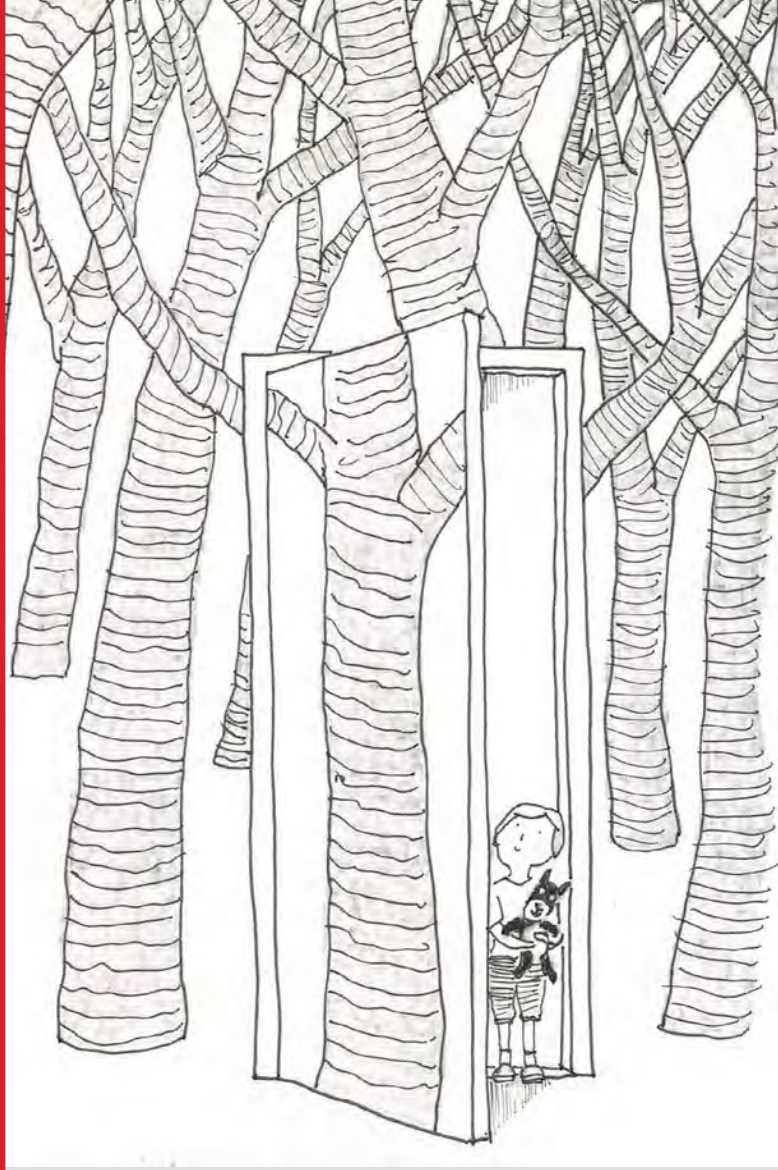
# Design across the Spectrum:

## PLAY SPACES



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Mary Brake, Autism Consultant from the Department of Education, was pivotal in providing expert guidance throughout the research project and feedback on final drafts.

The team would also like to thank Riverside Primary School, Launceston, Tasmania for providing the opportunity to refine and pilot the design guidelines in a real life design project.

This project facilitated an inspiring interdisciplinary sharing of knowledge that brought together architecture and the needs of the individual with Autism Spectrum Disorder (ASD). The collaboration has resulted in the production of a collection of insightful principles that can be applied to any situation - simply or elaborately.

The needs of individuals with autism and inherent challenges are in the main very invisible and unrecognised. As a result individuals with an ASD are very limited in the number of environments that they are able to access.
Design that is aware and considers these needs is groundbreaking and application of it is sure to open up greater life possibilities for individuals with an ASD. This work offers an invaluable resource to anyone thinking about these individuals, the spaces they currently occupy and increasing these possibilities and life's potentials!

Mary Brake
Autism Consultant
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# INTRODUCTION

## Inclusive design

Inclusive design is a fundamental aspiration in the design of the built environment in considering and accommodating the full breadth of human diversity and difference. Yet, the built environment continues to present barriers to inclusion for many people whose differences are not explicitly or commonly recognised in legislative frameworks or design guidelines.

For people with Autism Spectrum Disorder (ASD) the barriers to inclusion are both pervasive and invisible. ASD is a lifelong neurodevelopmental disorder characterised by difficulties in social communication and interaction and restricted or repetitive patterns of behaviour and interests [1]. ASD can also be understood as a different way of being in the world where sensory experience, cognitive processing and perception, social needs and interests diverge from neurotypical expectations [2]. Seen from this perspective, rather than the more narrowly defined diagnostic criteria, rethinking design to encompass a broader spectrum of sensory, cognitive and social difference offers opportunities in fostering social inclusion and enhancing wellbeing [3,4, 5, 6].

These design guidelines have been developed to inspire more inclusive design of



playgrounds. Much progress has been made to meet the needs of children with ASD within the classroom setting, including the design of the built environment [7, 8, 9]. However, break or 'play' times can be one of the most challenging situations for children with ASD. Not only does the physical environment present particular difficulties in relation to sensory and cognitive differences, but the emphasis on social interaction and unstructured play presents compounding problems [10].

## Autism and Play

Play is important for social, physical and cognitive development for all children. For children with ASD, the opportunity to participate in play in a shared environment with peers is vital for the development of future life skills [11].

There are many different types of play including social play, active play and cognitive play. Social play differs in levels of social engagement extending from solitary play, to parallel play, to interactive play. Active play involves physical activity and is important for development of motor skills as well as broader health benefits. Cognitive play includes imaginative play as well as games with rules[1]. More complex forms of cognitive play, such as dramatic play, are important for the development of abstract thinking skills.

[1] There is some contention over whether 'games with rules' can or should be defined as 'play' – see for example Smith, P.K. (2010) 'Chapter 1: An Introduction to Play' in Children and Play: Understanding children's worlds.

In the early years, both children with ASD and neurotypical children are more likely to be engaged in solitary and parallel play. As they grow older, and social and cognitive skills develop, neurotypical children begin to engage more in group and cognitive play; however, the developmental differences in children with ASD make it difficult for them to engage in these more social and cognitive forms of play[12]. Appropriate design of play spaces can assist children with ASD in engaging in different forms of play, as well as supporting their wellbeing more broadly [13,14,15].

## The design guidelines

These design guidelines have been developed through an extensive review of literature on autism and design and through consultation with autism and education specialists.

While the guidelines focus on the needs of children with ASD, their intent is to provide inclusive design strategies for all children across a broader spectrum of diversity. Specifically, the guidelines have been developed for the design of playgrounds in mainstream primary school settings, although many of the principles could be adapted and applied in other contexts, such as autism specific schools, public playgrounds and for children of different ages.

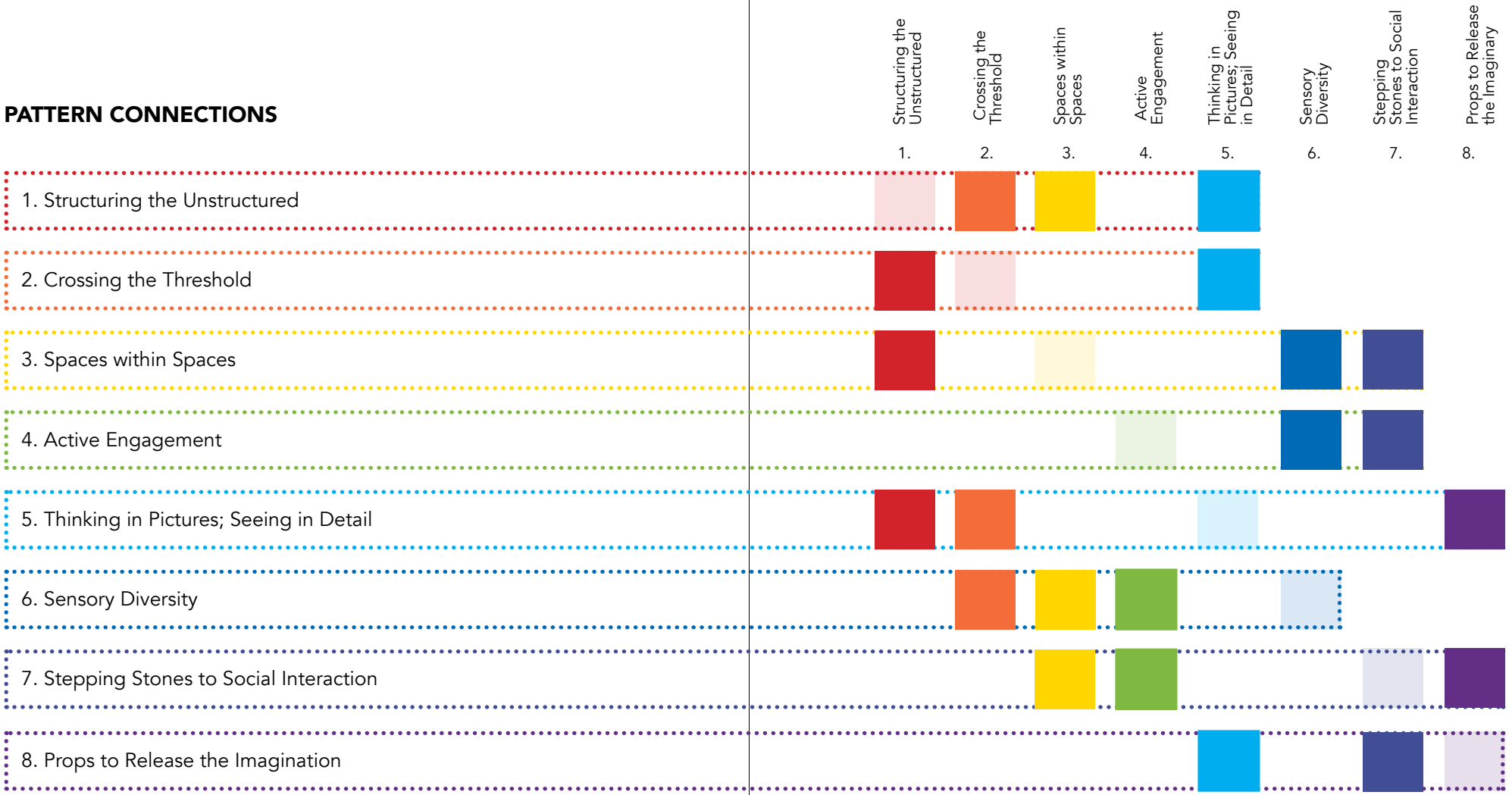
[2] The framework for the design guidelines is inspired by Alexander, C. Ishikawa, S. & Silverstein, M. (1977) 'A Pattern Language: Towns, Buildings, Construction', New York: Oxford University Press.



The design guidelines are structured as a series of eight 'patterns'[2] to provide a language to inspire opportunities for more inclusive design of playgrounds. Each pattern contains an image and a description of the overarching theme, followed by a series of design strategies. The patterns are inter-related and links to other key patterns are identified.

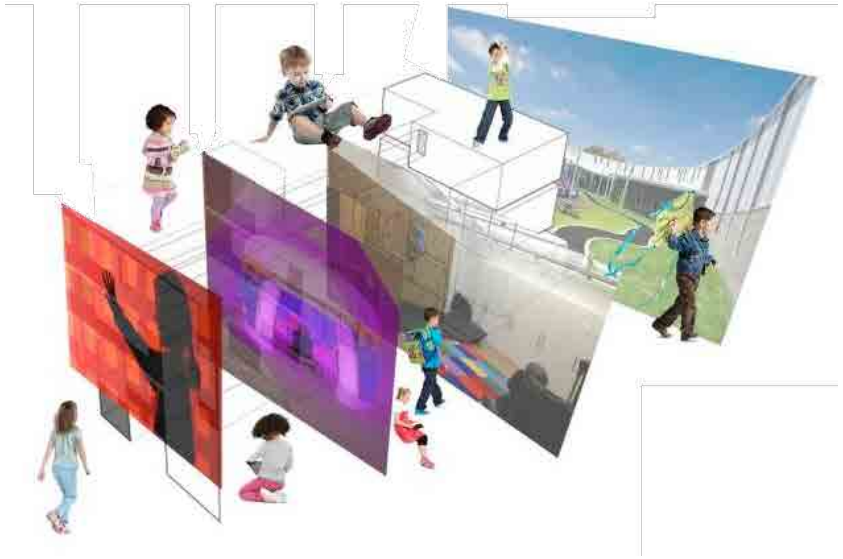
## PATTERN OVERVIEW

## PATTERN CONNECTIONS



# THE PATTERNS

# 1.
# STRUCTURING THE UNSTRUCTURED





Children with ASD can struggle with organising and making sense of space. Difficulties in imagining and anticipating situations can result in a heightened need for predictability.

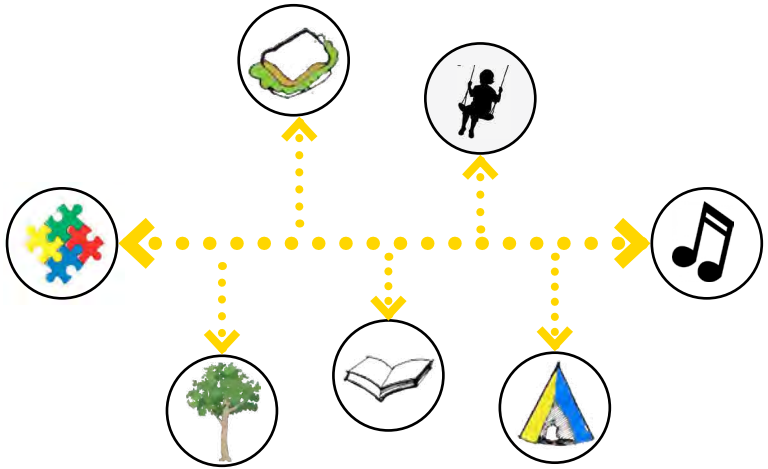
Large expansive playgrounds can be overwhelming for children with ASD. They may struggle to decipher what they are seeing due to excessive visual stimuli, or become confused about where to go and what to do. The unstructured nature of play time is also challenging. Children with ASD benefit from knowing where they are in time as well as space, and need longer to adjust when moving between activities. In order for children with ASD to engage in unstructured play and to feel comfortable in the playground environment there needs to be structure, routine and order.

Related patterns

- Crossing the Threshold
- Spaces within Spaces
- Thinking in Pictures; Seeing in Detail

## **STRATEGY 1 -** ZONING

Break the overall playground into different spaces with clearly defined functions for eating, active play, quiet play, gardening, games, stories etc. Overall there will be many choices of spaces and activities to engage in, but on an individual level each area will be clear in its purpose allowing children to choose what they do during unstructured play time without becoming overwhelmed.





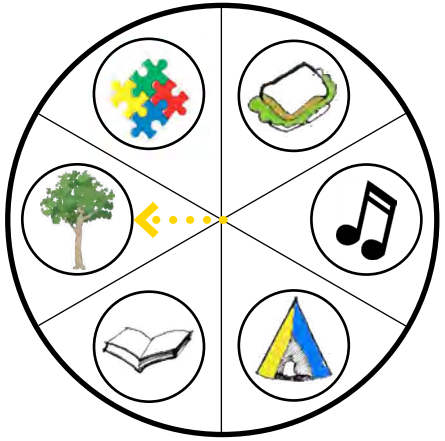
## **STRATEGY 2 -** VISUAL SCREENING

To facilitate focusing on the task at hand, use localised visual screening to separate zones of different activity. For areas used for multiple activities, use storage boxes, cupboards or screens to hide equipment that is currently not in use. By removing objects that are unnecessary to the task at hand, the amount of information and distraction for children with ASD is reduced.

Mouse and Cheese Fence by Hand Made Places  www.handmadeplaces.co.uk

## **STRATEGY 3 -** STRUCTURING TIME

Visual clocks can be used to signal how much time has passed and how much time is left before the next activity. This can enable children to prepare themselves in advance for the transition between 'play time' and 'class time'. Visual clocks can also be used to structure time and the progression of activities throughout longer play breaks, for example eating, active play, gardening etc.



# 2.
# CROSSING THE THRESHOLD



Coffey Architects, Inside Out House – doll's house connecting inside and outside play (Doll's House Project, Cathedral Group 2013)

http://coffeyarchitects.com/

Children with ASD prefer routine and order. Transitioning from one activity to another or from one space to another can present challenges. Children may become overwhelmed if transitions between spaces are too abrupt. This is particularly difficult in the transition between inside and outside and between 'class time' and 'play time'.

Transitions can also be difficult if boundaries are unclear as children with ASD need to be aware that a change is occurring and what that entails. They also need time to adjust to the change before moving between spaces and activities.

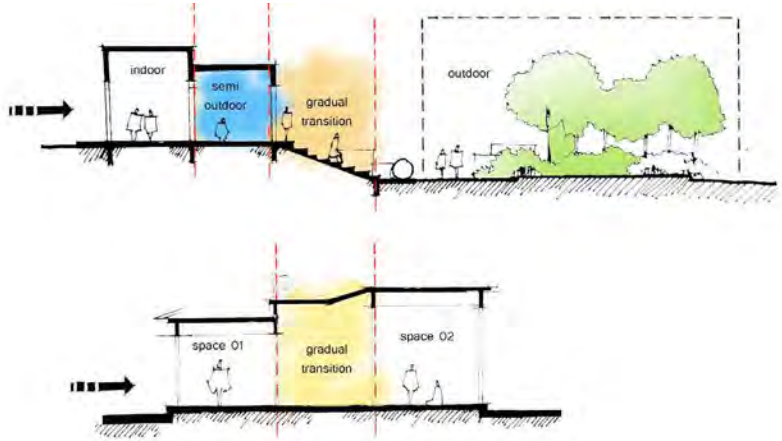


Related patterns:

- Structuring the unstructured
- Spaces within spaces
- Thinking in pictures; Seeing in detail
- Sensory diversity

## **STRATEGY 1 -** GRADUAL TRANSITIONS

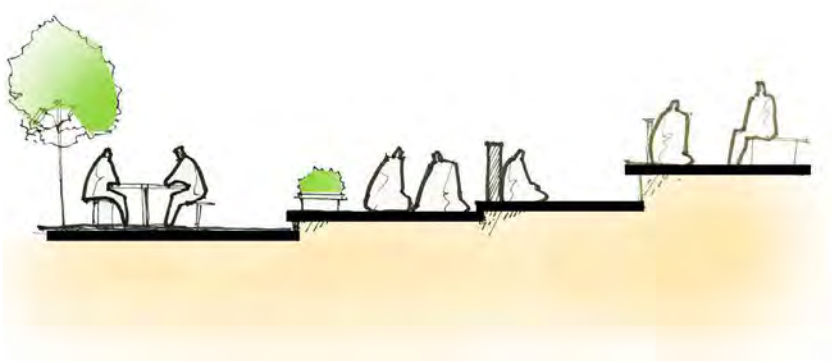
To prevent disorientation and sensory 'shocks', design transitions that create a gradual progression between spaces in relation to spatial, visual and other sensory stimuli. Particular care should be taken when designing the transition between inside and outside. This can include the use of sloping ceilings, walls that slowly reduce or increase in height, and battens that gradually adjust lighting levels. Consideration should also be given to movement between environmental conditions, particularly in relation to protection from wind and rain.






## **STRATEGY 2 -** CLEAR BOUNDARIES

There needs to be a balance between ensuring the transition between spaces is not too abrupt and creating clarity in identifying boundaries between different spaces and activities. Strategies to identify clear boundaries include the use of changes in levels, ground surface materials and colours.



## **STRATEGY 3 -** TRANSITION SPACE

Transition spaces between locations and activities can be useful in providing opportunities to pause between activities. Verandah spaces are particularly useful in preparing children with ASD for the transition between inside and outside and between ‘class time’ and ‘play time’. The spaces should provide opportunities to stop and sit away from heavy traffic movement in a low stimulus environment and offer opportunities for localised views into adjacent spaces.

# 3.
# SPACES WITHIN SPACES



Playgrounds are commonly large, open spaces with high stimulus activities and brightly coloured play equipment. For children with ASD the bombardment of sensory information can be extremely distressing. Furthermore, the expectations and demands of social interaction in school environments presents compounding challenges for children with ASD.

Children with ASD need spaces where they can moderate sensory stimulation to 'turn down the volume' and where they can make choices about the extent of social interaction with peers.

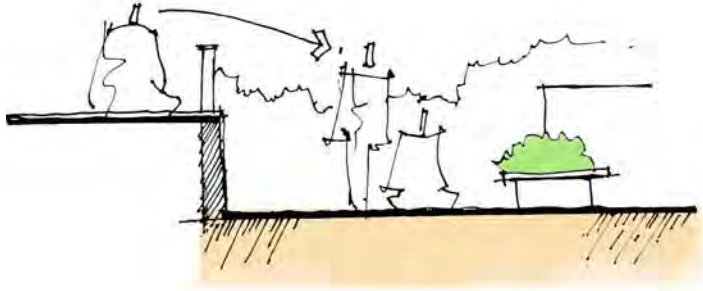
Related patterns:

- Structuring the unstructured
- Crossing the threshold
- Sensory diversity
- Stepping stones to social interaction

## **STRATEGY 1 -** PROSPECT AND REFUGE

There should be multiple opportunities for children to remain physically separate from, but visually connected to activities. This allows children to observe others and offers opportunities for passive social engagement without forcing social interaction. It also allows children an opportunity to get a sense of what is required or expected of them before engaging in different activities. Design opportunities include level separation and partial visual screening.

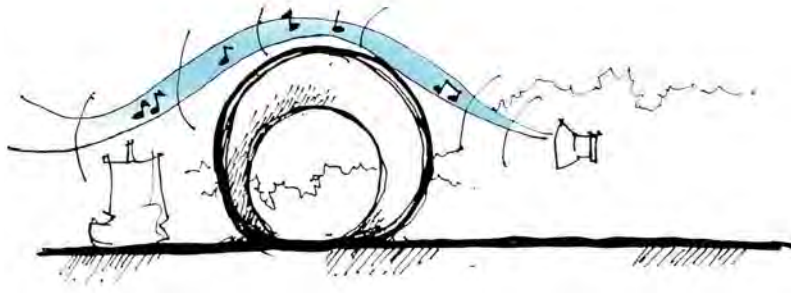




## **STRATEGY 2 -** TONES OF CONNECTIVITY

A variety of spaces should be provided that offer different levels and forms of sensory connectivity such as visually connected but acoustically muted, or acoustically connected but visually screened. Concrete pipes, earth mounds and vegetation offer opportunities for creating different levels of sensory connection. Where possible, retreat spaces should be provided where children can moderate sensory input themselves such as screens that can be opened to varying degrees.





## **STRATEGY 3 -** RETREAT SPACES

Some spaces should allow for retreat from multiple stimuli providing physical, acoustic and visual separation. The environment should be designed to be as calming as possible with neutral colours, soft light and materials and spaces that cocoon the child. Existing quiet retreat spaces in schools, such as gardens or spaces behind or between buildings where children with ASD may prefer to play, should be protected and identified as quiet retreat spaces. While these spaces should offer opportunities for separation from peers, consideration needs to be given to safety and the capacity for discrete observation by teachers.



Willow Dome by Hand Made Places www.handmadeplaces.co.uk

# 4.
# ACTIVE ENGAGEMENT



Children with ASD spend a higher proportion of unstructured playtime engaged in active play than neurotypical children. They tend to struggle to participate in socially active games, such as tag team games, and may rather engage in solitary, repetitive actions. However, strenuous physical activity and repetitive movements can also assist in calming children with ASD. The design of appropriate equipment and interventions can allow children with ASD to engage in repetitive behaviours without drawing attention to them.

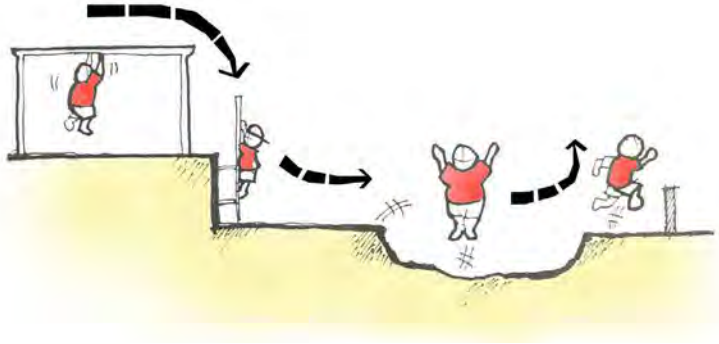
Some children with ASD have difficulty with gross motor skills including balance and coordination and awareness of body position in space or proprioception. Active play is important in developing gross motor skills, but design interventions need to consider multiple skill levels and safety including protection from falls, trip hazards and protrusions.

Related pattern:

Stepping stones to social interaction

## **STRATEGY 1 -** RELEASING ENERGY

Particular movements enjoyed by children with ASD include spinning, swinging and bouncing. Play equipment such as trampolines, hammock swings and roundabouts are popular, but need to be considered in relation to school safety requirements.





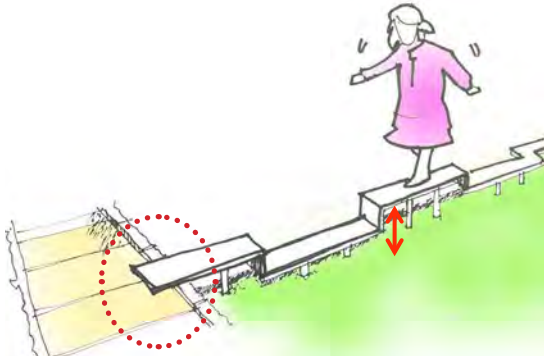
## **STRATEGY 2 -** REPETITIVE MOVEMENTS

Design playground equipment and props that enable repetitive behaviours without drawing attention to them. Opportunities include chairs that tilt and wobble and play equipment with moving parts or pieces such as abacuses, wheels and shape sorters.

## **STRATEGY 3 -** ENHANCING MOTOR SKILLS

Play equipment should be designed to meets diverse physical abilities and encourage participation for all students. In-ground sunken trampolines and low-level balance beams can provide safe options for all children. External 'gym' equipment offers benefits in structuring time and participation through visual cueing of rules, repetition, and organised turn-taking. Extra care should be taken in considering potential trip hazards and protrusions in play spaces.

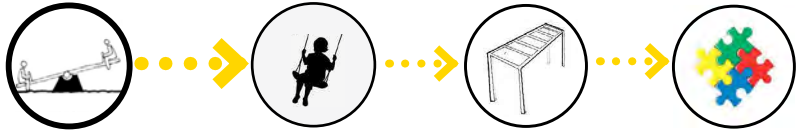




# 5.
# THINKING IN PICTURES; SEEING IN DETAIL



GARDEN



PLAY

Many children with ASD are visual thinkers and struggle with abstract, ambiguous communication. Children with ASD may also struggle with visual hierarchy and become overwhelmed by excessive details and multiple, competing visual stimuli. This can result in difficulties in understanding what is required in particular situations and in navigating and wayfinding, even in well-known environments.

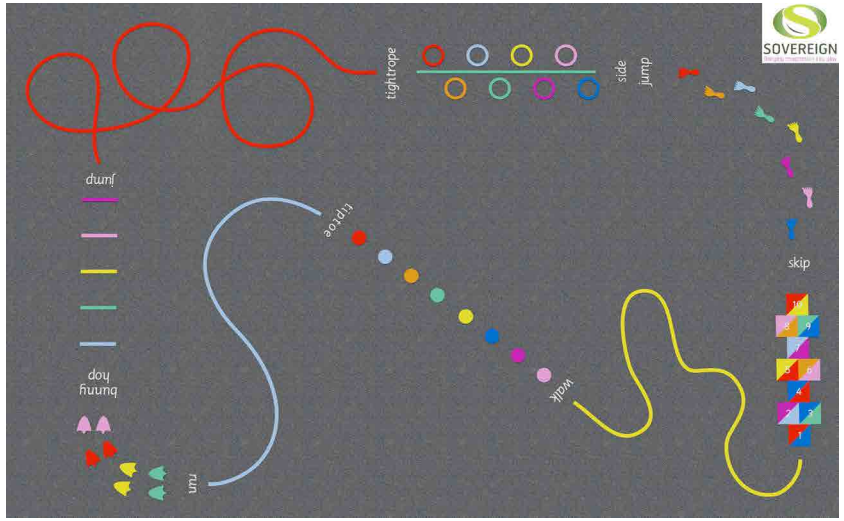
Visual aids are commonly used by educators and parents to enhance communication and foster independence. They are also useful as an aid to navigation so that children with ASD are better able to comprehend where to go and what to do. This is particularly important in the context of play spaces where children are expected to operate more independently.

Related patterns:

- Structuring the unstructured
- Crossing the threshold
- Props to release the imagination

## **STRATEGY 1 -** VISUAL CUES

Wherever possible use visual cues to communicate. Opportunities include the use of props and colour coding to designate particular areas and activities. These cues can take on different symbolic meanings as they are employed by teachers to support the needs of individual children. The use of colour on the ground plane can be particularly useful as a device for orientation, wayfinding and demarcating boundaries.




Agility Trail by Sovereign Play Equipment www.sovereignplayequipment.co.uk

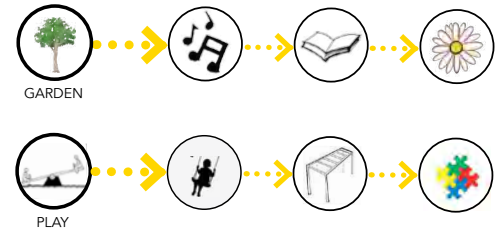


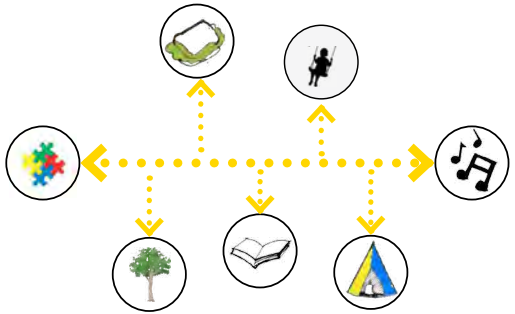
## **STRATEGY 2 -** CLEAR SIGNAGE

Use visual signs with clear and simple images to foster communication. Wherever possible, limit the sign to a couple of words with a universal symbol or icon. Font should be a simple, sans serif type. Ensure the sign is at a height where it is easily visible to children, either at eye level or below. For multi-use areas, visual signs can be used to display the activity that is occurring in the space at that time.

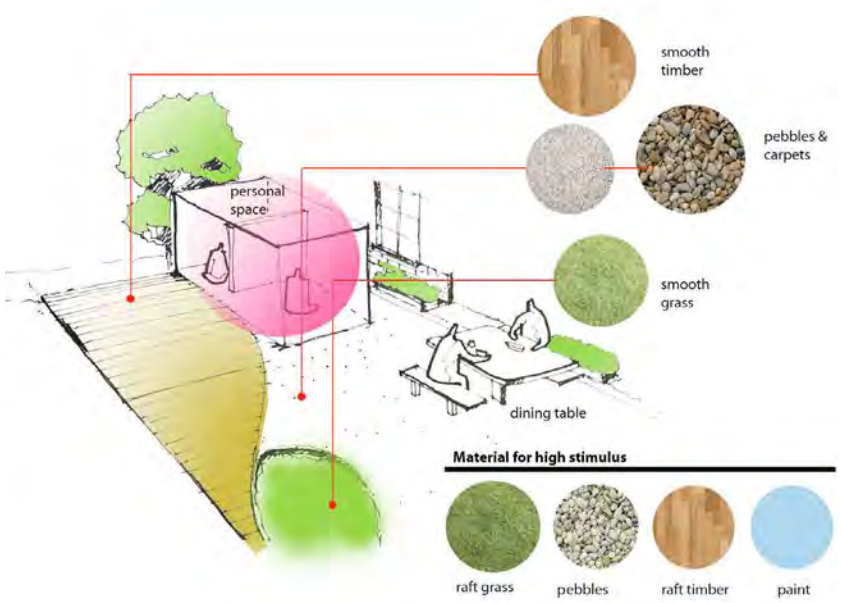
## **STRATEGY 3 -** CONSISTENCY IN COMMUNICATION

Ensure consistency in the method of communication. When using signs keep the same layout, font and common wording. Avoid mixing symbols and colours as children with ASD can struggle with typological thinking.



# 6.
# SENSORY DIVERSITY




Children with ASD can have very different sensory profiles, with hypo and hyper sensitivities to different environmental stimuli. Hyper sensitivities to acoustic and visual stimuli are common, but tolerances and preferences vary substantially from person to person.

Material choices are extremely important when designing for children with ASD as they provide many forms of sensory input including the way they look, feel, sound and smell. They must be carefully selected to balance hyper and hypo sensitivity to different forms of sensory input.

Related patterns:

- Spaces within spaces
- Crossing the threshold

## **STRATEGY 1 -** NEUTRAL BACKGROUND

The default design of play spaces should use neutral colours and low stimulus materials. This is to ensure that children with hypersensitivity are not bombarded with unpleasant stimuli that will cause them to withdraw or to go into 'meltdown'. Retreat spaces should also be designed with sensorially calming materials and colours.

SURFACEDESIGN INC., Cow Hollow School, San Francisco, CA (2010)
http://www.sdisf.com © Marion Brenner



## **STRATEGY 2 -** SENSORY ZONING

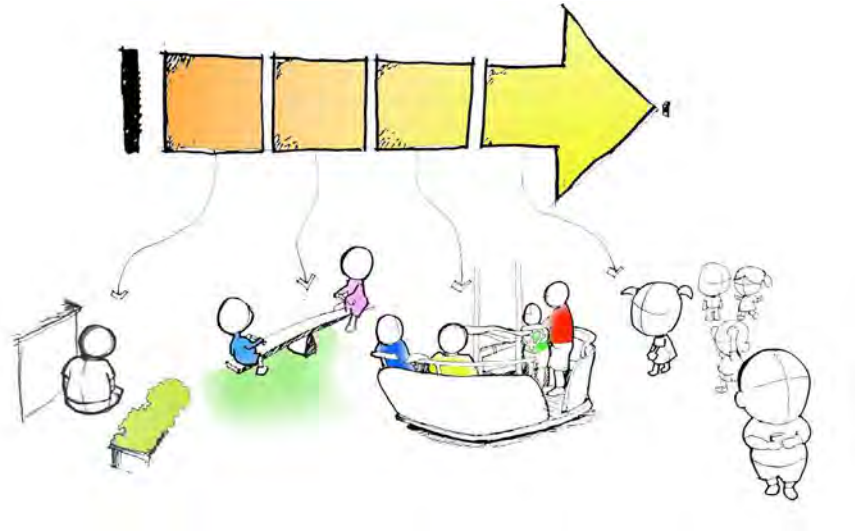
Creating a series of localised play spaces characterised by different levels and types of sensory stimuli provides higher levels of stimulus for children with hyposensitvities and accommodates different preferences. 'Sensory gardens' incorporate planting with different smells, colours, patterns and textures and can also allow tasting in edible garden spaces. All materials and plants should be selected to be non-toxic. Musical sculptures, tactile panels, water fountains and sand pits can be incorporated as part of the sensory garden to enhance acoustic and tactile stimulation.

Sensory Planter and Taste and Smell Totem by Hand Made Places www.handmadeplaces.co.uk

## **STRATEGY 3 -** COLOUR PALETTE

Colours are useful to visually identify activities and locations; however intense colours, particularly in large quantities, can become overwhelming. Use bright and bold colours sparingly, either for symbolic purposes or in visually separated sensory zones. Avoid using many colours in a single area. Muted colours in blues and greens are typically the most calming and vibrant reds and oranges the most stimulating. .

# 7.
# STEPPING STONES TO SOCIAL INTERACTION



Children with ASD struggle to socialise with other children. This is largely due to difficulties in understanding the complexities and rules of social play coupled with a general preference for less social interaction than the neurotypical child. Although children with ASD often engage in solitary, repetitive actions, studies have shown that they also feel lonely [16]. Further, opportunities to engage in social play are important for the development of future life skills.

Opportunities for social interaction need to be structured for children with ASD. However, this needs to be balanced with opportunities to be alone. It is particularly important when designing play spaces to consider the need for children with ASD to have time out, which contrasts with the neurotypical expectations of socialising.

Related patterns:

- Spaces within spaces
- Active engagement
- Props to release the imagination

## **STRATEGY 1 -** INTERACTIVE PROPS

Design interventions that encourage structured interactive play. Examples include see-saws, roundabouts and games involving two or more players.

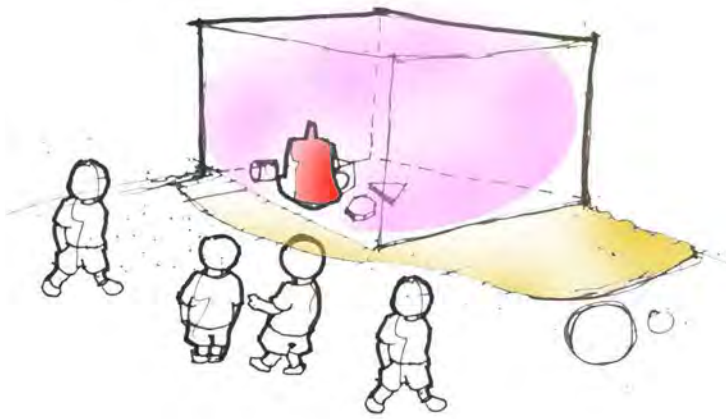


## **STRATEGY 2 -** PARALLEL PLAY SPACES

Arrange spaces to foster parallel play. Use edges such as planter boxes and seating to provide a degree of physical separation but enabling children with ASD to play alongside their peers. Vary heights and levels of containment to provide differing degrees of connectivity and choice in the extent of social interaction.

## **STRATEGY 3 -** 'MY SPACE'

Create 'safe' places for children to be on their own when they need solitary time. Spaces should provide different levels of sensory and social connectivity (see pattern 3 'spaces within spaces'). Visual cues, symbols and signs can be used to denote that this is a place to be alone. To foster acceptance and recognition that everyone needs time alone, the concept of 'my space' should be woven into the fabric of everyday life in schools.



# 8.
# PROPS TO RELEASE THE IMAGINATION

Duggan Morris Architects, Dolls House for children with Autism (Doll's House Project, Cathedral Group 2013)
http://dugganmorrisarchitects.com/



Children with ASD often struggle with abstract thought and experience difficulties engaging in forms of imaginative play. Greater success is usually achieved in games with rules, which provide structured play. As a result, children with ASD tend to engage in this style of play more often. The explicit communication of the norms and expectations of social interaction in games with rules assists children with ASD in knowing how to act and how others are likely to respond.

Playgrounds need to assist children with ASD in engaging in imaginary play, while also accommodating structured games that they enjoy.

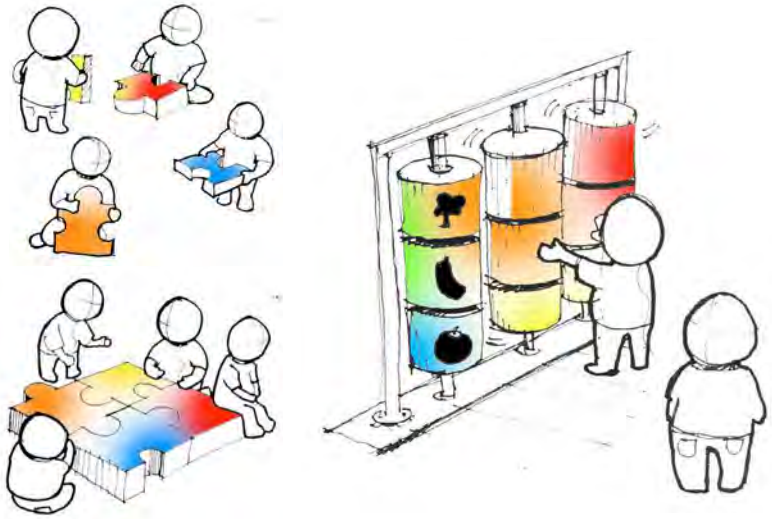
Related patterns:

Thinking in pictures; Seeing in detail

Stepping stones to social interaction

## **STRATEGY 1 -** GAMES WITH PATTERNS

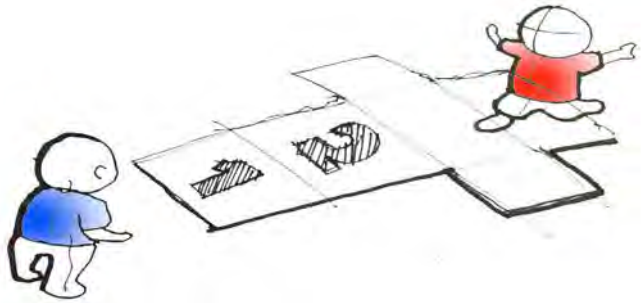
Start with simple cognitive games involving patterns that can be played alone. Design opportunities include structures with movable panels that can be arranged to create patterns or levers that produce sounds when moved in certain ways.





## **STRATEGY 2 -** GAMES WITH RULES

Design spaces that allow for games with rules. There should be a mix of individual, partner and multi-player games. Create patterned ground surfaces that can be used as game boards for chess, drafts, tic-tac-toe or hop scotch.



## **STRATEGY 3 -** VISUAL PROMPTS

Include props for imaginative play. They should be relatively simple and clear in their function. Where possible, props should be designed based on the specific interests of the children who are using them. Props that can be made or adapted by staff and students are ideal for this purpose.

Horse and Cart by Hand Made Places www.handmadeplaces.co.uk

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