ARCHITECTURAL SPACES PROMOTING ACTIVE LEARNING AND PROGRESSIVE EDUCATIONAL DELIVERY FOR THE PRIMARY SCHOOL STUDENT

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The education system in the United States is failing the next generation of young learners. The public school system was designed for a past generation and is no longer properly preparing students for their future. Projections for the 2030 job market suggest a skill shift towards more technological, social and emotional, and higher cognitive skills. Non-cognitive skills like mental elasticity, creativity, and critical thinking will be in high demand, yet these types of skills are not the focus in schools today. Students learn in a more social, technological, and informal way than in recent decades, and our current infrastructure does not support this paradigm shift. As educational methods continue to evolve, the spaces in which we learn must also adjust. Children are the most impressionable minds in society. How can we, as a society, instill the necessary skills into our youth that will lead to more productive people, accepting and adaptive society, and innovative future leaders? Additionally, what architectural spaces affect how children learn? How can we as designers and architects help to evolve learning spaces to become more flexible and encourage active learning pedagogies?

In order to prepare students for the global job market, public schools around the country should consider adapting their pedagogy to match the demand of future job markets. To achieve this, we must broaden the horizons of traditional educational practices to be focused on holistic, self-motivated, flexible learning. Through experiential learning, stronger connections between students and the development of their academics, core of basic skills, and empowerment for their own learning is strengthened. Teaching academic subjects (cognitive skills) in conjunction with non-cognitive skills gives students the opportunity to engage with their peers and learn how to creatively and collaboratively solve issues on both human and global scales. In addition to changes in approach, infrastructure must also change, adjust, and evolve to promote more active, flexible, and engaged learning.

Through the use of empirical research, case studies, observation, and interviews, dialogue uncovers how educational practices could be improved through intentional design of the learning space to encourage experiential learning. Active and flexible learning spaces provide teachers and students the opportunity to move and interact in ways that current school infrastructure does not support. Inherent flexibility also allows the school to evolve over time with changes in curricula, pedagogy, or educational delivery. During the thesis and design process, there will be a development of spaces that support a paradigm shift in technology, problem solving on a global scale, risk taking, experiential processes, lifelong learning, and intentionally designing architecture to evolve with each decade of life. Learning spaces that support innovative learning processes are not static. They must be an inherent flexibility and ability to move in the space to support energetic life-long learning.

WRITTEN PAPER

Thoughts on active learning

Architectural Spaces Promoting Active Learning and Progressive Educational Delivery for the Primary School Student

ABSTRACT

Education in the United States is failing the next generation. Students today advance through their education without the skills or passion for learning they will need to be marketable in their careers. And, our current educational infrastructure cannot keep up with constant technological and societal changes. Through experiential learning, young students are offered the opportunity to develop core subject understanding but also their ability to communicate, to be creative problem solvers, and to be adaptable in a variety of situations. Through empirical research and case studies, the topic of experiential learning, interpersonal skills, and the architectural spaces necessary for these activities to occur is examined. Architectural spaces that support innovative learning processes are not static. They must be an inherent flexibility in the space to encourage energetic learning. The goals are to develop spaces that support a paradigm shift in technology, problem solving on a global scale, experiential processes, lifelong learning, and the ability of the built environment to evolve with each decade of life.

INTRODUCTION

Projections for the 2030 job market suggest a skill shift towards a more technological, social and emotional, and higher cognitive skill job market. A study conducted by the McKinsey Global Institute shows in both US and European future job markets that there will be a rise in need for skills including: creativity, risk management, critical thinking, mental elasticity, and adaptability.[1] In order to prepare students for the global job market, public schools around the country should consider adapting their pedagogy to match the demand of future job markets.

The current public education system in the United States is failing the next generation of students. Students learn in a more social, technological, and informal way than in recent decades, and our current infrastructure does not support this paradigm shift. As educational methods continue to evolve, the spaces in which we learn must also adjust. Children are the most impressionable minds in society. They are learning how to interact with one another and the world around them. How can we, as a society, instill the necessary skills into our youth that will lead to more productive people, accepting and adaptive society, and innovative future leaders? Additionally, what architectural spaces affect how children learn? How can we as designers and architects help to evolve learning spaces to become more flexible and encourage active learning pedagogies?

To achieve this, we must broaden the horizons of traditional educational practices to be focused on holistic, self-motivated, flexible learning. Through experiential learning, stronger connections between students and the development of their academics, core of basic skills, and empowerment for their own learning is strengthened. Teaching academic subjects in conjunction with other marketable skills gives students the opportunity to engage with their peers in complex subjects to learn how to creatively solve issues on both human and global scales. The education system in America should be less focused on prescriptive test scores and more focused on producing productive, engaged, inclusive, life-long learners. During this process, there will be a development of spaces that

[1] Bughin, Jacques, Eric Hazan, Susan Lund, Peter Dahlstrom, Anna Weisinger, and Amresh Subramaniam. *Skill Shift: Automation and the Future of the Workforce*. PDF. Washington D.C.: McKinsey & Company, May 2018.

support a paradigm shift in technology, problem solving on a global scale, risk taking, experiential processes, lifelong learning, and intentionally designing architecture to evolve with each decade of life. Learning spaces that support innovative learning processes are not static. They must be an inherent flexibility and ability to move in the space to support energetic life-long learning.

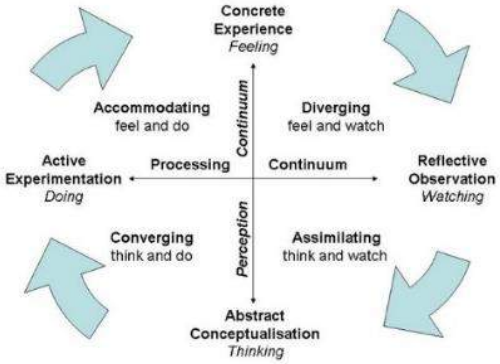
METHODOLOGY

Through the use of empirical research and case studies, discussion unfolds about current academic pedagogical practices and how school design does not support the 21st century child. Arguments for flexible spaces that encourage experiential learning and activate the development of marketable skills will follow. Case studies will be presented of the Finland educational system restructuring, learning spaces by Rosan Bosch, and other school designs that support active and flexible learning. These case studies present examples of modern school pedagogy, design, and social structure to help support the next generation of competitive workers and leaders on a global playing field. Interviews with elementary school teachers and experiential education advocates provide valuable information and insight on topics of experiential, active, and immersive learning.

THEORY

Academic learning is the widespread educational practice in the United States. This pedagogy supports direct instruction, results-based learning centered on standardized testing, and a high level of classroom and subject structure. With over 100,000 public elementary schools in the United States, there is not a set "standard" for educational delivery. Generally, the common curriculum includes reading, writing, math, science, and social studies. The academic learning pedagogy supports students in learning through prescriptive and proscriptive mannerisms. Most often, tests are the only indicator of student learning. Spatially, academic learning classrooms tend to be static; most have a presentation wall in which the instructor teaches the rows of sitting student. There is very little movement or direct connection to the material presented. School design of traditional academic learning is an industrialized response to education. Double loaded corridors with classrooms along each side are very typical and standardized. All classrooms are the same with little variation. These types of schools have met the needs for many past generations but are failing to meet the needs of the current and future generations.

Writing on experiential learning dates to the time of Aristotle. In *Nicomachean Ethics,* Aristotle states, "For what one has to learn to do, we learn by doing, example: people become builders by building." [2] Apprenticeships have long been the method of learning expertise in any field. More recently, John Dewey, Jean Piaget, and Kurt Lewin, wrote their ideas on experiences and how our experiences contribute to learning processes and interactions in the world. David Kolb expanded on the theories of the men listed above and wrote a more cohesive theory on experiential learning. According to Kolb, "[experiential] learning is the process whereby knowledge is created through the transformation of experience."[3] Kolb's theory looks at learning as a holistic, life-long process that is made through interactions between people and environments rather than a formal education system as the primary source of one's education. Kolb further explains that experiential learning has four cognitive activities which form a cycle of learning. These activities include concrete



[Figure 1: Kolb Experiential Learning Cycle][4]

[2] Aristotle, and C. C. W. Taylor. 2006. *Nicomachean Ethics*. Clarendon Aristotle Series. Clarendon Press. Page 2.

[3] Kolb, David A. 2014. *Experiential Learning. [Electronic Resource] : Experience as the Source of Learning and Development*. Pearson Education LTD. Chapter 2. Summary: A Definition of Learning.

[4] Mcleod, Saul. "Kolb's Learning Styles and Experiential Learning Cycle." Simply Psychology. February 05, 2017.

experience, observation, conceptualization, and active experimentation. It is important to consider all aspects of this cycle for knowledge to be gained. Not only are concrete experiences necessary, but also too is watching and reflecting on the experience. It is important to note that more effective learning occurs when all four cognitive activities are activated. Figure 1 presents a graphic representation of the cycle and the activities/ actions necessary for each stage to occur.

Experiential learning creates connections between the person and the subject they are learning in a way academic learning cannot. The concrete experiences learned through experience have been shown to increase learning retention and motivation to learn. In addition, experiential learning provides students with the opportunity to develop other skills not traditionally taught like creativity, critical thinking, risk management, and relationship building. These are the skills that prepare children for their future lives and careers. The University of Oxford, Oxford Martin School, conducted a research study into the skills that will be valuable in the 2030 market. The study concluded that among the most important skills based on future demand include: learning strategies, social perceptiveness, coordination, originality, and fluency of ideas, and active learning.[5] This reflects a movement in higher cognitive careers as technology and automation are expected to take over many sectors of the low-skilled job market. Ideally, the interdisciplinary educational approach of combining academic, experiential, and interpersonal developmental skills leads to active, life-long, motivated learners who have metal elasticity and emotional intelligence to be well prepared for the challenges they will face in their careers and futures as productive human beings.

Some pedagogies of experiential learning include Waldorf, Montessori, play-based, and project-based learning. While all four of these pedagogies have different approaches to education, all focus on child interaction and empowerment in an active way. Regardless of pedagogy, active and experiential learning can be incorporated into any curriculum. There is not a perfect pedagogy by which to follow for experiential learning. Rather, all of the pedagogies listed above should be viewed in the context of wholistic and lifelong learning.

How learning environments affect student learning:

Among educators, community members, and architects, discussion concerns how and why outdated school buildings do not best meet the needs of students today. In order to help to incorporate experiential learning into school curriculum, the school architecture and interiors must allow for movement and adaptability. Our buildings shape who we are and what we can do within them. In order for more active human behavior to occur, we must change the architecture to be flexible and conducive to movement.

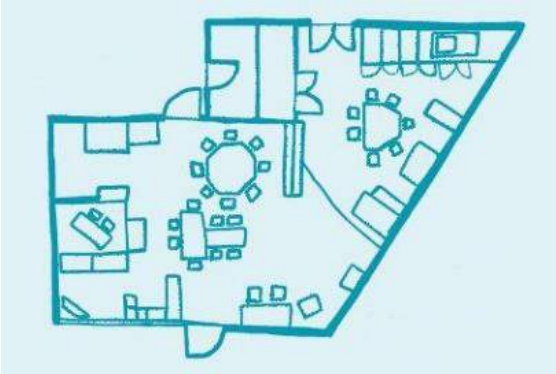
Clever Classrooms

In a study from the University of Salford in Manchester, UK, the Holistic Evidence and Design Project or HEAD, studied 153 primary school classrooms and their effectiveness on student learning. This comprehensive study analyzed classrooms from around the UK on three major characteristics: stimulation, individualization, and naturalness. The study "found that well-designed primary schools boost children's academic performance in reading, writing, and maths."[6] It is important to note that these statistics represent the difference of the design of a classroom only, not the methods by which the information is presented. The study also found that the individual classroom played a stronger role in effectiveness of learning compared to the design of the whole school. The study, focusing on factors like classroom layout, air quality, and lighting, among other things, found that these factors were the most influential to a child's ability to learn.

Accessed March 31, 2019. https://www.simplypsychology.org/learning-kolb.html.

[5] Bakhshi, Hasan, Jonathan M. Downing, Michael A. Osborne, and Philippe Schneider. *The Future of Skills: Employment in 2030*. PDF. London: Pearson and Nesta, 2017.

[6] Barrett, Peter, Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classrooms*. PDF. Manchester: University of Salford, February 2015. Page 3.



[Figure 2: Complex Classroom Shape][7]

From this study, architects can make more informed decisions on the design of classrooms spaces to create spaces conducive to student learning. For example, because lighting proved to be the strongest impact on learning, providing classrooms with adequate natural and artificial lighting is of upmost importance. Not only should we consider the amount of natural light, but also the orientation of where the light is coming from. Glare control via shades or blinds that are easy to adjust also greatly contribute to the overall light quality. Additionally, individualization and flexibility proved to be especially effective in younger groups of children. Providing a variety of learning zones, based on pedagogical requirements, help to engage students. Classrooms with a complex room shape provides a variety of different learning areas and opportunity for activity. See Figure 2 for an example of a complex room shape. Lastly, classroom stimulation plays a role in the third and final "naturalness" category. This applies to both architectural features and more temporary items like artwork or posters applied by teachers. The study found that the visual complexity of room layout and color displays should lie somewhere in the middle. Too little color or forms can cause a lack of interest in the students, while too many displays and strong use of color can be distracting and overstimulating. Generally, leaving 20-50% of wall space unadorned with artwork or vivid color is the ideal proportion of stimulation.

These main factors are especially helpful to architects and designers because we play an important role in the spaces students will be learning for many decades to come. Specialized design for classrooms and learning spaces should be sympathetic to the findings of this study because it is the only study that links student performance to the architectural space. While this may not be the sole answer for classrooms on a global scale, these should be carefully considered on a case-by-case basis. At the very least, it is a good starting point for designers with a variety of complex issues to consider.

Rosan Bosch Applying Theory to Practice

Combining theory and practice, Rosan Bosch, an artist and designer, is leading the way in implementing active, adaptable, and flexible design into academic spaces. Bosch believes learning should be fun, and that learning spaces should engage and excite students rather than serve only the purpose of educating.[8] Her architecture firm in Copenhagen, Rosan Bosch Studios, has been pursuing and designing "learning landscapes" for active and engaged pedagogies to stimulate young students to be excited in the spaces they learn. Bosch recognizes that the architecture is not the only factor in a school setting, in fact, she recognizes three main factors which include: pedagogy, design, and organization. All three of these factors are co-dependent on each other. Meaning, you can design a flexible and fun school, but if the teachers in the school continue to teach the way they always have, the school will not work for them. All factors must work together to allow for the optimal and most effective learning environment.

After much research, observing how students learn, and designing spaces that allow for different methods of teaching and learning, Bosch has created six principles that combine physical space design with how children learn. These principles include: mountaintop, cave, campfire, watering hole, hands-on, and movement.[9] Each of the

[7] Barrett, Peter, Yufan Zhang, Fay Davies, and Lucinda Barrett. *Clever Classrooms*. PDF. Manchester: University of Salford, February 2015. Page 28.

[8] Talks, TEDx. "Designing For A Better World Starts At School: Rosan Bosch at TEDxIndianapolis." YouTube. November 17, 2013. Accessed June 23, 2019. https://www.youtube.com/watch?v=q5mpeEa_VZo&t=6s.

[9] Rosan Bosch. "Learning Spaces Need to Enable and Motivate Every Learner." Rosan Bosch Studios. March 04, 2019. Accessed June 23, 2019.

principles describe a need for a physical space in order for these learning processes to occur. While some of the processes can occur in a variety of environments, having a variation is what makes a learning environment successful. And, because students learn in a variety of different ways, it is important for their learning environment to support a wide range of activities and methods for the best possible outcome: engaged students.

The best way to show these principles in action is to look at one of her projects. The Vittra Telefonplan School, located in Stockholm, Sweden, is one of her well known projects. The school was completed in 2011 and was designed to be an open plan school focusing on the individual student and their development rather than grade levels and assigned classrooms. There are areas for large group instruction as well as more private individual focused work. The design of the space helps to inform the activities that can occur in each space. The school is also highly technologically advanced. Each student is given a laptop at the beginning of their education that they use for their lessons and other related learning exercises. Students are free to work in spaces they feel the most comfortable. Refer to Figure 3 for the floor plan of the school.

[Figure 3, Vittra Telefonplan plan][10]

There are very few interior partitions, but the spaces are well defined. Each with their own name and character, the spaces allow for flexibility and movement in a student's school day. There are spaces that provide for each of the six principles. For example, #1 "The Tree" allows for campfire situations like interactions where meetings can take place without disrupting others. #2, "Dance Studio" supports movement interactions where students can use their body and movement to learn. #3 "Science Lab" is a hands-on area that provides space for students to interact and experience their learning in a more active way. Finally #4, "Concentration Niches" is a cave situation where students can retreat to focus. These are quiet areas designed for individual work.

There is a high degree of flexibility in the types of spaces provided. The variety of types of furniture allows for students to move and work in areas appropriate for the activities they are conducting. Additionally, Bosch believes that the space should be flexible, but so should the people. Spaces can be used for a variety of uses but are flexible in a sense that the spaces allow for different groupings and number of students can be accounted for.

CASE STUDIES

Finland – Lessons Learned

Finland has not always been one of the best countries for education. During the 1970's Finland's education system ranked near the bottom on a global scale, according to PISA. Since then, Finland has reevaluated and regenerated their entire educational system. Resulting from the slow process of change over four decades, Finland has seen a shift in culture as the most notable transformation, followed closely by creating a baseline curriculum, shifting the way they value and educate their educators, and finally by embracing changing teaching methods and technologies. Finland is now one of the top PISA performing countries and is considered to be one of the best countries for education in the world. Some of the ongoing successful characteristics of the educational system reform include: the same nine-year basic school for all, good teachers, flexible accountability (pedagogy), and a culture of trust.[11]

There are many factors outside the classroom that affect Finland's productive education system, but the one that affects the classroom daily is

https://rosanbosch.com/en/approach/learning-spaces-need-enable-and-motivate-every-learner.

[10] Jett, Megan. "Vittra Telefonplan / Rosan Bosch." ArchDaily. January 30, 2012. Accessed June 23, 2019. https://www.archdaily.com/202358/vittra-telefonplan-rosan-bosch.

[11] Aho, Erkki, Kari Pitkanen, and Pasi Sahlberg. 2006. "Policy Development and Reform Principles of Basic and Secondary Education in Finland Since 1968." Washington D.C.: The World Bank. 11-12.

pedagogy. The 2016 release of the "National Core Curriculum" is paving the way for students of a new generation to have access to new learning processes / pedagogies and enhanced learning outcomes. With the new curriculum, traditional subjects such as mathematics, language, history, and science will be accompanied with environmental studies, ethics, home economics, and crafts. Interdisciplinary and multidisciplinary learning activities are required at least once per school year that encourage complex issues and require the students to think about how school subject and learning can be combined with other lessons. These activities help students to develop "transversal competences" which are skills in which they will use to be successful in higher education and future careers.[12]

The shift in pedagogy is also affecting school design. Finland is "currently undergoing one of the most ambitious school redesign projects in Europe, exchanging traditional walled-in classrooms and rows of desks for more flexible and informal open-plan layouts."[13] This redesign includes the construction of 100 new schools and an unknown number of renovated schools. An example of this redesign is the Kalastama School located in Helsinki, Finland. This 91,200 square foot school was completed in 2016 and provides learning space for seven hundred students. The plan of the schools shows a variety of different size and shape of classrooms and learning spaces. Furniture and movable partitions allow for the maximum flexibility and student engagement.

[Figure 4, Kalasatama School Interior][14]

When comparing the Finnish and American education system, there are many differences. The largest difference is the cultural positions toward education. The Finnish education system is extremely well funded and trusted by the Finnish people. Finnish teachers are well paid and are extremely well respected. This "drastic" educational reform took four decades and is still evolving. The American system can learn from the Finnish for both legislative and school design reforms. While the learning spaces discussed above are most ideal for active and engaged students, much of the United States is not currently ready to make these types of spaces fully productive. The education system in the United States does not support this type of learning yet but may be able to in the future. Based on the failed open plan studies of the 1960's and 1970's, American teachers and students may not yet be prepared to be effective in a Bosch designed space. However, small steps can be taken to start to incorporate these ideas into traditional American schools. Teachers and designers understand that a different approach must be taken in order to engage students in the digital and technological age.

CONCLUSION

While the education system in America is still broadly focused on academic learning, the opportunity for experiential learning at all age levels is an important and necessary methodology of teaching that should be implemented for a more effective educational system. When teaching experiential learning and functional skills in conjunction with one another, the overall quality of learning increases. As it relates to architecture, the design of flexible and adaptable spaces will be essential in the successful implementation of this methodology of learning. Many American school districts may not ready for the drastic change, but we can start to adapt high performance learning spaces into the design of our current and future schools to start the shift. We know our designs

[12] Finnish National Agency for Education. "New National Core Curriculum for Basic Education." Finnish National Agency for Education. Accessed May 15, 2019. https://www.oph.fi/english/curricula_and_qualifications/basic_education/curricula_2014.

[13] O'Sullivan, Feargus. "Finland's Ambitious School Redesign Program." CityLab. August 18, 2017. Accessed May 15, 2019. https://www.citylab.com/design/2017/08/why-finland-is-embracing-open-plan-school-design/537060/.

[14] Villa, Valentina. 2017. "Kalasatama School and Day Care." ArchDaily. ArchDaily. February 19, 2017. https://www.archdaily.com/803268/kalasatama-school-and-day-care-jkmm-architects.

impact how children learn, and can start making informed decisions on how to best design spaces that will help children learn and be engaged with the world around them. Providing students with a more holistic, adaptable, interdisciplinary education which will better serve both the students and our global society in their future.

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REFLECTION

Reflection

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Introduction

I was initially interested in studying experiential learning as a way for learners to be more active and engaged. I think this would be the best way for young students to interact with one another and their teachers to provide the opportunity to intentionally develop their interpersonal skills. Skills like creativity, mental elasticity, and critical thinking; skills that are necessary in life now, and skills that will increase in demand by 2030. Ultimately, the goal is to create an environment for students that not only provides education in general knowledge subjects, but also helpes them to develop skills and experiences that better prepares them for their future.

Process

My research led me through a long series of case studies exploring pedagogies and global approaches to school architecture and the similarities, differences, and opportunities for school flexibility. Because the traditional classroom is restrictive, my research led me to look at more flexible room options. I found that the most opportunities for differentiated learning came from a network of spaces in close proximity to one another. This provides students the opportunity to move and learn in spaces that best fit activity or personality type while still providing teachers the ability to observe and facilitate their learning.

With an understanding that there are a wide range of aspects that influence a school outside of the architecture and active pedagogies, it became important to me to design a school that was flexible in a variety of ways. In doing so, the school could serve the current curriculum, but also any future changes in curriculum, pedagogy, or student population.

Additional design explorations included aspects of child-scale spaces, central gathering spaces, acoustics, safety, outdoor learning, and aspects of student and teacher ownership.

Final Design

Symmes Elementary School was selected for their guiding values and interest in different types of learning environments. The school district recognizes the need for changes in curriculum and understands their existing facilities no longer serve the current generation of learners.

My proposal for the design of Symmes Elementary represents ideas and questions raised in my research including designing child-scale spaces that provided students the opportunity to learn in non-conventional ways. Aspects of flexibility can be found throughout the design including movable walls, flexible furniture, and a variety of learning networks for students of all ages. Students at my proposed school would be organized by house. Each house consists of 100 students, one class per grade. In other words, a house would have one Kindergarten class, one first grade class, and so on. Students would spend their five years in the same house creating a consistent level of ownership that is hard to find in a flexible school. Each major programmatic element in the school was designed to have its own space that is directly connected to the central atria. The atria is the "heart" of the school and is designed to give the opportunity to have multiple gatherings simultaneously.

The final design had many aspects of active and flexible learning. The variety of spaces and networks could provide new learning experiences for the students and teachers. All houses have access to outdoor learning opportunities. The combination of indoor / outdoor and flexible learning environments would provide the opportunity for students to interact and move throughout their school day thus providing the ability to develop interpersonal skills.

If I were given more time to develop the project, I would continue to develop the massing of the school. The exterior form and materials could help to articulate the activities happening within. I would also further develop how these ideas could be transferred to other schools.

Thank You

I would like to thank my committee for their guidance, feedback, and patience throughout the thesis process. Your time and effort never went unnoticed and is greatly appreciated. Thank you!!

THESIS PROJECT


INVESTING IN OUR FUTURE ROOTS

CASE STUDIES

Others who have done similar work

These case studies were selected in order to better understand and analyze how school design provides opportunities for students to be active and learn in different environments throughout the course of a school day, week, month, etc.

The following case studies represent school design on a global basis. A variety of different pedagogies are also represented including: Montessori, Waldorf, Play-based, Project-Based, and Open-Plan schools. This wide range study was meant to analyze and compare the approaches of the pedagogies to find the subtle similarities and differences in the design of the spaces.

From this series of case studies, I found overall, regardless of pedagogy, the classroom shape and size remained constant. The classroom, while it allows for some movement and activity, is restrictive. The schools that had a wide range of opportunity for variety and flexibility were not restricted to the traditional four-walled classrooms. Rather, the schools with the most flexibility had a network of spaces in close proximity to one another that allowed for students and teachers to learn in a variety of different settings easily.

While analyzing what it meant for a school to be "flexible," I found there is a wide range of aspects that go into providing flexibility for a school. Every school provided different flexible options, and no two schools were alike. In terms of infrastructure flexibility, not only can furniture move, but the architecture itself can be manipulated to open and close off spaces as needed by the demands of an activity. Program proximities and adjacencies are also important in terms of the probability of the teachers and students to use the spaces as the design intended. Further analysis into school safety, adjacencies, and outdoor learning opportunities.

CASE STUDIES

120 Division School
Location: Shanxi, China
Architect: WAU Design
Completion: 2014
Square Footage: unknown
Pedagogy: Academic

Axis Pramiti
Location: Karnataka, India
Architect: The Purple Ink Studio
Completion: 2017
Square Footage: 14,000
Pedagogy: Academic

Blue School Middle School
Location: New York, NY
Architect: PelliOverton Architects
Completion: 2017
Square Footage: unknown
Pedagogy: Project- Based

Community Centre Kastelli
Location: Oulu, Finland
Architect: Lahdelmaa Mahlamaki
Completion: 2014
Square Footage: 265,330
Pedagogy: Community Center

Disney School
Location: Chicago, IL
Architect: Perkins & Will
Completion: 1960
Square Footage: 272,000
Pedagogy: Open Plan

El Tiller School
Location: Barcelona, Spain
Architect: Eduard Balcells, Ignasi Rius Architecture, & Tigges Architekt
Completion: 2018
Square Footage: 10,225
Pedagogy: Waldorf

Highgate PrimSchool
Location: Australia
Architect: iredale Pedersen hook architects
Completion: 2017
Square Footage: 11,646
Pedagogy: creative environment, different size spaces

Ivanhoe Grammar Senior Years & Science Centre
Location: Ivanhoe, Australia
Architect: McBride Charles Ryan
Completion: 2015
Square Footage: 30,892
Pedagogy: co-educational, interconnectivity, flexible

Kalasatama School and Day Care
Location: Helsinki, Finland
Architect: JKMM Architects
Completion: 2016
Square Footage: 91,277
Pedagogy: Finland

Kirkkojarvi Comprehensive School
Location: Espoo, Finland
Architect: Verstas Architects
Completion: 2010
Square Footage: 110,655
Pedagogy: Finland

Marecollege
Location: Leiden, The Netherlands
Architect: 24H Architecture
Completion: 2013
Square Footage: 40,902
Pedagogy: Waldorf

Marin Montessori School
Location: Corte Madera, CA
Architect: PFAU Long Architecture
Completion: 2005
Square Footage: 12,000
Pedagogy: Montessori

Marine Education Center
Location: Ocean Springs, Mississippi
Architect: Lake Flato
Completion: 2017
Square Footage: 34,000
Pedagogy: Environmental

Marlborough Primary School
Location: London, UK
Architect: Dixon Jones
Completion: 2017
Square Footage: 44078
Pedagogy: Academic

Montessori School
Location: Delft, The Netherlands
Architect: Herman Hertzberger
Completion: 1960
Square Footage: 7,265
Pedagogy: Montessori

Montessori School Waalsdorp
Location: Utenbroekestraat, The Netherlands
Architect: De Zwarte Hond
Completion: 2014
Square Footage: 26,694
Pedagogy: Montessori

New City School
Location: Frederikshavn, Denmark
Architect: Arkitema Architects
Completion: 2012
Square Footage: unknown
Pedagogy: Academic, Flexible

North Cascades Environmental Learning Center
Location: Rockport, WA
Architect: Henry Klein Partnership
Completion: 2005
Square Footage: 38,582
Pedagogy: Environmental

OSDM Standards
Location: Ohio
Architect: N/A
Completion: Current
Square Footage: N/A
Pedagogy: Academic

Our Lady of Assumption Primary School
Location: North Strathfield, Australia
Architect: BVN
Completion: 2019
Square Footage: 55,972
Pedagogy: Flexible

Our Lady of the Southern Cross Primary School
Location: Taylors Hill, Australia
Architect: Baldasso Cortese Architects
Completion: 2014
Square Footage: unknown
Pedagogy: Open Plan

Ruyton Girls School
Location: Melbourne, Australia
Architect: Woods Bagot
Completion: 2015
Square Footage: 52291
Pedagogy: student-centered flexible learning

Saunalahti School
Location: Espoo, Finland
Architect: VERSTAS
Completion: 2012
Square Footage: 113,021
Pedagogy: Finland

School Campus De Vonk
Location: Knokke-Heist, Belgium
Architect: De Pluim / NL Architects
Completion: 2017
Square Footage: 35,305
Pedagogy: Academic

School in Port
Location: Port, Switzerland
Architect: Skop
Completion Date: 2017
Square Footage: 38427
Pedagogy: Academic

Skovbakke School
Location: Skovvej, Denmark
Architect: CEBRA
Square Footage: 100,104
Completion Date: 2017
Pedagogy: special focus on exercise

SkyPlay
Location: North Perth, Australia
Architect: Tom Codden Architects & Matthew Crawfor
Completion: 2018
Square Footage: 16,684
Pedagogy: Play Based

Speelpleinstraat
Location: Merksem, Belgium
Architect: SINAE
Completion: 2012
Square Footage: 37,673
Pedagogy: Academic

St Mary of the Cross Primary School
Location: Point Cook, Australia
Architect: Baldasso Cortese Architects
Completion: 2013
Square Footage: unknown
Pedagogy: Open Plan

Steiner School
Location: Switzerland
Architect: LOCALARCHITECTURE
Completion: 2012
Square Footage: 14,725
Pedagogy: Waldorf

Taika Kindergarten
Location: Seinajoki, Finland
Architect: OOPEAA
Completion: 2017
Square Footage: 33,368
Pedagogy: Finland

Vittra Telefonplan
Location: Stockholm, Sweeden
Architect: Rosan Bosch
Completion: 2011
Square Footage: 20,451
Pedagogy: Open Plan

WeGrow
Location: New York, NY
Architect: Bjarke Ingels Group
Completion: 2018
Square Footage: 10,000
Pedagogy: Play-Based

Wilkes Elementary School
Location: Bainbridge, WA
Architect: Malum
Completion: 2012
Square Footage: 64,450
Pedagogy: Academic

Winton Woods K-6
Location: Cincinnati, OH
Architect: SHP
Completion: 2020
Square Footage:
Pedagogy: Project-based

CASE STUDIES: PEDAGOGY

MONTESSORI

FINLAND

OPEN PLAN

WALDORF

FLEXIBLE & ADAPTABLE

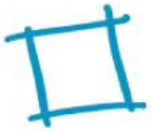
ACADEMIC

PROJECT-BASED

ENVIRONMENTAL LEARNING CENTERS

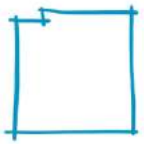
CASE STUDIES: CLASSROOMS - SIZE & SHAPE

1



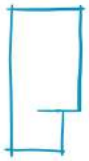
120 Division School
Avg class sqft: 989 sqft
students/classroom: 32
sqft/ child: 30.9

2



Axis Pramisi
Avg class sqft: 300 sqft
students/classroom: 20
sqft/ child: 15

3

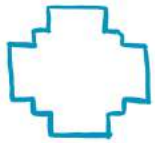


Blue School Middle School
Avg class sqft: 450 sqft
students/classroom: 18
sqft/ child: 25

4

Community Centre Kastelli
Avg class sqft: 825 sqft
students/classroom: 25
sqft/ child: 33

5

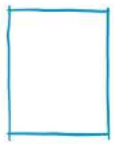


Disney School
Avg class sqft: unknown
students/classroom: n/a
sqft/ child: unknown

6

El Tiller School
Avg class sqft: 400 sqft
students/classroom: 15
sqft/ child: 26.6

7



Highgate Primary School
Avg class sqft: 1149 sqft
students/classroom: 25
sqft/ child: 45096

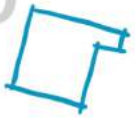
8

Ivanhoe Grammar Senior Years & Science Centre
Avg class sqft: 600 sqft
students/classroom: 30
sqft/ child: 20

9

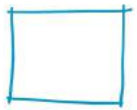
Kalasatama School and Day Care
Avg class sqft: 700 sqft
students/classroom: 14
sqft/ child: 50

10



Kirkkojarvi Comprehensive School
Avg class sqft: 425 sqft
students/classroom: 24
sqft/ child: 17.7

11



Marecollege
Avg class sqft: 825 sqt
students/classroom: 20
sqft/ child: 41.25

12

Marin Montessori School
Avg class sqft: 1400 sqft
students/classroom: 25
sqft/ child: 56

13

Marine Education Center
Avg class sqft: n/a
students/classroom: n/a
sqft/ child: n/a

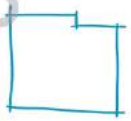
14

Marlborough Primary School
Avg class sqft: 715 sqft
students/classroom: 20
sqft/ child: 35.75

15

Montessori School
Avg class sqft: 1200 sqft
students/classroom: 28
sqft/ child: 42.8

16



Montessori School Waalsdorp
Avg class sqft: 600 sqft
students/classroom: 18
sqft/ child: 33.3

17

New City School
Avg class sqft: 650 sqft
students/classroom: 24
sqft/ child: 27

18

North Cascades Environmental Learning Center
Avg class sqft: n/a
students/classroom: n/a
sqft/ child: n/a

19

OSDM Standards
Avg class sqft: 900 sqft
students/classroom: 25
sqft/ child: 36

20

Our Lady of Assumption Primary School
Avg class sqft: 1600 sqft
students/classroom: 30
sqft/ child: 53.3

21

Our Lady of the Southern Cross Primary School
Avg class sqft: 640 sqft
students/classroom: 118 total
sqft/ child: 24.4

22

Ruyton Girls School
Avg class sqft: 750 sqft
students/classroom: 24
sqft/ child: 31.25

23

Saunalahti School
Avg class sqft: 550 sqft
students/classroom: 16
sqft/ child: 34.375

24

School Campus De Vonk
Avg class sqft: 550 sqft
students/classroom: 20
sqft/ child: 27.5

25

School in Port
Avg class sqft: 550 sqft
students/classroom: 24
sqft/ child: 22.9

26

Skovbakke School
Avg class sqft: 850 sqft
students/classroom: 28
sqft/ child: 30

27

SkyPlay
Avg class sqft: 500 sqft
students/classroom: 12
sqft/ child: 41.66

28

Speelpleinstraat
Avg class sqft: 400 sqft
students/classroom: 18
sqft/ child: 22.2

29

St Mary of the Cross Primary School
Avg class sqft: 3200 sqft
students/classroom: 50
sqft/ child: 64

30

Steiner School
Avg class sqft: 800 sqft
students/classroom: 24
sqft/ child: 33.3

31

Taika Kindergarten
Avg class sqft: 400 sqft
students/classroom: 15
sqft/ child: 26.6

32

Vitra Telefonplan
Avg class sqft: 800 sqft
students/classroom: 24
sqft/ child: 33.3

33

WeGrow
Avg class sqft: unknown
students/classroom: n/a
sqft/ child: n/a

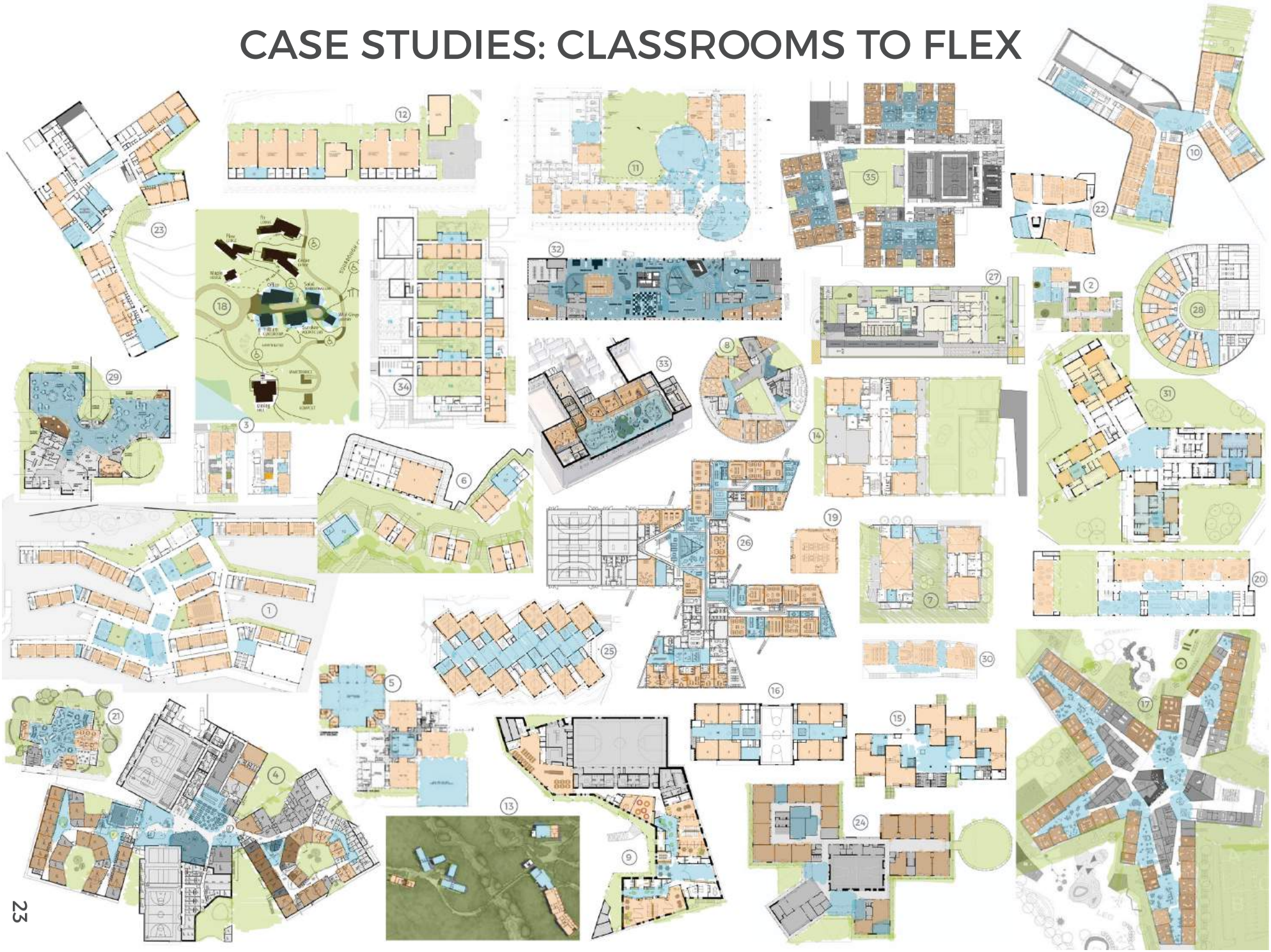
34

Wilkes Elementary School
Avg class sqft: 880 sqft
students/classroom: 24
sqft/ child: 36.6

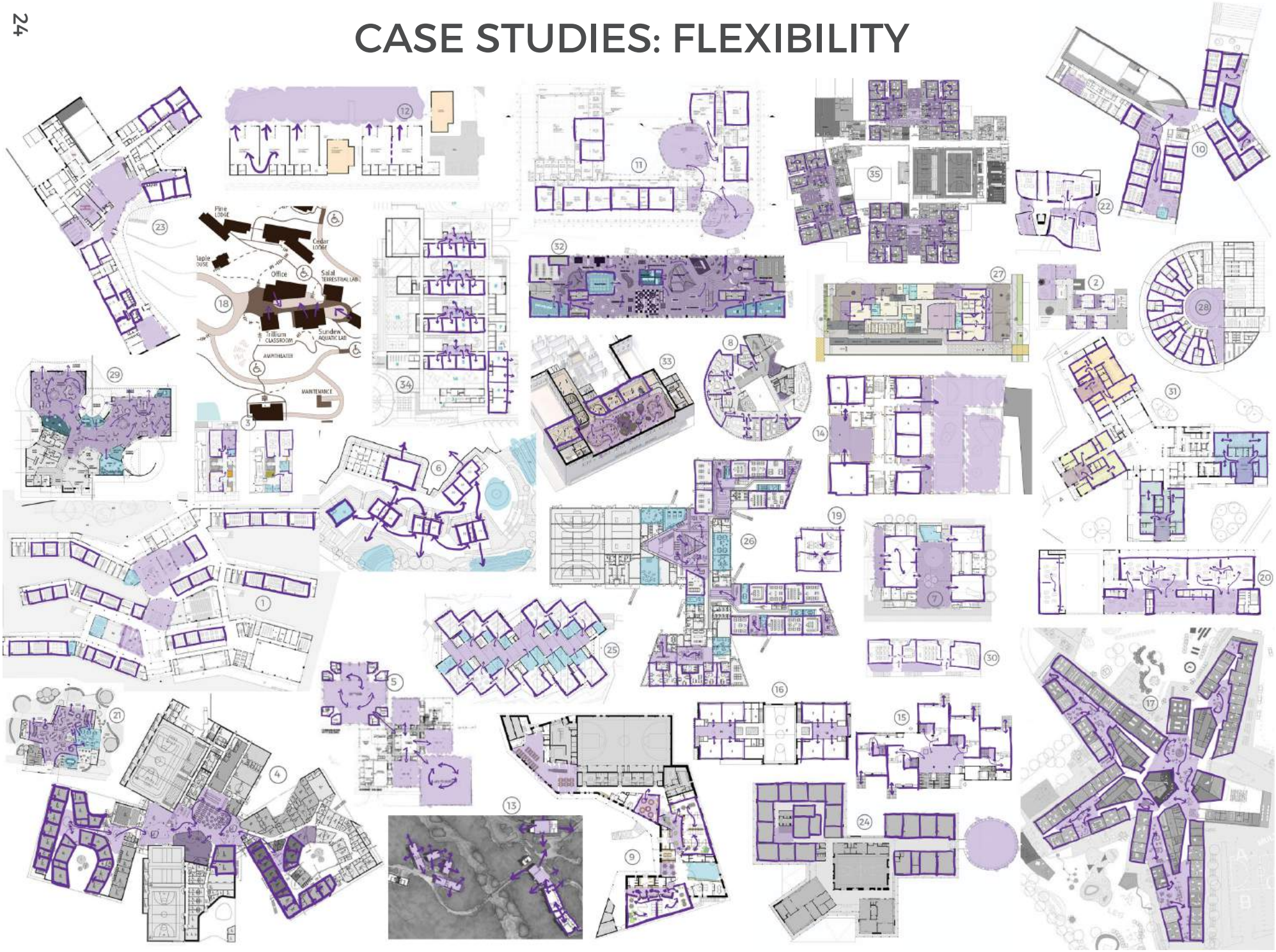
35

Winton Woods K-6
Avg class sqft: 800 sqft
students/classroom: 30
sqft/ child: 26.6

CASE STUDIES: CLASSROOMS TO FLEX



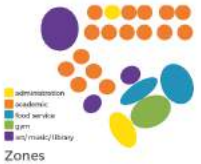
CASE STUDIES: FLEXIBILITY



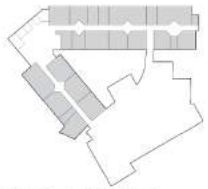
CASE STUDIES: SPECIALIZED

Kramer Elementary OSDM Standards
Location: Oxford, Ohio
Architect: SHP
Completion: 2016
Square Footage: 46,500
Pedagogy: Academic

First Floor Plan



Zones



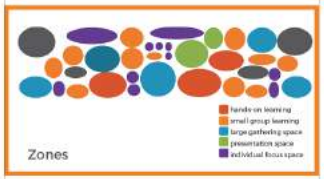
Double Loaded Corridors

Interior Courtyard

This double loaded corridor is the example of the type of educational design I do not want to pursue. While pairs of classrooms are connected with glass sliding doors, the classrooms restrict the movement and flexibility to a variety of learning environments. Learning areas are highly structured to support academic learning. One successful aspect of this project is the connection of gym, student dining, and music stage to create one large community space for after-hours use.

Vittra Telefonplan
Location: Stockholm, Sweeden
Architect: Rosan Bosch
Completion: 2011
Square Footage: 20,451
Pedagogy: Open Plan

Floorplan



Zones

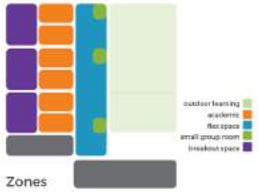
Density

Acoustics

Vittra Telefonplan represents a school with maximum flexibility and opportunity for a variety of different learning spaces. The plan provides spaces for individual, small group, and larger gatherings within close proximity of the other. Acoustics, safety, and natural lighting are a concern with this type of open plan.

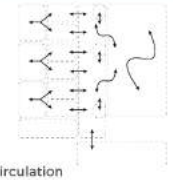
Arlington Elementary School
Location: Tacoma, WA
Architect: Mahlum
Completion: 2018
Students: 450
Pedagogy: Child-Centered

First Floor Plan



Zones

Outdoor Learning

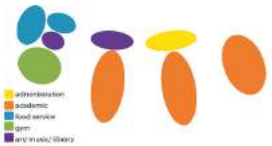


Circulation

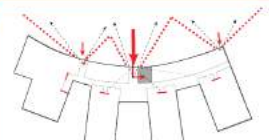
Arlington Elementary School is a very interesting example of mixed-learning spaces. While there are still formal classrooms, they are smaller than usual to provide other learning spaces like larger hands-on labs and a mixed-use flexible corridor. Additionally, each learning area has direct access to at least one outdoor learning space with is enclosed in school grounds. Covered outdoor areas make outdoor activities possible even in rainy conditions.

Sandy Hook Elementary
Location: Newtown, CT
Architect: Svigals + Partners
Completion: 2016
Square Footage: 86,800 sqft
Pedagogy: Academic

First Floor Plan



Zones



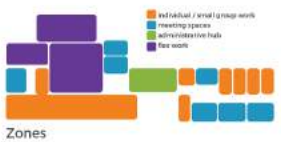
Entry Sequence & Sightlines

School Safety

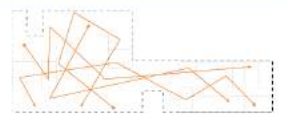
After the 2012 mass-shooting at Sandy Hook Elementary, the community opted to rebuild. The new school has a wide variety of safety considerations. The school was designed in zones that prevent and intruder from moving freely throughout the school. The distance from the main and secondary entrances to academic areas was increased in order to slow down an intruder's attack. Finally, the building is equiped with an integrated security system which includes intrusion detection and direct communication with emergency services.

Habita Coworking Office
Location: Istanbul, Turkey
Architect: PAB Architects
Completion: 2016
Square Footage: 6,996
Pedagogy: Coworking

Floor Plan



Zones

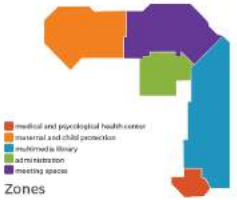


Space Use - Flexibility & Movement

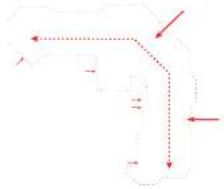
Co-working offices are becoming more prevalent in many countries around the world. Technology provides modern workers the ability to simultaneously work remotely and be connected. The Habita Co-working Office provides a wide variety of spaces that provides maximum flexibility. Individual, small group, and larger gathering areas provide options and flexibility throughout a person's day.

The Albert Schweitzer Community Centre
Location: Dammarie-Les-Lys, France
Architect: mobile architectural office
Completion: 2019
Square Footage: 37,675
Pedagogy: Community Center

Floor Plan



Zones

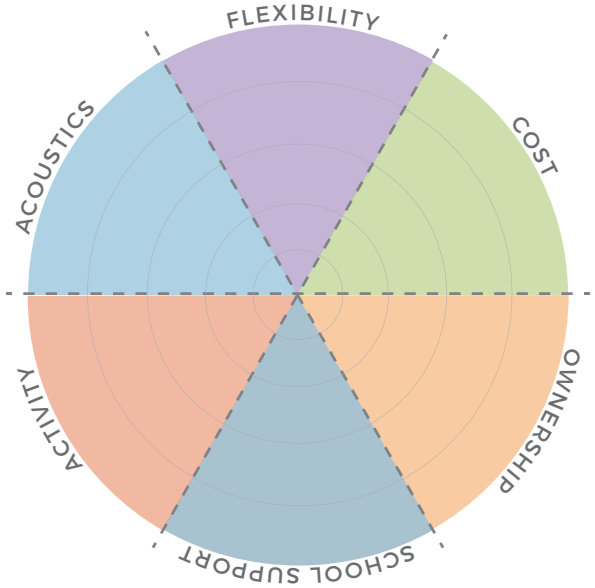


Circulation & Access

The Albert Schweitzer Community Center serves the community by providing a library, meeting spaces, and a health center. This precedent shows the possibilities for integrated community functions and how to design the building in zones that are somewhat independent of one another. The open plan of the library shows different arrangements of study including individual to small groups.

FLEX MATRIX

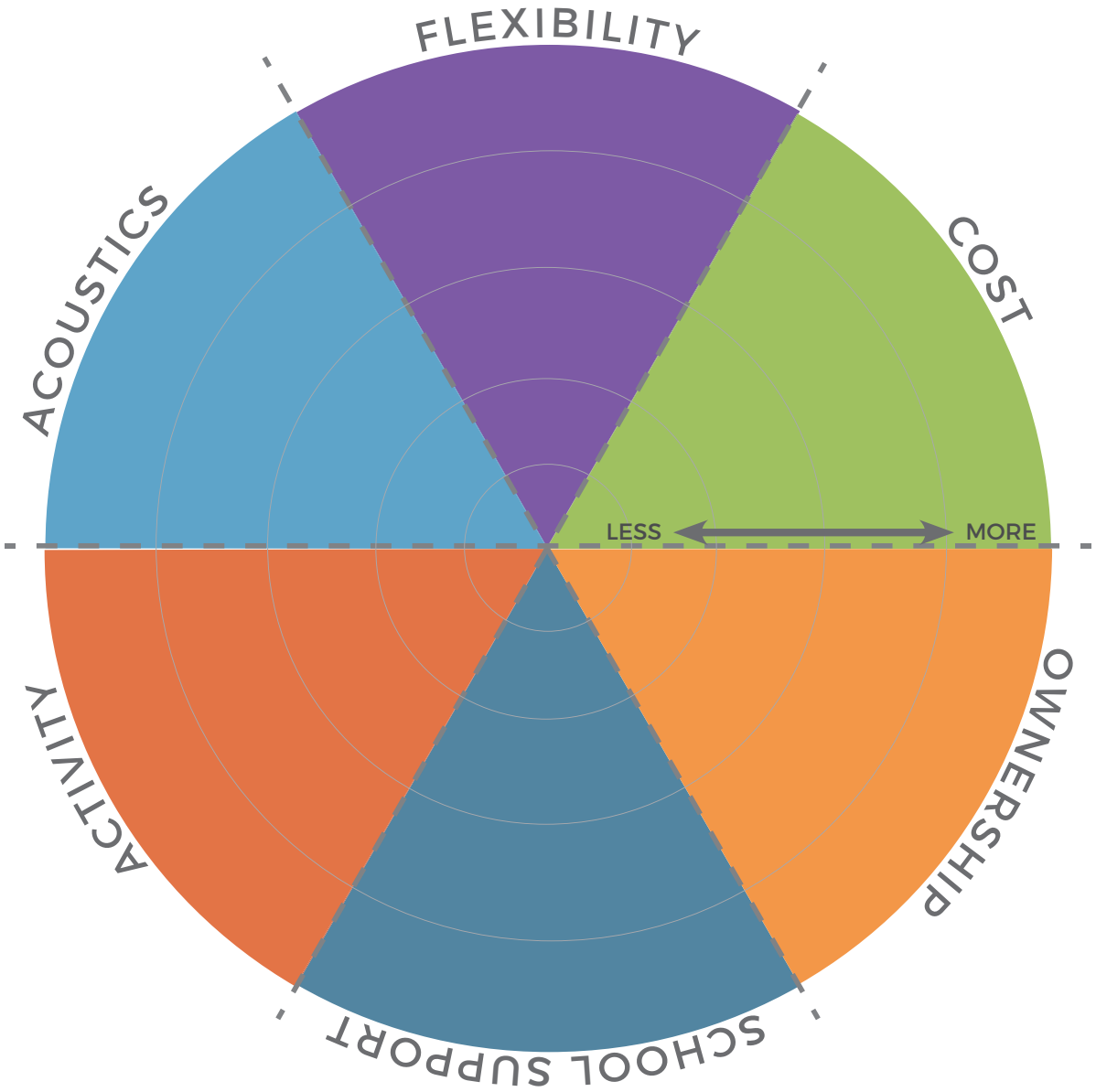
Aspects that impact active learning



I have embarked on a study trying to research/ create metrics that start to analyze the many factors that influence active, flexible, and effective learning spaces .

From my own personal experience in the K-12 sector of architectural design, there seems to be two paths school districts take during the educational visioning process. A school district is either likely to embrace new learning environments or they are not. This study begins to brisge the gap between the two to show a variety of different options a school district has as they consider the design of their new school. It is important to note that it is not the role of the architect to convince a school district to adopt a new pedagogy or curriculum. However, architects and designer should present and inform the district of the options that are available to best meet their needs, regardless of pedagogy.

The goal of this study is to find “benchmarks” or “phases” a school district can embark if they are interested in changing their learning environments, but are risk adverse. Small steps over the course of 5, 10, 15 years may allow the district to gain the support of their community, teachers, and students. This study helps to define how active and flexible spaces can be achieved, and how great their associated risks are. With time, patience, and funding, school districts can start to measure the effects active learning environments have on their student’s cognition, productivity, and engagement. The following classrooms and learning spaces are pulled from projects I have worked on personally or have studied over the course of my thesis process.


FLEXIBILITY
COST
OWNERSHIP
SCHOOL SUPPORT
ACTIVITY
ACOUSTICS
LESS
MORE

CLASSIFICATIONS

The schools studied on the next page are analyzed on the following six categories. The six categories were chosen based on active learning conditions and their associated risks to students, teachers, and school districts.

FLEXIBILITY refers to the ability for both students and teachers to easily move or adapt their environment over the course of a day, week, or month. Flexibility also refers to the space's ability to foster a wide variety of activities ranging from quiet reading to small group to large multi-class activities. If the space provides opportunities to be flexible, there is a higher likelihood that the occupants will be more active.

COST is a large risk factor especially for public school districts. Because most funding comes from public money, there is pressure from the community to fund things that are proven to lead a student to success. There is a cost associated with making learning environments more active and flexible which leads to risk adverse school districts and teachers.

OWNERSHIP refers to what teachers and students should expect to call "theirs" in a learning environment. Traditionally, teachers have had their own classroom and students have had their designated desks. Active and flexible learning environments do not hold high levels of ownership, so this classification studies how expectations of ownership can be maintained in different ways or managed over time.

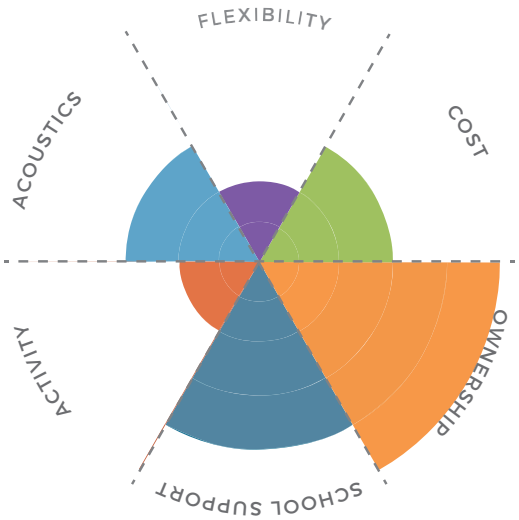
SCHOOL SUPPORT refers to community, district, and teacher backing of a more active pedagogy or curriculum. It also refers to how the teachers and students are satisfied with the space they have.

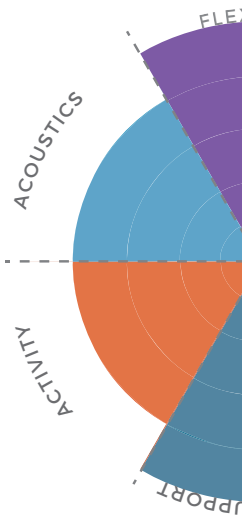
ACTIVITY refers to the ability for both teachers and students to move in their learning environments. This is different from flexibility in that it focuses on behavior and changes in behavior as environment changes during the school day.

ACOUSTICS refer to how quiet or noisy the space lends itself to be. Active and flexible learning often leads to activities that require student interaction and communication which can be loud. Noise is a distracting factor for students in adjacent spaces. The acoustics classification looks at how the space deals with the mitigation of noise.

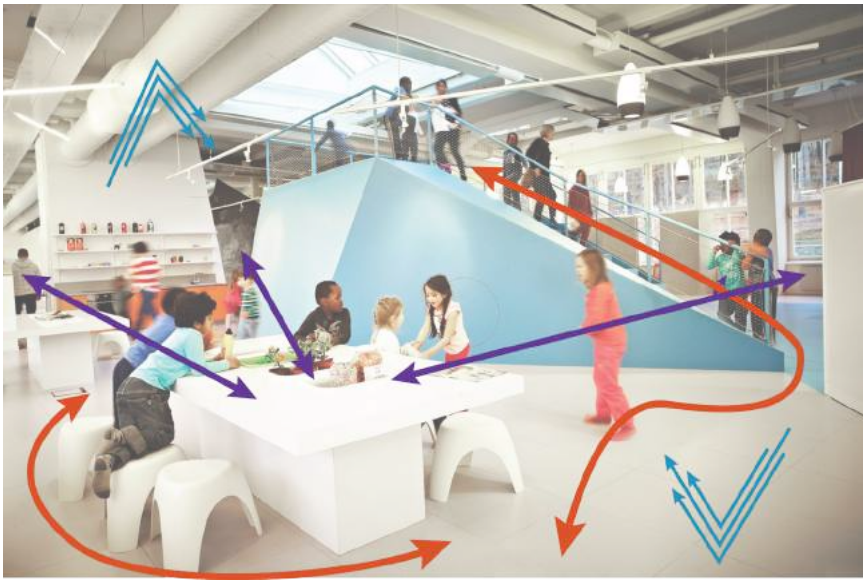
FLEX MATRIX CASE STUDY ANALYSIS

LESS PROGRESSIVE
LESS RISK





MORE PROGRESSIVE
MORE RISK



SITE SELECTION

The process of deciding site and school

Urban

Warner Elementary
Location: Nashville, TN
Grades: PK-4
Students: 320

Suburban

Symmes Elementary School
Location: Cincinnati, OH
Grades: K-4
Students: 463

Rural

Owsley Co. Elementary School
Location: Boonesville, KY
Grades: PK-6
Students: 492

SITE: SYMMES ELEMENTARY SCHOOL

Symmes Elementary School

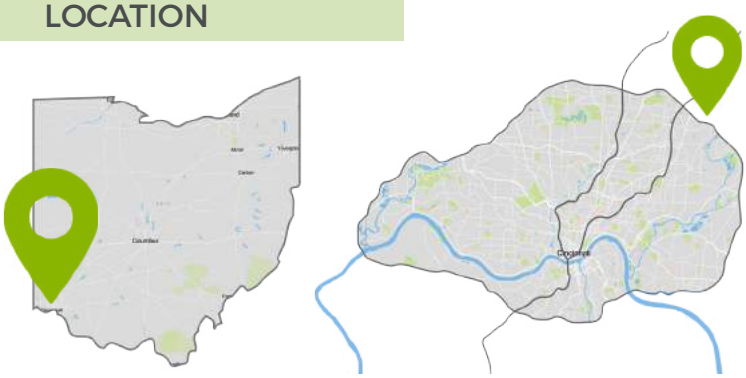
11820 Enyart Rd
Loveland, OH 45140

Coordinates: 39.2827, -84.3080

Site Size: 24.867 acres

Students: 463

LOCATION



Ohio | Cincinnati | School District | Site

SITE PHOTOGRAPHS

SITE INVESTIGATION

Solid/ Void

Hydrology

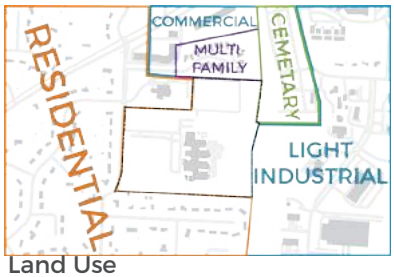
Vegetation

Sun Path

Noise

Views

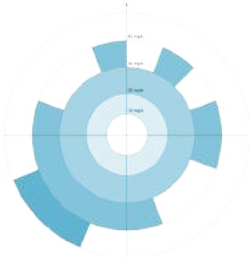
Site Circulation



Land Use

CLIMATE INFORMATION

Winds



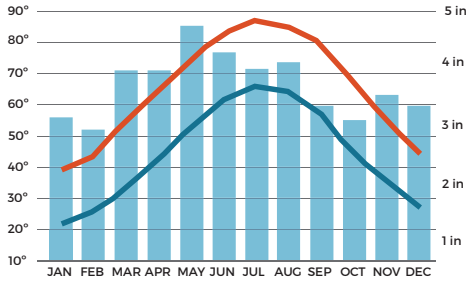
Sun Altitudes:

JUNE 21
8AM - 18.53º
12PM - 63.75º
4PM - 56.29º

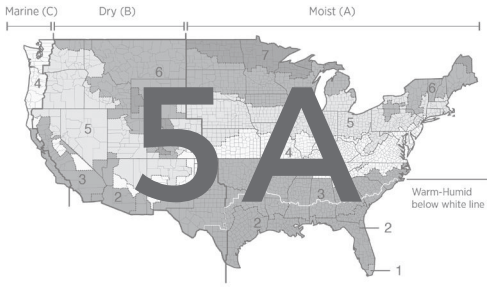
DEC 21
8AM - 0.74º
12PM - 26.78º
4PM - 11.23º

MARCH / SEPT 21
8AM - 3.37º
12PM - 44.31º
4 PM - 40.29º

Annual Temps and Rainfall



Climate Zone



SCHOOL DEMOGRAPHICS

463 Students
18:1 Student to Teacher Ratio

52% male
48% female

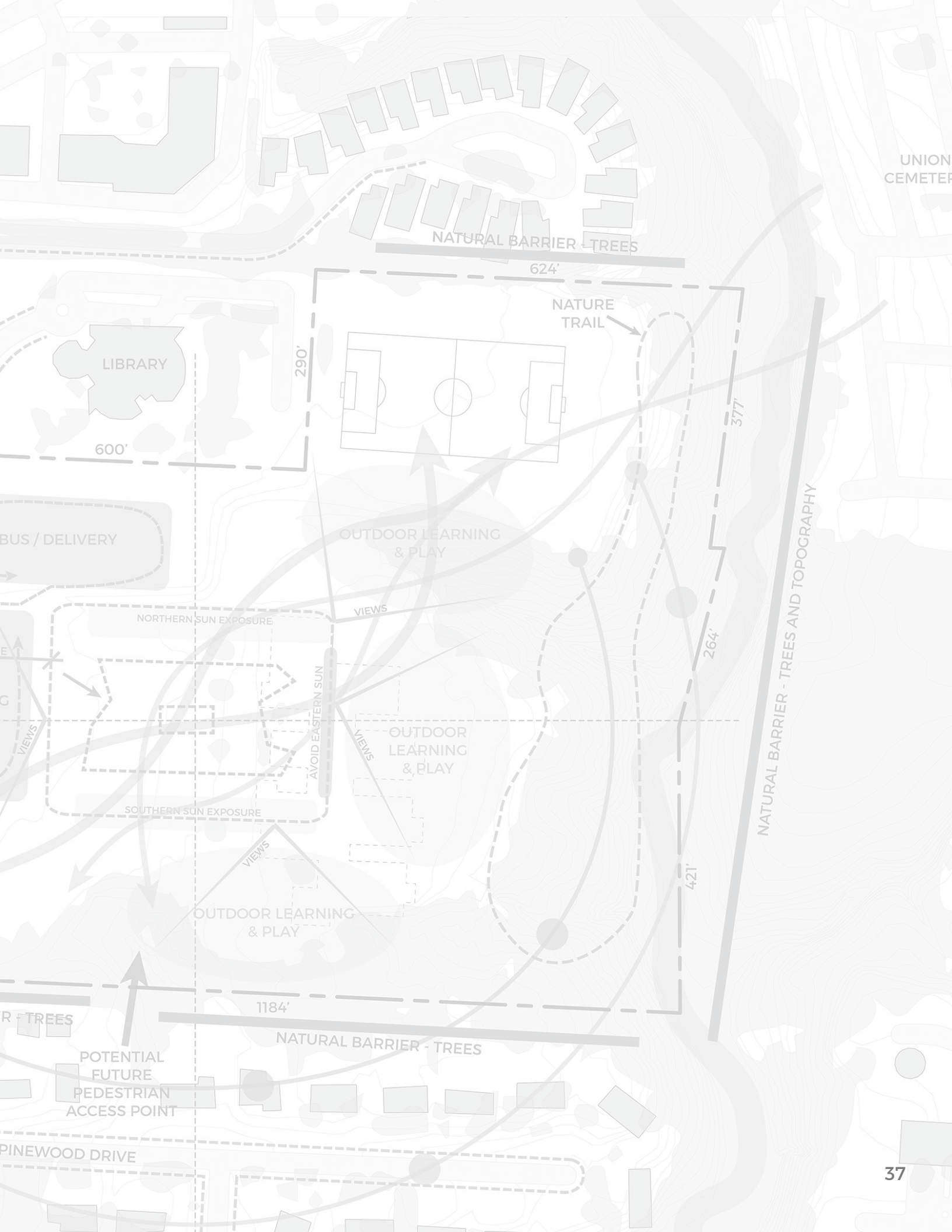
27% Free or Reduced Lunch

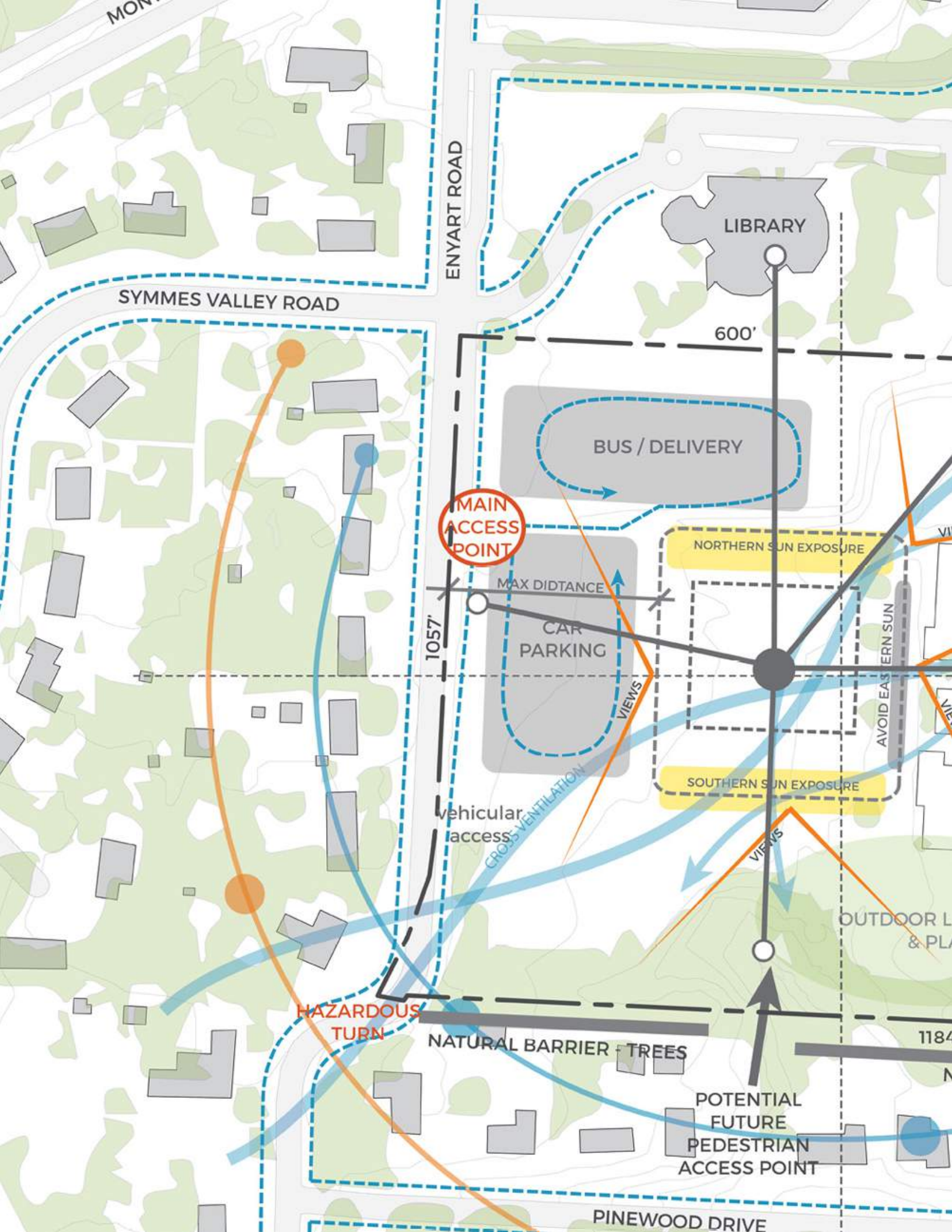
Race
52% White
25% Asian
9% Hispanic
8% Black
5% 2+ Races

Guiding Values

SITE ANALYSIS

How place impacts the project

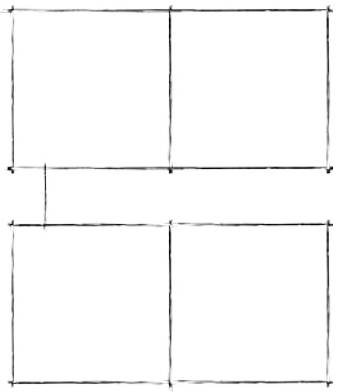

NATURAL BARRIER - TREES
624'
NATURE TRAIL
LIBRARY
290'
600'
377'
BUS / DELIVERY
OUTDOOR LEARNING & PLAY
VIEWS
NORTHERN SUN EXPOSURE
AVOID EASTERN SUN
VIEWS
OUTDOOR LEARNING & PLAY
264'
NATURAL BARRIER - TREES AND TOPOGRAPHY
SOUTHERN SUN EXPOSURE
VIEWS
421'
OUTDOOR LEARNING & PLAY
1184'
NATURAL BARRIER - TREES
POTENTIAL FUTURE PEDESTRIAN ACCESS POINT
PINEWOOD DRIVE

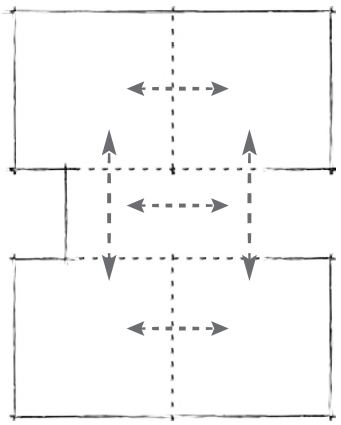

ENYART ROAD
SYMMES VALLEY ROAD
LIBRARY
600'
BUS / DELIVERY
MAIN ACCESS POINT
NORTHERN SUN EXPOSURE
MAX DIDTANCE
1057'
CAR PARKING
VIEWS
AVOID EASTERN SUN
SOUTHERN SUN EXPOSURE
vehicular access
CROSS-VENTILATION
VIEWS
OUTDOOR L
& PLA
HAZARDOUS TURN
NATURAL BARRIER - TREES
1184
POTENTIAL FUTURE PEDESTRIAN ACCESS POINT
PINEWOOD DRIVE

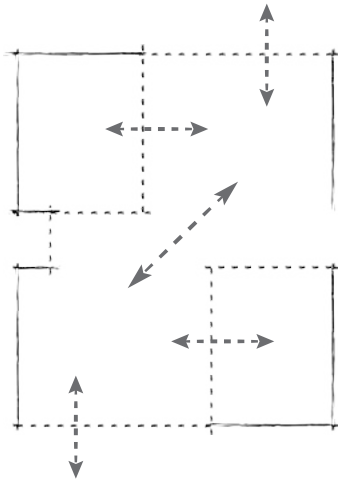

NATURAL BARRIER - TREES
624'
NATURE TRAIL
290'
377'
OUTDOOR LEARNING & PLAY
walking path
264'
NATURAL BARRIER - TREES AND TOPOGRAPHY
OUTDOOR LEARNING & PLAY
421'
access to outdoor learning
NATURAL BARRIER - TREES

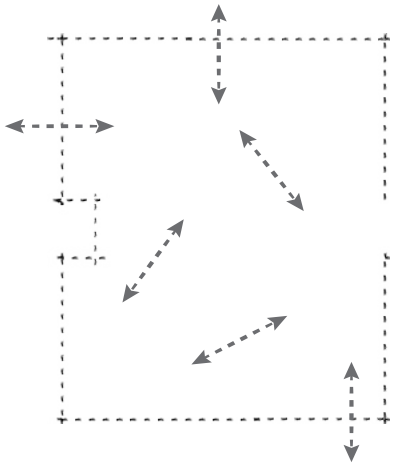
PROGRAM

What does the school need?









OSDM STANDARD PROGRAM

OSDM School Program for 500 Students

Space Description	Total # of Proposed Spaces	Square Footage SF	Total Square Footage TSF	Remarks
ACADEMIC				
Kindergarten Classroom	4	1200	4800	
Classrooms	16	750	12,000	
Science/Computer Classrooms	1	1,000	1,000	
Special Ed Classroom	2	875	1,750	
Teacher Planning Room	1	300	300	
Resource Room		0	0	
Small Group Rooms	3	200	600	
Multi Use Meeting	1	1,500	1,500	
Storage	2	200	400	
Restrooms	6	250	1,500	
ACADEMIC TOTAL			23,850	
ADMINISTRATION				
Reception / Secretary	1	700	700	
Offices	3	150	450	
Conference Rooms	1	250	250	
Clinic	1	350	350	
In School Suspension	1	250	250	
Workroom	1	225	225	
Multi-Purpose / Parent/ Volunteer	1	200	200	
Restrooms	1	60	60	
Storage	1	350	350	
ADMINISTRATION TOTAL			2,835	
MEDIA CENTER				
Books / Reading Area	1	1,500	1,500	
Workroom	2	250	500	
MEDIA CENTER TOTAL			2,000	
FOOD SERVICE				
Student Dining	1	3,000	3,000	
Stage	1	1000	1,000	
Staff Dining	1	250	250	
Table/ Chair Storage	1	250	250	
Family Restroom	1	80	80	
Kitchen	1	1800	1,800	
Dietician Office	1	75	75	
Restroom / Locker Room	1	140	140	
FOOD SERVICE TOTAL			6,595	

MUSIC			
Music Room	1	1,200	1,200
Music Storage	1	100	100
MUSIC TOTAL			1,300
PHYSICAL EDUCATION / WELLNESS			
Main Gym	1	4,000	4,000
PE Storage	1	300	300
PHYSICAL EDUCATION TOTAL			4,300
ART			
Art Room	1	1100	1,100
Art Storage	1	200	200
ART TOTAL			1,300
BUILDING SERVICES			
Workroom	1	250	250
Custodial Closet	2	50	100
Electrical Closet	2	50	100
Telecommunications Room	2	60	120
Mech Rooms	1	2800	2,800
Custodial Office	1	100	100
Corridors			7,000
Storage	2	200	400
Recycling Room	1	90	90
BUILDING SERVICES TOTAL			10,960

Total Sqft - 75,000
Parking Required - 275 parking spots
Buses - 10

SPACE GAME

The Space Game was created to help myself and committee understand how OSDM program can be divided into different configurations that are not standard to traditional school design. The colors correlate to the program shown on previous pages, and have a rough correlation to square footage. This is tool to help intermix program space and quickly adjust thinking on program and adjacencies. This is closely related to the Space Game I helped to create at SHP, utilized during educational visioning exercises.

SPACE VERSATILITY

The ability for a space to be adapted to many differnt functions or activities

SINGLE USE ⟷ MANY USES

art room
kitchen / food service
restrooms
storage
building services
custodial
clinic
workroom

food distribution
visual arts
science classroom
administration
special education
teacher planning
staff dining

gymnasium
music
library
books
technology education
parent volunteer
stage

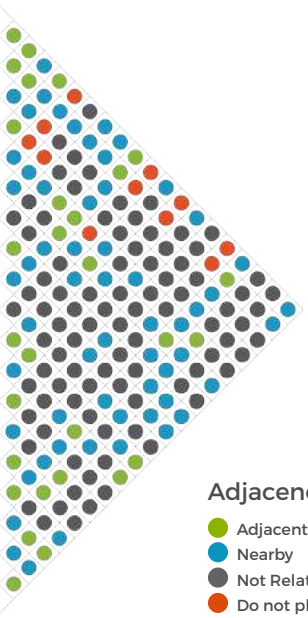
assembly spaces
student dining
small group rooms
in school suspension
maker space
resource room

academic space
outdoor learning
reading spaces
community space
flex space

media

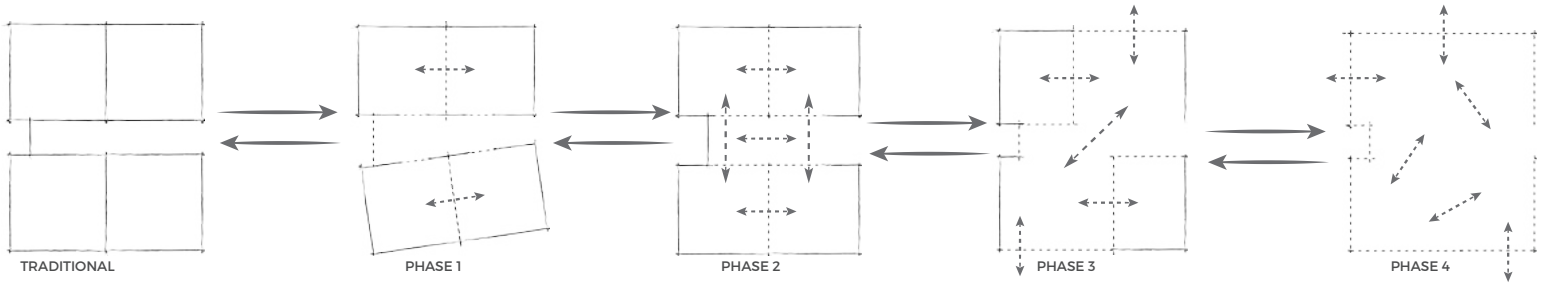
ADJACENCY MATRIX

Notes	Natural Daylight	Private	Public	Adjacencies	
	Y	N	N	4	Academic Space
	Y	Y	N	4	Special Education
	Y	Y	N	5	Small Group Rooms
	Y	N	Y	2	Reading Spaces
	Y	N	Y	5	Library / Media
	Y	N	Y	3	Gymnasium
	Y	N	Y	0	Music
	Y	N	N	2	Art
	Y	N	Y	2	Maker Space
	Y	N	Y	4	Outdoor Learning
	N	Y	N	3	Kitchen / food service
	Y	N	Y	4	Student Dining
	Y	Y	N	2	Staff Dining
	Y	N	N	2	Teacher Planning
	Y	N	N	2	Administration
	N	Y	N	2	Clinic
	N	Y	Y	4	Restrooms
	N	Y	N	3	Storage
	N	Y	N	1	Building Services
	N	N	N	4	Custodial



Adjacency Key
- Adjacent
- Nearby
- Not Related
- Do not place together

PROGRAM FLEXIBILITY FOR THE FUTURE

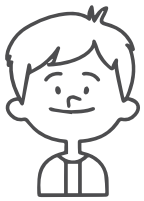


CHANGES IN CURRICULUM, PEDAGOGY, OR SHIFTS IN EDUCATION

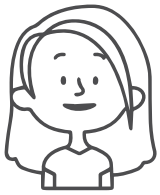
NARRATIVES

What does the school need?

Student: Age: 5
My name is Sophie and I am new here. My teacher is Ms. Katie. My favorite part of going to school is when we slide down the **slide** and read as a class. I sometimes feel a little lost, but I know I just go back to the orange area.



Student: Age: 8
My name is Oliver. I have been going to school here for three years. My favorite part of school is when we go **outside** for class. Sometimes Mrs. Smith lets us dig in the dirt to find bugs and worms. Our class helped to plant the big garden this year. I can't wait to see what we can grow.



Student: Age: 10
My name is Chloe. This is my last year at Symmes. Next year, I will go to the intermediate school. My favorite part about going to school is the ability to learn with **technology** and my iPad. I also really like that I get to see my friends at lunch and recess. I think I am going to miss walking to school everyday.

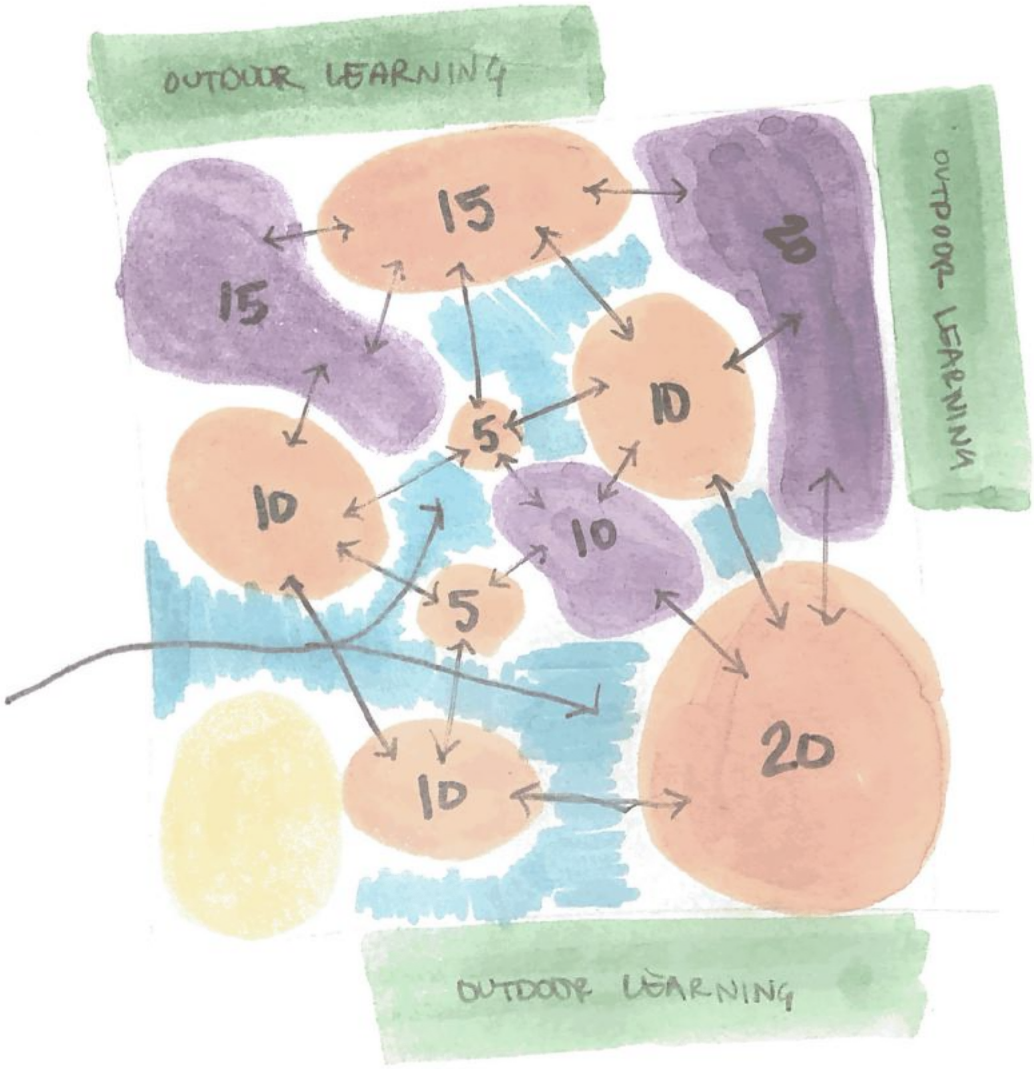
Principal: Experience: 15 years
Hello, my name is Ms. Campbell and I am the principal of Symmes Elementary. Before becoming principal, I taught and held other positions around the district. I wake up thankful everyday that I have the opportunity to teach our children in such an **innovative and engaging environment**.

Teacher: Experience: 8 years
My name is Mr. Harmon and I've been teaching at Symmes for 8 years now. Compared to the old building, the new building gives me so many **different teaching opportunities**. The students are **more engaged** and excited to be at school. I also use the outdoor learning spaces almost every day.

Janitor: Experience: 25 years
Well hello. My name is Albert and I am the lead custodian at Symmes. The kids keep me busy, but thankfully the building needs **less maintenance** than the old one. The new building pretty much runs itself, and when a light burns out, I get a notification.

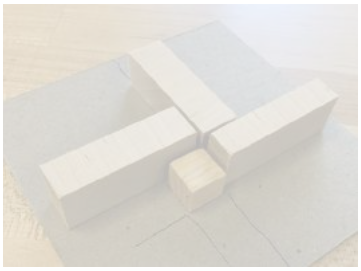
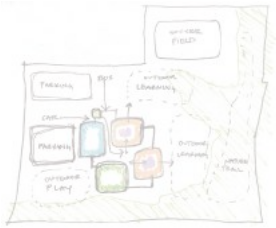
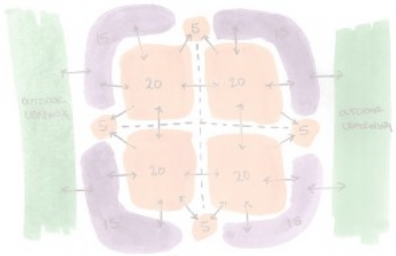
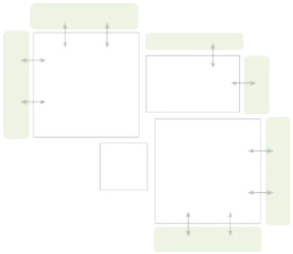
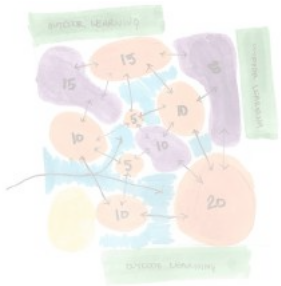
PROCESS

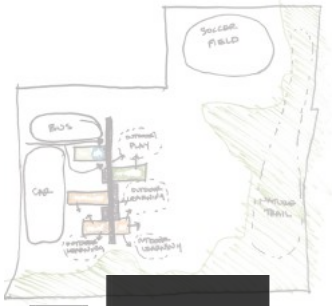
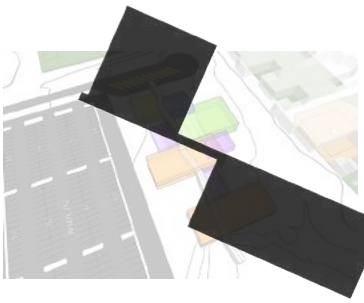
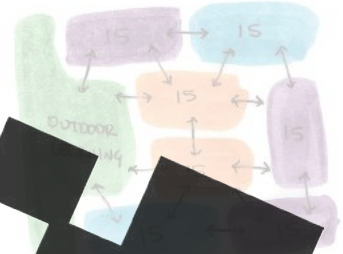
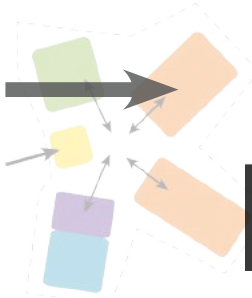
Assembled work along the way

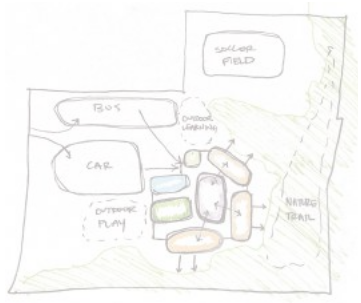
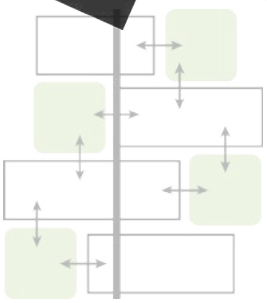
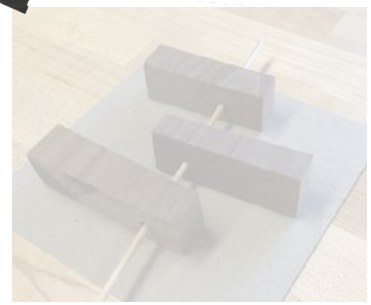

OUTDOOR LEARNING
15
15
30
OUTDOOR LEARNING
10
5
10
10
5
20
10
OUTDOOR LEARNING

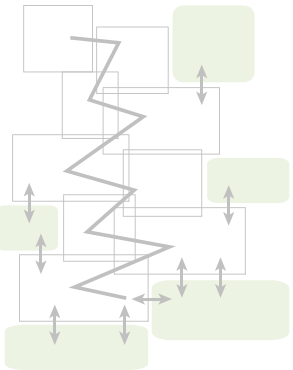
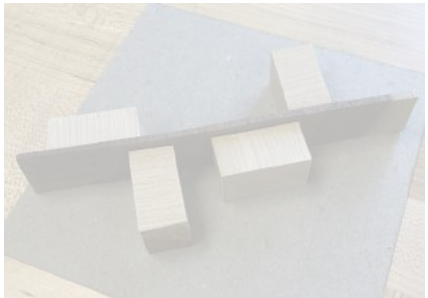
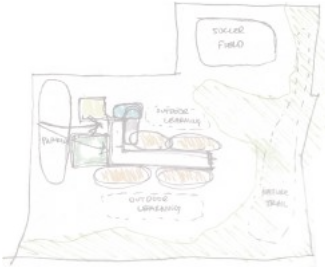
ITERATIONS

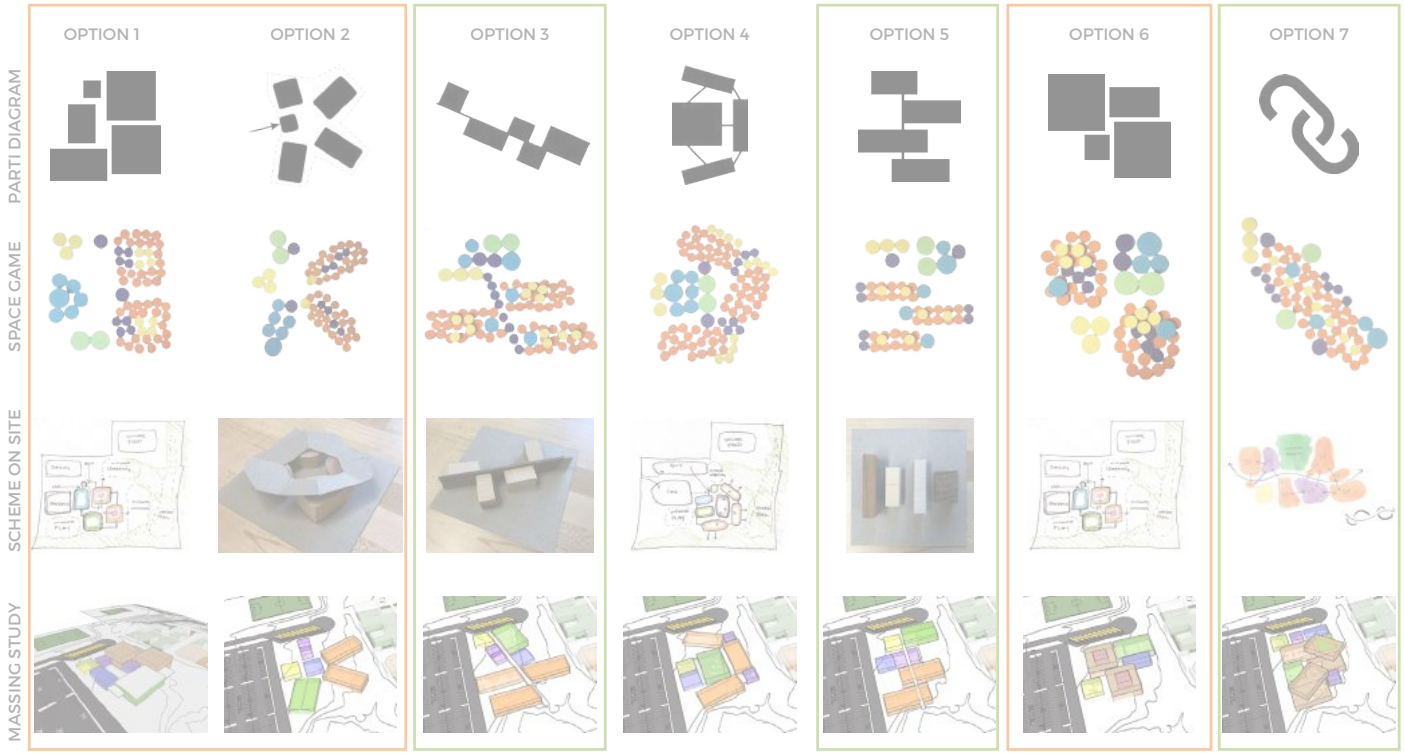
Schematic Design Schemes

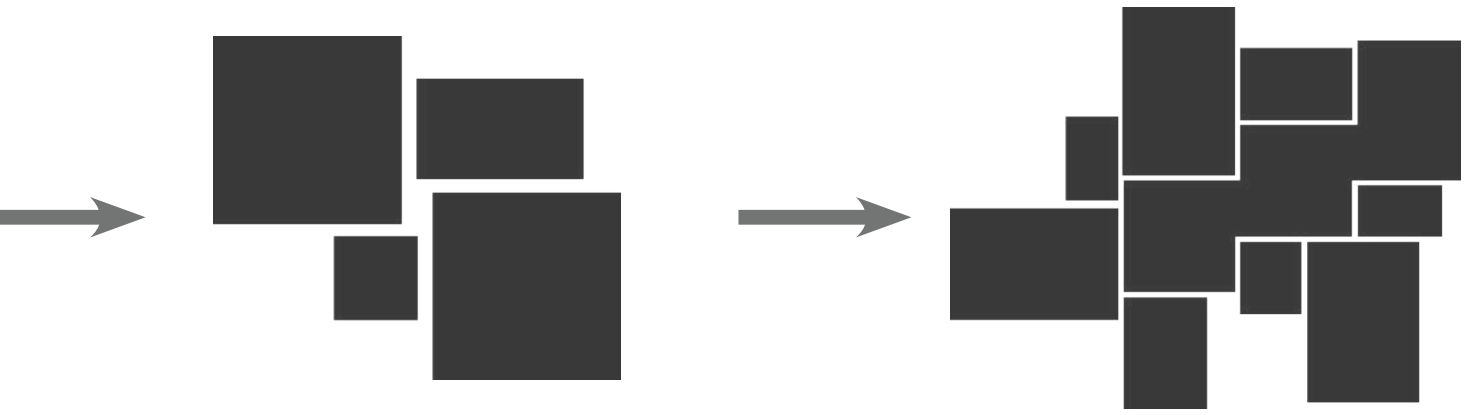






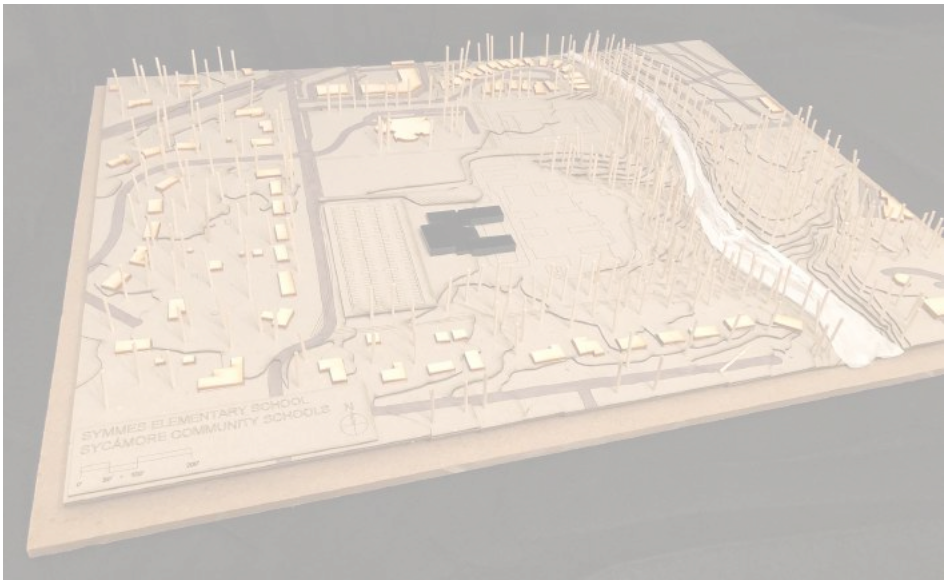








OPTION 1
OPTION 2
OPTION 3
OPTION 4
OPTION 5
OPTION 6
OPTION 7
PARTI DIAGRAM
SPACE GAME
SCHEME ON SITE
MASSING STUDY




SYMMES ELEMENTARY SCHOOL
SYCAMORE COMMUNITY SCHOOLS


5


6

VIGNETTES

These vignettes were created in an effort to prioritize child-scale spaces and introduce specific ideas on program and space. Many of these vignettes push the boundaries of traditional school design including providing spaces for activity outside the gym, student kitchens, movable partitions that can be easily manipulated, and regular and easy access to outdoor learning. These vignettes were also influenced by Christopher Alexander's *Pattern Languages*.

Central Atria

Shared Learning Areas

Window Nook

Access to Technology

Retreat

Outdoor Learning

Activity Nodes

Student Kitchen

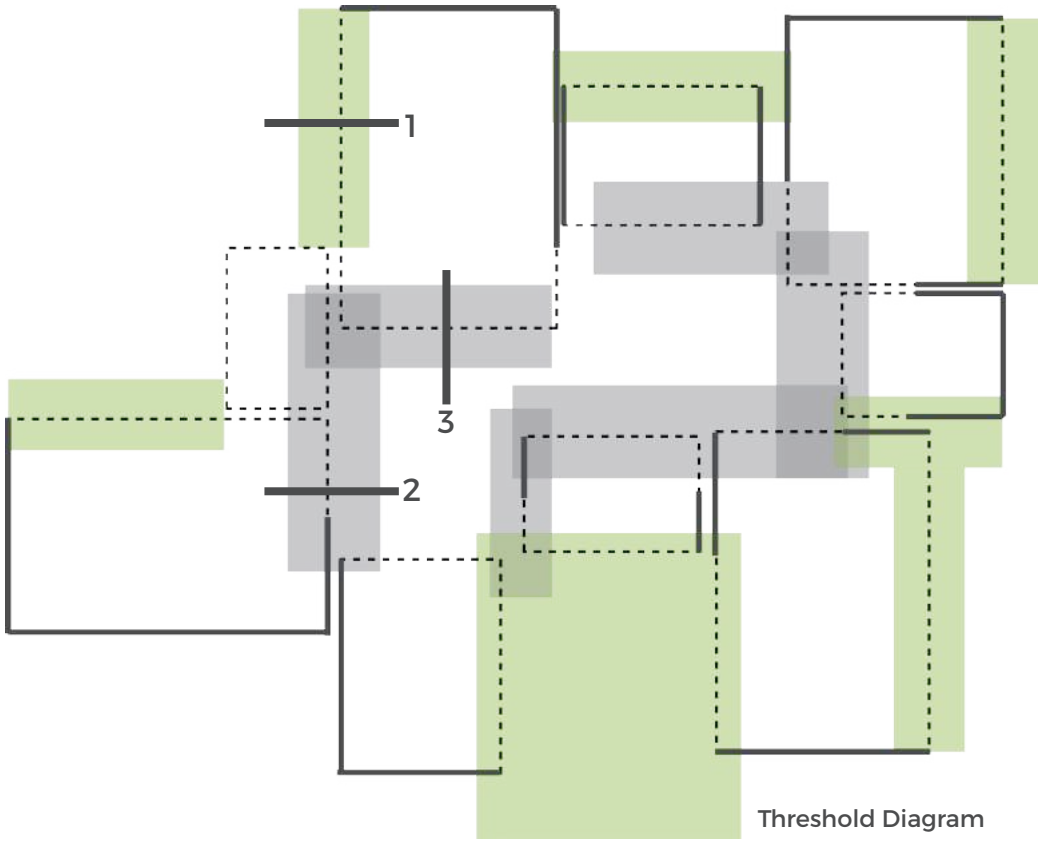
Indoor / Outdoor

Learning Stair

Dynamic Shadows

Main Entry

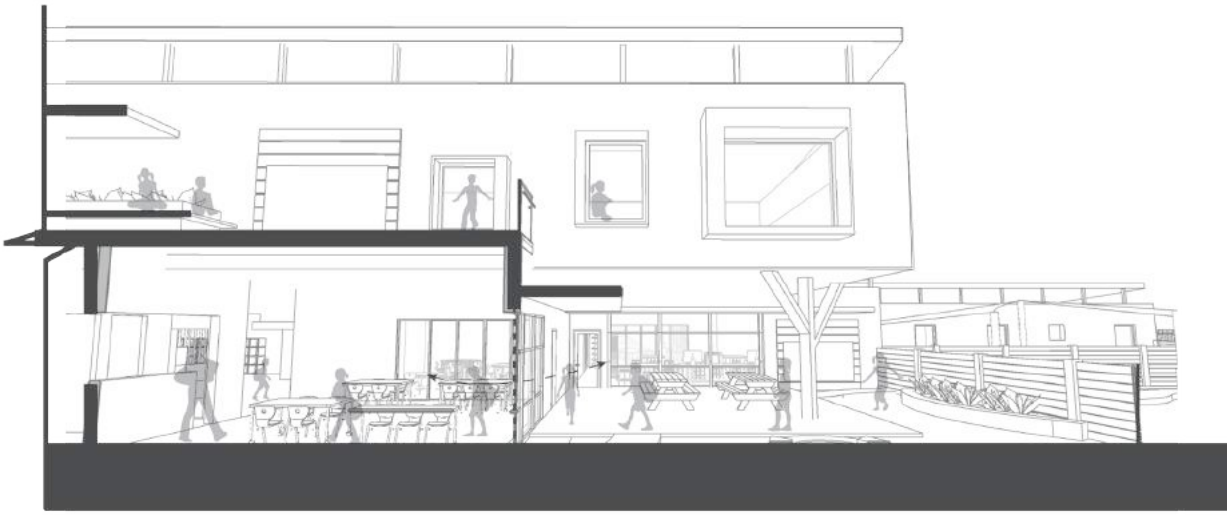
THRESHOLDS



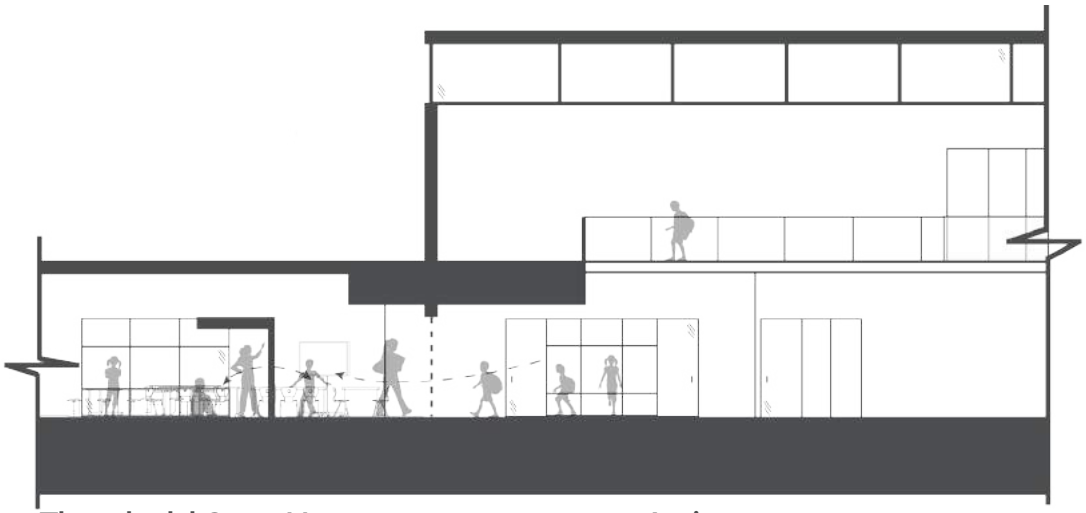
Threshold Diagram

Indoor ⟷ Outdoor

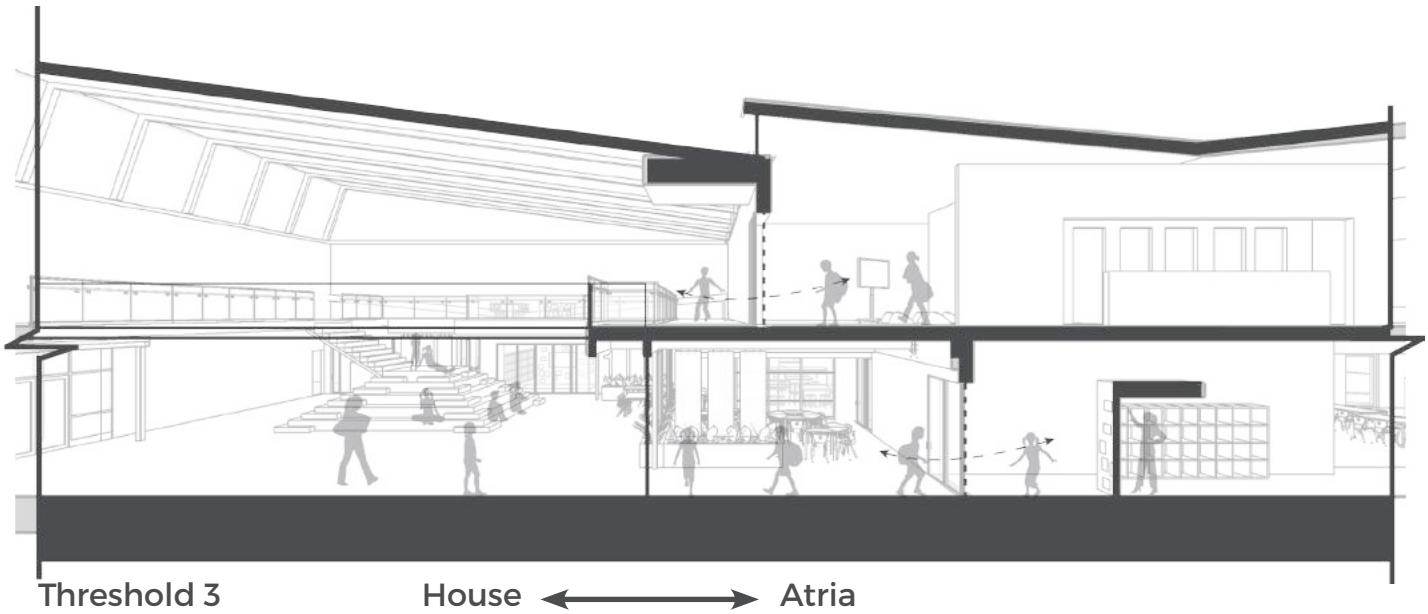
House ⟷ Atria



Threshold 1 Indoor ⟷ Outdoor



Threshold 2 House ⟷ Atria



Threshold 3 House ⟷ Atria

FINAL WORK

Final Presentation

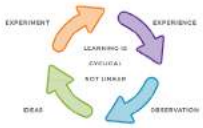
RESEARCH

THESIS QUESTIONS

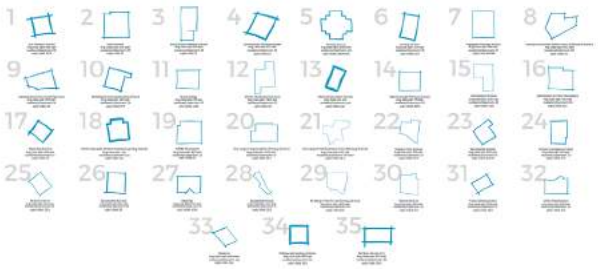
- How can we, as a society, instil the necessary skills into our youth that will lead to a more productive people, accepting, and adaptive society, and innovative future leaders?

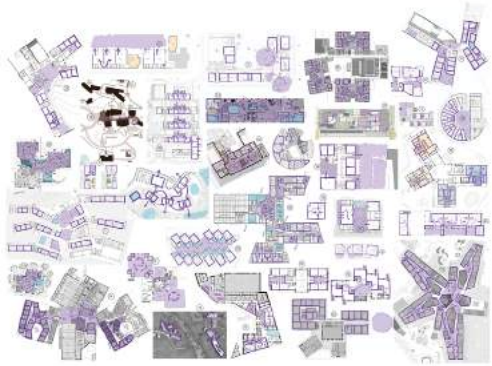
- What architectural spaces affect how children learn?

- How can architects help to evolve learning spaces to become more flexible and encourage active learning?

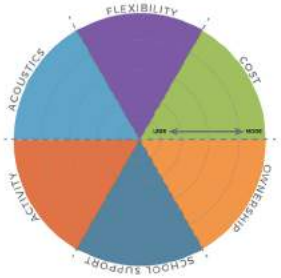


CASE STUDIES





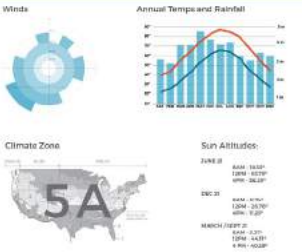
FLEXIBILITY MATRIX



SITE INFORMATION

SITE DIAGRAMS

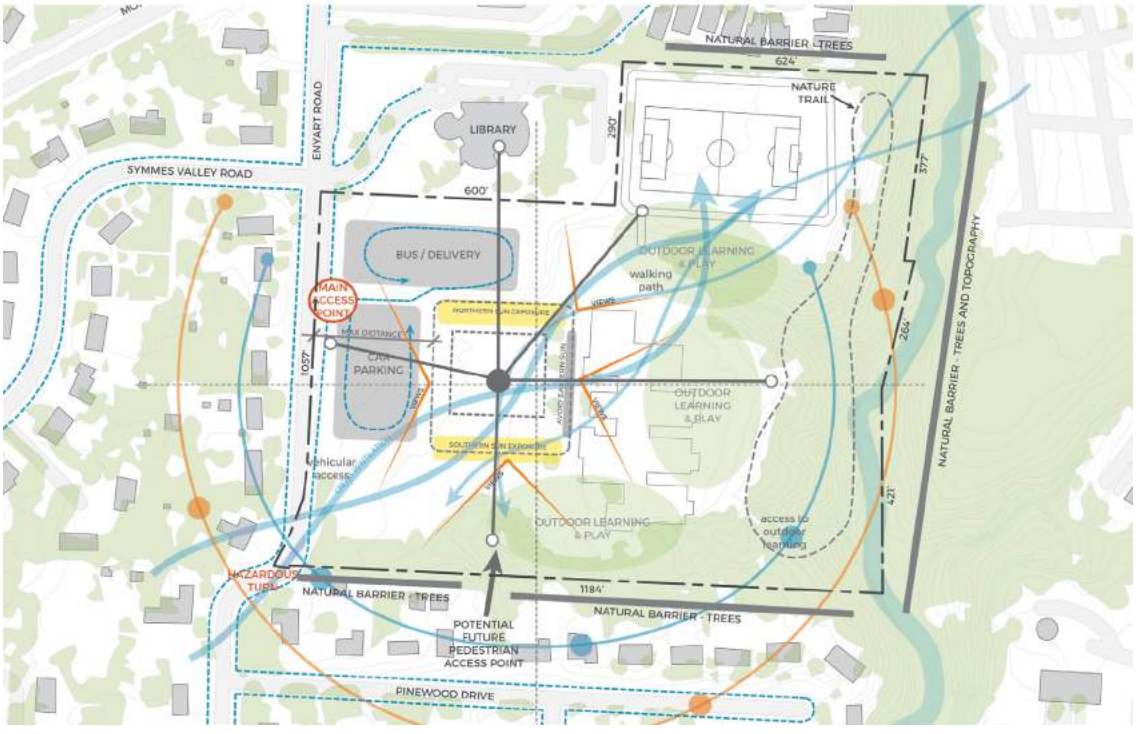
CLIMATE INFORMATION



SITE PHOTOGRAPHS

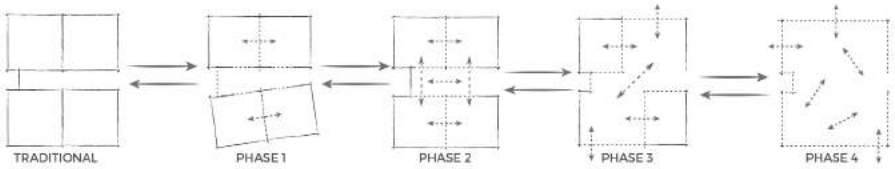
SCHOOL DISTRICT

SITE FORCES

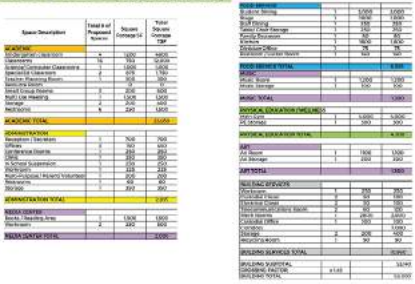


PROGRAM & PROCESS

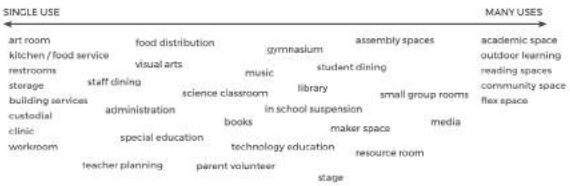
PROGRAM FLEXIBILITY NOW & FOR THE FUTURE



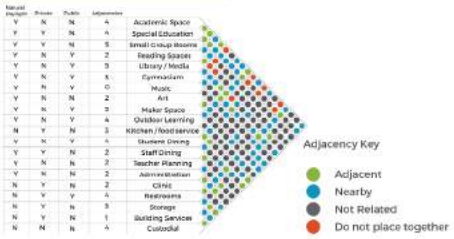
PROGRAM (OSDM STANDARDS)



SPACE VERSATILITY



SPACE ADJACENCIES

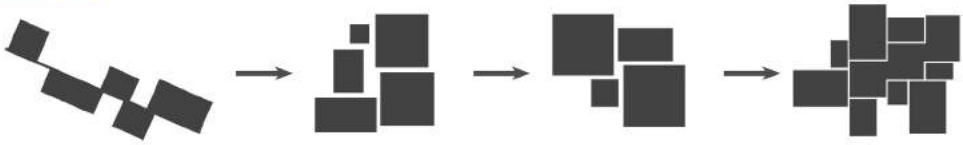


NARRATIVES

VIGNETTES

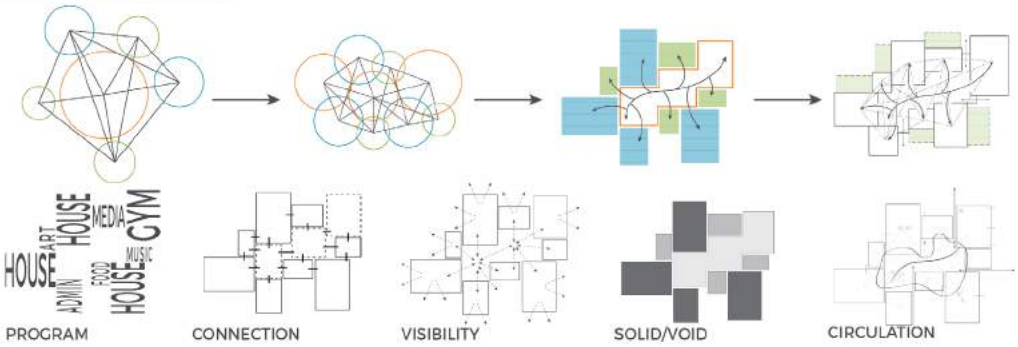
THRESHOLDS

ITERATIONS

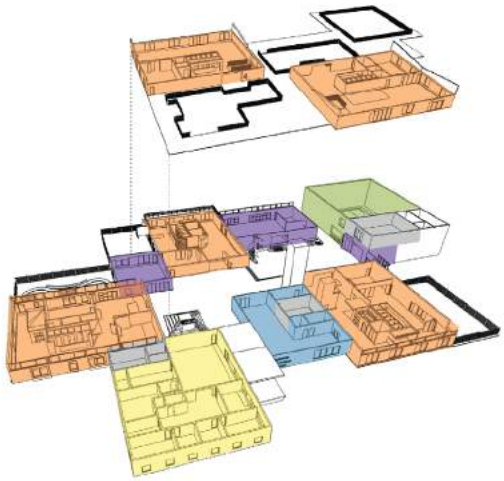


FINAL DESIGN

CONCEPT DIAGRAMS

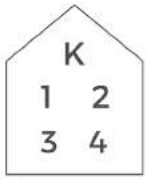


PROGRAM AXON



AREA DISTRIBUTION

53%	ACADEMIC	24,000 SQFT
4%	ADMINISTRATION	3,000 SQFT
3%	MEDIA	2,000 SQFT
10%	FOOD SERVICE	7,000 SQFT
2%	MUSIC	1,500 SQ/T
7%	PHYSICAL EDUCATION	4,500 SQFT
3%	ART	2,000 SQFT
20%	BUILDING SERVICES	15,000 SQFT
	Total Building Area	75000 sqft
	Total Site Area	24.8 Acres

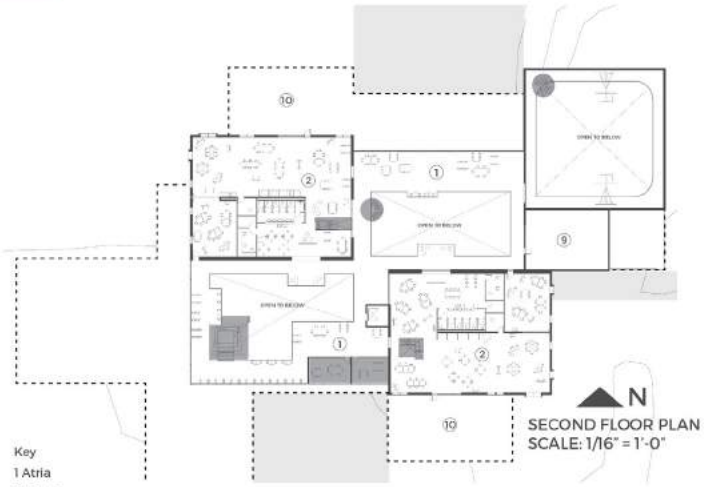


At the new Symmes Elementary students will be organized by "House." Each House is designed for 100 students and is to include a class from each grade level. A student would spend all 5 years of their elementary education in the same house.

SITE PLAN

FINAL DESIGN

FLOOR PLANS



SECOND FLOOR PLAN
SCALE: 1/16" = 1'-0"

Key
1 Atria
2 House
3 Art
4 Kitchen
5 Media Center
6 Music / Stage
7 Gym
8 Administration
9 Service
10 Outdoor Learning

FIRST FLOOR PLAN
SCALE: 1/16" = 1'-0"

ELEVATIONS

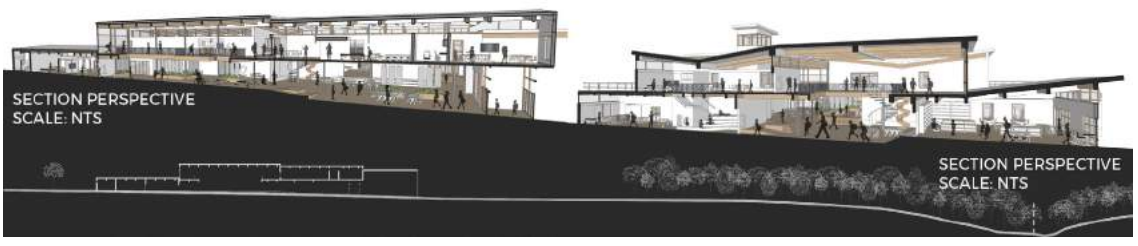
SOUTH ELEVATION
SCALE: 1/16" = 1'-0"

NORTH ELEVATION
SCALE: 1/16" = 1'-0"

SECTIONS

SECTION 1
SCALE: 1/16" = 1'-0"

SECTION 2
SCALE: 1/16" = 1'-0"

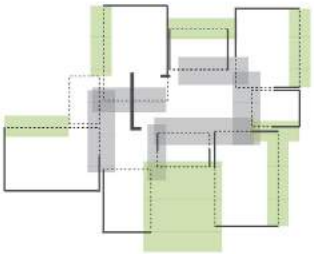


SECTION PERSPECTIVE
SCALE: NTS

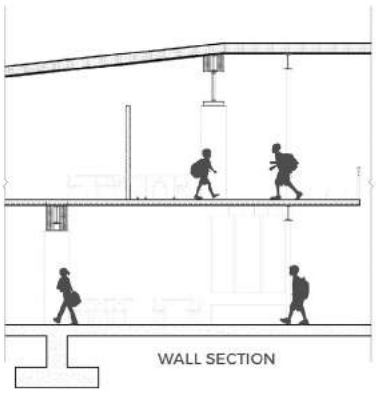
SECTION PERSPECTIVE
SCALE: NTS

FINAL DESIGN

THRESHOLDS



THRESHOLDS DIAGRAM



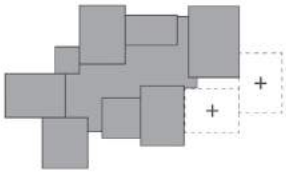
WALL SECTION

THRESHOLDS RENDERING

FLEXIBILITY AND ACTIVITY

FLEXIBILITY OF FURNITURE
ACOUSTICAL PANELS
WIDE RANGE OF ACTIVITY
OWNERSHIP THROUGH HOUSE AND DISPLAY

FLEXIBLE FOR THE PRESENT



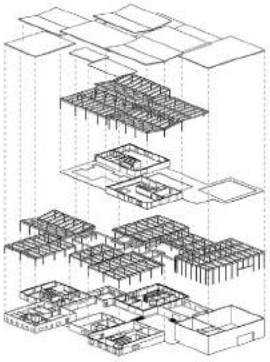
FLEXIBLE FOR THE FUTURE

USE AT 9AM

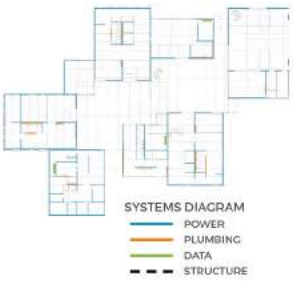
USE AT 12PM

USE AT 6PM

SYSTEMS AND SAFETY



STRUCTURE AXON



MATERIALS AND PLANTS

FINAL DESIGN

RENDERINGS

HOUSE VIEW

AERIAL VIEW

MAIN ENTRY VIEW

MEADOW VIEW

OUTDOOR LEARNING VIEW

ATRIA VIEW

HOUSE VIEW

VIRTUAL WALK-THROUGH

AERIAL VIEW

MAIN ENTRY VIEW

MEADOW VIEW

OUTDOOR CLASSROOM

MAIN ATRIA

HOUSE RENDERING

HOUSE RENDERING

THRESHOLD RENDERING

THANK YOU