



How can the design of schools be more inclusive?

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Introduction

Over the past few years, everyday my Mum would come back home with stories about her job: a teaching assistant at Sunny Bank Primary School. More specifically, the satellite school that is attached to the mainstream site. Her stories would always describe how her days could go from the most extreme to the calmest, but she would always enjoy them because “each day is different”, which is what she always says.

She transferred to the satellite school last year, the purpose is to help selected disabled children have the opportunity to integrate with students from a mainstream education. Still working as a teaching assistant at this new site, she still comes home and tells me these stories, they always seemed unrealistic especially when she would tell me some examples of extreme behaviours of the children. A lot of the time, she would talk about the difficulty of the transfer and where they are placed in the school, what teachers help out. Which teachers don't and what kind of support they get. One key moment I remember, is how their students are still separated within the school in terms of classroom placement.

This always had me wondering, is this separation still necessary? Our world has developed from a point where dehumanization was extremely common for disabled children, especially in orphanages where children were degraded for having a disability, in nineteenth century Europe (Karten, 2008:3). Now, our world has progressed where disability has become much more inclusive and more known about. Special needs schools were designed to give disabled children an opportunity to have an education as well as some social skills, which some may lack due to their personal disability. However, it is clear that there are still some separations, but why?



Fig. 1 *Building in Sunny Bank (2023)*

One thing that comes to mind to answer the ‘why’, is the design of a classroom. Through my growing interest in interior design, I think it will be fascinating to conduct research on whether or not design has an important factor in the inclusivity of disabled children in classrooms. Exploring the possibilities on whether or not all classrooms are designed with the same considerations is a key factor in exploration of inclusivity. How can a child with ADHD be affected by classroom design? If there is an affect, then is being taught in a mainstream school suitable enough for their education and personal well-being?

With these considerations in mind, then do these separations still need to exist? And is there a possibility that non- disabled children and disabled children can be taught together and has it been done before?

Using Sunny Bank Primary School as a case study, I want to research into the differences of a mainstream school and special needs school and understand the possibilities of the children learning together. How design can support education for these children will be a main focus throughout this investigation, whilst also acknowledging that there are other factors that may be going towards the separation of these students. Highlighting the differences and similarities between the two types of schools: mainstream school and satellite school, will help support the argument.

Chapter 01: Research

1.1 How has our education evolved?

To understand the inclusion of a classroom today, before researching into Sunny Bank, I believe it is important to understand how educational inclusion has changed over-time and to know what it was like for a child with disabilities in a classroom before protection laws for disabilities were legislated.



Fig. 2 Being cured for blindness (1300-25)

When doing my research, a key factor I felt was important was the labelling of disabilities during the Middle Ages. The church and religious beliefs had so much power over what was thought by people, so labelling disability as God's punishment would have degraded disabled people greatly (Snelson and Lingard, 2018:25). This form of segregation would continue for decades, especially in classrooms. Before the 1870s, in America, children who were deemed unfit to be in a mainstream school setting were to be separated and taught in a different classroom. Students who were unfit, during this time, would often have disabilities such as hearing and vision loss, physical impairments, or mental problems (Handler, 2007). However, in the UK, religious power was still dominant for the understanding of disabilities before the 1870s. Disabled children only had access to a basic education where they were instead taught in a workhouse (Armstrong, 2007, 554).

After the 1870's, teachers who had been trained were to teach those who were 'disruptive' in mainstream schooling. The term 'disruptive' is interesting to me, as in the educational institutions eyes this is what contributed to being disabled and what helped them justify why they should be taught separately (Handler, 2007). Although the term 'disruptive' is no longer used as an excuse for exclusion, I can start seeing where the separate teachings in today's society has come from.

Looking into legislations in the UK, the first signs of inclusion became apparent in the 1944 Educational Act. The act makes it clear that schools should supply for disabled students by providing special schools or specific treatment that is needed for the student's personal disability. This was put into place for primary and secondary schools. The next disability act was formed in 2001 which was called the Special Needs and Disability Act. This act identified the term 'mainstream school' which is a term I will be using a lot throughout. This act states that children can be taught in mainstream education unless a parent state otherwise or the school cannot supply facilities to help disabled children to be educated properly. If either of these factors occur, then the child is applicable to be taught in a special needs school. The difference in these acts shows the progress of having a choice and allowing a child to go to either a special needs school or a mainstream school is an important decision to make, especially for a parent. Discrimination against children with disabilities is no longer prohibited within an educational and work setting, according to the Equality Act (2010).

After reviewing the history of our education in response to disabled children, I can now understand that the purpose of Sunny Bank and satellite schools in general and how they become important for children with extreme disabilities to become involved with those without disabilities. It also highlights the importance of a teacher's role and that there was specific training that a teacher had to go through in order to teach disabled children.

1.2 The research of teachers

During my historical research, I discovered the importance of a teacher's role for disabilities. Not only this, but through the lens of a teaching assistant, I get to listen about the days that my Mum experiences which is what initially inspired me to research this topic. I made me realise how significant teachers can be for development and educational skills as well.

After this realisation, I decided that research on teachers would be important in discovering how to make our classrooms more inclusive. I initially conducted general research into inclusivity of classrooms and discovered different factors that can contribute to the exclusion of disability in design. I will discuss, in detail, these factors throughout my analysis.

Using these factors as a basis, I wrote a questionnaire to be answered anonymously by teachers and teaching assistants of the satellite and mainstream section within Sunny Bank. Each question delves into each factor in different forms, and I will reflect on these answers throughout chapter 02 and 03, as well as using research from books and journals to set out a basis for my findings.

Furthermore, I will also visit Sunny Bank school and measure classrooms as well as form my own opinions on the design. Through what I have learnt in interior architecture, spatial movement is significant for design and could play a vital role in design for children with disabilities. Therefore, I will create a series of diagramming for spatial movement and furniture movement.

1.3 Theories.

Before starting my initial research into inclusive classrooms, I searched for books and journals that supported my beginning knowledge of this topic, based on what I knew from my Mum's work.

From my knowledge of my Mum's classrooms colours (green and beige), I began research on colour theories and how certain colours can affect different people. For example, in an article I read it stated that the colour blue is almost assumed by everyone to be a calming colour and, therefore, has found its way in a lot of designs (Divers, 2023:445). However, Tobias Banaschewski et al (2006), completed some research into colour theory and how it can affect children with ADHD. Through his own research on the brain of ADHD people, he concluded that if the dopamine levels/systems in people with ADHD were different than those without, it can alter the perception of colour and colour naming (Banaschewski et al, 2006:568).

He then conducted his own research where he had thirteen children from primary schools, without any diagnosis, and fourteen children with ADHD, complete a series of tests, including IQ tests and colour naming (Banaschewski et al, 2006:569). Personally, I enjoyed reading his research because his initial statements of struggles with blue and yellow colours ended up being proven as there were more struggles within the colour perception tests from ADHD children, specifically within those colour spectrums (Banaschewski et al, 2006:570). This research alone is enough evidence for me to start seeing why designing inclusive classrooms is important. Although I would have liked to see this research be spread amongst other groups of people (maybe children or adults with autism), this small part of research can be implemented to help colour design and stop the assumption that blue is a calming colour.

Table 1 Sample description and results

| Measure | Controls (N) N = 13 (2; 2) ^a | | ADHD N = 14 (1; 3) ^a | | ANOVA | |
|-------------------------------------|--|------|---------------------------------|------|-------|------|
| | Mean | SD | Mean | SD | F | p < |
| Full-scale IQ | 108.9 | 10.0 | 104.4 | 7.6 | 1.8 | ns |
| Age (years) | 10.9 | .7 | 110.5 | 1.0 | 1.2 | ns |
| Spelling abilities (T-score) | 49.9 | 13.1 | 46.9 | 9.0 | .5 | ns |
| Word fluency (n/3*min) | 27.4 | 6.9 | 26.8 | 11.6 | .0 | ns |
| Farnsworth-Munsell 100 Hue | | | | | | |
| Total error score | 54.5 | 31.1 | 86.8 | 33.6 | 6.7 | .016 |
| Partial error score blue-yellow | 28.6 | 19.1 | 50.4 | 22.0 | 7.5 | .011 |
| Partial error score red-green | 25.9 | 12.9 | 36.4 | 15.1 | 3.7 | .065 |
| Stroop | | | | | | |
| Word (sec/72 items) | 44.5 | 10.4 | 56.9 | 26.6 | 2.5 | ns |
| Colour (sec/72 items) | 66.2 | 12.3 | 83.7 | 27.9 | 4.4 | .047 |
| Colour/Word (sec/72 items) | 116.8 | 30.9 | 174.7 | 56.2 | 10.8 | .003 |
| Nomination ^b (t score) | 52.0 | 7.5 | 51.6 | 12.5 | .01 | ns |
| Selectivity ^{bc} (t score) | 53.8 | 8.4 | 47.4 | 13.7 | 2.1 | ns |

^aTotal number (number of girls; number of probands with dyslexia). ^bNote: higher t scores = >better performance. ^cAbility to resist interference.

Fig. 3 *Table of results* (2006)

Another theory I looked into was the Institutional Design theory which Charles M. Reigeluth wrote about in his book. The theory itself depicts how to allow people to learn and develop better (Reigeluth, 1999:5). One particular aspect I took note on was the section that discusses the current education system. Although the book was published in 1999 and may seem outdated in terms of education system, I actually believe some of his points are continued today, or at least was when I was in school.

Drawing up on what education was like in the industrial age was highlighted in the writing. Group learning and our curriculum was set up to separate the people who the institution thought would be successful and who they thought wouldn't which allowed the comparison of children (Reigeluth, 1999:18). This idea of sorting children is something that continues today as I experienced being sorted into different sets in school, based on how fast we learned. Although this was of distinguishing children is still common, Reigeluth goes on to suggest that our education systems should avoid doing this.

It is suggested that teaching with the needs of children in mind is to be a lot more common now with the advancements of technology and aspects of work and with the values of people changing too (Reigeluth, 1999:18). This means that teaching must become individual based, especially as it is known that all students learn differently.

While I agree with Reigeluth that teaching should be considered through the eyes of the individual student, I dislike the origination point of the suggestion. I believe that the evolution of our world, technologies, and jobs, in some ways, does change our curriculum and how it should be taught. However, in my opinion, it should have always been about the students and not about what institution they were required to be a part of. It is known that each child's needs are different, especially looking at children with disabilities and for it to take the development of work to recognise this, is something I find hard to understand. However, I want to discuss how this origination of educational curriculum and group learning has impacted classroom design and if it is still necessary based on his ideas on individual learning.

1.4 Inclusion of satellite schooling

The purpose of a satellite school is to transfer selected students from special needs schools into a mainstream school in an attempt to integrate these students with children from contemporary schooling (Croyden, 2017). In an interview with my Mum, she discusses that the majority of children in the satellite school have ADHD, autism, and global development delay, as well as health related issues such as, asthma and anxiety.

Sunny Bank, in my view, is one of the schools that can be seen as progressive and through talking with the headteacher on my visit, he seems interested and innovative in terms of integrating these students.

Although I see Sunny Bank as a step towards inclusive classrooms, I think that using this school can create an interesting case in a series of comparisons throughout the different classrooms (similarities also) and how I can use this school in creating a guide for teachers in designing inclusive settings for all students.



Fig. 4 *Satellite school building* (2023)

Chapter 02: Inclusive design.

Before answering the 'how' question, I believe it is important to understand the 'why'. Why aren't schools already inclusive to all and why is it being prevented?

Through reading journals and online articles. I came to discover three significant factors as to why schools may not already be inclusive. The most important factor being universal design, design that is inclusive to all which includes all types of disabilities (Pilgrim, 1992). However, through studying interior architecture and design, we are always pushed to consider ramps and lifts in design proposals. Although, we see access to ramps and lifts to be a lot more common in today's design world, they are only considered for those with physical disabilities, such as wheelchair users (Guffey, 2017), not for those with disabilities like autism and ADHD.

The two other factors I researched were teachers' capabilities and educational curriculum throughout the school. Using these factors, I want to see if the design of a school classroom is affected and if it can be improved. For example, does a teacher's lack of information on disabilities affect the decoration and design of a classroom?

2.1 Having a choice

Designing a classroom is key in attracting young students in their studies. Making the space interactive and exciting in a way that keep students interested is something all teachers should aim for. The idea of inclusive design in all classrooms seems like an exciting idea for those who have experienced a lack of something due to inaccessible features. They should be designed with everyone in mind and serving for everyone (Hamraie, 2017).

In schools, it is important to understand the different types of disabilities that children have, especially if it affects the way they learn. A common feature of this outside of design is students being allowed extra time on exams. This is mostly for children with learning disabilities that experience trouble with focusing (Dean and Forray, 2017:4).

Teachers having control over the design layout of a classroom should be a considerate task as they are creating spaces for students to learn. According to my Mum, in an interview I conducted with her, she makes it clear that a lot of their own considerations of classroom design goes down to as little as furniture placement and lighting; they also have complete control over it. For the satellite schoolteachers, it means that forming connections with the students to understand each of their personal needs is compulsory for classroom design.

An example she mentions is floor space. Of course, working on tables for students is something all schools do, however for the satellite classrooms, extra floor space is significant because some of their students have short attention span, which means they do not always want to sit in a chair and do work for long periods of time. It seems to be all



Fig. 5 Floor space in classroom (2023)

about choice in the satellite school, so if they want to be taught a lesson on the floor, they have that option which keeps comfortability for the individual. As well as, if a child wants to sit on a different object, such as a bouncy plastic ball which was present in a satellite classroom, then they have permission to do so; the work required can still be completed.

In Sunny Bank, however, a classroom I picked up on I had noticed that the floor space in there wasn't as visible as the one classroom in the satellite. Although a small factor, this actually contributes to the idea that maybe there isn't enough thought into mainstream classrooms. Something just as little as table placement, even though tables are present throughout most schools, is something that can affect a student's learning. This is when understanding each student's needs has its importance because reactions to discomfort can cause disruptions to the whole class's learning and the individuals too.

However, something that I personally found interesting was the amount of floor space the younger year group classrooms have compared to the older year groups in the mainstream school. The number of grouped tables could simply come down to how populated the classroom may be. Although it's quite interesting to think that the older you get, the more confined you will be in your seat. This would link to Reigeluth's theory of school setting us up for work.

2.2 Colour and lighting.

A noticeable difference between a mainstream school and a special needs school is that the students in a special needs school have already got their disabilities identified. However, there is a possibility and very likely that a lot of children that are educated under a mainstream school have some form of hidden or learning disability that has gone undiagnosed and unreported (Dean and Forray, 2017:3). In terms of design, it is important that the unknown is considered as it can affect a student. An example where this can occur is through the use of colour throughout a classroom. When observing the classrooms in the satellite school, I noticed the dull and earthy colour scheme that was present in the decoration of a classroom.

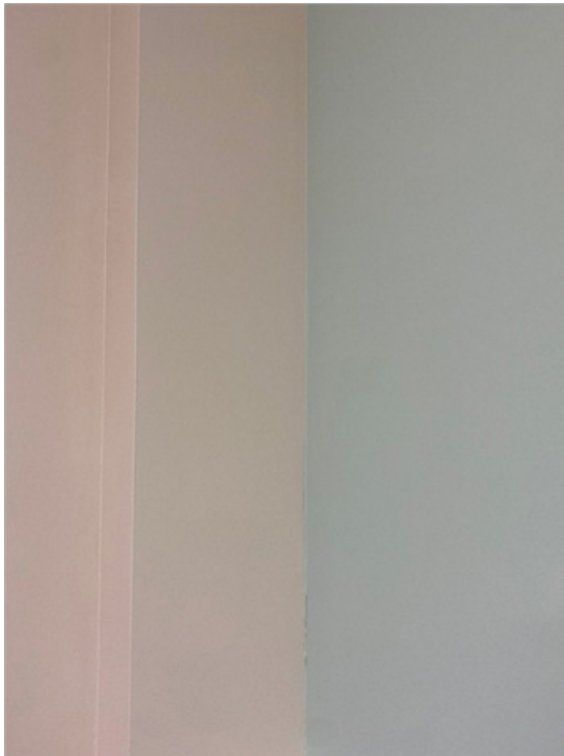


Fig. 6 Wall colour in satellite classrooms (2023)

Design becomes thoughtful because every space makes us feel different emotions. Every designer would hope for producing a positive feeling, however, negative feelings such as anger or a sense of unwelcoming can occur in some individuals (Divers, 2023:445). These negative feelings can be caused by the mind processing colour differently to the average person. This is most commonly found in boys with ADHD. Although unexplainable, children with ADHD find bright colours to be quite triggering which can then cause extreme behaviours for children as ADHD is distinguished by overactivity and acting with impulsiveness (Branaschewski et al, 2006: 568).

Therefore, in Sunny Bank's Satellite school, the colours that we usually see as dull, and boring are instead most common and beneficial towards their students. In the interview, my Mum has stated that 'if a classroom is too busy,

they get distracted so easily'. The term 'busy' refers to bright and exciting colours which if used, will not maintain a classroom environment.

When viewing the classrooms, myself, the colour paint in the satellite rooms were consistent with the mainstream rooms. I believe this is a progressive step as from my own personal experience with schooling, it was all about the bright colours and how they mainly attract students to learn and be excited with the work. A small detail I saw in the school, was the random outbursts of colour that was present throughout. For example, how in one satellite classroom, the earthy toned colours remained consistent through the carpet. Then, in a Year 1 class, there was a dark blue carpet which really stood out.



Fig. 7 Carpet in satellite classroom (2023)



Fig. 8 *Mainstream classroom* (2023)

The argument here is that colour design and consideration should be taught to all teachers. When thinking about those who are undiagnosed and are in a mainstream education space, if bright colours exist, then a safe space for a student doesn't exist either. Unknowingly creating an unwelcoming environment is something that can easily be prevented just by acknowledging different colour theories for disability.

Lighting is just as important as colour theories, especially because the way we view colour can be altered through usage of light. Through the interview with my Mum, she expressed her knowledge of lighting and how natural window lighting is pushed much more than turning on a wall light.

This all ties in nicely with the questionnaire I handed out, as all teachers (mainstream and satellite) said that they use natural lighting in their classrooms and that the main colour theme was green and white.

2.3 Sensory activation.

Sensory sensitivities are a common aspect of some disabilities, autism being one of them. As discussed previously, colour, light, sound and how busy a space is can all create an overstimulating environment for disabled children. If a person who does not know or understand these stimulations is not present, then it can cause more distress for the child (NAS, 2021 cited in Love 2022: 595). However, with design we can manage these overstimulation's. Or even create a space for a student to take ownership of their behaviour and give them spaces to calm down. Some examples are avoiding exclusion of space from where the learning is occurring (Love, 2022:609), creating wide spaces with room for lots of movement as some children can be sensitive to how busy a space is, and promoting a variety of activities for the children

(Love, 2022:608). By allowing students to have the choice of different activities/ environments, it allows them to express themselves freely (Kinnaer et al, 2016 cited in Love, 2022: 609).



Fig. 9 Sensory space (2023)

In relation to the satellite school, I was introduced to their sensory space, which was located just outside the classrooms. Still surrounded by the same colours as all classrooms on site, in figure 9, you can identify the difference in furniture and how wide the space is. With a miniature trampoline and soft play mats, this space was designed by the teachers at the satellite school to allow their students to remove themselves from overstimulating situations and calm down before entering back into a learning environment.

Another part of their sensory area included these sequin boards that were on a wall, which students can touch and play with. According to the teachers, these are a favourite for the students as they become focused on the different patterns they can create. This is a good example of teachers understanding their own students' needs and implementing them into classroom design.



Fig. 10 Sequin boards (2023)

After having a conversation with my Mum about this area, she confirmed to me that this is extremely effective for children's learning and understanding their own behaviour as, once again, it's all about having that choice. A child knows when they are feeling overstimulated and to have that space where they can make that personal decision to remove themselves from a situation can boost independence. It is also effective because I found out, from my Mum, that teachers from the mainstream section have been using these spaces for their own students. As well as, from the questionnaire, children from mainstream have sensory toys in their own classroom. So, why shouldn't a sensory space be implemented into all classroom design?

Chapter 03: What can our teachers do?

3.1 A teacher's involvement.

The Centre of Research in Autism and Education had conducted some research into the outcomes and opinions into satellite schooling in London, 2019. They did this by holding interviews with young autistic people and their parents. Whilst reading through their research, a piece of the text that I found most interesting was when it was mentioned that most parents has said that mainstream schools had failed in educating their children due to staff struggling with their behaviour (Croydon et al, 2019:7).

Struggles with behaviour could potentially mean that teachers are not properly trained on disabilities or how to handle it. This could then result in a failure of designing an inclusive classroom. After all, it should be a requirement for teachers to learn skills and knowledge to help achieve an appropriate classroom environment (Aldabas, 2020:2).

However, the training of teacher's would come from the school, meaning that the institution itself is delivering their knowledge. So, could there be a potential fault in the way teachers are taught? Not only this, but what about what they are trained to teach? Can our curriculum be a factor?

In response to this, this is where my questionnaire becomes useful. The discoveries I found that were most valid to this point was that the majority of mainstream teachers feel that they are not educated on learning disabilities and that they also do not feel correctly trained to handle extreme behaviours. The satellite teachers' answers show that they feel the opposite and are educated on disabilities and feel prepared. This comparison is significant because it suggests to me that there is a difference in the education or training of teachers. This would then affect classroom design because, how can a teacher design for a disability if uneducated?

What is even more concerning is that all mainstream teachers who took my questionnaire say they don't get much say in designing their classroom. This eliminates considerations in a classroom for each individual student, which goes against what was discussed about forming connections with students and designing for them.

3.2 Educational Curriculum.

Our educational curriculums make it, so a group of students are taught the same subject in the same amount of time. However, learning at the same rate was never successful and almost all teachers would agree that everyone learns differently at different rates. This way of teaching started because education used to be about training children for work. However, work values have changed which means teaching needs to change (Reigeluth, 1999:18). So, how does design push this original agenda

of teaching and how can we use it to change it?

In school, group-based learning is pushed because being able to cooperate and communicate with other people around you are a key working skill. However, when this type of learning occurs, it actually excludes the focus on a child's individual needs (Reigeluth, 1999:19). If we look at this from a design perspective, it means that teachers should design classrooms with all students in mind to promote individual based learning, especially when teaching the subjects that are required. This can come down to as little as table placement.

The diagram below shows a classroom from the satellite section in Sunny Bank and a photograph from a Year 6 classroom in the mainstream school. From the diagram, it is clear that in both spaces the tables are grouped. This pushes the narrative of group learning because students are surrounded and facing each other. However, as mentioned previously, in the satellite classrooms, I noticed that there were a lot more areas and when I asked about this, I was told that it was to facilitate for the individual students. For example, the extra floor space for when students do not want to learn on the table.

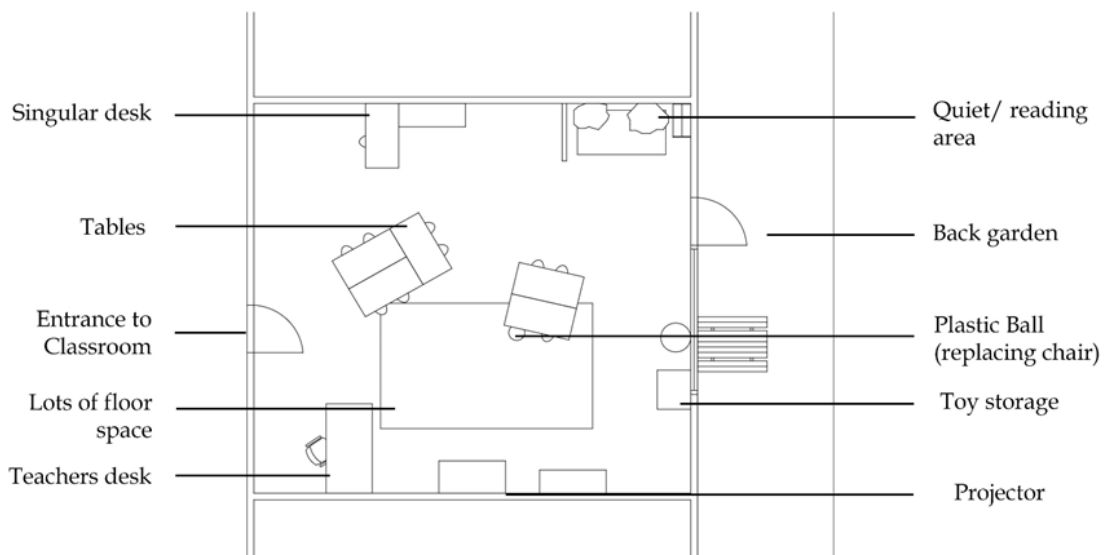


Fig. 11 *Diagram of satellite classroom (2023)*



Fig. 12 *Mainstream Year 6 classroom (2023)*

From the viewing of the classroom, and the portrayal of the diagram, it is clear that the students in a satellite school have more opportunity for individual based learning because they can choose what and where they want to do/ be. From figure 12, the unavailable space in the year six classroom is a pointer to the less opportunity for the students to choose. Also, for a design purpose, due to the lack of space, it would be difficult to match the considerations and variety of spaces of the satellite classrooms. This would mean that, overall, the planning and design/ architecture of schools needs to be thought about more.

Furthermore, part of the educational curriculum for special needs children, is that they are taught life skills. In the satellite building, they have a room designed to look like a miniature kitchen (as shown in figure 13). In general, children with special needs are taught certain life skills in comparison to children in a mainstream education. This is because it is thought that the delays of their development mean that it is required to teach them to live independently or it allows them to not rely as much on others (Jay et al, 2018:2).



Fig. 13 *Play kitchen* (2023)

When I was introduced to this classroom, I immediately asked what occurs within this space to which a teacher described to me that in the mornings, their students are able to make their own breakfast as well as tidy and clean their own mess that is made. The teacher also said that they only intervene when necessary and that they usually just stand back and watch to let the children grow their own confidence and independence.

However, this classroom is only present to be used by the students at the satellite school. From my personal experience in primary school, I had never experienced this type of learning in a kitchen space. Although I believe that teaching these students different skills in life is significant to their own personal development, I find it hard to understand why this isn't implemented throughout all educational curriculums or completed enough for it to become a routine.

In my opinion, this difference in curriculum benefits greatly for children with disabilities that it can almost come across as positive discrimination. This is because, although we are positively educating them, we are assuming that they cannot learn it from home. Whereas mainstream curriculum assumes you can.

This links to inclusive design because, again, it can impact the way new schools can be designed altogether. For example, having a whole separate classroom with a kitchen set up can benefit all types of students. Or considering a kitchen design in individual classrooms which can be promoted through use of play for the younger years. This is to teach them how to navigate a kitchen space at school to then implement what they've learnt, at home.

Chapter 04: Space

4.1 Spatial movement.

When discussing educational curriculum, the mentioning of usage of space started to become very common and showed its importance. It allows more access and freedom for the students to move and to decide how they want to work. Therefore, for further research, I asked my Mum to map out some scenarios for their average day during school and conducted my own research in spatial movement for children's disabilities to see if there was a comparison to be made.

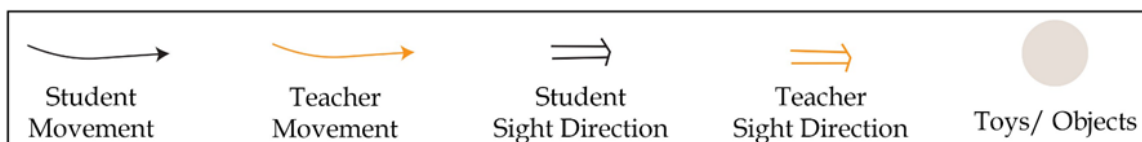
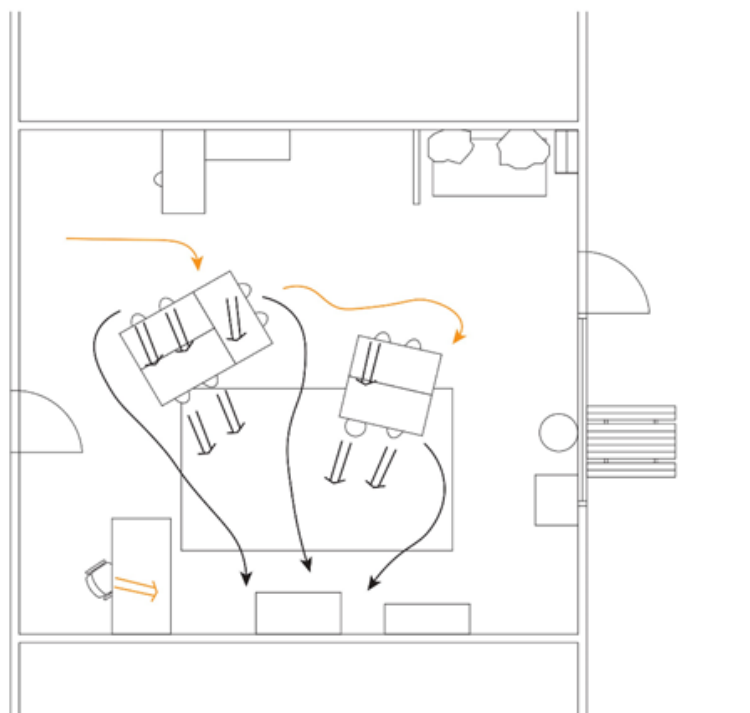
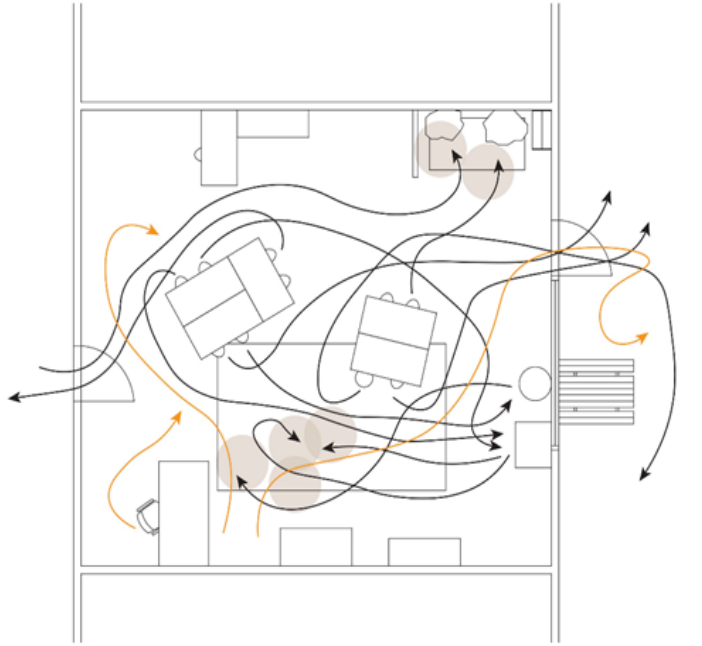


Fig. 14 Key (2023)



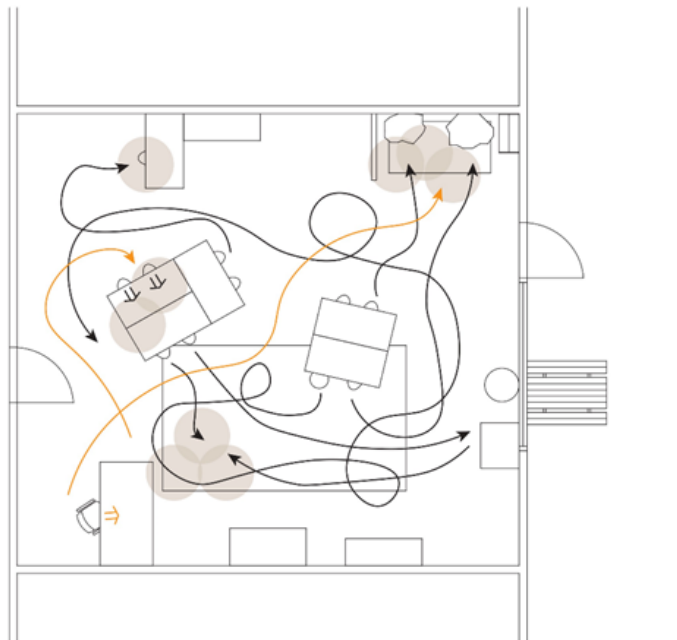
What does the average English lesson look like?

Fig. 15 Spatial diagram 1 (2023)



What does the end of the day look like?

Fig. 16 *Spatial diagram 2* (2023)



During indoor play, what does the movement look like?

Fig. 17 *Spatial diagram 3* (2023)

In the first diagram, I asked to map out a typical English lesson. Using the key to understand the movement, you can visually see that there is a sense of focus and stability. My Mum stated that when it comes to the students learning, it has to be interactive hence why there is movement towards the projector. However, in the other two scenarios, I asked what indoor play, and the end of the day looks like. I chose these scenarios because I believed there would be much more versatility in the student's movement, which was proved correct in the diagrams. In comparison to the first diagram, there is a very dramatic change in movement. It gives a sense of chaos in the room, and it is clear that all areas are used by the students. The difference between these two scenarios is that when it comes to the end of the day, it was described to me how the students get to decide what they would like to do, and they also have jobs to complete. For example, one student would put laptops away. This gives them a sense of routine whilst also enjoying the freedom to do what they wish.

In my questionnaire, I asked the teachers if the majority of their space was used within their classroom. Although responses were different, they portrayed the same answer or concern, this was that space is limited in their mainstream classrooms. One questionnaire mentioned that the students stick to the allocated tables and in another, they said that children move between the carpets and table, but again, there is a limitation of space.

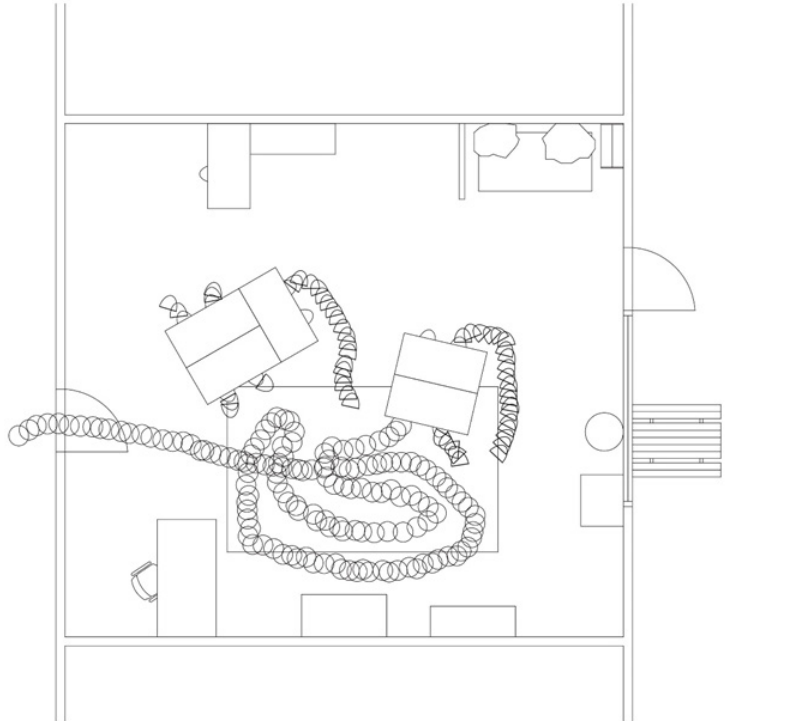


Fig. 18 Year 5 mainstream classroom (2023)

4.2 Furniture.

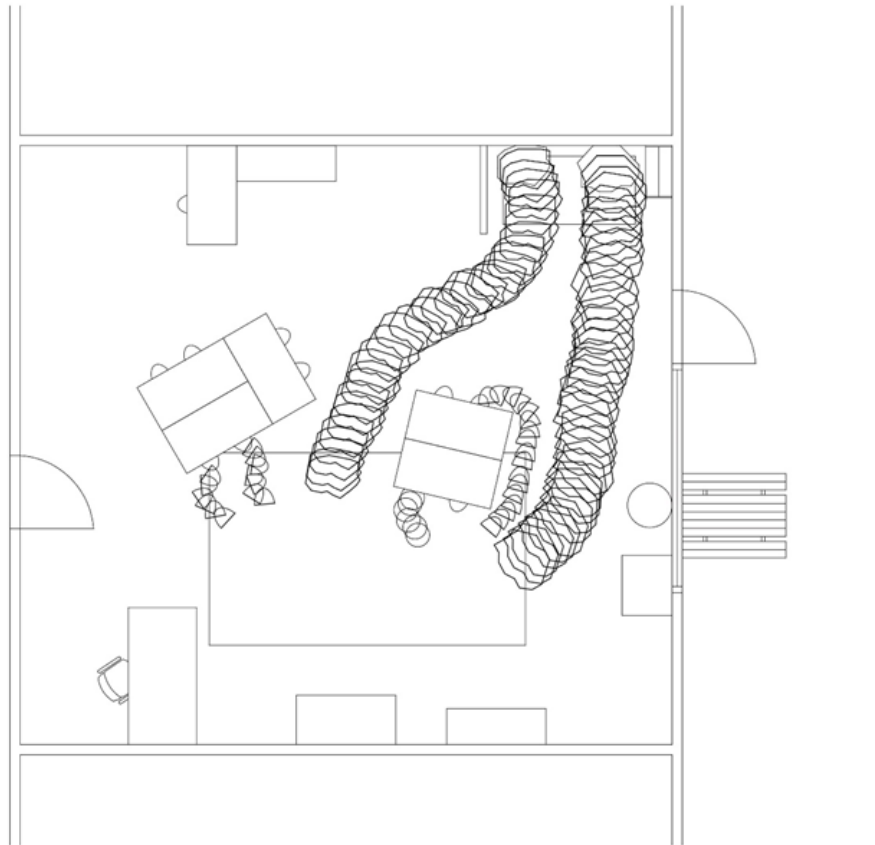
The movement around the classroom and the interactions with the different types of furniture had me wondering about the impacts of furniture on children with special needs. For example, how I mentioned that a student in my Mums class sits on a plastic ball instead of a chair. My Mum has stated that this helps the student be able to fidget and do his work together. It is also used as a sensory object if they are feeling over stimulated. It has been proven that children will express more positive feelings to activities, such as learning, if they have accessible sensory stimulation available that focuses on their personal needs (Bagwell et al, 2010 cited in Wang, 2021:50).

Looking at the diagrams below, I wanted to see how the students respond to furniture around their classroom and then how that responds to the space. Again, I asked for the movement of furniture around different scenarios of their day. In the first diagram, it is clear that the plastic ball experiences more movement than the chairs. When I asked my Mum to describe this scenario, she described to me that some mornings can be stimulating for the students due to the excitement of the school day. Their students also have a choice if they want to sit at the tables or move themselves to the front carpet to listen to their teacher discuss the routine of the day. In the second diagram, I asked what movement of furniture is like during circle time. From this scenario, I can see that all types of furniture are used in the classroom as the beanbags are also an option for seating.



What does the beginning of your day look like?

Fig. 19 Furniture diagram 1 (2023)



How much does your furniture move during circle time?

Fig. 20 Furniture diagram 2 (2023)

Space and furniture seem to play an important role in inclusive classrooms as it values the idea that the students can have a choice, especially in comfortability. Furniture should be versatile, optional, and adaptive as it can accommodate for children with special needs, as well as those without (PR Newswire, 2011). In Sunny Bank, the mainstream teachers who answered my questionnaire said that carpet and book corners were the extra furniture pieces in their classrooms.

Just like the plastic ball, a balance ball chair could be considered to for classroom furniture. Both are very similar except the chair remains stable whereas the ball on its own promotes more movement. Sensory stimulation is helped through the use of the chair and is actually seen as effective in participation of children during activities, specifically those with autism (Tunstall, 2010 cited in Wang 2021:50). Even if the ball or the chair was an option in mainstream class, it could help calm a student who is seen to have disruptive behaviour.



Fig. 21 Balance ball chair (s.d)

Another piece of furniture I discovered was a bean bag that is filled with shredded foam, instead of the typical beads (PR Newswire, 2011). This bean bag has been approved by many parents for helping their children with special needs. This is because, when sat on, the bean bag takes the shape of your body and forms around it, as if you were sinking in. This is supposed to create a sense of comfort and security for those who use it (PR Newswire, 2011), which can be beneficial for all students on any school if they were experiencing lack of focus



Fig. 22 Kid sack (s.d)

If schools were to start implementing different furniture options, it would have to be introduced from young age groups and unlikely to work if there was an immediate introduction for older year groups. Teaching children to have this option at a younger age would most likely be more effective as they are more likely to grow up and understand the principles of this furniture better. This is due to their brain still developing, unlike children in older year groups, where they have already understood the environment, they have been in. This also allows them to understand the idea of taking care of themselves and personal boundaries (Wang, 2021:40).

Conclusion: A guide for design.

Consistently throughout my writing, I noticed a theme of consideration in terms of designing a classroom. How can colour be considered? How can our furniture choices be more thought about? If inclusivity for special needs isn't considered for design when teaching teachers, then how would they know what needs to be done? My research I conducted was based around the differences between mainstream education and special needs education and Sunny Bank School really opened my eyes in what's being done and what needs to be done to improve our schools. So, what can we do to make sure we create inclusive classrooms?

In terms of curriculum, I propose that individual learning is more focused upon than group-based learning. With the understanding that group learning can encourage speech confidence in children, it almost abolishes the idea of understanding their own personal needs as they are taught with others. The curriculum should allow teachers to identify these needs of their students and implement this into design whilst making sure it isn't affecting others. If the grouping of tables and students facing each other continues, then we could consider personalisation of their own space. That way a student can understand and learn a lot about themselves and what will help them focus.

Personalisation can go from colour to furniture. This would link into my next proposal on making sure that classrooms are multipurpose spaces. Whilst learning and teaching the general subjects is important, a classroom's design can push the idea of student's developing their own sense of self. A choice on where to play, where to sit, what to sit on and where to calm down can grow independence. It could mean that their own personalisation would be that choice to sit on a beanbag throughout the day, but then having that option to change that choice on a different day. Teaching them independence from a secondary standpoint is just as significant as from a parent because school grows confidence.

My third proposal would be that sensory spaces need to be informed everywhere. As mentioned previously, there are children in mainstream education that have special needs, meaning that not all children can be taught the same or react the same. Especially for younger children, where their brain is still developing, having a space where they can calm themselves would not only be beneficial to the students, but also the teachers. Children's "bad" behaviour happens all the time and punishing them for something that they may not understand themselves doesn't help the child's development or the teacher's morale. From positive reactions of the sensory space in

Sunny Bank from the mainstream site, I think it's time to consider these spaces in all schools. This includes primary and secondary schools and may go as far as universities and colleges.

The last proposal goes towards a point I mentioned in Chapter 04 about the introduction of kitchen spaces. I believe that all schools should encourage life skills teaching for everyone. For special needs children, space is a necessity, and this can be a problem for current schools. Therefore, during the planning and development of new schools, classroom sizes and the amount should be considered. Larger classrooms would allow a multipurpose space to exist which can then enforce an area for teaching skills as part of a classroom. Or a dedicated separate classroom to schedule and allow all children to be taught this, not just selected children.

Schools can go so much further for inclusivity just by teaching and making children aware of disabilities and creating a non-judgemental attitude for them to follow. However, in classroom design we can make it a possibility for no separation for those with special needs. Something as simple as changing colour schemes can allow more children to enter that environment. Throughout all my research, I can conclude that it is completely down to considering what children need. Identifying exclusion is one thing, but attempting to resolve that to make sure all children are considered throughout a classroom design can make children that have felt separated before, feel part of something now.

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Appendices:

1. Transcript of an interview with my Mum:

Q: Describe your average day in school. This could be the structure of lessons, what time you go to break and lunch, what you teach.

A: Our average school day consist of morning register, we follow a structured timetable which consists of English, maths and reading daily. Subjects like science, ICT and history would only occur at least once a week. We participate in a weekly assembly on a Friday which is celebrating the week's achievements at the school. This includes our students and students from the mainstream school. Although we follow a visual timetable, which means that the children can visually see what they are up to during the day, we are susceptible to change to fit the ever-growing needs of the children. For example: If a child is struggling, this could be a sensory or processing need, in a particular subject we are teaching, then the child is applicable to leave the teaching in order to meet their personal needs for them to regroup to learn.

Q: What kind of special educational needs do the children within your satellite classroom have?

A: This can range from ADHD, autism, global development delay, children with tics, anxiety needs as well as mental health needs and emotional needs. On top of these needs, a lot of our children have major health related issues such as: asthma, epileptics, and severe allergies.

Q: Describe some of the behaviours you experience from the students.

A: Any type of behaviour is a form of communication for the students. Anything from verbal abuse (swearing or insults), physical abuse (hitting and spitting etc), stripping, mimicking adults, throwing things, destroying property and refusal to work.

Q: Are you trained how to handle this behaviour? What are you taught?

A: We are regularly trained on how to best deal with this type of behaviour. We are taught how to see it through their eyes. Lots of training on disabilities and what they could mean for the children. In a given situation that involves behaviour, talking is the best form of keeping them calm. We rotate staff so they get to see different people. We also change the environment or scenery for them, for example, take them for walks, outside the classroom or something they love to do. It's fitted around each individual child. So, it's important to understand a child's personal passions which is why our student number are small in every class. My class is 7 students.

Q: Does your students interact with the other students on site. If yes, explain some moments where they have. If no, could you give a reason why?

A: We interact at break times, lunch times, food halls, assemblies, library. We also interact in events. For example, church at Christmas time, art classes, science fairs. They are given a choice whether or not they want to participate in the events. We have a science fair every year where the children create a science project to be judged and if they win, they get to go to other schools and show other kids how it is used. One of ours won last year so we go to do this. We only really have interactions

with mainstream children when our students seem to have fewer social issues or larger families at home. When they are more able, they interact more. We have never experienced any bullying from any children from the mainstream site.

Q: How much say do you get in designing the layout of your classroom?

A: All the staff, teachers and teaching assistants included, do everything when designing the classroom. Not everything stays the same, we are always changing things depending on whether or not we think it's working. So, for example, we tend to not put a lot of things around windows in our sensory areas whereas others might.

Q: What factors do you consider when designing/ decorating your classroom?

A: We always include a sensory area in our classrooms for the students. It is supposed to be a closed space where there are no noise objects that are visual: touch, sight, and smell. We consider lighting in the classrooms because a lot of children are affected by it. If its too bright or too dull, it can take a toll on a student. Which is why we include as much natural light. Colour is so important for us. Natural colours and calming colours are the main scheme we go for. If a room is too busy for a child with the disabilities I work with, they get distracted so easily and it's hard for them to focus. Everything is labelled with words and images; this gives the child an opportunity to look at the words or images to find an object around the classroom. Considering space is valid too, it's all about making the children comfortable, so if they want to choose to work on the floor, we will make sure that we have the space to do that.

Q: Is there anything through your knowledge of designing your classroom, that you believe should be introduced into mainstream classrooms? And why?

A: I think it's more the values of designing the classroom that should be introduced to classroom design everywhere. Understanding a child's needs is so important. Having secluded areas because you know a child cannot work with loads of people around them shouldn't be an issue as long as their getting the work done. We have things in our classroom that suits individual children. It's so much more than just putting a table in the centre of a room.

2. Questionnaire that was handed out:

1. What school do you teach in, in Sunny Bank?

Mainstream / Satellite

2. What is your role?

Teacher/ Teaching Assistant

3. Would you say you are educated on learning disabilities (dyslexia, dysgraphia)?

Yes / No

4. Would you say you are educated on hidden disabilities (ADHD, autism, anxiety etc)?

Yes / No

5. As a teacher, do you feel prepared and correctly trained to handle a child's extreme behaviours or hyperactive state?

Yes / No

6. Do you believe you could identify a possible disability in a student?

Yes / No

7. In terms of designing/ decorating your classroom, how much say do you get?

All of the say / most of the say / little to none.

8. From this list, please circle the three main colour schemes that you commonly use in your classroom (this can be furniture, presentation boards etc)

Red

Green

Yellow

Blue

White

Pink

Purple

9. What type of lighting do you prefer to use in your class?

White light / Blue light / Colourful lights / Natural light

10. Do you believe your classroom has been designed to support students with disabilities?

Yes / No

Please explain your answer:

11. What do you think could be improved in the layout of your classroom?

12. Are there certain objects/ areas of your classroom that support specific needs of the children?

If so, what are they? If no, explain why not.

13. When designing decorative boards in your classroom, what do you consider?

14. Do you use any other furniture other than tables and chairs?

Yes / No

If yes, what other options do you have? If no, then why not?

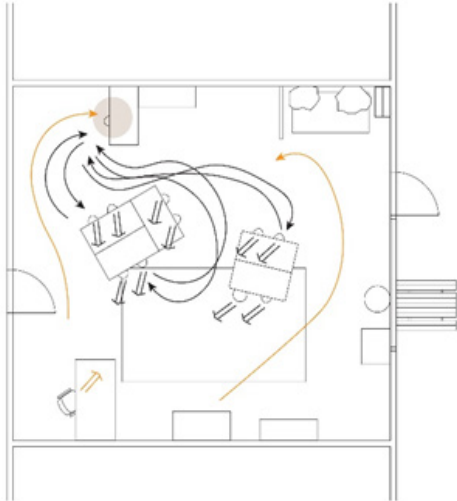
15. Would you say the students navigate the classroom well? For example, they know where things are allocated?

16. Would you say your students use the majority of space in their classroom?

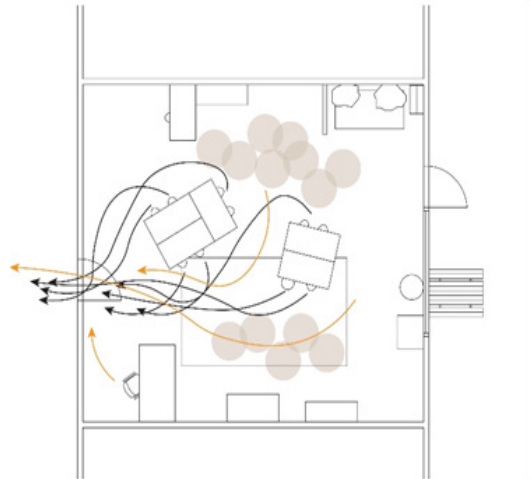
Yes / No

Explain your answer.

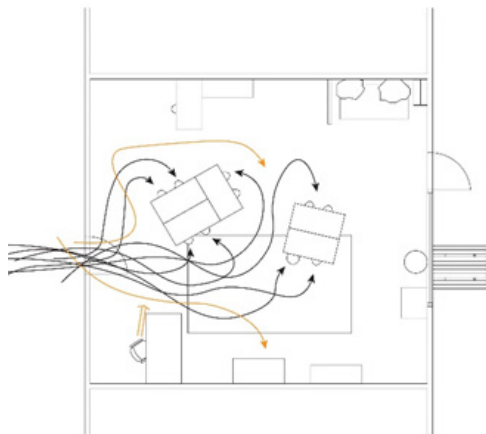
3. Extra spatial movement diagrams:



What does the movement look like before leaving for a school trip?



What does before lunch time look like?



What does the beginning of the day look like?



What does getting ready for forest school look like?

Research Question and Research Context



Throughout my thesis, I uncovered a series of topics from my own investigations to understand what is important to create an all-inclusive classroom from a design perspective. After a personal site visit to a mainstream school, with a satellite school attached to it, I managed to connect with teachers from both schools (including my Mum) to conduct my own research based on their understanding of classroom design. Through research, I managed to form my own opinions to what could be done better from an educational standpoint, especially within a mainstream school. One moment I enjoyed from my research was surveying a satellite and a mainstream classroom and creating spatial movement diagrams based on prompts I gave to teachers. My findings showed a clear difference in the types of movement that occurs in the classrooms and this is something I would like to further research into. My goal is to continue investigations into spatial movements, but focussing on the types of spaces that are in use and the type of activities that occur within them. Then, understanding behaviour of each child and engagement levels will explore the idea that each child is different and what types of spaces and activities should be introduced in a mainstream setting to allow an all-inclusive space.

Research Methods

To begin with, I am going to conduct secondary research to the types of spaces that should be in a mainstream and an SEN setting, as well as, looking at what aspects of school can affect student behaviour or engagement. This will give myself context as to what I could expect to uncover during my own research. When conducting my primary research, I will be having discussions with my Mum (an SEN teaching assistant and Emotional Learning Support Assistant), to gather information about the spaces that are used within the satellite school and how student behaviour is affected. To understand the differences in the students, I created anonymous characters which my Mum and I based their profiles on students she has worked with. The satellite school will then be compared to a mainstream classroom to show the differences of space and what could be done better.

Fig. 1 Sunny Bank School (2023)

Fig. 2 Aerial view of Sunny Bank School (2024)

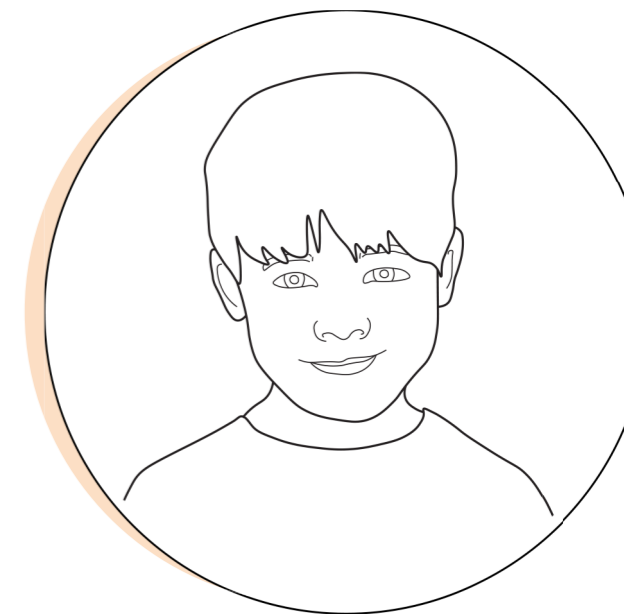
Characters

These are anonymous characters which represent students my Mum has worked with in the satellite school. For their profiles, I wanted to know their favourite and least favourite spaces within the school. This will allow me to understand if there are behavioural differences or reactions to particular spaces and whether or not there is a restriction of space if they choose not to be there.



LUCY

Age: 8
Favourite space: Book Corner
Least favourite space: Sensory Space
SEN diagnosis: Global Development Delay, Autism, and ADHD



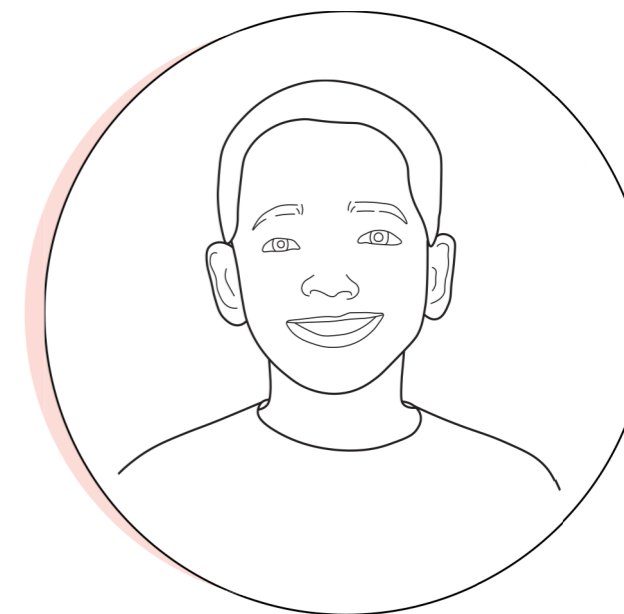
JACK

Age: 8
Favourite space: Anywhere other than his classroom
Least favourite space: Sensory Space
SEN diagnosis: Autism and ADHD



EVIE

Age: 9
Favourite space: Sensory Space
Least favourite space: Her classroom
SEN diagnosis: Autism

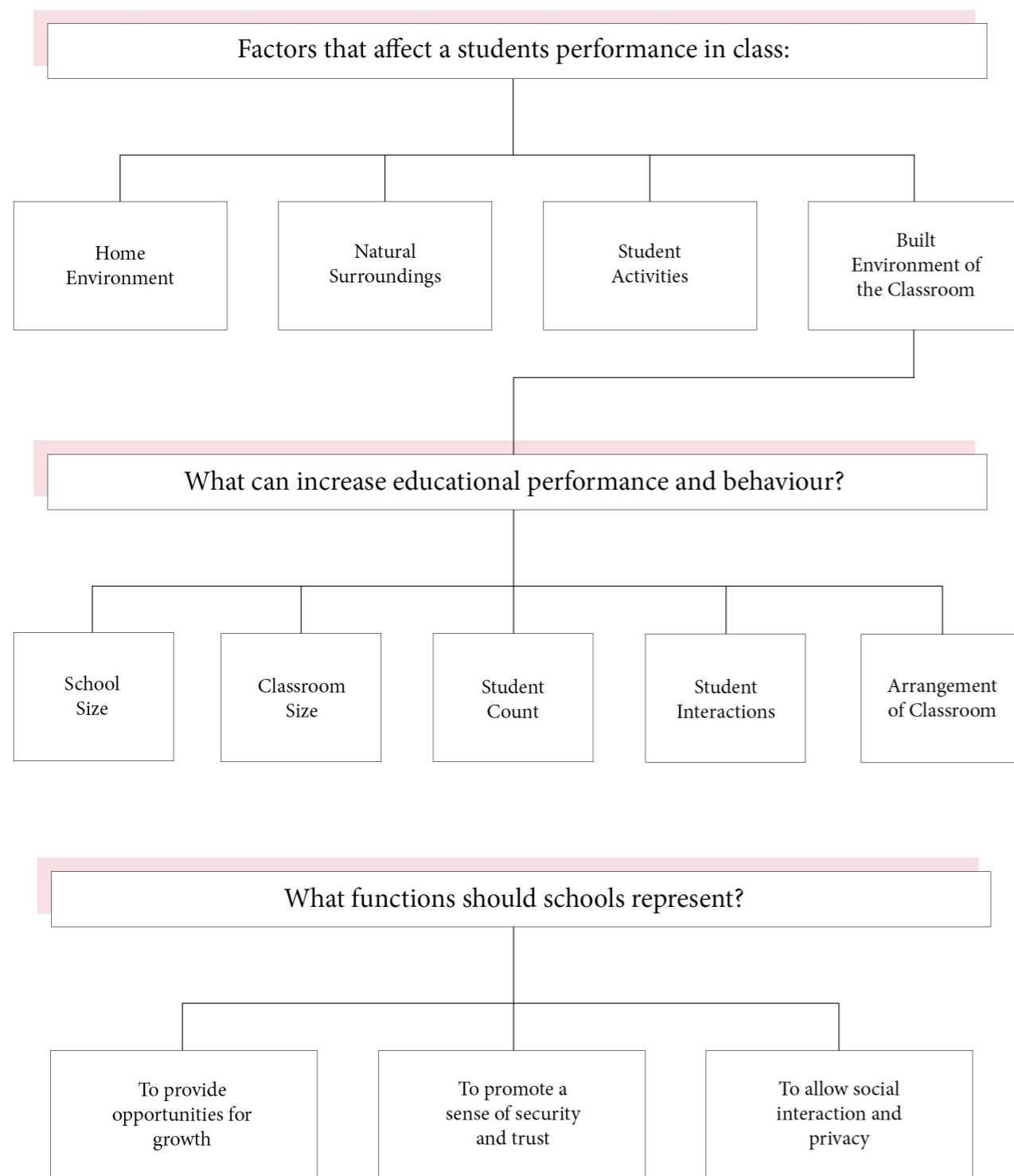


FRED

Age: 10
Favourite space: Trampoline in Sensory Space
Least favourite space: Playground
SEN diagnosis: Autism and ADHD

Fig. 3 Student profiles (2024)

Secondary Research: Functions, Behaviour and Performance



Before starting my own research, I wanted to look into research that spoke about space within schools and what affects the performance of a student. The above mapping shows a diagram of listing I created through multiple sources that state that performance and behaviour are affected by aspects within school. The second diagram is showing the spaces that should or shouldn't be within an educational space, depending on year group. Both these diagrams show what should be expected from schools, but my investigations will see if this becomes true or not for both mainstream and SEN classrooms.

Fig. 4 Affects on engagement and behaviour (2024)

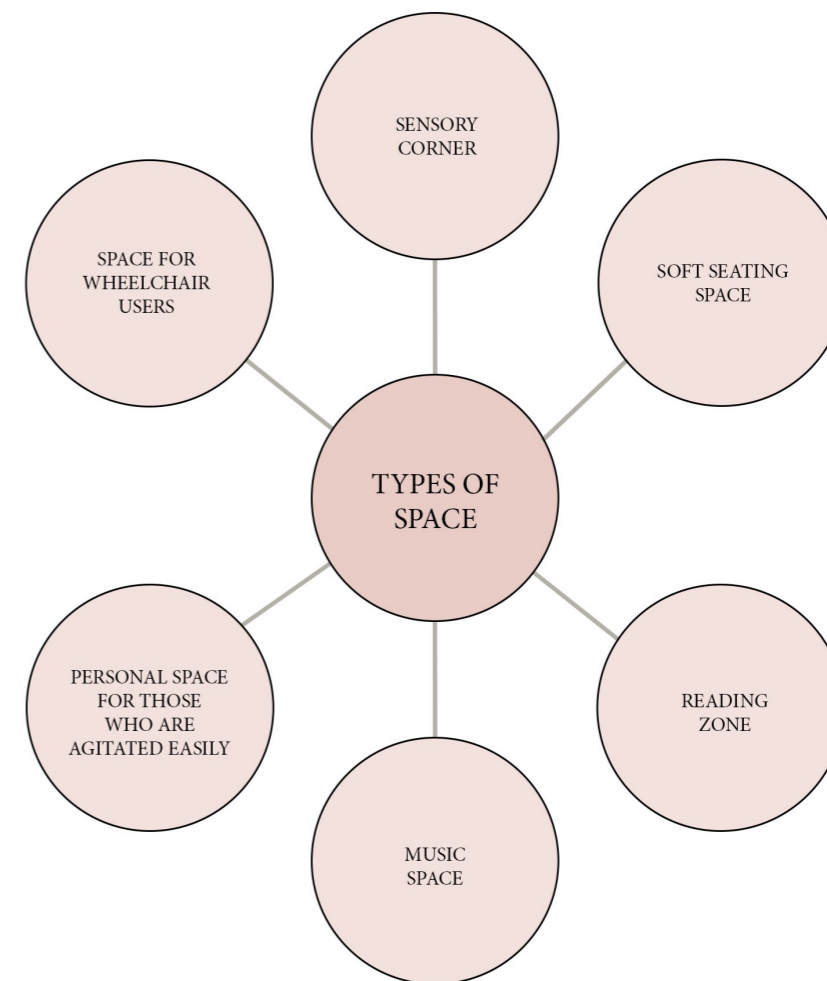
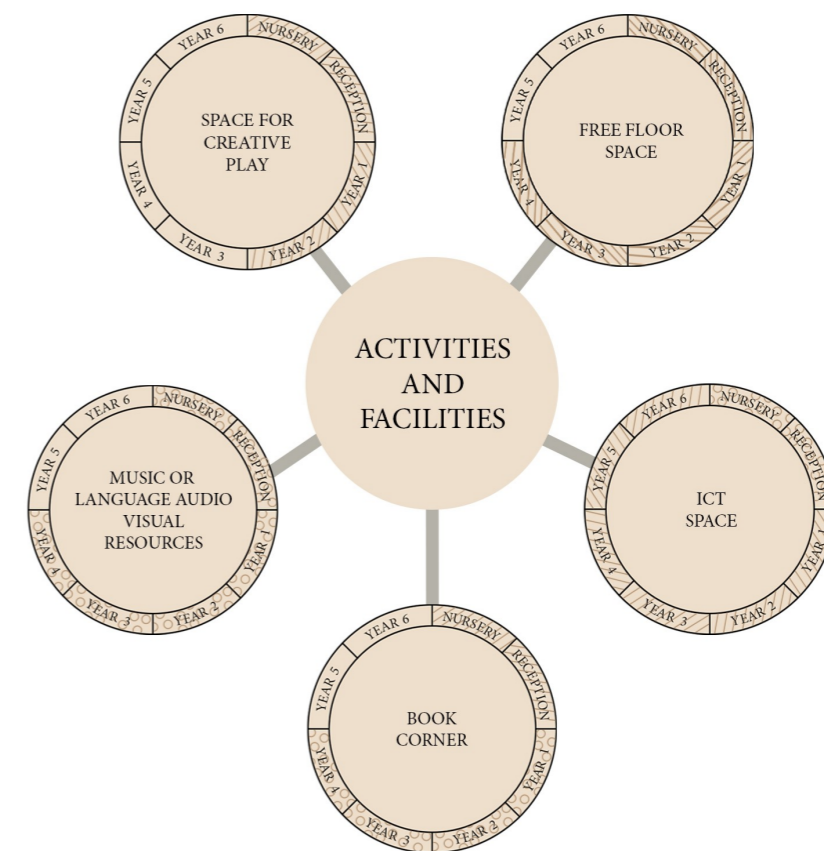


Fig.5 Diagrams of the spaces required in classrooms (2024)

The Spaces in the Satellite School

This diagram shows the various spaces within the satellite school and the sort of activities you would expect to see when these spaces are being used.

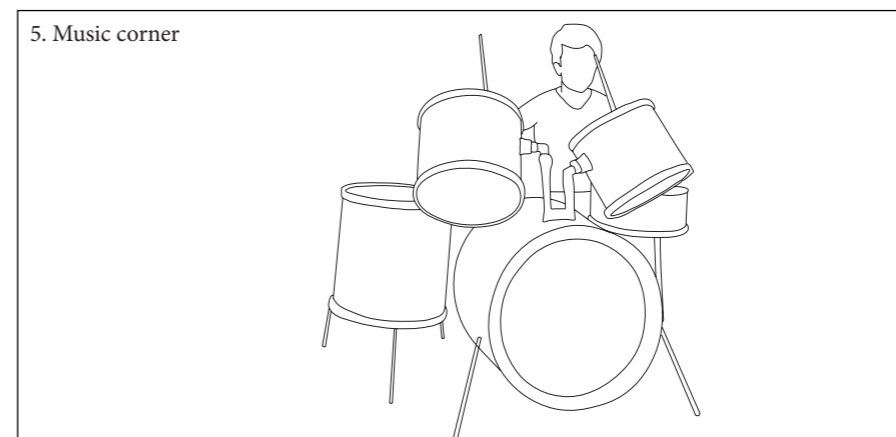
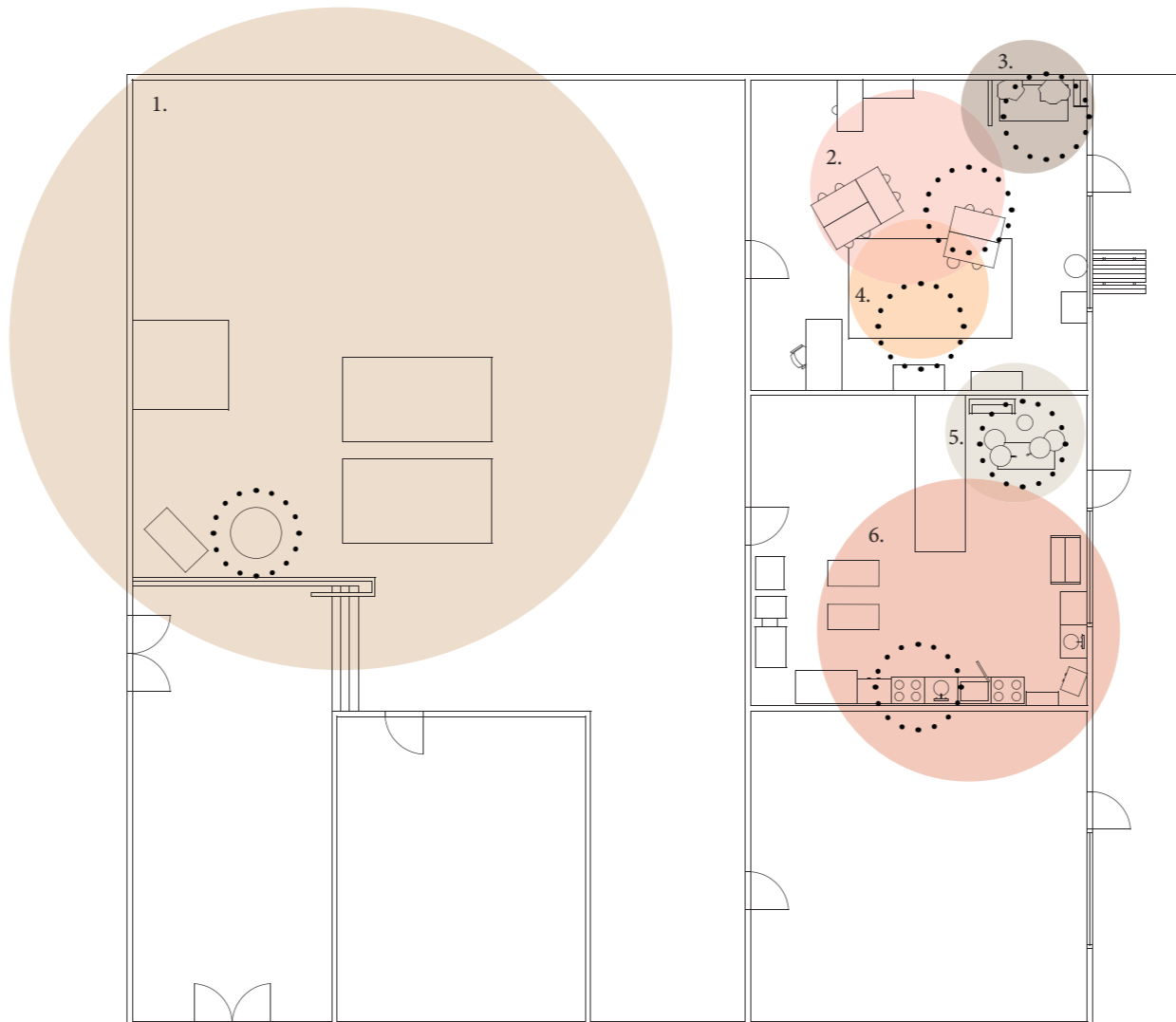
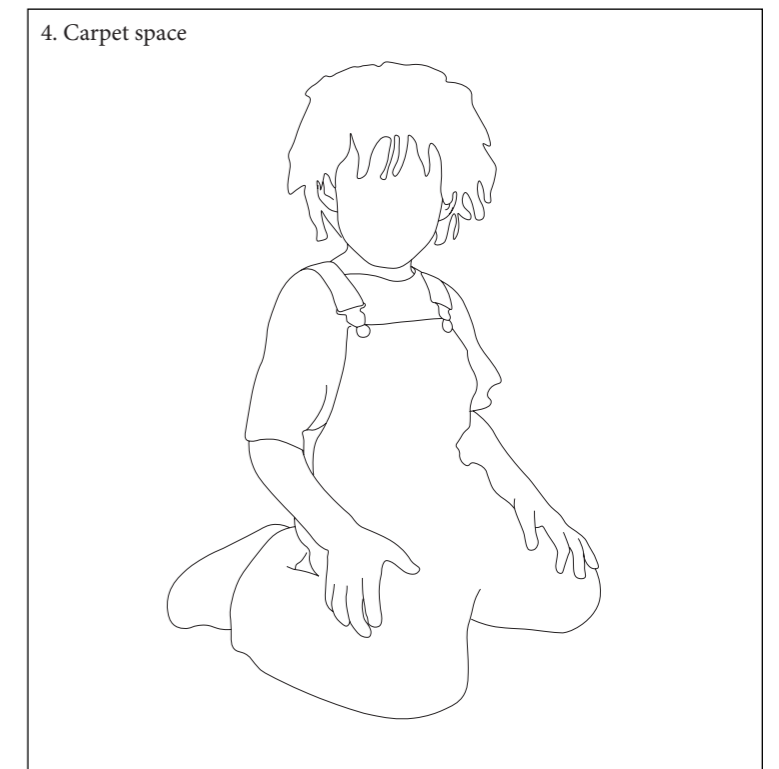
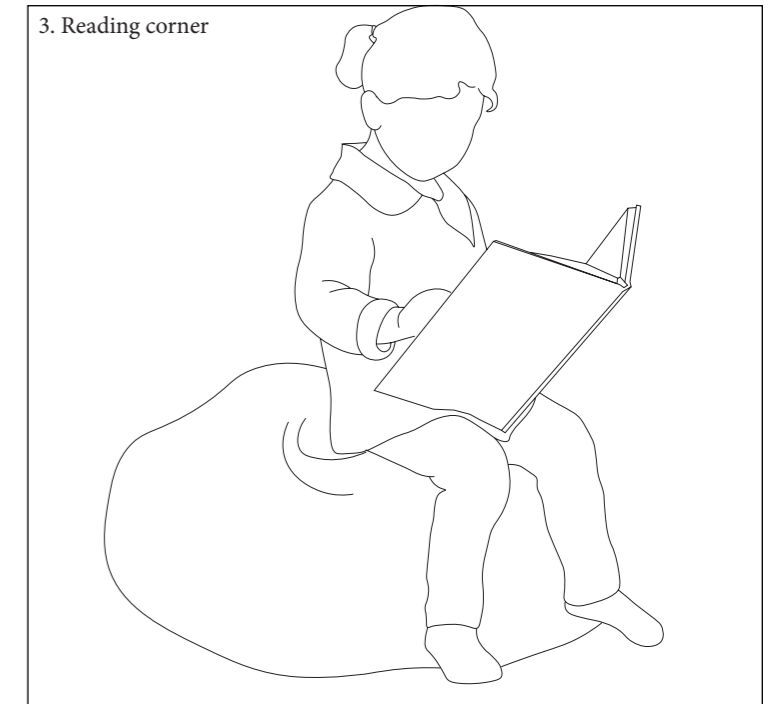
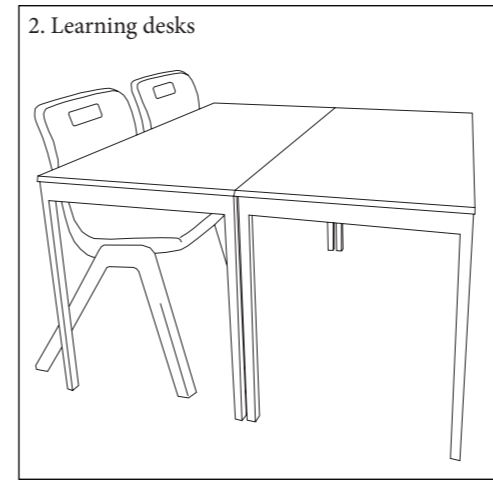
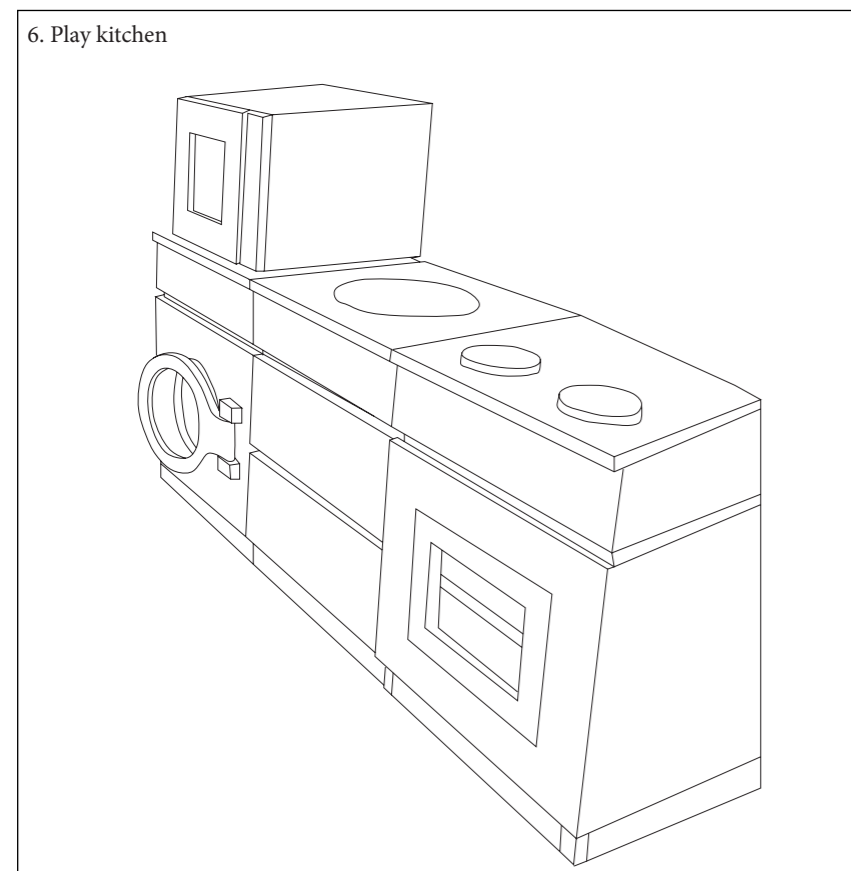
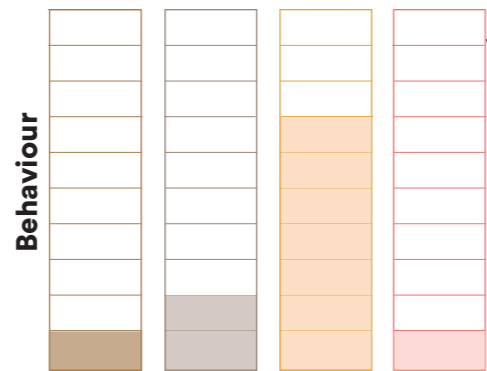
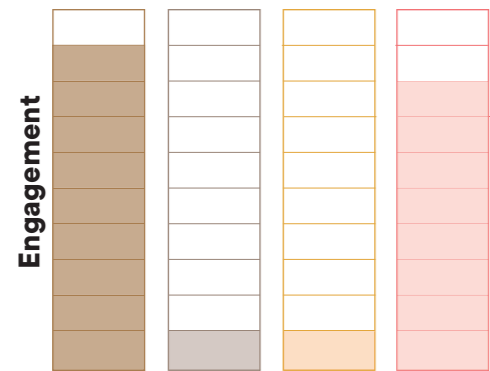


Fig. 6 Spaces in the Satellite School (2024)

How do the students interact with the reading corner?



Engagement and behaviour bars. These are presented through a scale of 1-10. 1 being no engagement and good behaviour and 10 being good engagement and bad behaviour. I will be using these to determine the different reactions to certain spaces being used.



This first diagram shows the students reacting to the reading corner. When two students enjoy that space, the other two do not. Yet the diagram shows that Evie and Jack (the two who don't enjoy this space) clearly have elsewhere to go, even if their behaviour gets worse in response to this space.

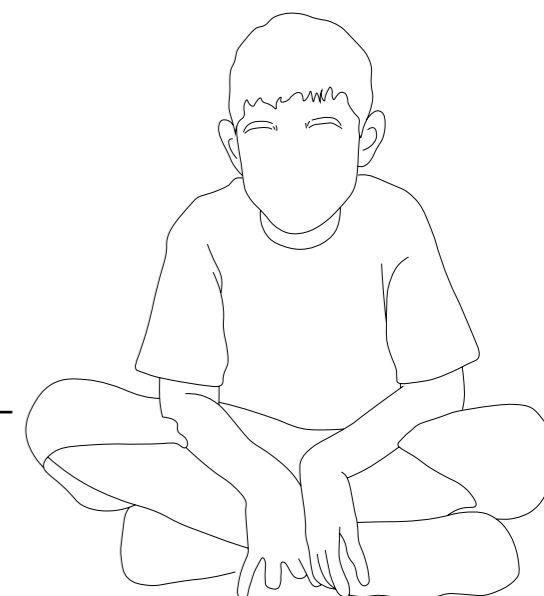
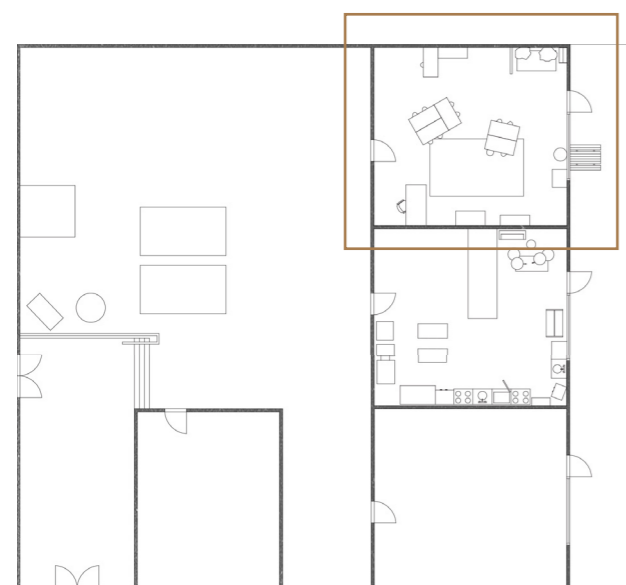
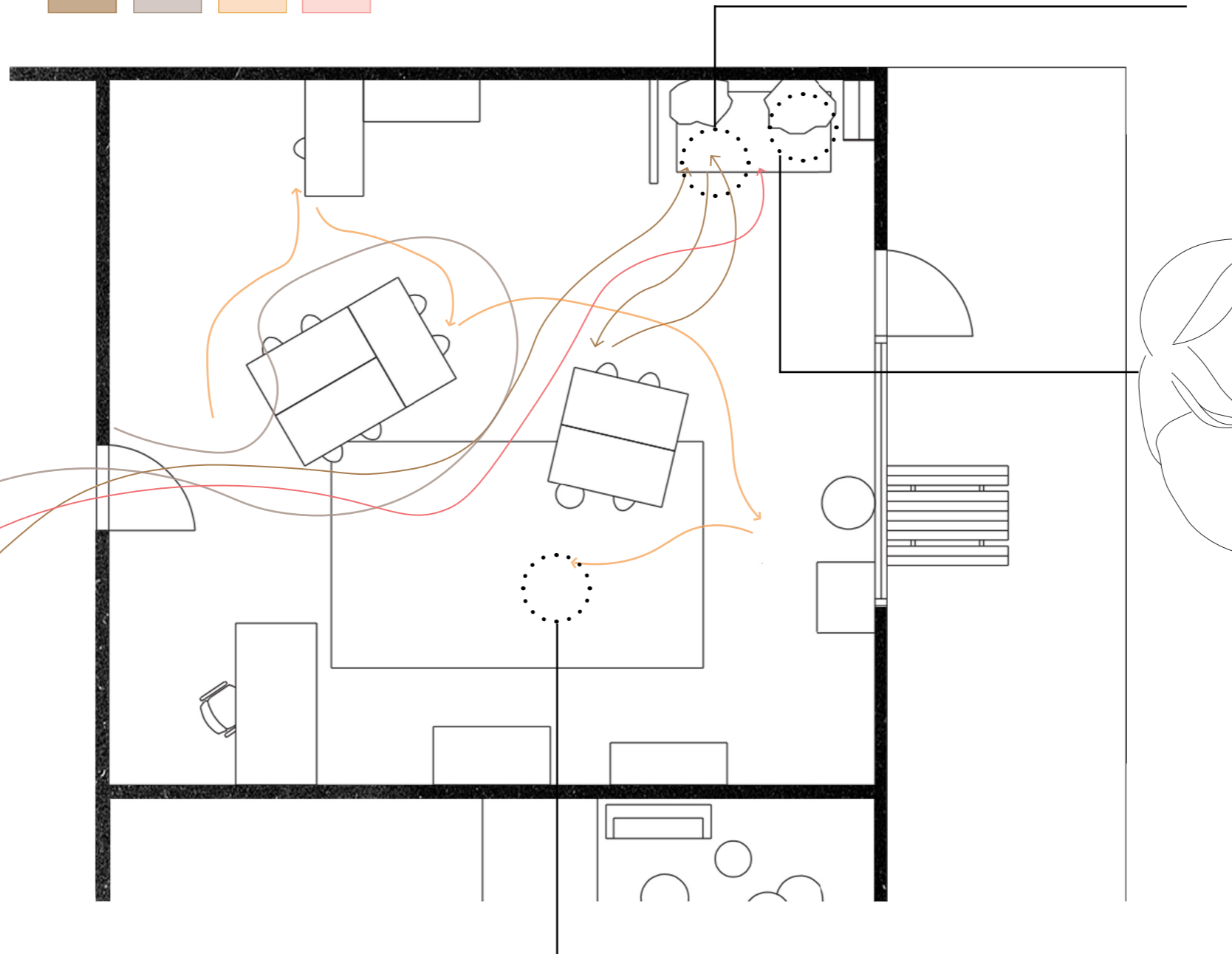
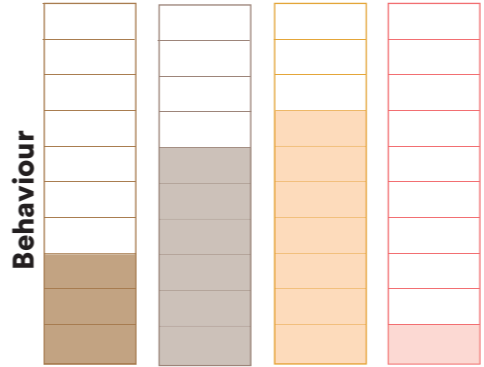
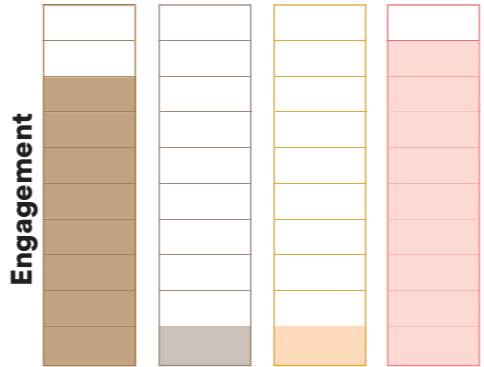


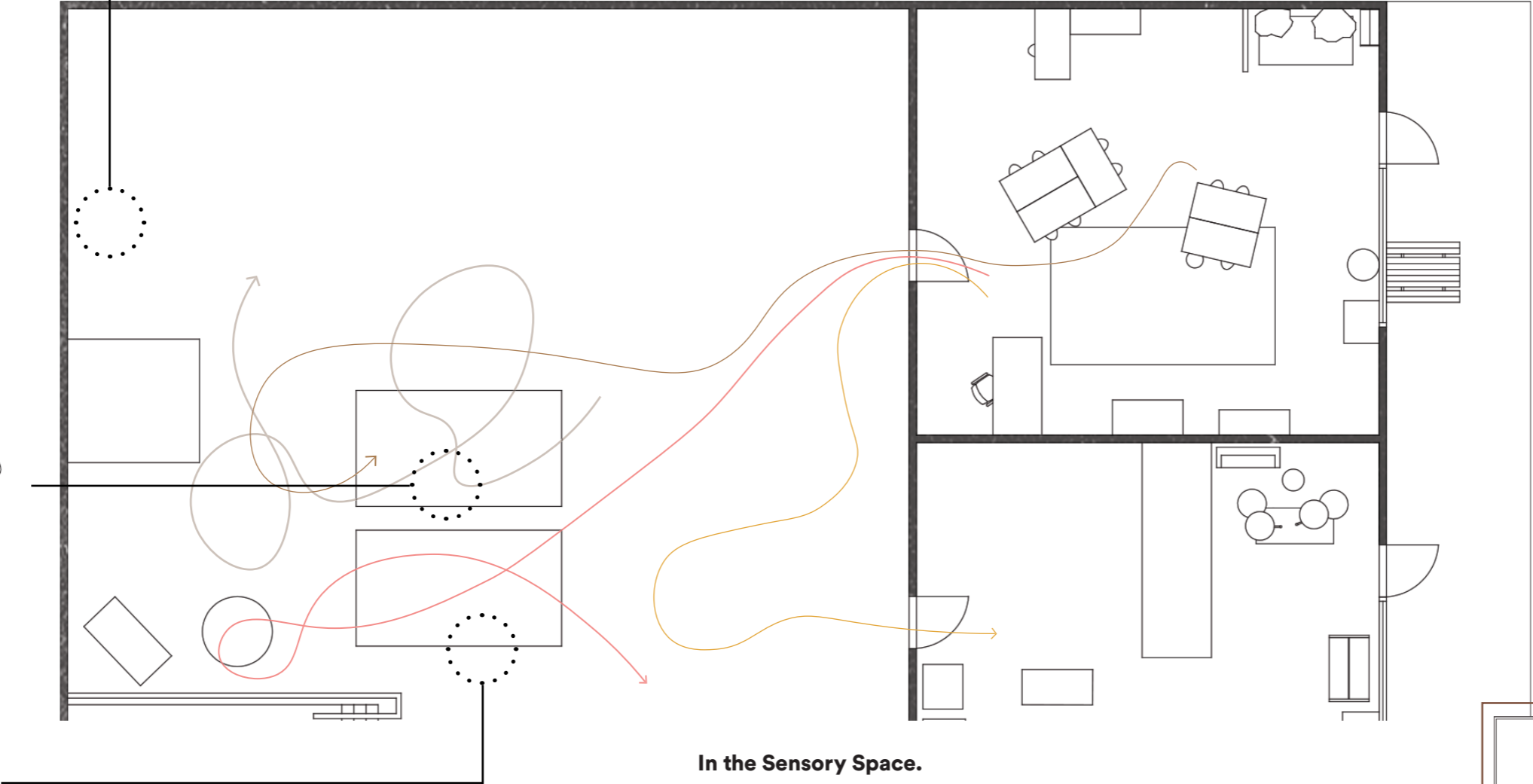
Fig. 7 Reading Corner mapping (2024)

How do students interact with the sensory space?

All four students, for this prompt seems to have completely different reactions when in need of the sensory spaces, which then changes when within the space itself. Their engagement levels grow and their behaviour becomes less which is a response of getting the attention they require and can have due to the optional spaces.



In need of the Sensory Space.



In the Sensory Space.

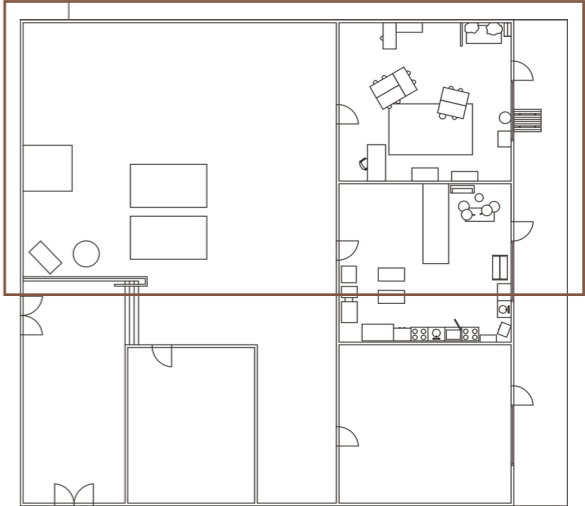
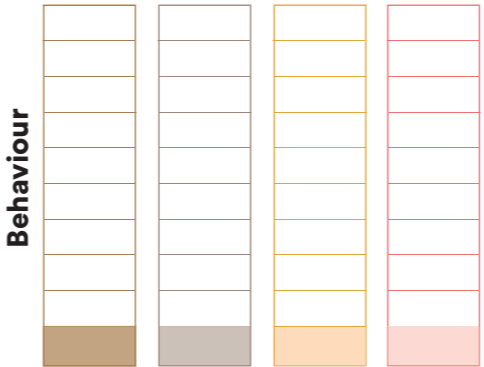
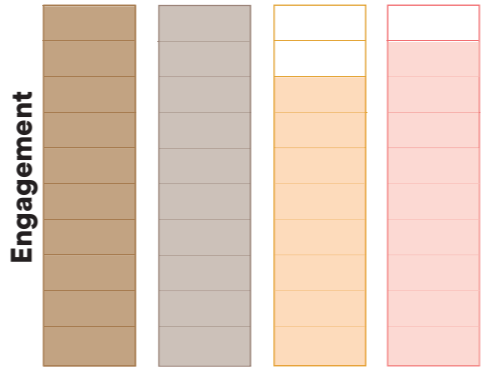
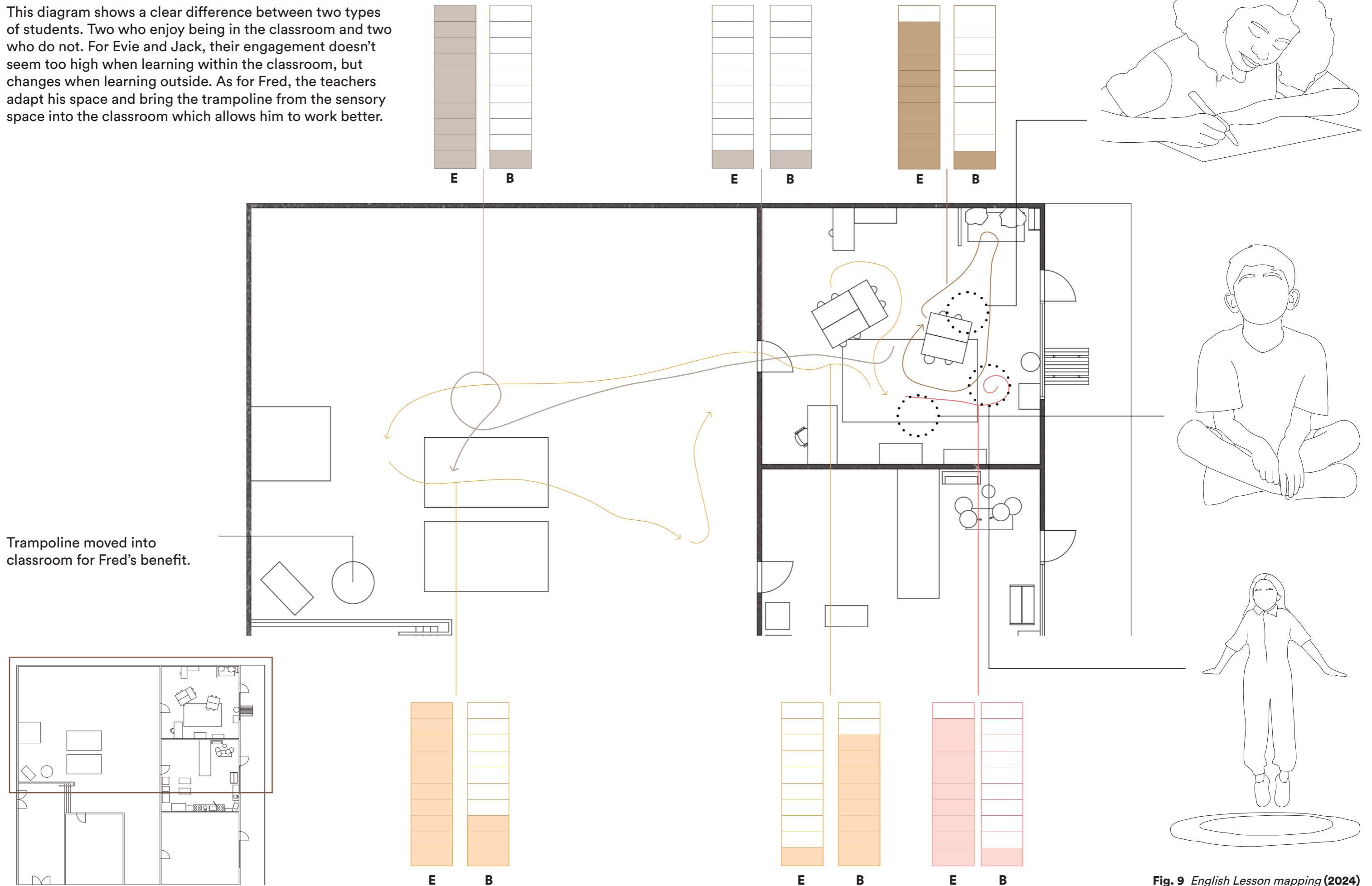


Fig. 8 Sensory Space mapping (2024)

What is the interaction of space during an English lesson?

This diagram shows a clear difference between two types of students. Two who enjoy being in the classroom and two who do not. For Evie and Jack, their engagement doesn't seem too high when learning within the classroom, but changes when learning outside. As for Fred, the teachers adapt his space and bring the trampoline from the sensory space into the classroom which allows him to work better.



Trampoline moved into classroom for Fred's benefit.

Fig. 9 English Lesson mapping (2024)

Comparison to mainstream classroom.

When looking at the mainstream classroom setting, it was a little difficult to distinguish the different activities due to how limited spatial movement is. With the classroom being filled with desks and storage drawers, there isn't much option for space or activities for the students to engage in. Leaving them to either sit at a desk all day, or get objects from drawers. When students become over stimulated, where do they go? If they want to work elsewhere, do they have that choice?

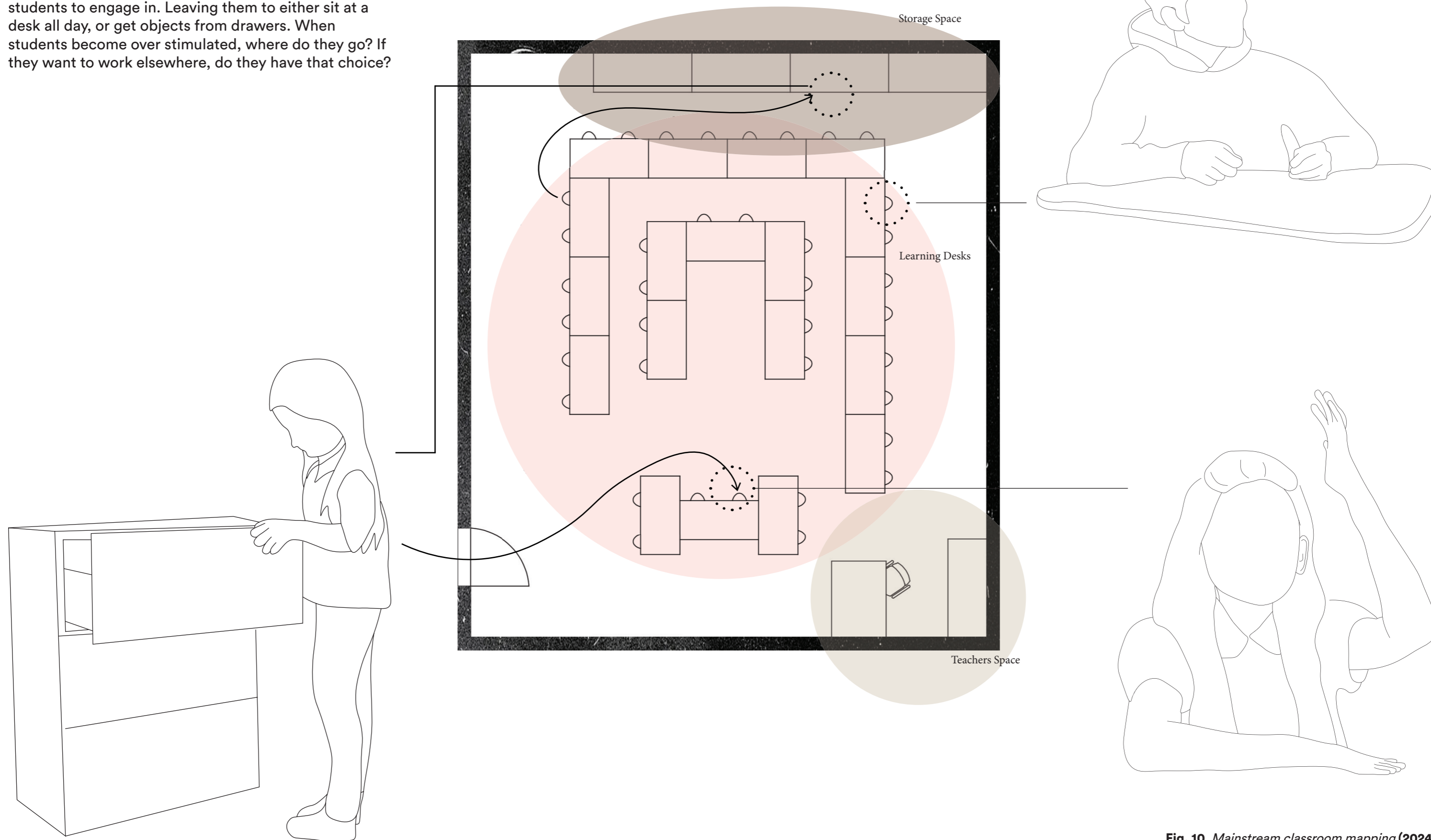


Fig. 10 Mainstream classroom mapping (2024)

Conclusion: What is the importance of space?

This research has been very insightful into what needs to be done for mainstream schools. The option of space is very present in a satellite school and it's clear to see that through the various movement of the students. Just looking at the map of a mainstream school could tell many people that it seems very tight for space and not a lot of movement can be done. This would restrict students to a choice of space and activities, which students at the satellite school do experience.

The idea of an all-inclusive classroom can not be done if there is a huge difference in the way the classrooms are designed, this would need to change in order for this to be achieved. Maybe introducing more classrooms for the sake of optional spaces, or splitting larger classes up to create more space could be potential ideas. Either way, we are limiting the idea of an all-inclusive space for those who may be deemed as a neurodivergent whilst attending a mainstream space. Not everyone's disability is obvious.

When looking at the behaviours and engagements, it is obvious that every child is different and has different reactions to each space. However, the option to move things around or change that student's environment is possible in a satellite school. This can maintain a positive classroom environment for all the students and keep up with the children's needs. This isn't clear in a mainstream school and therefore sparks the idea that the importance of space is very valuable and should be considered more than what it already is.

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