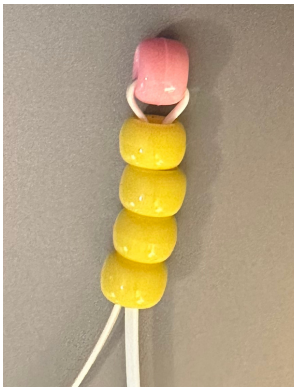
BUILD - A - NEURON Activity

Student Name: _____ **Date:** _____

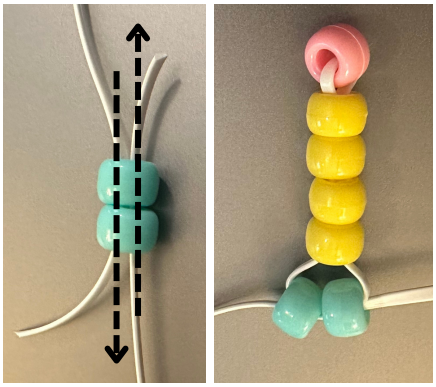
Bead Neuron: The ziplock should contain the correct number of beads for each of the parts of the neuron (see table below). Be sure you have the correct amount of beads for each part of the neuron, and record the color of the bead for each in the blank. To make the beaded neuron, string the beads using the directions and pattern in the diagrams below.

Dendrites = 20 _____ beads	**Axon** = 7 _____ beads
Cell Body = 6 _____ beads	**Synaptic Terminal** = 2 _____ beads
Nucleus = 1 _____ bead	**Tip of Dendrite** = 5 _____ beads

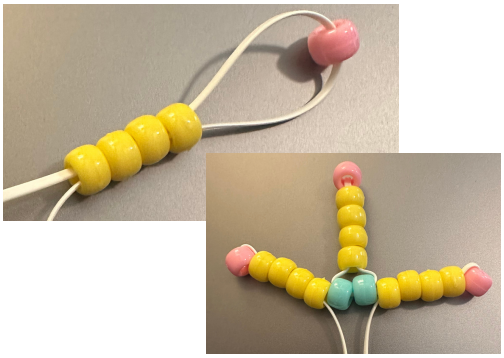
Step 1: Put one of the tip of the dendrite beads through the string and center in the middle. Take 4 dendrite beads and put both ends of the string through.



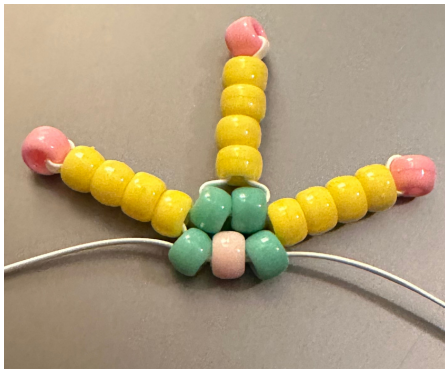
Step 2: Add 2 cell body beads and cross the string through both of the beads. Pull the string to adjust the beads toward the center of the neuron.



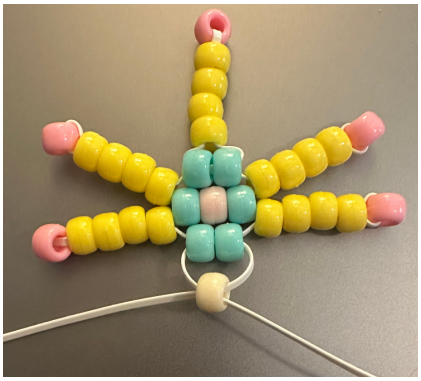
Step 3: String 4 dendrite beads followed by one tip of dendrite bead on one of the strings from the side. Take the end of the string and thread it back through just the 4 dendrite beads. Repeat with the string on the other side.



Step 4: Repeat the process in *step 2,* stringing the beads in order: one cell body bead, the nucleus, followed by another cell body bead. Cross the strings through all 3 beads and pull the string to position the beads.



Step 5: Repeat the process in *step 3*, adding one more dendrite on each side for a total of 5 dendrites. Cross the strings through one axon bead. Repeat 6 more times and tie a knot.



Step 6: Add the two synaptic terminal beads, one to each string. Tie a knot to secure the bead.

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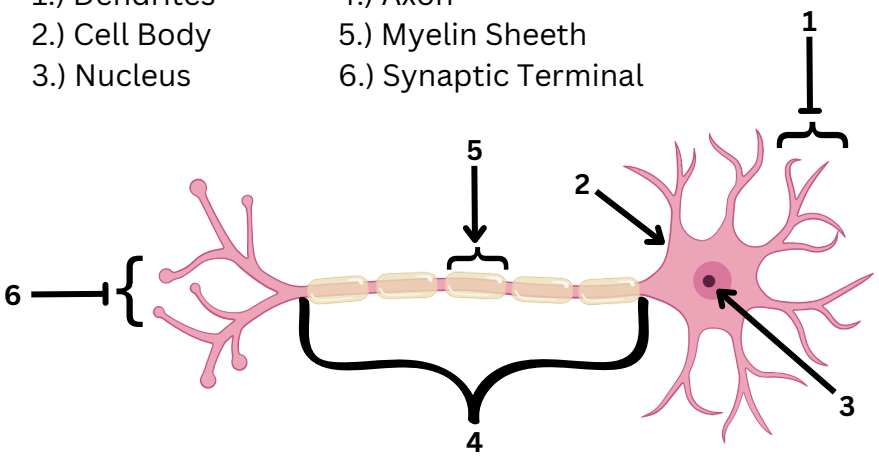
LEARN ABOUT **NEURONS!**

Neurons are one type of cell in the brain, and there are on average 86 billions neurons in the primate (or human) brain. In order to communicate with one another, the neurons release chemicals called neurotransmitters that other neurons can recognize as signals for different actions. There are many different types of neurotransmitters, and each allows the neuron to communicate a different message, such as when to start or stop an action. Refer to the labeled neuron below, and read a little about each part of the neuron and their functions!

Parts of the Neuron:

1.) Dendrites
2.) Cell Body
3.) Nucleus
4.) Axon
5.) Myelin Sheeth
6.) Synaptic Terminal



3 Major Types of Neurons:

1. Sensory Neuron
   - Cells that are activated by sensory input from the environment.
2. Motor Neuron
   - Cells that allow us to move, speak, swallow, and breathe.
3. Interneurons
   - Cells that aid in the communication between sensory and motor neurons.

Dendrites

Dendrites are branch-like projections that receive and carry impulses from neighboring neurons to the cell body. Neurons can have hundreds of dendrites, each having their own connections with other neurons.

Cell Body

The cell body (otherwise known as soma) contains many vital organelles, such as the mitochondria and the nucleus. The cell body helps protect the organelles inside from anything harmful in the environment outside the cell.

Nucleus

The nucleus is housed within the cell body. It controls some of the neurons activities and as well as contains the cell's genetic material (RNA/DNA). The nucleus is also responsible for guiding the cells impulse down the axon to the synaptic terminal.

Axon

Axons carry electrical impulses that are the means of communication within the brain. The impulse travels down the axon from the cell body to the synaptic terminal. Neurons (typically) only have one axon!

Myelin Sheath

Myelin sheaths are insulating segments on axons that allow electrical impulses to travel quickly. In between each segment of myelin, the signal traveling down the axon is regenerated, creating faster and more efficient communication between the cells.

Synaptic Terminal

Synaptic terminals are the site at which the electrical impulses are converted into a chemical signal (neurotransmitter release). This signal then triggers a new electrical impulse in the connected neighbor neuron. This is how communication between cells occurs.

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