Sensation

Interacting with our environment

Sensation

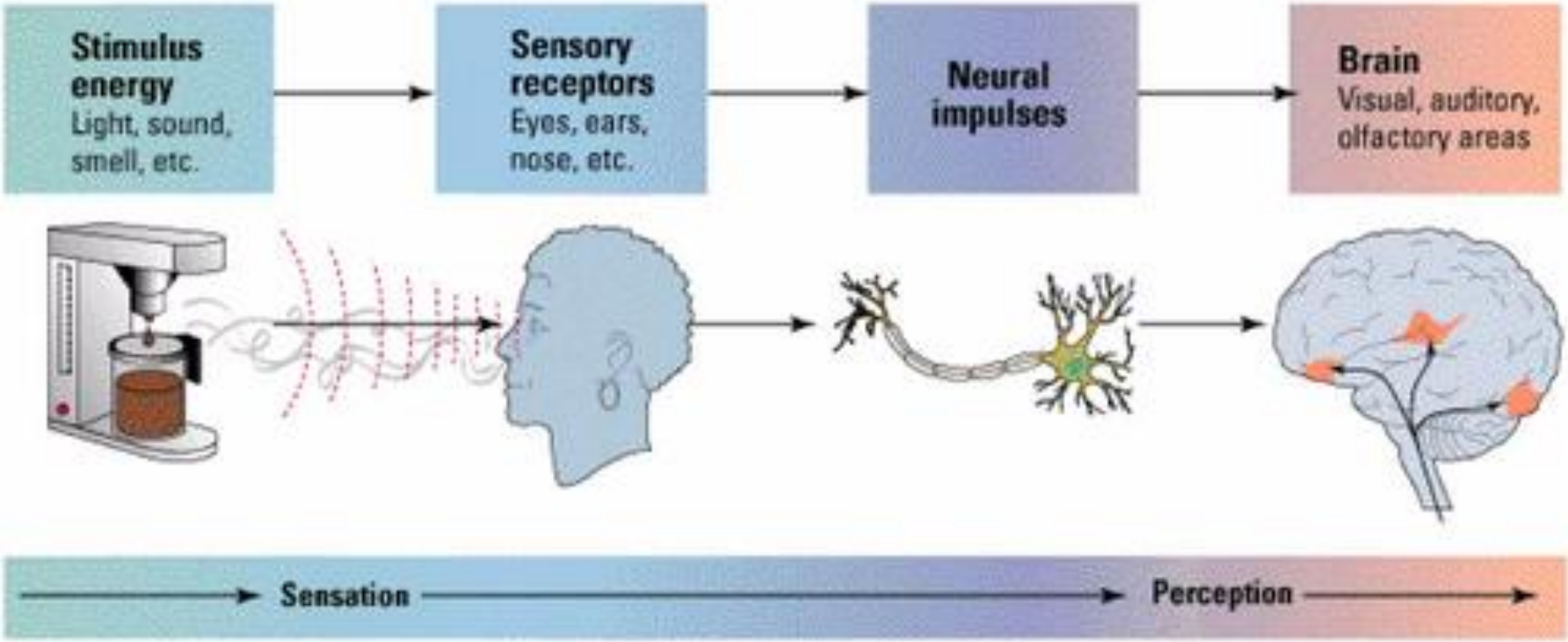
The detection of physical energy emitted or reflected by physical objects

Occurs when energy in the external environment or the body stimulates receptors in the sense organs

Perception

The process by which the brain organizes and interprets sensory information

Sensation and perception



Types of Sensation

- We can divide easily the sensation process into five categories on the basis of sense organs.
  - 1.Visual Sensation
  - 2. Auditory Sensation
  - 3. Olfactory Sensation
  - 4. Taste Sensation
  - 5. Tactual Sensation

Organs involved in Sensation:

- Eye
- Ear
- Nose
- Tongue
- Skin

Sl. No.	Type of Sensation	Sense Organ	Senses	Knowledge gaining
1.	Visual Sensation	Eye	Sight	83%
2.	Auditory Sensation	Ear	Hear	11%
3.	Olfactory Sensation	Nose	Smell	3.5%
4.	Taste Sensation	Tongue	Taste	1.0%
5.	Tactual Sensation	Skin	Touch	1.5%

Elements of Sensation:

The main elements of the sensation process are given below:

- ***Quality:*** The nature of each sensation is different from other. Every type of sensation has got its own special quality or characteristics. This quality of the sensation helps us to distinguish one from other. For example, green sensation of eye, cold sensation of skin.
- ***Intensity:*** Sensation differs in respect of its intensity. If two sounds are created at once, one will be the intenser than other. It is differs in same type of sense or among the different types of sensations.

Elements…

- ***Extensity:*** Extensity refers the extension in space. Each sensation has its extensity. The vaster the stimulus, the more extensive the sensation. The extensity is not true for all the types of sensation, but restricted to certain.
- ***Duration:*** Every sensation has its duration or lasts for certain time. The auditory sensation of aero plane sound is more extensive than the sound of the calling bell.
- ***Clarity:*** Every sensation has got clarity. The sensation which lasts for longer period becomes clearer than the sensation lasts for shorter period.

Perception: Meaning

- When things come into contact with any of our sense organs, we feel sensation. When brain comes to know the form of these sensations, it comes to know the stimulus fully. This cognitive experience of the brain is called perception.
- Perception is the process by which an organism interprets sensory input so that it acquires meaning.

Perception = Sensation + Meaning *(interpretation).*

Definitions:

- Perception is the process of getting to know objects and objective facts by use of senses – *Woodworth*.
- Perception refers to the complex processes which begin with the stimulation of a sense organ and end with an interpretation of the resulting neural activity by the organism i.e. with the meaning of the stimulus – *James A. Dyal*.

Perception:

- All knowledge of the world is ultimately obtained thorough sensory experiences.
- Sensation alone is meaningless and it will not result in acquisition of knowledge. Sensation is to be followed by application of mind. Then it results in perception.
- In other words we can say that the first response to a stimulus is sensation and perception is the next response following sensation.

Nature of Perception:

- Perception is meaningful.
- Perception is selective.
- Perception is based on sensation.
- Perception is preventive and representative process of mind.
- Perception needs observation / experience.
- Perception makes use of images.
- Perception is both analytic and synthetic.
- In perception sensory data gets enriched.

Factors related to Perception

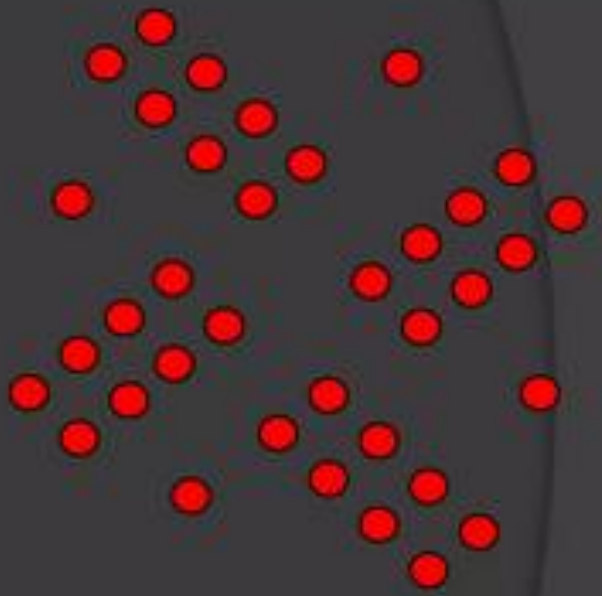
- There are several factors involved in perception. They are categorized under two types namely,
  - External and
  - Internal factors.

External Factors:

- ***Similarity:*** Similar elements tend to be perceived as belong together and they are viewed as wholes. Stimuli that have the same size, shape and colour tend to be perceived as parts of the pattern.

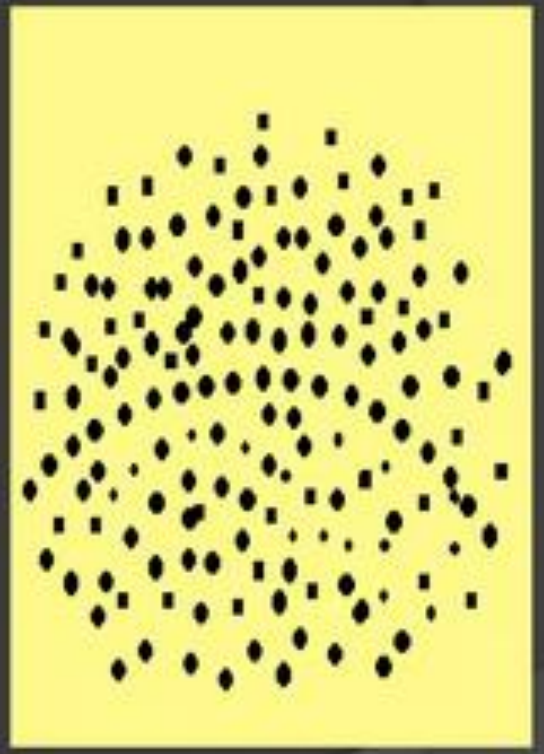
External…

- ***Proximity:*** When objects are close to each other, the tendency is to perceive them together rather than separately. Even if the individual items do not have any connection with each other they will be grouped under a single pattern or perceived as a meaningful picture.



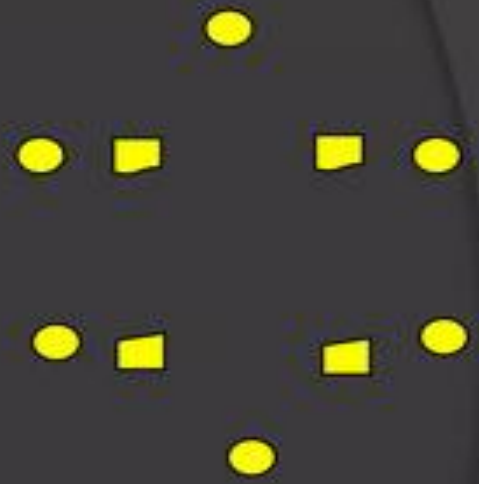
External…

- ***Continuity:*** Anything which extends itself into space in the same shape, size and colour without a break is perceived as a whole figure.
- For example, several dots from a curved line, an individual may perceive the figure as two different continuous lines irrespective of the factors like proximity and similarity of the dots. Thus, the whole figure is organized into a continuum though the dots are unconnected.



External…

- ***Inclusiveness:*** The pattern which includes all the elements present in a given figure will be perceived more readily than the other figures.
- The hexagonal figure formed by all the dots may be perceived more readily than the square formed by the four middle dots. Single dots at either end act as a fence or enclosure within which all the other elements are included.



External…

- ***Closure:*** Closed areas more readily form in group. The illusion of figure was caused by closure which did not allow the attention to dwell on by gaps, so that the figures appeared organized.

Internal Factors:

- ***Familiarity:*** An organisation with which the person is aquatinted, is perceived easily and with enthusiasm. Seeing a familiar picture quiz, we at once understand its reality and solution and the remaining figure forms no obstacle in this. But if the aquatinted person is affected by some other part of the picture, he will be incapable of recognizing it, not withstanding his familiarity.

Internal…

- ***Mental Set:*** Mental set has a by no means insignificant effect upon the organization of the sensation. One of the causes of mental set is habit. For example, a philosopher looks at the truths of the universe, while a trader is always involved in worthy things.
- ***Reinforcing Factors:*** These include good figure. The supplementing of the incomplete is a mental tendency, which diverts our attention from gaps and presents a whole. The idea of good figure is explained by the picture, in the description of closure.

Perceptual Errors:

- It is quite possible that the same object may be perceived differently by different people or by the same person on different occasions.
- There are two errors of perception namely illusion and hallucination.

Illusion:

- A wrong perception is called illusion.
- A state in which errors of perception are immediately confirmed by experience is called an illusion.
- In illusion we take a wrong meaning of the stimulus present before us. It is related with the stimulus.

For example, at dim light the rope that we find on the way is taken for a snake. Error may result from inadequate stimulation, poorly functioning sense organs or incorrect interpretation of sensations.

Causes for Illusion:

- Irregular or unusual conditions in the external world
- Defects in sensory organs
- Anticipation expectation and suggestions
- Interest and habits
- Previous experience and present selfishness
- Present aptitudes

Hallucination:

- Hallucination is false perception. Here, a person experiences of the stimulus even in the absence of it.
- A hallucination is a mental state in which a person begins to perceive something in spite of the absence of any external stimulus.
- For example, at night a person may see a ghost when practically there is no stimulus either in the form of a human figure or anything resembling it. This is a case of hallucination. There is no stimulus in hallucination and memory image is taken for perception.

Types of Hallucination:

- There are two kinds of hallucinations.
  - ***Visual Hallucination:*** A hallucination which occurs in the sphere of vision is called a visual hallucination, and it means seeing an object which is not in front of eyes at all.
  - ***Auditory Hallucination:*** The hallucination which occurs in the sphere of hearing is called auditory hallucination. For example, while sitting in solitude or loneliness, we may suddenly feel, that someone is calling us, through, in reality no one has called us.

Causes for Hallucination:

- More but vague and irrelevant continuous thinking
- Excessive imagination or day-dreaming
- The will and desire in the unconscious mind
- Hysteria / madness, schizophrenia and other related mental diseases.

Difference: Sensation & Perception

Sl. No	Sensation	Perception
1.	Sensation is a normal, simplest, initial mental process	Perception is a complex and developed mental activity
2.	It begins with stimulus	It begins with some object / fringe of meaning
3.	It is based on external stimuli, conditions	It is associated with internal mental conditions
4.	There is passivity in sensation	There is activity in perception
5.	The basis of sensation is mental analysis	The processes of perception linked with actual life experience.

What's the difference?

Sensation

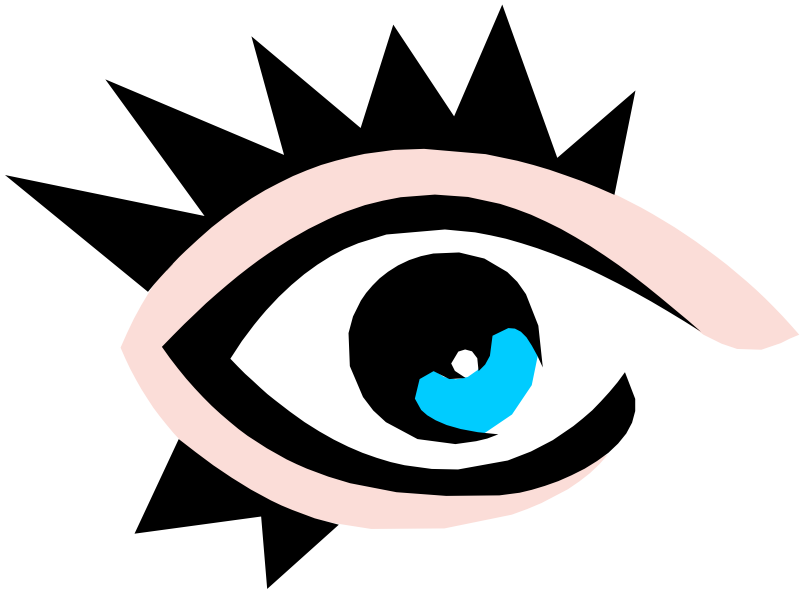
- Interaction between the body-environment
- the reception of physical stimulation.
- Use of specialized cells.

Perception

- our interpretation
- active decoding process
- influenced by
  - experience
  - thoughts
  - beliefs...

The 6 Senses

- Vision
- Olfactory
- Taste
- Tactile
- Kinesthetic
- Auditory



Keeping Homeostasis

- Receiving Information
  - Absolute threshold
    - Signal Detection theory
  - Difference threshold
    - jnd
    - sub- & supra- liminal messages
      - priming effects “RATS”
- Sensory Adaptation

Theories of Sensation

- Physical Stimuli
- Basic Function
- Current Theories

Seeing

Vision

- wavelengths of light
- saccades vs. tracking
- Trichromatic Theory
- Opponent-Process Theory

Chemical Brothers

Olfactory

- dissolved chemical signals
  - aromatherapy
- weights of odorant
- Stereochemical theory
  - difficult to study
- linked to memory

Taste

- dissolve chemical signals
- Papillae
- Basic 4
  - sweet
  - sour
  - salty
  - bitter

Sensations & Balance

Tactile

- largest organ
- product of neural patterns
- Homunculus
- Gate-Control Theory
  - differences in mylenation
  - receptors in spinal cord

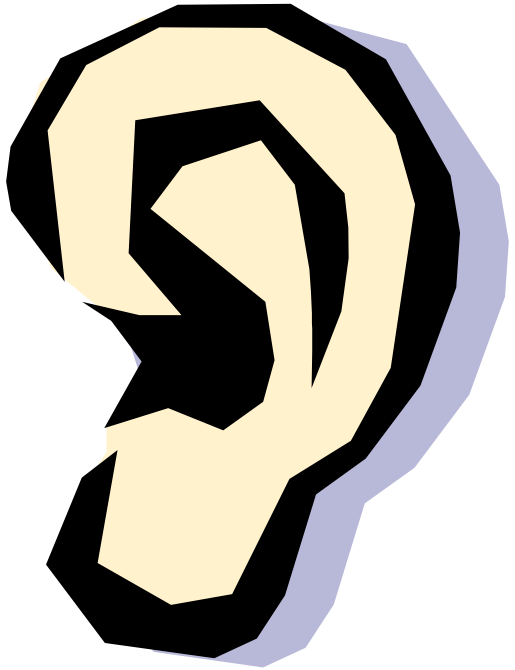
Kinesthetic & Vestibular

- Cerebellum & receptors
- the inner ear
- linked to the other senses
  - limbs in space
  - motion sickness

Hearing

<u>Auditory</u>

- sound waves….moving bones & hair
- loudness : amplitude pitch : frequency
- Place theory
- Frequency theory



Perception

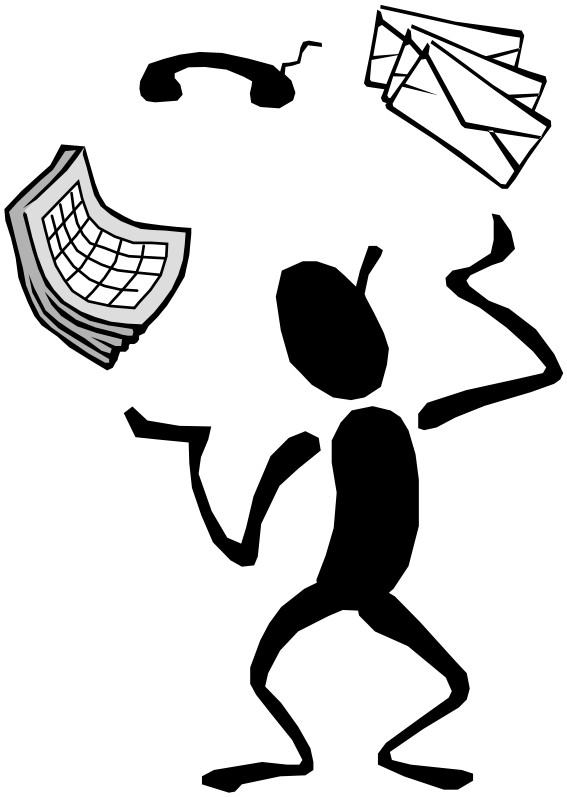
Interpretation of our experiences

What is Perception?

- Selective
- Organization
- Interpretation

Organizing Principles

- Figure-Ground
- Grouping
- Constancy
- Patterns
- Distance Cues



Gestalt Laws of Grouping

- Similarity
- Proximity
- Continuation
- Closure
- Common Region
- Simplicity

Visual Distance Cues

Monocular

- Size
- Linear
- Texture
- Atmospheric
- Overlap
- Height
- MOTION PARALLAX

Binocular

- Convergence
- Retinal Disparity
  - stereograms

Q: How do Magic Eye 3-D Pictures Work?

A: Both **stereograms** **and the magic eye** pictures capitalize on a binocular depth cue called retinal or binocular disparity. Normally when we view a scene, objects at various distances project a slightly different image in the left and right eye. Hold your thumb about one inch away from your nose. Close one eye, and then the other. You will note that the view of your thumb changes depending on which eye you look at it with. The brain uses this disparate information to locate objects in depth. **A stereogram "fools" the brain by presenting a slightly different view of a scene to each eye.** The brain reconstructs the views, and objects appear at various distances. The magic eye pictures do the same thing except each view is a very high contrast dot diagram of the scene. Note that two images are presented. As you focus on the flat images, they appear to be just a swirl of dots – we are not getting any depth information. However, when you allow your eyes to un-focus, each panel presents a slightly different dot pattern to each eye. The disparity is integrated, and presto – an image appears.

Paris in the the Spring

So, you think you're a pretty

pretty good reader. Then I bet you

you see the problem in the

the words that you are

are reading right now

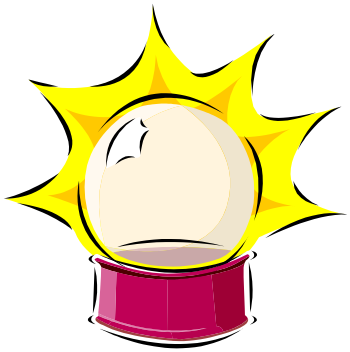
now. If you don't, then

then you better rethink your

your ability!

Extra-Sensory Perception (ESP)

- Precognition
- Clairvoyance
- Telepathy
- Psychokinesis



Q: Why can you sometimes still see flashing lights or "spots" after you shut your eyes?

A: While light is the primary stimulus for vision, it is not the only way to stimulate the visual receptor cells. The rods and cones in your eyes can be **stimulated mechanically**. Recall that the eyeball itself is filled with a viscous fluid called the vitreous humor. Pressure on the front of the eyeball is transferred to the back of the eye where we find the retina. This pressure causes the visual receptors to fire. If you close your eyes and press gently, you will begin to see random flashes of light that result from this mechanical stimulation. So, when you close your eyes tightly, the **pressure results in a visual experience.** Remember that the eyelid is somewhat translucent and a certain amount of light will also pass through and fire the receptors.