

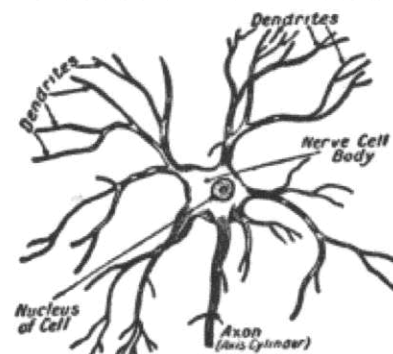
The Nerve Cells

By Jennifer Kenny



¹ Your body is made up of millions of cells that you can't see without the help of a microscope. They come in all kinds of shapes and sizes. Different kinds of cells work together to form different body parts. For example, muscle cells form muscles and bone cells make bones.

² **Neurons** are the special name for nerve cells. Nerve cells make up the brain, nerves, and spinal cord.



³ The main part of the nerve cell is called the **cell body**. It measures 0.0008 inches wide. Inside the cell body is the **nucleus**, or control center of the cell. Inside there are also mitochondria that provide energy to the cell.

⁴ Around the cell body are nerve fibers called axons and dendrites. **Dendrites** are long, thin spidery-looking parts. One nerve cell may have more than 10,000 dendrites. The word dendrite comes from a Greek word meaning "tree." Around the cell body is also a longer, slightly thicker part called an **axon**. Most nerve cells have one axon each. The axon and dendrites look like microscopic wires that carry electrical signals. The axon and dendrites are wrapped in a protective covering. The inner sheath is called a **myelin sheath**. It is made of a fatty substance. Doctors and scientists believe it may act like insulation to keep nerve messages from interfering with one another. The outer sheath is called **neurilemma**. It is made of living cells. Only some nerve cells have the neurilemma. The brain's neurons and the spinal cord's neurons don't have it. Those that do, though, seem to help a cut nerve fiber grow back together.

⁵ For many years, scientists didn't even know that axons and dendrites existed because they couldn't be seen with the microscope. In 1873, Camillo Golgi, an Italian neurologist, or a nervous system specialist, added a silver-containing stain to the nerve cells, which revealed the dendrites and the axon. This led them to see the **synapses** as well.

⁶ The synapses are the junctions where nerve cells are together. The dendrites and the axons don't actually touch. Instead, the synapses are tiny gaps. So what is the importance of these tiny gaps? Well, the brain and nerves work using nerve signals, or **impulses**, which are passed along in codes and patterns. The dendrites carry the signals toward the cell body. The axon carries the signal away. At the synapses, the nerve signal can jump from one to the next. The dendrites receive nerve signals from other nerve cells and pass them to the axon. The axon carries them long distance to dendrites of other nerve cells. At the synapses, the signals always pass in the same direction. They don't work in reverse.

⁷ There are 10 billion nerve cells in the brain and nerves. Nerve cells can't reproduce

themselves. We only have the ones we are born with. Logically, then, you can understand why, very often, an elderly person's brain doesn't work as quickly as a younger person's brain.

⁸ In the brain, there's another kind of cell that is important as well. They are called **glial cells**. They outnumber the neurons ten to one. While they don't carry messages, they do supply nutrients and other chemicals to the neurons. They help repair the brain after an injury. They can also attack invading bacteria. The word glial comes from the Greek word meaning "glue." This name is quite appropriate since glial cells help hold the tissue together.

⁹ A bundle of neurons make up a nerve. The thinnest nerves are narrower than a hair. The thickest nerves are like white rope.

¹⁰ Different kinds of **stimulus**, such as a touch or a smell, make a nerve cell fire off a message called a **response**. Sensory neurons respond to the stimuli. Motor nerves carry messages to parts of your body so you respond. For example, if you touch a hot pot (stimulus), your sensory nerves send messages to the brain and, in turn, your brain sends messages through your spinal cord to your motor nerves so you pull your arm away! Isn't that amazing?

Name _____



Date _____

The Nerve Cells

<p>1. What is another name for a nerve cell?</p> <p><input type="radio"/> A Nucleus</p> <p><input type="radio"/> B Neuron</p> <p><input type="radio"/> C Sense</p> <p><input type="radio"/> D Dendrite</p>	<p>2. Which is not a nerve fiber?</p> <p><input type="radio"/> A Axon</p> <p><input type="radio"/> B Nucleus</p> <p><input type="radio"/> C They are all nerve fibers.</p> <p><input type="radio"/> D Dendrite</p>
<p>3. A nerve cell may have thousands of axons.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>	<p>4. All nerve cells have a neurilemma.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>
<p>5. The _____ are the junctions where nerve cells are together.</p> <p><input type="radio"/> A Myelin sheath</p> <p><input type="radio"/> B Glial cells</p> <p><input type="radio"/> C Synapses</p> <p><input type="radio"/> D Impulses</p>	<p>6. If your nerve cells die, your body can make new ones.</p> <p><input type="radio"/> A False</p> <p><input type="radio"/> B True</p>
<p>7. Why doesn't an elderly person's brain work as well as a young person's brain?</p> <p>_____</p> <p>_____</p>	<p>8. Which is not a function of glial cells?</p> <p><input type="radio"/> A They help repair the brain after an injury.</p> <p><input type="radio"/> B They attack invading bacteria.</p> <p><input type="radio"/> C They carry messages.</p> <p><input type="radio"/> D They supply nutrients to neurons.</p>