**Sensation – Transduction – Perception Chart**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sense Organ | Layman’s Term | Scientist’s Term | Energy source/Stimulus | Site of Transduction | Tranduced into What Energy Source | Absolute Human Threshold |
| Eye | See | Visual | Electromagnetic energy in the form of visible light (waves) | Photoreceptor cells (rods and cones in the retina) | Electrochemical | Candle flame from 30 miles away on a clear, dark night |
| Ear | Hear | Auditory | Compression and expansion of molecules in the air in the form of sound waves | Organ of corti in cochlea (between hair cells and basilar membrane) | Electrochemical | Ticking watch from 20 feet away in a quiet room |
| Nose | Smell | Olfactory | Chemicals that are air-borne or in a substance | Epithelium membrane in olfactory channel | Electrochemical | Drop of perfume diffused in a small house |
| Tongue | Taste | Gustatory | Chemicals mixed into saliva | Taste cells within the taste buds on tongue | Electrochemical | One teaspoon of sugar in 2 gallons of water |
| Skin | Touch | Tactile | Touch, pressure | Sensory receptor in skin | Electrochemical | Wing of a bee dropped on a cheek from 4/10 in away |

Vestibular Sense: sensing mechanisms in semi-circular canals of inner ear (balance/posture)

Kinesthetic Sense: sensing mechanisms are in the muscles, tendons, and joints (motion/movement)

“Sixth Sense:” Extra-sensory-perception (ESP)



Additional Notes on Hearing

The ear detects both **frequency** (loudness) and **pitch** (highness or lowness) of sound

Types of hearing loss

1. **Sensorineural** – damage to cochlea’s receptor cells, AKA “nerve deafness.” It can be aided with **cochlear implant** which stimulates the auditory nerve by using electrodes threaded into the cochlea
2. **Conduction** – damage to the mechanical system that conducts sound waves to cochlea

Theories

**Place Theory** – theory that pitch is determined by where the cochlea’s membrane is stimulated

**Frequency Theory** – theory that rate of nerve impulses matches the frequency of a tone