

Cognition

AP Psychology ■ Unit 2

AP Psychology



What we will cover

- 1 Perception
- 2 Depth, Constancy, and Movement
- 3 Thinking and Problem-Solving
- 4 Memory Systems
- 5 Encoding and Storing
- 6 Retrieving and Forgetting



Perception

Unit 1 ended with **sensation**, the detection of a stimulus. **Perception** is what the brain does next: it organises and interprets that information. The same signal can be perceived in more than one way.

- **Bottom-up processing** starts from the raw sensory information and builds upwards.
- **Top-down processing** starts from what you already expect and know.
- **Selective attention** focuses on one input. The **cocktail party effect** is hearing your own name across a noisy room.
- **Inattentional blindness** is failing to see something visible because attention was elsewhere; **change blindness** is failing to notice that something has changed.

Perception, continued

Internal filters shape perception. A **schema** is a mental framework built from past experience. A **perceptual set** is a readiness to see something in a particular way.

External filters matter too: **context** and cultural expectations change what people report seeing.

The Gestalt grouping principles

figure and ground

one part is seen as the object, the rest as background – and it can flip

closure

the brain **fills in gaps** to complete a familiar shape

proximity

things close together are grouped as one

similarity

things that look alike are grouped as one

perceptual constancy

an object looks the same even as its retinal image changes – a door stays rectangular as it swings

Gestalt 's claim is that the whole is grouped **before** the parts are examined. Perception is organised, not assembled.



Depth, constancy, and movement

Monocular cues

Work with *one* eye: **relative clarity**, **relative size**, **texture gradient**, **linear perspective**, and **interposition** (a nearer object blocks a further one).

Binocular cues

Need *both*: **retinal disparity**, the small difference between the two images (the bigger the difference, the closer the object), and **convergence**, the inward turn of the eyes for near objects.

Perceptual constancy

An object keeps looking the same even as its retinal image changes – a door stays rectangular as it swings open.

Apparent movement

The brain perceives motion where none exists, which is why a series of still frames looks like a film.

To build a three-dimensional world from a flat retinal image, the brain uses **depth cues** – and a painter can use only the monocular half.

Depth cues: cover one eye

BINOCULAR — needs both eyes

retinal disparity — the two images differ
convergence — how far the eyes turn inward
both fail beyond a few metres

MONOCULAR — one eye is enough

interposition — what blocks what
relative size, texture gradient
linear perspective, motion parallax
these are what a flat picture uses

The test is mechanical: **cover one eye**. Whatever still works is monocular, and that is the half a painting can use



Thinking and Problem-Solving

Two ways to solve a problem:

- An **algorithm** tries every possible solution and is guaranteed to work, but is slow.
- A **heuristic** is a mental shortcut. It is fast but can lead to error – the **representativeness heuristic** judges by how well something matches a prototype, and the **availability heuristic** judges by how easily examples come to mind.

Concepts, schemas, and the two kinds of thinking

concepts

the basis of thought – mental categories

prototype

the **best example** of a concept; a robin is a better prototype for 'bird' than a penguin

assimilation

fitting new information *into* an existing schema

accommodation

changing the schema because the new information will not fit

executive functions

generating, organising, planning and carrying out goals

divergent vs convergent

generating many possible answers, against narrowing to the single correct one – **creativity** needs the first

Assimilation keeps the schema and bends the fact; accommodation keeps the fact and bends the schema. Say which happened.

Thinking and Problem-Solving, continued

Thinking can also get stuck. A **mental set** is the tendency to repeat a solution that worked before. **Functional fixedness** is seeing an object only in its usual use.

The **gambler's fallacy** (believing a run must end) and the **sunk-cost fallacy** (continuing because of what is already spent) both hinder good decisions.

Heuristics, and the error each makes

- An **algorithm** tries every possible solution and is guaranteed to work, but is slow.
- A **heuristic** is a mental shortcut. It is fast but can lead to error - the **representativeness heuristic** judges by how well something matches a prototype.

Heuristics, and the error each makes, in detail

THE SHORTCUT	WHAT IT SUBSTITUTES	SOUNDS LIKE
AVAILABILITY	how easily an example comes to mind, for how common it is	<i>"Plane crashes are everywhere — I saw two on the news."</i>
REPRESENTATIVENESS	how typical it seems, for how likely it is	<i>"He is quiet and reads a lot, so he must be a librarian."</i>
ANCHORING	the first number heard, for a considered estimate	<i>"It was listed at 900, so 700 is a bargain."</i>
CONFIRMATION BIAS	evidence that agrees, for all the evidence	<i>"Everything I have read supports it."</i>

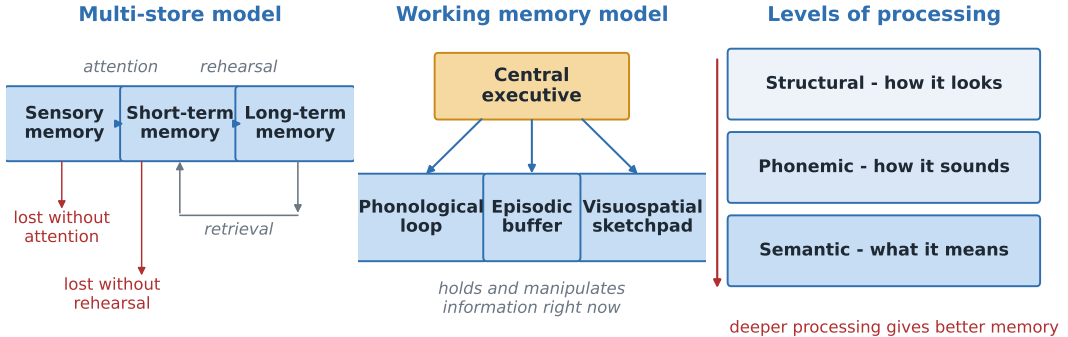
A **heuristic** is a mental shortcut.



Three models of the same journey

Three models of one journey: multi-store, working memory, and levels of processing.

Three models of the same journey, in detail



The three examinable memory models: information flows through stores, is actively held in working memory, and is remembered better when processed deeply

Memory Systems

Memory is divided by how information is processed.

- The **multi-store model** proposes **sensory memory** (including **iconic** and **echoic** stores), **short-term memory** , and **long-term memory** .
- The **working memory model** treats the middle stage as active, not a waiting room. It has a **phonological loop** , a **visuospatial sketchpad** , and a **central executive** .
- The **levels of processing model** says deeper processing gives better memory: **shallow** processing of appearance, then sound, then **deep** processing of meaning.

The kinds of long-term memory

explicit

can be **described** to others – also called declarative

episodic memory

a kind of explicit memory: **personal events** – your first day of school

semantic memory

the other kind: **facts and meanings** – the capital of France

implicit memory

cannot easily be described: **procedural memory** for skills like cycling, and conditioned responses

long-term potentiation

the biological basis – synaptic connections **grow stronger with repeated use**

Amnesia patients who cannot recall meeting you yesterday can still improve at a skill they do not remember practising. That dissociation is why the categories exist.



Encoding and Storing

Storage differs by system. **Maintenance rehearsal** repeats information to hold it; **elaborative rehearsal** links it to what you already know and works better.

- **Mnemonic devices** such as the **method of loci** aid encoding.
- **Chunking** groups items into meaningful units, which raises how much short-term memory can hold.
- The **spacing effect** shows that spreading study over time beats **massed practice** (cramming).
- The **serial position effect** means items at the start (**primacy**) and end (**recency**) of a list are remembered best.

Encoding and Storing, continued

A few people show **highly superior autobiographical memory** , which suggests biological differences.

Storage can also be impaired: **Alzheimer's disease** and **infantile amnesia** both limit what can be stored or recovered.



Retrieving and Forgetting

Retrieval takes two forms: **recall** (producing information without cues) and **recognition** (identifying it among options). Recognition is easier, which is why a multiple-choice question feels easier than an essay.

Practising retrieval helps too – the **testing effect** shows that testing yourself beats rereading.

Memory is reconstructed, not replayed

reconstructive

each recall **rebuilds** the memory from fragments, and can alter it

misinformation effect

information encountered *after* the event changes what a person remembers of it

context-dependent

recall is better in the **place** where the learning happened

state-dependent

recall is better in the same **physical or mood** state

source amnesia

remembering the content but not **where it came from** – the root of many false memories

This is why eyewitness testimony is unreliable, and why the wording of a question can change the answer a witness gives.

Worked example – the 2025 Article Analysis Question

A study gave a summary with 20%, 50% or 80% misleading sentences, then asked about a video. Correct responses fell from 74% to 63%. ***“Explain how at least one finding supports or refutes the misinformation effect.”***

- **Full marks:** *“Participants in the high misinformation condition answered 63% correctly against 74% in the low condition. Because more misleading detail lowered accuracy, the finding supports the misinformation effect, in which information received after an event changes the memory of it.”*
- Quote the data, *then* name the concept it supports.

A restated definition with no number does not answer **Explain**. The command word wants the finding *and* the link.

Four failures, all called forgetting

ENCODING FAILURE — it never got in, so it was never forgotten

STORAGE DECAY — the trace weakens over time

RETRIEVAL FAILURE — it is there, and the cue is missing

INTERFERENCE — another memory is in the way, from before or after

The tell is what happens with a **cue**. If a prompt recovers it, the memory was stored and the failure was retrieval

The named causes of forgetting

Forgetting curve

Loss is fastest *right after* learning, then levels off – which is why review works best early.

Encoding failure

It never got in. No cue can recover what was never stored.

Interference

Proactive: old learning blocks new. **Retroactive:** new learning blocks old.

Retrieval failure

Stored but unreachable – including the **tip-of-the-tongue phenomenon**.

Cue-dependent recall

Context-dependent, **state-dependent memory** and **mood-congruent memory**: recall is better when the place, the physical state or the mood matches.

Prospective memory

Remembering to *do* something later – the kind an alarm exists to rescue.

The tell is what a **cue** does. If a prompt recovers it, the memory was stored and the failure was retrieval.



Intelligence and Testing

Any psychological assessment must meet **psychometric principles** :

- **Standardization** – the test is given under consistent procedures and scored against a comparison group.
- **Validity** – it measures what it claims to. **Construct validity** and **predictive validity** are both examinable.
- **Reliability** – it gives similar results each time, checked by **test-retest reliability** and **split-half reliability** .

Intelligence and Testing, continued

Early tests produced an **intelligence quotient (IQ)** by dividing mental age by chronological age.

Modern scores are compared with a **normal curve** of the population.

Every psychological test must clear three bars

reliability

the test gives **consistent** results – across time (test–retest) and across items (split-half)

validity

the test measures **what it claims** to: construct validity, and predictive validity

standardisation

administered and scored identically, and compared against a **representative norm group**

Spearman's g

one general ability behind all mental tasks – other theories propose several independent abilities instead

Flynn effect

IQ scores have **risen worldwide** over generations – societal, not biological; and **stereotype threat** can lower a score on the day causes

A test can be reliable and still invalid – consistently measuring the wrong thing. Reliability is necessary, never sufficient.

Theories of intelligence, and reconstructive memory

Spearman's g

one **general ability** underlying performance on all mental tasks

multiple intelligences

Gardner – several independent abilities, from linguistic to bodily-kinaesthetic

the triarchic theory

Sternberg – analytical, creative and practical intelligence

why the disagreement lasts

the theories differ on **how many things** intelligence is, and the tests were built on the first answer

context-dependent memory

recall is better in the **place** where the learning happened

the misinformation effect

later information reshapes the memory, because recall **rebuilds** rather than replays

An intelligence test measures what its designers decided intelligence is. That circularity is the standing criticism, and it is examinable.

Fluid and crystallised intelligence

The disagreement

Psychologists still disagree about how to *define* intelligence. **Spearman's g** proposes one general ability; other theories propose several.

Fluid intelligence

Fluid intelligence reasons with novel problems – and it **declines** with age.

Crystallised intelligence

Crystallised intelligence is accumulated knowledge and vocabulary – and it does **not**.

Two kinds of thinking

Divergent thinking generates many ideas (creativity); **convergent thinking** narrows to the one right answer.

An age curve that falls and one that does not, inside the same person – which is why a single IQ number hides more than it shows.

Exam tips

- Keep **sensation** and **perception** apart: detecting is sensation, interpreting is perception.
- **Bottom-up** starts with the stimulus; **top-down** starts with expectation. Say which the scenario shows.
- Learn the interference pair by direction: **proactive** means old material acts forward onto new.
- For **encoding** questions, name a specific strategy – chunking, spacing, elaborative rehearsal – not "studying harder".
- On testing questions, separate **reliability** from **validity**. A test can be reliable and still measure the wrong thing.
- When data are given, quote a figure before naming the concept. Findings-based parts award the link between the number and the term.



Unit 2 – key takeaways

1

Sensation

detect; perception interprets

2

Processing

bottom-up from stimulus; top-down from expectation

3

Memory

proactive: old onto new; name a real encoding strategy

4

Tests

reliable $\neq$ valid – can measure the wrong thing well

Check yourself

- 1 Detecting a tone vs recognising a tune – which is perception?
- 2 Old French making new Spanish harder: which interference?
- 3 Can a test be reliable but not valid?
- 4 Name one encoding strategy other than “study harder”.

Answers: recognising the tune ■ proactive ■ yes ■ chunking / spacing / elaborative rehearsal