

Exercise walk-through

1.6

Sensation

AP Psychology

Sensation

The **just-noticeable difference** is the smallest change a person can detect.

Sensory adaptation
is reduced sensitivity to an unchanging stimulus – you stop noticing a smell.

Sensory interaction
means the senses work together.
Synesthesia
is when one sense triggers another.

The other senses, and the thresholds

olfaction

smell – the **only** sense not relayed first through the thalamus, which is why odours reach memory and emotion so directly

gustation

sweet, sour, salty, bitter and **umami**

touch and pain

skin receptors transduce touch; “hot” comes from warm *and* cold receptors firing together. Pain is processed in body **and** brain, which is why expectation changes it

absolute threshold

the weakest stimulus detected **half** the time

difference threshold

the smallest change that can be noticed – a **proportion** of the original, by Weber’s law

Sensory adaptation

means constant stimuli fade from awareness. You stop feeling your watch within minutes of putting it on.

Vision and hearing, in the terms the exam uses

visual accommodation

the **lens**

changes shape to focus light on the **retina**

when it fails

nearsighted focuses in front of the retina, **farsighted** behind it

place theory

pitch from **which part** of the cochlea vibrates – explains **high** frequencies

frequency theory

pitch from **how fast** the whole membrane fires – explains **low** frequencies

deafness

conduction deafness
sensorineural

damages the mechanism; **sen-**
damages the hair cells or nerve

Sound is air movement: **wavelength gives pitch**, **amplitude gives loudness**. Two theories are needed because neither covers the whole range alone.

The senses, receptor by receptor

Rods and cones

Rods see in dim light with no colour; **cones** need light and give colour and detail, packed most densely at the **fovea**.

Focus and hearing

Nearsightedness focuses the image in front of the retina, **farsightedness** behind it. **Sensorineural deafness** is damage to the hair cells or the auditory nerve.

Colour and afterimages

Opponent-process theory explains **afterimages**: cells signal red-or-green, so fatiguing one leaves the other.

The other senses

Kinesthesia senses limb position; the **semicircular canals** sense balance; **oleogustus** is the taste of fat; **sound localization** compares the two ears' timing and intensity.

Trichromatic theory works at the receptor, opponent-process after it. Both are right, at different stages.

Use the actual sample when judging generalization

The 2025 AP Psychology Set 1 Article Analysis study recruited 127 students at one large university for course credit. Ages ranged from 18 to 39; the mean was 21.21. The sample included 69% women and 31% men.

Write a claim tied to participant evidence

Explain a limit on extending this study's findings to adults aged 65 and over. Would "127 is a large sample, so the findings apply to everyone" answer the task?

Exercises 2.1·2.2

2.1 Define transduction and give one example.

[2]

2.2 State the difference between an absolute threshold and a difference threshold.

[2]

Exercises 2.1·2.2

2.1 Define transduction and give one example.

[2]

2.1

- the conversion of physical energy into neural signals; e.g. light converted to a signal in the retina, or sound in the cochlea

2.2 State the difference between an absolute threshold and a difference threshold.

[2]

2.2

- absolute threshold: the smallest stimulus detected 50% of the time; difference threshold: the smallest detectable change in a stimulus, which grows with starting intensity

Exercise 2.3 (a)

2.3 A person stops noticing the hum of a fan after a few minutes.

(a) Name the process responsible.

[1]

Exercise 2.3 (a)

2.3 A person stops noticing the hum of a fan after a few minutes.

(a) Name the process responsible.

[1]

(a)

- sensory adaptation

Exercise 2.3 (b)

2.3 A person stops noticing the hum of a fan after a few minutes.

(b) State one advantage of this process.

[1]

Exercise 2.3 (b)

2.3 A person stops noticing the hum of a fan after a few minutes.

(b) State one advantage of this process.

[1]

(b)

- it frees attention for changes in the environment, which are usually more informative

Exercises 2.4-2.6

2.4 Describe how the ear converts sound waves into a neural signal.

[2]

2.5 Distinguish absolute threshold from difference threshold.

[2]

2.6 State Weber's law and give an everyday illustration.

[2]

Exercises 2.4-2.6

2.4 Describe how the ear converts sound waves into a neural signal. [2]

2.4

- Sound waves vibrate the eardrum, and the three ossicles amplify the vibration and pass it to the fluid in the cochlea; the moving fluid bends the hair cells, which transduce the movement into a neural signal that travels along the auditory nerve

2.5 Distinguish absolute threshold from difference threshold. [2]

2.5

- Absolute threshold is the minimum stimulation needed to detect a stimulus 50% of the time; difference threshold is the minimum difference needed to tell two stimuli apart 50% of the time

2.6 State Weber's law and give an everyday illustration. [2]

2.6

- The difference threshold is a constant proportion of the original stimulus, not a fixed amount; adding one candle to ten is noticeable, but adding one to a hundred is not

Exercises 3.1-3.2

3.1 Rods differ from cones mainly in that rods

[1]

☐

- A** detect colour and fine detail
- B** work better in dim light without colour
- C** are located in the cochlea
- D** transmit sound

3.2 Adding one candle to a room with two candles is noticeable; adding one to a room with fifty is not. This illustrates

[1]

☐

- A** absolute threshold
- B** a difference threshold that grows with intensity
- C** sensory adaptation
- D** transduction

Exercises 3.1-3.2

3.1 Rods differ from cones mainly in that rods

[1]

☐

- A detect colour and fine detail
- B work better in dim light without colour
- C are located in the cochlea
- D transmit sound

3.1 B

- rods support vision in dim light but do not code colour

3.2 Adding one candle to a room with two candles is noticeable; adding one to a room with fifty is not. This illustrates

[1]

☐

- A absolute threshold
- B a difference threshold that grows with intensity
- C sensory adaptation
- D transduction

3.2 B

- the just-noticeable difference is proportional to the original intensity

Exercise 3.3 (a)

3.3 A hearing test finds the quietest tone a person can detect half the time.

(a) Name the measure being taken.

[1]

Exercise 3.3 (a)

3.3 A hearing test finds the quietest tone a person can detect half the time.

(a) Name the measure being taken.

[1]

(a)

- the absolute threshold for that tone

Exercise 3.3 (b)

3.3 A hearing test finds the quietest tone a person can detect half the time.

(b) State one reason results vary between people.

[1]

Exercise 3.3 (b)

3.3 A hearing test finds the quietest tone a person can detect half the time.

(b) State one reason results vary between people.

[1]

(b)

- any one of: age-related hearing loss; prior noise exposure; attention or motivation during the test

Exercise 3.4 (a)

3.4 A student is tested in a laboratory on their senses.

(a) Define transduction, and describe where and how it happens in the eye.

[4]

Exercise 3.4 (a)

3.4 A student is tested in a laboratory on their senses.

(a) Define transduction, and describe where and how it happens in the eye. [4]

(a)

- Transduction is the conversion of physical energy into a neural signal; in the eye it happens at the retina, where rods and cones convert light energy into an electrical signal; that signal passes through bipolar and ganglion cells to the optic nerve

Exercise 3.4 (b)

3.4 A student is tested in a laboratory on their senses.

(b) Compare rods and cones in two ways.

[2]

Exercise 3.4 (b)

3.4 A student is tested in a laboratory on their senses.

(b) Compare rods and cones in two ways.

[2]

(b)

- Any two: rods are more sensitive and work in dim light while cones need bright light; rods give no colour while cones detect colour and fine detail; rods are peripheral while cones concentrate at the fovea

Exercise 3.4 (c)

3.4 A student is tested in a laboratory on their senses.

(c) The student is asked to say when they can just detect a faint tone. Name the threshold being measured and state the criterion used to define it. [2]

Exercise 3.4 (c)

3.4 A student is tested in a laboratory on their senses.

(c) The student is asked to say when they can just detect a faint tone. Name the threshold being measured and state the criterion used to define it. [2]

(c)

- Absolute threshold; it is the minimum stimulation detected 50% of the time

Exercise 3.4 (d)

3.4 A student is tested in a laboratory on their senses.

(d) The student can tell 100 g from 105 g but cannot tell 1000 g from 1005 g. Name the principle this illustrates and explain it. [3]

Exercise 3.4 (d)

3.4 A student is tested in a laboratory on their senses.

(d) The student can tell 100 g from 105 g but cannot tell 1000 g from 1005 g. Name the principle this illustrates and explain it. [3]

(d)

- Weber's law; the difference threshold is a constant proportion of the original stimulus rather than a fixed amount; 5 g is 5% of 100 g and detectable, but only 0.5% of 1000 g, which falls below the proportion needed

Exercise 3.4 (e)

3.4 A student is tested in a laboratory on their senses.

(e) After several minutes in the laboratory the student stops noticing its constant hum.
Name this process and explain why it is useful. [3]

Exercise 3.4 (e)

3.4 A student is tested in a laboratory on their senses.

(e) After several minutes in the laboratory the student stops noticing its constant hum. Name this process and explain why it is useful. [3]

(e)

- Sensory adaptation; sensitivity to a constant, unchanging stimulus decreases; this is useful because an unchanging stimulus carries no new information, so ignoring it frees attention for changes, which are more likely to matter