



# 7 Senses Street Day

*Bringing the common sense back to our neighbourhoods*

**Saturday, 16 November 2013**

## What are the 7 Senses?

Most of us are familiar with the traditional five senses - sight, smell, taste, hearing, and touch. The two lesser known senses refer to our movement and balance (Vestibular) and our body position (Proprioception).

This article gives an overview of each of the senses and how the sensory processing that occurs for us to interpret the world around us.



### Quick Definitions

**Sensory integration** is the neurological process that organizes sensations from one's body and from the environment, and makes it possible to use the body to make adaptive responses within the environment. To do this, the brain must register, select, interpret, compare, and associate sensory information in a flexible, constantly-changing pattern. (A Jean Ayres, 1989)

Sensory Integration is the adequate and processing of sensory stimuli in the central nervous system – the brain. It enables us interact with our environment appropriately.

**Sensory processing** is the brain receiving, interpreting, and organizing input from all of the active senses at any given moment.

For every single activity in daily life we need an optimal organization of incoming sensory information. If the incoming sensory information remains unorganized – e.g. the processing in the central nervous system is incorrect - an appropriate, goal orientated and planned reaction (behavior) relating to the stimuli is not possible.



## Sight

Sight or vision is the capability of the eyes to focus and detect images of visible light and generate electrical nerve impulses for varying colours, hues, and brightness. Visual perception is how the brain processes these impulses – recognising, differentiating and interpreting visual stimuli through comparison with experiences made earlier in life.

The visual system is very important in regards to learning to read, write and count and lots of other qualities that are important to be successful in school and work life. Visual perception is divided into five areas: Visual-motor coordination; Figure-ground perception; Form constancy; Position in space; and Perception of spacial relations.

Activities that help sharpen our visual sense:

- Finding things on a picture with a busy background
- Comparing objects with minimal differences/pay attention to details
- Matching objects
- Separating overlapping objects in a busy picture
- Making sense of things that are only partly visible
- Playing with optical illusion



## Smell

**Smell** or **olfaction** is our ability to detect scent – chemical, odour molecules in the air. Our olfactory system begins in our nose which has hundreds of olfactory receptors. Odour molecules possess a variety of features and, thus, excite specific receptors more or less strongly. This combination of excitement is interpreted by the brain to perceive the 'smell'.

How olfactory information is coded in the brain to allow for proper perception is still being researched and the process is not completely understood, however, what is known is that the chemical nature of the odorant is particularly important, as there may be a chemotopic map in the brain.

Great olfaction provides lots of aspects that often relate to the world of joy. People with a well working olfactory sense enjoy a better awareness of the environment. Just imagine the smell of freshly mowed lawn, homemade cake or the sea breeze and realize the effect of just the thought of it. Also the gustatory sense is enhanced when the sense of smell is working properly. Further, our olfactory sense saves us in situations of danger eg fire/smoke or food that is off.

Activities to stimulate the olfactory system:

- Smell tubes with inbuilt fans (insert herbs, essential oil, flowers)
- Smell boxes. They contain different smells and are used blind-folded
- Walk through Sensory Gardens
- Food stands in 7 senses streets on activity day



## Taste

**Taste**, or **gustation**, refers to the capability to detect the taste of substances such as food, certain minerals, and poisons, etc. The sense of taste is often confused with the “sense” of flavour, which is a combination of taste and smell perception.

Humans receive tastes through sensory organs called taste buds concentrated on the upper surface of the tongue. There are five basic tastes: sweet, bitter, sour, salty and umami.

The sense of taste is well developed at birth and diminishes when we grow older. In the early years sweet sensations are preferred and as we age the sense of taste changes and differentiates tastes (gustatory stimuli) better.

Like the sense of smell our gustatory sense serves highly our joy/quality of life but also our protection: It warns us in relation to poisonous things we might ingest.

The ability of taste can be decreased through smoking, alcohol, environmental pollution, viruses, bacteria, etc.



## Hearing

**Hearing**, or **audition**, is the ability to perceive sound by detecting vibrations, changes in the pressure of the surrounding medium through time, through an organ such as the ear. As with sight, auditory processing relies on how the brain interprets, recognises and differentiates sound stimuli.

The auditory system differentiates between:

- Localisation: where does the noise come from?
- Differentiation: Is it “log” or “lock”?
- Interpretation: that noise is the school bell, not a mobile phone.
- Memorising: to be able to memorise multiple numbers and Silben

Activities/environments that stimulate the auditory sense:

- An echo-box to walk into and talk and make sounds
- A walk-in quiet box / room
- Headphones (with/without any music, noises)
- Musical instruments like drums, xylophones, gongs, triangles etc.
- Flow of water



## Touch

**Touch**, or **somatosensory**, is a perception resulting from activation of neural receptors, generally in the skin including hair follicles and a variety of pressure receptors respond to variations in pressure (firm, brushing, sustained, etc.).

The somatosensory system is a diverse sensory system that is spread through all major parts of our body. At its simplest, the system works when activity in a sensory receptor is triggered by a specific stimulus (such as heat); this signal eventually passes to an area in the brain uniquely attributed to that area on the body and this allows the processed stimulus to be felt at the correct location.

There are active and passive touch experiences. The passive touch experiences are of a mechanical nature and are, for example, provided through surfaces that we come in contact with by sitting or leaning on them, breezes hitting our skin etc.

The active touch experiences are chosen active exploration of objects and add to our knowledge about the environment we live in. When we actively explore a stick its surface might be moist, sticky, rough, bumpy, warm. After numerous times of exploring different sticks we know how to categorise different features of a stick without the need to touch it again and again.

Activities to promote a well working somatosensory system:

- brushing over the skin with different textures/brushes
- creative wall with different surfaces made of sandpaper, wool, cotton wool balls, dried peas
- playing with play dough, mud, clay, water, and sand
- rolling over grass, snow, sand, carpet



## Vestibular

The **vestibular system** explains the perception of our body in relation to gravity, movement and balance. The vestibular system measures acceleration, g-force, body movements and head position. Examples of the vestibular system in practice include knowing that you are moving when you are in an elevator, knowing whether you are lying down or sat up, and being able to walk along a balance beam.

One important function of the vestibular system allows us to coordinate our eye movements with our head movements. This occurs in activities such as copying from a blackboard, turning our head to watch a moving object and looking across a page to read. It also helps us to develop and maintain our muscle tone, which allows us to hold our body in position, to maintain positions and to hold our head up. Also, the vestibular system influences our balance, equilibrium, ability to coordinate both sides of our body and some aspects of language.

Activities that fine-tune our vestibular system:

- swinging, spinning, merry-go-rounds
- doing activity while lying on your stomach holding your head up
- active movements like jumping, hopscotch, rolling downhill



# Proprioception

**Proprioception** is the sense of the relative position of neighbouring parts of the body and strength of effort being employed in movement. This sense is very important as it lets us know exactly where our body parts are, how we are positioned in space and to plan our movements.

A proprioceptive system that works properly functions without vision.

Examples of our proprioception in practice include being able to:

- clap our hands together with our eyes closed,
- write with a pencil and apply with correct pressure,
- navigate through a narrow space.
- judge distances so we don't run into things

The proprioceptive system is activated through push/pull type activities, jumping and activities that involve weight and deep pressure or firm touch. This kind of sensation is often calming and may be helpful to a child who becomes easily disorganized.