

Unit 2: Biological Bases of Behavior

Topic 2.1 – Interaction of Heredity and Environment

1. Define heredity.
2. Describe the role Charles Darwin has in the area of heredity and environment?
3. What is heritability?
4. Explain the difference between nature and nurture.
5. Which psychological perspectives learn towards the nature side of the debate?
6. Which psychological perspectives learn towards the nurture side of the debate?
7. What is the difference between epigenetics and brain plasticity?

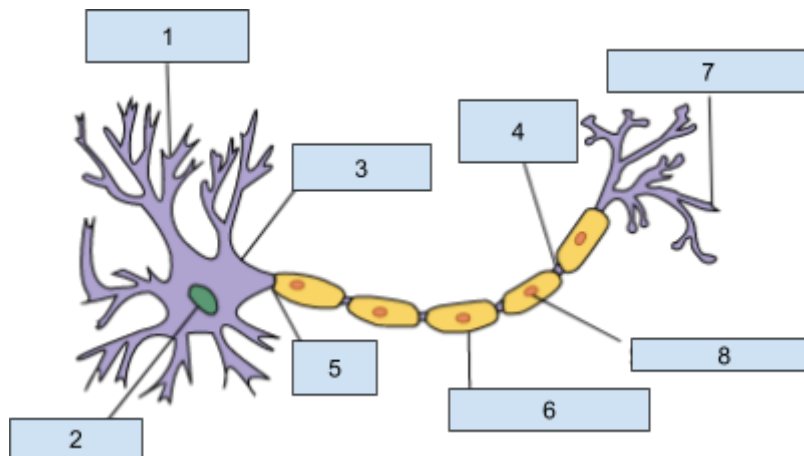
Topic 2.2- The Endocrine System

1. What is the difference between the nervous system and endocrine system?
2. Explain what homeostasis is.
3. Explain the role of the hypothalamus in the endocrine system.
4. Complete the table below.

| Gland | Location/Function | Hormones |
|-----------------------------|-------------------|----------|
| Pituitary Gland | | |
| Pineal Gland | | |
| Thyroid & Parathyroid gland | | |
| Adrenal glands | | |
| Pancreas | | |
| Gonads | | |

Topic 2.3- Overview of the Nervous System and the Neuron

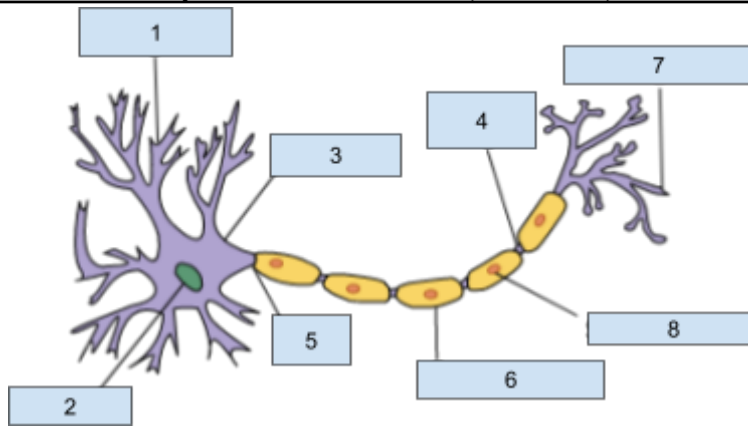
1. What is the difference between the central and peripheral nervous system?
2. Describe the different parts of the peripheral nervous system. (Sensory & Motor)
3. How do afferent neurons differ from efferent neurons?
4. Explain the difference between the somatic nervous system and autonomic nervous system.
5. Identify the two divisions of the autonomic nervous system.
6. What is the function of the two different autonomic nervous systems?
7. What is a glial cell?



8. Complete the table below.

| Part of the Neuron | Name | Function |
|--------------------|------|----------|
| 1 | | |
| 2 | | |
| 3 | | |
| 4 | | |

Topic 2.3- Overview of the Nervous System and the Neuron (Continued)



8. Complete the table below. (Continued)

| Part of the Neuron | Name | Function |
|--------------------|------|----------|
| 5 | | |
| 6 | | |
| 7 | | |
| 8 | | |

Topic 2.4- Neural Firing

1. What is action potential?
2. What must happen for an action potential to occur?
3. What does permeability mean?
4. Complete the table below.

| Term | Description |
|-------------------|-------------|
| Resting Neuron | |
| Depolarization | |
| Repolarization | |
| Refractory period | |

Topic 2.4- Neural Firing (Continued)

5. Describe the synapse.
6. What is the difference between an electrical synapse and chemical synapse?
7. What is a neurotransmitter?
8. Define the synaptic gap.
9. Describe the difference between the presynaptic terminal and postsynaptic terminal.
10. What does reuptake mean?
11. Explain how an excitatory neurotransmitter and inhibitory neurotransmitter impact a neuron.
12. What is hyperpolarization?
13. Complete the table below.

| Type of Neurotransmitter | Description |
|--------------------------|-------------|
| Acetylcholine | |
| Dopamine | |
| Serotonin | |
| Endorphins | |
| Epinephrine | |
| Norepinephrine | |
| Glutamate | |
| GABA | |

Topic 2.5- Influence of Drugs on Neural Firing

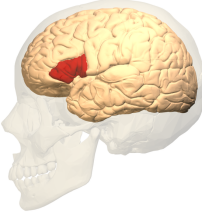

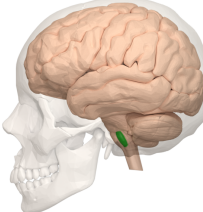

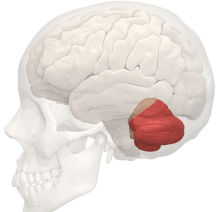

1. Describe the difference between agonists and antagonists drugs.
2. Explain how agonist drugs impact receptors in the synapse.
3. Explain how antagonist drugs impact receptors in the synapse.

Topic 2.5- Influence of Drugs on Neural Firing (Continued)

4. Describe the difference between agonists and antagonists drugs.
5. Explain how agonist drugs impact receptors in the synapse.
6. Explain how antagonist drugs impact receptors in the synapse.
7. Identify an example of an agonist substance and describe its impact on the body.
8. Identify an example of an antagonist substance and describe its impact on the body.

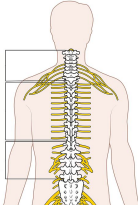

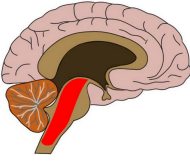
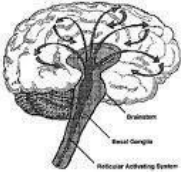

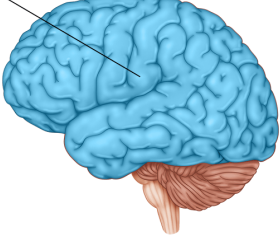

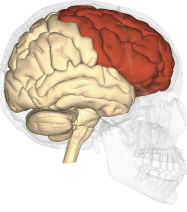

Topic 2.6- The Brain

1. Complete the table below.

| | | |
|---|--|--|
|  <p>Brain Structure: Broca's Area</p> |  <p>Brain Structure: Wernicke's area</p> |  <p>Brain Structure: Medulla Oblongata</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Pons</p> |  <p>Brain Structure: Cerebellum</p> |  <p>Brain Structure: Brainstem</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |

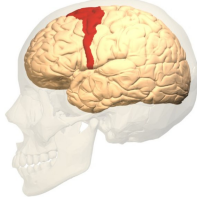
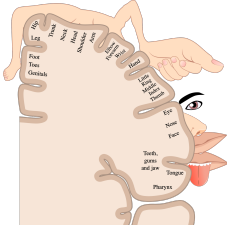
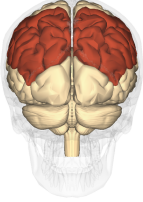
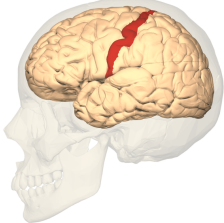

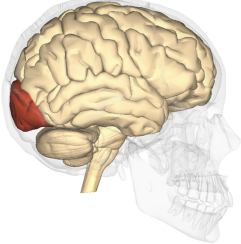
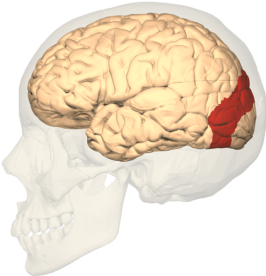
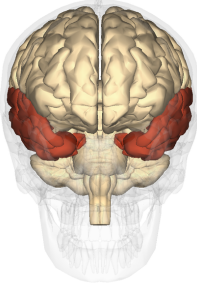
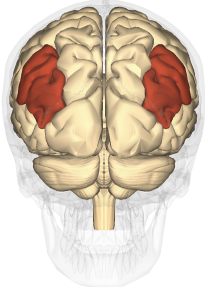
Topic 2.6- The Brain (Continued)

1. Complete the table below. (Continued)

| | | |
|---|--|---|
|  <p>Structure: Spinal Cord</p> |  <p>Brain Structure: MidBrain</p> |  <p>Brain Structure: Reticular Formation</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Reticular Activating System (RAS)</p> |  <p>Brain Structure: Cerebrum</p> |  <p>Brain Structure: Cerebral Cortex</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Corpus Callosum</p> |  <p>Brain Structure: Frontal Lobe</p> |  <p>Brain Structure: Prefrontal Cortex</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |

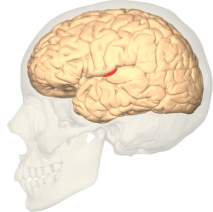
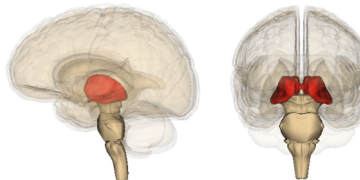
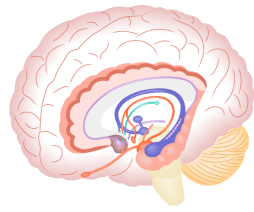
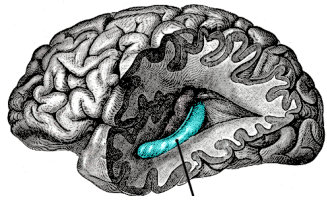
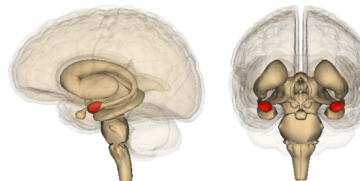
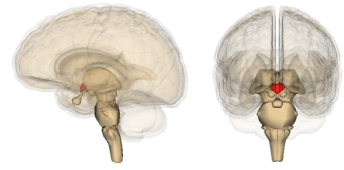
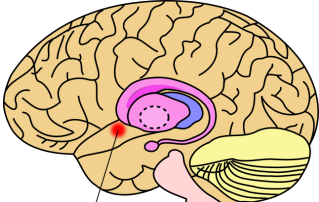
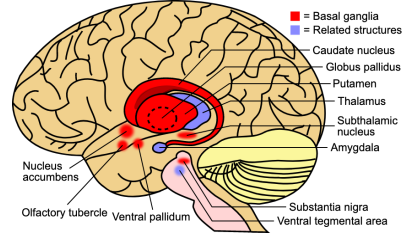
Topic 2.6- The Brain (Continued)

1. Complete the table below. (Continued)

| | | |
|--|---|---|
|  <p>Brain Structure: Motor Cortex</p> |  <p>Motor Homunculus</p> |  <p>Brain Structure: Parietal Lobe</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Somatosensory Cortex</p> |  <p>Sensory Homunculus</p> |  <p>Brain Structure: Occipital Lobe</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Visual Cortex</p> |  <p>Brain Structure: Temporal Lobe</p> |  <p>Brain Structure: Angular Gyrus</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |

Topic 2.6- The Brain (Continued)

1. Complete the table below. (Continued)

| | | |
|---|--|---|
|  <p>Brain Structure: Auditory Cortex</p> |  <p>Brain Structure: Thalamus</p> |  <p>Brain Structure: Limbic System</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Hippocampus</p> |  <p>Brain Structure: Amygdala</p> |  <p>Brain Structure: Hypothalamus</p> |
| <p>Description:</p> | <p>Description:</p> | <p>Description:</p> |
|  <p>Brain Structure: Nucleus Accumbens</p> |  <p>Brain Structure: Basal Ganglia</p> | |
| <p>Description:</p> | <p>Description:</p> | |

Topic 2.6- The Brain (Continued)

2. What are the three major regions of the brain and their locations?
3. Explain what brain lateralization is.
4. Describe what roles the left and right brain are better at due to hemispheric specialization.

Topic 2.7- Tools for Examining Brain Structures and Function

1. Explain what happened to Phineas Gage.
2. What are Roger Sperry and Michael Gazzaniga known for?
3. Why would someone have a split brain procedure done?
4. Describe what happens to an individual when the corpus callosum is cut.
5. What happened to a split-brain patient when shown a word in their right visual field?
6. Explain when lesion studies would be used.
7. Identify two benefits to performing an autopsy on an individual's brain.
8. Complete the table below.

| Neuroimaging technique | Description |
|--|-------------|
| Electroencephalogram (EEG) | |
| Computed tomography (CT) | |
| Positron emission tomography (PET scan) | |
| Magnetic resonance imaging (MRI) | |
| Functional magnetic resonance imaging (fMRI) | |

Topic 2.8- The Adaptable Brain

1. What is neuroplasticity?
2. Identify three ways in which the brain can be damaged.
3. What happens when you learn new information or practice old skills?
4. What is an individual's consciousness?

Topic 2.8- The Adaptable Brain (Continued)

5. Explain how Sigmund Frued and William James viewed consciousness.

6. Complete the table below.

| Psychoactive Drugs | Description |
|--------------------|-------------|
| Psychoactive | |
| Depressants | |
| Opioids | |
| Stimulants | |
| Hallucinogens | |

Topic 2.9- Sleep and Dreaming

1. What is the circadian rhythm?

2. Complete the table below.

| Why Do We Sleep? | |
|-------------------------------|--|
| Restoration Theory | |
| Adaptive Theory | |
| Information processing theory | |

3. What type of neuroimaging technique can be used to visualize the sleep cycle?

4. Describe the difference between alpha waves and beta waves.

5. Describe the difference between theta waves and delta waves.

6. Complete the table below.

| Stages of Sleep | Description | Brain Waves |
|-----------------|-------------|-------------|
| NREM Stage 1 | | |
| NREM Stage 2 | | |

Topic 2.9- Sleep and Dreaming (Continued)

6. Complete the table below. (Continued)

| Stages of Sleep | Description | Brain Waves |
|-----------------|-------------|-------------|
| NREM Stage 3 | | |
| REM | | |

7. What are hypnagogic sensations and what stage of sleep would they occur?

8. Complete the table below.

| Dream Theory | Description |
|------------------------------|-------------|
| Activation-synthesis model | |
| Cognitive development theory | |
| Activation theory | |
| Physiological function | |

9. Complete the table below.

| Sleep Disorder | Description |
|------------------------------|-------------|
| Insomnia | |
| Sleep apnea | |
| Sleep terrors/ Night terrors | |
| Narcolepsy | |