EXPLORING THE BRAIN AND COMMUNICATION

MEDMD: WEEK 5

AGENDA

01 What is the Nervous System?

02 The Brain

03 The Lobes

04 The Spinal Cord

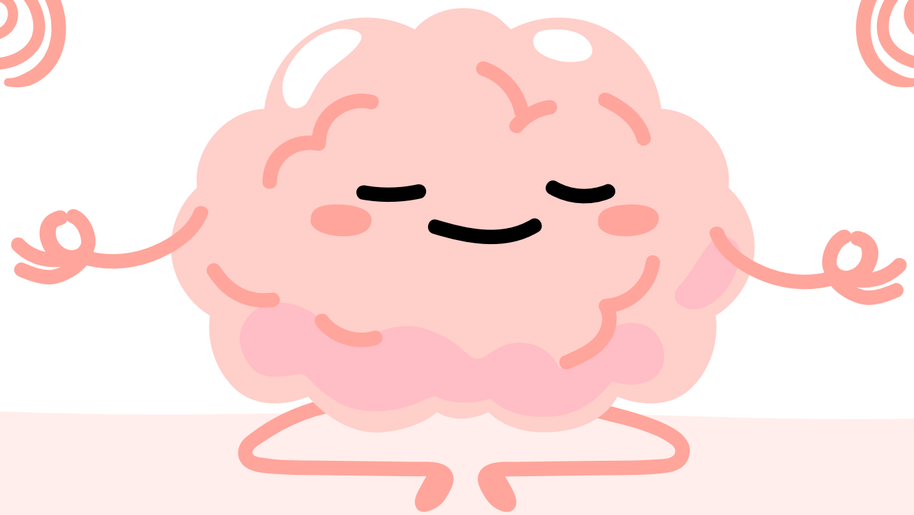
05 Neurons and Nerves

06 Different Neurons

07 Reflexes

08 Quizizz Recap

What does your brain help you do everyday?



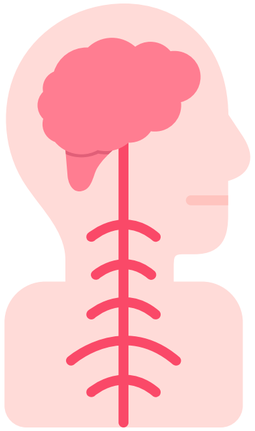
WHAT IS THE NERVOUS SYSTEM?

- The body's control and communication system
- Controls thinking, breathing, movement, sensing the world

THE TWO BIG MAIN PARTS

CENTRAL NERVOUS SYSTEM (CNS)

Brain + Spinal Cord
Controls most functions of body and mind



PERIPHERAL NERVOUS SYSTEM (PNS)

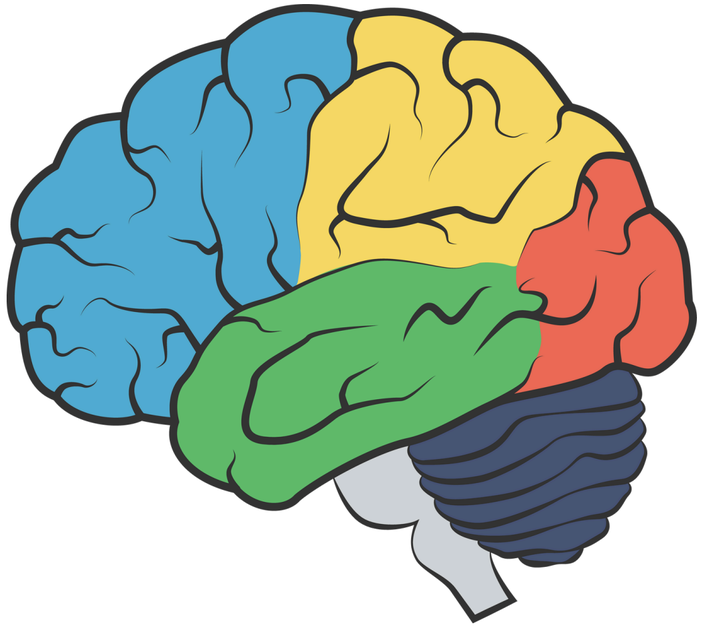
Nerves that branch to the body
Sends messages to/ from CNS & body

SORT: CNS, PNS, BOTH?

- You touch a hot stove and pull your hand away.
- You decide to raise your hand in class.
- Your heart keeps beating while you sleep.
- Your eyes see a ball flying at you.
- You wiggle your toes.
- You feel a bug crawling on your arm.

WHAT IS THE BRAIN?

- Helps you think, feel, move, and remember
- Works 24/7, even when you sleep!
- Sends and receives millions of messages every second from the rest of your body
    - Like a video game controller
- Protected by your skull and cushioned by a fluid



CEREBRUM

- Largest part of the brain
- Made of lobes with different jobs:
  - Frontal 🧠
  - Parietal ✋
  - Temporal 👂
  - Occipital 👁️

FRONTAL LOBE

- Located behind the forehead
- Responsible for:
  - Decision-making
  - Planning
  - Personality
  - Voluntary movement

PARIETAL LOBE

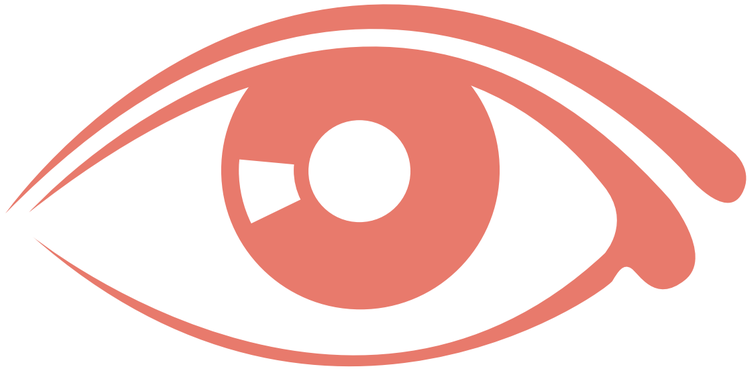
- Processes touch, pressure, pain
- Helps you know where your body is in space
- Optional activity: touch your other hand and try guessing where you think it is

TEMPORAL LOBE

- Regulates sound and memory
- Near your ears
- Handles hearing, memory formation, and language

OCCIPITAL LOBE

- Located at the back of the head
- Main goal is processing vision
- Controls and has a role in color, light, shape, and motion
- Damage can cause visual motion even if the eyes work properly



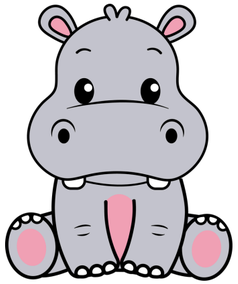
MATCH THE LOBE WITH ITS PURPOSE

Occipital	• Regulates sound
Frontal	• Regulates vision
Temporal	• Regulates touch
Parietal	• Regulates personality

MORE BRAIN AREAS

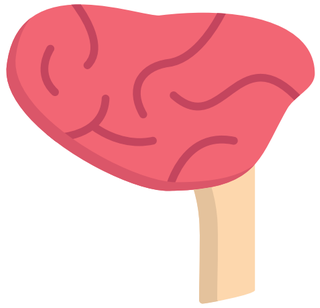
HIPPOCAMPUS

Deep inside the temporal
Memory formation
Connecting emotions and senses to memories
Active during dreaming and sleep consolidation



CEREBELLUM

Located at the base of the brain (under cerebrum)
Balance
Posture
Coordination
Fine motor skills

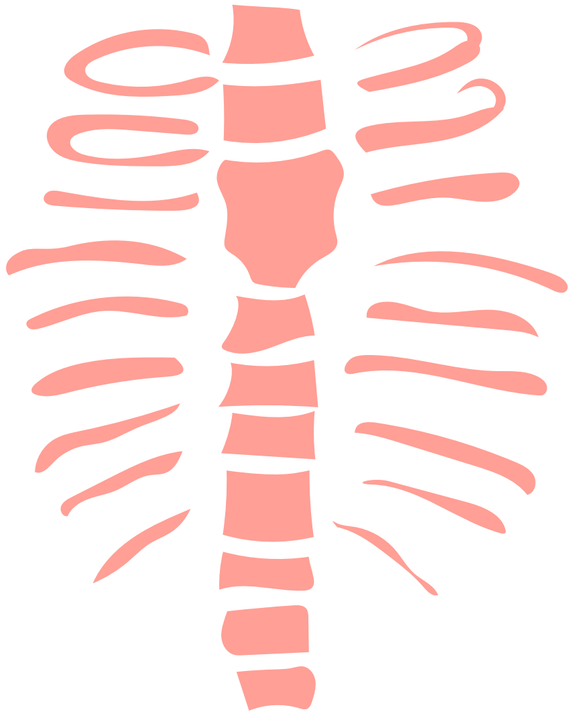


BRAIN STEM

Connects the brain to the spinal cord
Controls automatic life functions
Breathing, Heartbeat, Digestion, Swallowing

THE SPINAL CORD

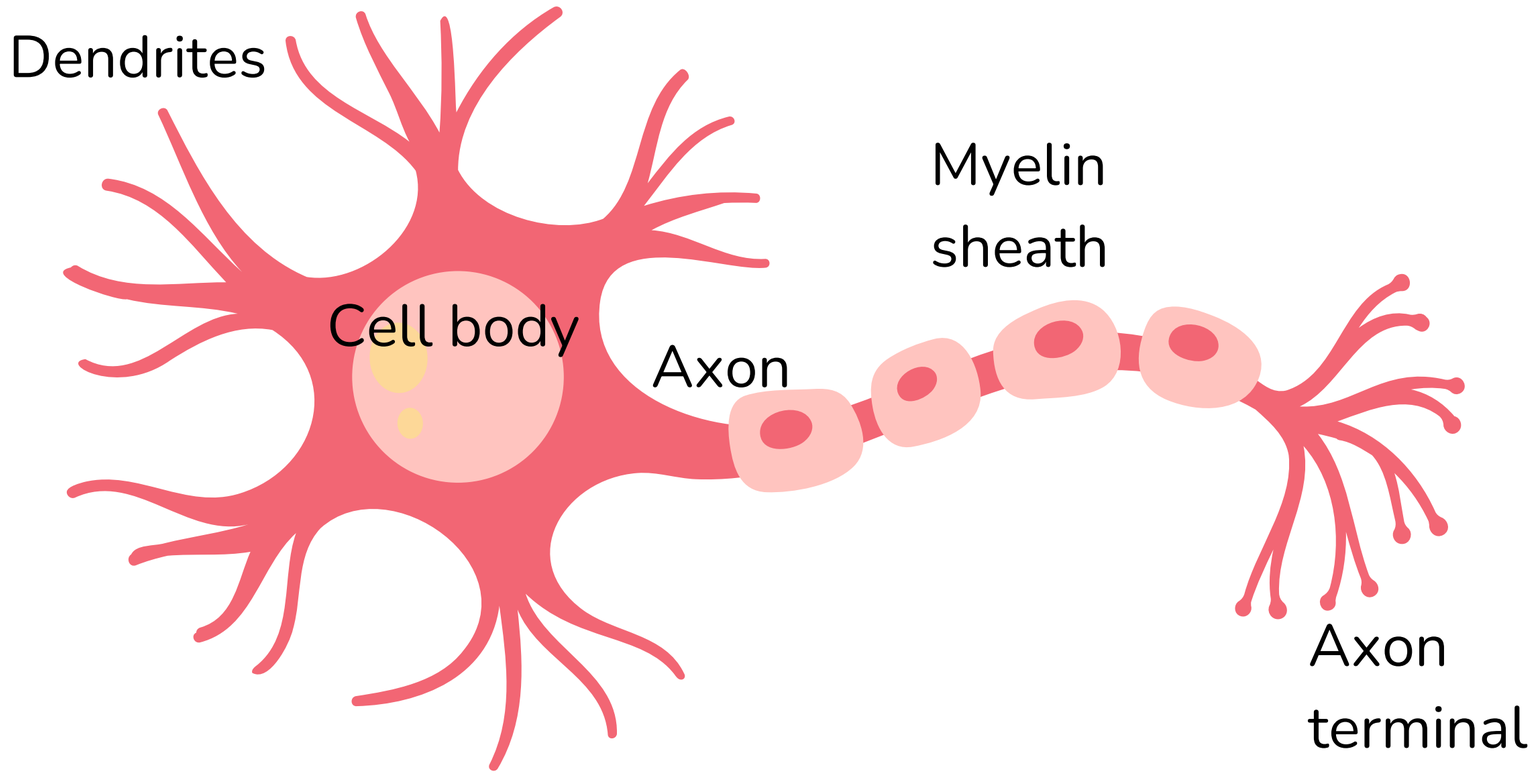
- A thick bundle of nerves protected by the spine
- Carries information:
  - To the brain (sensory info)
  - From the brain (motor commands)
  - Responsible for reflex actions



NERVES AND NEURONS

- Nerves are bundles of neurons (nerve cells)
- Neurons use electrical impulses and neurotransmitters to send signals quickly
- Sensory neurons: From body to CNS
- Motor neurons: From CNS to muscles/glands

NEURON STRUCTURE



MOTOR VS. SENSORY NEURONS

SENSORY

Carry messages from senses to brain

MOTOR

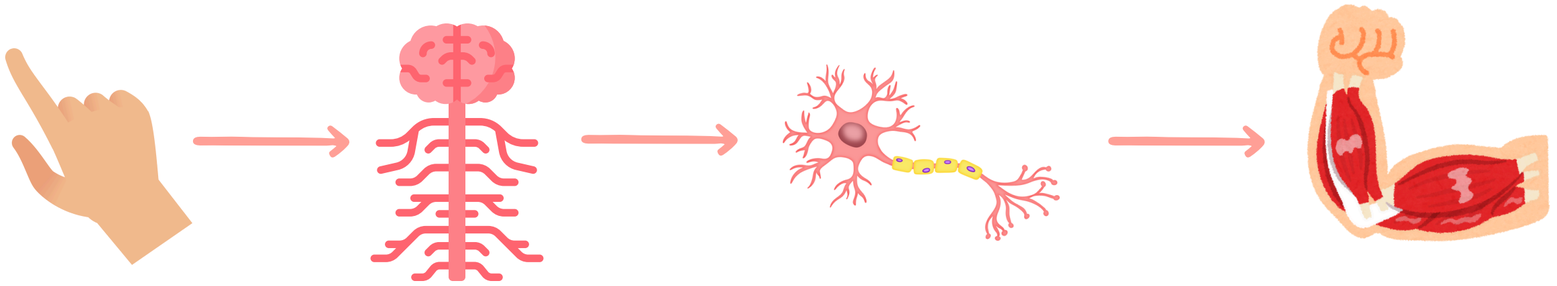
Carry messages from brain to muscles

SENSORY PROCESSING

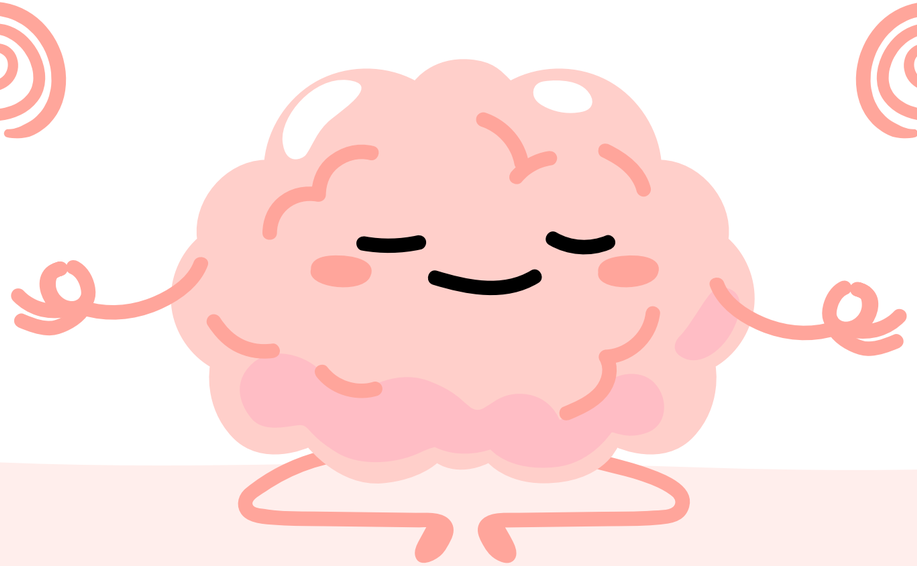
- Sensory organs (eyes, ears, skin, nose, tongue) detect stimuli
- Sensory neurons carry data to CNS
    - Brain interprets and decides on action

REFLEX ARC

- A reflex is a quick, automatic response to danger
- Bypasses the brain for speed!
- Example: Pulling hand from hot stove



What’s a reflex versus a voluntary action?



DIFFERENCE

- Reflexes are by spinal cord, instant
  - Name an example
- Voluntary actions are by brain and are slower such as typing or talking
- Reflexes protect us from harm
- They’re involuntary for speed/safety

Neuron Flow Acting Challenge (6 students)

ANY QUESTIONS?