Nerve Cells

The human body is made up of trillions of cells.  Cells of the nervous system, called nerve cells or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, are specialized to carry “messages” through an electrochemical process.  The human brain has approximately **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

Neurons come in many different shapes and sizes.  Some of the smallest neurons have cell bodies that are only **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**wide.  Some of the biggest neurons have cell bodies that are **\_\_\_\_\_\_\_\_\_\_\_** wide (Remember, 1 micron is equal to one thousandth of a millimeter!).

Neurons are **similar** to other cells in the body because:

1. Neurons are surrounded by a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
2. Neurons have a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**that contains genes.
3. Neurons contain cytoplasm, mitochondria and other organelles.
4. Neurons carry out basic **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**such as protein synthesis and energy production.

However, neurons **differ** from other cells in the body because:

1. Neurons have specialized cell parts called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.  Dendrites bring electrical signals to the cell body and axons take information away from the cell body.
2. Neurons communicate with each other through an **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** process.
3. Neurons contain some specialized structures (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**) and chemicals (**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**)

Connections to Previous Knowledge: Exocytosis and Neurotransmitters

* When nerve cells release large molecules, called neurotransmitters (a chemical), they are releasing them through **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. **This is the “chemical” part of electrochemical communication between neurons.**
* Remember, what does exocytosis require? (aka what kind of transport is it?) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Neurons can be classified by the direction that they send information.

1. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**send information from sensory receptors (e.g. in skin, eyes, nose, tongue, ears) TOWARD the central nervous system.
2. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**send information AWAY from the central nervous system to muscles or glands.
3. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**send information BETWEEN sensory neurons and motor neurons.  Most interneurons are located in the central nervous system.

Connection to Previous Knowledge: The Famous Sodium Potassium Pump!

* What type of transport is this? Does it require energy (ATP)?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Which ions are transported across the membrane? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Nerve cells send electrical signals through their axon to communicate information from one cell to the next. **This is the “electrical” part of the electrochemical communication** along the neuron and is called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.



