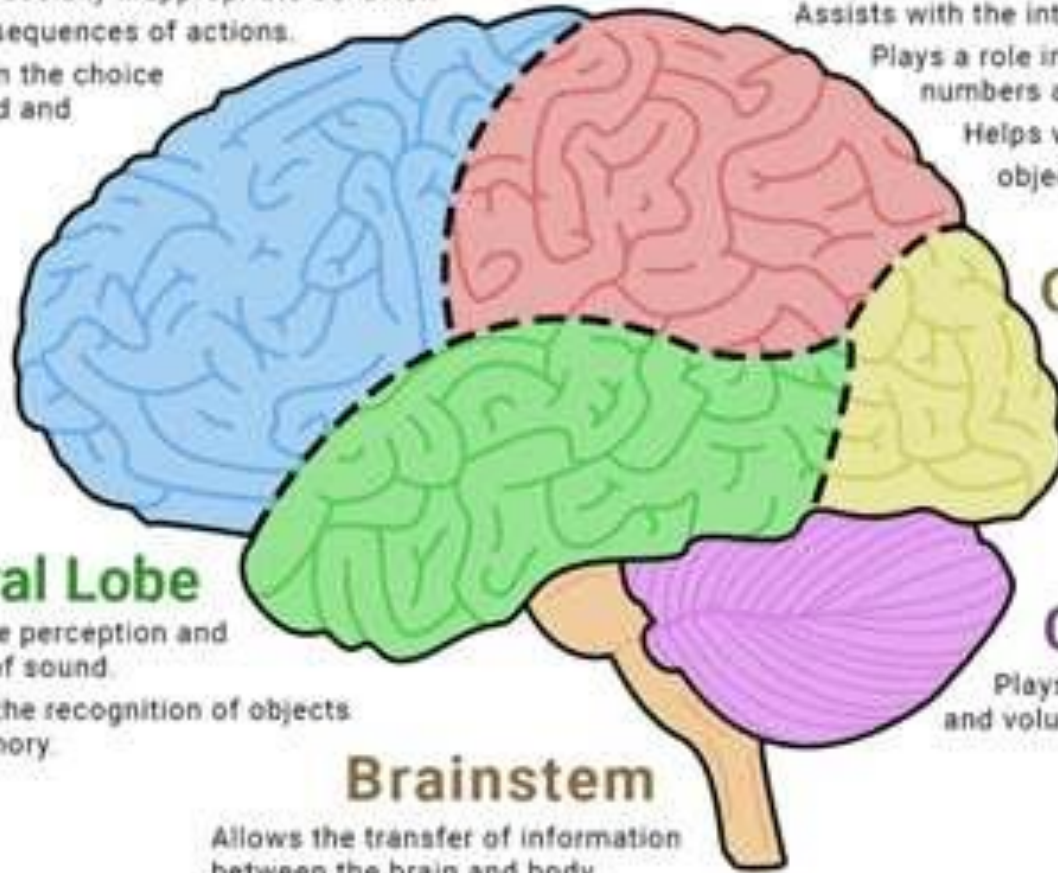


Frontal Lobe

Suppresses socially inappropriate behavior.
Predicts consequences of actions.
Plays a role in the choice between good and bad actions.

Parietal Lobe

Assists with the interpretation of touch.
Plays a role in the knowledge of numbers and their relationships.
Helps with the understanding of objects, shapes, and space.



Occipital Lobe

Processes and makes sense of visual information.

Temporal Lobe

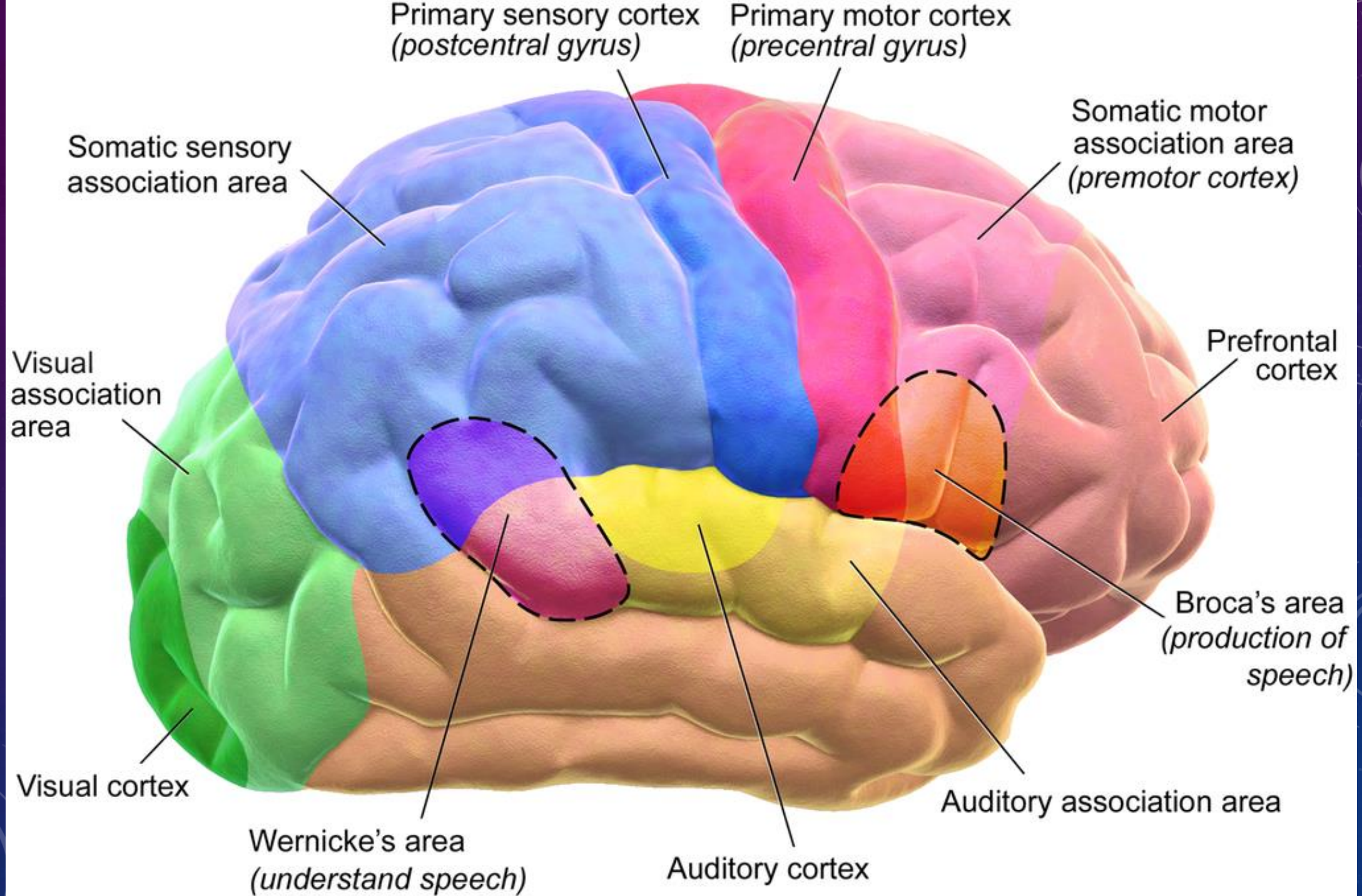
Assists with the perception and interpretation of sound.
Plays a role in the recognition of objects and visual memory.

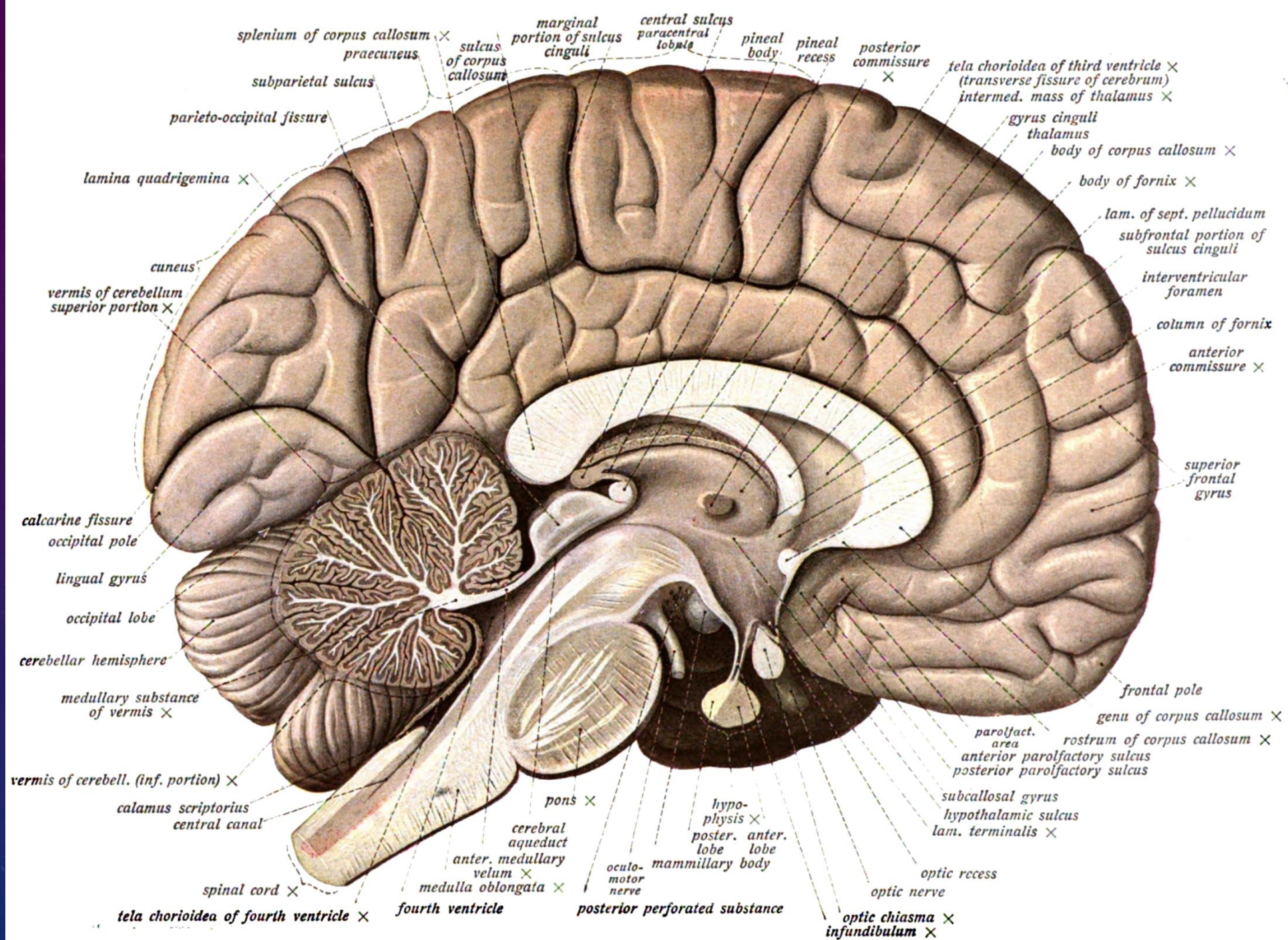
Cerebellum

Plays a major role in balance and voluntary motor skills.

Brainstem

Allows the transfer of information between the brain and body.
Plays a role in automatic functions such as the heartbeat and breathing.





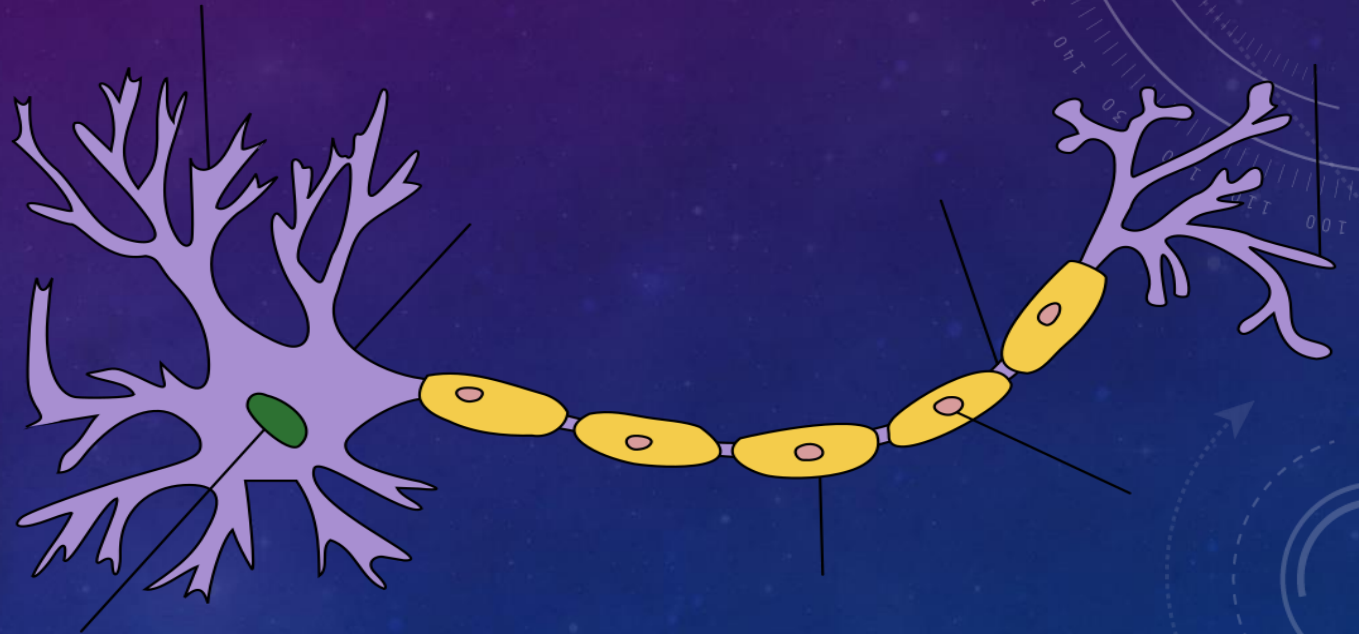
THE NERVOUS SYSTEM

But not really THAT kind of nervous.



NEURONS

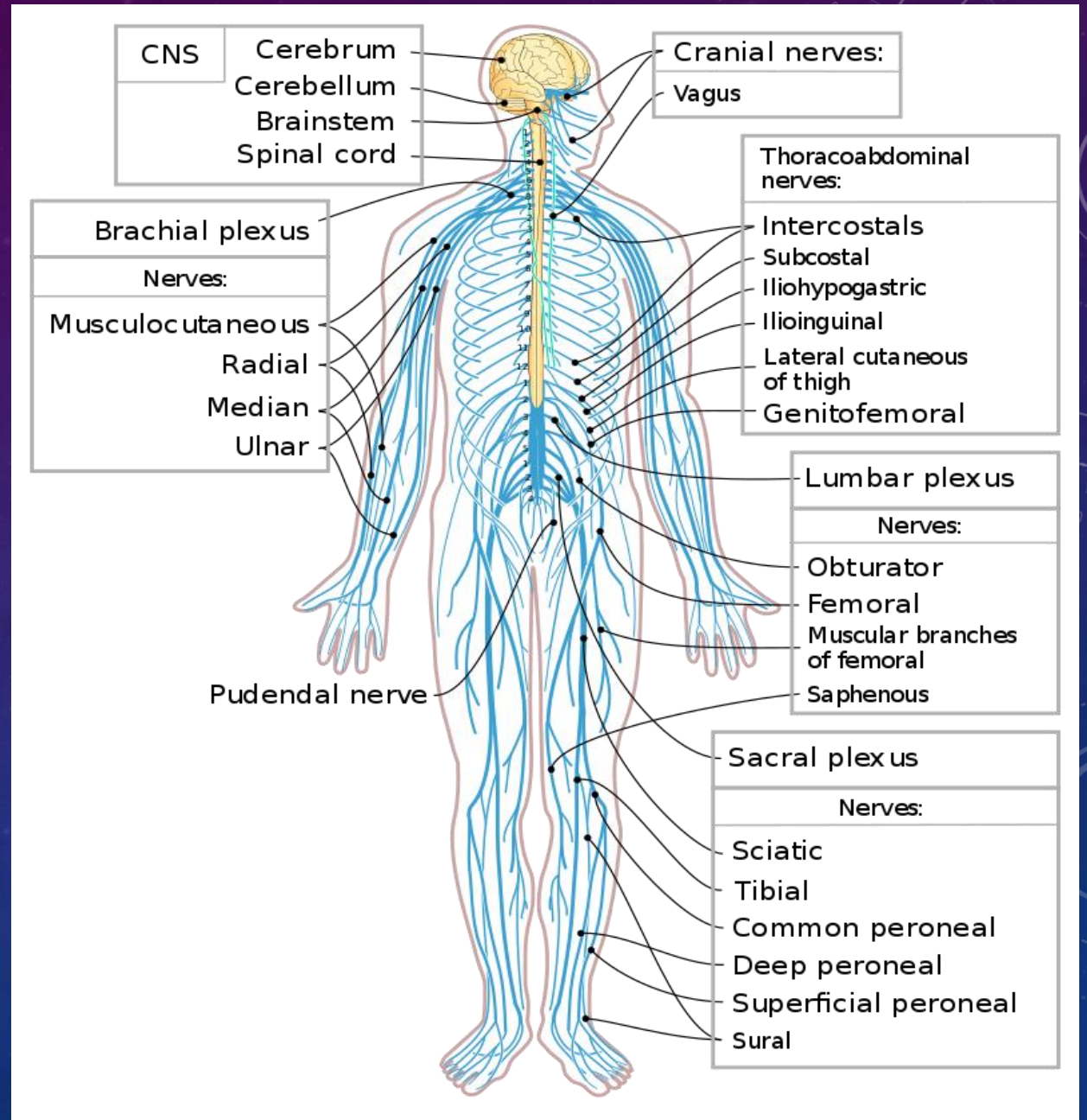
- Also called a nerve cell
- Transmits electrical signals
- Chemicals jump from the axon terminal to the next neuron's dendrites
- Neurons can be different lengths
- Supported by glial cells



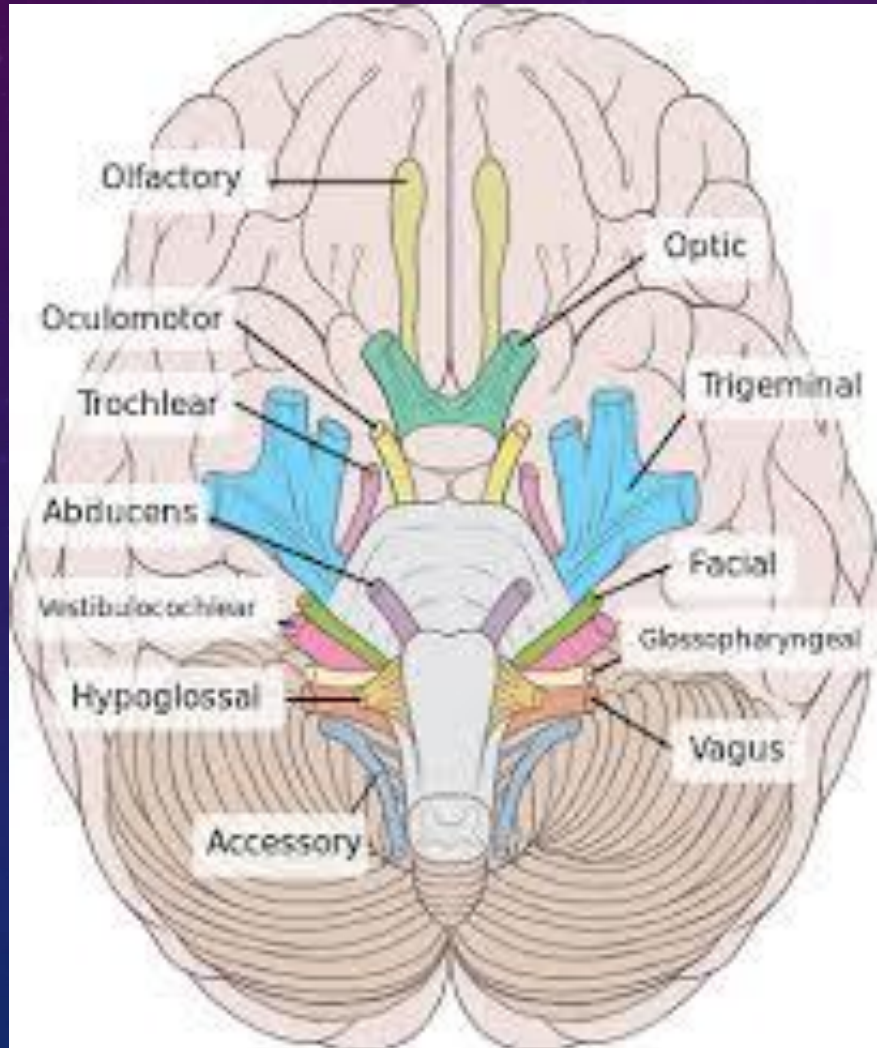
THE SPINAL CORD

Nerves decussate in the brain and then travel down into the body.

This is the Peripheral Nervous System (PNS)



CRANIAL NERVES



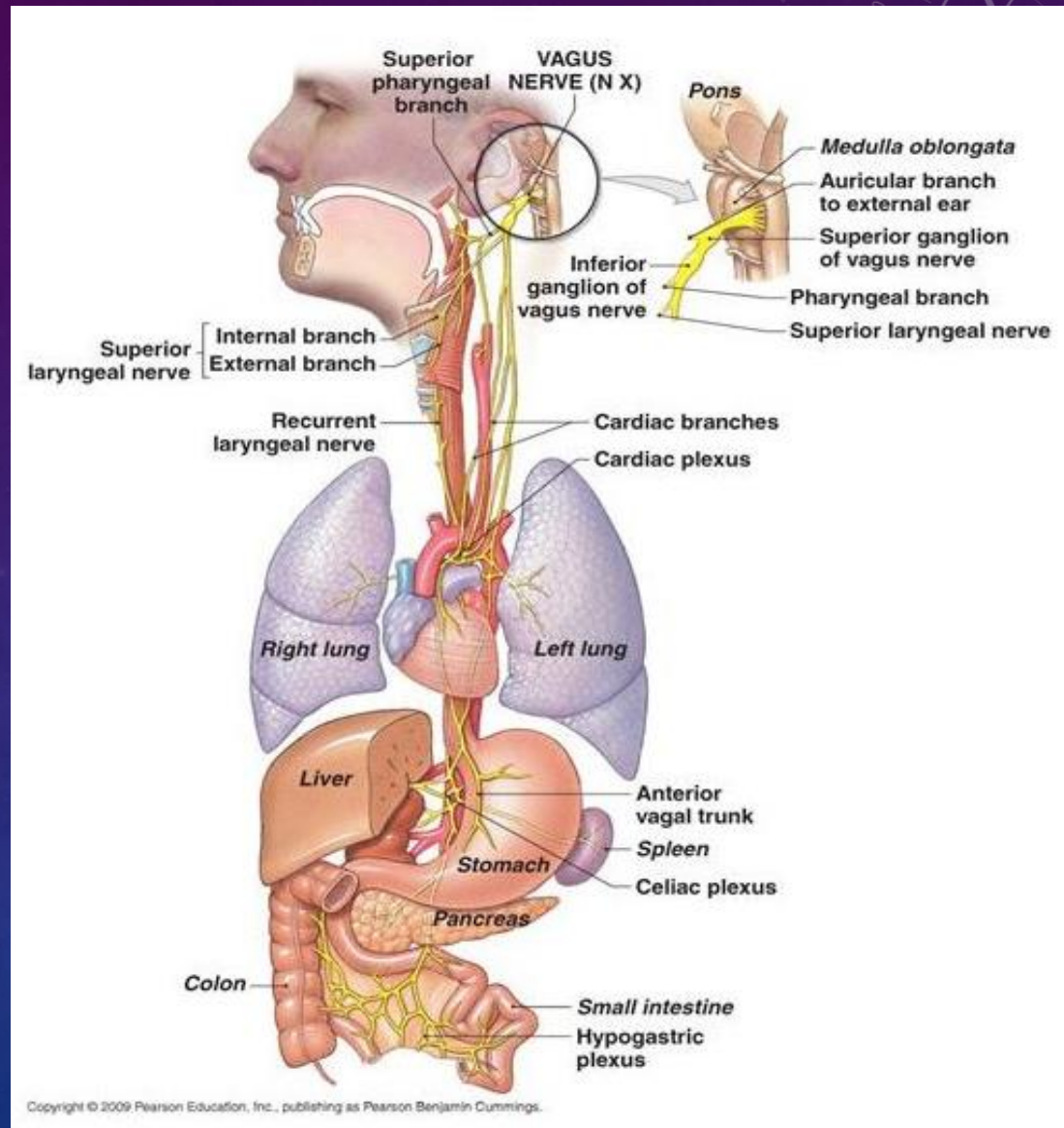
- I Olfactory
- II Optic
- III Oculomotor
- IV Trochlear
- V Trigeminal
- VI Abducens
- VII Facial
- VIII Vestibulocochlear
- IX Glossopharyngeal
- X Vagus
- XI Accessory
- XII Hypoglossal

VAGUS NERVE (CN X)

Longest nerve in the body

Latin name means “wanderer” or “vagabond”

Mixed functions, mostly sensory, but motor functions are VERY important





WHAT DOES IT ALL MEAN?

AND WHY SHOULD I CARE?

I'M GLAD YOU ASKED

- Understanding nerve function can help you better predict and manage how your body will react to stimuli, and also how your clients may react
- Knowing how your body works can empower you to make good decisions and advocate for your health
- Knowing how brains work can help you make plans that will work with your clients' brains instead of using wishful thinking
- Brains change with age and sometimes through outside forces like injury or illness, but these folks still can be singers and deserve good teaching
- It helps you to know YOU better! And that can make you a more empathetic teacher.

TYPES OF KNOWLEDGE

- Language: talking it out
- Schemata: “theme-ata,” organizing information into categories
- Procedural knowledge: how to do stuff in the right order

THREE ELEMENTS REQUIRED FOR LEARNING

- Time
- Repetition
- Sleep

TIME

- Allows for the brain to engage in “target practice”
- Lays down neuronal connections
- Experimentation
- Wonky stage
- We are amateurs
- Lack of consistency

REPETITION

- After the initial neural pathways are laid down, the brain then works to find the most efficient and consistent pathway
- Non-helpful neural pathways are eliminated
- The best neural pathways are strengthened
- “Muscle memory”
- We don’t have to think as hard to get the same results
- We move from amateur to more experienced status
- Neural activity may actually slow down because we are using established pathways to complete tasks

TARGET PRACTICE

- As we try new things, time is needed for the brain to figure out what works, what doesn't, and which neural pathway is the most efficient.
- Time and repetition are essential for “human-compatible learning”



SLEEP

- During sleep, the brain moves things from short term and working memory into long term memory
- This is an essential part of the process and should not be skipped
- Good sleep hygiene is also good singing hygiene
- Younger brains and older brains need more sleep to function, much less to remember things