

Sensory Processing Dysfunction

Occupational Therapy Pre-referral advice for schools

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Introduction

We have developed this resource pack for those working with children who have sensory processing difficulties.

The strategies provided in this resource pack are sensory-based interventions that use discrete sensory experiences, cognitive awareness and environmental modifications to improve attention to support regulation of behaviour to prepare the child for engagement and promote organised behaviour in everyday contexts in order to meet the demands of different activities in school, home and community.

The aim is to help identify why a child is having difficulties with a particular activity and to provide advice and some ideas on how to help them.

The pack is suitable for children of all ages with some adjustment of activities for age appropriateness.

The pack has been set out so you can find the area of difficulty (e.g. tactile, auditory) and the strategies that can be used to overcome this. Strategies need to be implemented daily, regardless of how the child presents (e.g. even on a good day) and progress reviewed.

Many of the strategies could be a benefit to children who do not have sensory processing difficulties. Think about the situation when a normal baby becomes distressed: the adult will either hold the baby to provide slow rhythmic swinging movement stimulation (calming vestibular inputs) or pat the baby with gentle touch stimulation (calming tactile inputs). These sensory strategies will help calm the baby down but it does not mean the baby has a sensory processing disorder / difficulties. Another example is when you are tired and under-aroused, you will try to do different activities to alert yourself like stretching your arms up and arching your back, getting up to walk about or having a glass of cold water. These activities will provide alerting sensory inputs to increase your arousal levels which will work even if you do not have difficulties with sensory processing. Therefore consider how you can incorporate some of the strategies described in this pack to benefit the whole class.

Referral to Occupational Therapy

Before we will accept a referral for an assessment we will require evidence that the advice and ideas provided in this pack have been followed at school and home for at least one school term.

If, after using the advice provided in the pack, the child still continues to find tasks hard, it may be appropriate for the child to be referred to the Children's Occupational Therapy department for a specialist assessment.

We have included a suggested format of how to log the strategies that have been tried. In addition we request the most recent education report including child's IEP or EHC if applicable is included with the referral for specialist assessment by the Children's Occupational Therapy Service.

If a child is experiencing difficulties with fine motor co-ordination then please refer to the Fine Motor Co-ordination Difficulties: Occupational Therapy Pre-referral advice for schools for advice and strategies to try.

Please feel free to contact us if you have any questions or you wish to discuss activities suggested, in relation to a specific child.

Contact Details:

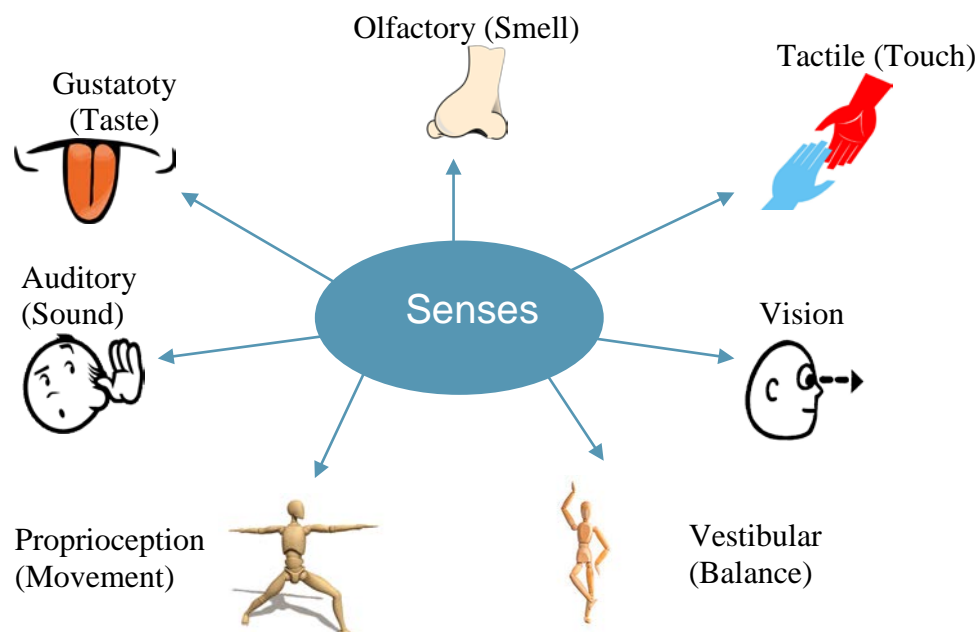
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What are our senses?



Each sense will be considered in greater detail with the following information:

- Description of sensory system
- Things you may see if over / under responsive
- Strategies to overcome difficulties

What is sensory processing?

“We receive a great deal of information from our senses. We use this information in many ways – to help us understand our body, understand the environment, and successfully interact in the world”. (Ayres 1979). When our senses are integrated correctly we are able to respond appropriately to the sensation.

Imagine peeling and eating an orange. You sense the orange through your eyes, nose, mouth, the skin on your hands and fingers, and the muscles and joints inside your fingers, hands, arms and mouth. How do you know it's a single orange rather than many different oranges? What makes your two hands and 10 fingers all work together?



All the sensations from the orange and all the sensations from the fingers and hands somehow come together in one place in your brain and this integration enables your brain to experience the orange as a whole and to use your hands and fingers together to peel the orange.

Integration is what turns sensations into perception. We perceive our body, other people and objects because our brain has integrated the sensory impulses into meaningful forms and relationships. As we look at the orange our brain integrates the sensations from our eyes so that we experience its colour and shape. As we touch the orange, the sensations from our fingers and hands are integrated to form the knowledge that it is rough on the outside and moist on the inside. The integration of sensations from the nose tells us that the orange has a citrus odour (Ayres 1979).

If the brain does a poor job of organising sensations this will interfere with many things in life. There will be more effort and difficulty, less success and satisfaction.

Reference: Sensory Integration and the child: Understanding hidden sensory challenges. A J Ayres 2005

What is sensory modulation?

Sensory modulation is the ability to respond to sensations appropriately, maintain an optimal state of alertness to attend to tasks. Some children are over responsive, some children are under responsive.

What do we mean by over and under responsive?

Sometimes the body doesn't receive enough information and is under responsive. This is when the body doesn't process sensory information effectively and therefore seeks more sensory input.

Sometimes the body struggles to manage sensory input coming in and is over responsive. This is when the body misinterprets sensory information as aversive, negative and out of proportion to sensory input that most of the population wouldn't.

A child can be over responsive in one system and under responsive in another. There are many contributing factors.

Proprioception - body awareness

This is about our movement and body position (like internal eyes). It's the messages we get from our muscles and joints about where we are in space and how our body parts relate to one another without needing our eyes to tell us. It informs us how fast we are moving and how much force to apply.

What might an under responsive proprioceptive system look like?	What might an over responsive proprioceptive system look like?
<ul style="list-style-type: none"> • Child is a fidgeter and struggles to sit/stand still • Child leans on people when sitting or standing • Child is heavy footed • Child seeks extra movement e.g. crashes, bumps, constantly jumps • Child is heavy handed e.g. throws ball too hard, presses on hard when writing, gives really firm hugs • Child has a high pain threshold • Child chews on inedible objects • Child tends to play more rough than peers and breaks items without meaning too • Child might need to use their eyes to feel a movement e.g. looks at their feet when riding a bike • Child may find some activities more difficult to pick up than their peers e.g. riding a bike, swimming, team games • Child presents as floppy and appears to have weak muscles 	<p>This is extremely uncommon as proprioceptive input has the potential to be both calming and alerting.</p>

All children may demonstrate some of these behaviours, but a child with sensory processing difficulties is more likely to present with many of these, or some to an extreme degree.

Proprioception strategies

We use proprioceptive activities to calm and organise all our systems (also see self-regulation section) For example if we are having difficulties in our tactile sense we use proprioceptive activities to override these difficulties. E.g. when we bump into something and hurt ourselves we automatically rub it better. This is utilising the proprioceptive system (rubbing uses deep muscles) to inhibit the tactile response (pain to area bumped).

Under Responsive – consider any activity that causes muscles to repetitively stretch, bend, move, put extra weight through, activities that are hard work or resistive. Can include, but not limited to:

- Jumping on a trampoline
- Pillow fights
- Playing tug of war
- Animal walks – crab walk, bear walk, duck walk, kangaroo jumps
- Chair push ups - Place palms on each side of the seat, push down and lift your bottom off chair. Hold position for as long as you can; make sure feet are off the floor, as this means you will put more weight through your arms.
- Wall pushes - Stand arms length away from the wall, with hands at shoulder height, keep back and legs straight and bend your arms to do push ups
- Floor push-ups
- Rolling games e.g. Roll the child up tightly in a blanket or rug leaving their face exposed
- Any leisure / sports activities such as swimming, climbing, ball games, crawling through tunnels
- Wheelbarrow walks
- Carry a backpack with a bit of weight in (no more than 10% of child's body weight)
- Wear leg weights during P.E or when walking to and from school (no more than 10% of child's body weight)
- Massage – using firm pressure touch on arms, legs, palms of hands and feet
- Use lap pads (or wheat bags) for increased proprioceptive input when seated
- During school allow for regular movement breaks
- Playdough or theraputty use – can be used to warm up the hands ready for handwriting tasks
- Allocate the child jobs to provide movement breaks, e.g. library book collector/monitor, taking messages to the office
- Try tying theraband around the legs of a chair for child to push legs against for resistance



- Pull theraband/resistive bands and hold for 10 seconds
- Fidget toys
- Helping to re-arrange furniture (supervised)
- Hand out heavy books in class
- If using too much pressure when handwriting try placing work on a surface that gives more sensory feedback e.g. bubble wrap, Dycem mat (if the child presses on too hard he will go through the paper and therefore learns how much pressure to apply), on a pad of paper etc.
- See oral motor section on page 22 for proprioceptive activities involving the mouth




Vestibular - movement sense

The vestibular system is located in our inner ear. It is a movement-detection system that consists of gravity receptors to inform us about movement of our head and body against gravity.

It helps us understand the position of our head and body in space and gives us information about which way is up and where we are going. It helps us with balance, spatial orientation, and maintaining a stable visual image, even when we are in motion.

The information from the vestibular sense also passes through an area of the brain that impacts on our attention and arousal level (sleep/wake cycles).

Since movement is a part of everything we do, the vestibular system is important for all of our interactions with the sensory world (Kawar, M. J. et al). The vestibular system is a major organiser of sensory input and is considered to be an influential sensory system and has tremendous impact on a child's ability to function daily.

What might an under responsive vestibular system look like?	What might an over responsive vestibular system look like?
<ul style="list-style-type: none"> • Excessive movement and difficulty sitting still • Excessive spinning or watching things spin • Inability to sustain listening without moving the body • Difficulty maintaining attention • Often oblivious to safety concerns • Doesn't get dizzy with spinning • Poor balance (static or when moving with no fear of movement) • Trouble walking on uneven surfaces (with no fear of movement) • Difficulty reading and scanning • Poor eye hand coordination 	<ul style="list-style-type: none"> • Avoids movement and playground equipment • Gets car/ travel sick easily • Poor balance (static or when moving with fear of moving) • Excessive emotional response with movement e.g. when lifted up child screams or cries • Difficulty walking on uneven surfaces • Difficulty scanning and reading • Very cautious and hesitant with movement • Poor eye hand coordination • Dislikes head tilting backwards • Avoids sports • Always holds rails or furniture, especially when coming down stairs • May manipulate their environment or other people to avoid vestibular input

Some vestibular difficulties may fit into **either category** e.g. poor balance, difficulty walking on uneven surfaces, poor hand eye coordination etc.

A child with an **over responsive** vestibular system is likely to resist input and will have high levels of anxiety or fear in response to movement. They may have excessive emotional reactions, even when there is no danger of falling.


A child who is **under responsive** to vestibular input will often enjoy movement and seek it out but may be uncoordinated.



Vestibular strategies:

When working with a child with vestibular difficulties you need to be careful to monitor all input. It is important to discourage spinning as this can be very disorganising.

Vestibular work should be followed by a calm proprioceptive activity to assist with organisation and correct level of self- regulation.

If you feel the child has anxiety and fear in relation to movement please make a referral to occupational therapy. Within the referral provide details and examples of the child's anxiety/fear in relation to movement.

If Under Responsive	If Over Responsive
<p>Consider activities which challenge the centre of gravity and cause the head to move out of alignment. Can include, but not limited to:</p> <ul style="list-style-type: none"> • Jumping on a trampoline • Hopping, skipping and running • Tumbling and gymnastics • Animal walks – crab walk, bear walk, duck walk, kangaroo jumps • Monkey bars, climbing frames, spinning wheels, slides • Yoga or Pilates • Using a therapy/exercise ball (bounce on/roll over etc.) • Boxing • Wheelbarrow walks 	<ul style="list-style-type: none"> • Use a firm supportive seat that will not tip, to help the child feel stable and secure whilst sat at their desk. Make sure their feet stay flat on the ground • Make allowances in PE, e.g. reduce the amount of vestibular activity, i.e. forwards roll or activities where the feet are off the ground etc. • Allow the child to be at the front or back of the line when negotiating stairs • When ascending and descending stairs, allow child to use the handrail • Allow child to leave class 5 minutes early to avoid busy corridors

<ul style="list-style-type: none"> • During school, allow for regular movement breaks • Swings, both indoor and outdoor • Use a 'move and sit' cushion  	<ul style="list-style-type: none"> • Gentle activities incorporating vestibular input e.g. row row row your boat, rocking in a rocking chair etc.
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Tactile system - touch

Our skin is our largest most sensitive organ; it has different receptors that give more detail about what the skin is feeling.

The tactile system registers light touch, pain and temperature and serves to protect us. It acts as an alarm informing us of danger. Our body has a fight or flight response and the tactile system uses this to protect the body e.g. an insect lands on our arm we automatically brush it off to prevent it from stinging or biting. Our bodies respond to danger in one of three ways

1 = Fight – we stand and fight the danger

2 = Flight – we run from danger



3 = Fright - we freeze in response to the danger.

If the body misinterprets tactile information the person is often in a fight or flight state and therefore it takes very little to evoke a reaction.

Other receptors in our tactile system are pressure touch known as discriminative touch.

Through touch we gain information about where and how our bodies are positioned. We get information about objects and our environment that allows us to develop refined fine motor skills.

The tactile system helps with motor planning, body awareness, self regulation (the ability to achieve an optimal state of alertness in order to achieve the task in hand), and it helps us form relationships and emotions e.g. giving hugs.

What might an under responsive tactile system look like?	What might an over responsive tactile system look like?
<ul style="list-style-type: none"> • Child isn't aware of touch e.g. when you brush past them they do not acknowledge this. • Child leaves clothes twisted on their bodies • Child has messy face and hands and doesn't seem to notice  <ul style="list-style-type: none"> • Child constantly touches things within their environment 	<ul style="list-style-type: none"> • Child avoids messy play or wants to wash hands immediately after • Child avoids contact with other children, e.g. stays on the outskirts • Child is irritated by certain types of clothes, labels and seams in clothes and may avoid wearing them • Child avoids crowded environments such as playtime, assemblies or lining up, or these times are when the child gets into more trouble. • Child avoids going barefoot • Child dislikes daily living activities such as having hair washed, cut and brushed, brushing teeth  <p>The over responsive child may react with whining, clinging (fright), lashing out (fight) and running away (flight).</p>

Tactile strategies

Sensory information travels to the central nervous system on one of two pathways. Proprioception and tactile input use different pathways and the route proprioception travels can override (cut off) the tactile system.



If Under Responsive	If Over Responsive
<ul style="list-style-type: none"> • Encourage the child to experience as many tactile experiences as possible e.g. <ul style="list-style-type: none"> - Messy play – sand, water, finger paint, shaving foam, jelly, slime, mud box - Use different textures – lentils, rice, seeds, beans, pasta, cotton wool, sand paper - Feely box – make a box with different objects inside and use hands to identify objects (start with objects with different shapes and textures and then try objects with similar shapes and textures). - Playdough / Theraputty – pinch, roll, squeeze, pull, find objects hidden inside 	<ul style="list-style-type: none"> • Use proprioceptive activities – see proprioceptive section on page 8 especially before and after activities with a tactile element • Allow child to stand at the front or end of line to avoid being bumped into or brushed past • Arrange seating in classroom to avoid risk of being bumped by fellow class mates • Consider tactile element to activity and where possible modify, e.g. when painting or using playdough, allow use of tools and/ or wearing gloves or allow child to wash their hands if requested • Avoid light touch – use firm pressure when touching the child and always approach from the front • If touch is necessary give the child prior warning • Allow child to leave the classroom a couple minutes early for transitions to avoid busy environments

Vision



There are different aspects of our visual system.

1. Our eye movements

- The movements of our eyes are controlled by muscles, these allow us to follow a moving object with our eyes, fix on an object, scan a page of writing and focus our eyes on one object then move to another and refocus quickly.

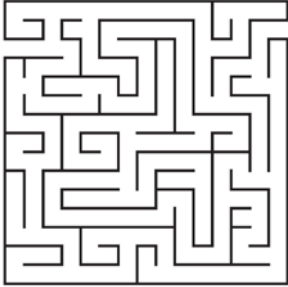

2. Visual processing

- The brain selects and responds appropriately to visual input. It processes information that enables us to evaluate the environment and recognize similarities and differences between object forms, sizes and positions.

What might an under responsive visual system look like?	What might an over responsive visual system look like?
<ul style="list-style-type: none"> • Likes to watch things like the washing machine or toy cars wheels spin (excessively) • Spins objects • Stares intently at people or objects • Blinks a lot • Scrunches eyes up • Squints • Child brings things very close to their eyes • Child looks out of the corner of their eyes frequently • Child struggles to cease noticing the pictures or people in the room 	<ul style="list-style-type: none"> • Prefers to be in the dark • Becomes frustrated when trying to find objects in competing backgrounds or messy environments • Express discomfort/avoids bright lights – struggles with change in lighting in different environments  <ul style="list-style-type: none"> • Takes longer to adjust to lights and change in lights • Complains of headaches, rubbing eyes or squinting (where medical reasons have been ruled out) <p>The over responsive child may react with whining, clinging (fright), lashing out (fight) and running away (flight).</p>

Visual strategies

Prior to completing these activities ensure vision has been assessed to rule out any underlying visual problems which may be contributing to the child's difficulties.



If Under Responsive	If Over Responsive
<ul style="list-style-type: none"> • Dot to dots, mazes, word searches, Where's Wally, find it books, colour by numbers  <ul style="list-style-type: none"> • Place work on a bright piece of paper to draw attention to task • Clearly display/highlight important information in the same place e.g. when working have date and time in same spot on wipe board 	<ul style="list-style-type: none"> • Use proprioceptive activities – see on page 8 to help calm an overly alert sensory system • Where possible reduce visual distractions or have a designated area for child to work in with reduced visual stimuli • Position child near the front of the classroom preferably not facing the window • Create an individual workstation with built up sides – a pop up visual screen • Clearly display/highlight important information in the same place e.g. when working have date and time in same spot on wipe board • Consider the lighting in the classroom • Wear sunglasses and a hat when outside  <ul style="list-style-type: none"> • Use neutral colours

For children with suspected difficulties with vision check they have had their vision tested recently.

For children with suspected difficulties with eye movements please make a referral to ophthalmology.

Auditory system - hearing


Auditory processing refers to how the brain recognises and makes sense of sounds. Sound consists of loudness, pitch, how long it lasts for and where it is coming from.

What might an under responsive auditory system look like?	What might an over responsive auditory system look like?
<ul style="list-style-type: none">• Makes noise for noise sake e.g. sings, taps• Talks in a loud voice• Appears not to hear what you say but you know their hearing is good• May hum to themselves 	<ul style="list-style-type: none">• Places hands over ears in response to noise e.g. when the bell rings, when the Hoover is on, hand dryers• Responds negatively to unexplained noise• Overly reacts to sound that others barely notice• Can't stop noticing the noise of the fan, air con, lights buzzing etc which interferes with participation in tasks <p>The over responsive child may react with whining, clinging (fright), lashing out (fight) and running away (flight).</p> 

For children with suspected difficulties with auditory input (hearing) check they have had their hearing tested recently.

Auditory strategies

Prior to completing these activities ensure hearing has been assessed to rule out any underlying auditory problems which may be contributing to their difficulties. Please note children with underlying auditory conditions i.e. glue ear/ cochlear implants etc. may display sensory behaviours.

Under	Over
<ul style="list-style-type: none"> • Make sure the child is facing you when giving instructions  <ul style="list-style-type: none"> • Give simple instructions – don't use too many words or use visual cues alongside • Speak loudly and clearly • Simplify instructions and ask the child to repeat the instructions back to you • Wait for the child to process and respond to auditory information – remember this may take them longer • Get the child to focus on the task in hand 	<ul style="list-style-type: none"> • Use proprioceptive activities – see proprioceptive section on page 8 to help calm an overly alert sensory system • Respect their sensitivity it really does hurt! • Try to forewarn the child of any loud noises before they occur • Minimise auditory distractions e.g. use a rug in a classroom to reduce excess noise • Consider ear defenders or ear plugs • Allow child to work in a quieter environment for activities that require prolonged focused attention • At lunchtime allow the child to eat in a quieter room if required • During assembly allow the child to sit at the end of the line to minimise noise. Allow them to go in first and the noise to build around them • Consider quieter spaces on the playground for the child to socialise or take part in quieter activities • Allow child to leave classroom a couple minutes early for transitions to avoid noisy environments • Use visual cues to support auditory instructions and minimise the number of instructions given



Olfactory system – smell / Gustatory System - taste

Smell is often our first response to stimuli, it alerts us to fire before we see the flames


Smell is a chemical sense, when a smell is detected it passes on electrical impulses to the brain which interprets its odour.

Smell passes through the limbic system in the brain which is vital to our behaviour, mood and memory. Smell can often trigger memories good or bad. Smell is closely linked to our sense of taste; think about how bland food tastes when we have a cold.

The taste system with smell indicates whether food should be eaten. Taste buds interpret the identity concentration and pleasant/unpleasant quality of the substance. This information also prepares the gastrointestinal system to receive food by causing salivation and swallowing (or gagging and regurgitation if the substance is noxious)

What might an under responsive smell / taste system look like?	What might an over responsive smell system look like?
<ul style="list-style-type: none"> Child likes to smell objects (food and non food)  <ul style="list-style-type: none"> Likes spicy/sour foods Adds extra flavour to foods i.e. extra salt, pepper, ketchup 	<ul style="list-style-type: none"> Child becomes distracted by a smell and cant refocus on task  <ul style="list-style-type: none"> Child gags or has an aversive response to smells / tastes Child comments on smells other people may not notice Child may struggle at dinnertime or in restaurants due to strong or complex smell of foods Dislikes foods with flavour e.g. prefer bland foods Child dislikes food with different texture/consistencies e.g. pasta with sauce <p>The over responsive child may react with whining, clinging (fright), lashing out (fight) and running away (flight).</p>

Olfactory/gustatory strategies


If Under Responsive	If Over Responsive
<ul style="list-style-type: none"> • Encourage the child to have as many smell experiences as possible e.g. <ul style="list-style-type: none"> - Scratch and sniff stickers - Aromatherapy oils - Scented felt tips - Scented candles • Encourage the child to try a variety of tastes e.g. spicy, sour, zingy 	<ul style="list-style-type: none"> • Use proprioceptive activities – see proprioceptive section on page 8 to help calm an overly alert sensory system • Allow child to have their favourite scent or object that they like the smell of to block out the offensive smell e.g. sweat band with aromatherapy oil or mums perfume on • Try scented candles for home and school • Be considerate of taste requirements – never force a child to eat something they feel uncomfortable doing

Oral motor


Oral motor control is important for many activities such as managing secretions (saliva), speech, feeding etc. The face, mouth and tongue are made of many small muscles. The first thing a baby has to learn to do is suck, swallow and breathe.

As we develop the mouth is crucial in exploring and learning about the environment. From an early age babies explore their environment by taking things to their mouth. This is a normal developmental stage, as a child gets older they no longer need their mouth to explore as they start to use their hands to interact with their environment.

Oral motor can also be used in self-regulation (see self-regulation section for further information) and to enable us to calm or increase our levels of alertness e.g. by sucking or chewing.

What might an under responsive oral motor system look like?	What might an over responsive oral motor system look like?
<ul style="list-style-type: none">• Child puts non-food objects in mouth to chew and suck• Chews on clothing  <ul style="list-style-type: none">• Child over fills mouth when eating• Child puts food too far back in their mouth• Child dribbles/spits	<ul style="list-style-type: none">• Child dislikes having their teeth cleaned• Child is picker eater• Child gags easily• Child refuses to participate in any food based activity

Oral motor strategies

If Under Responsive	If Over Responsive
<ul style="list-style-type: none"> • Dots around the outside of the mouth – using your index finger press firmly on a spot around the mouth then take your finger off and repeat further along until you have gone all around the mouth. Repeat three times • Facial massage – Use firm pressure to massage the cheeks in small circular movements. Repeat three times • Bite and tug – Bite on a chewy tube or piece of theratubing on the back molars and pull, repeat ten times then repeat on opposite side. • Wake the mouth up – Use a vibrating / electric toothbrush and brush across the tongue. Move the back of the vibrating toothbrush along the outside of the cheeks. • Blowing – Blow toys may help to increase oral-muscle-tone and awareness of the mouth. Toys that help include: harmonicas, blowing bubbles, pin wheels, hooters, balloons, ball blowers, whistles, blow pens. Other games include: blowing through a straw in the bath into soapy water to make bubbles, blowing a ping-pong ball through a straw around an obstacle course etc. 	<ul style="list-style-type: none"> • Use activities for under responsive as these use the proprioceptive system and help reduce sensitivities. • Be considerate to child's dislikes – don't force them to eat things or participate in food based activities

<ul style="list-style-type: none"> • Sucking – Use activities that use suck e.g. suck up cotton wool balls or smarties using a straw • Cheek exercises <ul style="list-style-type: none"> ○ Put lips together and puff cheeks out. Hold for 10 seconds whilst breathing in and out of the nose ○ Puff one cheek out then the other ○ Use the tongue to push the cheek out • Chewing 2/3 pieces of chewing gum at the same time • Eat crunchy or chewy foods • Try spicy or strong flavoured foods ie, pickled monster munch, chutney, pickles 	
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Alertness / self-regulation

Alertness can be considered a state of the nervous system describing how alert we feel. To attend, concentrate, and perform tasks in a manner suitable to the situational demands our nervous system must be in an optimal state of alertness for that particular task (Mercer and Snell 1977).

“How does your engine run? The Alert Programme for Self-Regulation” (Williams and Shellenberger, 1992 & 1994) uses the principles of sensory integration and involves matching cognitive awareness with sensory experience.

Although initially designed for children 8-12 years, the Alert Programme has been adapted for preschool through to high school and even adults.


The Alert programme is designed to improve awareness of self-regulation through the use of charts and activities. Adults guide children to recognise the way in which sensory modulation disorder affects alertness and help them to learn strategies to change their levels of alertness or arousal.

The Alert programme helps children realise that their “engines” (i.e. nervous system) need the proper amount and kind of sensory information to function optimally. It increases the child’s collection of strategies for changing levels of alertness.

The goal of the programme is not only to teach children how to get their “engines to run just right” and remain there throughout the day but also how to change their level of alertness to meet situational demands (Shellenberger and Williams 2002).

Children and adults can together determine the strategies that support optimal functioning. In cases where children are too young to use the programmes concepts parents and teachers become the detectives identifying and providing the type of sensorimotor input that best supports the child’s self-regulation and performance. We can use these principles with children who struggle to self-regulate for example have difficulty sitting on the carpet or fidget in their chairs or seem switched off. We can use our activities within our sensory diet (see sensory diet section on page 30) to change our levels of alertness

What do our “engine” levels look like?



When my engine is too low	When my engine is just right	When my engine is too high
<ul style="list-style-type: none"> • Talks slowly and quietly. • Is too tired to listen to his/her teacher • Is too tired to do his/her work.  <ul style="list-style-type: none"> • Moves slowly. • Is too tired to play with his/her friends. 	<ul style="list-style-type: none"> • Uses his/her “just right voice” to talk. Not too loud and not too soft. • Listens to his/her teacher and follows her directions because his/her body is “just right.” • Gets his/her work done because his/her body is “just right.” • Plays the same game with his/her friends and talks about the same things his/her friends are talking about. 	<ul style="list-style-type: none"> • Speaks with a loud voice. • Has a hard time listening to his/her teacher because his mind is racing • Has a hard time doing his/her work because his/her body is moving too fast. • Is always moving. • Body and mind is moving fast when he/her plays with his/her friends. Others or himself/herself may get hurt.



We typically learn to self-regulate on our own. For example, have you ever been sitting in a class or meeting, and realise that you are daydreaming or getting sleepy. As adults, to self-regulate, we simply begin to bounce our leg up and down, click the top of our pen, or pop in a piece of chewing gum. Soon we find ourselves paying attention. That is an example of our car engine running “Too Low” and naturally bringing it to “Just Right”.

Another example, you are getting ready to leave for a 5-day holiday to Spain. You have to get through your last full day of work. You are so excited that you find it really hard to pay attention and concentrate. You find yourself doing breathing exercises, stretches, or drinking a warm cup of tea, so you are able to calm down and concentrate to get your work done. That is an example of your car engine being “Too High” and naturally bringing it to “Just Right”

The following are some examples of activities to help a person achieve a calm alert state.

It is important to note that although most children respond in a calming or alerting manner to the activities listed below, some children may have an opposite response. Therefore, it is important to monitor a child's response to make sure it is the type desired. For example, chewing gum and sucking on hard sweets may be alerting to some children but calming to others, active play can be calming for some children but for others this is stimulating. For children who fluctuate between high and low levels of alertness refer to the multi-effect modulation technique section in the table below.

Calming Techniques (for children in a high engine level)	Multi – Effect Modulation Techniques (for children fluctuating between high and low engine levels)	Alerting Techniques (for children in a low engine level)
<ul style="list-style-type: none"> • Use low level lighting or dim the lights • Encourage the child to listen to quiet music or stories with headphones • Use a soft voice and slow down your movements and your speech • Provide a quiet hidden corner to work or play in • Provide a rocking chair or bean bag to sit in 	<ul style="list-style-type: none"> • Give the child a bear hug in order to provide deep pressure touch (Krauss, 1987) • Provide proprioceptive inputs by placing your hands on the child's shoulders when he or she is seated and push down • Teach the child to self- modulate by placing both hands on top of head and push down with slow counting • Have the child push hard on the wall, do wall push ups on a desk or table top • Provide the child with pushing, 	<ul style="list-style-type: none"> • Give the child cold or iced water in a water bottle  <ul style="list-style-type: none"> • Use bright lighting • Have the child pat cool water on his or her face • Take frequent breaks during more difficult tasks (march, hop, skip, jump, run in place, do 10 sit ups) • Play loud, fast paced music before doing a lesson or homework • Encourage an active break time or outside playing time with swinging, running, sliding and climbing


<ul style="list-style-type: none"> • Suggest that the child use a lap pad • Avoid rushing or hurrying the child as much as possible – plan ahead • Have chewy food available – liquorice, fruit roll ups, raisins, carrots, celery. • Have crunchy food available – dry cereal, crisps, trail mix  <ul style="list-style-type: none"> • Allow bubble blowing during break time 	<ul style="list-style-type: none"> pulling, carrying and lifting activities with less body movements • Allow the child to manipulate hand fidgets or squeeze a small, hand held pliable ball • Have squeezing and stretching objects available such as theraband, theratubing, koosh balls, theraputty, play doh, clay and hand fidgets • Allow the child to chew sugar free gum or suck on sugar free hard sweets • Allow the child to sit on a therapy ball or move 'n' sit cushion while doing his or her school work (Schilling et al 2003) 	<ul style="list-style-type: none"> • Have a mini trampoline available in the classroom or P.E hall. 
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If you notice during break time a child is spinning a lot and after break then struggles to sit and complete work you may introduce a different sensory experience to better prepare their body for work.

Below is an example of a chart that can be used in the classroom on the child's desk to help them indicate where their engine levels are at any given time. If it helps the child could identify their own pictures to illustrate their engine levels ('too high'; 'just right'; 'too low') instead of the colours shown below.

The box opposite can be filled with activities which you and the child have identified help change their engine level. Initially you can help the child label their engine speed and then use the activities to change it. The ultimate goal is for the child to start to do this independently (e.g. to recognise their own engine speed and know what activity they need to do to achieve a calm-alert state).

How's My Engine?

		Things I can do in my seat when my engine Too High
	Too High	<ul style="list-style-type: none"> • Squeeze hands together (push or pull) • Chair push-ups (Put hands on seat and use arm muscles to push you up) • Take 3 deep breaths • Stretch your arms and legs
	Just Right	
	Too low	Things I can do in my seat when my engine Too Low <ul style="list-style-type: none"> • Blowing bubbles/ whistles • Movement break – star jumps • Have a drink of iced water

Sensory diet/snacks

A sensory diet is an individualised program that is practical, carefully scheduled and based on the concepts that controlled sensory input can affect functional abilities. The specific sensory diet will vary according to an individual's goals, preferences, resources and limitations (Wilbarger 1984).

The goals of a sensory diet are to reduce or eliminate sensory behaviours, promote an optimal level of alertness and organise a child's sensory system to allow better engagement with his/her environment.

When planning a sensory diet consider:

- What are you trying to achieve (GOALS)
- Structure and routine (times of day, frequency, duration)
- Consistency
- How to incorporate activities into daily life

Sensory diets need to be done consistently every day at home and school for maximum affect, therefore good liaison between home and school is vital for its success. The frequency of activities will depend on the needs of each child. Discussing what works in different environments will help to get the best effects from your sensory diet e.g. How much space is there in the home? What can be done if the weather is poor? Could activities be completed at the child's desk?

Ongoing communication between home and school is needed to review and adjust to ensure success.

Sensory diet example

Time of day	Sensory activity	Duration
7am	Put bright light on / warm up light (VISION) Big bear hugs when getting out of bed (TACTILE/PROPRIOCEPTION) Breakfast – something crunchy, chewy or sour (ORAL MOTOR/TASTE)	5 minutes
8am	Trampoline or jumping and crashing on the sofa. Big squashes with a therapy ball/ pillow (VESTIBULAR/PROPRIOCEPTION)	10- 15 minutes
10.00	Use proprioceptive work such as: <ul style="list-style-type: none">- Wheelbarrow walks- Row your boat- Rolling over a big ball- Obstacle course	10-15 minutes

	<p>Try some vestibular activities as well including:</p> <ul style="list-style-type: none"> - Swings - Hot dog rolling (roll Child up in a blanket and squish with some pillows. He is the hot dog in the bun). Ensure face is not covered. 	
11.00	<ul style="list-style-type: none"> - Chair push ups - Wall push ups - Movement break 	10-15 minutes
11.30	<p>Oral motor work including:</p> <ul style="list-style-type: none"> - Bite and tug activities with a chewy tube - Blowing out a candle - Drinking through a straw <p>Some proprioceptive input such as:</p> <ul style="list-style-type: none"> - Row your boat pulls - Weighted back pack - Moving furniture - Digging in the garden etc. 	<p>15 minutes</p> <p>Oral work is used as it is a fantastic way for Child to self-regulate.</p>
1pm	<p>More proprioceptive work:</p> <ul style="list-style-type: none"> - Animal walks <ul style="list-style-type: none"> 1. crab walk 2. bear walk 3. frog jump 4. commando crawl - Jumping on the trampoline - Running around outside - Climbing on climbing frames - More bite and tug activities with the chewy tube 	<p>15 minutes</p> <p>Ensure the animal walks are done in a slow and calm manner so as not to over- arouse.</p> <p>This will help to improve shoulder stability and muscle tone</p>
2.30pm	<p>Oral motor work:</p> <ul style="list-style-type: none"> - Blowing bubbles in a cup using water and a straw. These are called 'bubble monsters' - Blowing steam on a mirror - Blowing suds off his/her hands - Bite and tug activities with chewy tube 	20 minutes
4pm	<p>Proprioceptive and vestibular work such as:</p> <ul style="list-style-type: none"> - Cuddle Swings or regular swings - Jumping on the trampoline - Having a crunchy or chewy snack - Drinking liquids through straws - Bite and tug with chewy tube - Crashing on a big pile of pillow - Hot dog rolling - Rocking horse 	10- 15 minutes

5.30pm	Bath time: <ul style="list-style-type: none"> - Having cups to pour water in and out - Blowing bath bubbles of his hands - Giving firm wash with a sponge - Firm rub down with towel after the bath - Massage with firm touch 	10 minutes
7pm	<ul style="list-style-type: none"> - Quiet music (AUDITORY) - Aromatherapy oils e.g lavender (SMELL) - Gentle but firm massage - Big bear hugs - Teddy/comfort toy to snuggle into (TACTILE) - Reduce lighting (VISION) 	10 minutes **Note activities before bed should be non alerting therefore no spinning, play fighting etc.

Remember, siblings and other class members can join in with these activities too. We can use activities that include sensory experiences for all the senses (see relevant sections)

Sensory dysfunction examples

- **Child uses too much force or intensity when using pencils or during play.**

What could this mean?

Child is not getting enough feedback through the proprioceptive system and is therefore unable to detect or sense the amount of pressure he/she is applying.

Ideas to help:

Implement a good sensory diet that includes activities which use the proprioceptive system (see proprioceptive system on page 8).

- **Child has difficulty at circle time**

What could this mean?

Circle time not only involves the child being required to sit still; there are unpredictable bumps and brushes against the skin from others, a child talking too loud next to them, and the demands of following instructions and possibly having attention drawn to the child during a circle time activity. Prior to circle time, have the child engage in heavy hard work activity.

Ideas to help:

Provide a fidget toy, use a lap pad and weighted blanket or provide a chewy tube. Prior to circle time, have the child engage in heavy hard work activity (proprioception).

Have a designated space for a child to sit e.g. carpet square or hoop. Sit child at end of the line or front or back so they are not surrounded by other children.

- **Child appears switched off in lessons**

What could this mean?

Child may have low levels of alertness at various times of the day impacting on his/her ability to focus during classroom activities.

Ideas to help:

Introduce sensory diet to increase levels of alertness. Teach child (where appropriate) levels of alertness and ways to change their engine level independently. See sensory diet section on page 30 and alertness section on page 25.

- **Child puts non food objects in their mouth frequently**

What could this mean?

Child is seeking extra sensory input through their mouth. This could be a strategy used to help them self regulate or manage anxieties in the classroom.

Ideas to help:

Encourage regular crunchy snacks throughout the day.

Allow child to chew on more appropriate items e.g. chewy chews, chewelry, chewy gems, chewing gum.

Complete oral motor activities such as blowing (bubbles, whistles, harmonicas) and sucking as part of a sensory diet. See oral motor section on page 22.

Example sheet for recording what has been tried and whether it was useful

Record of Strategies Tried and Progress

(To be completed by the staff member working with the child)

Please also attach a copy of your sensory diet that has been used in school, ensuring it details activities used, times and duration.

Pupils Name _____ Class _____

TA's Name _____ Hours per week _____

Date	Activity / strategy	Areas targeted within sensory system	Summary	Staff
Daily 7-21 Sept	<i>X engages in Oral Motor games 5-10 min per day Provision of chewy pencil topper</i>	<i>Reduce oral motor seeking behaviour</i>	<i>Continues to mouth pencil topper during classroom activity Reduced incidences of mouthing other objects Unable to blow consistently / grade force</i>	ST
Daily 7-21 Sept	<i>X engages in 5min proprioceptive activity before school, at break, at lunch and before end of school Use move 'n' sit cushion</i>	<i>Increase body awareness and force grading Reduced fidgeting Manage arousal levels</i>	<i>X is now able to sit nicely and listen to teacher during carpet time using move 'n' sit cushion X is now able to throw a ball back and forth with appropriate force grading</i>	ST
Daily 7-21 Sept	<i>Movement breaks added into daily routine Participated in gross motor group with proprioceptive activities twice a week for 30min wearing 0.5kg leg weights</i>	<i>Manage arousal levels</i>	<i>X is able to concentrate for 5 min but struggles with longer pieces of work or in a multi sensory environment</i>	
Daily 21 Sept onwards	<i>Access to quiet environment to complete targeted work or when over stimulated</i>	<i>Manage arousal levels</i>	<i>X accessed quiet room 3 times from 21sept – 21st Oct when over stimulated but needed adult direction to initiate. Completed oral motor strategies in quiet place to reduce over stimulation to good effect.</i>	

Sensory Processing Dysfunction: Record of Strategies Tried and Progress

(To be completed by the staff member working with the child)

Please also attach a copy of your sensory diet that has been used in school, ensuring it details activities used, times and duration.

Pupils Name _____

Class_____

TA's Name _____

Hours per week_____

[illegible]

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Wibarger, P. (1984). Planning an adequate sensory diet: application of sensory processing theory during the first year of life. Zero to three, 5(1).

Further information and details about equipment suggested

The suppliers listed are only examples if you Google the name of the piece of equipment alternative suppliers can be found and many of the items can be found on Amazon.

Equipment/ Information

Places to buy

Move n' Sit and Wobble Cushions		www.backinaction.co.uk/move-n-sit fledglings.org.uk/docs/pdf/brochure
Theraputty		www.sensoryplus.co.uk www.nrs-uk.co.uk fledglings.org.uk/docs/pdf/brochure
Theratubing		www.thera-bands.co.uk www.rompa.com
Theraband		www.thera-bands.co.uk www.thera-bands.co.uk

Chewy tubes / toys 	www.sensorydirect.com fledglings.org.uk/docs/pdf/brochure
Leg weights 	www.sensorydirect.com
Lap pads / wheat bags 	www.resourcesforautism.org.uk
Weighted vest (no more than 10 % of child's body weight) 	www.resourcesforautism.org.uk www.sensorydirect.com www.rompa.com
Fidget toys 	fledglings.org.uk/docs/pdf/brochure www.sensorydirect.com
Dycem 	www.dycem.com www.nrs-uk.co.uk

Suggested Further Reading

Out of Sync Child

Carol Stock Kranowitz

Out of Sync Child has fun

Carol Stock Kranowitz

Understanding your child's sensory signals

Angie Voss

Your Essential Guide to Understanding Sensory Processing Disorder

Angie Voss