

OpenStax Psychology
Chapter 5 Sensation and Perception
Study Guide

5.1 Sensation versus Perception

- **Sensation** is based on a system of sensory receptor neurons that respond to varied types of stimuli.
 - *A sensation occurs when sensory information is detected by these sensory receptors.*
- Relaying messages across cells, sensory stimulus energy converts to what's called an action potential; a process is known as **transduction**.
 - However, this does not mean all senses are detected. In order for the stimulus energy to be sensed, it must cross the **absolute threshold**, which is the minimum required stimulus energy needed to be detected.
- **Perception**: Although our sensory receptors continually pick up bits of information, it is how we interpret and perceive such information that affects how we view things regarding. In doing so, these bits of information are organized accordingly.

Perceptions encompass two types of information processing.

- **Bottom-up processing** refers to a specific concept or idea and branching out. Perceptions encompass two types of information processing.
- **Top-down processing** utilizes general, broad ideas that are further specified.
- Despite our constant take in of perceived stimuli, constant awareness is not maintained. This is due to **sensory adaptation** in that we lose perception over constantly present stimuli. For example, think about a meeting a friend at a coffee shop. You arrive early and hear the music of the store playing. When your friend arrives and you both start a conversation, you lose focus on the music and all you hear is your friend talking. This of course can also be due to the shift or lack in focus or attention, which can demonstrate **Inattentional blindness**.

Questions:

SENSATION

1. Briefly explain how we sense things in the environment
2. What is an example of what absolute threshold refers to?

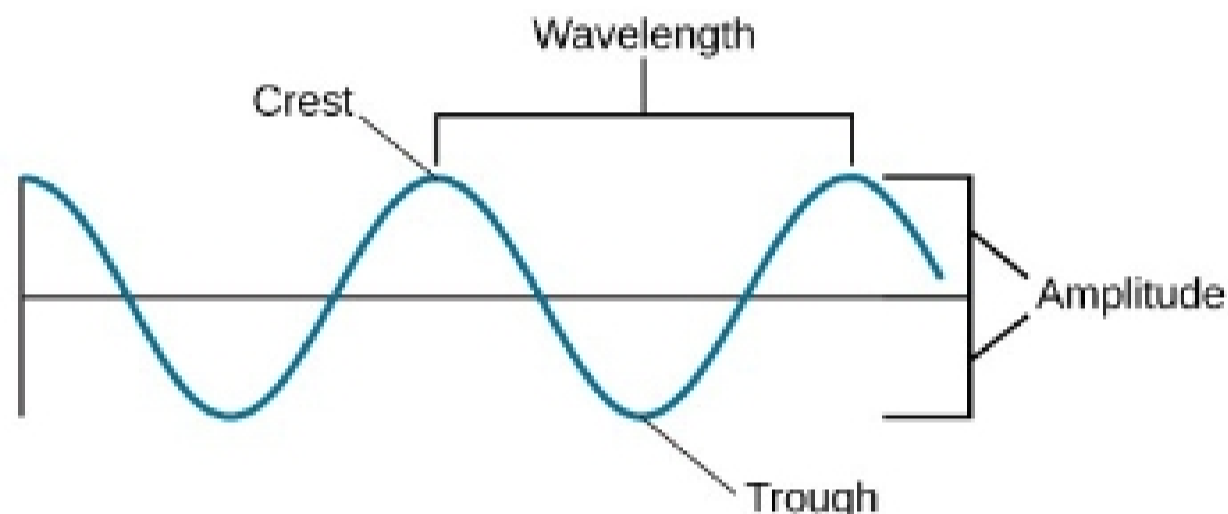
PERCEPTION

3. What does perception refer to?
4. What is the difference between sensation and perception?
5. What is the difference between bottom-up and top-down processes? Give an example of each.
6. Why don't all sensations result in perception?
7. What are other factors that affect perception?
 - i. How does attention affect our perception?
 - ii. Describe the concept of inattentional blindness
 - iii. Briefly describe one study that showed evidence for inattentional blindness

5.2 Waves and Wavelengths

So it is evident that we constantly perceive stimuli but how are the stimuli actually presented? Both visual and auditory stimuli occur in the form of waves, which are composed of two physical characteristics.

- **Amplitude** is the height of the wave measured from the highest to lowest and is typically associated with loudness or volume.
- The **wavelength** refers to the length of a wave from the peak to the trough.
 - The **frequency** in these wavelengths describes the number of waves passed.
- All sounds possess a **timbre**, or quality that distinguishes it from others, making each sound truly unique despite similarities in amplitude or wavelength frequency.



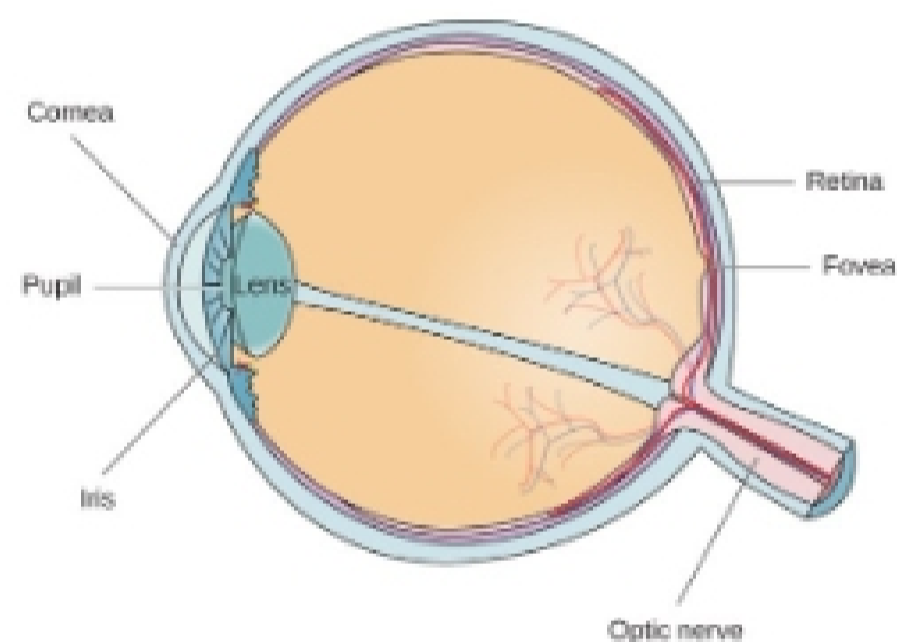
Questions:

- Why do you think it is important to know the characteristics of waves?
 - How is this related to sensation and perception?
- A. LIGHT WAVES
- How much can humans see from the electromagnetic spectrum and what is it called?
 - In humans, what are light wavelengths associated with?
- B. SOUND WAVES
- How do we perceive sounds?
 - How is the loudness of sound measured and how loud can we withstand without leading to hearing damage?

5.3 Vision

Despite sharing waves, visual processing works a rather differently. To construct a mental representation, the visual system must take into account color, depth, light, shape, and much more. The eyes play the most vital role and are the major sensory organs involved in visual perception.

- Light waves transmit across the **cornea**, the covering of the eye, into a small opening where light passes known as the **pupil**.
- The size of the pupil's opening is controlled by muscles connected to the colored portion of the eyes known as the **iris**.
- Passing the pupil, light crosses the **lens**, a transparent structure for focus, hitting the back of the eyes.
- Here, the **retina** containing the **fovea** utilizes light detecting photoreceptors (**rods** and **cones**) to perceive color and light.
- Images then exit the back of the eye through the **optic nerve** that carries visual information to the brain. The two optic nerves from each eye cross at a point known as the **optic chiasm**, which shares images received from each eye respectively.
- However, life is not monochromatic or 2D in that we utilize a series of color and distanced based cues to determine both coloring and depth of the images we perceive.



Questions:

ANATOMY OF THE VISUAL SYSTEM

1. Briefly explain how light waves are transmitted through the various parts of the eye
2. What are the differences between rods and cones?
3. Why do we have a blind spot?
4. What is the role of the optic chiasm in transferring visual information into the brain?
5. What do the "where/how" and "what" pathways refer to?

COLOR AND DEPTH PERCEPTION

6. Compare and contrast the theories of color vision and give evidence for each one of them
7. Explain what depth perception is and why you think it is important to have
8. What types of cues do we use to perceive depth?