

UNIT 1: BIOLOGICAL BASES OF BEHAVIOR



COGNITOEDU.LINK/AP-PSYCH-U1

Scan for Unit 1 notes

20 AP-style MCQs across topics 1.1 to 1.6. Practice, review, revisit.

WHAT'S INSIDE

- ✓ 20 MCQs, four options each, in the style of the real AP exam
- ✓ Every question tagged to a Unit 1 topic so you know what to revise
- ✓ Full answer key with a short explanation for every question
- ✓ Mix of standalone and stimulus-style stems, matching real AP question formats

HOW TO USE IT

- 1. Untimed pass.** Work through slowly, aiming for around 90 seconds per question. Read every option before you commit.
- 2. Timed pass.** Redo the pack in 24 minutes. That matches AP exam pace (72s per MCQ) and builds stamina.
- 3. Review.** Check the answer key and mark every miss. Revise those topics on Cognito, then retry after a week.

TOPICS COVERED

- **1.1** Interaction of Heredity and Environment
- **1.2** Overview of the Nervous System
- **1.3** The Neuron and Neural Firing
- **1.4** The Brain
- **1.5** Sleep
- **1.6** Sensation

STRUGGLING WITH A TOPIC?



Any topic tricky? Scan the QR to jump straight to the Unit 1 notes on Cognito. For the full AP Psychology course (all 5 units, lessons, quizzes, flashcards and past-paper FRQs), head to **cognitoedu.link/ap-psych-notes**. Rework the questions you got wrong a week later to lock the concepts in.

AP EXAM CONTEXT

15-25% 75

UNIT WEIGHT (MCQ
SECTION)

MCQS ON THE REAL EXAM

72s

AVERAGE TIME PER MCQ

AP PSYCHOLOGY

Unit 1: Biological Bases of Behavior

SECTION I · MULTIPLE CHOICE

Time—24 minutes

20 Questions

Directions: Each of the questions or incomplete statements below is followed by four suggested answers or completions. Select the one that is best in each case and mark it clearly on your answer sheet or circle your choice below.

Questions 1, 2 refer to the following information.

Researchers compared identical twins raised together, identical twins raised apart, and fraternal twins raised together on a standardized measure of extraversion. All participants were adults, and the researchers reported correlation coefficients for the extraversion scores within each pair.

Table 1. Correlations of extraversion scores within twin pairs

Pair type	Rearing	Correlation (r)
Identical twins	Raised together	0.55
Identical twins	Raised apart	0.38
Fraternal twins	Raised together	0.20

- Which conclusion is best supported by the correlations shown in Table 1?
 - Extraversion is driven mainly by shared home environment, since the twins-raised-together correlation is the highest of the three.
 - Extraversion has a heritable component, since identical pairs still correlate more strongly than fraternal pairs even when reared apart.
 - Fraternal twins share about the same amount of genetic material as identical twins, so the differences in correlation must reflect the effect of home environment on this trait.
 - A correlational study of this type cannot support any inference about a genetic contribution to extraversion.
- Which of the following is the strongest methodological reason for including the identical-twins-raised-apart group in the design?
 - It lets the researchers manipulate genetic similarity between participants across the different pair conditions.
 - It guarantees that the sample sizes in the three groups are equal for a valid statistical comparison.
 - It helps separate shared environment from shared genes, since these twins share genes but not upbringing.
 - It removes the possibility that any observed within-pair similarity reflects a shared upbringing effect.

Questions 3, 4 refer to the following information.

A person is walking through a quiet park when a large dog suddenly lunges toward them, barking loudly. Within a second, their heart rate spikes, their pupils dilate, and they feel a surge of energy as they leap out of the way. Once the dog is pulled back by its owner, the person's heart rate slowly returns to normal over the next several minutes.

- The rapid rise in heart rate, dilated pupils, and burst of energy the person feels when the dog lunges are most directly produced by activation of which division of the nervous system?
 - The sympathetic branch, which mobilizes the body for fight-or-flight responses.
 - The somatic nervous system, part of the peripheral nervous system.
 - The parasympathetic branch, which supports rest, digestion, and recovery after arousal.
 - The central nervous system, working through the spinal cord and higher cortical areas.
- As the person's heart rate slowly returns to normal after the dog is pulled away, which division of the nervous system is playing the largest role in that recovery?
 - The sympathetic branch, which continues firing to gradually lower heart rate after a threat has passed.
 - The somatic branch, which voluntarily commands the heart to slow through skeletal muscle control.
 - The peripheral nerves alone, acting independently of any input from the brain or spinal cord.
 - The parasympathetic branch, which restores resting activity and slows the heart after arousal.

AP PSYCHOLOGY · Unit 1: Biological Bases of Behavior · Section I (continued)

Question 5 refers to the following information.

A team of neuroscientists wants to test whether an eight-week mindfulness training program causes a reduction in amygdala reactivity to stressful images, measured with functional magnetic resonance imaging (fMRI). The team has 200 college student volunteers available.

5. Which research design would best allow the team to test whether mindfulness training causes a reduction in amygdala reactivity?
 - (A) A naturalistic fMRI study that scans students who already practice mindfulness on their own during exam week.
 - (B) A single detailed case study of one motivated volunteer scanned before and after completing the program.
 - (C) An experiment that randomly assigns volunteers to training or a matched control, with fMRI scans before and after.
 - (D) A correlational survey linking self-reported meditation hours to self-reported perceived stress ratings.
6. A neuron receives many small signals from other neurons at its dendrites. Only when the combined signals push the membrane past a specific voltage does the neuron fire a full action potential down its axon, and that action potential does not vary in strength once triggered. Which principle does this pattern illustrate?
 - (A) The all-or-none response, in which the action potential fires at full strength once threshold is met.
 - (B) The refractory period, which briefly blocks a second action potential right after one has fired.
 - (C) Reuptake, in which neurotransmitters are pulled back into the sending neuron after their release.
 - (D) Myelination, in which a fatty sheath on the axon speeds up the propagation of an action potential.

Questions 7, 8 refer to the following information.

A physician prescribes a new medication for a patient with an anxiety condition. The medication binds to postsynaptic receptor sites in brain circuits that regulate arousal, and once it is bound it opens the same chloride channel that the endogenous transmitter normally opens at that site. The patient reports feeling calmer and more relaxed within an hour of taking the drug. Laboratory assays show that the receptor site is the main inhibitory receptor in the central nervous system.

7. Based on the drug's binding profile and its effect on the postsynaptic neuron, it is best classified as which of the following?
 - (A) An antagonist, which occupies the receptor and blocks the body's own neurotransmitter from binding there.
 - (B) An agonist, which activates the receptor and produces the same physiological response as the body's own neurotransmitter.
 - (C) A reuptake inhibitor, which prevents the body's own neurotransmitter from being pulled back into the sending neuron.
 - (D) A precursor, which supplies raw material used inside the cell to synthesize the body's own neurotransmitter.
8. What is the most likely effect of the medication on the postsynaptic neurons whose receptors it binds?
 - (A) It makes them more likely to fire an action potential in response to incoming signals.
 - (B) It raises their baseline firing rate without changing their response to incoming signals.
 - (C) It leaves their firing rate unchanged, since receptor binding cannot alter neuronal output.
 - (D) It makes them less likely to fire an action potential in response to incoming signals.

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9. Researchers test a new drug that targets dopamine pathways in adults diagnosed with Parkinson's disease. After eight weeks, patients complete a standardized 0-to-100 motor-function scale on which higher scores indicate better motor function. Group 1 (drug) has a mean of 62 and a standard deviation of 8. Group 2 (inert pill) has a mean of 58 and a standard deviation of 20. Which conclusion about the two sets of scores is best supported by these descriptive statistics?
- (A) Group 1's scores show more variability than Group 2's, because Group 1's mean is higher.
- (B) Group 1 and Group 2 have the same spread of scores, since a mean and a standard deviation are two ways of describing the same property.
- (C) Group 2's scores are more spread out around their mean than Group 1's scores are around theirs.
- (D) Spread cannot be compared from a mean and a standard deviation alone without also knowing the median of each set of scores.
10. A student reads that ghrelin plays a role in triggering feelings of hunger before a meal. In the body, ghrelin is best classified as which of the following?
- (A) A hormone released into the bloodstream from tissues in the endocrine system.
- (B) A neurotransmitter released at synapses between neurons in hunger circuits.
- (C) An enzyme that breaks down other signaling molecules once they have been released.
- (D) A postsynaptic receptor protein that other signaling molecules must bind to in order to have an effect.

Questions 11, 12 refer to the following information.

A neurologist examines three patients who each experienced damage to a different part of the brain after a stroke. Each patient shows a distinct pattern of impairment while other abilities remain intact.

Table 2. Observed impairments after localized brain damage

Patient	Damaged region	Main impairment
1	Left frontal lobe	Slow, effortful speech; comprehension intact
2	Left temporal lobe	Fluent but meaningless speech; poor comprehension
3	Cerebellum	Uncoordinated movement and difficulty with balance

11. Based on Table 2, which function is most likely impaired in Patient 1 but preserved in Patient 2?
- (A) Recognizing familiar faces and objects in the visual field.
- (B) Producing fluent, well-articulated spoken language.
- (C) Understanding the meaning of spoken and written words.
- (D) Coordinating balance and smooth voluntary movement.
12. Which everyday task would Patient 3 most likely find difficult given the impairment described?
- (A) Recalling the names of people met earlier in the same day.
- (B) Recognizing a familiar melody played on the piano keyboard.
- (C) Naming common household objects placed in front of them.
- (D) Walking a straight line and picking up a small object.
13. A researcher wants to test whether damage to one specific brain region is what prevents patients from forming new long-term memories after their illness. In humans, which approach would provide the strongest evidence for this causal claim?
- (A) Compare memory performance between patients with damage localized to that region and matched controls.
- (B) Survey a large convenience sample of older adults about how often they forget recent everyday events.
- (C) Deliberately induce lesions in the target region in healthy adult volunteers and measure memory later.
- (D) Follow one motivated patient in detail over many years without collecting data on a comparison group.

AP PSYCHOLOGY · Unit 1: Biological Bases of Behavior · Section I (continued)

Questions 14, 15 refer to the following information.

A sleep researcher records brain activity from a healthy adult across a full night. In one segment, the electroencephalogram (EEG) shows large, slow delta waves and the person is very difficult to wake. Later in the night, another segment shows an EEG that resembles wakefulness, along with rapid eye movements and near paralysis of the skeletal muscles.

14. The later segment of the recording, with rapid eye movements and near paralysis of the skeletal muscles, is most consistent with which stage of sleep?
 - (A) Stage 1 sleep, a brief transitional period at the start of a cycle.
 - (B) Stage 2 sleep, marked by sleep spindles and K-complexes on the EEG.
 - (C) REM sleep, the stage most closely associated with vivid dreaming reports.
 - (D) Full wakefulness, with normal muscle tone and a typical daytime EEG.
15. The earlier segment of the recording, with large slow delta waves and difficulty waking the sleeper, is most consistent with which sleep state?
 - (A) The REM stage of sleep, common in the second half of the night.
 - (B) Stage 1 sleep, a light transition at the very start of sleep.
 - (C) Eyes-closed relaxed wakefulness, marked by regular alpha waves.
 - (D) Stage 3 sleep, the deep slow-wave stage of the sleep cycle.
16. A person reports repeatedly falling asleep without warning at work, sometimes in the middle of a conversation or while eating, despite getting a full night of sleep. This pattern is most consistent with which of the following sleep disorders?
 - (A) Insomnia, marked by difficulty falling or staying asleep at night.
 - (B) Narcolepsy, marked by sudden uncontrollable sleep attacks.
 - (C) Sleep apnea, marked by repeated pauses in breathing during sleep.
 - (D) Somnambulism, marked by complex movements during deep NREM sleep.

17. A sleep researcher wants to study how melatonin release changes across the evening in healthy adults. Which of the following gives the strongest operational definition of 'evening melatonin release' for use in the study?
 - (A) How sleepy each participant feels at bedtime, rated on a 1-to-5 self-report scale.
 - (B) The average number of hours of sleep each participant reports getting during the previous week.
 - (C) Salivary melatonin concentration in picograms per milliliter, sampled every 30 minutes from 6:00 p.m. to 11:00 p.m.
 - (D) Whether each participant answers 'yes' or 'no' when asked if they believe their melatonin is rising.

Question 18 refers to the following information.

A student is studying at a desk in a quiet room and puts on a wristwatch. At first, they notice the weight and slight pressure of the watchband. After about ten minutes of reading, they stop noticing the watch entirely, even though the physical pressure on the skin is unchanged.

18. Which concept best explains why the student stops noticing the watch on their wrist after several minutes?
 - (A) Absolute threshold, the minimum intensity needed to detect a stimulus half of the time.
 - (B) Weber's law, the rule that a just-noticeable difference is a proportion of the original stimulus.
 - (C) Sensory adaptation, the drop in receptor response to a stimulus that stays unchanged over time.
 - (D) Transduction, the initial conversion of physical energy into neural signals for the brain.

AP PSYCHOLOGY · Unit 1: Biological Bases of Behavior · Section I (continued)

19. A movie soundtrack suddenly plays a very loud crash of thunder, and the viewer startles in their seat. Compared with a quiet whisper earlier in the movie, the loud crash has sound waves with which property?
- (A) Greater amplitude, which the ear interprets as increased loudness.
 - (B) Greater frequency, which the ear interprets as increased loudness.
 - (C) Greater amplitude, which the ear interprets as a higher pitch.
 - (D) Greater wavelength, which the ear interprets as a higher pitch.
20. A soccer player traps a ball with the inside of their foot without looking down. They can tell exactly where their foot is in relation to their leg and the ball, even with their eyes closed. This ability is best explained by which sense?
- (A) The vestibular sense, which tracks overall body balance and head position in space.
 - (B) Kinesthesia, which senses the position and movement of individual body parts.
 - (C) Olfaction, which detects airborne chemicals through receptors in the nose.
 - (D) Gustation, which detects dissolved chemicals through receptors on the tongue.

Q1. Answer: B

Topic 1.1 · Interaction of Heredity and En...

Identical twins share about 100% of their DNA and fraternal twins about 50%. Identical pairs correlate more strongly (0.55, 0.38) than fraternal pairs (0.20), even when reared apart, which points to a heritable component. A ignores that identicals raised apart still resemble each other. C is factually wrong about twin biology: fraternal twins share less genetic material than identical twins, not the same amount. D overstates the limit: twin studies are the standard tool for estimating heritability.

Q2. Answer: C

Topic 1.1 · Interaction of Heredity and En...

Identical twins raised apart share nearly all their genes but not their rearing environment, so a substantial correlation in this group is hard to explain by shared upbringing. That comparison is what twin-adoption designs exist to make. A is false because researchers cannot manipulate genes; twin type is measured, not assigned. B is unrelated to the design logic, and D overclaims what a single comparison group can rule out.

Q3. Answer: A

Topic 1.2 · Overview of the Nervous System

The sympathetic branch of the autonomic nervous system accelerates the heart, dilates pupils, and releases energy for fight-or-flight, which matches the person's response to the lunging dog. The parasympathetic branch does the opposite and dominates the slow return to baseline once the threat has passed. The somatic nervous system controls voluntary skeletal muscle rather than involuntary heart and pupil responses, and the central nervous system does not produce these effects on its own without the autonomic pathways of the peripheral nervous system.

Q4. Answer: D

Topic 1.2 · Overview of the Nervous System

The parasympathetic branch dominates once a threat is over, slowing heart rate and returning the body to a resting state. A reverses the roles of the two autonomic branches. The somatic system controls voluntary skeletal muscle, not heart rate, and the brain is very much involved in interpreting that the danger has passed, so C is also wrong.

Q5. Answer: C

Topic 1.4 · The Brain

A causal claim about a brain measure requires random assignment to conditions plus a comparable control group, so a randomized pre-post fMRI design is the correct approach. Naturalistic and correlational designs cannot rule out third variables such as pre-existing amygdala differences, and a single case study cannot support a general causal claim about the intervention.

Q6. Answer: A

Topic 1.3 · The Neuron and Neural Firing

Once the threshold is reached, the action potential fires at a fixed intensity and travels the full length of the axon; below threshold, nothing happens. That is the all-or-none response. The refractory period follows an action potential and briefly limits new firing, reuptake is a synaptic recycling process, and myelination speeds signals rather than illustrating the threshold pattern described.

Q7. Answer: B

Topic 1.3 · The Neuron and Neural Firing

An agonist binds to a receptor and produces the same effect as the natural neurotransmitter. Because GABA is the main inhibitory neurotransmitter in the central nervous system, boosting its effect reduces overall neural excitation, which fits a calming, anti-anxiety response. An antagonist would block the receptor, a reuptake inhibitor works on the transporter rather than the receptor, and a precursor supplies building blocks rather than binding the receptor.

Q8. Answer: D

Topic 1.3 · The Neuron and Neural Firing

Because the target is the main inhibitory receptor in the central nervous system, activating it hyperpolarizes the postsynaptic membrane and moves it away from firing threshold. That fits the patient's calmer, less aroused state. A describes an excitatory effect, B misdescribes what inhibition does, and C ignores that receptor binding directly changes membrane potential.

Q9. Answer: C

Topic 1.3 · The Neuron and Neural Firing

Standard deviation directly measures how far scores typically fall from their group mean, so it is the correct statistic for comparing spread. The placebo group's SD of 20 is much larger than the treatment group's SD of 8, so placebo scores are more spread out around their mean. A confuses the mean (a measure of central tendency) with the SD (a measure of spread). B misdescribes what a mean and an SD tell you. D is factually wrong: the SD by itself already quantifies spread, and the median is not required for that comparison.

Q10. Answer: A

Topic 1.3 · The Neuron and Neural Firing

Ghrelin is a hormone: it is released into the bloodstream and travels to the brain to influence hunger. Neurotransmitters cross the tiny gap of a synapse between neurons rather than traveling through the blood, so B is the wrong signaling category. Enzymes (C) break down molecules but are not themselves the messenger, and receptor proteins (D) receive signals rather than triggering hunger from the endocrine side.

Q11. Answer: B

Topic 1.4 · The Brain

Patient 1 shows slow, effortful speech with intact comprehension (the classic Broca profile), while Patient 2 shows fluent but meaningless speech with poor comprehension (the Wernicke profile). The function that fails in Patient 1 but works in Patient 2 is fluent speech production. C is the opposite pattern (impaired in Patient 2, spared in Patient 1). A points to the visual cortex, and D points to the cerebellum (Patient 3).

Q12. Answer: D

Topic 1.4 · The Brain

Uncoordinated movement and poor balance are signature effects of cerebellar damage, so tasks that need smooth motor coordination will be hardest. A points to hippocampal memory function, B to auditory cortex, and C to language and object-recognition pathways in the temporal and parietal lobes, none of which match Patient 3's described impairment.

Q13. Answer: A

Topic 1.4 · The Brain

In humans, researchers cannot ethically create brain lesions, so the strongest available evidence comes from carefully matched patient-vs-control comparisons in people with naturally occurring, localized damage. B measures self-reported forgetting rather than the memory system in question, C would be a clear APA ethics violation, and D provides no comparison group and cannot support a general causal claim.

Q14. Answer: C

Topic 1.5 · Sleep

REM sleep is defined by rapid eye movements, wake-like brain activity, and near paralysis of voluntary muscles, and it is the stage most associated with vivid dreaming. Stage 1 is a brief transition into sleep without paralysis, stage 2 shows characteristic spindles and K-complexes rather than the pattern described, and full wakefulness would not show muscle paralysis.

Q15. Answer: D

Topic 1.5 · Sleep

Delta waves and a high arousal threshold are the fingerprints of stage 3 sleep, the deep slow-wave stage that appears most prominently in the first half of the night. REM shows fast, wake-like activity rather than delta waves, stage 1 is brief and lighter, and relaxed wakefulness is marked by alpha waves.

Q16. Answer: B

Topic 1.5 · Sleep

Narcolepsy is characterized by sudden, uncontrollable sleep attacks during the day, often in the middle of ordinary activities. Insomnia is difficulty falling or staying asleep at night, sleep apnea involves repeated pauses in breathing during sleep, and somnambulism (sleepwalking) involves complex movements during NREM sleep rather than daytime sleep onset.

Q17. Answer: C

Topic 1.5 · Sleep

An operational definition specifies exactly how a concept will be measured. C gives a physiological measurement (salivary melatonin), a unit (pg/mL), and a schedule (every 30 minutes across the evening), so another researcher could replicate it. A and D substitute self-reported feelings or beliefs for the biological signal the study is meant to measure. B measures total sleep time from self-report, which is a different construct from evening melatonin release.

Q18. Answer: C

Topic 1.6 · Sensation

Sensory adaptation describes the drop in receptor response to an unchanging stimulus, which is exactly why a steady watchband fades from awareness. Absolute threshold is about detecting a faint stimulus at all, Weber's law is about detecting a proportional change between stimuli, and transduction is the initial conversion of energy into neural signals rather than the fading over time.

Q19. Answer: A

Topic 1.6 · Sensation

Amplitude is the height of a sound wave and determines loudness, while frequency (waves per second) determines pitch. A crash of thunder has much greater amplitude than a whisper. B and D confuse loudness with pitch, and C incorrectly links amplitude to pitch rather than loudness.

Q20. Answer: B

Topic 1.6 · Sensation

Kinesthesia is the sense that tracks the position and movement of individual body parts through receptors in muscles, tendons, and joints, which is why the player can feel where their foot is without looking. The vestibular sense handles whole-body balance and head position, olfaction detects smell, and gustation detects taste, none of which supply limb-position information.