Autism Design Principles for Schools

A practical guide to support schools in creating more inclusive learning environments

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Foreword

It is a real privilege to be able to write the opening to this incredibly important piece of collaborative research and work. As part of the Autism in Schools programme funded by NHS England, we at the Autism Education Trust have been working across the London region with our Partners for the last three years to secure improvements in education for autistic children and young people.

One of our key themes at the AET is enabling environments. We know that the environment is a fundamental part of creating a positive education for autistic children and young people. Our Autistic Young Experts, parents and carers, and professionals have told us how the education environment is so often inaccessible, overwhelming and inflexible. Although there is a duty for settings to make reasonable adjustments, these small changes may only make the environment bearable, rather than a place in which an autistic or neurodivergent learner can thrive.

The AET is therefore committed to exploring the learning spaces of the future; educational spaces where autistic and other neurodivergent learners are included by design and can feel safe, secure and empowered to learn. Without a shift to neuroinclusive design, our learning spaces will continue to poorly serve our autistic and neurodivergent pupils, remain a barrier to their progress and stifle their aspirations.

I hope that you find the guidance and case studies in this document useful in starting to think about neuroinclusive design and the power of the learning environment.

Dr Sarah Broadhurst

Chief Executive of the Autism Education Trust





The Eight Design Principles

The Autism Design Principles for Schools guidance introduces a set of Eight Design Principles to support mainstream schools and settings in creating more inclusive learning environments for autistic pupils.

In addition to the design principles, the guide features some case studies and concept designs that can be used by school leaders, practitioners and other stakeholders as reference points when assessing existing educational spaces and developing specifications for new ones.

The ideas and concepts presented in the guide have been derived from knowledge gained from working on educational building projects involving autistic pupils.

Autism in Schools Project (AIS)

The Autism Design Principles for Schools guidance has been developed as part of Phase 2 of the Autism in Schools Project (AIS).

AIS is a collaborative partnership programme involving autistic young people, their families, service providers and subject matter specialists. It aims to improve access to education for autistic children and young people and support more positive outcomes for them in school and beyond.

AIS provides schools with information and tools to enhance their knowledge, skills and expertise on autism, so as to improve the capacity of school teams to support their autistic pupils by creating more inclusive learning environments.





Purpose

The design principles should be used by schools to consider how their premises might be modified in ways that will be beneficial to autistic pupils and the wider pupil population.

In creating and distributing the Autism Design Principles for Schools guidance, AIS is seeking to:

- Setablish a standard for good autism practice in the design of educational environments, with a focus on mainstream primary and secondary schools.
- Build upon good autism practice with the project participants, as well as inform and promote a long-term vision to sustainably share information and develop practice beyond the boundaries of the project.
- Meet the challenges of adapting existing school buildings and informing new builds.

More than a third of school buildings in England currently exceed their design lifespan. As such, effective adaptation offers a great level of achievable impact with respect to the volume of refurbishment work being completed on existing school buildings versus the number of new developments being funded.





Understanding Autism

Autism affects the way that a person communicates, interacts and experiences the world around them.

The AET approaches autism as a different way of being – as a difference, not a deficit. The Autistic Young Experts¹ state that:

"Autism is a difference not a deficit. Differences are to be valued not 'fixed'. My normal is different from your normal and the aim shouldn't be conformity but wellbeing."

This is not to suggest that autistic pupils do not experience significant barriers to learning and wellbeing, it is simply that those barriers are external – the sensory and social environment, inflexible systems, being misunderstood by others, etc.

Why Autism Is a Difference, Not a Deficit

Autistic pupils will have both strengths and support needs in each of the following three areas of difference. To receive a diagnosis of autism, these differences must have a significant impact on how they experience the world and engage with it.



The Three Areas of Difference





Social Understanding and Communication

Autistic people are often highly respectful of written rules. Rules provide them with clarity and consistency in an otherwise confusing world. Social rules, however, change constantly depending on context and are rarely written down. They are not written down because, for most neurotypical people², they are intrinsically understood. This may not be so for autistic people.

Autistic people have a preference for – and a strength in using – clear, direct language. They are often excellent communicators on topics that motivate them and have impressive vocabulary in those areas. However, they may be confused by some social communication conventions – particularly the use of non–verbal communication (such as facial expressions and body language) and indirect communication (such as sarcasm, teasing and idioms).







Flexibility, Information Processing and Understanding

This area of difference relates to:

Autistic people's preference for knowing what to expect, their tendency to thrive when following well established and clear routines, and to find change, particularly when unexpected, a barrier to wellbeing.

Passionate interests that are narrow and deep. Passionate interests are not simply hobbies for autistic people, they are fundamental to their identity and to their wellbeing. Inadequate access to these interests is one of the sources of poor mental wellbeing in the autistic population.

Differences in learning styles, such as:

Being strongly visual learners: processing, understanding and retaining information more readily if it is in a visual format.

Having a language processing delay. Often, they will come up with good responses to questions but may take considerably longer to do so.

- Having good long-term memory, particularly for facts and figures, but struggling with short-term working memory, which in turn may affect organisational skills.
- Being monotropic thinkers: capable of intense, focused attention, on topics of interest to them. However, struggling to either shift attention from one thing to another, or to divide their attention: for example, looking and listening at the same time.







Sensory Processing and Integration

Some autistic people experience hyper (over) sensitivity or hypo (under) sensitivity to everyday sights, sounds, smells, tastes and touches.

Where hypersensitivity is experienced, the natural response will be to avoid sensory input that can be aversive – for example, by flinching away when touched.

Where hyposensitivity is experienced, the natural response is to seek out sensory input – for example, by fidgeting or fiddling with objects, in order to gain sufficient sensory feedback to feel comfortable in their own bodies.

Most autistic people will experience both hypersensitivity and hyposensitivity. These may fluctuate depending on factors such as mood, expectations and environment.

All autistic people share the core differences identified, but how those differences impact an autistic individual will vary significantly.

We need to understand autistic pupils as unique individuals, with unique profiles of strengths, talents, interests and challenges.





Autistic Fatigue and Burnout

The school environment can be a demanding space to inhabit and a challenging one to navigate for autistic pupils.

The day-to-day routine associated with attending school can contribute to mental, physical and sensory exhaustion. Over a prolonged period of time, this fatigue – and the pressures associated with managing the circumstances underlying it – can lead on to a more sustained exhaustion, or burnout, affecting all aspects of a person's life.

Autistic fatigue can be brought about by	Characteristics of autistic burnout include
Sensory overload.	Increased sensitivity to sensory input.
Or Changes to routine.	Or Physical pain and headaches.
Regular demands or challenges associated with social situations.	Or Physically shutting down (including the loss of speech).
Camouflaging one's autism (masking).	
Suppression of stimming ³ .	



Legislation and Guidance

There is legislation and government guidance in place to promote the delivery of an equal, safe and supported learning environment for autistic pupils.

- Autism Act 2009

The Autism Act 2009 places a legal duty on the Government to have an autism strategy dedicated to improving support and services for autistic people, and to provide guidance and improve the provision of relevant services by local authorities, NHS bodies and NHS foundation trusts.

• The national strategy for autistic children, young people and adults: 2021 to 2026

In 2021, the Government published an updated autism strategy for 2021–26. The strategy includes children and young people alongside adults for the first time and focuses on:

- Improving understanding and acceptance of autism within society.
- 🧭 Improving autistic children and young people's access to education and supporting positive transitions into adulthood.
- Supporting more autistic people into employment.
- 🧭 Tackling health and care inequalities for autistic people
- \Im Building the right support in the community and supporting people in inpatient care.
- Improving support within the criminal and youth justice systems.



Building Bulletin 102 (BB102)

Building Bulletin 102 provided non-statutory guidance on designing and planning accommodation in both mainstream and special educational needs (SEN) schools to provide a suitable environment for disabled and SEN children, including autistic pupils, in England. It was influenced by the Children's Act 2004.

• Building Bulletin 104 (BB104)

Building Bulletin 104 was published in 2015 and superseded BB102. It provides non-statutory guidance for the development of appropriate learning environments that will enhance and support the education of disabled and SEN children, including autistic pupils, mainstream and SEN schools.

Part A provides floor area requirements for buildings for primary and secondary schools.

Part B provides guidance on the site area requirements for special schools, as well as alternative provision (AP), special resourced provision (SRP) and designated units.

Building Bulletin publications are directed at education advisers, architects and designers. They may also be useful to building contractors on school building projects, setting leaders and managers in other children's service to deliver a more inclusive environment for all by focusing on the following areas:

- Background and briefing.
- **S** The design approach.
- 장 Designing spaces.
- 🧿 Detail development.



Legislation and Guidance

PAS 6463:2022 Design for the mind – Neurodiversity and the built environment

PAS 6463 was published by the British Standard Institute (BSI). It provides guidance on designing the built environment to include the needs of people who experience sensory or processing differences and encompasses a wide range of conditions. These include autism, attention deficit hyperactivity disorder (ADHD), dyslexia and dyspraxia.

The document covers buildings and external spaces for public and commercial use, along with residential accommodation for independent or supported living. This reflects a commitment to ensuring that all users are considered when creating buildings or spaces, with input from subject experts and people with lived experience.

The document features technical guidance on acoustics, lighting, thermal comfort and wayfinding, providing information on creating accessible and comfortable built environments. It has been published to help organisations meet legal and social obligations, including under the Equality Act 2010 and Autism Act 2009, as well as Article 9 in the UN Convention on the Rights of Persons with Disabilities.

PAS 6463 does not cover the more complex requirements of SEN schools.





Autism Design Principles for Schools

Inclusion by Design

When designing the school environment, it is critical to have a clear understanding of the needs of autistic pupils and the dynamics of the learning environment. A successful space is one that is suitable for both autistic pupils and the school's pupil population as a whole.

The concept of the autism design principles is to deliver a calming environment for autistic pupils. Such an environment supports productive learning and improved wellbeing as it has identified sources of challenge and reduced the prospect of overload. In addition, it is not a space that has been artificially over-designed to leave autistic pupils removed from their wider surroundings or unable to interact with their peers.

- Valuing Voice

The autism design principles have been determined through consultation with autistic people, their families and educators in the process of designing educational facilities. Observing and engaging with autistic pupils has been central in understanding the factors that have a meaningful impact in the delivery of an autism–friendly education environment. This knowledge has facilitated the development of the following eight principles that are critical to the design and delivery of good learning environments for autistic pupils.





Autism Design Principles for Schools







Simple Geography

Simple Geography

Autism Design Principles for Schools

A Clear and Consistent Layout

When looking to create an autism-friendly school environment, begin by establishing a clear and consistent layout for users to navigate. Seek to involve autistic pupils and design experts in participatory design sessions to gain their input on what this might look like in your space.

Avoid linear corridors with abrupt directional changes where possible. These spaces can contribute to the feeling of being restricted, especially during lesson changes when they become crowded and there is little opportunity to pause or retreat from the increased hustle and bustle.

It is important to avoid sharp and harsh angled walls and introduce soft curved walls, as these help to navigate a person from one area to another in a more natural way.

Hallways, lobby areas and other transitional spaces within the built environment can contribute to a low-arousal navigation route by reducing potential triggers for sensory overload. A space that is wide and designed to incorporate seating as a quiet retreat will be useful in transition.

Concept Respite Centre Plan: Example of a Simple Layout and Circulation







Straightforward Wayfinding

Wayfinding is an important element in building design because it employs the visual elements of signage, simple graphics and colour to help an individual navigate a space.

This can help the user to learn about their surroundings and better understand the function of a space or building. It can aid the flow of people through a building, encourage social distancing and improve the user's experience of a space, contributing to their overall sense of wellbeing and security.

There are four types of wayfinding signage that can be especially useful navigational aids for autistic pupils in educational buildings:

Identification

This signage can confirm when the person has arrived at their location. As such, identification signage should be simple. It may highlight classrooms or a structure, pinpointing the user's location on a map.

Directional

This signage supports the user to navigate from one place to another. Effective directional signage can help reduce pedestrian traffic at peak times – for example, when pupils are moving between classes – by helping to maintain order in movement and reduce bottlenecking.

· Informational

This signage provides the user with information about specific facilities, including entrances and exits, lifts, stairs and toilet locations. Information signs or symbols should be visually accessible and not abstract.

Regulatory

This form of signage focuses on safety standards and reinforces the rules and regulations associated with a space. It sets boundaries for everyone accessing the school environment.





Good Proxemics



Autism Design Principles for Schools

What is Proxemics?

Proxemics is the study of personal space and the impact personal space has on non-verbal communication, social interaction and behaviour.

There are four main proxemics zones:

Intimate space (touch–45 centimetres)

Is a distance of close physical contact. This usually involves intimate conversations or haptic communication between family members or people in intimate relationships.

- Social space (1.2 metres-3.6 metres)

Is a neutral space that strangers feel comfortable in during initial interaction. This space is suitable for teaching or a classroom interaction between pupils and practitioners.

Personal space (45 centimetres-1.2 metres) -

Is a distance best suited to creating rapport and developing relationships safely without heightened anxiety. It might be seen when a practitioner and pupil are discussing personal issues.

- Public space (3.6 metres-7.6 metres)

Is a neutral distance with no interaction between pupils and practitioners. It is not conducive to creating an effective learning environment as the distance can lead to distraction.





Good Proxemics

Autism Design Principles for Schools

Autistic pupils can experience anxiety resulting from their spatial surroundings. As such, a good educational environment will seek to reduce the potential for escalation by:

- Oesigning out the scenarios that lead to crowded spaces without the option of removing oneself easily and quickly.
- Using lighting and shading to help define the relationship between the space and the individual.
- Creating seating areas within circulation spaces, to help redefine the space from social to personal.
- Featuring a quiet space or sensory room to provide sanctuary and an opportunity to reset (including customisable lighting, soundproofing and room for movement).

Acland Burghley School: Example of a Good Proxemics Plan







Low-Arousal Colours



Low–Arousal Colours

Autism Design Principles for Schools

The Importance of Colour

Colour plays an important role in the creation of a low–arousal environment, as we are constantly reacting to it in both the natural world and our built environment.

Proxemics and spatial comfort levels are influenced by colour. GA Architects, in collaboration with the Design Research Centre (DRC) at Kingston University London, conducted research into the development of an autism–friendly colour palette for schools and residential environments. Their report concluded that autistic pupils preferred colours that were subtle (those that have grey undertones) with a preference for colours in the blue/green hue range. This included muted colours for material finishes for walls, floors and soft furnishings, as this helped reduce overstimulation and hypersensitivity by creating a more comfortable environment in which to work.

The use of strong primary colours and bold patterns is not recommended. In particular, the colours red and yellow should be avoided as they can impact on autistic pupils' sensory experience of a space, often being perceived as fluorescent and high–energy colours.







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centres.

Colour Specification



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Low–Arousal Colours

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Checklist

- Soft pastel colours are generally more suitable in creating autism-friendly environments.
- Avoid primary colours.
- Always review the colour palette in both daylight and under artificial lighting to confirm its suitability for the space. The lighting conditions, room shape and design influence colour perception.
- Solution and wayfinding.
- Specify subtle, low-arousal colours when decorating large spaces such as walls.
- Create a harmonious space by avoiding patterned floor and wallpaper finishes.
- Choose a matte and non-reflective finish.
- Soft block colours with plain designs are suitable for soft furnishings.

TCES School Construction: Sensory Room Soft Pink



Acland Burghley School Common Room: Plain Low–Arousal Colours







Good Acoustics



Creating Calming Spaces

Creating a calm environment using sound-absorbent materials is an essential consideration when designing learning spaces for autistic pupils.

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Hypersensitivity to sound is common among autistic pupils. Sound can be a source of distress and heighten anxiety. Whilst excessive volume can be problematic, it is also important not to create completely soundproof spaces (autistic pupils will need to access social spaces where soundproofing is not possible).

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Having a clear understanding of your buildings' existing noise conditions is an important starting point in designing out sounds which may be uncomfortable or provide a distraction from learning. A noise site survey will determine the prevailing noise climate around the building as well as the noise levels internally.

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It is important to review your acoustic solution against existing legislation and guidance, such as the building regulations Approved Document E and Building Bulletin 93 (BB93), although the requirements for autistic pupils will vary and go beyond the BB93 method of simply enhancing the base criteria.

It is advisable to consider the application of both BB93 sound insulation and internal ambient noise level (IANL) design criteria to classrooms dues to the potential acoustic sensitivities of autistic pupils.

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Successful delivery of a low-arousal acoustic space takes into consideration the impact of any upgrade to the external building fabric, the internal separating elements (such as partitions and floors) and the control of reverberation has on the environment. It is important to use Class A acoustic absorbent treatments to the ceiling, walls and floors. Timber can be specified if it forms part of an acoustic system such as ceiling boards.



Avoid the specification of hard materials that reflect sounds such as marble, granite, smooth concrete, plaster finish, metal and plastic. Carpets are a good sound absorbent for learning spaces, although hygiene and cleaning maintenance can prove more problematic and so a good acoustic vinyl flooring is also recommended.



) Good Acoustics

Autism Design Principles for Schools



Sunfield School: Acoustic Timber Ceiling Detail



TCES School: Acoustic Wall Lining and Carpet



TCES School: External Fabric and Internal Acoustic Treatment

Facade Construction

Consider acoustic drylining using metal stud to the internal face.

The age of the building will determine the level of upgrade as traditional cavity masonry or hybrid masonry and lightweight systems are likely to meet the required performance.



TCES School Facade Detail: Acoustic Treatment





Good Acoustics

Autism Design Principles for Schools

Glazing

Thermal double glazing with a performance of $\geq Rw$ (weighted sound reduction index) 30 decibels (dB) should be installed to achieve the IANL classroom criterion specified in BB93.

Secondary glazing can be used if the building is listed and the windows cannot be upgraded.



TCES School Facade Detail: Acoustic Treatment

Ventilation Strategy (Natural or Mechanical)

Measured noise levels determine whether a space is naturally ventilated.

Mechanical services will need to be designed such that the resultant noise levels of the services, combined with the IANL from external noise sources, do not exceed the required internal noise levels.

Mitigating strategies for the transfer of sound from the external environment and mechanical equipment, such as mechanical ventilation with heat recovery (MVHR), should be implemented.



TCES School Mechanical Services: Acoustic Treatment



Good Acoustics

Autism Design Principles for Schools

Pitched Roof

Consider reverberation control treatment in combination with roof tiles, mineral wool insulation and solid plasterboard ceilings to mitigate noise ingress and the control of rainfall noise.

Upgrade to meet the BB93 rainfall noise protections where required.



TCES School Roof Detail: Reverberation Control



TCES School: Acoustic Treatment Construction

Reverberation Treatment

The treatment of reverberation is equally as important as soundproofing. Sound reverberation is the reflection of sounds bouncing off a surface "echo". The reverberation impacts on sound intelligibility, which can make it more difficult to focus on a conversation.

Doorsets for classrooms and specialist teaching rooms should achieve a performance of Rw 35 dB to SEN spaces.



Phoenix School: Reverberation Details





Subtle Lighting



Autism Design Principles for Schools

Access to Daylight

Access to daylight is important as it helps to regulate the body's biorhythm and sleep cycle. This can support improved cognition and have a positive effect on mental health and physical wellbeing. It also offers a positive visual connection to the world outside whilst providing suitable light for working and reading.

Indirect natural sunlight is best suited to a classroom environment. A glare-free, naturally-lit classroom can offer a more comfortable environment for autistic pupils with a sensitivity to light.

Rooflights provide a higher wall luminance compared to facade windows and reduce the risk of glare, whilst high level windows ensure lighting is adequate but not overwhelming by reducing brightness levels and glare on desks and workstations.



New Barn School: Detail of Canopy and High Level Glazing



New Barn School: Full Height and Raised Windows with Locks

Artificial Lighting

For autistic pupils with a sensitivity to light, the classrooms and corridors of the school environment can be challenging to work in and to traverse.

The appropriate use of artificial lighting is important in creating a more autism–friendly environment. This is because the type of lighting used (such as incandescent, fluorescent or light emitting diode (LED) lighting), alongside the intensity and uniformity of light, influences our spatial and colour perception. An inadequate lighting design can contribute to disinterest or disorientation.

Fluorescent lighting should be avoided where possible because of its harsh and bright quality. It can flicker up to 100 times a second and emit an audible humming. The use of light covers or diffusers can reduce the bright glare and shield the flickering.

LED lighting can be used to create a calmer learning environment. This form of lighting is typically more energy efficient and does not emit ultraviolet light, unlike florescent lighting.

Dimmable LED lighting can be used for scene-setting in classrooms, as well as sensory rooms, and create a focus on learning or stress reduction if required. Educational settings should specify adjustable natural white 4000–4500K (colour temperature in degrees kelvin) or daylight white 6000–6500K LED colours.





Autism Design Principles for Schools





Acland Burghley School: Lighting Section





Design for Safety

Design for Safety

Autism Design Principles for Schools

The school environment can be a source of anxiety for autistic pupils and present challenges in allowing them to express and manage their needs in safe and secure ways. With this in mind, it is important to develop an environment that reduces the opportunity for distressed or dysregulated behaviour⁴ to lead to harm.

Safety precautions such as choosing anti-ligature ironmongery (including locks, bolts and latches) should be considered, as well as using building automation systems for facilities control (including heating, cooling and lighting) to manage control over the environment and its sensory characteristics.

TCES School Classroom: Design for Safety







Autism Design Principles for Schools

Heating Elements

The installation of underfloor heating is preferable to radiators.

The upgrade of the existing radiators to a low surface temperature (LST) radiator with a maximum surface temperature of 430 degrees celsius within an insulating case prevents access to the element.

Access to Openings

Access to windows should be lockable with a universal key and staff controlled. This will help prevent incidents of autistic pupils removing themselves from a distressing situation or environment without the awareness of staff.

Consider the installation of a Secured by Design⁵ accredited secondary glazing system with a tamper-proof flush lock that is difficult to pick and open. The secondary glazing improves the acoustics of the room, especially if the building is listed or lies in a conservation area. Automated rooflights and high level windows reduce the likelihood of a pupil climbing out of the window. Upgrade existing windows with anti-ligature handles and restrictors which can be controlled by staff.

In addition, the use of integral blinds can control glare and removes cords.

Furniture, Fixtures and Equipment (FF&E) Specifications

The specification and procurement of FF&E items is an important component in creating a more autism–friendly environment. As such, it is important to always consider the health and safety risks of any proposals, along with future furnishing requirements.

Lighting

Lighting should be dimmable with automated controls. It should feature flush to the ceiling or wall, with no visible screws – some autistic pupils may find these engaging.





Autism Design Principles for Schools

Sockets and Switches

Ensure that any sockets and switches are tamper-proof, with a screwless design and child-resistant specification that is designed to inhibit access to the electrical supply.

Glazing

To enhance safety, all glazing should be made with toughened laminated glass which is five times stronger than clear floating glass and reduces the risk of injury if damage occurs. The structure is kept intact due to the combination of the glass and interlayers of plastic.

Doors

Solid particle doors should feature concealed lippings which cannot be unravelled. The doors should also be chemical and water resistant.

Wall and Floor Finishes

Internal walls and partitions should be robust and feature impact-resistant plasterboard with sealed coved skirtings for protection.

Vision Panel Detail







Unobtrusive Supervision



Unobtrusive Supervision

Autism Design Principles for Schools

The safeguarding of autistic pupils is imperative, and a sympathetic planning approach and design can ensure that supervision does not feel overly institutionalised or clinical for practitioners and pupils:

- A curved circulation design supports clear visual processing and assists independent and safe transition from one space to the next.
- A curved wall creates clear sight lines within the building without "dead corners", obstructive corners and hidden doorways.
- The use of vision panels in doors allows for subtle observation whilst also allowing autistic pupils to observe and process the space that they are entering into or exiting from, supporting them to access spaces in a controlled manner.
- Having clear views of the outdoors, and controlled access to the outdoors, can reduce the risk of a pupil leaving of their own accord (as the space they are occupying may feel less restrictive).
- A design that creates a single storey learning environment is easier to maintain and supervise. It enables a dynamic connection with the outside world.
- The inclusion of robust furniture and fittings that cannot be easily picked apart, such as screwless fittings, fixed furniture and tough anti-ligature ironmongery, contribute to creating a safe space and reduce the need for indiscreet oversight.

Concept Study of Curved Corridor







Promote Sustainability



Promote Sustainability

Autism Design Principles for Schools

Healthy Buildings

A healthy environment is central to supporting development, reducing absence and improving function, focus and productivity among the occupants of a building.

The design of a healthy building should have the wellbeing of its occupants at its core, allowing them to engage physically, socially and have a connection to nature.

Sustainable buildings usually have better indoor air quality and low exposure to harmful chemicals caused by the release of volatile organic compounds (VOC) toxins into the air. Specify sustainable building materials free from toxic substances and which incorporates green building materials and techniques where possible. Any mechanical ventilation system should have good air filtration to reduce the accumulation of pollutants.

Good indoor environmental quality can be developed by providing plenty of natural daylight and reducing noise pollution, which helps to maintain a comfortable and productive environment.

The development of a good building maintenance plan that is understood by staff, and includes cleaning and inspections strategies, will maintain the robustness and longevity of the building.

Specification

The inclusion of a sensory garden in your premises contributes to promoting a more holistic learning environment.

Access to a green space or sensory garden is an important, yet often sidelined, feature that provides autistic pupils the opportunity to engage with the natural world, to exercise and de-escalate in a safe and controlled way. It also allows pupils to socialise and to develop their senses.



Sensory Garden Concept



Promote Sustainability

Autism Design Principles for Schools

A good sensory garden design should:

- Allow for visual stimulation with the incorporation of colours across soft and hard landscaping elements. It should avoid bright primary colours in clustered spaces.
- Create a balance of audio stimulation by offering areas that are tranquil whilst including elements that produce distinct and potentially soothing sounds such as wind chimes, water features or planting that interacts with the wind – for example, bamboo, leafy plants and grasses.
- Feature scent in design, with complimentary plants grouped by their strength of smell.

Consider the changing seasons with regard to the sense of smell – for example, lemon balm, honeysuckle and cosmos for the summer months.

Offer an opportunity to stimulate taste receptors in a controlled way. This can be achieved by the inclusion of edible plants in the garden to support exposure to and understanding of taste and texture.

It is important that all the plants are non-toxic if eaten inadvertently. With this in mind, consider including common fruit trees in your garden design alongside evergreen and perennial planting such as lavender, tomatoes, strawberries, mint and other herbs.

Feature plants that have a variety of textures. Plants such as Jerusalem sage have moss-like soft and spongy surfaces, whilst yellow sage has a more sticky, prickly and wrinkled consistency.

Sensory Garden Concept





Birkbeck Primary School

Birkbeck Primary School is a three form entry primary school, reception and nursery located in Sidcup, Bexley, London. The setting includes 21 classrooms and a nursery class and has a total of 511 pupils on roll. It features a forest school as well as an outdoor play and learning (OPAL) programme.

The school includes provision for autistic pupils. All staff are responsible for identifying pupils with SEN, whilst the class teacher has overall responsibility for ensuring all pupils with SEN, including autistic pupils, have an inclusive experience of the curriculum.

The school has mixed-age building stock, with the most recent extension and renovation project completed in 2020.

Design Analysis of a Key Stage 2 (Year 6) Classroom

The focus of this study was to choose a space in either the existing building or the recent extension and to examine whether it met the needs of autistic pupils.

A Year 6 classroom was identified as the space to be assessed during an initial site visit by GA Architects. The classroom is located on the first floor of the extension.

The assessment was carried out in two parts. The first was a site-specific workshop that took place within the classroom with seven autistic pupils from Year 5 to gauge their perspectives on the classroom. The second part was an analysis of the classroom from an autism design perspective, taking into account the feedback from pupils and their teachers.



Workshop with Year 5 Autistic Pupils

The workshop started with an observational mind-mapping exercise.

The pupils were supported to evaluate the space taking into consideration:

- Y The overall design of the classroom (including the layout).
- 🔗 Material finishes (ceiling, walls and floor).
- Fixtures and fittings.

The mind-mapping session ascertained what the pupils liked and disliked about the classroom in its existing specification:

Likes	Dislikes	
Views out of the large windows.	Ine perforated ceiling boards.	
🧭 The pitched roof design.	🧭 The plain white walls.	
Or The rooflight and high level window (looking at the sky).	🧭 The hanging lights.	
🔗 The colour "statement" wall.	🧭 The dark carpets.	
♂ The hanging lights.	Being able to see friends outside whilst not being able to join in (distracting whilst in class).	



The second part of the workshop involved a creative session during which the pupils thought about improvements that could be made to the classroom and created individual moodboards based on their proposals.

To enable this, the pupils were supplied with paper copies of two-dimensional plans of the classroom, examples of typical classroom furniture, samples of material finishes and colour samples.

Montage of the Workshop





Moodboard Analysis

- 🧭 Colours to the walls were universal.
- Colour to the ceiling board without the perforations.
- All the pupils chose pastel colours.
- 🚫 Light coloured carpets.
- Association of colours with nature blue clouds and green grass.
- 🧭 Timber flooring.
- Soft, fluffy carpets.
- Surface mounted lighting.
- 🧭 Round lighting.
- Flexible seating formation based on their friendship groups.

Materials Concepts

















Architect's Overview

The pitched volume of the space provides an example of good proxemics. There is a good level of natural daylight in the space and a connection to the natural world outside via the rooflight and clerestory windows. In combination with the full height glazed facade windows, this allows for maximum daylight.

Some aspects of the classroom's design do not deliver a low-arousal learning environment and overlook the needs of autistic pupils. This was the result of a lack of engagement with relevant education stakeholders in the planning phase, including the SEN Manager.

Observations

- 🔗 The classroom is assumed to be mechanically ventilated but there is an issue with overheating the room gets hot and stuffy.
- Y The circular perforations on the acoustic ceiling boards form a busy pattern that can be distracting for autistic pupils.
- Solution The cold white walls are not conducive to creating a low-arousal environment.
- Intere are no blackout blinds on the high level window so it will not be possible to create flexible sensory environments.
- The facade glazing is a distraction to pupils when they are being taught, as they have a clear view of the outside; pulling the blinds down will impact on the indoor light quality.
- 🧭 There is a lack of built-in storage.
- $ec{\mathcal{Y}}$ The blinds may present a safety issue (they are not anti-ligature blinds).



Proposal

1. Acoustic ceiling tiles	2. Openable rooflights and high level windows
 A simple non-perforated surface. Smooth matte surface with high reflection and light diffusion. Robust material that is anti-static and which withstands dirt to create a comfortable indoor environment. 	 Automated opening rooflights that are controlled as part of a smart ventilation system or by an individual. An automated system will remove the risk of autistic pupils accessing the opening and closing mechanism. The controlled opening also helps with ventilation, air quality and the management of odours and fragrance within the space.
3. Ceiling lights	4. Motorised blinds
 Recessed LED lighting with no visible screws. Surface mounted LED lighting with no visible screws. 	 A motorised cassette blind system with no visible cord or access to the blind structure. Combined blackout and glare control blind.



5. Built–in storage seating

- Fixed seating and storage to remove visible clutter, reduce visual distractions and contribute to a low-arousal environment conducive to learning and comfort.
- Bench seating to be used for storage and space for pupils to have time out.

6. Floor finish

- Choose a lighter carpet colour that is sound absorbent and that can easily be cleaned.
- An acoustic vinyl sheet, or tiles that can withstand heavy duty cleaning products such as bleach, are good alternatives to carpet.

7. Kitchen units

- I Heavy duty units with strong steel runners.
- Anti-ligature handles.
- Full overlay mounting hinges that allow the door to be fully opened and lay flat against the adjacent unit and prevents the door from being pulled off.
- Socket and switches with no visible screws that the pupils can access.
- 🔗 Choose lockable units either as a key or star key.
- 🧭 Low-arousal colour palette.







Autism Education Trust

Proposal Components

Langdon Park School

Langdon Park School is a community co-educational mainstream secondary and sixth form school located in Poplar, Tower Hamlets, London.

The school has an intake age range of 11 to 18 years old. It has 1,077 pupils on roll. It is part of the Teach East London Teaching School Alliance (TELTSA) programme.

The school's premises include a four storey Edwardian building and a sensory garden to the north-west of the site.

The school has a Special educational needs coordinator (SENCO) who is responsible for the day-to-day running of its SEN provision and working to ensure that there is equal access to educational development opportunities for all pupils.

The focus of this study was how best to upgrade the sensory garden, which features in a central location within the school's grounds, to meet the needs of the autistic pupils who have sole use of the garden.

Map of Langdon Park School





Design Analysis of a Sensory Garden

The sensory garden is an open and accessible area which is flanked on the corner of Hay Currie Street and Bright Street, with Langdon Park Docklands Light Railway Station to the west and Langdon Park to the north. The workshop group of seven were all Year 9 pupils and consisted of five autistic pupils and two neurotypical pupils.

The study was carried out in two parts. The first was a site visit to the sensory garden. This was followed by a mind-mapping session analysing the positives and negatives of the space at present and producing an alternative design based on how pupils would like to use the sensory garden.

Workshop with Year 9 Pupils

The first part of the workshop involved a group trip to the sensory garden. The participating pupils were provided with a copy of the existing plans to support their understanding of the relationship between the two-dimensional drawing of the space and its three-dimensional reality.

The pupils were supported to evaluate the sensory garden taking into consideration:

- 🧭 Design and layout.
- Material finishes.
- 🏹 Planting.
- 🧭 Fixtures and fittings.

A mind-mapping session ascertained what the pupils liked and disliked about the space:



Likes

🔗 The openness.

- 🔗 Bench and tree location (for shading).
- 🔗 The scented lavender flowers in the beds.
- 🔗 The colour "statement" wall.
- 🔗 The hanging lights.

Dislikes

- 🔗 The limited selection of plants.
- Hard landscaping (considered a trip hazard).
- 🔗 Too many hard surfaces.
- 🧭 A lack of opportunity for jogging.
- \bigcirc A lack of activities and play equipment.
- 🔗 It is not a fun space (a lack of sensory experiences).
- 🧭 It is not obvious that the garden is just for autistic pupils.

Pupils' Sensory Garden Concepts

















Architect's Overview

Observations

- The garden feels exposed with the majority of the trees and shrubs to the fence boundary which makes it difficult to navigate.
- The design is based on a grid system with straight paths, which does not create a natural movement through the space.
- It is difficult to distinguish between the foreground and background as the design is fairly standardised.
- The layout and flow of the garden feels unintuitive as there are limited transitional spaces within the garden (the options are either rectangular patches of grass or pavers).
- There is minimal shading to the seating zones. The Learning Block and a single tree provides shading which reduces the use of the garden during the hot summer months.
- There are no defined zones for different activities such as running, a sensory play zone or a quiet space which can support emotional regulation.
- The raised planter provides sensory planting, featuring lavender plants and herbs.

Sensory Garden Concept Plan





Proposal

The sensory garden should serve as a tool to help with the development of pupils' physical, social, emotional and sensory wellbeing through the engagement of their sensory systems. It should enable autistic pupils to interact with nature and support their sensory regulation, being beneficial for pupils experiencing both hyper and hyposensitivities:

- Create a trail close to the perimeter using painted markings to produce a more structured environment. This will create an opportunity for proprioceptive stimulation for hyposensitive pupils.
- Add a palette of plants and flowers grouped according to textures and scent. Include a wild garden. Raised vegetable beds can provide autistic pupils with a means to stimulate the sense of touch through planting, pruning and picking.

- Provide covered areas within the garden. This will encourage autistic pupils to use the space throughout the year and provide a place for quiet contemplation and the opportunity to observe their surroundings regardless of the weather.
- Provide curved seating in different locations to enable autistic pupils an opportunity to socialise whilst also allowing them to regulate and refocus. The provision of a selection of play structures will encourage pupils to play independently and can be a used to create a point of interest to explore.
- **Introduce a safe water feature** to allow autistic pupils to interact with the environment through touch or sound.









Concept View from South West Corner



Summary

This guidance document has set out a series of eight design principles to support mainstream schools in creating more inclusive learning environments for their autistic pupils.

The Autism Design Principles for Schools guidance should be considered by school leaders, practitioners and other stakeholders when embarking on projects to renovate their existing educational spaces or in planning for and commissioning new spaces to be built. This will support more productive learning and improved wellbeing for autistic pupils and others accessing these spaces.





Glossary of Terms

- ¹The AET's <u>Autistic Young Experts Panel</u> are a group of 16 to 25-year-olds, who add their voices and life experiences to all AET projects and have input into AET strategy.
- ²Neurotypical describes someone not displaying or characterised by autistic or other neurologically atypical patterns of thought or behaviour.
- ³ Stimming refers to the self-regulating and self-soothing behaviours that an autistic person uses to calm their anxiety, sense of being overwhelmed or adaptation to an unfamiliar environment.
- ⁴Distressed behaviours are the stress response of an autistic individual who is experiencing extreme overwhelm. This can be referred to as "overwhelm" and "sensory overload". It is not a tantrum. These can be displayed as a "fight", "flight", "freeze" and "fawn" behaviours.
- ⁵ <u>Secured by Design</u> is a police security initiative relating to improving the security of buildings and their immediate surroundings. It includes a product based accreditation scheme (the police preferred specification) which provides standards for security products.



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