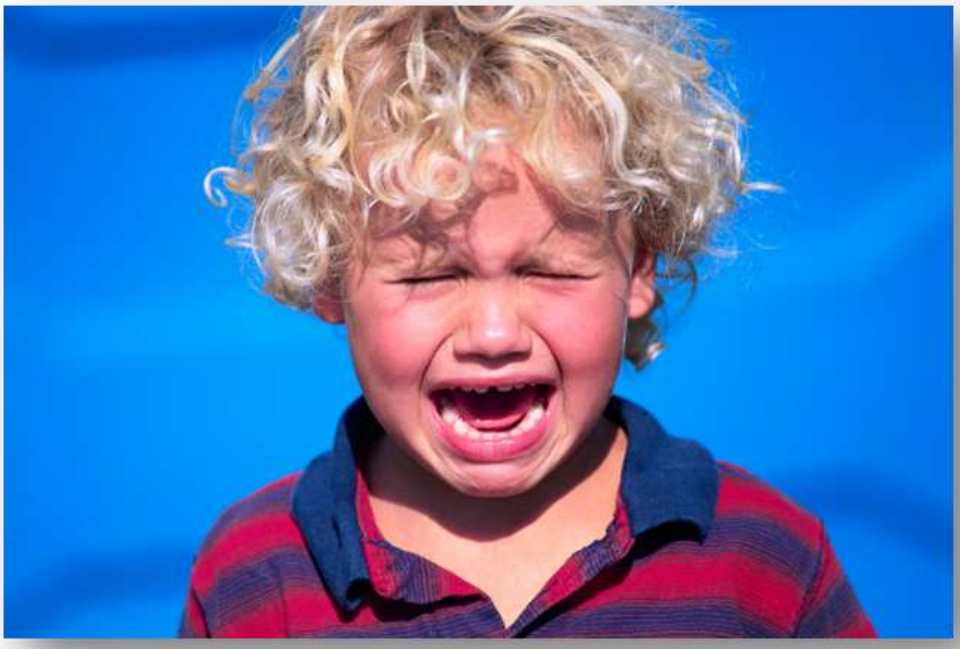
The Senses Handout

A guide for Parents/Carers and Early Years Practitioners



Barnet Early Years SEND Advisory Team is committed to supporting early year's settings to move to more inclusive environments for children with a variety of special educational needs and disabilities. This Document has been produced by Barnet Early Years SEND Advisory Team.

The Senses

The Eight Senses

1. **Hearing**
2. **Vision**
3. **Taste**
4. **Smell**
5. **Touch**
6. **Proprioception**
7. **Introception (new one)**
8. **Vestibular**

General Terminology

- **Hyper** – over sensitive to sound, light, movement, touch - so environment needs to be 'toned down'.
- **Hypo** – senses need lots of stimulation, particularly the senses of proprioception and vestibular.

Some children may be hypo sensitive to some senses whilst hyper sensitive to others. At times they may use one sense to override another – making a noise themselves to drown out noise or spinning an object so that their focus is on this (something they can control) thereby distracting them from the random movements in the room which they can't control.

Propioception – another word to help understand this is 'feedback'. Imagine there are millions of nerves in our muscles and joints and each of these wizzes messages back to the brain to say 'yep, I know I'm sitting down on a chair or a cushion'. The more often the messages are sent, the stronger the connections. In children with hypo-proprioception sense, they will need to keep moving to restimulate/confirm those

nerves to send the message to the brain. Wobble/comfort cushions and balance boards can help children with this.

A good way to imagine how this might feel is to think back to a time when you experienced numbness or pins and needles! Our first instinct is usually to rub vigorously, move the foot or arm, or squeeze and generally stimulate that area – that's what children with hypo or 'poor' proprioception are doing when they move around, engage in repetitive actions e.g. rocking or tapping, jumping etc.

Some children who have hypo proprioception in their hands/arms, may have difficulty holding objects, particularly if there are differences in weight, fragility (e.g. an egg shell) and texture (soft/hard, rough/smooth). Because the message is only sent once, the brain has not built up a store of references based on previous experiences and so a child may appear quite clumsy or seen to always be 'spoiling' another child's piece of work – it's simply that they haven't learnt how to regulate their response to objects and materials. For these children we need to be offering them lots of opportunities to engage in sensory exploration of a variety of materials.

> **Brushing** Occupational therapists often advise 'brushing' every two hours to stimulate the proprioception senses – this isn't random brushing so would need an O.T.'s advice for a specific child.

Rather than sensing external reality (touch), proprioception is the sense of 'where our limbs are in space'. Those of us a little longer in the tooth might know this as 'spacial awareness'. Without the sense of proprioception, we'd need to consciously watch our feet to make sure that we stay upright while walking.

Proprioception doesn't come from any specific organ, but from the nervous system as a whole. Its input comes from **sensory receptors** as distinct from tactile receptors — nerves from inside the body rather than on the surface. Proprioceptive ability can be learnt, as can any motor activity.

Without proprioception, drivers would be unable to keep their eyes on the road while driving, as they would need to pay attention to the position of their arms and legs while working the pedals and steering wheel. If you happen to be snacking while reading this article, you would be unable to put food into your mouth without taking breaks to judge the position and orientation of your hands.

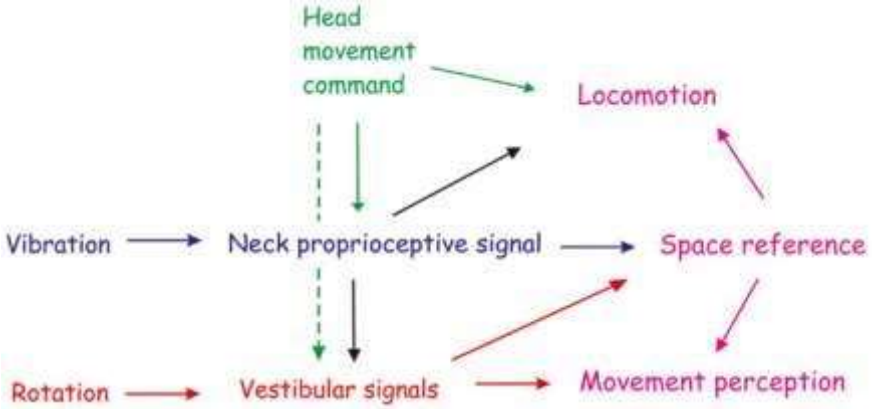
Introception

This sense tells us when we're feeling hungry, thirsty, tired etc. It reflects the signals that are taking place internally.

Vestibular - How do you keep your balance?

Balance is maintained not only by the vestibular system found in your ears but also by your visual and sensory systems. If any one of these systems is damaged/impaired, you may experience dizziness or loss of balance which in turn may manifest itself as fear and anxiety.

The brain uses the visual system to help orientate us in our surroundings. The vestibular system detects both circular motion and movement in a straight line. This includes everyday actions such as stopping, starting or turning. The sensory system keeps track of the movement and tension of our muscles and joints. It also monitors the position of our body with respect to the ground. The brain receives signals from all these systems and processes the information gathered to produce a sensation of stability.



The tubes and sacs within the vestibular system are filled with fluid containing crystals. When we move our heads, this fluid also moves. The vestibular system also contains specialised sensory cells. Movement of the fluid causes these sensory cells to bend. This change results in an electrical signal which is carried, via a nerve, to the brain for interpretation.
Once the brain has interpreted the signals as movement, it controls your eyes so that they keep providing information about your position. The brain also sends signals to your muscles so that they help to ensure balance regardless of the position of your body.

If the signals sent to the brain by the vestibular system do not match those which the eyes and sensory system send then dizziness and motion sickness can result. This can happen, for example, if you travel on a boat but you are looking at the boat rather than at the horizon. Your eyes see that you are not moving relative to the boat but your ears and body can feel that you are moving. It's the discrepancy between the two that causes the motion sickness.

In our children, under stimulation or impairment in the processing of these senses may result in children being unsteady on their feet, 'falling' on children who are sat next to them or as they attempt to step over them, walking 'through' objects rather than round them and classically, appearing to 'fall' off their chair. Close observation of the child will usually enable us to say what is a sensory processing difficulty and what is possibly attention seeking behaviour – either way, strategies can be put in place to address these.

Children may classically engage in repetitive actions/movements to either stimulate the senses (hypo sensitivity) or 'block out' overwhelming sensory input (hyper). In order to begin to understand which is which an idea may be to take children into a quiet space and observe their interactions with a variety of stimulating/calming objects to identify which they choose. Many children develop these behaviours as 'Emotional Regulators'. A child in one of my nurseries always goes to his heavy rucksack whenever he begins to feel distressed. Initially, staff thought he was indicating he wanted to go home but he was actually 'grounding himself' as the weight of the rucksack gave him familiar vestibular and proprioceptive feedback – he could control these senses when the sights and sounds were too much.

Sensory integration: This is a form of occupational therapy in which special exercises are used to strengthen the patient's sense of touch (tactile), sense of balance (vestibular), and sense of where the body and its parts are in space (proprioceptive). It appears to be effective for helping patients with movement disorders or severe under- or over-sensitivity to sensory input.

I could go on for ever and there is so much to know but I hope this helps a little.

Ann Goldstein – Area SENCO 9th
March 2016

HAND SKILLS DEVELOPMENT

Around the age of two a child should be able to:

- Use 'doer hand and helper hand' at midline (18months)
- Start to have a preferred hand *
- Build a tower of about 6 blocks
- Turn pages of a book
- Place regular shapes in a inset puzzle
- Thread large beads (may use a stiffer lace)
- Hold a crayon with thumb and fingers
- Imitate circular scribbles, horizontal and vertical strokes
- Undo large buttons and zips
- Handle fragile items carefully
- Unwrap food items in simple wrappers
- Wash hands
- An object is passed from hand to hand to get it in the correct place
- Hold and use a spoon with more finger/thumb control
- Snip with scissors (between two and three yrs)

This is because they have:

- Reasonable trunk stability and stable rotation of trunk particularly in static positions
- Shoulder, elbow and wrist are still working as a unit
- An understanding that the fingers are better at holding and controlling smaller objects
- An understanding that finger tips give more sensory feedback
- The beginning of the separation of the two sides of the hands – stabilising and manipulating
- Sense of proprioception is starting to give more refined feedback Good visual tracking
- Emerging eye-hand coordination when working close to the body

Skills are dependent on opportunity

- Gross motor skills, ie development of core/trunk muscles, shoulder stability, wrist and hand stability, balancing and managing weight through hands, knees and feet, rotation of head and trunk, inhibition of reflexes
- Sensory skills ie stimulation and opportunity to explore and understand the world through all seven senses: touch, vision, taste, smell, auditory, vestibular and proprioceptive
- Appropriate fine motor play – which can be restricted at two.

<u>At four years old the child should be able to</u>:

- Have a preferred hand which is starting to develop slightly superior skills
- Thread small beads
- Move a small object from the palm of their hand to their finger tips
- (Use scissors without associated mouth or other hand movements)
- Cut around a symmetrical shape
- Use a digital grasp when holding a pencil though no dynamic finger movement
- Draw vertical, horizontal, vertical lines and a cross (+)
- Colour in a shape with reasonable accuracy (may need bold lines)
- Manage buttons at the front of clothing
- Screws on top of toothpaste
- Attempts to brush hair
- Pinches tissue off end of nose (and blows on request)

<u>Because they have</u>:

- Well developed trunk stability - which has developed in proportion to child's size and improved.
- Shoulder stability
- Isolated control of the elbow/forearm and wrist
- Consistent use of appropriate fine grasps, pincer, lateral/key, and tripod
- Emerging isolated use of the manipulation side of the hand for tasks
- Emerging manipulation skills (though not fully developed)
- Emerging palmar arches
- Emerging stabilisation of the joints of the fingers/hands
- Appropriate feedback from sensory systems, no conflicting information
- Visual attention

Key Point in Skills Development

- Allow opportunity to establish the building blocks before attempting a refined task that is too physically challenging
- Habits that are established when developing tool use are difficult to break, therefore if the child is motivated to use tools structure it to facilitate good habits.

Reasons to avoid 'W' sitting



Always try to encourage children to kneel up on their knees, or sit on their heels as opposed to having their feet out to either side whilst their bottom is on the floor (which ultimately act as stabilisers). By encouraging children to kneel/sit back on their heels and then lean forward from this position, we will encourage the development of stomach muscles, core stability and strengthen the hips.

In general, have as many floor based activities as possible – use builders trays (can be bought from Wickes, B & Q, Homebase) which are large flat black plastic trays and are ideal for containing materials, equipment etc. Children can kneel around the edge and as they lean forward to interact with items in the tray, they are building their core stability, strengthening muscles and developing balance and coordination.

Children who 'wriggle', lie down, 'slouch' at the table and move around a lot often have difficulties with one or more of their senses, in particular, proprioception (nerves in the muscles/joints sending messages back to the brain about where they are – by moving they are sending reminders) or vestibular which is to do with balance, where they are in terms of their environment. Another cause is that children have not developed 'core stability' and so the muscles in their back, stomach, shoulders etc struggle to support them in sitting.

Encourage big movements with arms etc – writing and many other fine motor skills originate from the shoulders and with the advent of hand held gaming toys, remote controls and the world of technology in general, many children do not have the opportunities to develop good shoulder stability/control. Old fashioned skipping ropes, ribbons, throwing/catching games all give children opportunities to develop these muscles.

Get rid of the chairs!! In general children can work much more effectively if they are encouraged to stand at an activity. Try to have a variety of tables at different heights – children come in various sizes!

Be creative with activities. Use blue tack to fix large sheets of paper to the back of a cupboard or on a wall whist putting the materials in a box or tray on the floor. The children will need to move around, kneel down, get up whilst carrying something in their hands – this in turn develops their physical skills =- and helps the more kinaesthetic learners. It also helps to keep them mentality alert and focussed – and makes them tired and happy ready for home.