The Nervous System PowerPoint Notes

The anatomy and physiology of animals illustrate the complementary nature of structure and function.

There are two major divisions of the nervous system.
1. The central nervous system is your body’s command center. It includes the ____________ and __________________.
2. The peripheral nervous system consists of ____________ that connect all areas of the body to the central nervous system. You can think of the peripheral nervous system as the “information highway” of your nervous system.

Neurons and nerve impulses
Your nervous system is made of hundreds of billions of specialized cells called ____________. A neuron has three parts: the cell body, a long stalk called the _______________, and finger-like projections called _______________. Neurons send signals called nerve ____________ throughout your body. A nerve impulse is wave of ____________ and ____________ activity transmitted between neurons.

How your body responds to a stimulus
Imagine you’re relaxing on the couch, watching your favorite television show. Someone sneaks up behind you and touches the back of your neck with a wet, frosty ice cube. Before you even have a chance to think “who did that?” your body springs into action. The ice cube triggers an ____________ response called a ______________ ____________ that happens without a conscious decision on your part. A withdrawal reflex happens because nerve impulses are sent through the ____________ in your body. When an ice cube touches the back of your neck, sensory nerves in your skin send nerve impulses through wire-like nerve fibers to your ________________. In the spinal cord, the nerve impulse is transferred to ______________ nerves. Motor nerves control ____________ contractions. Impulses from your motor nerves cause the muscles in your neck and back to contract, jerking your body away from the ice cube. All of this happens in a split second!

How a nerve impulse works
A withdrawal reflex starts when ______________ nerves in your skin receive a stimulus from outside the body. That ______________ starts a nerve impulse along the cell membrane. When a neuron is at rest, the inside of the cell membrane is electrically ______________ compared with the outside. The stimulus causes the cell membrane to open channels that let positively charged particles into the cell. The inside of the cell becomes ______________ charged compared with the outside. Other channels open and let positively charged particles out of the cell. As they leave, the inside of the cell membrane once again becomes negatively-charged compared with the outside. The nerve impulse travels down the ______________ like dominoes falling. When the impulse reaches the end of the axon, ______________ are released and picked up by a neighboring neuron, causing the nerve
impulse to continue. Each second, your body fires off about _____________________ nerve impulses.

Your emotions, decisions, and physical actions all happen through nerve impulses traveling through ______________ in your brain, spinal cord and nerves. A single neuron can have up to ten thousand dendrites connecting to other neurons. It is estimated that just one cubic millimeter of brain tissue contains a _____________ connections between cells!

What is the brain?
The brain is the _____________ and control center of your nervous system. The brain and spinal cord are made of tissues called ___________ and ___________ matter. Gray matter is mostly made up of the ______________ of neurons. White matter is mostly made up of the _____________ coming from those cell bodies. In general, grey matter makes up the parts of the brain responsible for _____________ processing. White matter is responsible for _____________ nerve impulses.

The brain has three parts
The ______________ parts of the brain are the cerebrum, the cerebellum, and the medulla.

1. Cerebrum
The ______________ part of your brain is the dome-shaped cerebrum. The cerebrum controls ______________ movements and the ______________ (touch, taste, smell, vision, hearing). It also allows you to think, talk, solve problems, and imagine. The cerebrum is divided into two halves called ______________. The right hemisphere controls the _________ side of the body and the left hemisphere controls the right side of your body! But _________ sides are involved in most activities. These parts are all connected but each part has its own ______________.

2. Cerebellum
The ______________ provides feedback on the ______________ of the body in space. It receives sensory information and sends nerve impulses to different skeletal muscles to keep you ______________. The cerebellum is located underneath the back of your cerebrum.

3. Medulla
The ______________ is the part of the brain that controls your spinal cord. It also controls your ______________ breathing, heart rate, blood pressure, and some other involuntary activities. It receives sensory input from the heart and blood vessels and sends nerve impulses back to those organs to control their ______________. The medulla is located underneath the cerebrum and in front of the cerebellum.