

# Aldo goes to Primary School

Experiencing Primary School through the lens of the autistic spectrum.

*McNally Morris Architects in association with Architecture at  
Queen's University Belfast*

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## Authors

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### About the Authors

**McNally Morris Architects** are a firm of architects based in Belfast. Their work covers a wide range of building types in the public and private sectors including; residential, community, youth and sports and they are experienced in designing for the needs of people with autism. Both directors combine practice with research and teaching in the School of Planning, Architecture and Civil Engineering at Queen’s University Belfast (QUB).

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## Contents

<b>Introduction</b>	<b>4</b>
<b>Methodology</b>	<b>5</b>
<b>Arrival</b>	<b>6</b>
<b>Personal Space and Movement</b>	<b>8</b>
<b>Wayfinding</b>	<b>10</b>
<b>Legibility</b>	<b>12</b>
<b>Scale and Organisation</b>	<b>16</b>
<b>Threshold</b>	<b>18</b>
<b>Classroom</b>	<b>20</b>
<b>Sensory Issues</b>	<b>23</b>
<b>Engaging with Others</b>	<b>33</b>
<b>Quiet Space</b>	<b>36</b>
<b>Safety and Security</b>	<b>38</b>
<b>Conclusion</b>	<b>42</b>
<b>Acknowledgements</b>	<b>43</b>
<b>Bibliography</b>	<b>44</b>

## Introduction

Autism is a lifelong complex developmental disorder characterised by difficulties in three main areas; social communication, social interaction and social imagination. These are sometimes referred to as the “triad of impairments.” People with autism therefore often have difficulty in understanding verbal and non-verbal communication and then in communicating with others. As a result of this they can find social communication quite daunting and unpredictable, which means that social situations can be very demanding and stressful experiences for those with autism.

In addition, people with autism often have difficulty in processing sensory information. Consequently they can experience sensory integration problems, also referred to as “sensory sensitivity”. A person with autism may be either hypersensitive (over-sensitive) or hyposensitive (under-sensitive) to one, any or all of the seven senses, these being:

- **Sight**
- **Sound**
- **Touch**
- **Taste**
- **Smell**
- **Balance**
- **Proprioception**

Adding to these difficulties, people with autism can also experience sensory mixing or “jumbling” resulting in a confused reading of the world through a disordered mixture of several senses. Moreover, those with autism can have co-ordination difficulties in gross and fine motor skills, sometimes presenting the symptoms of dyspraxia. All of these factors have an impact on their ability to negotiate comfortably in the built environment.

The term Autism Spectrum Disorder (ASD) covers the range of disorders within the autistic spectrum. While people with autism will share certain difficulties, the nature and severity of these difficulties will vary from individual to individual. The range of the spectrum is such, that while some with ASD may be able to live relatively independently, others will require lifelong continuous support.

As architects we have a responsibility and a duty to provide designs that respond to the needs of all members of society. As part of that commitment, we the authors have an interest in exploring the role that the built environment can play in the daily life of a person with ASD. Accordingly, through this booklet we try to focus particularly on the primary school environment to highlight the many challenges that a child with autism may encounter.

School is a place of special significance in the formative development of children. It is important in the advancement of both academic and social skills that will be necessary in later life. In order to facilitate a positive learning experience, children should be made to feel as comfortable as possible and be at ease in their school environment. The combination of social and sensory difficulties that people with autism experience means however that this is often not the case. For the pupil with ASD, school can instead be a confusing and even frightening place. Feelings of disorientation, separation and fear can hinder opportunities for learning and discovery, thereby further alienating the pupil with ASD from the rest of society.

Any unwanted distraction can impact negatively upon that child’s ability to learn. For most of us, the built environment that provides the framework for our lived experience, largely occupies a secondary position. For the pupil with ASD however, the sensory and social difficulties characteristic of

the disorder can endow the surrounding environment with increased significance as a source of stimulation and distraction. This can act as a barrier to learning, hampering the development of the child. Conversely, if considered appropriately, the surrounding environment can enhance the learning experience and positively influence the child’s development.

In the following pages we provide a series of “social stories” illustrating some of the everyday issues that a primary pupil with ASD may face in the school environment. Using the context of each story, we identify some architectural and design considerations that may help to improve conditions for the child with ASD in the primary school setting.

## Methodology

The booklet draws largely on the results of research carried out by Hugh McNally and Dominic Morris of McNally Morris Architects and Keith McAllister of Queen’s University Belfast between November 2012 and February 2013. The objective of the study was to obtain a greater understanding of the impact that architecture and the built environment can have on people with autism. The investigation of the subject centred on parents of young children with ASD in the belief that they are most likely to have an intimate knowledge of the issues that affect their children and are relatively well positioned to communicate those issues.

The study comprised a number of components.

- Focus Group Discussions with parents of children with ASD
- A Postal Questionnaire completed by parents of children with ASD

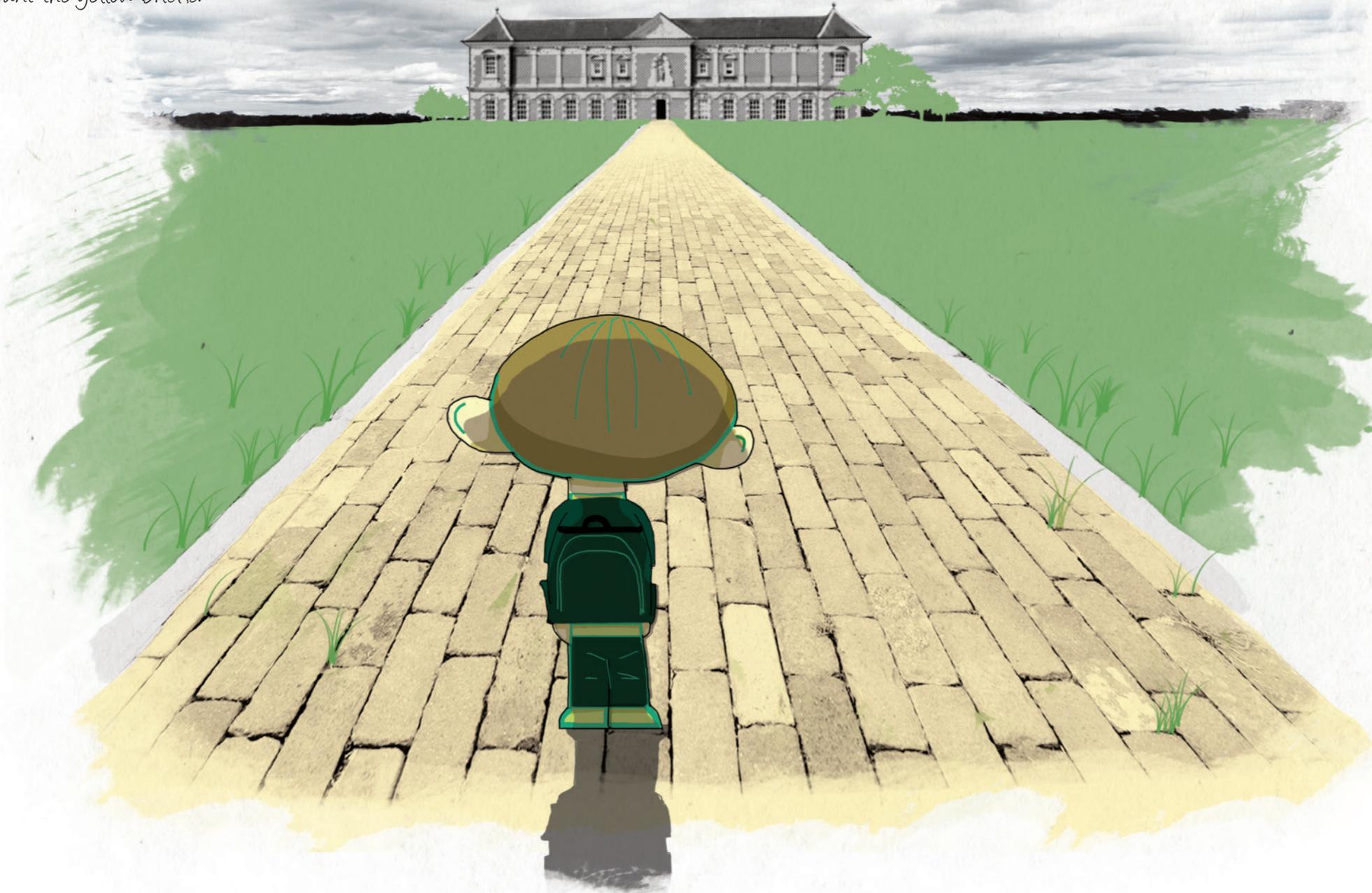
- A Desktop study of recent research into the relationship between ASD and various aspects of the built environment.

The specific stories used here to illustrate the world of a child with ASD are the authors’ interpretations of some of the issues and narratives that emerged from the discussions and questionnaire responses. While we have operated with a degree of artistic licence, we hope that our interpretations have done justice to the level of engagement of those who contributed to our study by capturing something of the communicated vibrancy of their lived and very real experiences.

We also hope that this document will raise awareness of some of the issues affecting primary school children with ASD and perhaps generate discourse among those whose task it is to provide an appropriate learning environment for all children. This includes teachers, health professionals, architects, parents, carers, school boards, government bodies and those with ASD themselves. We believe that it is only by working together and by sharing resources, information and expertise that we can build the foundations for a truly inclusive society.

While this booklet uses the primary school as a lens through which to view some of the issues associated with ASD, it is our belief that the school can be seen as a “microcosm” for the wider world and that lessons taken from the learning environment can be applied elsewhere. We therefore hope that our brief illustration here may raise awareness of the myriad issues for those with ASD that are embedded in the vast landscape of urban configurations and building types making up the spatial framework of our society.

*Daddy drops me off at the school gates and says "Goodbye". I don't like walking to my classroom on my own. Sometimes it takes me a long time to get to my class because sometimes I forget where it is ... and sometimes I remember to count the number of yellow bricks in the path but I forget to go to my classroom. Some mornings Daddy waits at the gate for a long time. He waves at me and reminds me not to count the yellow bricks.*



## Arrival

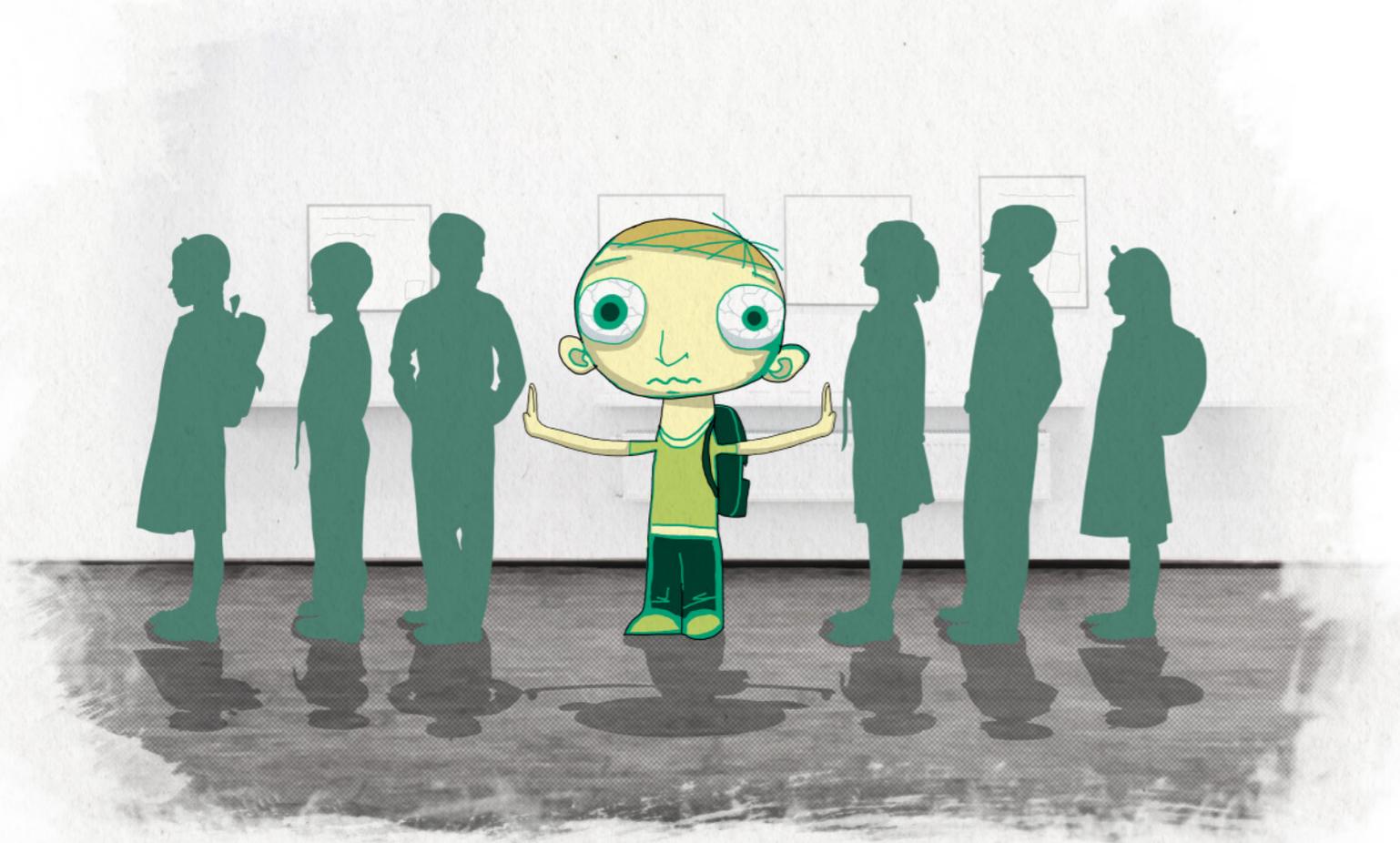
Arrival at the school is an extremely important moment for all children. For children with autism, who find change difficult to deal with, moving to the hustle and bustle of the school environment from the comfort of home can be distressing.

Making this transition as straightforward and as stress-free as possible will help to make the experience more tolerable and hopefully even enjoyable for the school child with autism.

Some schools do not permit entry to parents beyond the school gates, or only allow access to a certain point within the grounds of the school. School policy on parental access is likely to be defined by the size and layout of the school and may restrict what it can practically offer in this regard to meet the emotional needs of children. Some children with ASD may wish to have a parent or carer accompany them as far as possible within the grounds of the school. This is important and should be a consideration from the very earliest days in the procurement of a building right through to the implementation of school management policy.

Children with ASD can benefit greatly from having access to a separate secondary entrance. They can use it to avoid the noise and the crowd at the main entrance, thereby helping to reduce the number of socio-sensory hurdles the child has to manage on a daily basis.

At lunchtime we go and line up outside the hall. I hate standing in lines. People always stand too close to me and sometimes I have to move to the other side of the corridor and wait until everyone else has gone in for dinner. My teacher says that they are not touching me ...but I know that they are.



## Personal Space and Movement

Children with ASD often need more personal space than their peers. Due to problems with proprioception and in processing information, they can find it more difficult than others to locate themselves in space. Any invasion into this personal territory can be very upsetting for the child with ASD.

We have school dinner in the big hall and the tables are very close together and I have to carry my dinner past all the other people to get to my seat. One day someone touched me when I was carrying my tray. My tray went up in the air and my dinner fell all over the floor.



Movement through the circulation and social spaces of the school can be very challenging for children with ASD. The hustle and bustle of the corridor or dining hall for example can be especially stressful. Allowing extra space for circulation can give the child with ASD more of an opportunity to find a comfortable distance from his peers. Extra space can also help to reduce the stresses of hypersensitivity to noises, smells and other senses by improving opportunities to find a place that is more comfortable (or less stressful ) in the school.

*My school is very big and sometimes I get lost. One day I wanted to go to the library and I asked the dinner lady how to get there and she told me to go out the door and turn left and then turn right and then go through the second door on the right, but that was not the library. That was a small room with no books and with shelves and brushes and mops and plastic bottles and no windows and I didn't like that room and when my teacher found me it was nearly time to go home.*



## Wayfinding

Circulation areas can be potentially distressing for pupils. Becoming disorientated or lost can cause great stress to a child with ASD. Complex layouts, long corridors and frequent changes of level can contribute to a feeling of disorientation and create a sense of anxiety. It is important that effort is made to ensure that circulation around the school is as clear and comprehensible as possible. These factors should be considered at the design stage of a building. Difficulties experienced by individual pupils with ASD should also be observed in-situ with a view to the implementation of suitable mitigating measures.



*When I was in Mrs Johnsons' class I couldn't concentrate very well because it was in a "Port-a-cabin" which is like a caravan without wheels but caravans are for holidays and for playing and for going to the beach and they are not for numeracy and literacy and science.*

## Legibility

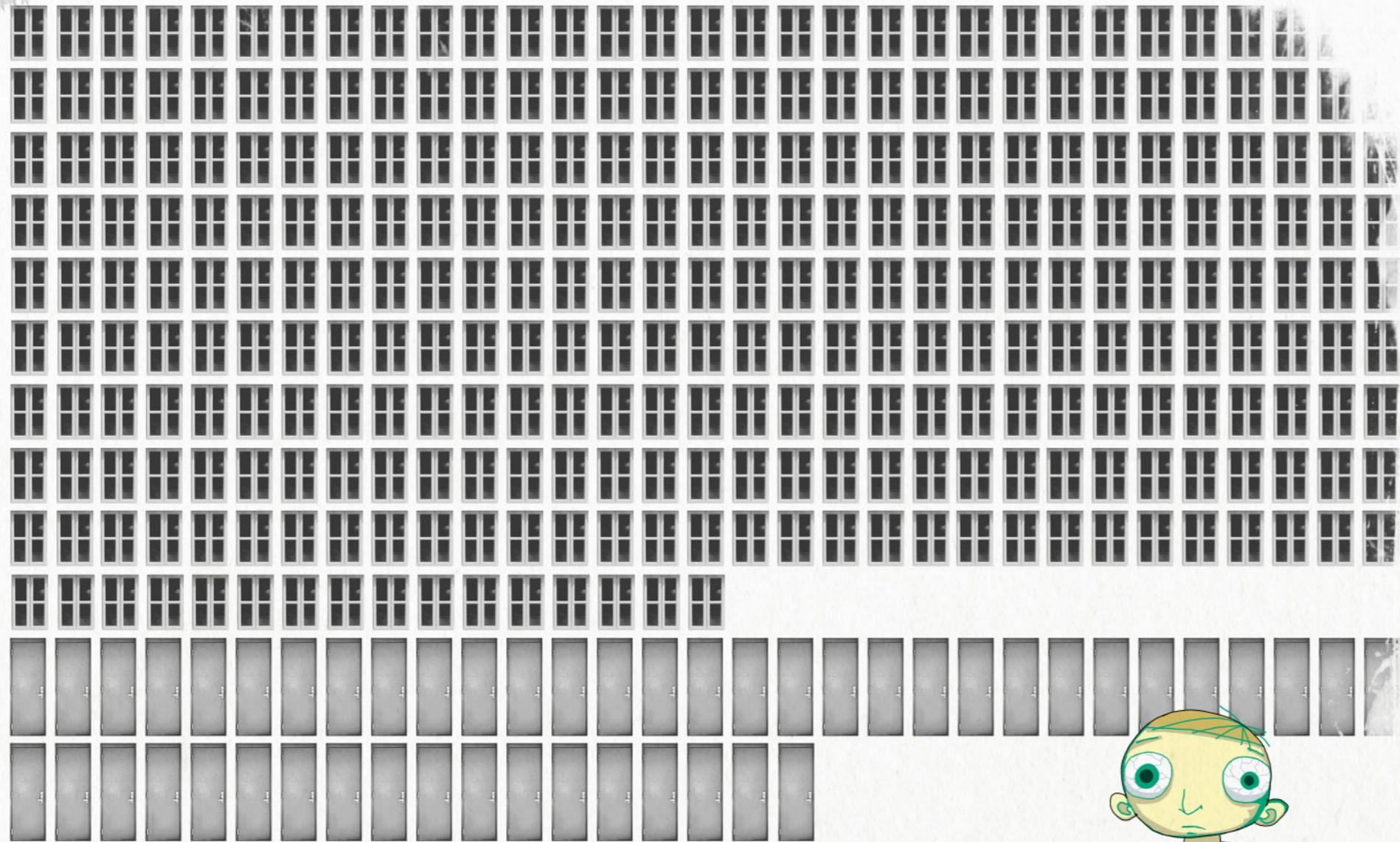
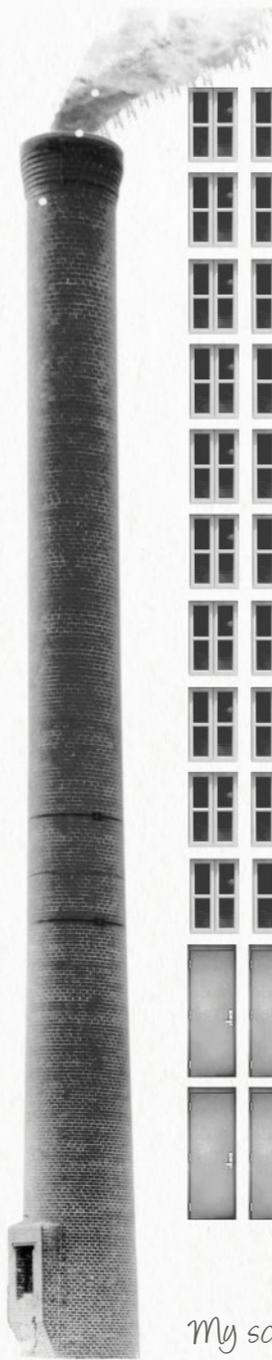
One of the qualities of a good environment is ease of comprehension. Any school, large or small will be more accessible to a pupil with ASD if the environment affords visual clues that help the pupil to orientate themselves and identify the activities associated with various rooms.

Personalising rooms or neighbourhoods using individual colours or objects can facilitate association for the pupil with ASD. Similarly, using a restricted amount of glazing to allow a view into the interior of rooms can help the pupil to understand the school layout. (Always ensuring that the glazing is positioned in such a way as to minimise potential distraction of students in the classroom).

It is also worthwhile ensuring that as far as possible, each activity is rooted in a particular place within the school. It can be helpful for a person with ASD to be able to identify one particular place with a specific activity. Conversely, places or rooms where multiple activities take place can be confusing for a person with ASD.



Every day we go into the big hall to have our dinner.... But sometimes when we go into the big hall we play football and do running and climbing and exercises and gymnastics. Sometimes when I do running and climbing the dinner lady tells me to SIT DOWN AND EAT MY DINNER!!



*My school has three hundred and forty five windows and sixty six doors and one hundred and fifty four steps and one football pitch and one chimney. My school is a big school.*



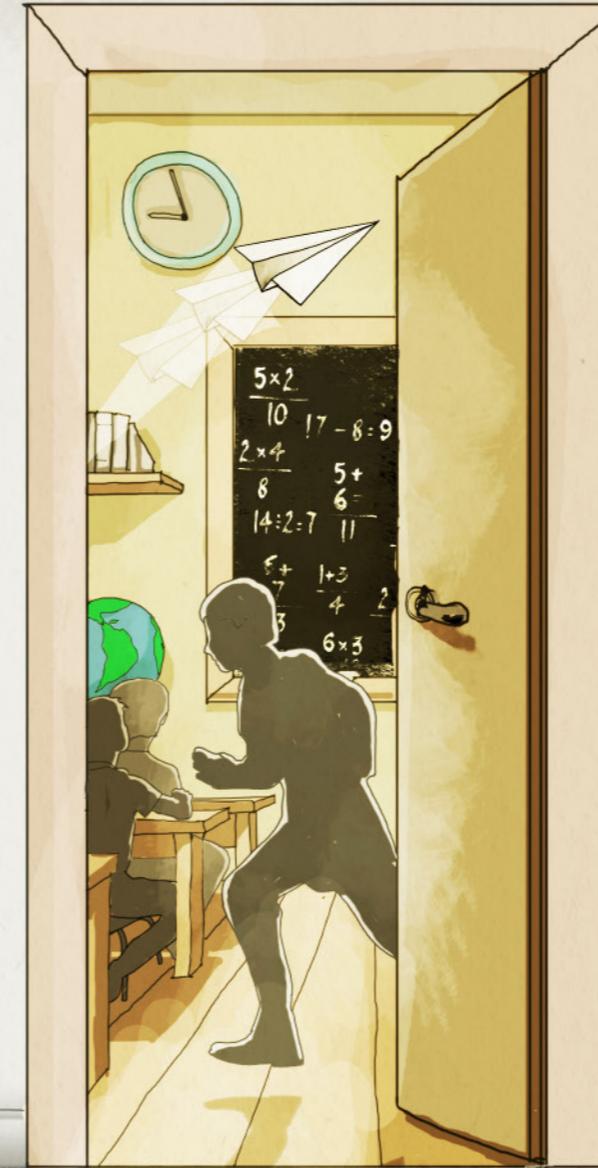
## Scale and Organisation

The scale of a large school can be daunting for a pupil with ASD. The sheer number of buildings, doors, windows, staircases and the variety of classrooms, corridors, offices and countless other rooms that go to make up the landscape of any large school can present an intriguing yet sometimes bewildering universe for most children. Children with ASD will be most comfortable in an environment that they can easily comprehend. Small schools or those with simple organisational layouts offer the most basic conditions for easy comprehension.

Larger schools can be disorientating and frightening places for children with ASD. If they are organised into a sequence of smaller neighbourhoods or classroom clusters, perhaps based on Year groups or Key-Stages, this can provide a level of logic that may help minimise disorientation. Neighbourhoods may also act as a buffer between the scale of the classroom and the wider school beyond. There are a wide variety of spatial approaches in which smaller neighbourhoods can be used to structure the overall social geography of a school. Classrooms may be grouped around a shared resource base, a courtyard or a shared area, to form an identifiable grouping or cluster. Irrespective of the particular spatial strategy, a successful approach will result in a logical arrangement of circulation spaces and rooms which is easily perceived by the pupil with ASD and their peers.

Clarity in the layout of the school will help to provide easily navigable environments where all users can orientate themselves both physically and socially in the school.

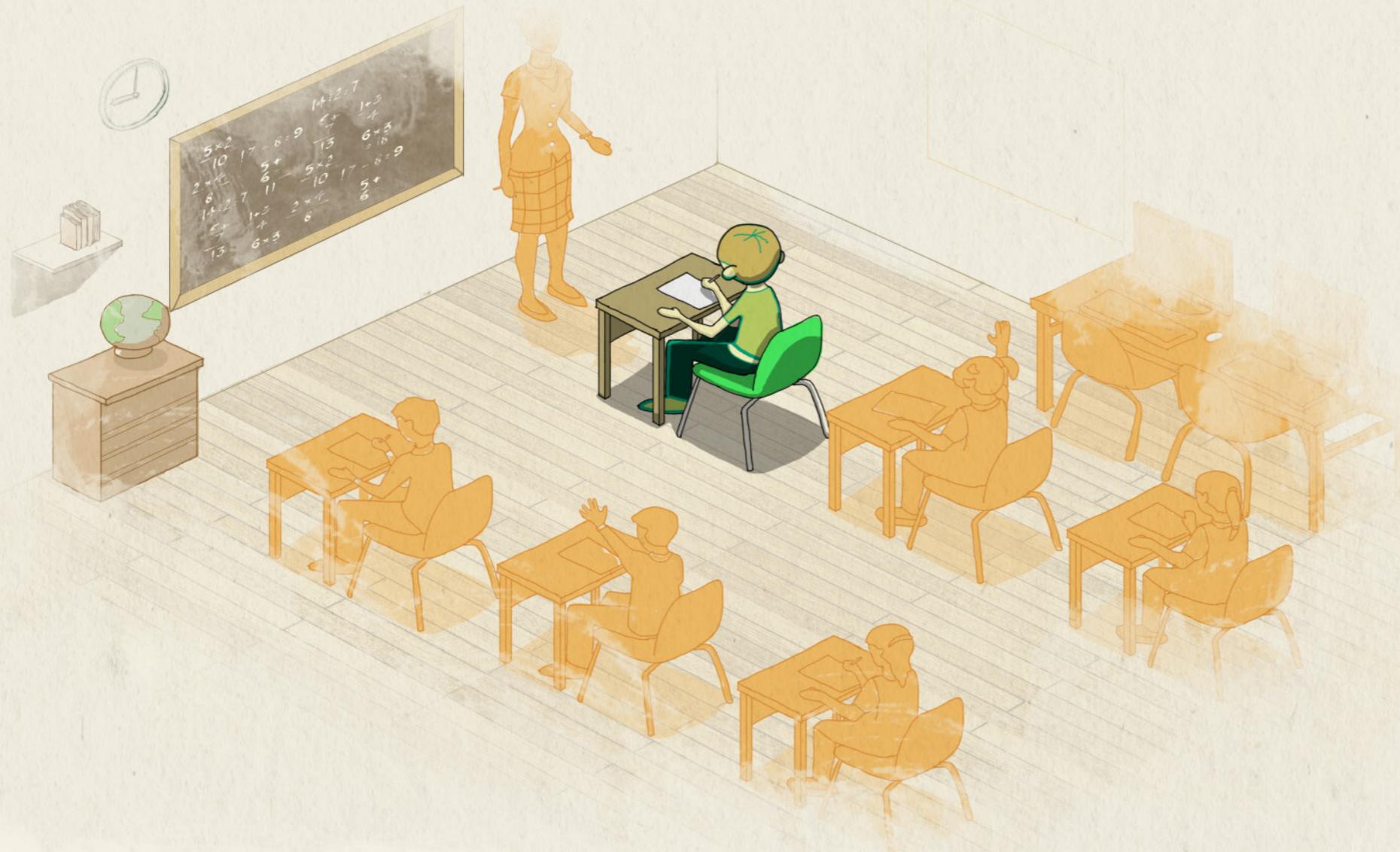
I go to the cloakroom and take off my coat and put it on the peg with the blue hedgehog above it. Then I take out my lunch box and put it on the seat underneath the peg with the blue hedgehog above it. All the other children are already in the classroom. I wait, then when they stop running around and making noise, I go in.



## Threshold

Coping with change is always a difficult issue. For children with ASD, the transition from the corridor or circulation space to the classroom is an important moment. This is a two-way process that applies to the transition from the turbulent and unpredictable universe of the corridor to the relative routine and order of the classroom and vice versa. The child with ASD should be afforded time and space to prepare for this change. This may be provided in the form of a recess in a corridor, a seated space within the classroom or even a separate cloakroom. Having a designated cloakroom area with seating, shelving and coat storage gives each pupil space to prepare themselves for change.

I like my classroom. I have a chair that is made of plastic and it is coloured green. My green chair is always at the front of the classroom near the teacher. Before I got my green chair I never knew where to sit.



## The Classroom

The classroom is the place where pupils spend most of their time at school. It is an especially important environment for the child with ASD. If the child can be made to feel comfortable and relaxed, the classroom can provide a place of security and familiarity, a safe place from which to venture forth as well as to seek refuge from the chaos that the rest of the school environment may represent.

One of the best ways to create a comfortable and welcoming classroom is by providing a well-structured and supportive environment. The classroom environment should have order and routine and the pupil should know where each activity will happen and when. The identification of one activity with one area is an important one for someone with ASD and ideally each activity should have its own defined zone within the classroom. This physical structure, combined with a structured routine, illustrated by a visual timetable, will help the child with ASD to predict events and therefore minimise anxiety. The visual timetable is a very important reference point for pupils with ASD and it should be located in a prominent position in the classroom.

*Sometimes my teacher makes us do "group work". "Group work" means that everybody can talk and stand up and move around the table and sit on any chair they want to. The other children talk to me and to each other and I can never concentrate and sometimes they sit too close to me and I push them away and then I get in trouble.*



The sensory issues experienced by pupils with ASD will occur throughout the whole school. Pupils will spend most of their time in the classroom so it deserves careful attention. As proprioceptive difficulties are common among people with ASD who often need more personal space in order to feel comfortable, due consideration needs to be given when arranging the class for different activities. Clearly identifiable teaching zones and classrooms with larger than standard floor areas per pupil will create a more comfortable environment for all pupils.

## Sensory Issues

It is always going to be difficult to provide an environment free of problems for a child with ASD. A good start however is to ascertain what triggers are likely to upset each pupil so that staff can be made aware of them. Appropriate strategies can then be employed to help both pupil and teacher learn to cope with these distractions. Potential triggers and problems include:

### Visual Distraction

Many pupils with ASD are very easily distracted by visual stimuli and find paying attention difficult. Bright shiny surfaces, bold geometric patterns and strong textures can all be potential distractions.

### Sun & Glare

Bright sunlight and glare can be disruptive for any class, especially so for pupils with sensory sensitivity.

### Lighting

Some pupils perceive the flicker of fluorescent lighting in a very pronounced way which can be unsettling.

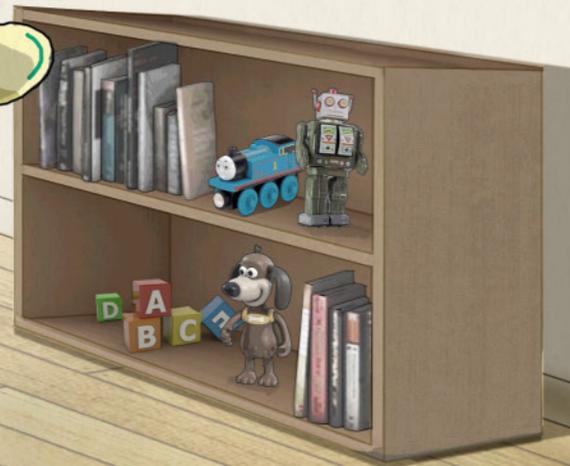
### Acoustics

Excessive noise can be distracting. Playgrounds, sports facilities, dining rooms and plant rooms are often problematic in this regard.

### Smell

Strong smells and even subtle odours can be problematic. School kitchens, dining halls, swimming pools and bin areas are all potentially problematic sources of strong smells.

I love looking at the books and the toys on the shelves. Sometimes my teacher puts our paintings on the wall after we do art and I look at the paintings for hours and hours and I can't hear anything that teacher is saying because there are so many colours and shapes. I sometimes stare at the paintings for the whole day.



It is generally accepted that calm low stimulus spaces provide the best learning environment for most children with ASD.

Since pupils with ASD can struggle with visual distraction, closed storage is an important consideration. Like most children, pupils with ASD love to see their work displayed. However it is important for staff to be afforded the flexibility to determine what and how much is displayed. With this in mind it is important that adequate storage space is available for the teacher. Large-scale toys and equipment are also a feature of working with young pupils with ASD. Storage for these items should also be available. All storage should ideally be accessed directly from the classroom.

Low arousal colours such as cream (but not yellow or white) or calming pastel shades on walls floors and ceilings can help to provide a good background for teacher chosen artworks, posters and displays.

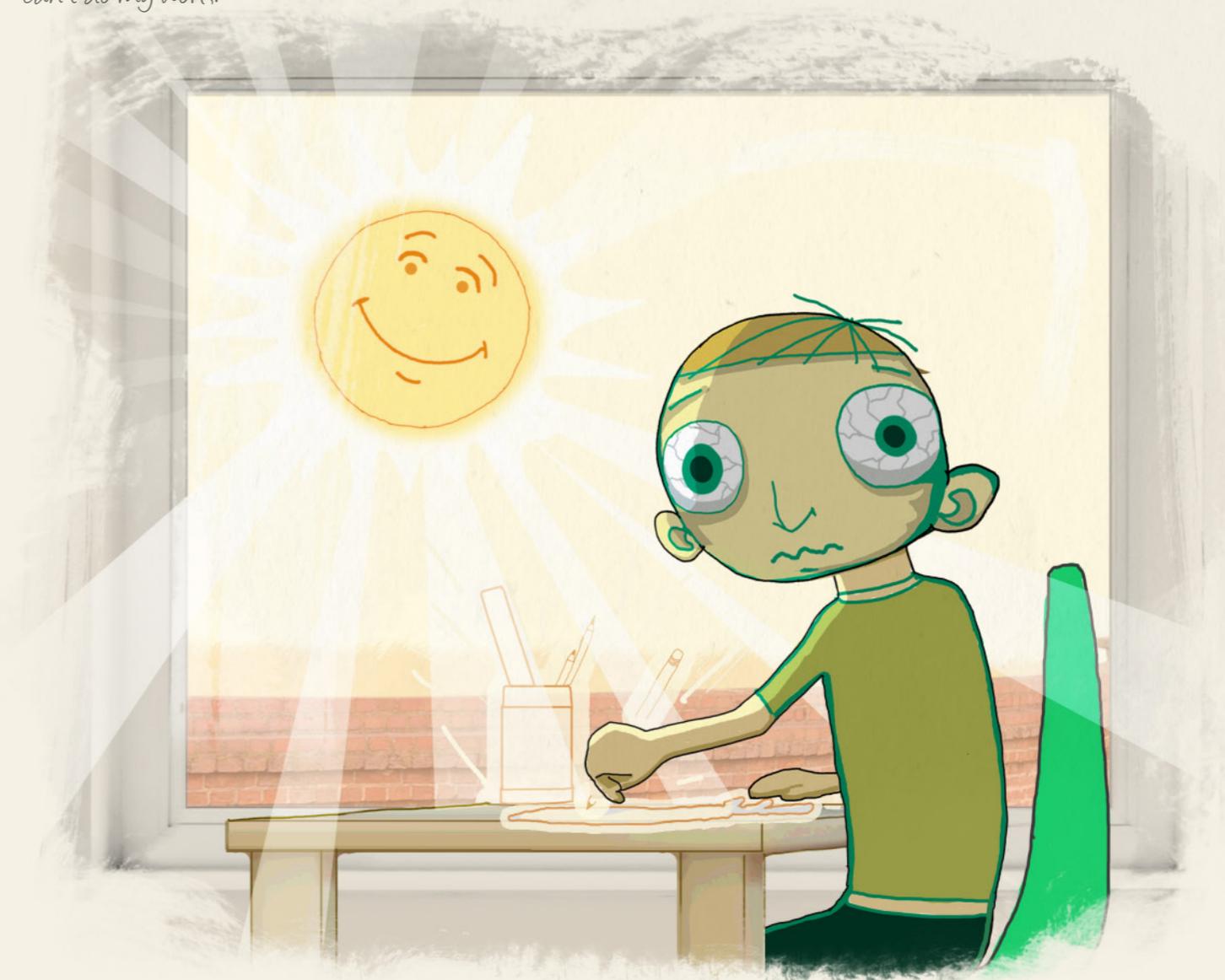
*I love to look out the window at the trees and the grass and the wall of our playground. I can count the branches and the leaves and the bricks and it makes me feel calm.*

*When the other children are outside, teacher always pulls the blinds down on the windows. She says it is too "distracting" for me but even when the blinds are down I can still see the noises.*



A view to the exterior can have a calming influence on a pupil with ASD and be beneficial to both teacher and student alike. Visual distraction can however be an issue. Flexibility and choice for teacher and pupil is paramount, allowing change to suit different demands. Provision of curtains or blinds to windows may be helpful in order to minimise distraction though slatted blinds are not always suitable as they can become a distraction in themselves for some children. It is always important to provide a number of workstations or spaces within the classroom where the visual distraction can purposely be minimised.

*Sometimes the sun comes through the window and makes my book and my pencils disappear....and then I can't do my work.*



Providing windows at both low and high level in the classroom can also be beneficial. Measures used to constrain views through the windows to the outside can be implemented at eye level while still admitting natural light to the classroom. It is important however to be mindful of orientation, taking care to avoid solar gain and glare from direct sunlight which can be an issue for children with ASD.



*I hate going to my new classroom because first there is a corridor with no light and no windows and I hate dark places because I can't see anything or hear anything and I don't know what is there.*

Bright light, shadow and dark all present potential difficulties for the pupil with ASD to negotiate. Consideration should be given to interior lighting levels. Care however needs to be taken when choosing artificial lighting. Fluorescent lights should be avoided. A range of softer lighting can help provide a more calming environment.

In our school we have a bell that rings very loudly at nine o'clock in the morning and at half past ten in the morning and at a quarter to eleven in the morning and at half past twelve in the afternoon and at one o'clock in the afternoon and at three o'clock in the afternoon. The bell is like an earthquake in my head..... and when I know the bell is going to ring I get worried and can't concentrate and when it rings I cover my ears and sway back and forwards and one day the bell did not ring at nine o'clock but it rang at half past nine instead and I had to stay in the quiet room and keep my hands over my ears all day because it was a bad day.



Of the many distractions that create worry for the child with ASD, noise is consistently a problem. Sudden loud noises can be especially difficult. Strategic use of ear defenders, taking care over the positioning of the bells or the use of coloured lights instead of classroom bells are some strategies that can be employed in a school environment to reduce this difficulty.

I hate going to PE. The hall is very tall and shoes don't go click clack like they do outside, they go squeak, squeak squeak! Squeak!! SQUEAK!!!!... I hate that sound!





*And in the toilets there are bad smells and loud noises and the hand drier sounds like a jet plane and the flush of the toilet is like a waterfall and you never know when it is going to start and sometimes when I need to pee I get so worried that I can't go.*

## Engaging with Others

Children with autism are at their most vulnerable when they have to venture outside the relatively ordered and familiar environment of the classroom. Meal times, PE time and break times can be difficult for children with ASD.

*Eating dinner is like maths....it is very hard and takes a long time. Everyone else eats very quickly and they don't concentrate, they talk and shout and throw things and the noises flap around the room like "bats in a belfry" and bother me so that I can't eat my dinner.*



The large spaces of playgrounds and the cavernous volumes of PE halls and canteens can be noisy, chaotic, and are therefore more likely to result in over-stimulation and distress for pupils with ASD. In these environments there will be times when the pupil will wish to retreat from the crowd and be alone. Provision of respite places, where children can rest or pause momentarily to collect themselves, can be beneficial. A rest space can provide a safe location from where the pupil can watch the others without being completely removed from their activity. Similarly a recess with seating along a corridor or circulation area can provide a refuge for pause or rest.

At half past ten we go to play. We play in the small playground beside our classroom. I like to play there because there are no big boys and because even when everybody is running and shouting, the noise flies away up to the sky. Sometimes I sit on the green bench on the wall beside the door to our classroom and watch the sounds.



It can be helpful, particularly for children in the lower years of the school, if a classroom has access to a secure external play area associated only with that class or age group. This area can then be linked to a larger play area for the entire school population. This hierarchical approach to play space provides choice for the pupil with ASD and gives them more scope to determine their level of social engagement.

Sometimes when I am in my classroom I get "really hot" and my head hurts with noise. I need to get away to give my brain time to cool down.



### Quiet Space

Children with ASD can begin to exhibit disruptive behaviour when they become tired, distressed or overstimulated. It is essential to have a space nearby to allow the child time to calm down and in effect 'recharge their batteries.' This can be a quiet area designated within the classroom itself or alternatively it may be separate from but adjacent to the classroom.

Ideally a quiet room will be an area acoustically separated from but directly accessed from the classroom. The quiet room may also be treated as a flexible space, doubling as a storage area or sensory room. Depending on the way it is designed it may even be used as a small reading area or stage area that can contribute to the wider learning environment of the classroom.

## Safety and Security

Safety and security is of paramount importance when dealing with vulnerable children who may have difficulty comprehending the dangers inherent in the environment.

*The big yard in our school has two gates and sometimes when I finish my dinner I run out the small gate and down the road and across the road at the traffic lights and down the road again and over the bridge and to the bus stop that takes me to my granny's house and I sit at the bus stop until my headmaster comes to get me because I do not have a ticket for the bus. My headmaster says I have to wear a hoodie at dinner time so that he can keep an "eye" on me!!*



Many pupils with ASD will attempt to escape at some time, perhaps by bolting out through the doors of the classroom during class or the through the gates of the school during play time or break time. Without recommending the imposition an overtly secure regime, it can be useful to provide double locks and restrictors on windows, or to try to ensure that any escape path from the classroom to exterior is hampered by the action of at least two doorways. While the external environment is a great resource, it is important that access to and from the school is secure and that pupils are monitored at all times.



Children with ASD can often make sudden and unexpected movements. Stress can also induce behaviour that can be damaging both to the environment and the child. Children with tactile hyposensitivity can be under-sensitive to extreme temperature and pain with the resultant dangers that this brings. Fascination with fixtures and fittings can result in physical attention that can exceed the standards of robustness for which the items were designed. Consideration should always be given to the use of materials, fixtures and fittings that can cope with an above average level of use and can reduce the impact of accidental injury.

Examples might include:

- Underfloor heating rather than exposed, surface mounted radiators.
- Using laminated or toughened safety glass wherever possible
- Ensuring that toilet cisterns are boxed in or have lockable lids
- Considering curved edges to walls, furniture, and fittings where possible.

It is a natural part of children's development for them to explore their environment. Children with ASD often have little or no sense of fear and can therefore be more inclined to explore beyond those safe boundaries that other children might naturally self-impose. When this tendency is combined with some of the other sensory and co-ordination difficulties that children with ASD experience, the built environment can be full of risk and danger.



*I love climbing!! Climbing is my favourite*

## Conclusion

As architects we have a responsibility and a duty to provide an inclusive environment for all members of society.

Despite signs that the incidence of ASD is on the increase in UK, there is a notable lack of specific or comprehensive guidance on the subject of designing for ASD in the realm of the built environment. We recognise that this is not without good reason. There are difficulties in providing comprehensive design guidelines for a spectrum condition where the nature and severity of difficulties can vary so greatly from individual to individual. There is also a view that efforts to totally alleviate difficulties for people with ASD in one aspect of the built environment can, by restricting their exposure to the reality of the wider world, actually hinder their development towards a level of independence.

While we have written this booklet from the point of view of interested architects, and we offer considerations for the design of the built environment, it does not in any way intend to be prescriptive nor does it claim to constitute a definitive study. Our considerations are exactly that...they are provided for consideration.

It is our contention that the built environment plays a significant role in all of our lives and this booklet illustrates some of the ways in which it is relevant to the everyday experience of the primary school pupil with ASD. At the same time we acknowledge that design of the built environment represents only one of many relevant considerations for improving the learning environment for pupils with ASD and successful solutions are likely to draw on input from teachers, carers, therapists, parents and the children themselves. Moreover, we recognise that pupils are, first and foremost individuals, and that a “one size fits all” attitude has limited relevance at best.

We contend that if considered well, the school can provide a positive learning environment for children with ASD through:

- helping the pupil to feel more relaxed and thus affording them the freedom to concentrate more fully on their studies.
- increasing opportunities for the pupil to interact with their peers
- optimising opportunities for learning to negotiate and cope in the wider built environment

We also recognise how important it is that school should be a comfortable environment for all concerned and that design decisions should help ensure a holistic enjoyment of the school environment for the entire population.

In conclusion it is our hope that this booklet might point the way towards an improved level of engagement with the many environments that affect the daily lives of those with ASD. While we accept that the anecdotes, narratives and considerations that make up this booklet are specific to the primary school environment and may not easily be translated to other situations, we hope that it will provide insights and relevancies beyond the particular.

It is our sincere wish to signpost the way not only towards further detailed and focussed research into the various elements of the primary school environment but also beyond, towards comprehensive research into the relationship between people with ASD and the multifarious spaces, places and networks of which our society is composed.

## Acknowledgements

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