Sensory Spaces

Design guidelines for the spatial and perceptual needs of individuals with autism

SAULT STE.MARIE

Table of Contents

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Autism Spectrum Disorder

Autism Spectrum Disorder (ASD) is a neuro-developmental disorder that affects communication, behavior, interests and activities. These issues can cause significant impairment in social, occupational and other areas of functioning.

People on the spectrum may experience difficulties processing everyday sensory information. Autism's sensory issues can involve hyper-sensitivity (over-reactive and often prone to sensory overload) and hypo-sensitivity (under-reactive and sensory seeking) to sensory input. Sensory perceptions can become frightening or even painful leading to high anxiety.

Autism and Design

This guideline provides a brief summary of how interior spaces can pose significant challenges for individuals with ASD due to sensory activities.

Modifications of the environment is the most accessible intervention for sensory processing difficulties. Design considerations are recommended to help make spaces more welcoming and accommodating, while at the same time build tolerance as well as independence.

It should be recognized that each individual has their own unique set of challenges and abilities. There is no "one size fits all" solution. What can be helpful for some people could be harmful for others.

Auditory

The buzzing of artificial light, humming of the air conditioner, and the constant ticking of a clock are some examples of every-day sounds that go unnoticed by the average person, but for many with ASD, particularly among hyper-sensitive individuals, these can be a source of distraction, pain and even panic. Sound is the most common sensory deficiency for those diagnosed with ASD.

In contrast, other individuals exhibit signs of hearing loss due to their inability to register noise and sounds. It is not atypical for such individuals to engage in "sensory seeking" behaviours.

All users of a space can benefit from noise reduction. Minimizing background noise, echo and reverberation is critical. Providing visual supports and reducing unwanted noise also helps to establish a more accommodating environment.

- HVAC systems and ductwork that is specifically designed to generate minimal noise is recommended.

- Hard surfaces on walls, floors and ceilings should be minimized to reduce the amount of sound reflection. Sound absorbing finishes, such as spray-on acoustic insulation, baffles, wall panels, carpets and rubber cushioned floors are appropriate materials that can reduce the amount of hard surfaces.

- Doors, partitions, walls and floors with acoustical performance standards should be used.

- As a general rule, the quantity of sound absorbing material to use should be about the same as the floor area of the room.

- Fluorescent lighting can emit noise and should therefore be minimized in use. Natural lighting is recommended.

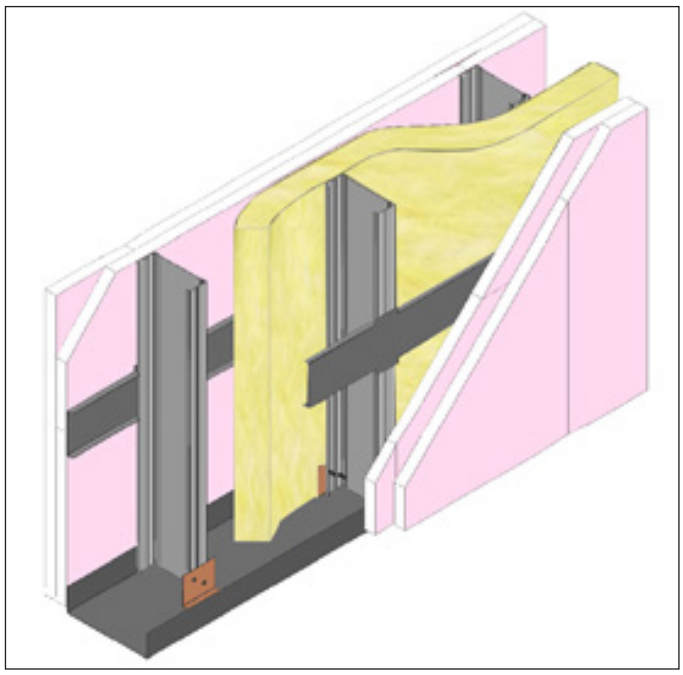
Ceiling baffles and acoustical tiles reduce the level of airborne sound.

Soft materials mounted on the feet of tables and chairs can reduce moving noise.

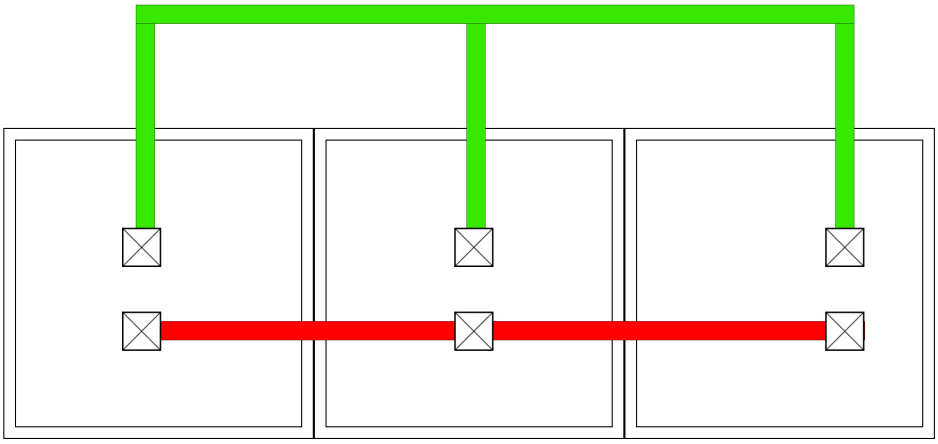
- Wayfinding methods such as signage, graphics and other visuals are effective support tools for those with hearing and communication difficulties.

- Cabinets and toilets with a “soft close” hinge prevent unwanted noises when slammed closed.

Signage is an effective communication tool.



Interior walls can be made from additional rows of studs and layers of drywall sheets, and fitted with a sound board or insulation.



HVAC design plays an important role in sound mitigation. Ductwork can transmit noise from room to room (red diagram) if designed without any buffer space. A better designed HVAC system (green diagram) connects to a central conduit in a different space, such as a hallway, where noise can be dissipated. Thick duct liners can also insulate noise.

Sight

Strategies to accommodate those with sight-sensory challenges can be addressed by using modified lighting, colour and space organization.

Excessive focus on even the most minor of details to seemingly having a visual impairment are common examples of what those with ASD can experience.

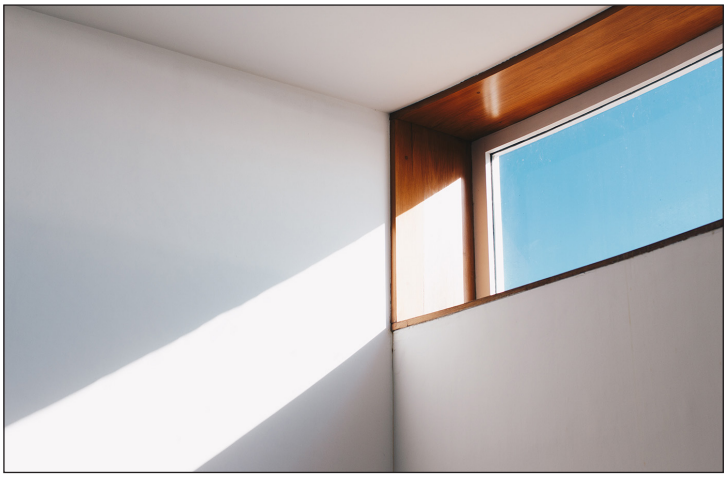
- The ability to control the intensity of light is critical. Window blinds and tints, glazing size and light bulb dimming are examples of how light can be controlled.

- Natural lighting is the more comfortable light source; however, a balance of natural and artificial lighting is recommended.

- Applying window tinting, installing draperies or blinds and incorporating clerestory windows are examples of how light intensity and outdoor visual distraction can be controlled. The solar orientation of interior spaces should also be considered as a means to reduce glare.

- Dimmable LED light fixtures, uplighters, diffusers and coloured filters are examples of illumination that increase comfort. Fluorescent lights should be avoided as they are a harsher form of light that can flicker and emit noise.

Indirect and diffused lighting provide a softer, more comfortable form of illumination.



Clerestory windows - the use of these windows above eye level, create environments that are open and bright. These can block exterior noise and distractions, as well as reduce the amount of excessive glare and allow a more ambient light instead.

- Frosted glass windows, matte surfaces (e.g. matte paint, carpet and fabric-based wall coverings) can reduce glare and reflection.

- Clutter should be avoided as it can be distracting and overwhelming for some. Ample storage space should be provided to help mitigate cluttered spaces.

- Walls and visual partitions should be used to minimize distractions.

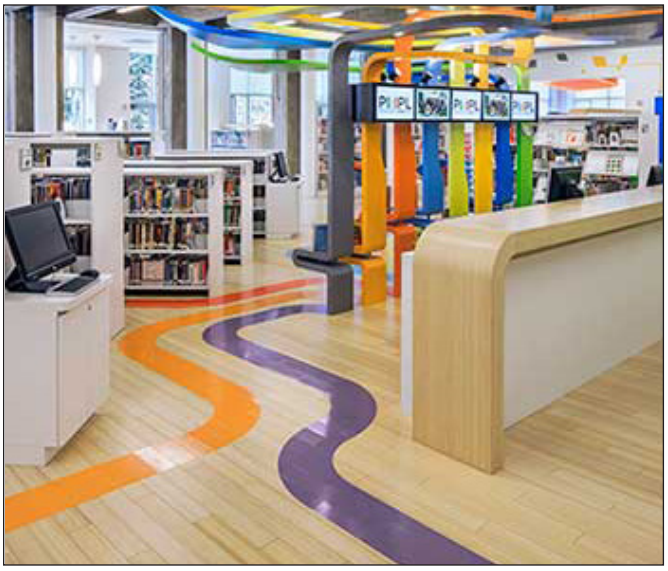
- Smaller rooms are easier to spatially process than for larger rooms.

The impact of colour goes beyond aesthetics. Studies have suggested a link between colour and the physical and mental state of ASD individuals. Bright colours, bold patterns, or too many colours can potentially create a discomforting environment for many, as they see colour with greater intensity.

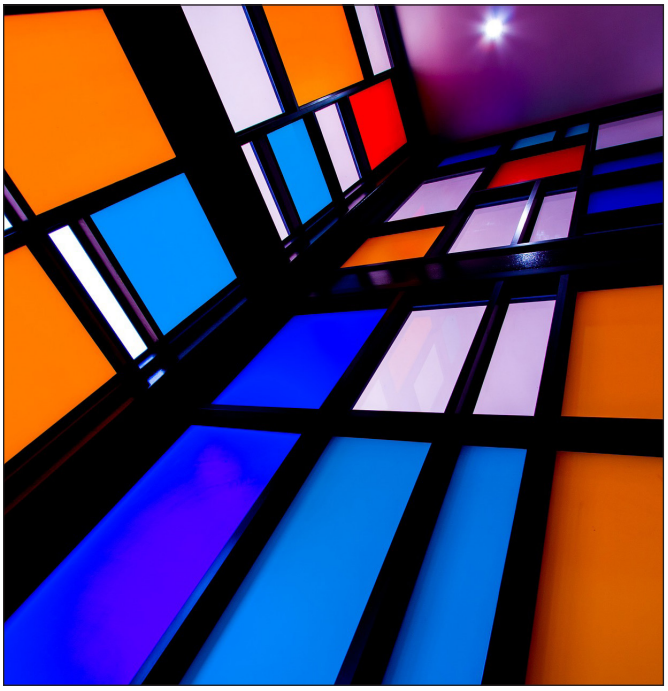
- Light, warm and neutral colours are appropriate choices. Subdued greens, blues and pinks have been found to provide a peaceful and soothing atmosphere. Reds are perceived as over-stimulating and “loud”, hence should be avoided.

- Minimizing contrast and colour mixtures is recommended. Patterns should be avoided.

- Be aware of the influences that light can have on colour perception.



Coloured markings and colour coding can be used as a wayfinding and organizational strategies.



Bright colours and bold patterns can cause discomfort for those with hyper-sensitive sight sensory deficiencies.

Tactile

Tactile sensory disorder is the second most common ASD deficiency. Some will shun touch altogether while others will seek extra pressure for affective touch or for the feel of calm and safety.

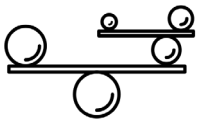
A sense of personal space, as well as opportunities for physical feedback should be made available.

- Private spaces and wider corridors should be used to provide personal space and enable users to acclimatize to their surroundings and to transition throughout the environment with minimal contact.
- Opportunities for positive sensory feedback should be integrated throughout the environment. Sensory walls is one such example.
- Upholstered and high-back chairs in an angled seating arrangement can make individuals feel protected and more comfortable.
- Be wary of those who seek touch for sensory input. They may inadvertently cause physical harm to themselves or others. Fittings to protect from hot water exposure and to reduce sharp edges and corners are recommended.

Sensory walls that give tactile, visual and auditory input provide an opportunity for rich sensory exploration

Hands-on activities stimulate the senses and can engage individuals in their activities.

Ball pits, which can provide pressure sensations, can be integrated into play areas.



Body Awareness and Balance

Alongside the recognized five senses (touch, taste, smell, sound and sight), body awareness and balance, often referred to as the sixth and seventh sense, enable a person to perceive their physical position and movement in space. Balance, body awareness, momentum, force and motor skills are all influenced by these two senses.

Deficiency can result in clumsiness, a tendency to fall, difficulty manipulating small objects such as buttons and resistance to new motor movement activities. One's self-esteem is also likely to be impacted.

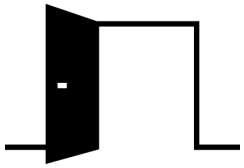
Situations that require motor skills and sequencing, such as playing sports or even walking up the stairs, may pose a source of discomfort for hyper-sensitive individuals.

Hypo-reactive individuals enjoy moving around and tend to have frequent bursts of energy.

- Position furniture around the edge of the room to help with navigation.
- Different flooring materials should be used as a wayfinding method as well as to help indicate boundaries in a space.
- Stations to practice gross motor skills should be available for hyper-sensitive individuals.
- Opportunities for individuals to exert physical energy, especially for those who are hypo-sensitive can help reduce stress and gain clarity of their surroundings.

Surfaces should be flush with one another. When steps are required, they should be colour-differentiated and properly illuminated. Essential rooms should be on main floor.

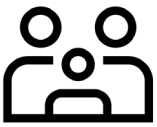
Swings and hammocks can help manage the need for movement, especially for hypo-sensitive individuals.



Respite Rooms

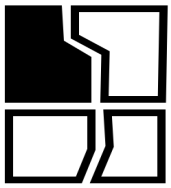
Respite rooms are spaces that offer calmer places for the brain to rest. The objective of such spaces is to provide respite to individuals with ASD, who can become overstimulated and distressed as a result of their environment. The space could be a small partitioned area that would provide a neutral sensory environment, and containing various items close at hand for individuals choosing to activate their senses. Examples of items could include cushions of various textures, brushes, sand paper, blankets, fiber optic lights, exercise balls, rocking chairs aromatherapy oils, and headphones to listen to music or block noise. Cushioned seating and phone chargers are simple items that could further benefit users of the space.

Respite rooms should be easily identifiable with colour, moldings, or other techniques.



Family-Friendly Facilities

Change rooms and washrooms separated by gender do not facilitate an optimal environment of safety and supervision. This becomes apparent when a care companion is of a different gender. Unisex or single-user change areas and washrooms are more appropriate facilities that offer greater accessibility.



Sensory Zoning and Sequencing

Sensory zoning is the grouping of spaces based on sensory stimulation. It is a space planning strategy to help those with ASD better understand their environment since they tend to organize their surroundings with their senses. Areas of physical activity and high stimulation, such as gymnasiums, music rooms and eating areas should be grouped together and away from low stimulation areas, such as study spaces.

Transition zones between sensory areas should be incorporated to help recalibrate the user's senses.

Spatial sequencing refers to the organization of space based on their scheduled use, and it facilitates a seamless flow of movement from one space to the next. Spatial sequencing enforces routine and predictability, key features that can benefit those on the spectrum. Wayfinding tools can assist with an effective sequencing strategy.

Outdoor Spaces

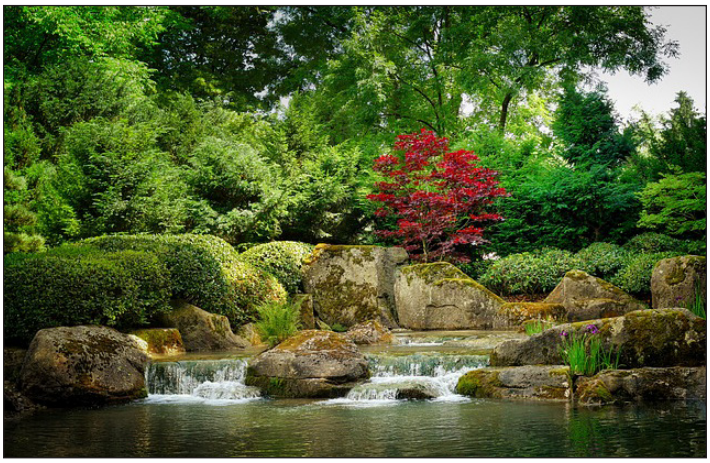
A few simple design considerations can significantly improve the sensory experience of outdoor spaces. Pathways, gardens, playing and seating areas and covered porches are examples of outdoor spaces that can provide relaxation, respite and restoration, social gatherings of various sizes, and sensory therapy activities. Interior design considerations can be applied to the outdoors.

- A wide range of activities utilizing varying degrees of physical contact, exertion, and motor skills should be incorporated throughout the area.

- Sidewalks and pathways should be wide enough to accommodate three adults side by side. A mid-level barrier should be placed between a walkable pathway and a road. These enhancements can lessen the effects of crowding, traffic and other street distractions, as well as provide added safety for those with motor impairment.

- Crowds, noise, brightness, changes in weather, and other unpredictable events can be over-stimulating for some. Retreat spaces should be integrated throughout the outdoors. These spaces should be quiet, shaded, partially concealed and should blend in with the general environment.

Landscape features, such as rocks and trees, can provide a sense of enclosure and safety within the larger outdoor environment.



Interaction with nature, and even views of nature from within a building can help behaviors, encourage learning, and improve the sense of well-being.

- Wayfinding signage and other picture symbols can increase accessibility, safety, spatial orientation, and inform outdoor explorers of what to expect next. Identification of respite area locations, pedestrian and vehicular paths of travel in parking lots, pick-up and drop-off points, and illustrations of the organizational structure of the outdoor area are all effective applications.

- Environmental materials should be receptive to the various sensitivities of ASD individuals. For example, plants should be non-toxic and safe for children. Concrete or rubber paving should produce minimal glare and be smooth enough to prevent vibrations when mobility-aids are used.

- There should be adequate outdoor visibility to ensure child safety through supervision. View corridors can also be established from an observation point within a building.

Vibration exposure is an uncomfortable experience for all. ASD individuals who require the assistance of a mobility aid are further susceptible to discomfort due to sensory disorders.

- Individual and group seating areas should be strategically placed to accommodate a variety of social gatherings as well as to allow one to take a break and process the environment before continuing on the outdoor adventure.

Signage and landmarks are an effective precautionary tool that improves safety for all.