



# Sensory Systems Overview

**Sensory Integration:** The ability to take in information from all our sensory systems and effectively utilize it to respond to task & environmental demands.

| Sensory System                      | Definition   | Typical Responses  | Sensory Under-Responsive  | Sensory Over-Responsive ("Avoiders")  | Sensory Seeker/Craver  | Strategies to Help   |
|-------------------------------------|--|--|---|---|--|--|
| <b>Hearing</b><br><i>(Auditory)</i> | <ul style="list-style-type: none"> <li>All sounds that enter our ears</li> <li>What we hear</li> </ul>   | <ul style="list-style-type: none"> <li>Notices a siren</li> <li>Turns head toward a voice</li> <li>Not distracted by background environmental noise (a/c; fan)</li> <li>Imitates sounds</li> </ul> | <ul style="list-style-type: none"> <li>Does not respond to name</li> <li>Does not turn toward sound even if hearing tests are positive</li> <li>Delayed response to noises, verbal requests</li> </ul>                        | <ul style="list-style-type: none"> <li>Covers ears, hides, or startles easily with noise (usually worse with unpredictable)</li> <li>Frequently distracted by environmental noises</li> <li>May scream, talk to self to try to "block" disturbing noises</li> </ul>                                       | <ul style="list-style-type: none"> <li>Prefers music with very loud volume</li> <li>Uses loud voice, makes noisy sounds</li> <li>Enjoys &amp; repeats loud noises (toilet flushing, water running)</li> <li>Holds musical toys, instruments next to ear</li> </ul> | <ul style="list-style-type: none"> <li>Minimize echo with floor rugs.</li> <li>Forewarn about upcoming loud noises when possible (bell, fire alarm).</li> <li>Use "secret signal" to notify child if using loud voice volume.</li> <li>Give concrete, concise directions.</li> <li>Provide directions in multiple ways (verbal, demonstrate steps, have finished sample available).</li> </ul>   |
| <b>Sight</b><br><i>(Visual)</i>     | <ul style="list-style-type: none"> <li>All info we take in with our eyes</li> <li>What we see</li> </ul> | <ul style="list-style-type: none"> <li>Interested in looking at faces (peers, family), toys</li> <li>Closely examines novel objects</li> <li>Notices distant objects (signs, airplane)</li> </ul>  | <ul style="list-style-type: none"> <li>Appears not to notice objects in environment</li> <li>May tilt head when examining items</li> <li>May not recognize self in mirror</li> <li>May trip over new items in path</li> </ul> | <ul style="list-style-type: none"> <li>Squints, rubs eyes</li> <li>Gets upset by bright/sun light</li> <li>Refuses to play with light-up or flashing toys</li> <li>Avoids looking at picture books</li> <li>Avoids eye contact</li> <li>Motion sickness w/intense visual experience (3D movie)</li> </ul> | <ul style="list-style-type: none"> <li>Stares at bright or flashing lights</li> <li>Stares at fingers or objects moving in front of eyes</li> <li>Moves/shakes head while drawing</li> <li>Holds items very close to eyes</li> </ul>                               | <ul style="list-style-type: none"> <li>Make eye contact before giving directions, stating requests.</li> <li>Suggest sunglasses on playground.</li> <li>Limit amount of art projects, posters on walls in area.</li> <li>Curate #/type of toys seen in classroom - use closed cabinets or sheet/fabric to cover open shelves for extra materials.</li> <li>Position child near teacher to facilitate child's ability to visually focus on task (i.e. Story Time).</li> </ul> |

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| <b>Touch</b><br><b>(Tactile)</b>   | <ul style="list-style-type: none"> <li>• What we take in through our skin</li> <li>• Helps us identify touch, texture, temperature, pressure.</li> </ul>                              | <ul style="list-style-type: none"> <li>• Enjoys hugs and physical contact with others</li> <li>• Plays with paint, sand, glue</li> <li>• Enjoys baths and water play</li> <li>• Walks barefoot in grass</li> <li>• Likes "touch and feel" books</li> </ul> | <ul style="list-style-type: none"> <li>• No response to change in temperature (cold floor, hot heater)</li> <li>• Unaware of messy face/body or clothing -&gt; may affect potty training</li> <li>• Constantly touches objects; hand trails on wall</li> <li>• Seeks out intense touch experiences (dryer vibration, sandpaper)</li> </ul> | <ul style="list-style-type: none"> <li>• Resists hugs or cringes when touched lightly</li> <li>• Bothered by tags, socks; insists on specific clothing choices/textures</li> <li>• Plays away from peers to avoid contact</li> <li>• Struggles with messy or grooming tasks (paint, glue, wash hands, wipe nose)</li> </ul> | <ul style="list-style-type: none"> <li>• Sticks with "messy" (paint, mud, glue) tasks longer than typical</li> <li>• "Fidgets" with textured items constantly, including picking skin, hair</li> </ul> | <ul style="list-style-type: none"> <li>• Encourage child to look in mirror to observe messy face/body.</li> <li>• Strategic positioning: assign spot/job at end of line, head of table; assign cubby at end of row to minimize unexpected touch of being bumped by classmates.</li> <li>• Explain task, have child watch peers 1<sup>st</sup>, use tools (brushes, cookie cutters) instead of fingerpaint for art projects.</li> <li>• Have a washcloth ready to rub hands before and after intense tactile experiences.</li> <li>• Provide alternate fidgets.</li> </ul> |
| <b>Taste</b><br><b>(Gustatory)</b> | <ul style="list-style-type: none"> <li>• What we take into our mouth</li> <li>• Allows us to enjoy food; experience spicy, salty, sour</li> <li>• Protective function, too</li> </ul> | <ul style="list-style-type: none"> <li>• Enjoys a variety of foods</li> <li>• Babies explore toys with mouth, tongue</li> <li>• Makes a face in response to strong flavors but willing to try novel tastes</li> </ul>                                      | <ul style="list-style-type: none"> <li>• Prefers strong flavors (suck on lemons, pickles)</li> <li>• Mouths/sucks on non-food objects (clothes, toys) beyond expected 4-7 month age</li> </ul>   | <ul style="list-style-type: none"> <li>• Diet limited to specific food tastes (sweet fruit, salty chips)</li> <li>• Refuses to try new food</li> <li>• Intense reactions and behaviors re: food</li> </ul>  | <ul style="list-style-type: none"> <li>• Prefers very spicy, hot, cold foods</li> <li>• Consistent mouthing of items persists beyond typical age</li> </ul>  | <ul style="list-style-type: none"> <li>• Play with whistles, blow paints, bubbles.</li> <li>• Offer alternate oral input: water bottle, chewable necklaces.</li> <li>• Introduce new tastes repeatedly and praise small steps (i.e. licking new food) - novel snacks, "playing" with food.</li> <li>• Chewing gum can be very helpful to help with regulation as it provides proprioceptive input (see below).</li> </ul>   |

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| <b>Smell</b><br><i>(Olfactory)</i>                 | <ul style="list-style-type: none"> <li>• What we take in from our nose</li> <li>• Helps create emotions, activates emotions</li> </ul>  | <ul style="list-style-type: none"> <li>• Enjoys a variety of smells</li> <li>• Responds to smell with smile or crinkled nose</li> </ul>   | <ul style="list-style-type: none"> <li>• Does not respond to even intense smells</li> <li>• Can not discriminate between different smells</li> </ul>  | <ul style="list-style-type: none"> <li>• Becomes upset/sick by smells</li> </ul>   | <ul style="list-style-type: none"> <li>• Sniffs everything before using → can interfere with play like mouthing</li> </ul>   | <ul style="list-style-type: none"> <li>• Practice smelling new aromas and gradually increase intensity of smell.</li> </ul>   |
| <b>Vestibular</b><br><i>(Movement and Balance)</i> | <ul style="list-style-type: none"> <li>• Located in inner ear</li> <li>• Responds to changes in head position, movement</li> <li>• Coordinates movement, helps balance, makes muscles work</li> <li>• Supports interplay between eye movement, balance, and coordination</li> <li>• Affects emotional regulation</li> </ul> | <ul style="list-style-type: none"> <li>• Enjoys swings, hanging upside down, somersaults</li> <li>• Can negotiate around or step over obstacles in path or uneven surfaces</li> <li>• Strong muscles support play, movement experiences in park</li> <li>• Able to sit upright at school with good posture</li> </ul> | <ul style="list-style-type: none"> <li>• "Clumsy" – uncoordinated, slow movement; trips and/or lose balance often</li> <li>• Muscles seem weak (lies down when playing, hard to hold a crayon)</li> <li>• Tires easily</li> </ul> | <ul style="list-style-type: none"> <li>• Dislikes/avoids movement experiences like playground or gymnastics class</li> <li>• Fearful of swings, slides</li> <li>• Motion/car sickness – physical responses such as: nausea; headache; sweating/clamminess; turning pale/blushing</li> <li>• Afraid of heights, riding bikes</li> </ul> | <ul style="list-style-type: none"> <li>• Craves intense jumping, spinning, bouncing → risk taker with possibly poor safety awareness</li> <li>• Constantly moving</li> <li>• Not getting dizzy (past point when others would)</li> </ul> | <ul style="list-style-type: none"> <li>• At Circle Time, use "balcony seats," BackJack floor chairs, stools, or Disc 'o Sit cushions to help sit upright.</li> <li>• Improve core strength – animal movements, yoga.</li> <li>• Provide practice opportunities; offer alternatives when scared.</li> <li>• Follow child's lead regarding amount of spinning, rolling-&gt; Begin with gentle, predictable, straight, front-to-back movement before increasing intensity, unpredictability, rotation of movement. Allow them to feel in control of movement by offering choice of # of turns.</li> <li>• Provide frequent opportunities for movement breaks, especially those that provide proprioceptive input (see below) and ideally before seated tasks.</li> </ul> |

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| <b>Proprioception</b><br><b>(Body Position)</b> | <ul style="list-style-type: none"> <li>• Located in muscles and joints</li> <li>• Responds to movement</li> <li>• Foundation of body awareness</li> </ul> | <ul style="list-style-type: none"> <li>• Explores "heavy work" movement experiences as play (climbing, jumping)</li> <li>• Moves around room without bumping into obstacles</li> <li>• Adjusts amount of pressure/force for tasks (throw ball hard and fast; pet a cat gently and slowly)</li> </ul> | <ul style="list-style-type: none"> <li>• Messy eater</li> <li>• "Clumsy" – drops items, bumps into things, breaks toys</li> <li>• Plays "rough" with friends</li> <li>• Stomps feet when walking</li> </ul> | <ul style="list-style-type: none"> <li>• Doesn't enjoy climbing, jumping</li> <li>• Poor endurance; fatigues easily</li> <li>• Bodies seem tense or stiff</li> <li>• Prefers to remain sedentary</li> </ul> | <ul style="list-style-type: none"> <li>• Enjoys crashing into walls, people, objects – may seem aggressive</li> <li>• Chew on non-food objects (shirt collar, sleeve, hair), bite nails, suck on fingers</li> <li>• Adores "bear hugs"</li> <li>• Unaware of "personal space" boundaries</li> </ul> | <ul style="list-style-type: none"> <li>• Provide "heavy work" opportunities to help give the body more info about where it is in space (i.e. animal walks; wall/chair push-ups; hang from bar; jobs to move heavy chairs/books; crunchy/chewy foods; resistive materials like clay and Legos).</li> <li>• Use "sitting spots," walk holding hula hoops to delineate body space and reduce bumping.</li> <li>• Give gentle shoulder squeezes, back rubs to provide input and help with attention.</li> <li>• Incorporate a variety of movement experiences into curriculum to practice adjusting amount of force (i.e. how hard to throw/kick).</li> </ul> |

**End-Products of Effective Sensory Processing**, from Sensory Integration and the Child by A. Jean Ayres, Ph.D.

*Auditory + Vestibular* = Speech and Language

*Vestibular + Proprioception* = Posture, Balance, Muscle Tone, Eye Movements

*Vestibular + Proprioception + Tactile* = Body Awareness, Coordination, Motor Planning, Attention Span, Emotional Regulation

*All Systems* = Concentration, Organization, Self-Control, Self-Esteem