

Nervous System



Your brain, spinal cord, nerves, and you

4/20/12

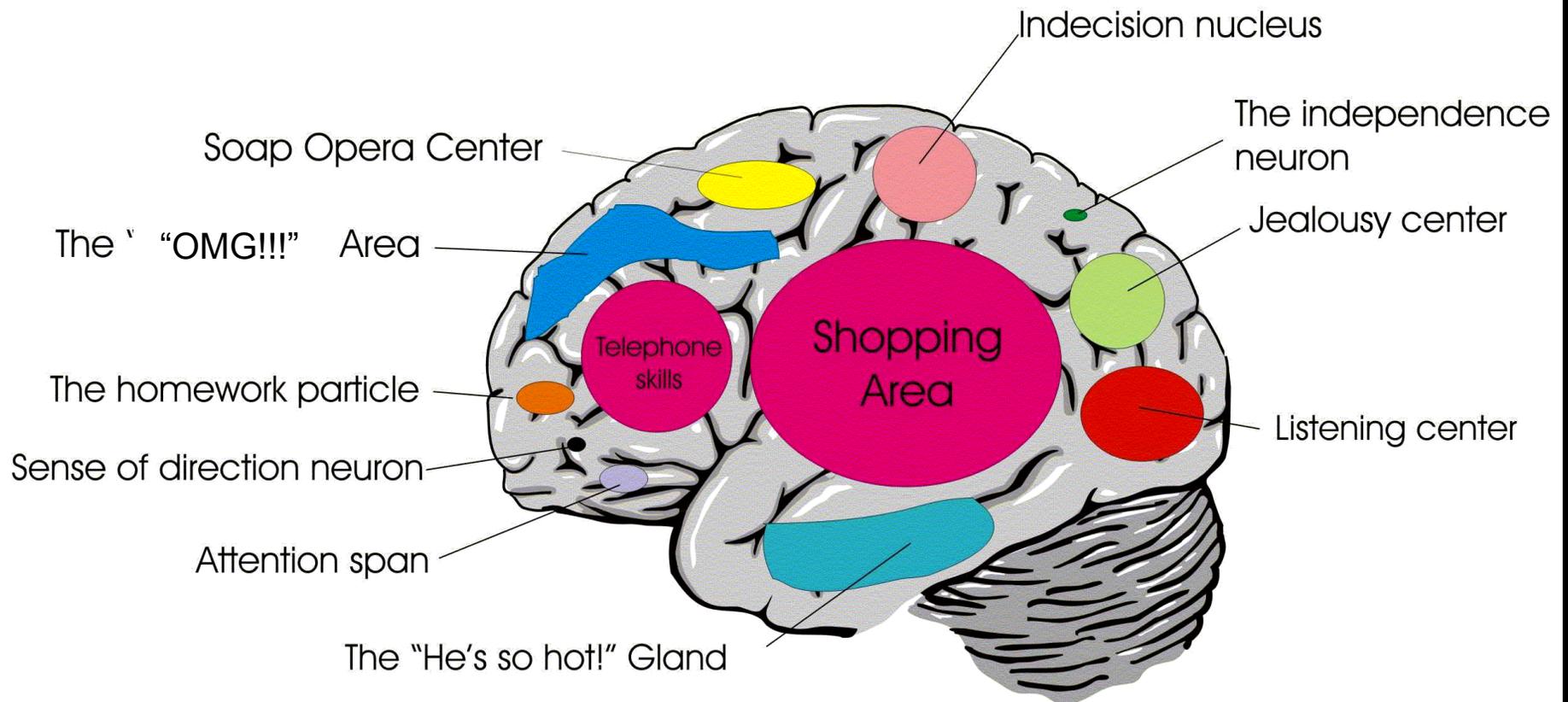
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Today's Warmup

- Scientists have recently developed a new brain scan that shows the specific parts of a middle-school student's brain... both male and female...
- **Be prepared to be amazed!**
- (Note: Neither brain shown actual size...)

The Middle-School Girl's Brain

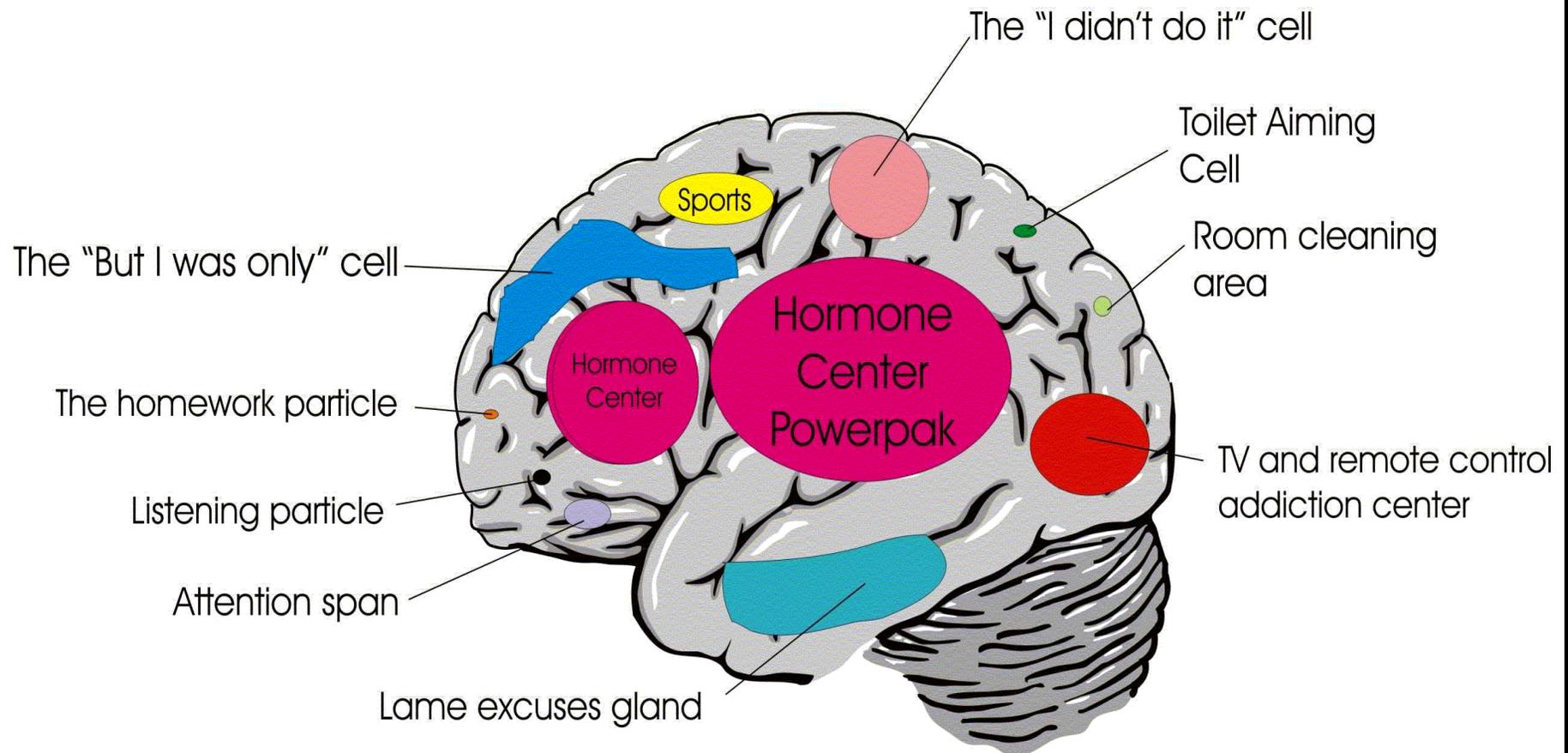
Brain of a Female Middle School Child



Footnote: The "You can tell me; I won't tell anyone else!" Gland was too large to put on this diagram because it obscures everything else.

The Middle-School Boy's Brain

Brain of a Male Middle School Child



Today's Objectives

- 5 Senses Thought Questions...
- ***Nervous System***
 - *Parts*
 - *Functions*
- ***Central and Peripheral nervous system***
- ***Somatic and Autonomic nerves***
- ***Reflexes***
- Nervous System BrainPop



Human Body Systems: Nervous System



Questions

Vocabulary words

Formulas

Main Ideas

Possible Test Questions

Key Words

Notes

Summary of the notes and information learned

5 Senses Thought Questions

- Your senses: sight, hearing, smell, touch, and taste are directly connected to your nervous system, and all are important...
- Which of these 5 would you be most willing to give up? Why
- Which of these 5 would you be least willing to give up? Why
- Rank them from 1 to 5 (with 1 most important to you)

Vocabulary to Know

- Homeostasis
 - The regulation of steady, life-maintaining conditions inside an organism, despite changes in its environment... (keeping the body in balance)
 - Examples: body temperature, blood-sugar concentration, water/salt concentration

Vocabulary to Know

- Stimulus
 - Any change (inside or outside the body) that brings about a response
 - Examples: bright light causes you to squint, a hot object causes you to pull back, dust causes you to sneeze

Major Parts of the Nervous System

- Brain- the main control center
- Spinal Cord- the main highway
- Nerves (Neurons)- the signal carriers

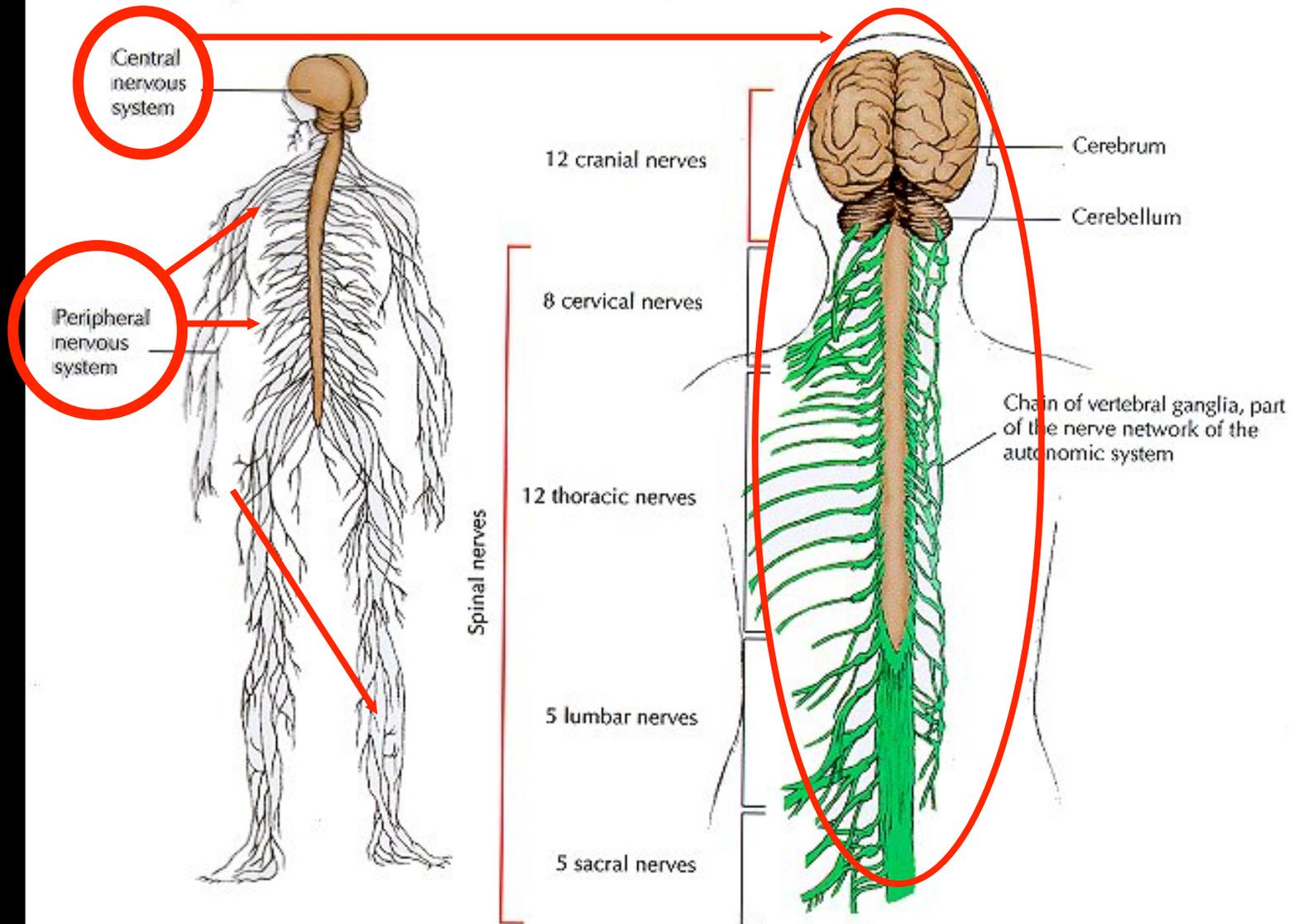
Major Functions of the Nervous System

- **Sensory Input**- gathering information about the world around you via your senses
- **Integration**- the interpretation and understanding of the signals sent from the senses; the brain “makes sense” of those signals
- **Motor Output**- the brain sends a response out

Nervous System

- The nervous system can be divided into two main segments
- Central Nervous System (CNS)
- Peripheral Nervous System (PNS)

The Central and Peripheral Nervous Systems



Central Nervous System- The Brain

- Coordinates body activities
- Made up of approximately 100 billion neurons (nerve cells)
- Divided into three major parts-
 - the cerebrum
 - the cerebellum
 - the brain stem

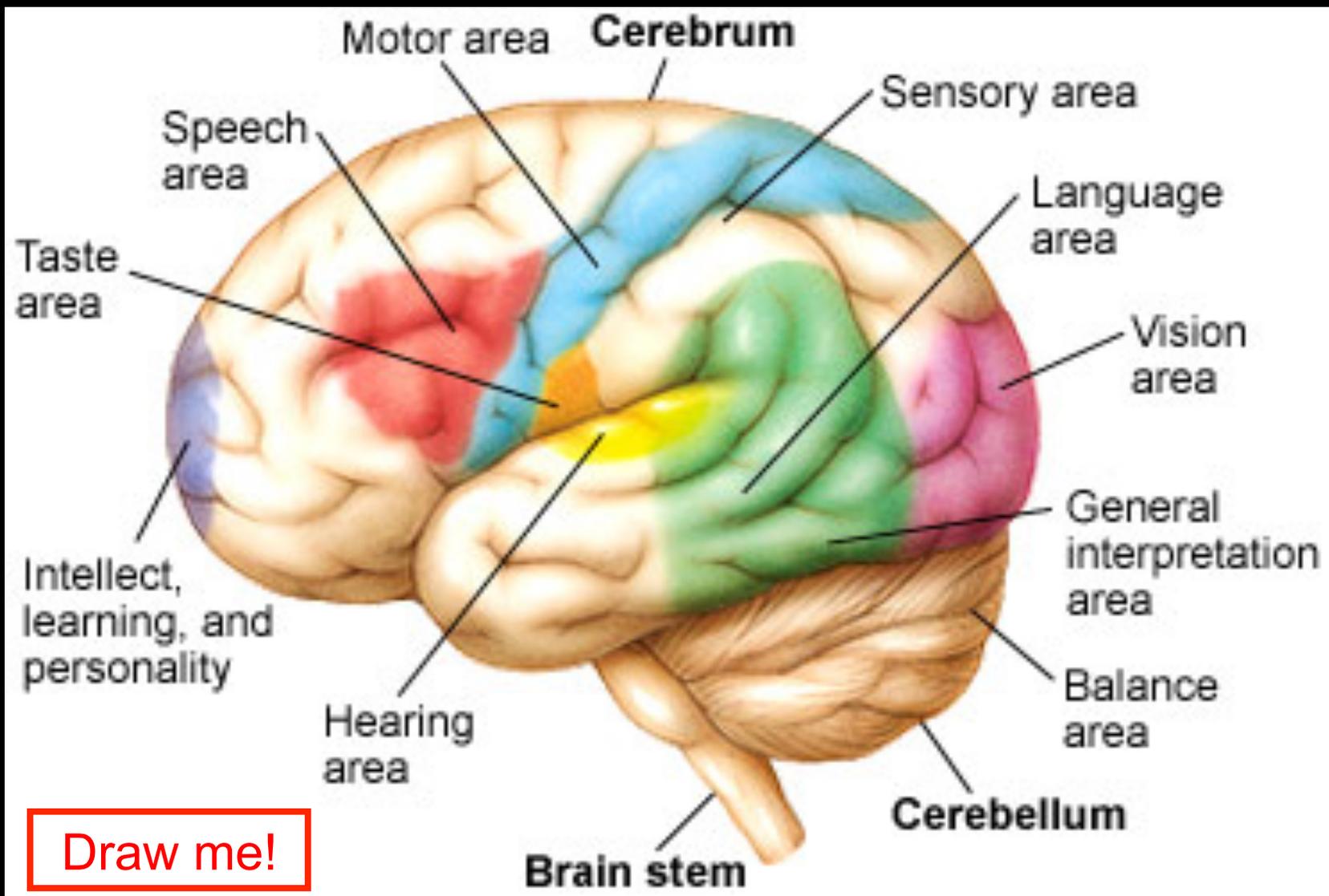


The human brain

Photograph by Fred Hossler/Getty Images

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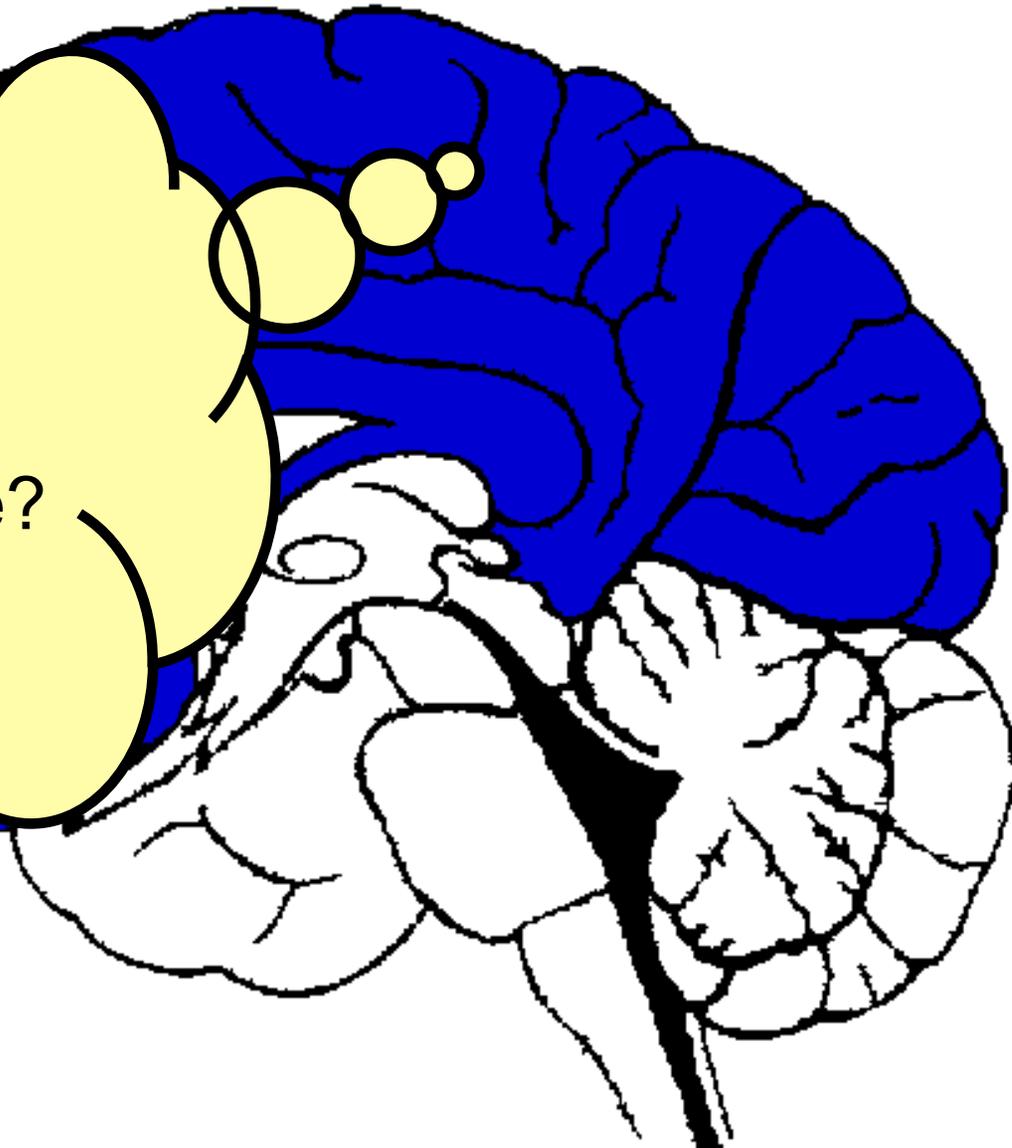


Cerebrum: The Brain

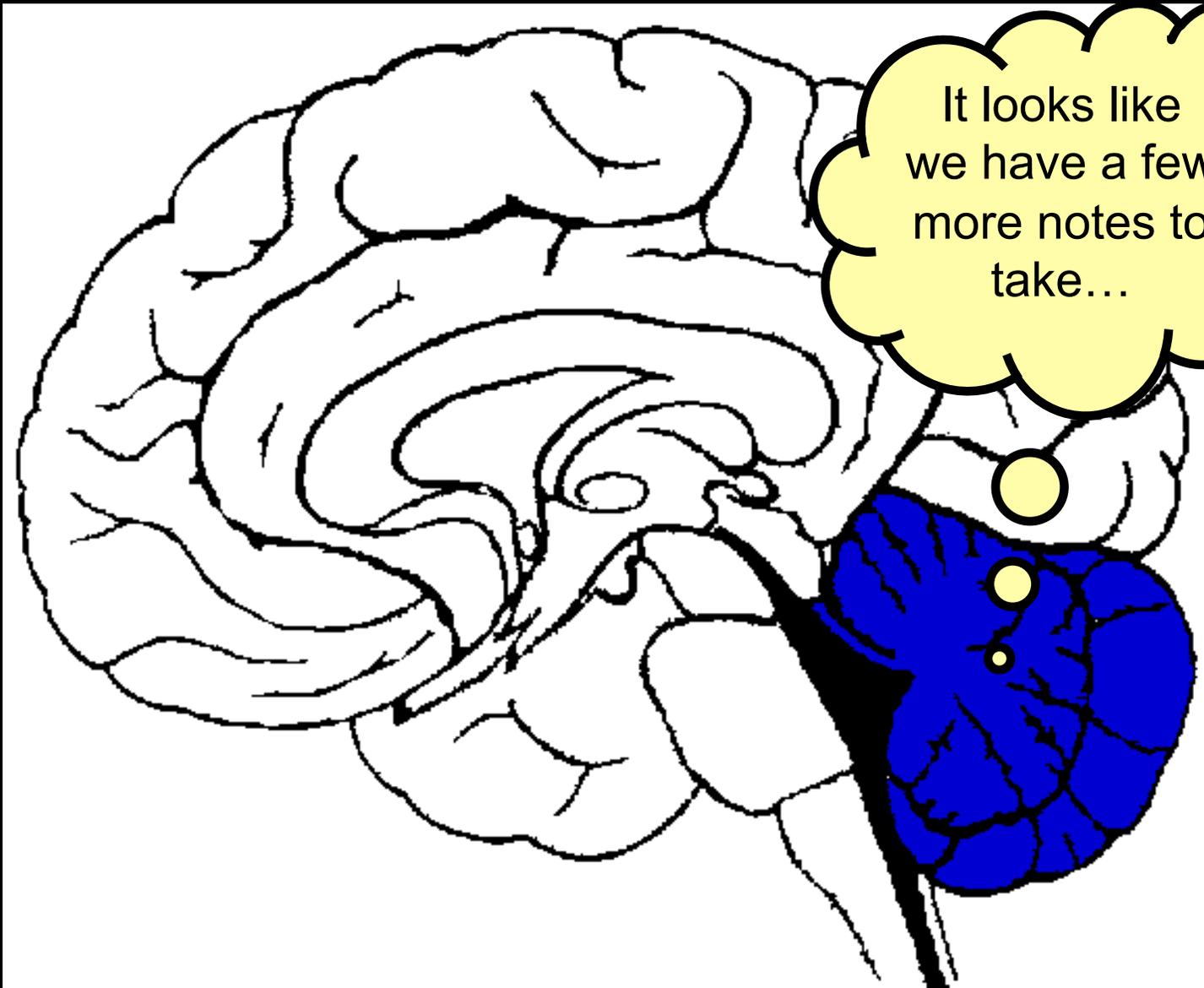
Who am I?

What is the
meaning of life?

What's for
lunch?

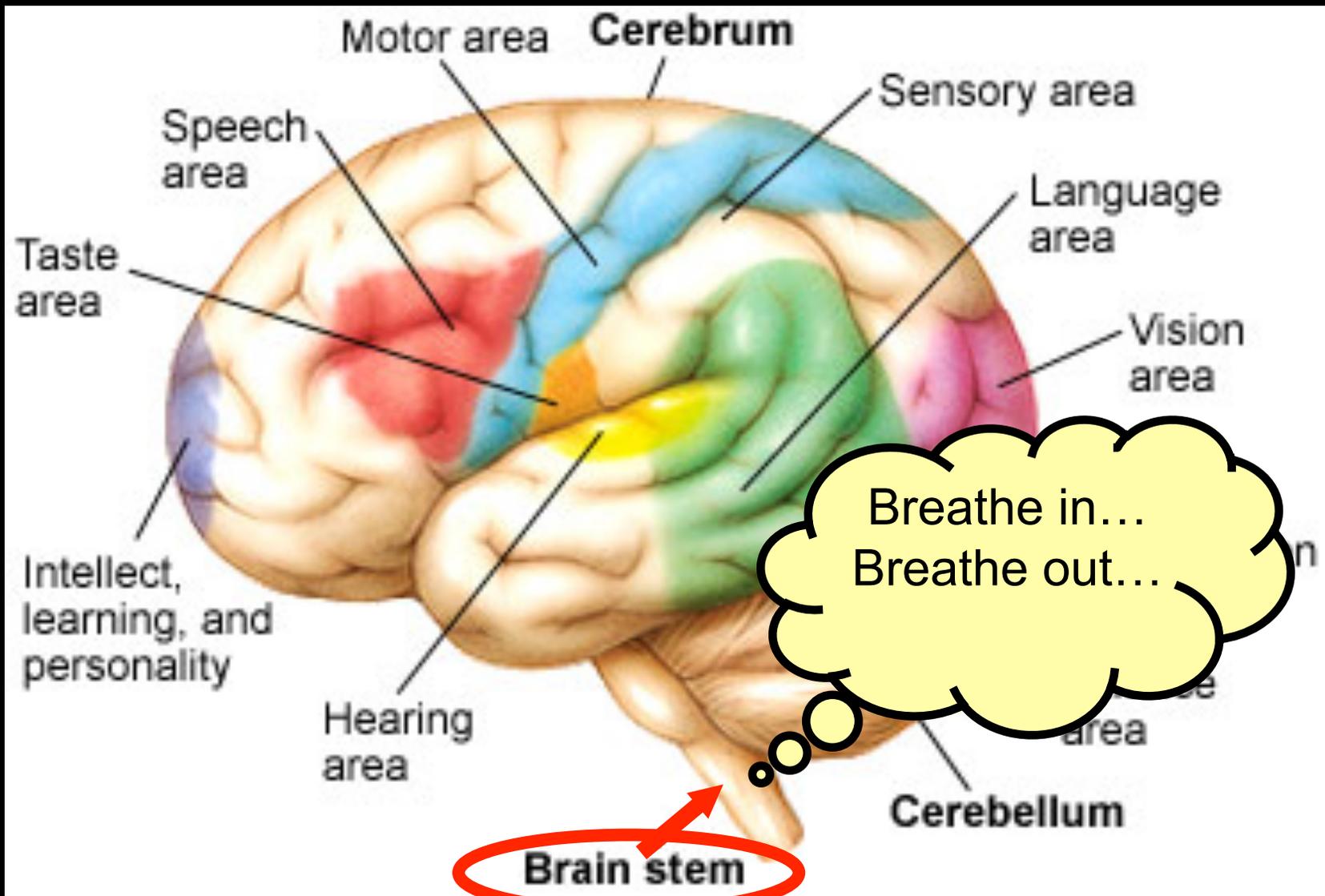


Cerebellum: The Brain



It looks like
we have a few
more notes to
take...

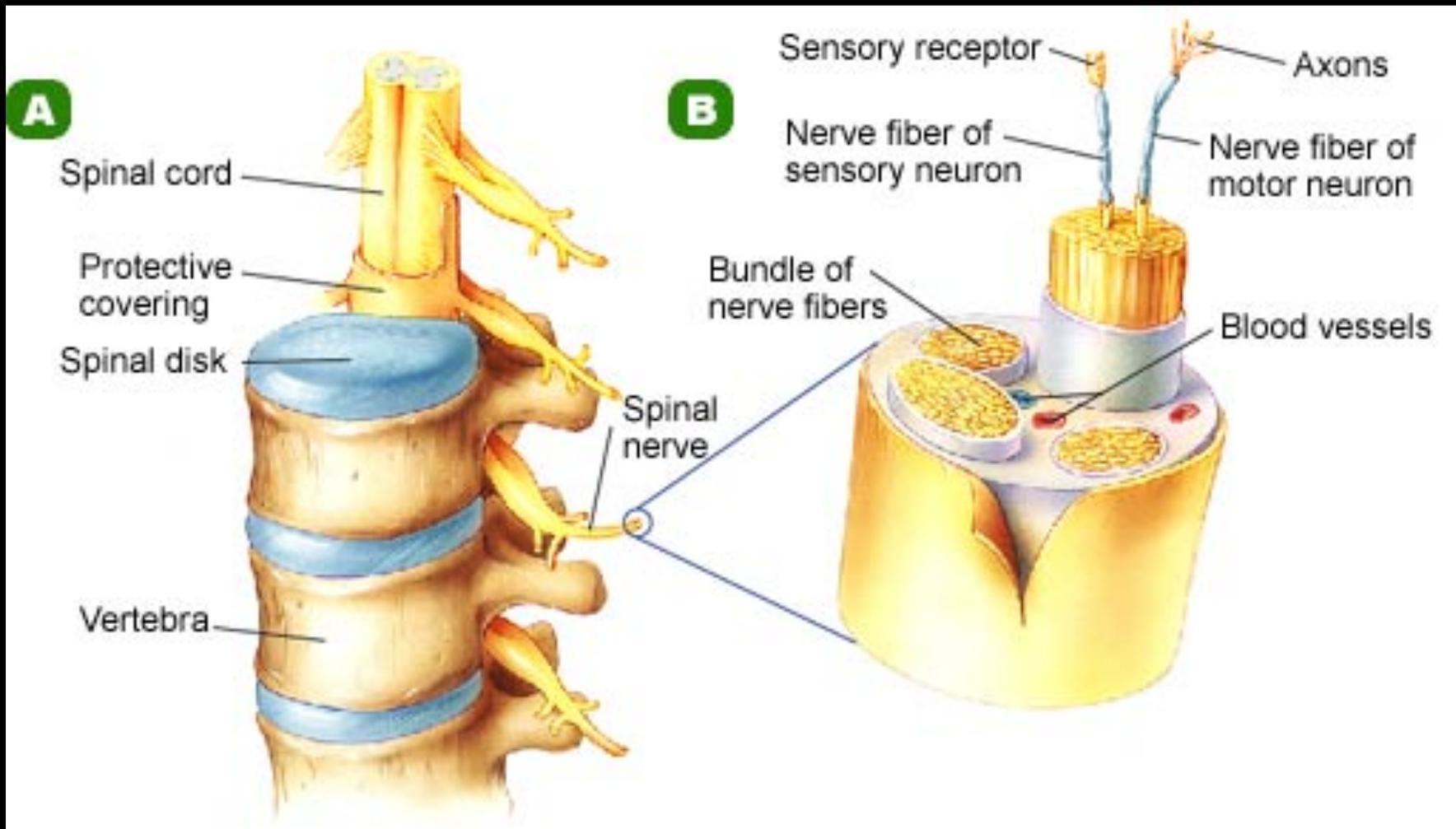
Brain Stem: The Brain



Central Nervous System-The Spinal Cord

- The “main cable”
- Extension of the brain stem
- Bundles of neurons that carry impulses from all parts of the body to the brain and from the brain to all parts of your body

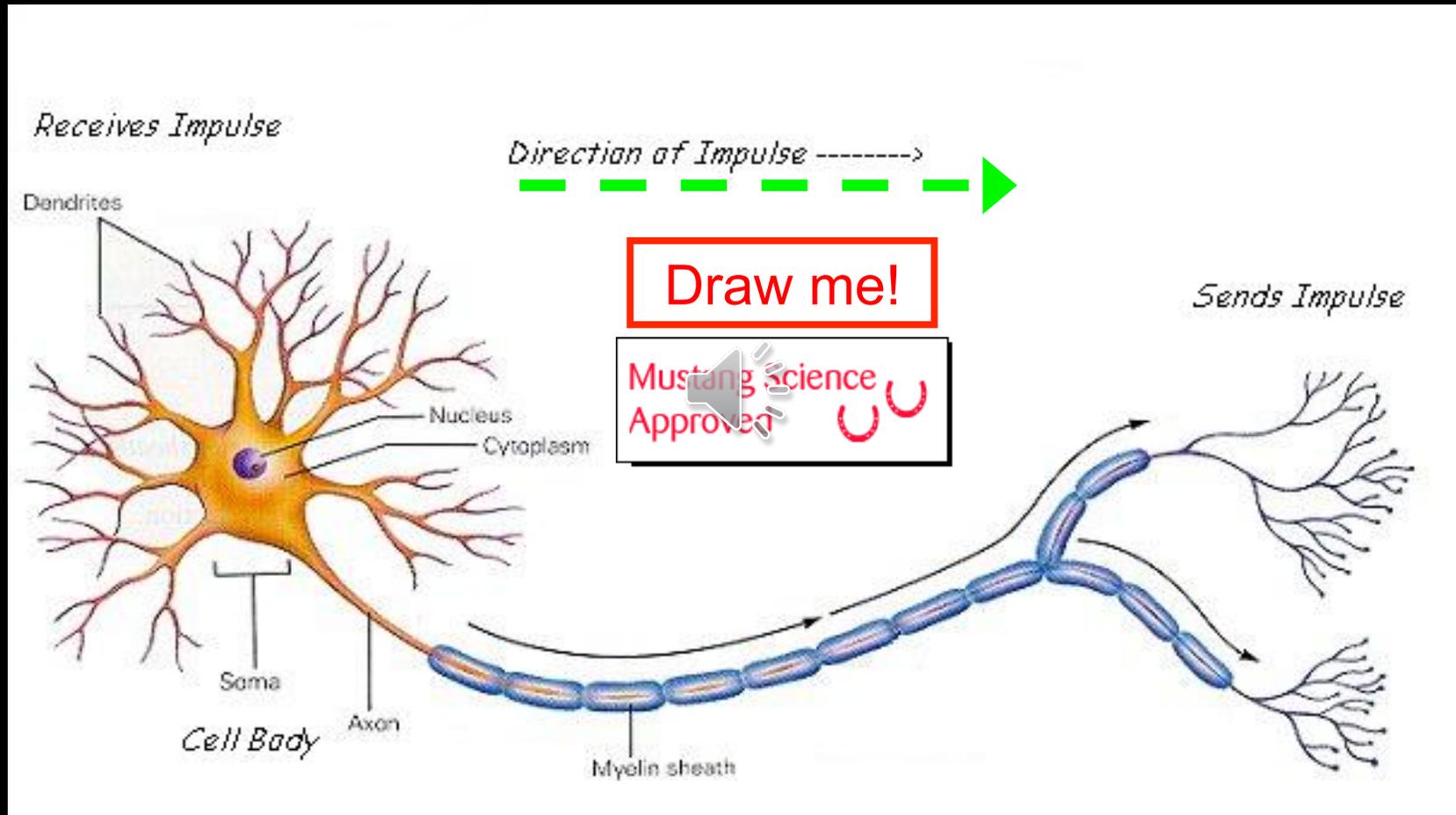
The Spinal Cord



Peripheral Nervous System

- Connects body to brain & spinal cord
 - Bundles of nerves throughout the body
 - Sensory neurons receive information and send impulses to the brain or spinal cord
 - Motor neurons conduct impulses from the brain or spinal cord to muscles or glands throughout your body

Neurons



A message carried by a neuron is called an impulse.

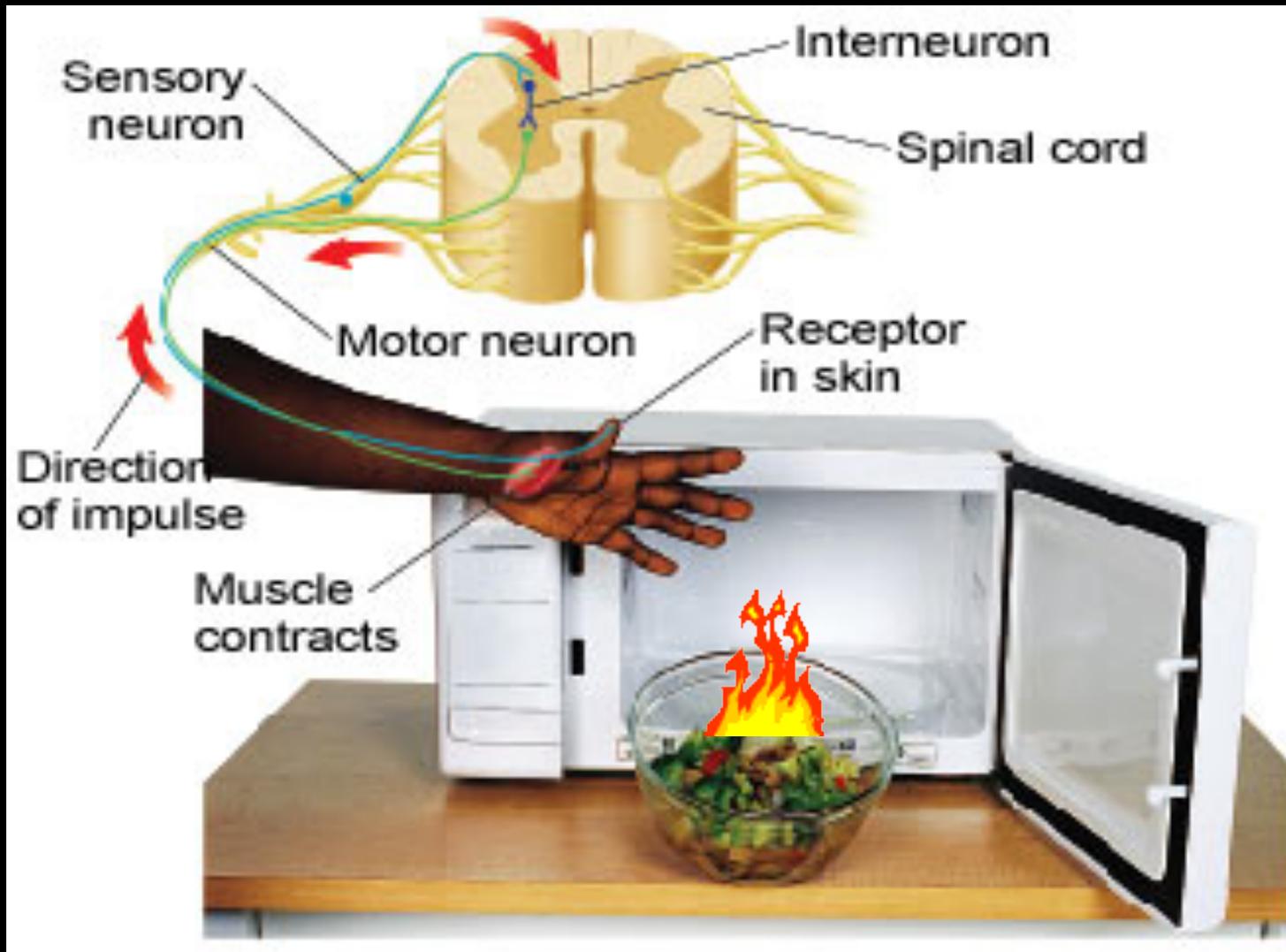
Peripheral Nervous System

- Two divisions:
 - Somatic = Controls voluntary actions-
like raising your arm/hand to answer a
question
 - Autonomic = Controls involuntary
actions-those not under conscious
control-such as your heart rate,
breathing, and digestion

Reflexes

- Involuntary, automatic response to a stimulus
- Involves a simple nerve pathway called a reflex arc- to the spinal cord and straight back
- Very fast response!

Reflexes- OUCH... that's hot!





Human Body Systems: Nervous System



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Notes

Mustang Science Approved



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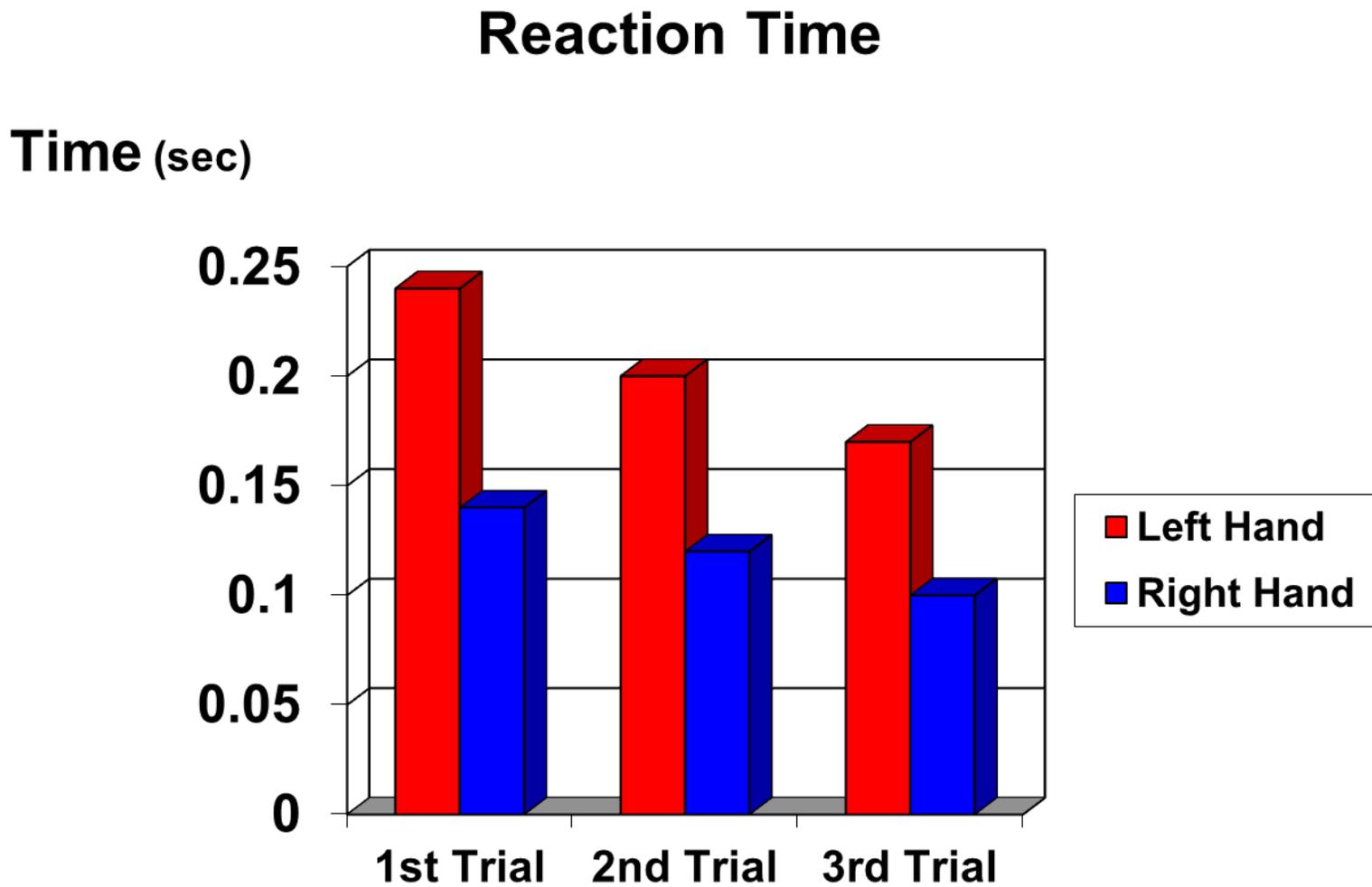
Reaction Time Lab Activity

- See Worksheet
- Work with lab partner- Each person will do 5 trials with the left and 5 trials with the right hand
- Place your arm on the table with your hand hanging off the edge; fingers 1 inch (2.5 cm) apart
- The end of the meter stick should be at the top of the fingers. Drop without a warning or signal.

Reaction Time Lab Activity

- Record your measurements and use the chart in the textbook to estimate reaction time in seconds.
1. Identify the stimulus, response, and variable in this activity
 2. Create a bar graph of your data (one color for each hand)
 3. Find and record the average time for each hand
 4. Explain why the right and left times may be different

Reaction Time Lab Activity



Make it a great day
Mustangs!

