**AP Psychology Unit 4: Biological Bases of Behavior**

**Unit 4 Essential Questions:**

* To what extent are our behaviors and personalities impacted by nature and nurture?
* How does our brain function and adapt to the world around us?
* Why is the study of biological processes important to psychology?
* At times when our biological processes do NOT work as they are supposed to, is this adaptive or maladaptive?

**III. Biological Bases of Behavior (8–10%)**

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| **College Board Description** | **Enduring Understandings** |
| An effective introduction to the relationship between physiological processes and behavior—including the influence of neural function, the nervous system and the brain, and genetic contributions to behavior—is an important element in the AP course.  AP students in psychology should be able to do the following:  • Identify basic processes and systems in the biological bases of behavior, including parts of the neuron and the process of transmission of a signal between neurons.  • Discuss the influence of drugs on neurotransmitters (e.g., reuptake mechanisms).  • Discuss the effect of the endocrine system on behavior.  • Describe the nervous system and its subdivisions and functions:  — central and peripheral nervous systems;  — major brain regions, lobes, and cortical areas;  — brain lateralization and hemispheric specialization.  • Recount historic and contemporary research strategies and technologies that support research (e.g., case studies, split-brain research, imaging techniques).  • Discuss psychology’s abiding interest in how heredity, environment, and evolution work together to shape behavior.  • Predict how traits and behavior can be selected for their adaptive value.  • Identify key contributors (e.g., Paul Broca, Charles Darwin, Michael Gazzaniga, Roger Sperry, Carl Wernicke). | * Each part of the brain is specialized to perform a specific function. * Our brain is highly complex and adaptable; we are only beginning to understand the depth of its functioning. * Neurons are the building blocks of the brain. * Neurons release neurotransmitters on an all or nothing principle. Neurotransmitters are an essential element of our thoughts and behaviors. * The nervous system is our “fast” response system. The endocrine system is our “slow” response system. * Nature and nurture interact to create every aspect of who we are. * Study of genes and heritability can show trends, but cannot predict accurately what will happen on an individual level. * We can use drugs to artificially mimic or inhibit the actions of neurotransmitters in the brain. |

**Unit Vocabulary**

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| Level A  Quiz 1 | Lesion  EEG  CT Scan  PET Scan  MRI  fMRI  Brainstem  Medulla  Reticular Formation  Thalamus | Level B  Quiz 1 | Chromosomes  DNA  Monozygotic Twins  Dizygotic Twins  Evolutionary Psychology  Natural Selection  Mutation  Zygote  Genes  Heritability |
| Level A  Quiz 2 | Cerebellum  Limbic System  Amygdala  Hypothalamus  Cerebral Cortex  Frontal Lobes  Parietal Lobes  Occipital Lobes  Temporal Lobes  Association Areas | Level B Quiz 2 | Dominant Trait  Recessive Trait  Genotype  Phenotype  Split Brain  Dual Processing  Prefrontal Cortex  Sensory Neurons  Motor Neurons  Interneurons |
| Level A  Quiz 3 | Motor Cortex  Sensory Cortex  Broca’s Area  Wernicke’s Area  Corpus Callosum  Hindbrain  Pons  Midbrain  Forebrain  Hippocampus | Level B  Quiz 3 | Dominant Trait  Recessive Trait  Genotype  Phenotype  Split Brain  Dual Processing  Prefrontal Cortex  Sensory Neurons  Motor Neurons  Interneurons |
| Level A  Quiz 4 | Plasticity  Right Hemisphere  Left Hemisphere  Neuron  Dendrite  Axon  Soma  Myelin Sheath  Terminal Buttons  Synapse | Level B  Quiz 4 | Endorphines  Adrenal Gland  Pituitary Gland  Thyroid Gland  Parathyroid  Pancreas  Gonads  Achetylcholine  GABA  Glutamate |
| Level A  Quiz 5 | Action Potential  Threshold  Neurotransmitter  Reuptake  Central Nervous System  Peripheral Nervous System  Autonomic Nervous System  Somatic Nervous System  Sympathetic Nervous System  Parasympathetic Nervous System | Level C  Quiz 1 | Genome  Michael Gazzaniga  Roger Sperry  Turner’s Syndrome  Down Syndrome  Huntington’s Disease  Tay-Sach’s Syndrome  Aphasia  Neurogenesis  Fissures |
| Level A  Quiz 6 | Endocrine System  Hormones  Dopamine  Serotonin  Norepinephrine  Excitatory Neurons  Inhibitory Neurons  Agonists  Antagonists  Fight or Flight Reaction |  |  |

**Unit Overview**

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| --- | --- | --- | --- |
| Monday | Tuesday | Thursday (BLOCK) | Friday |
|  |  | 10/30  Homework:  **Study for Level-Up Quizzes – Fri is final day!** | 10/31  **SWBAT identify various types of neurons and parts of the neuron**  Homework:  Myers p69-82  Study for Level-Up Quiz |
| 11/3  **SWBAT identify & describe the parts & functions of the brain**  Homework:  *Online Quiz – 3B 1&2*  *PsycSim 5 – Hemis. Special.*  *PsycSim 5 – Brain & Behavior*  Study for Level-Up Quiz | 11/4  **SWBAT identify & describe the parts & functions of the brain**  Homework:  Myers p 94-102  Study for Level-Up Quiz | 11/6  **SWBAT describe the process of neural communication**      Homework:  Myers p 103-110  *Online Quiz – 3C 1 &2*  Study for Level-Up Quiz | 11/7  **SWBAT describe the functions of various neurotransmitters**  **SWBAT explain the functions of agonists and antagonists**  **SWBAT explain brain/neuron book assignment**  Homework:  *Online Quiz – 3A 1 & 2*  *PsycSim 5 – Neural Messages*  **Complete Brain/Neuron Book Assignment Over Benchmark Week** |
| 11/10  **No Class Today**  Benchmark Homework Overview:  **Finish Brain Project (Typed Explanations & Model)**  **OR**  **Finish Neuron Book Project (All Writing & Illustrations)**  **PROJECT DUE MON 11/17** | 11/11  **No Class Today** | 11/13  **Benchmark Testing** | 11/14  **Benchmark Testing**  Homework:  Myers p82-91  Study for Level-Up Quiz |
| 11/17  **BRAIN OR BOOK PROJECT**  **DUE TODAY!**  **SWBAT identify & describe the parts & functions of the nervous & endocrine systems**  Homework:  *Myers 3C Review*  *p112-113 MC & FRQ*  Study for Level-Up Quiz  & Unit Exam | 11/18  **SWBAT describe the various methods of studying the brain**  **SWBAT describe how split-brain patients teach us about brain lateralization**  Homework:  *Myers 3A & 3BReview*  *p 65 & 92-93 MC & FRQ*  Study for Level-Up Quiz  & Unit Exam | 11/20  **SWBAT review for the**  **unit 4 exam**  Homework:  Study for Level-Up Quiz  & Unit Exam | 11/21  **SWBAT show mastery on**  **the unit 4 exam**  Homework:  Complete Development Project over Thanksgiving Break |

**Unit 4 Quiz Tracking Sheet**

**Quizzes come from the terms list included in your unit plan.**

***Unit 4 Level-Up Grades (Count as a UNIT TEST grade):***

*60% = Pass 4 A’s*

*70% = Pass 6 A’s*

*80% = Pass 6 A’s & 2 B’s*

*90% = Pass 6 A’s & 4 B’s*

*100% = Pass 6 A’s, 4 B’s, & 1 C*

You can take quizzes during the first seven minutes of any class. You may take as many quizzes as you would like as long as you finish in the first seven minutes. You can also take quizzes after school if you tell me in advance so I can be sure to be available.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Quiz Title** | **Score 1** | **Score 2** | **Score 3** | **Sticker**  **Passed! ☺** |
| Biological - Level A - Quiz 1 |  |  |  |  |
| Biological – Level A – Quiz 2 |  |  |  |  |
| Biological – Level A – Quiz 3 |  |  |  |  |
| Biological – Level A – Quiz 4 |  |  |  |  |
| Biological – Level A – Quiz 5 |  |  |  |  |
| Biological – Level A – Quiz 6 |  |  |  |  |
| Biological – Level B – Quiz 1 |  |  |  |  |
| Biological – Level B – Quiz 2 |  |  |  |  |
| Biological – Level B – Quiz 3 |  |  |  |  |
| Biological – Level B – Quiz 4 |  |  |  |  |
| Biological – Level C – Quiz 1 |  |  |  |  |

**Overall Unit 4 Grade: \_\_\_\_\_\_\_\_**

**Group 1 – Oldest Structures of the Brain**

Terms to include in your presentation:

Cerebellum

Brainstem

Thalamus

Reticular Formation

Medulla

Pons

For EACH term, your group should have:

1. An explanation of that part’s function
2. EXAMPLES of what that could look like in every-day life. (How would that brain part impact your thoughts/behaviors?) USE EITHER THE CAR DRIVING OR SUPERHERO SCENARIO IN YOUR EXPLANATION!!
3. Diagrams showing what that part looks like and where in the brain it is located (Use the brain diagrams people have – you can ask them to color/label etc as you teach!
4. Give people a written or visual mnemonic to help them remember each part. Try to come up with your OWN if you can (Though you can also share the one in your packet.)

Keep in mind you will have 8-10 min max for your presentation and you will need to allow time for questions!

**Group 2 – The Limbic System**

Terms to include in your presentation:

Limbic system

Hypothalamus

Pituitary Gland

Amygdala

Hippocampus

For EACH term, your group should have:

1. An explanation of that part’s function
2. EXAMPLES of what that could look like in every-day life. (How would that brain part impact your thoughts/behaviors?) USE EITHER THE CAR DRIVING OR SUPERHERO SCENARIO IN YOUR EXPLANATION!!
3. Diagrams showing what that part looks like and where in the brain it is located (Use the brain diagrams people have – you can ask them to color/label etc as you teach!
4. Give people a written or visual mnemonic to help them remember each part. Try to come up with your OWN if you can (Though you can also share the one in your packet.)

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**Group 3 – The Forebrain**

Terms to include in your presentation:

Cerebral Cortex

Parietal Lobe

Frontal Lobe

Occipital Lobe

Temporal Lobe

Motor Cortex

Sensory Cortex

For EACH term, your group should have:

1. An explanation of that part’s function
2. EXAMPLES of what that could look like in every-day life. (How would that brain part impact your thoughts/behaviors?) USE EITHER THE CAR DRIVING OR SUPERHERO SCENARIO IN YOUR EXPLANATION!!
3. Diagrams showing what that part looks like and where in the brain it is located (Use the brain diagrams people have – you can ask them to color/label etc as you teach!
4. Explain how the motor and sensory cortex are set up. How does the amount of space allocated in the brain correlate with sensation/movement?
5. Give people a written or visual mnemonic to help them remember each part. Try to come up with your OWN if you can (Though you can also share the one in your packet.)

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**Group 4 – Association Areas**

Terms to include in your presentation:

Motor Cortex

Sensory Cortex

Auditory Cortex

Visual Cortex

Broca’s Area

Wernicke’s Area

For EACH term, your group should have:

1. An explanation of that part’s function
2. EXAMPLES of what that could look like in every-day life. (How would that brain part impact your thoughts/behaviors?) USE EITHER THE CAR DRIVING OR SUPERHERO SCENARIO IN YOUR EXPLANATION!!
3. Diagrams showing what that part looks like and where in the brain it is located (Use the brain diagrams people have – you can ask them to color/label etc as you teach!
4. Spend most of your time explaining association areas. What are they? Where are they? How do they function in the brain?
5. Give people a written or visual mnemonic to help them remember each part.

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**Group 5 – Hearing & Speaking Language**

Terms to include in your presentation:

Aphasia

Broca’s Area

Angular Gyrus

Wernicke’s Area

Visual Cortex

Motor Cortex

For EACH term, your group should have:

1. An explanation or definition
2. Diagrams showing what that part looks like and where in the brain it is located (Use the brain diagrams people have – you can ask them to color/label etc as you teach!
3. **Explain the PROCESS of hearing and speaking language. Make sure students clearly understand the role each part plays, and also the order in which each part receives and processes information.**
4. Give people a written or visual mnemonic to help them remember each term/brain part.

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**Group 6 – Brain Adaptation**

Terms to include in your presentation:

Plasticity

Neurogenesis

Dual Processing

Consciousness

Cognitive Neuroscience

For EACH term, your group should have:

1. An explanation or definition
2. Give people clear examples of how each of the above terms work and where/when each of these things might happen.
3. Also with plasticity, neurogenesis, and dual processing, be sure to discuss the BENEFITS of these features AND their limitations (How are these things helpful? What can we NOT do??)
4. How do brain plasticity and neurogenesis help someone who has a part of their brain damaged or removed? What if a child is born without a part of their brain? How does age impact neurogenesis/plasticity?
5. Give people a written or visual mnemonic to help them remember each term.

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**Group 7 – Split Brain Patients**

Terms to include in your presentation:

Corpus Callosum

Split-Brain Operation

Roger Sperry

Michael Gazzaniga

For EACH term, your group should have:

1. An explanation or definition
2. Explain how researchers use split-brain patients to test how the brain works. What can people do? What can they not do?
3. Make sure the class could explain back to you how these operations work and what they tell us about the brain.
4. Also, be sure the class could tell you what a person would say/do depending on what eye saw an image/word in a split-brain study.
5. Give people a written or visual mnemonic to help them remember each term.

Keep in mind you will have 8-10 min max for your presentation and you will need to allow time for questions!

**Group 8 – Hemispheric Specialization**

Terms to include in your presentation:

Corpus Callosum

Right Hemisphere

Left Hemisphere

Brain Lateralization

Hemispheric Specialization

For EACH term, your group should have:

1. An explanation or definition
2. Explain the specialized functions of each hemisphere.
3. What are the limits of hemispheric specialization? Be sure the class is clear that most brain functions involve an interaction between both hemispheres.
4. How does brain lateralization impact body movement? Be sure the class understands how the brain processes visual fields AND movement on the right and left side of the body.
5. Give people a written or visual mnemonic to help them remember each term.

Keep in mind you will have 8-10 min max for your presentation and you will need to allow time for questions!

**Group 1**

**Do not write on, fold, or damage packets!!!**

**Group 2**

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**Group 6**

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**Group 7**

**Do not write on, fold, or damage packets!!!**

**Group 8**

**Do not write on, fold, or damage packets!!!**