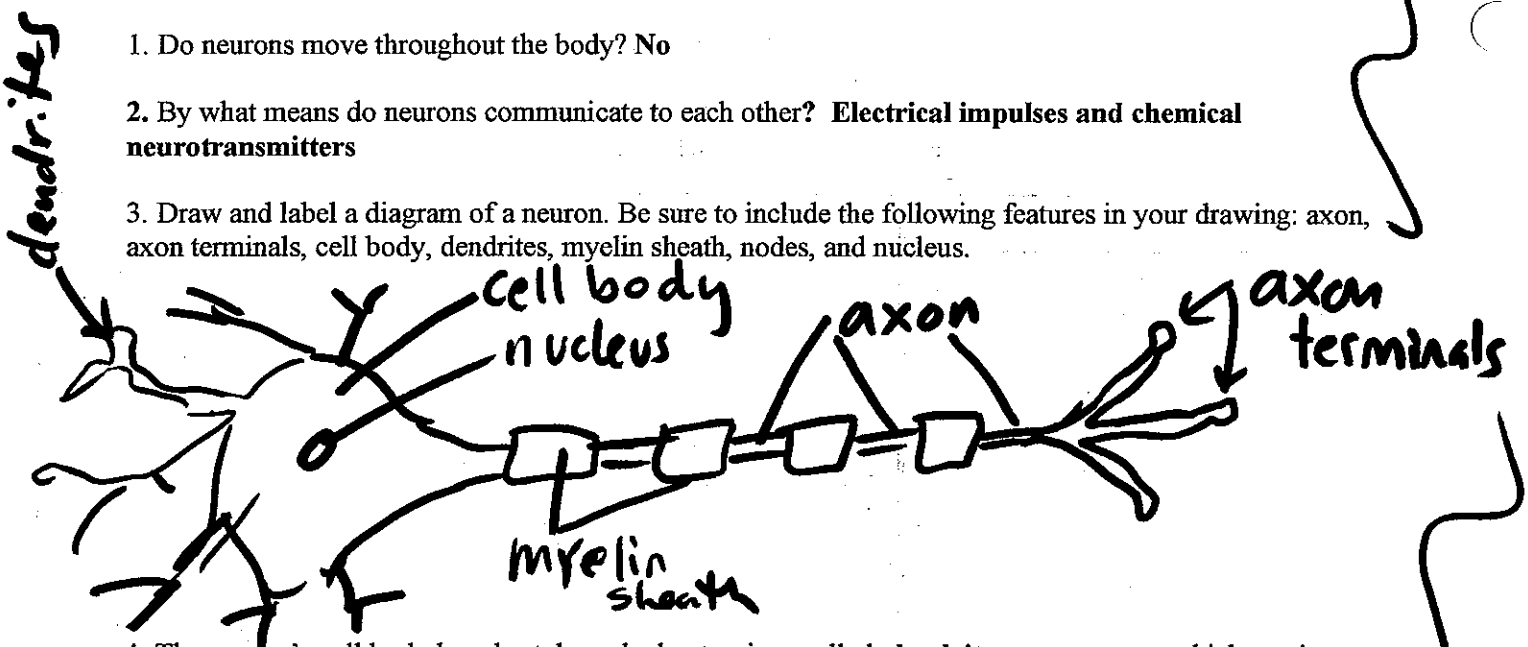
Name _____ Class _____ Date _____

**Honors Nervous System HW**---Chapter 31 in parrot book-

1. Do neurons move throughout the body? **No**

**2.** By what means do neurons communicate to each other? **Electrical impulses and chemical neurotransmitters**

3. Draw and label a diagram of a neuron. Be sure to include the following features in your drawing: axon, axon terminals, cell body, dendrites, myelin sheath, nodes, and nucleus.




4. The neuron's cell body has short, branched extensions called **dendrites** which receive impulses from other neurons.

**5.** The space between neurons is called the: **synaptic cleft**

**6.** The insulating membrane that surrounds a single axon in some neurons is called the **myelin sheath**.

**7.** How does the myelin sheath speed up neuron signaling? **It allows the signal to jump from node to node (nodes are spaces between the sheath)**

**8.**

9. Relate a nerve to a neuron. **A nerve is a bundle of neurons.**

**10.** Describe and explain the internal and external charge of a neuron at rest (is the charge positive or negative, and why?)? **Internal portion of neuron is negative, outside is positive due to the work of the sodium-potassium pump during active transport. The pump uses 1 molecules of ATP to move out 3 Na+ ions and 2K+ ions into the cell. More Na+ ions are outside versus K+ inside, so the cell is polarized, meaning it is more positive outside compared to the inside.**

**11.** What is the resting potential refer to?
**Difference in charge on out/ inside of neuron. It is measured as being -70mV.**

**12.** What is the action potential and when does it occur? **It is a reversal of charges on the in/outside of a neuron, the outside is temporarily negative and the inside temporarily positive. It occurs when the neuron is stimulated and channels temporarily open to allow sodium ions to diffuse in.**

**13.** What is necessary to restore the neuron to its resting potential after the sodium ions have flood the cell? **The potassium gates open and potassium ions flow out. This restores the negative charge on the inside of the neuron and positive on the outside.**

14. What is a threshold and how is it similar to a row of falling dominoes?
**= minimum level of a stimulus to produce an impulse. If the first domino gets pushed hard enough, the whole row of dominoes falls, just like the opening of ion channels during an impulse.**

**15.** How does a neuron follow the "all or nothing principle?" **If stimulus is below threshold, no impulse is produced, anything above threshold will produce impulse.**

**16.** How does the signal from one neuron pass through the synapse/synaptic cleft to the next cell?
**Vesicles containing neurotransmitters are released when an impulse reaches the end of the neuron at the axon terminal. The neurotransmitters move across the synapse to the next cell and attach to receptors on the next cell.**
**After the n.t. attach to the next cell, what is their fate? After a few seconds the n.t. detach and are either broken down or taken back by the original axon terminal for reuse.**

17. Create a flowchart to show the events that occur as a nerve impulse travels from one neuron to the next.

**18.** What are the 2 main divisions of the nervous system? **Central and peripheral**

19. What are the 2 structures that make up the central nervous system? **Brain and spinal cord**

**20.** There are ---- **4**--parts called------**lobes**---- in the cerebrum, they are named for the-------**bones of the skull they are under**------.
21. The right half of the brain controls the---**left**----- half of the body and vice versa.

22. The-------**cerebrum**---- is the part of the brain that controls movement and coordinates balance.

23. What does the brain stem control? **Breathing, blood pressure, etc.**

24. What does the thalamus do? **Receives info from senses and sends info to cerebrum**

25. What parts of the brain are changed by drug use? **Synapses-**

26. What is dopamine? **Neurotransmitter which is related to pleasure and happiness**

27. How do drugs cause addiction? **Because drugs cause dopamine levels to increase, the brain reacts by reducing the number of dopamine receptors, so it takes more of the same drug to get the same high, and normal activities do not make one feels as happy—yikes!!**

28. Complete the table.

| Effects of Drugs on the Body | |
|---|---|
| **Drug** | **Effects on the Body** |
| **meth** | Releases a flood of dopamine, produces an instant high |
| **cocaine** | Keeps dopamine in the synaptic region longer, intensifying pleasure and suppressing pain |
| Nicotine and alcohol | **Increase in release of dopamine** |

29. What might be the effects on someone who seriously injured his or her cerebellum? Explain your answer.
**Problems walking, moving, balance, etc.**

30. For the terms below, match the of the brain with its function.

| **Part of Brain** | **Function** |
|---|---|
| **C** **Z.** cerebrum | **A.** Coordinates and balances the actions of the muscles |
| **A** **Y.** cerebellum | **B.** Regulates the flow of information between the brain |
| **B** **X.** brain stem | and the rest of the body |
| **E** **W.** thalamus | **C.** Controls voluntary activities of the body |
| **D** **V.** hypothalamus | **D.** Controls hunger, thirst, fatigue, anger, and body temperature |
| | **E.** Receives and relays messages from the sense organs |

31. What is the difference between the sensory and motor divisions of the central nervous system?
**The motor division sends impulses from cons to muscles/ glands, while the sensory division sends impulses from sense organs to the cns.**

32. Which nerves go through openings in the skull and stimulate the head and neck? **Cranial nerves**

33. What are ganglia? **Bundles of cranial and spinal nerves in clusters**

34. What is the function of the sensory division of the peripheral nervous system?
**-transmits impulses from sense organs to CNS**

35. What are sensory receptors? **Cells that transmit info regarding internal and external environments**

36. Which type of sensory receptor would you associate with the following stimuli?

A. light_____**photoreceptor**_____

B. touch and pressure_____**mechanoreceptor**_____

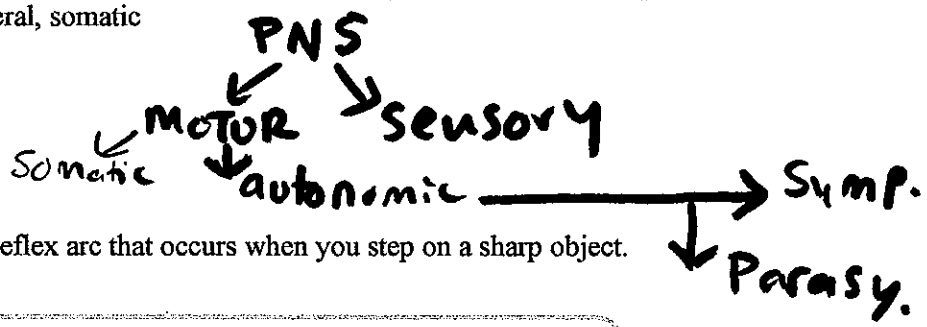
C. temperature changes_____**thermoreceptor**_____

D. tissue injury_____**pain receptor**_____

37. What are the 2 divisions of the motor division and how do they differ?
**Somatic- usually under conscious control, like using arm muscles to raise your hand.**
**Autonomic- automatic- not under your control, like heart rate increasing during exercise.**

38. What are the next 2 divisions of the autonomic nervous system and how do they work together to maintain homeostasis? **sympathetic and parasympathetic--they have opposite effects on glands/ muscles like on/off switches. Symp= increase, Para-decrease**

39. Visually organize or create an outline with the following terms: parasympathetic, sympathetic, motor, sensory, autonomic, central, peripheral, somatic




Complete a flowchart showing the reflex arc that occurs when you step on a sharp object.

1. Sensory receptors react to a stimulus and send an impulse to sensory neurons.
2. SN → IN (spinal cord)
3. IN → MN
4. MN → effector (muscle)
5. Muscle contracts