Unit 1 Cheat Sheet: Biological Bases of Behavior

AP® Psychology · Unit 1 Review · Topics 1.1 to 1.6

> **The big idea:** Unit 1 follows a signal into you: senses turn energy into neural messages, neurons relay them chemically, and the brain turns them into thought, emotion, sleep, and action. It is 15 to 25 percent of the multiple-choice section.
>
> **How to use it:** Fill in the blank version from memory first, then check it here. Star anything you missed. Those are your review targets.

KEY TERMS

Heredity and the nervous system (Topics 1.1 and 1.2)

Adoption vs. family studies	Adoptees vs. birth and adoptive parents splits genes from home; kin share both.
Evolutionary perspective	Behavior shaped by natural selection for survival and reproduction.
Eugenics	Deciding who should have children by "genetic worth"; psychology rejects it.
Central vs. peripheral nervous system	Brain and spinal cord vs. the nerves that link them to the rest of the body.
Somatic vs. autonomic	Voluntary movement of skeletal muscles vs. automatic jobs like heart rate.

Neurons and neural firing (Topic 1.3)

Neurons vs. glial cells	Carry information vs. support neurons (structure, insulation, cleanup).
Reflex arc	Sensory neuron to interneuron (spinal cord) to motor neuron; no brain needed.
Resting potential vs. threshold	Negative charge inside at rest vs. the level the charge must cross to fire.
Depolarization vs. refractory period	Charge flips positive in an action potential vs. a brief time it can't fire.
Reuptake	The sending neuron pulls leftover neurotransmitter back in.
Multiple sclerosis vs. myasthenia gravis	Damaged myelin slows signals vs. blocked acetylcholine receptors.

Hormones and drugs (Topic 1.3)

Neurotransmitters vs. hormones	Cross a synapse fast vs. travel in the blood: slower and longer lasting.
Adrenaline, melatonin, oxytocin	Energy burst in stress; sleepiness (rises in darkness); bonding and trust.
Leptin vs. ghrelin	Signals fullness vs. signals hunger.
Stimulants vs. depressants	Speed neural activity up (caffeine, cocaine) vs. slow it down (alcohol).
Hallucinogens vs. opioids	Distort perception and thinking (marijuana) vs. relieve pain (heroin).
Tolerance vs. withdrawal	Needing more for the same effect vs. unpleasant symptoms when use stops.

The lower brain (Topic 1.4)

Brainstem (medulla)	Keeps you alive: breathing, heart rate.
Reticular activating system	Controls alertness and arousal.
Cerebellum	Balance, coordination, and procedural learning (riding a bike).

Limbic system, cortex, and scans (Topic 1.4)

Thalamus vs. hypothalamus	Sensory relay (all but smell) vs. hunger, thirst, temperature; directs the pituitary.
Hippocampus vs. amygdala	Forms new explicit memories (facts, events) vs. fear and aggression.
Frontal vs. parietal lobe	Planning and movement (motor cortex) vs. touch (somatosensory cortex).
Prefrontal cortex	Executive functions: planning, judgment.
Temporal vs. occipital lobe	Hearing and language (sides) vs. vision (back of the brain).
Plasticity	The brain rewires with experience or after injury; other areas can take over.
EEG vs. fMRI	Electrical activity (great timing; sleep stages) vs. which areas are active.

Sleep (Topic 1.5)

Circadian rhythm	The roughly 24-hour sleep/wake cycle; jet lag and shift work disrupt it.
REM rebound	Extra REM after missing REM.
Restoration vs. consolidation	Why we sleep: to repair and refuel vs. to strengthen the day's learning.
Activation-synthesis vs. consolidation	Why we dream: random brain activity made into a story vs. sorting memories.
Insomnia, narcolepsy, sleep apnea	Ongoing trouble falling or staying asleep; sleep attacks; breathing pauses.
REM sleep behavior disorder	Acting out dreams in REM; sleepwalking (somnambulism) happens in NREM 3.

Sensation (Topic 1.6)

Sensory adaptation	Fading sensitivity to a stimulus that doesn't change (the feel of your socks).
Rods vs. cones	Dim light, shape, motion, no color vs. color and detail (packed in the fovea).
Trichromatic vs. opponent-process	Three cone types (color deficiency) vs. opposing pairs (afterimages).
Place, frequency, volley theories	Where the cochlea vibrates (high pitch), firing rate (low), turn-taking (middle).
Conduction vs. sensorineural	Deafness from a damaged eardrum or middle-ear bones vs. hair cells or nerve.
Olfaction	Smell: skips the thalamus at first.
Gate control theory	The spinal cord can block or pass pain signals (rubbing a bumped elbow).
Vestibular sense vs. kinesthesis	Balance (semicircular canals) vs. the position and movement of body parts.

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NEUROTRANSMITTERS (TOPIC 1.3): THE ONLY EIGHT THE EXAM ASKS ABOUT

NEUROTRANSMITTER	WHAT IT DOES
Dopamine	Reward, motivation, and movement; the brain's reward center is a dopamine pathway
Serotonin	Mood, sleep, and appetite; some antidepressants block its reuptake
Norepinephrine	Alertness and arousal
Glutamate	The main excitatory neurotransmitter (makes firing more likely); learning and memory
GABA	The main inhibitory neurotransmitter (makes firing less likely); calms brain activity
Endorphins	Natural pain relief; opioids such as heroin act like endorphins
Substance P	Sends pain signals
Acetylcholine	Muscle movement and memory; blocked receptors cause the weakness of myasthenia gravis

DON'T CONFUSE THESE

Twin study logic	Genes are implicated when identical twins are more alike than fraternal twins, not just alike.
Sympathetic vs. parasympathetic	Stresses vs. pacifies: fight or flight (heart speeds up, pupils dilate) vs. rest and digest.
All-or-none principle	A neuron fires fully or not at all: a stronger stimulus makes it fire more often, never harder.
Agonist, antagonist, reuptake inhibitor	Mimics or boosts a neurotransmitter vs. blocks its receptor (less effect) vs. plugs reuptake, so it stays in the synapse longer (more effect).
Broca's vs. Wernicke's area	Produces speech (frontal lobe) vs. understands language (temporal lobe); damage: aphasia.
NREM 3 vs. REM sleep	Deep, slow-wave sleep that comes early in the night vs. vivid dreams, an awake-looking EEG, and a still body (paradoxical sleep); REM periods lengthen toward morning.
Absolute threshold vs. just-noticeable difference	The weakest stimulus you detect at least 50 percent of the time vs. the smallest change you can detect, a constant proportion of the original (Weber's law).
Sensation vs. perception	Detecting energy (receptors transduce it into neural signals) vs. interpreting it (Unit 2).

STUDIES TO KNOW COLD

Split-brain (Sperry, Gazzaniga)	With the corpus callosum cut, a key flashed to the left visual field reaches only the right hemisphere: the patient can't name it (speech is usually on the left) but the left hand finds it.
Bouchard's twins reared apart	Identical twins reared apart were about as alike in personality as those reared together.
Maguire's London taxi drivers	Drivers had a larger rear hippocampus than people who didn't drive taxis, and the longer they had driven, the larger it was: often cited as evidence of plasticity.
Patel's taxi driver study (2024)	Of 443 jobs (about 9 million death records), taxi and ambulance drivers had the lowest shares of deaths from Alzheimer's. Correlational, so it can't show cause and effect.
Dillard's hearing meta-analysis	Pooling 33 studies (19,046 people ages 12 to 34), about 24 percent listened through earbuds or headphones past safe limits; at concerts and clubs, about 48 percent.

FRQ: HOW UNIT 1 SHOWS UP

PROMPT SAYS	WHAT TO DO
Identify or state	Name it. No explanation needed.
Describe	Give its key features or details.
Explain	Say how or why, using evidence or reasoning.
Propose	Make a claim of your own that answers the question.
Support or refute	Say whether the evidence backs the claim, and why.
Use evidence	Give specific results or conclusions from the source.

Likely Unit 1 FRQ angles

- Identify the method, like a correlational study of death records, and state an operational definition.
- Describe what a difference in mean or median sleep shows.
- Identify an ethical guideline used, like informed consent.
- Explain how far the findings generalize, given who took part, like only ages 12 to 34.
- Explain how a finding supports or refutes the hypothesis.
- Propose a claim, then support it with two sources and a different concept for each (EBQ).

> **FRQ rules:** Apply each concept to the study or source; a definition alone earns nothing. Cite EBQ sources by number (Source 1, 2, or 3). Write in complete sentences.

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