**The Nervous System**

**Station 1 – Main Structures and Functions**

*Use the diagram to fill out the first section of your notes. Then read Section 9.2 in your text (p. 207) to list and summarize the 3 functions of the nervous system. Make sure to match the function with description/image provided and fill in the remaining parts of the descriptions.*

***The Nervous System consists of:***

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ & \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_)

|  |  |  |
| --- | --- | --- |
| **Functions of the Nervous System** | | |
| *Function* | *Description* | *Picture* |
|  | Uses sensory receptors and nerve endings to: | **Screen Shot 2014-12-17 at 10.12.31 AM.png** |
|  | Uses the sensory information received and relates it to past experiences, allowing us to make: | **Screen Shot 2014-12-17 at 10.11.36 AM.png** |
|  | Utilizes effectors (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_) to act on the decisions made by the Central Nervous System | **Screen Shot 2014-12-17 at 10.10.31 AM.png** |

**Station 2 – Divisions of the Nervous System**  
*As Ms. Steffen goes through the notes on the board, follow along and fill in the information below.*

|  |  |  |
| --- | --- | --- |
| **Main Divisions of the Nervous System** | | |
| *Division* | *Abbreviated as* | *Consists of* |
|  |  |  |
|  |  |  |

**Divisions of the Peripheral Nervous System (PNS)**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to CNS
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from CNS
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - carries information to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - carries information to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - fight or flight response - preps body for action
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - rest and digest – slows things down

*In the space below, create a flowchart that diagrams the divisions of the Nervous System.*

**Station 3 - Types of Neurons**

*Read the section titled, “Classification of Neurons” in your textbook (p. 211-212) and use the information to fill out the two charts in your notes.*

|  |  |  |  |
| --- | --- | --- | --- |
| **Neurons Classified by Structure** | | | |
| **Name** | **Description** | **Location** | **Sketch** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |

|  |  |  |
| --- | --- | --- |
| **Neurons Classified by Function** | | |
| **Name** | **Function** | **Location** |
|  |  |  |
|  |  |  |
|  |  |  |

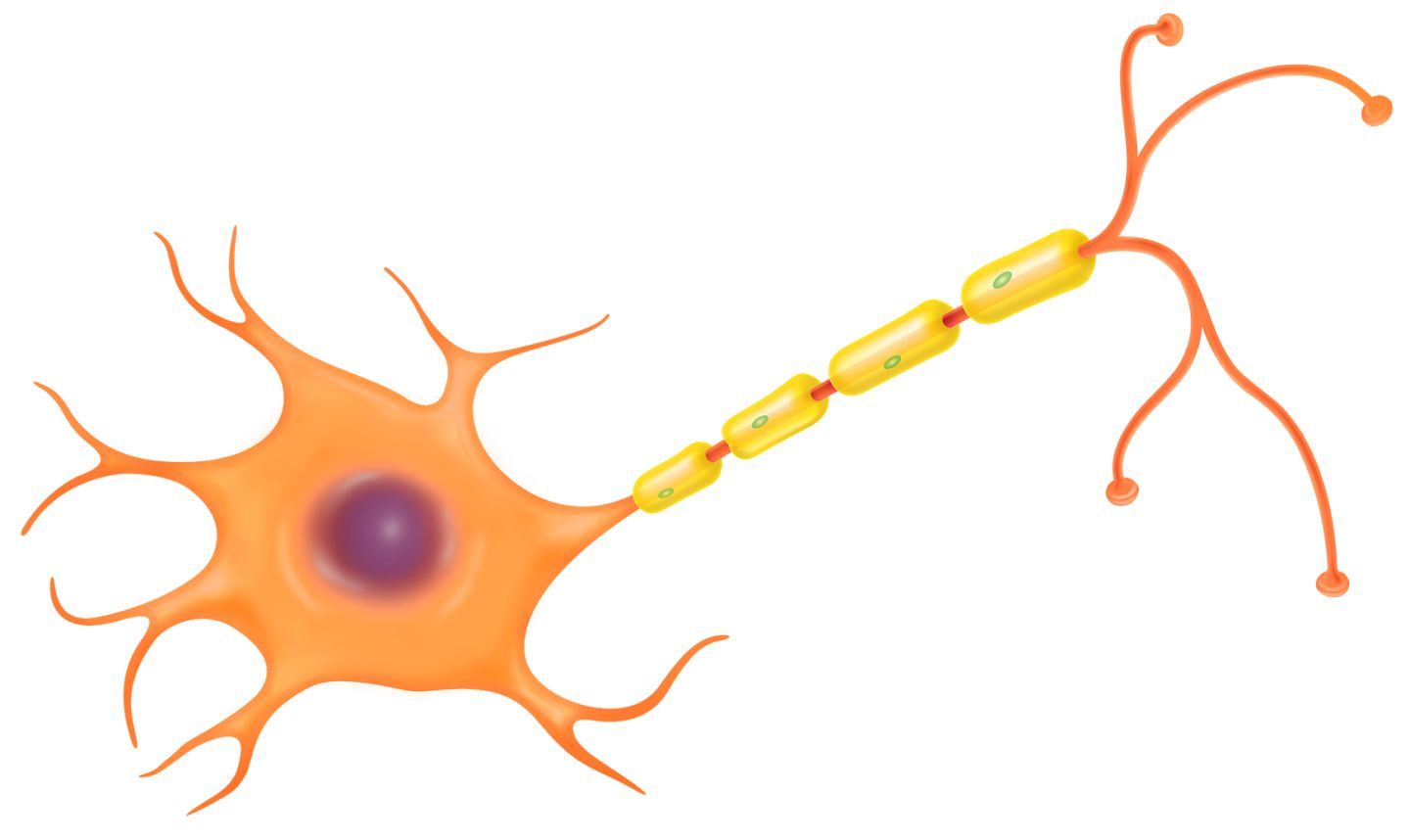
**Station 4 - Neuron Structure**

*Read the information provided on the diagram to label the parts of a neuron AND provide a brief description of its function. Make sure to label the following parts:*

*Cell body*

*Nucleus*

* *Axon*
* *Dendrite*
* *Myelin sheath*
* *Node of Ranvier*

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*When everyone in your group has completed their notes, send one person up to Ms. Steffen to:*

* *check off the answers*
* *pick up the supplies and the instruction sheet for what to do next*

**Station 5 - Nervous Tissue and Neuroglial Cells**

*Use the diagrams and information provided to fill in the following section of notes and the table below.*

**Nervous Tissue**

Nervous tissue consists of two types of cells:

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* **What is a nerve impulse?** \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - cells that provide \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ for neurons.

|  |  |  |  |
| --- | --- | --- | --- |
| **Types of Neuroglial Cells** | | | |
| ***Name*** | ***Location*** | ***Function*** | ***Extra Info*** |
| **Schwann Cells** |  |  |  |
| **Astrocytes** |  |  |  |
| **Oligodendrocytes** |  |  |  |
| **Microglial** |  |  |  |
| **Ependymal** |  |  |  |

**Station 6 - Myelination of Axons**

*Use the reading provided to fill in your notes below. When you are finished, see Ms. Steffen to get your patient/case study and laptop.*

**Myelinated vs. Unmyelinated**

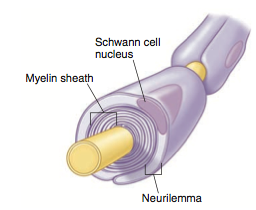
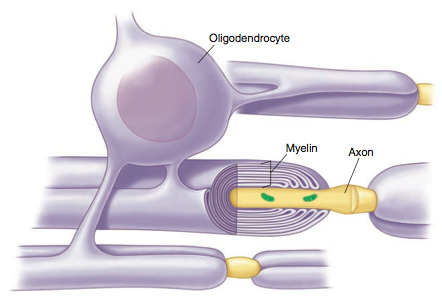
* Not all nerve fibers are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* **Unmyelinated** nerve fibers conduct \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ more \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Myelinated** nerve fibers are used when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is more important
  + Example: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**PNS vs. CNS**

* In the PNS, the myelin sheath is formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells.
  + The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ cells wrap themselves around the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and lay down multiple \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + The nucleus and cytoplasm are in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ known as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - The neurilemma is essential for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* In the CNS, the myelin sheath is formed by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + One \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forms the myelin sheath for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + The nucleus is located \_\_\_\_\_\_\_\_\_\_\_\_\_ from the myelin sheath and outward \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wrap around the nerve. As a result, there is \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - With no neurilemma, injured neurons in the CNS can’t \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
    - Explains why paralysis from a spinal cord injury is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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**Station 7 - Nerve Impulse Transmission**

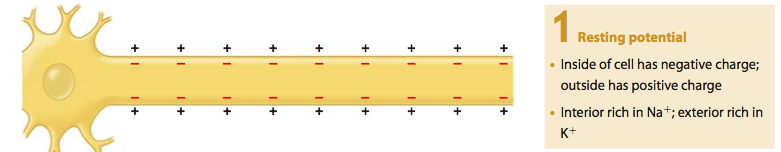
*As Ms. Steffen goes through the notes on the board, follow along and fill in the information below.*

**Cell Membrane Potential**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - Whenever ions with opposite charges are separated by a membrane, the potential exists for them to move toward one another
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - A membrane that exhibits membrane potential has an excess of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions (\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_) on one side, and an excess of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ions (\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_) on the other side

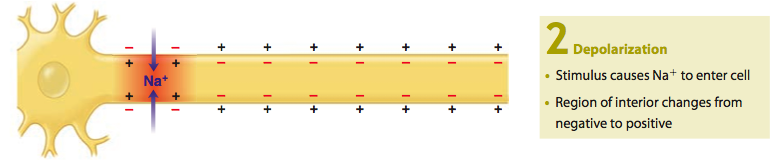
**1. Resting Potential**

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of a neuron is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ relative to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + Inside: Has permanent negative ions and high \_\_\_\_\_\_\_\_\_ concentration
  + Outside: Has high \_\_\_\_\_\_\_\_\_\_ concentration

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**2. Depolarization**

* Stimulation of a membrane can affect its resting potential  
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* When a stimulus comes along, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, causing Na+ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The membrane potential then becomes \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the membrane is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

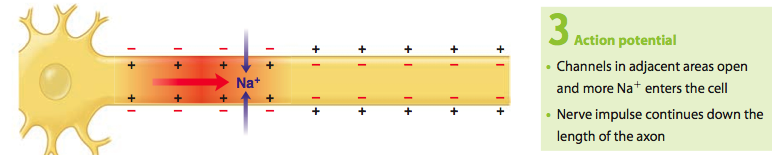


**3. Action Potential**

* If strong depolarization occurs, a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is achieved and   
    
  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* When threshold is reached, an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (aka: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ ) is created.

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ continues down the axon as one segment \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

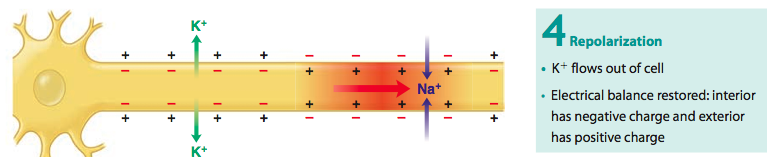
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**4. Repolarization**

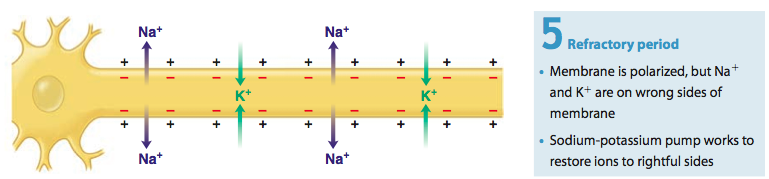
* The sudden increase in \_\_\_\_\_\_\_\_\_ triggers the opening of channels to allow \_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, thus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the cell

* + Inside = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Outside = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**5. Refractory Period**

* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ works to return the \_\_\_\_\_\_\_\_\_\_\_ to the outside and the \_\_\_\_\_\_\_\_\_ to the inside and thus returns the cell to its rest

**Impulse Conduction**

* Unmyelinated fibers – conduct impulses over \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Myelinated fibers – conduct impulses from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  + Leap frogs its way down the neuron which is much faster!

**All-or-None Response**

* All-or-None Response - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + If the threshold isn’t reached, the neuron doesn’t fire
* All impulses carried on an axon or the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + A stronger impulse doesn’t produce a stronger response

**Communication Between Neurons**

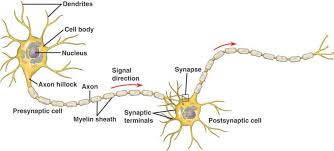
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ usually travel through \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ before reaching their target \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Thus, the neurons must have some way of transferring the impulse from one neuron to the next.

**The Synapse**

* Synapse - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Synaptic Cleft - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Presynaptic Neuron - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Postsynaptic Neuron - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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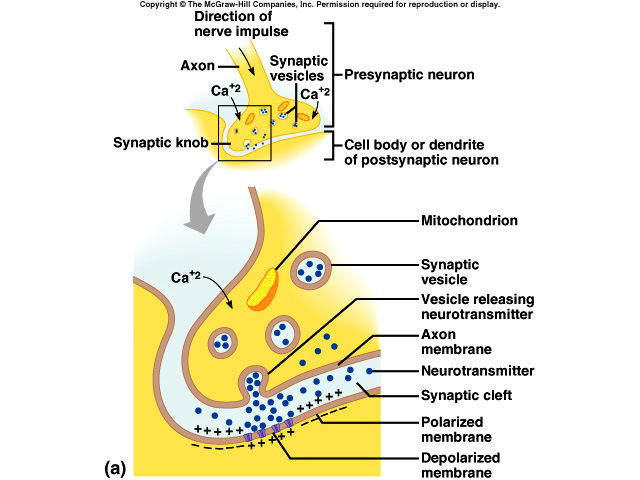
**Synaptic Transmission**

* Nerve impulse crosses the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to reach the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ using \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* + Neurotransmitters are stored in synaptic vesicles
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ bind to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and allows the impulse to continue

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**Types of Neurotransmitters**

* Excitatory - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  + Acetylcholine – involved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Norepinephrine – involved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, creates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Inhibitory - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  + Serotonin – involved in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Station 8 – Reflexes and Reflex Lab**

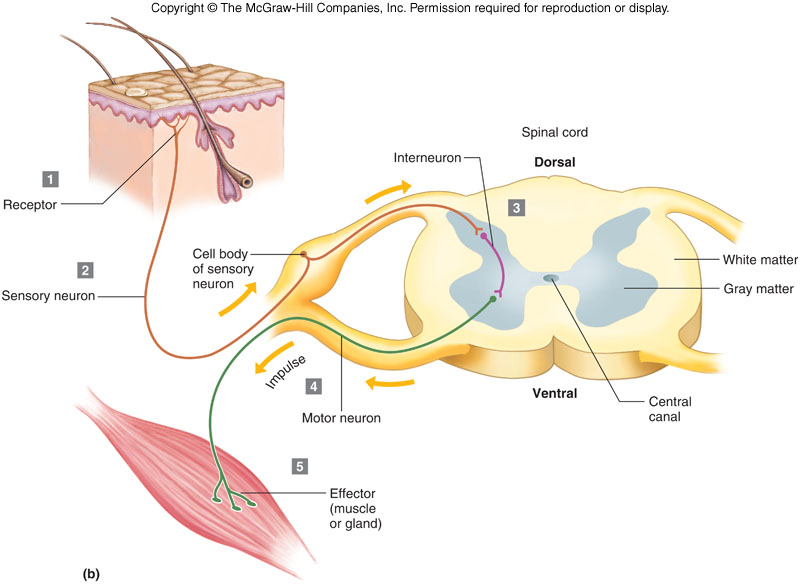
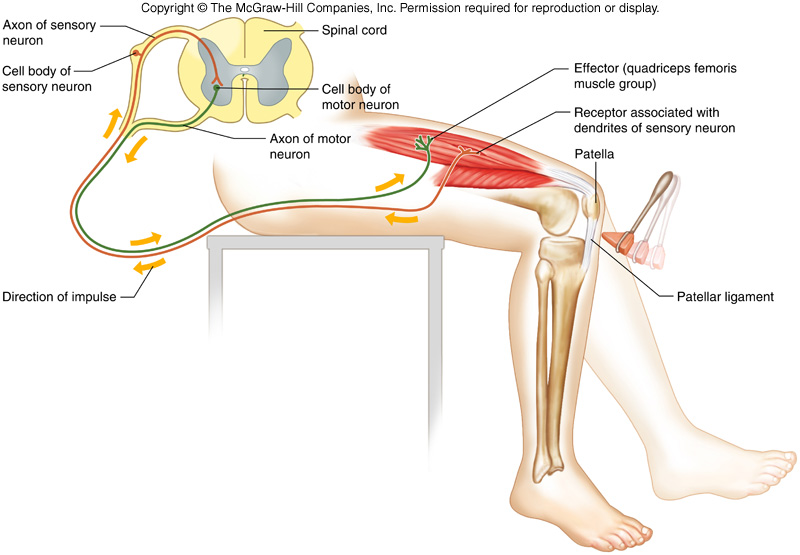
*Read the introductory information in the Reflex Lab and then use the information to fill in your notes below.*

**Reflexes** - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Two types
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Knee-jerk Reflex – helps maintain an upright posture
    - Withdrawal Reflex – prevents or limits tissue damage

**Reflex arc**

* Includes 5 parts:   
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

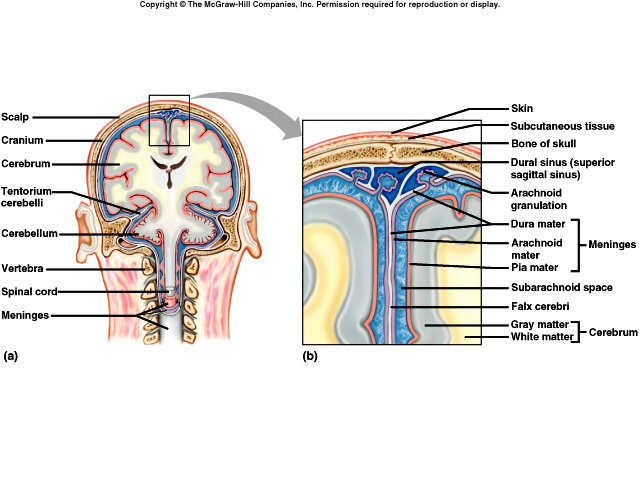
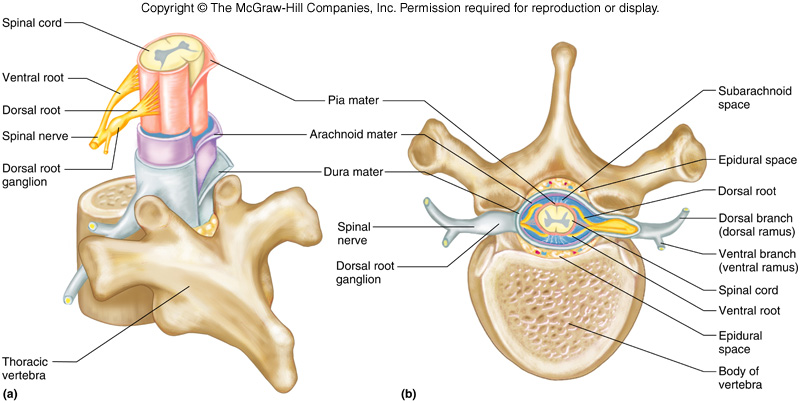
 

**Station 9 – Structures of the Central Nervous System**

*You and your group members will work together to produce a PowerPoint slide highlighting a various structure within the Central Nervous System. You will be given two sets of material to read regarding the structure you have been assigned. Your group must then work to summarize the information to create your slide. You will then present your slide to the class.*

***Group 1 - Meninges***

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Meninges** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Dura Mater** |  |  |  |
| **Arachnoid Mater** |  |  |  |
| **Pia Mater** |  |  |  |
| **Subarachnoid Space** |  |  |  |

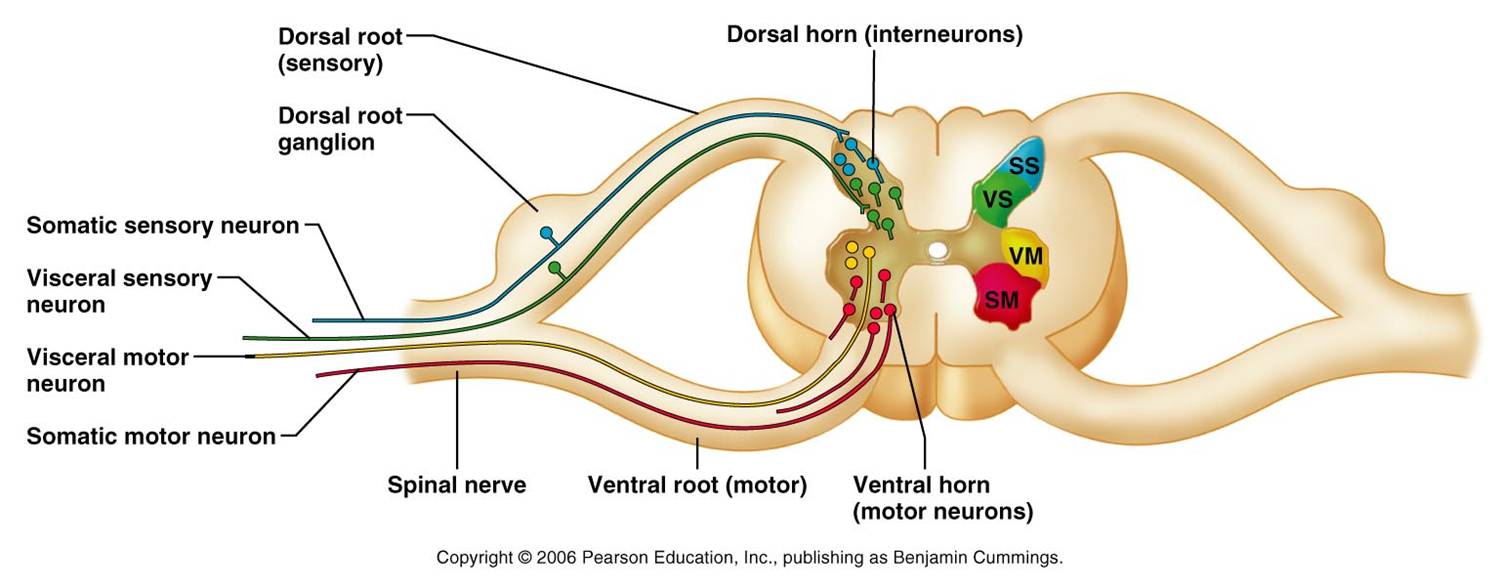


***Group 2 - Spinal Cord***

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Spinal Cord** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Cervical Enlargement** |  |  |  |
| **Lumbar Enlargement** |  |  |  |
| **Spinal Nerves** |  |  |  |

**Cross Section of Spinal Cord**

* Spinal Nerves  
  + Dorsal root - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Ventral root - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



***Group 3 - Brain Stem***

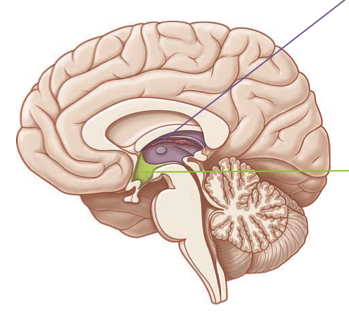
|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Brainstem** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Medulla Oblongata** |  |  |  |
| **Pons** |  |  |  |
| **Midbrain** |  |  |  |

***Group 4 - Cerebellum***

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Cerebellum** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Limbic System** |  |  |  |
| **Hippocampus** |  |  |  |
| **Amygdala** |  |  |  |

***Group 5 - Diencephalon***

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Diencephalon** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Thalamus** |  |  |  |
| **Hypothalamus** |  |  |  |



Cerebellum

Brainstem

Midbrain

Pons

Medulla Oblongata

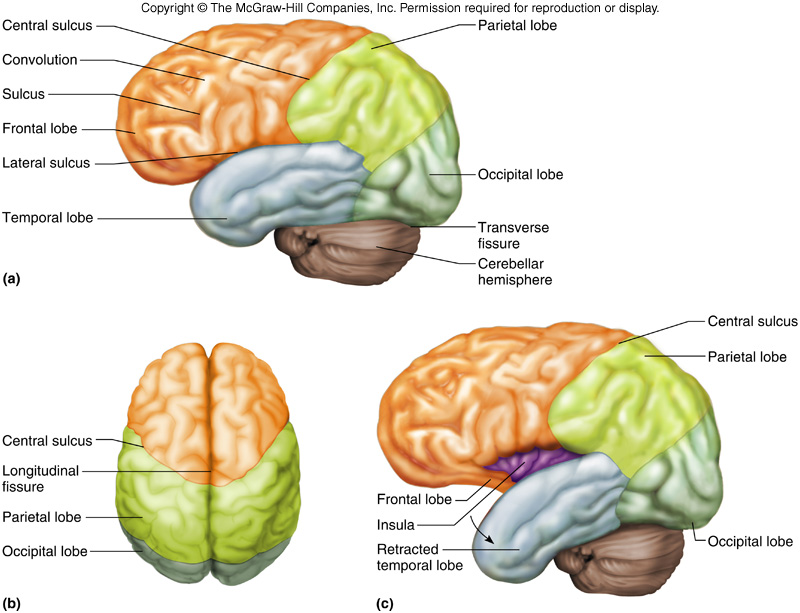
Diencephalon

Hypothalamus

Thalamus

***Group 6 - Cerebrum***

|  |  |  |  |
| --- | --- | --- | --- |
| **Primary Structure** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Cerebrum** |  |  |  |
| **Secondary Structures** | | | |
| **Structure** | **Location** | **Function** | **Extra Info** |
| **Corpus callosum** |  |  |  |
| **Gyri/Sulci** |  |  |  |
| **Longitudinal fissure** |  |  |  |
| **Transverse fissure** |  |  |  |



**Station 10 – Lobes of the Cerebrum** *Go to the following website: https://www.opencolleges.edu.au/informed/learning-strategies/  
 and explore the brain! Use the information to fill in the chart below for the location and function of each lobe of the brain.*

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - Anterior portion of each hemisphere
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - Posterior to the frontal lobe
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - Inferior to the frontal and parietal lobes
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - Posterior portion of each hemisphere

|  |  |  |
| --- | --- | --- |
| **Structure** | **General Location**  (Anterior/Poster  Superior/Inferior, etc.) | **Function** |
| **Frontal Lobe** |  |  |
| **Parietal Lobe** |  |  |
| **Temporal Lobe** |  |  |
| **Occipital Lobe** |  |  |

|  |  |  |
| --- | --- | --- |
| **Structure** | **Location**  (which lobe?) | **Function** |
| **Broca’s Area** |  |  |
| **Prefrontal Cortex** |  |  |
| **Motor Cortex** |  |  |
| **Sensory Cortex** |  |  |
| **Auditory**  **Cortex** |  |  |
| **Visual Cortex** |  |  |

**Station 11 - Peripheral Nervous System**

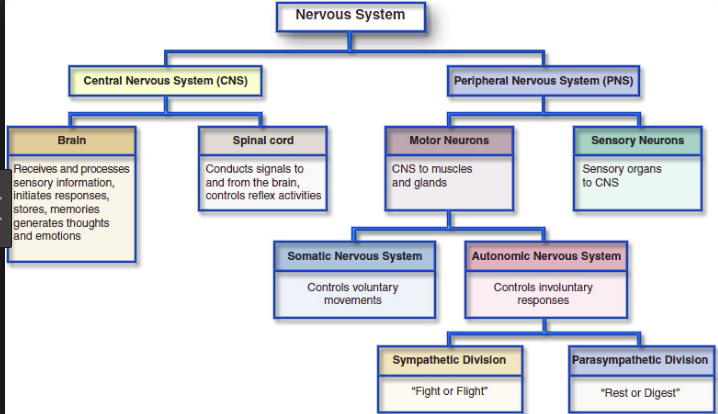
Consists of nerves that branch out from the CNS and connect it to other body parts

* Includes:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - arise from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - arise from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Sensory/Afferent Division** – conducts impulses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**Motor/Efferent Division** – conducts impulses \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

* **Somatic Nervous System**
  + Cranial and spinal nerves that connect to \_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ activities
* **Autonomic Nervous System**
  + Nerve fibers that connect \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (heart, stomach, etc.)
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ activities  
    - **Sympathetic Nervous System** - prepares body for fight or flight  
      * Examples:
    - **Parasympathetic Nervous System** - prepares body to rest and digest  
      * Examples:

 **Station 12 - Cranial Nerves**

|  |  |  |  |
| --- | --- | --- | --- |
| **Number** | **Name** | **Sensory/**  **Motor/Mixed** | **Function** |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
|  |  |  |  |
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|  |  |  |  |
|  |  |  |  |

**Station 12 cont’d - Spinal Nerves**

**Spinal Nerves**

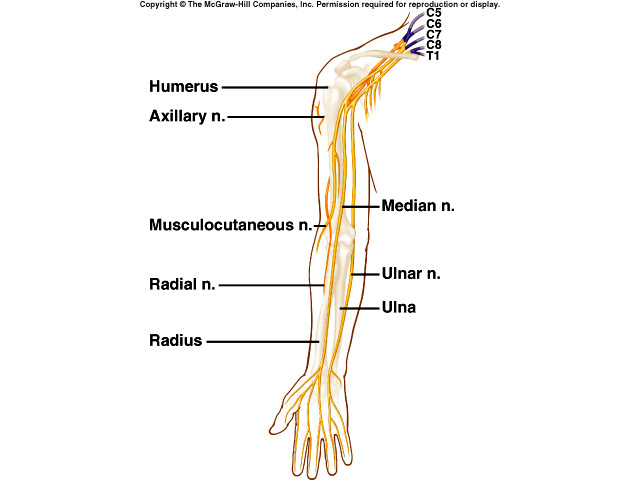
* All \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ nerves
* \_\_\_\_\_\_\_\_ pairs  
  + 8 cervical nerves
  + 12 thoracic nerves
  + 5 lumbar nerves
  + 5 sacral nerves
  + 1 coccygeal nerve

**Plexuses**

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - complex networks formed from spinal nerves

**Cervical Plexus**

* Lies deep in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Supply muscles and skin of the neck



**Brachial Plexuses**

* Spinal nerves of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Lies deep within \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Nerves:
  + Musculocutaneous
  + Ulnar
  + Median
  + Radial
  + Axillary

**Lumbosacral Plexuses**

* Spinal nerves of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Extend from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Nerves:
  + Obturator, Femoral, Sciatic

