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## classrooms

WHERE  
PEDAGOGY MEETS  
ARCHITECTURE



# intersect



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# introduction

THE INTERSECTION OF K-12 DESIGN AND STUDENT SUCCESS

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The classroom continues to evolve, expanding from its traditional set of four walls to more flexible, open spaces that present new opportunities for students and teachers. In order to enhance the modern teaching and learning experience we must consider many design factors to support the full potential of the instructional environment. This document aims to capture the minor and major interventions possible in a space to support a wide array of teaching and learning styles.

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## EXPLORING THE INTERSECTION.

This is an exploration into the design of and meaning behind learning spaces within schools. As we consider where research around positive student outcomes intersect with the design of learning environments, one thing becomes abundantly clear—the social and emotional wellbeing of each student and educator is a critically important component to fostering engagement and ensuring academic progress. Space can help support wellbeing in so many ways, and one important consideration is that it's not a one-size-fits-all approach.

Successful learning environments can be designed and built efficiently so that:

- Introverts have as much of a sense of belonging as extroverts
- Group sizes large and small can be easily accommodated
- Natural light and visual connections to nature are prioritized
- Occupants of a building can contextualize a space through use of branding, color, or references to their community and/or history
- Students have barrier free access to resources (technology, specialized support, cross-disciplinary pursuits)
- Learning is celebrated by being put on display and made visible

The classroom, a basic building block of a school, has undergone a significant transformation, and it continues to evolve. Classrooms are being recognized as more than the four walls that define a set amount of square feet. We need to consider classroom proportion, material, transparency, connectedness, and adjacency in order to support the full potential of the teaching and learning experience. Instructional spaces reach farther and farther beyond the bounds of classroom as a "room" as lines are blurred and edges are eroded. This document aims to capture the possible design interventions —minor and major —that can be made to support a wide array of teaching and learning styles.

Each case study herein considers the unique needs of our clients, in support of their pedagogical goals, while strategically planning for future growth and the evolution of education for years to come. Flexibility and adaptability are at the core of this future planning. We look at each case study through three scales:

- The whole building
- The academic wing
- The academic units

At each scale, we implement strategies to shape adaptable learning environments that help each student achieve their full potential.

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***Successful 21st Century educational design is achieved through careful consideration and thoughtful implementation of flexible spaces and engaging environments in support of educational pedagogy.***

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# cristo rey jesuit high school



## EDUCATING THE WHOLE PERSON.

The culture fostered by Cristo Rey is one steeped in the Jesuit tradition; spiritually, through their dedication to faith, academically, through their commitment to school, and professionally through work experience. The mission of this organization centers around the Jesuit mission and value, *Cura Personalis*, or “care for the whole person.” Cristo Rey employs this mission through their dedication to educating the whole student—mind, body, and spirit.

As a response to this ethos, the building has been organized into three main parts relating to the mind, body, and spirit. The chapel, commons, learning stair, and media center are arranged centrally, relating to the religious and cultural “spirit” of the school. Athletic programs located on one end of the building, and the two-story academic wing on the other end, represent the “body” and “mind,” respectively. Our focus in this section will be on the academic areas.

*The Self Determination Theory teaches us that the most conducive ways of fostering motivation are to create conditions of autonomy, competence, and relatedness.<sup>1</sup>*

1 REFERENCE | “Theory -Self Determination.” Center for Self Determination Theory, n.d. <http://selfdeterminationtheory.org/theory/>.





## PROJECT DATA

### TYPE

High School (9-12), New Construction

### CLIENT

Cristo Rey Jesuit High School

### LOCATION

1818 W. National Avenue, Milwaukee, WI

### MAX PROJECTED ENROLLMENT

500 students

### SQUARE FOOTAGE

106,369

### COMPLETION DATE

August 2020

## DYNAMIC EDUCATION

### CURA PERSONALIS

Taking care of the whole person and caring for the individual needs of yourself and others

### EDUCATION

Intellectual  
Social  
Emotional  
Professional

Fig 1.2



Academic Alcove



Academic Alcove

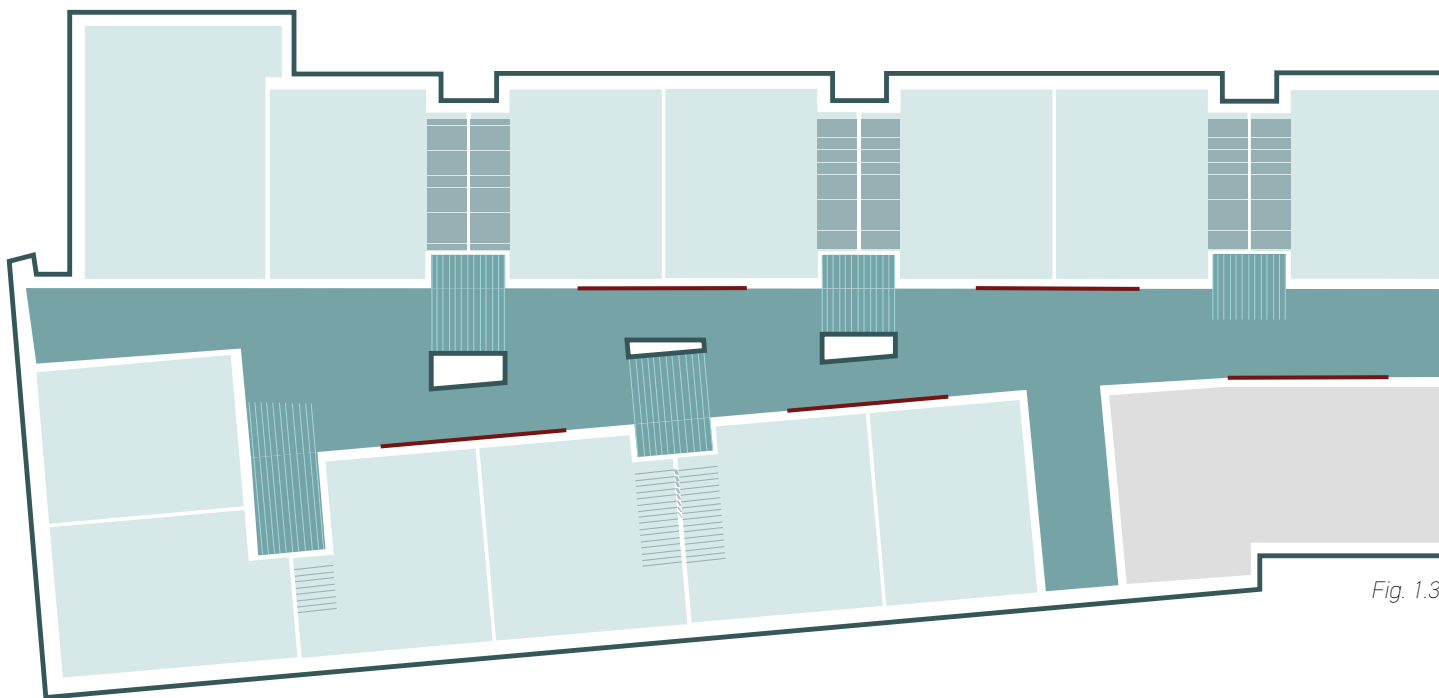


Fig. 1.3

### VISIBILITY AND CONNECTEDNESS.

Core classrooms are organized around a corridor shaped like a wedge—wider at one end than the other. This shape allows for the corridor to be not only a connection path between spaces, but also an area where students can collaborate outside of the classroom in academic alcoves.

An area in the back of the classrooms is defined and furnished as a lounge, providing a comfortable space to spread out and work away from one's desk.

The lockers, which line the corridors, are situated below ribbons of borrowed lights and are strategically placed to allow for passive supervision to occur.

Fig. 1.3 Key

<span style="display:inline-block; width:20px; height:10px; background-color:#d9e1f2; border:1px solid black;"></span>	Classroom
<span style="display:inline-block; width:20px; height:10px; background: repeating-linear-gradient(45deg, transparent, transparent 2px, #d9e1f2 2px, #d9e1f2 4px); border:1px solid black;"></span>	Classroom Lounge
<span style="display:inline-block; width:20px; height:10px; background-color:#4f81bd; border:1px solid black;"></span>	Corridor + Resource Space
<span style="display:inline-block; width:20px; height:10px; background: repeating-linear-gradient(-45deg, transparent, transparent 2px, #4f81bd 2px, #4f81bd 4px); border:1px solid black;"></span>	Academic Alcove
<span style="display:inline-block; width:20px; height:10px; background-color:#c00000; border:1px solid black;"></span>	Lockers

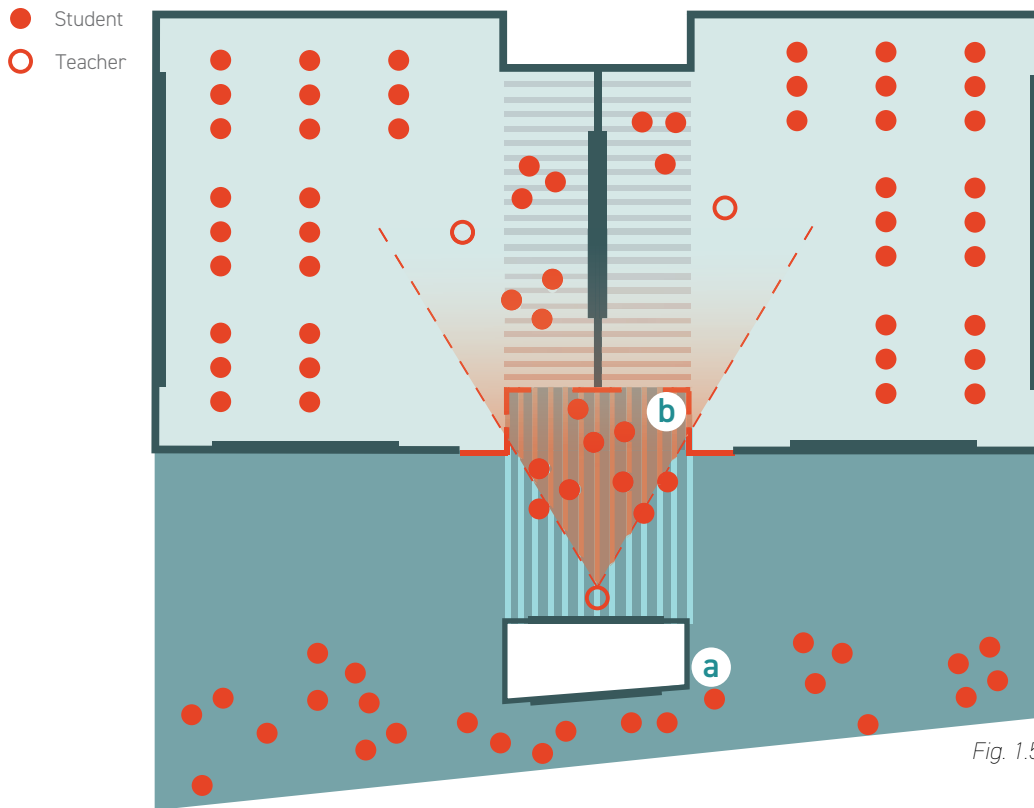


Fig. 1.5

*Pushing the limits of the traditional four-wall classroom means implicitly and explicitly defining zones to support various uses and users, without any barriers.*

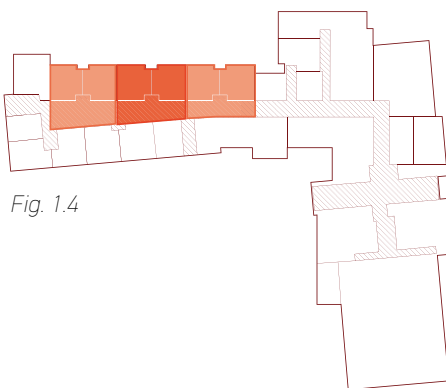


Fig. 1.4

### PAIRED LEARNING ENVIRONMENTS.

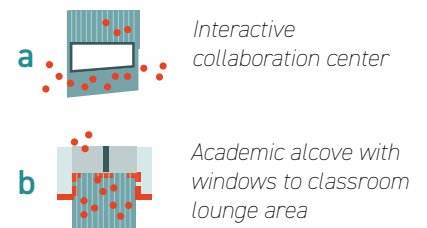
Taking a closer look at a pair of classrooms reveals the flexibility that two simple learning environments can provide with a few key interventions.

Figure 1.3 above depicts a hypothetical behavior and usage map of teaching and learning. This example pushes the limits of a traditional four-wall classroom. By shaping explicit and implied zones outside of and within those four walls, students and teachers have the ability to flex seamlessly between areas as desired to meet various needs.

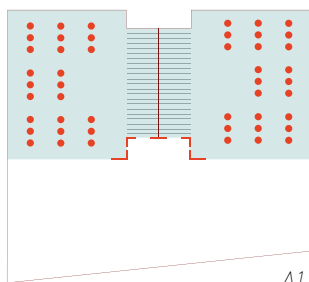
By providing the appropriate visual connections, embedded resources, and furniture solutions, these learning environments are easy to activate and adapt to multiple modalities of learning while giving students a sense of independence.

The diagrams on the adjacent page further illustrate the opportunities around these classroom pairs. We can see furniture configurations in Column A, visual connectedness in Column B, zones of activity in Column C, and full activation of the classroom pair and the related support spaces in Column D.

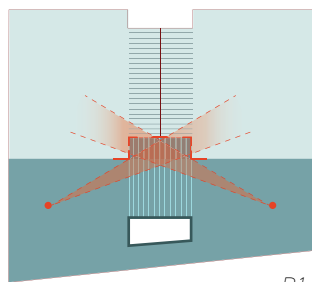
### Key Learning Unit Elements



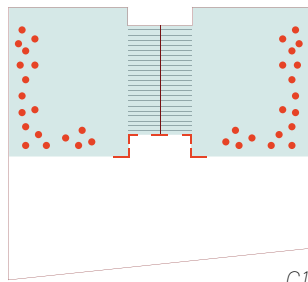




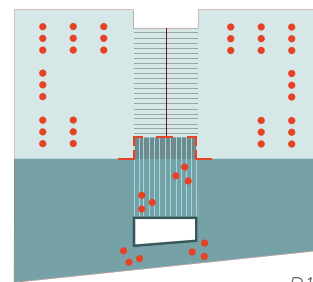
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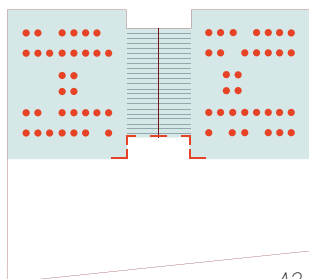
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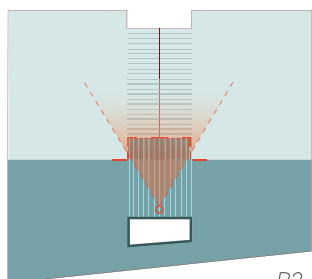
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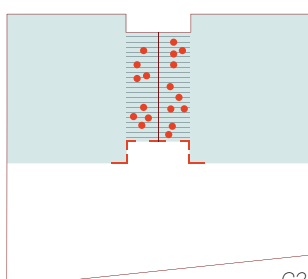
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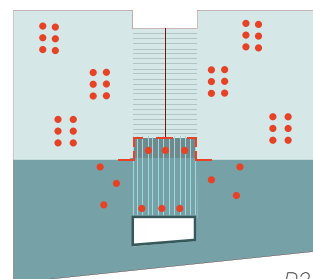
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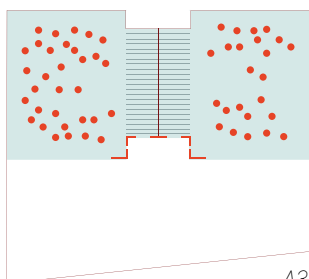
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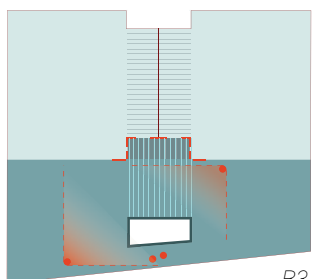
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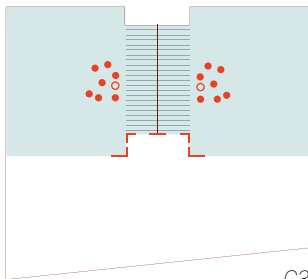
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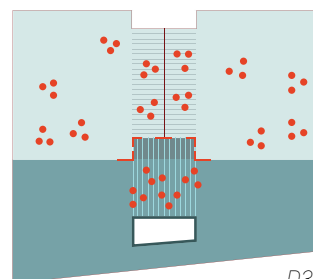
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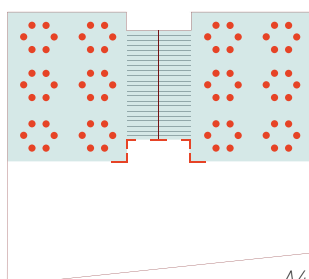
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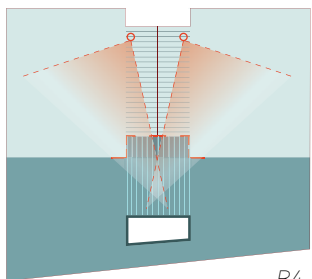
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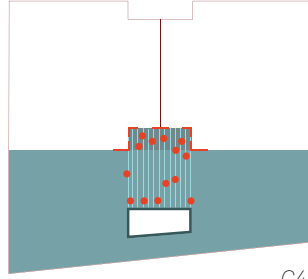
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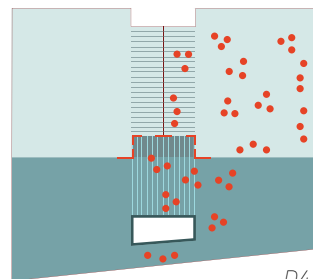
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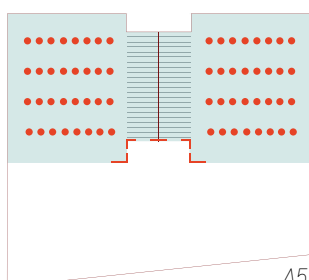
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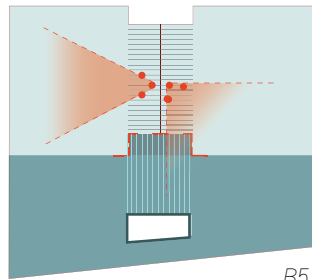
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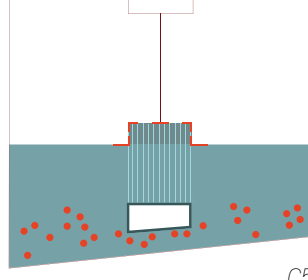
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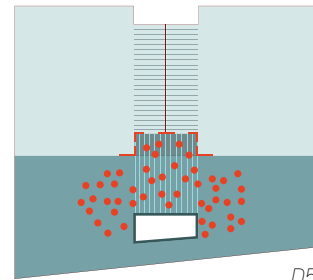
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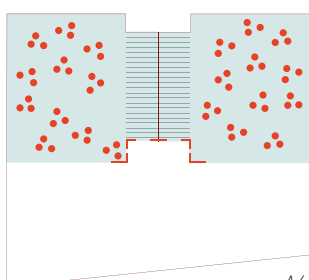
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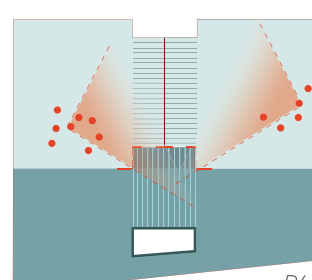
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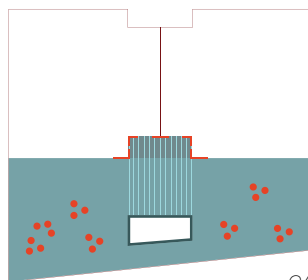
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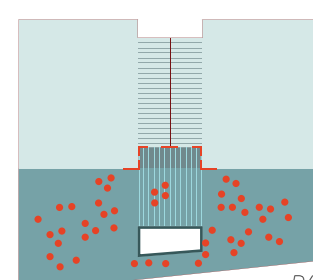
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B6



C6



D6

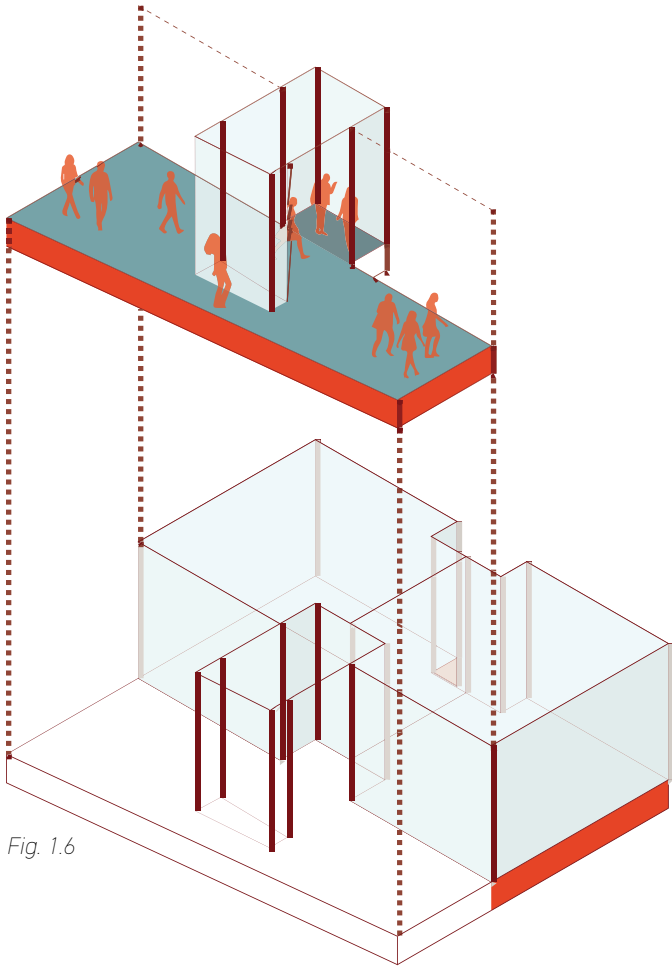


Fig. 1.6

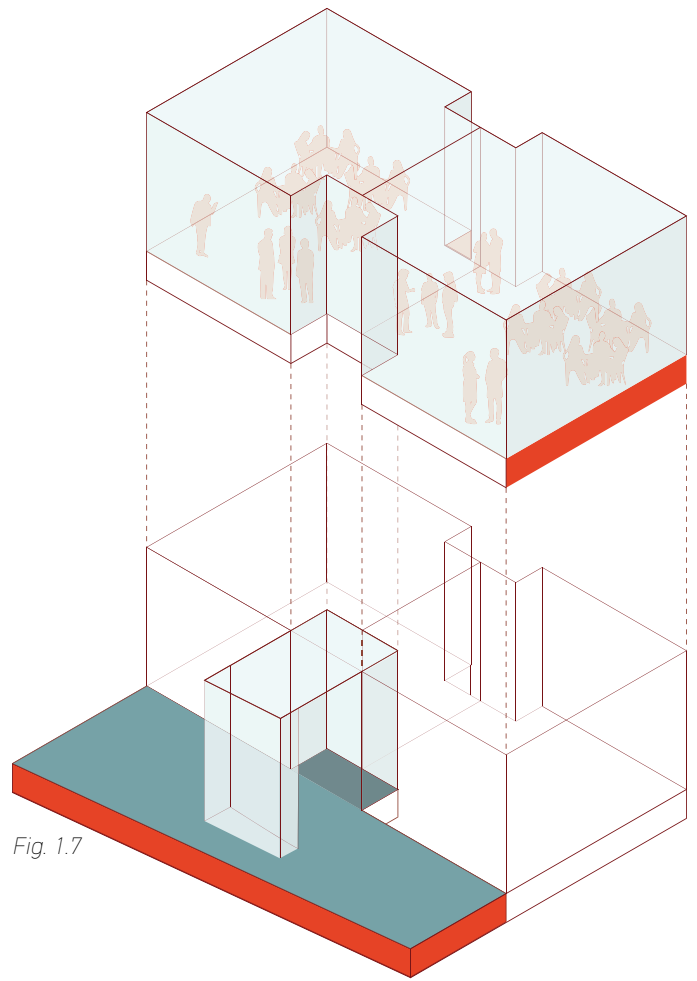


Fig. 1.7



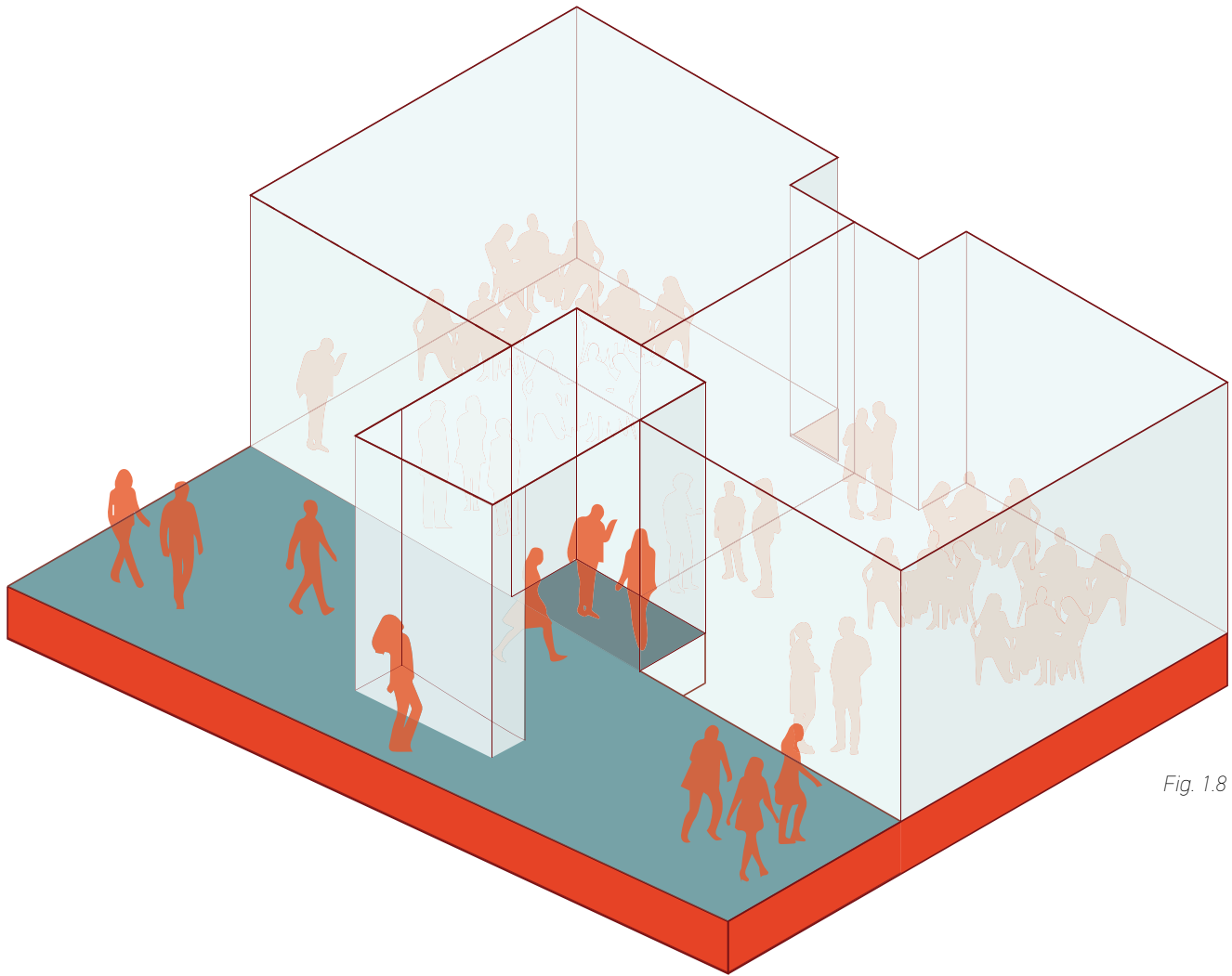
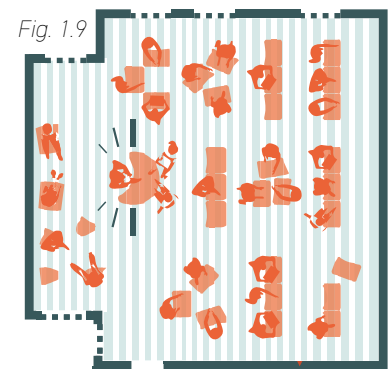


Fig. 1.8

**CLASSROOM AND BREAKOUT.** One of the key components to the classroom and corridor environments is how they intersect and overlap. This relationship is illustrated in Fig. 1.6, Fig. 1.7, and Fig. 1.8 above. At the intersection of the academic alcove and the classroom pair – the classroom lounge is defined. This in turn, helps the academic alcove read more naturally as an extension of the classroom, and therefore helps imply its utility to those not accustomed to doing work outside of a classroom. The overlap point also provides the critical visual connection previously mentioned.

At Cristo Rey, teacher desks are set up in the back of the classroom. This practice helped to inform and define the classroom lounge. This desk set up allows students to comfortably receive one-on-one support or informally meet and build an academic relationship with their instructor.

From the back of the room, the teacher has sightlines to the classroom and academic alcove. Whether moving about the classroom during instruction or supervising from the desk during group-work, the teacher can easily see all students in the locations that are best suited to their studying needs.



**The selection of furniture and the ways it can be arranged in a space is critically important to understand and respond to architecturally.**









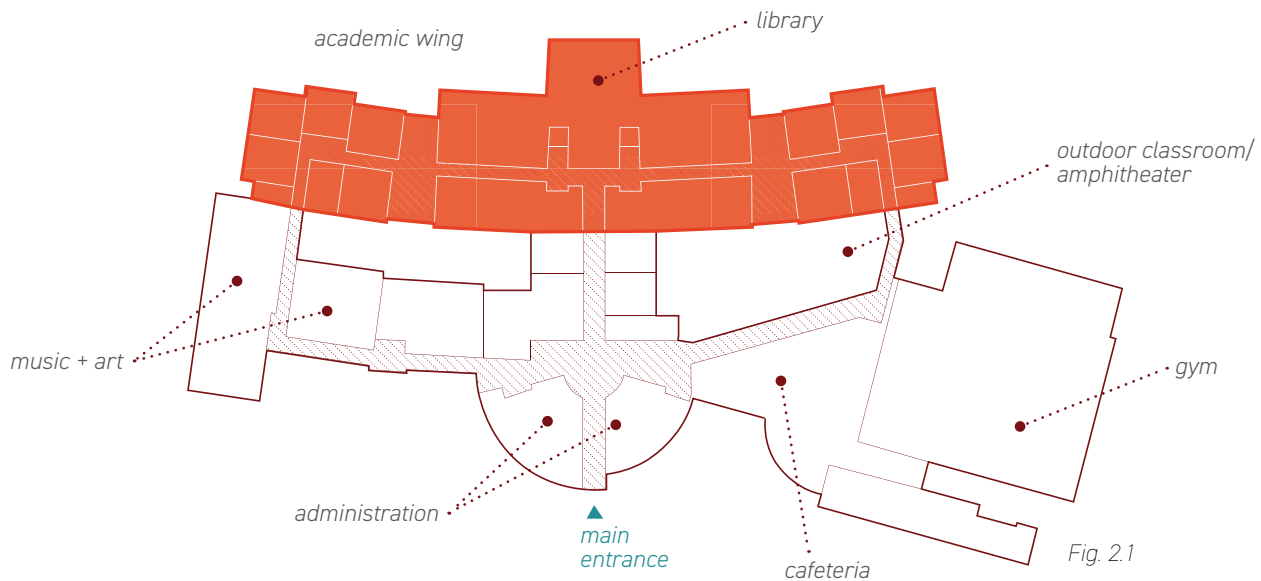
### Contrast Differences

- Life in College
1. Not a class all day
  2. Lots of assignments (less free)
  3. No parental restrictions
  4. Different daily schedule
  5. New friends
  6. Don't need to have food
  7. Changing habits
  8. Money spending habits change
  9. For this, the only reason
  10. Transitions within friends



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# muskego lakes **middle school**



**PIXEL PERFECT.** “Pixels” was one of the themes that helped to inform design features at Muskego Lakes Middle School. Within a digital image, an individual pixel has its own traits and qualities. Apart from the other pixels, however, a coherent image cannot be formed. Conceptually, this relates to the importance of community, collaboration, and seeing value in others—all of which represent the core of the educational values at Muskego Lakes. This pixel theme appears architecturally throughout the building in various ways: rectangular acoustical panels and ceiling clouds; floor pattern; and branding graphics placed to identify the grade associated with an academic neighborhood.

The library, pictured to the right, is a soaring open-concept space serving as the central hub of activity in the building. It features a maker space, flexible furniture, and warm natural light. Flanking the library on each end of the building are the two-story academic wings in which the four grades, 5th–8th, are organized into separate neighborhoods. The following pages will take a closer look at one of these neighborhoods.

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*The theme of pixels can be recognized by students throughout the school, aiding in way-finding and sense of place.*

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## PROJECT DATA

### TYPE

Middle School (5-8), New Construction

### CLIENT

Muskego-Norway School District

### LOCATION

W 124S8009 N Cape Road, Muskego, WI

### MAX PROJECTED ENROLLMENT

750 students

### SQUARE FOOTAGE

136,836

### COMPLETION DATE

August 2018

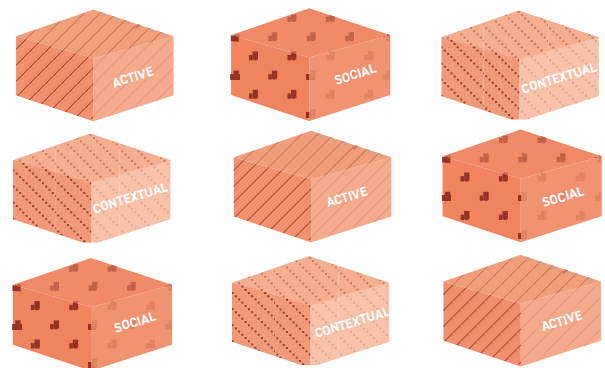




## CONSTRUCTIVIST THEORY OF LEARNING

Learners construct knowledge by understanding new information building on their current understanding and intellectual paradigm. Learning is best served when it is **CONTEXTUAL**, **ACTIVE**, and **SOCIAL**.<sup>3</sup> Flexible and engaging spaces created at Muskego, allow students' strengths within these three realms to be met.

Fig. 2.2





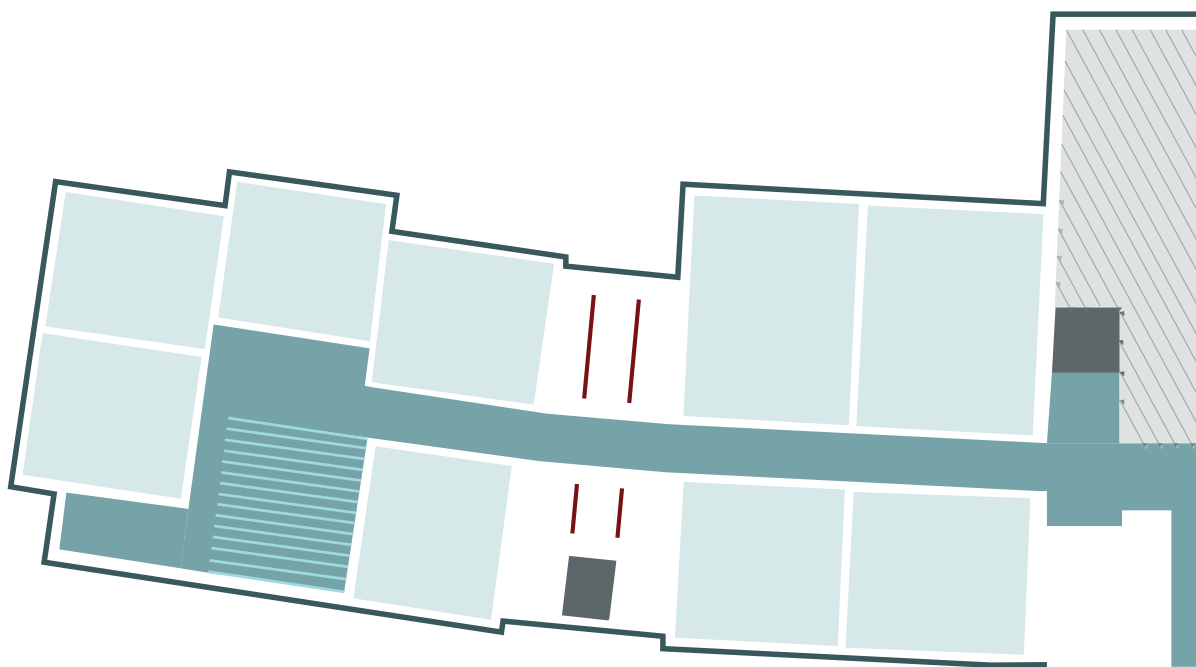








Fig. 2.3

Fig. 2.3 Key

	Classroom
	Corridor
	Collaboration Space
	Small Group Instruction
	Library Below
	Lockers

3 REFERENCE | Brown, Malcom.  
"Learning Spaces." Educase.edu, n.d.  
<https://www.educause.edu/research-and-publications/books/educating-net-generation/learning-spaces>.

**CONNECTEDNESS.** Classrooms within a neighborhood are organized around a single, shared collaboration space where interdisciplinary learning is fostered and nurtured. This spatial relationship encourages the connectedness and community described in the tenets of the Constructivist Theory of Learning.

Resources such as technology, writable surfaces, and access to power are readily available in the collaboration space, removing barriers to encourage ease of use. Visual and

physical connections between classrooms and collaboration space are critical to connect the learning environments and ensure proper supervision. These features will be explored on the following pages.

Additionally, lockers have been isolated from these learning environments into organized alcoves. This allows the neighborhoods to exist without the clutter and noise that accompanies locker environments.

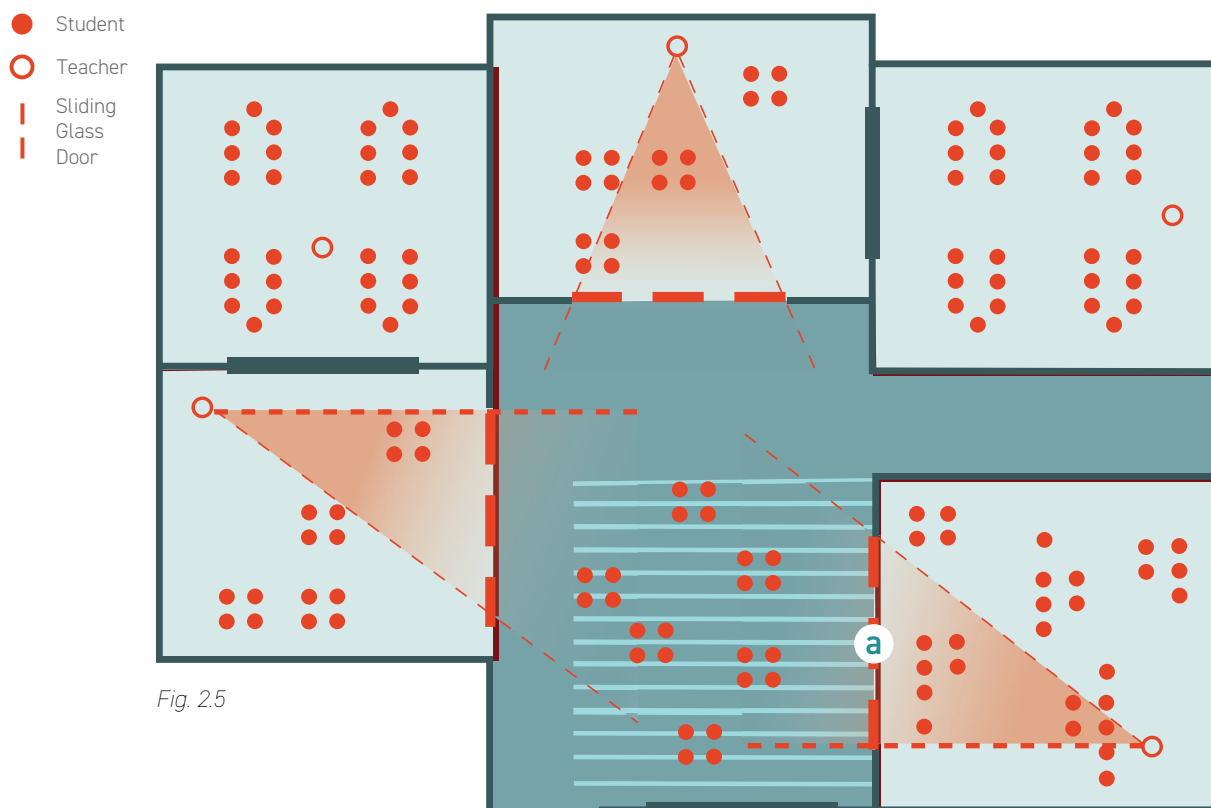


Fig. 25

*In the right moment, when students and teachers are activating the entire environment of their neighborhood, its almost as though the walls disappear.*

**EMPOWERING LEARNERS.** Column A to the right illustrates the various ways in which the classroom environments can be arranged. Simple dot representations of students and teachers paint a compelling picture of the way a single classroom can evolve into a multitude of group sizes and activity zones.

Three of the five neighborhood classrooms open directly onto the central collaboration space with expansive sliding glass doors. This visibility and option for physical openness transforms the neighborhood into a learning environment ripe for interaction and sharing ideas, as illustrated in column B to the right. Encouragement of such social behavior is an asset in direct support of instructional goals set forth by the Muskego-Norway School District.

The transparency afforded by the sliding glass doors, in conjunction with thoughtful selection of furniture and appropriate resources, empowers students and teachers to take full ownership of their environments. In column C and Fig. 2.4 above, its almost as though the classroom walls disappear as teaching and learning flows freely in an environment shaped to support agile adaptations of use and activation.

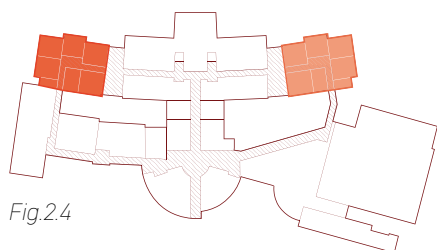
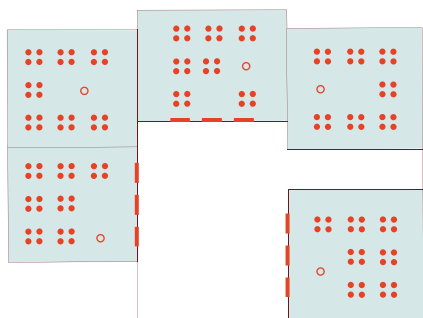


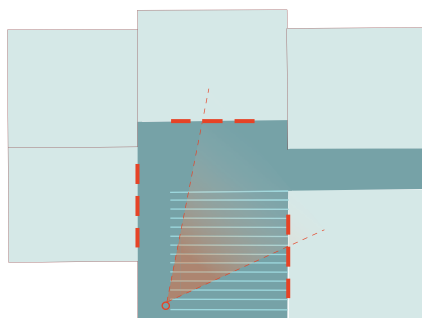
Fig.2.4

### Key Learning Unit Element

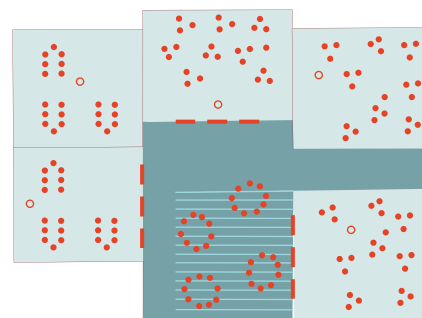




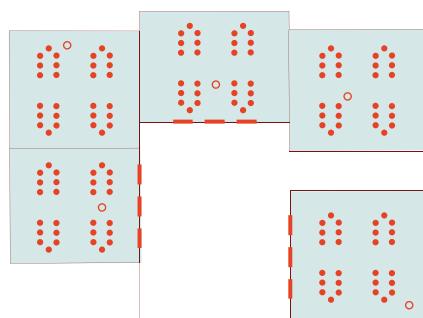
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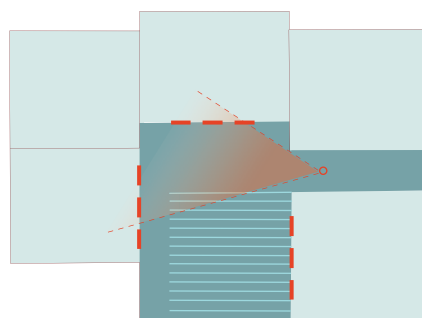
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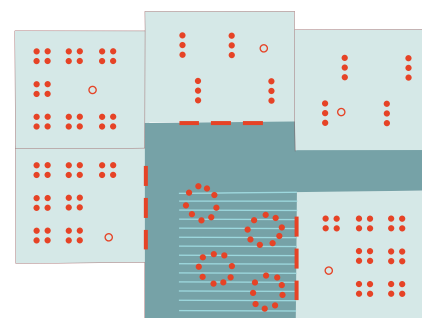
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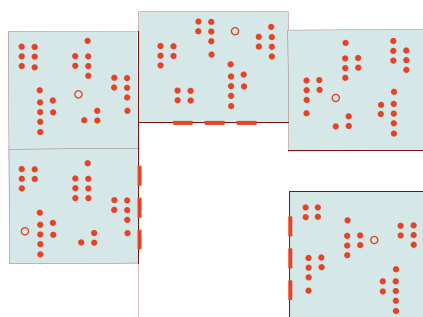
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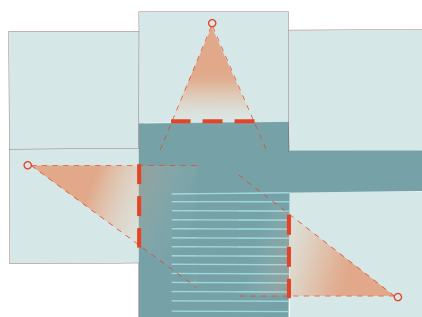
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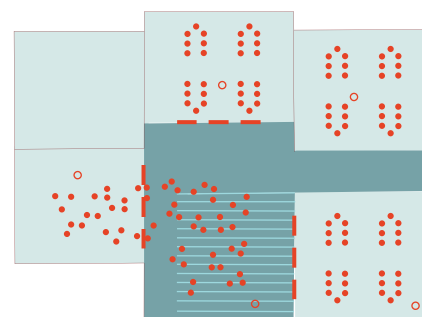
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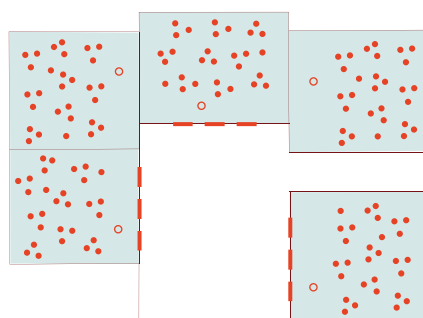
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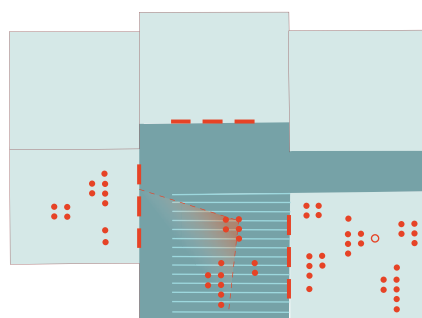
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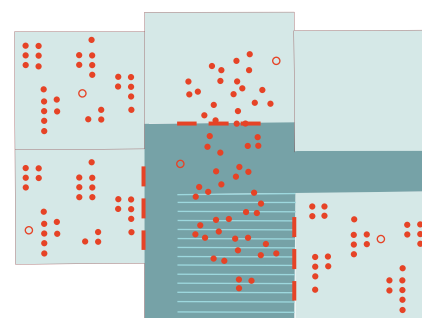
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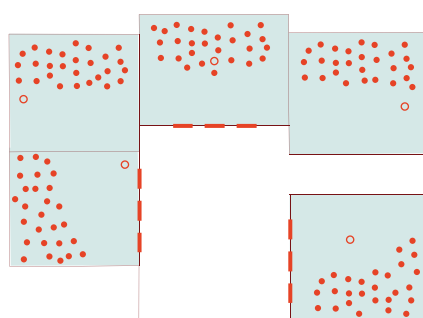
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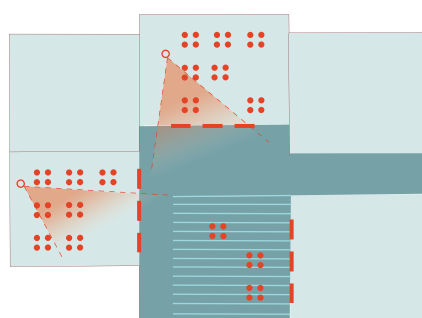
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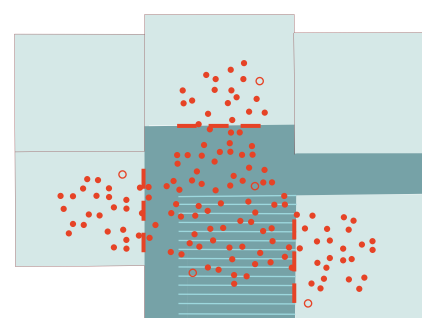
C4



A5



B5



C5

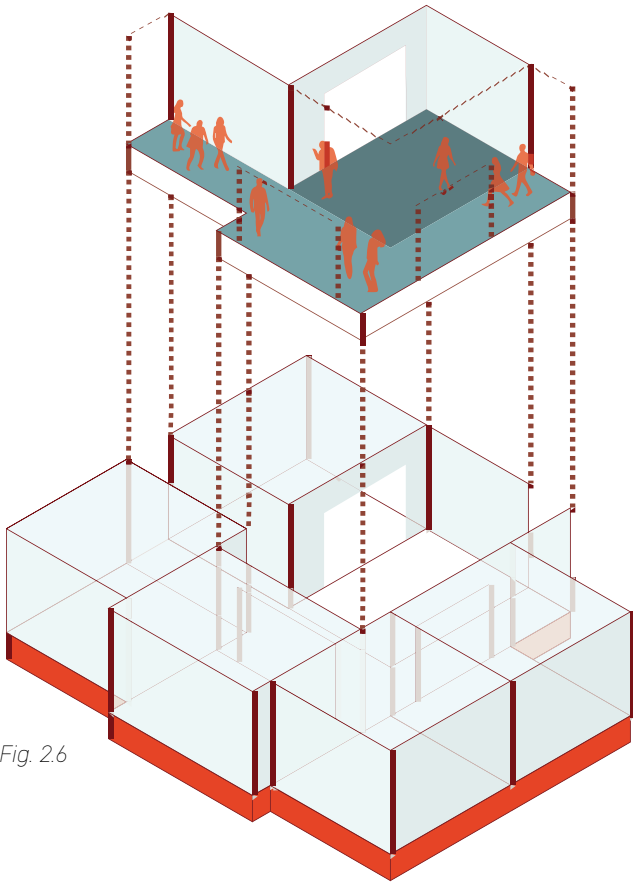


Fig. 2.6

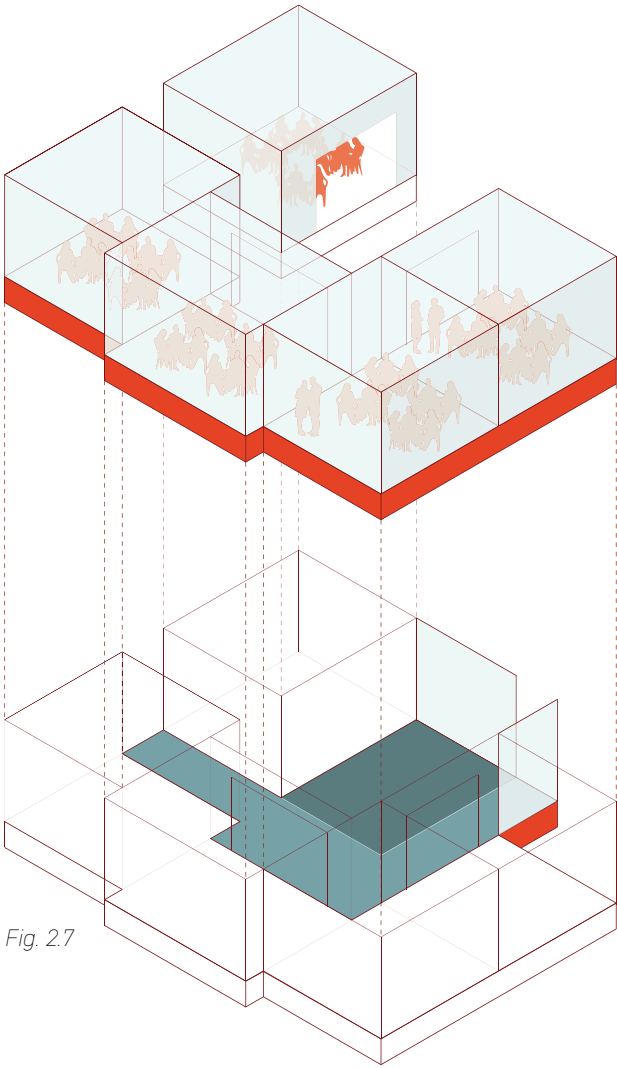


Fig. 2.7



Collaboration



Classroom

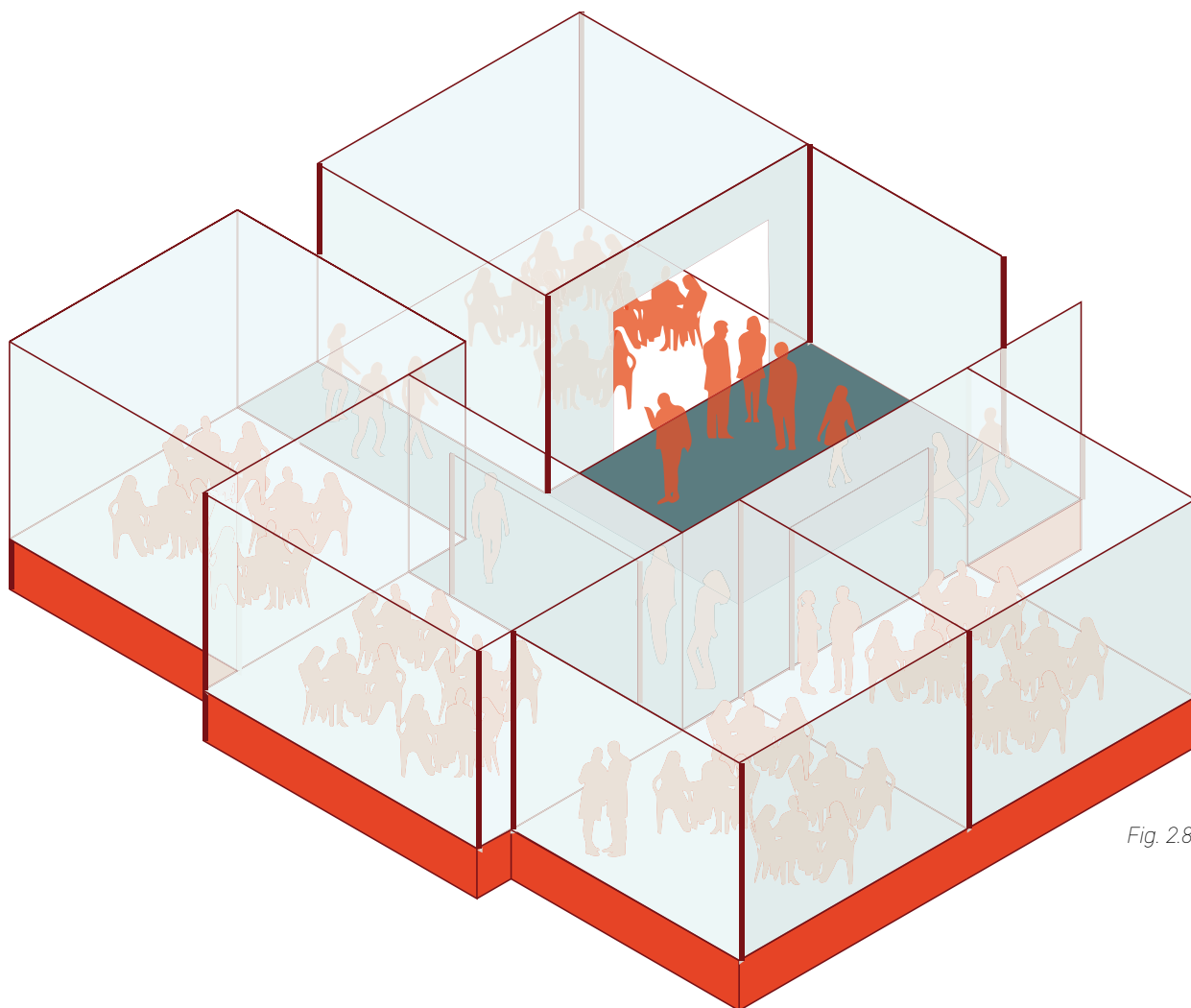


Fig. 2.8

**STUDENT AGENCY.** Students benefit when their neighborhoods give them autonomy and agency inside and outside of the classroom. Teachers value this connectedness as it supports their own collaboration and the development of interdisciplinary opportunities within the curriculum.

It takes a dedicated group of teachers, students, and administrators to knit together the opportunities available in a physical environment with the curricular and cultural goals of their organization. The ability to be agile and adapt is essential and must be considered across a spectrum of time and scales.

Day to day, shifting between spaces, seats, subjects, and size of group should be unencumbered as long as both active and passive participants understand the expectations within each space.

Taking long-term flexibility into consideration, Fig. 2.9 shows that, if necessary, a sixth enclosed classroom could be carved out of the open collaboration space.



Fig. 2.9

**The 6th classroom is evidence that the building can adapt to meet changing pedagogy needs.**



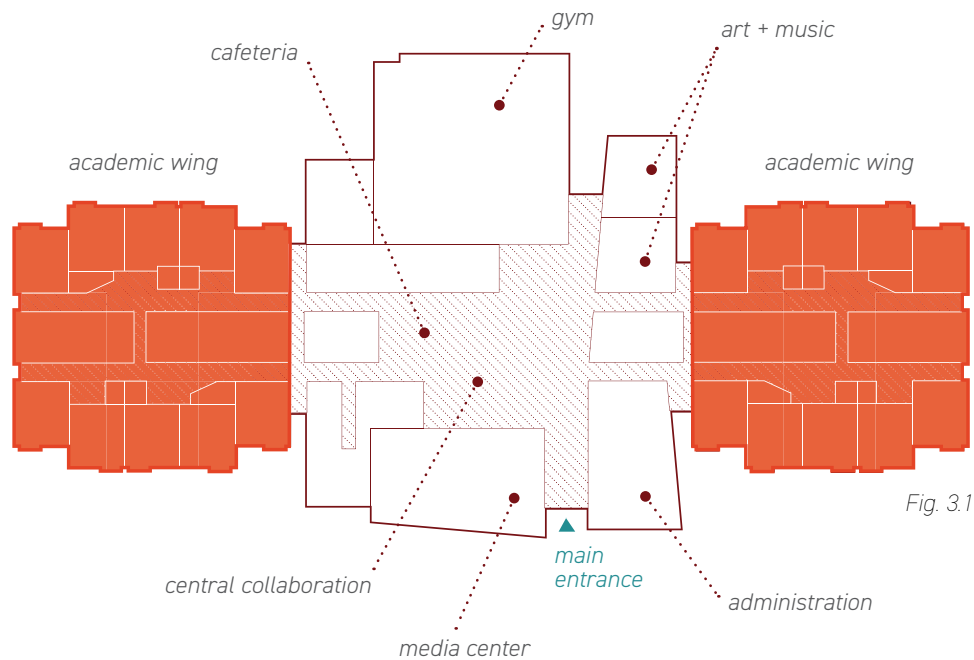








# beloit turner elementary school



**A SENSE OF PLACE.** This single-story elementary building is organized in a very straightforward manner. A central core is seen as the “downtown” where all the commonly accessed amenities such as the gym, cafeteria, and media center are located. The academic wings are located at each end of the building, accommodating 2nd through 5th graders.

Two grades are paired together in each of these wings, and each grade has its own distinct neighborhood with a theme intended to relate to a local or regional place type: Industry, Farmland, Wilderness, or Riverfront.

Especially with younger learners, a physical environment that evokes something familiar can help alleviate anxiety and encourage an implied connection that may serve to break down barriers to learning.

At the central core, the relationship between the media center and cafeteria is intentionally fluid. Instead of defining the zone with walls, transition in flooring type, change in ceiling height and treatment, and flexible furniture help visually separate the space.

*A physical environment that evokes something familiar can help alleviate anxiety and encourage an implied connection that may break down barriers to learning.*



Media Center  
Breakout  
Space



## PROJECT DATA

### TYPE

Elementary (2-5), New Construction

### CLIENT

School District of Beloit Turner

### LOCATION

3245 Bartells Drive, Beloit, WI

### MAX PROJECTED ENROLLMENT

500 students

### SQUARE FOOTAGE

80,975

### COMPLETION DATE

August 2021



KEY ELEMENTS TO CLASSROOM DESIGN<sup>4</sup>

FLEXIBLE  
FURNITURE

Teachers can accommodate various needs of students while also giving them agency

LIGHT  
FILLED

Student learning rates increase by up to 26% when they have adequate natural light

INTEGRATED  
RESOURCES

Having tools at their fingertips motivates activity and allows students to move at their own pace

COLOR

Attributing colors to a grade group creates identity that students gravitate towards

Fig. 3.2

**THE NEIGHBORHOOD.** Both sets of five classrooms within a neighborhood are organized around a central support core that includes lockers, restrooms, and flexible meeting rooms for small group instruction (SGI).

Each side of the academic wing is designated for a specific grade level. Connection between the two grade levels is supported through the resource space in the core of the wing. This connection not only provides a means to share resources, but also expands opportunities for collaboration and supervision.

Considering the four key elements of classroom design as described by Wierman in Fig. 3.2, we can start to imagine the impact that each element can have on the classrooms and adjacent collaboration space.

By incorporating the corridor into the learning environment, we are able to take advantage of otherwise underutilized square footage and activate that space in a number of ways.

All classrooms have a direct relationship with the collaborative corridor, though the way they connect varies, allowing for different levels of collaborative engagement.

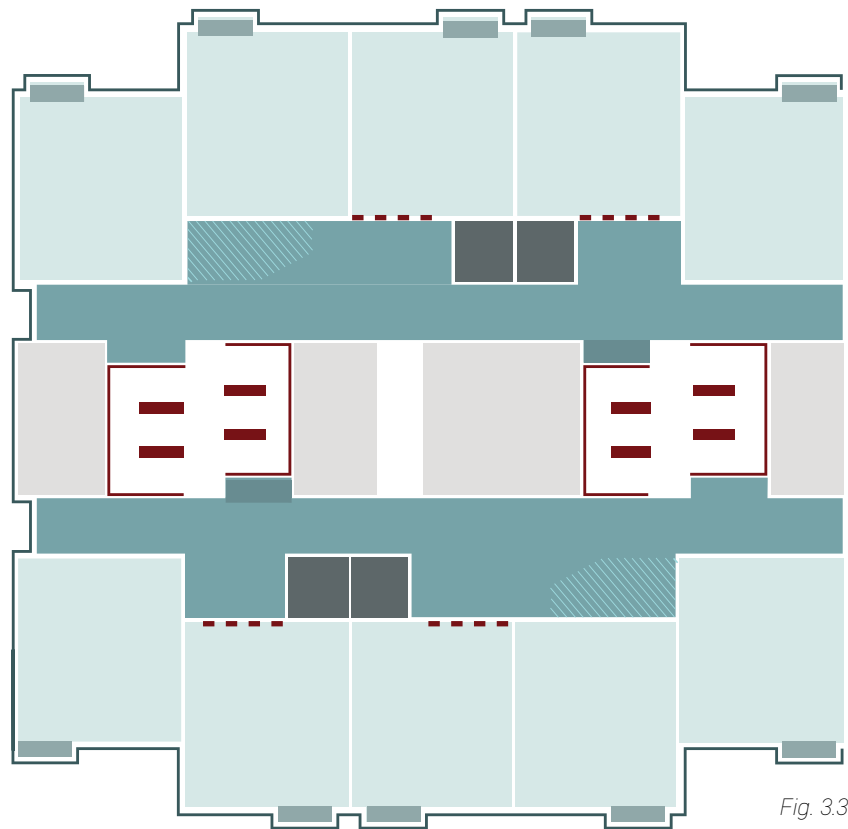


Fig. 3.3

4 REFERENCE | Wierman, McKenna. "4 Key Elements of 21st Century Classroom Design." Getting Smart, January 27, 2017. <https://www.gettingsmart.com/2016/12/21st-century-classroom-design/>.

Fig. 3.3 Key

- Classroom
- Satellite Libraries
- Academic Corridor
- Tiered Reading Corner
- Small Group Instruction
- Sliding Doors
- Cubbies

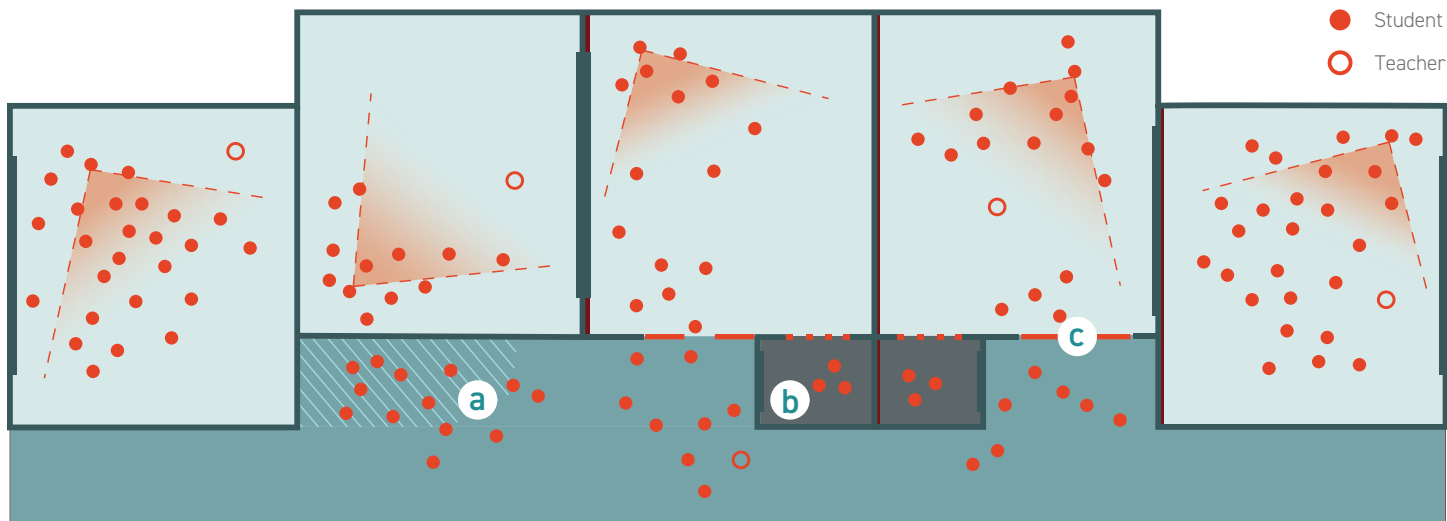


Fig. 3.4

**EDGE TREATMENT.** The diagrams in the columns to the right show the influence of physical and visual connectedness on an environment. Students and teachers have the opportunity to interact in a variety of rooms and spaces, which are either explicit (enclosed) or implied (open). By allowing for individuals or different group sizes to gather in various spaces, we attempt to ensure that any mode of learning can be accommodated anytime, without barriers.

Resources, such as technology or whiteboards, that help facilitate collaboration should be readily available and easily accessed. Ownership of any space should be defined as loosely as possible, where no single person or group is allowed to overtake a space and make it unavailable or unwelcome to others. Perhaps the most important factor is the treatment of the edges between spaces. In other words, the amount of transparency and openness (which translates to supervision and flexibility) directly relates to how often and well-utilized each space will be.

As illustrated in Fig. 3.4 above, when the classrooms with sliding glass doors spill out into the corridor, the core learning space is expanded. Though more students may gather, one teacher would still be able to oversee a larger group. Similarly, students can gather in the tiered reading corner or be meeting within the SGI rooms—all under the supervision of an aide or teacher.

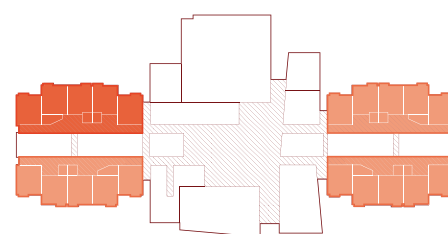
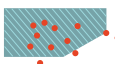


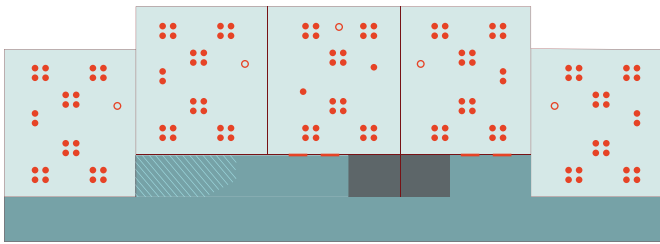


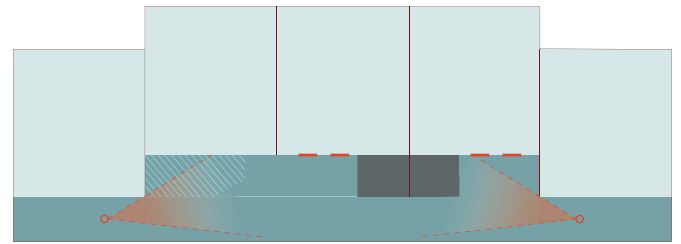
Fig. 3.5

### Key Learning Unit Elements

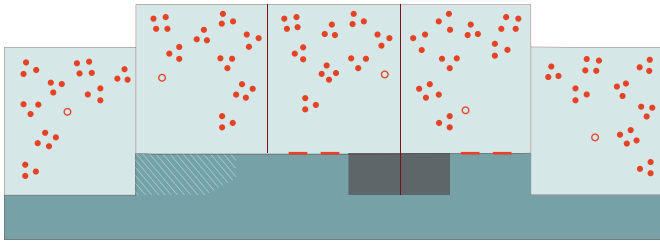
- a**  Tiered Reading Corner
- b**  SGI with window into classroom
- c**  Sliding glass doors between classroom and corridor



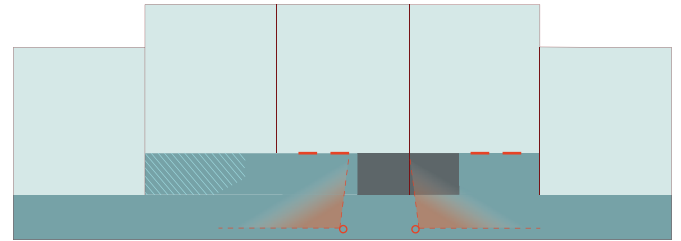
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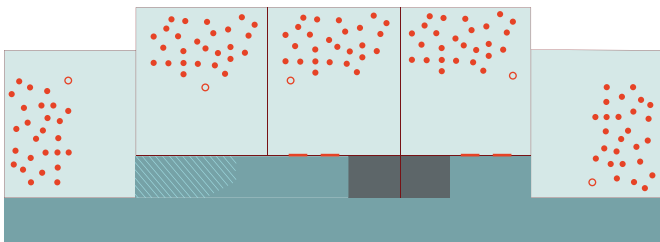
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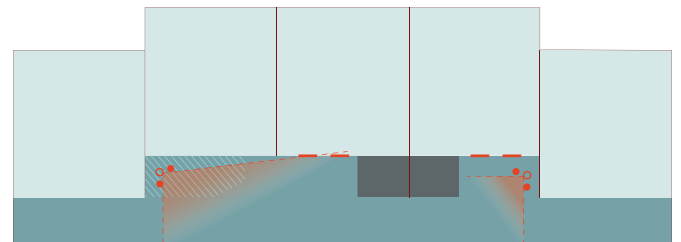
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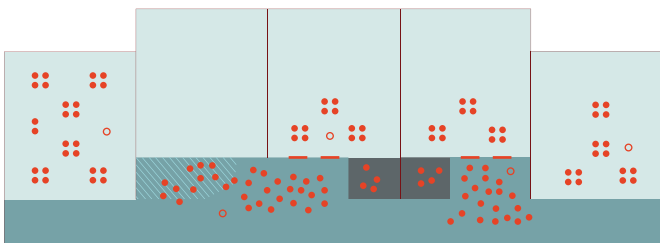
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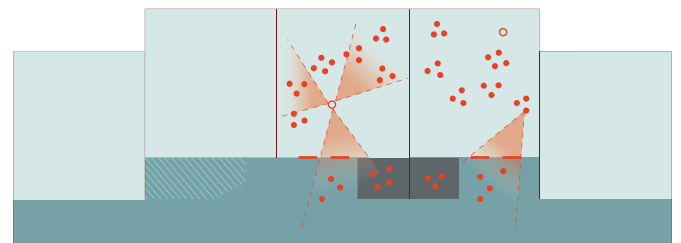
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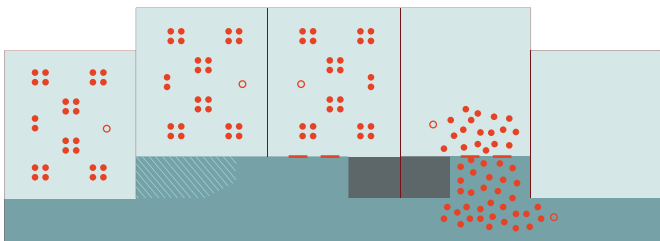
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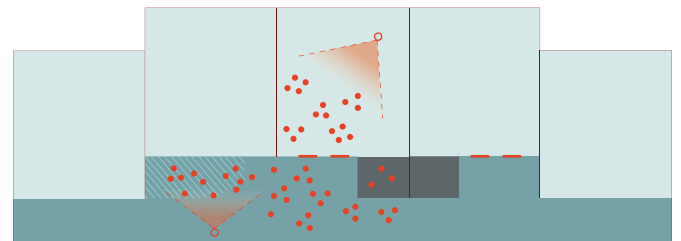
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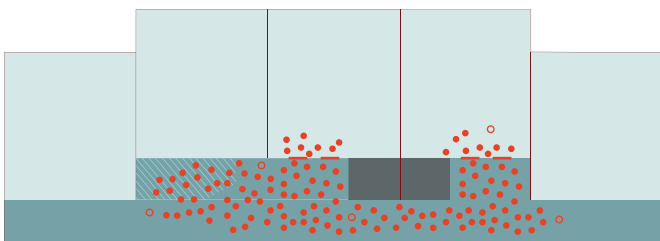
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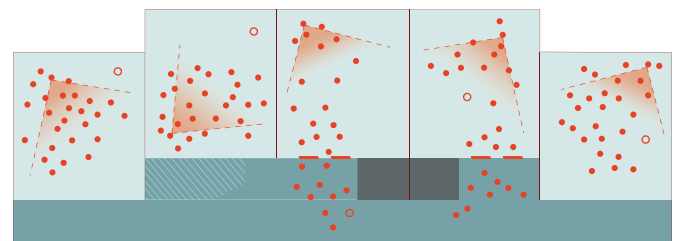
A5



B5



A6



B6



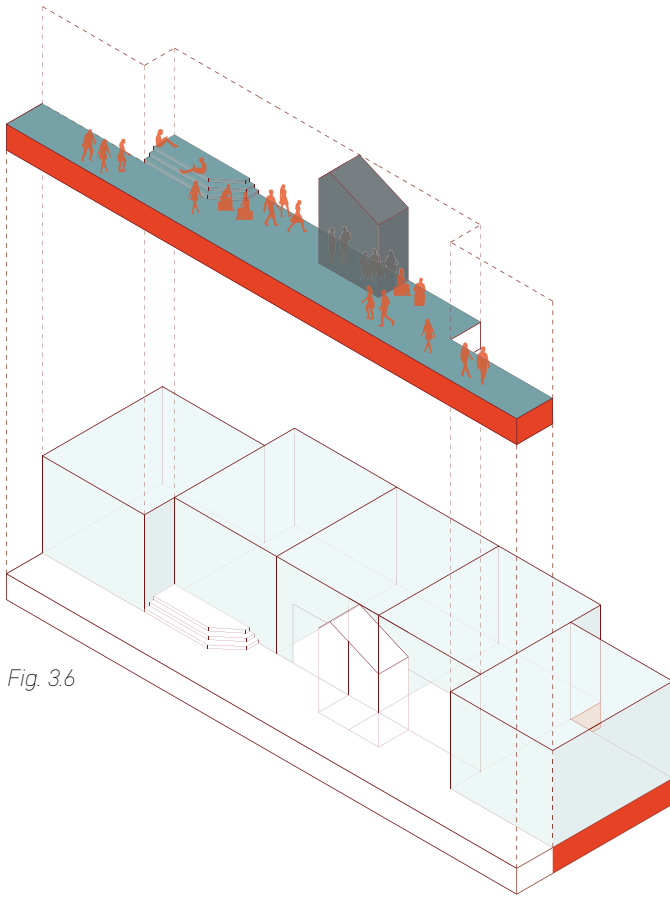


Fig. 3.6

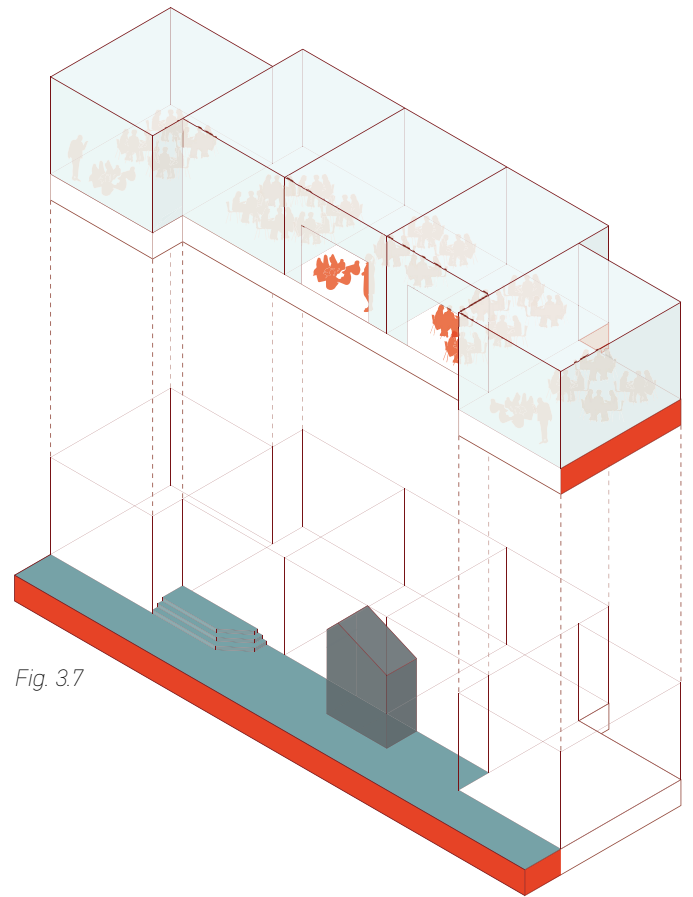


Fig. 3.7



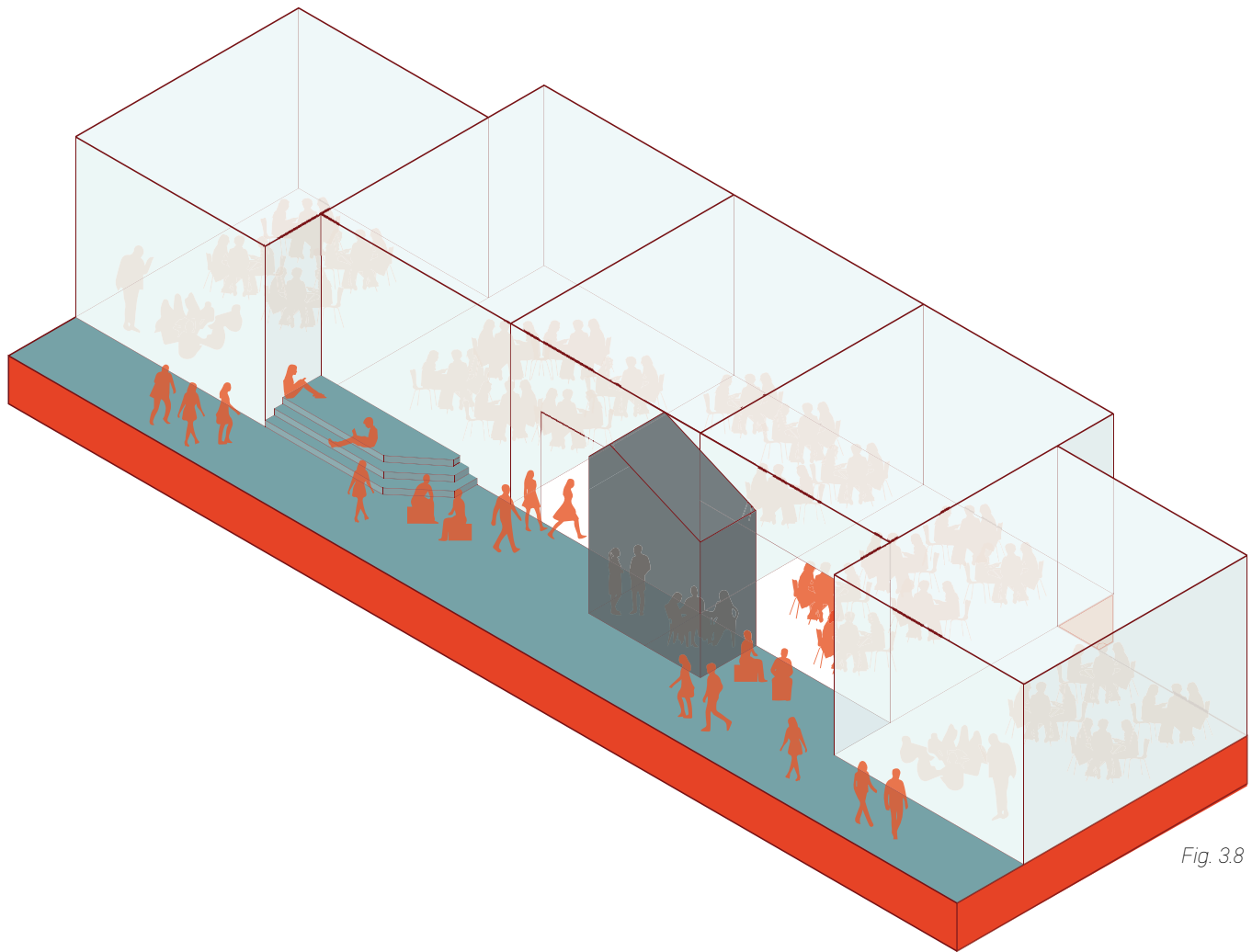


Fig. 3.8

**CONNECT TOGETHER.** The power within these learning environments reaches full potential where classroom and corridor come together and when the lines between them are blurred. These two components are illustrated separately in Figures 3.6 and 3.7 and are shown interlocked in a way that encourages the most utility, flexibility, and collaboration in Fig. 3.8.

Grade themes encourage students to feel connected to their learning environments by shaping a unique sense of place. Each grade theme is identified to the left.

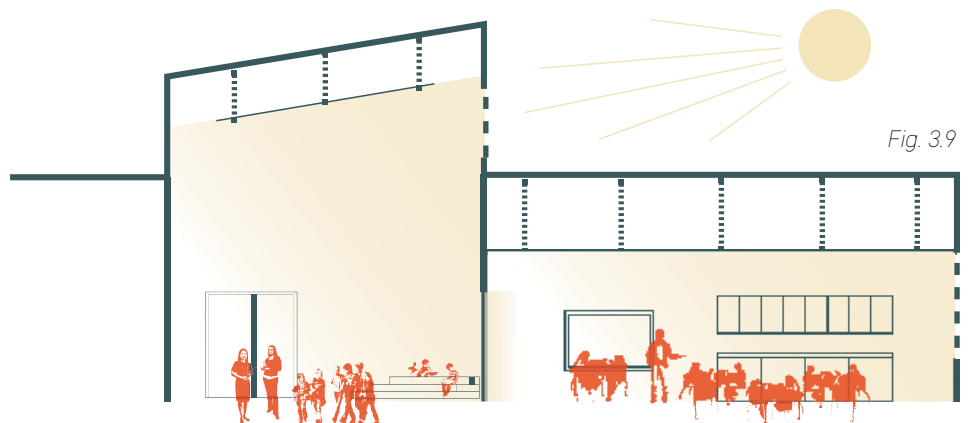


Fig. 3.9

Figure 3.9 illustrates how natural light is welcomed into the building through both typical exterior windows, which have lowered sills to ensure that younger students have a direct outdoor view, and through the use of clerestory light, bringing a diffuse overall natural luminance to the space.





## CONCEPT



### PLAN

Add Some Brief  
To Explain

### START

Add Some Brief  
To Explain

### STEPS

Add Some Brief  
To Explain

## BIG CONCEPT

Add Some Brief Here to  
Explain



### CONCEPT

Add Some Brief Text  
Here to Explain



### CONCEPT

Add Some Brief Text  
Here to Explain



### CONCEPT

Add Some Brief Text  
Here to Explain

MATHEMATICS

AIM: GEOMETRIC SHAPES



CIRCLE



SPHERE



SQUARE



CUBE



TRIANGLE

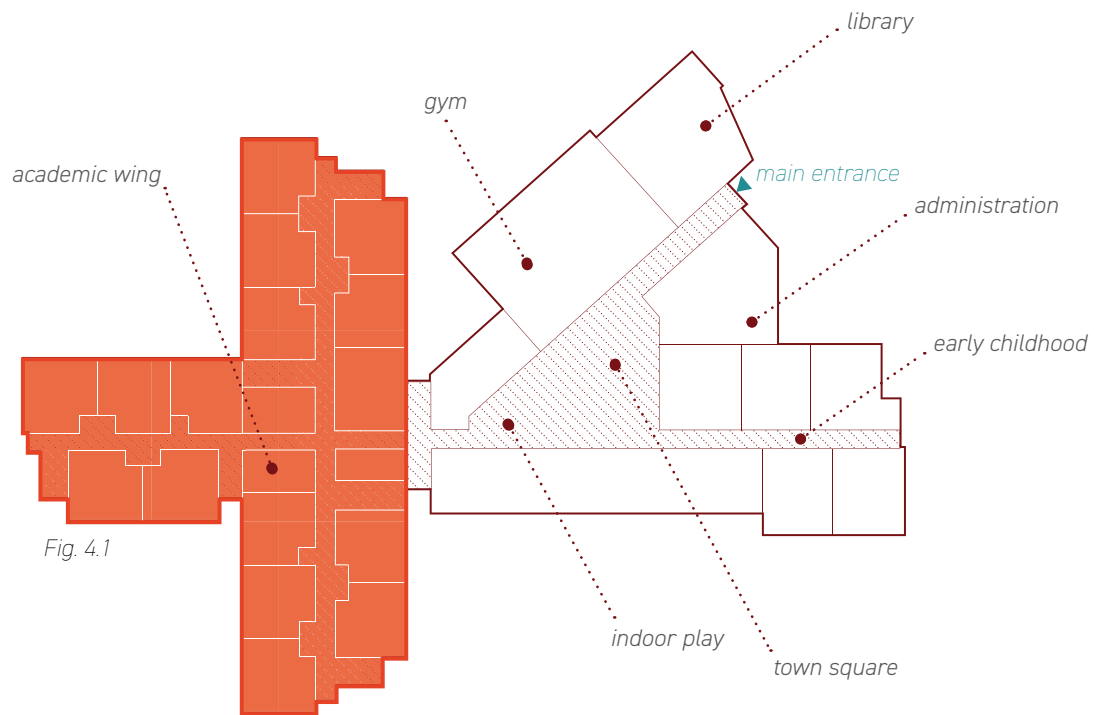


PYRAMID





# little prairie **primary school**



**LINKED TO LOCAL.** Many of the design concepts woven throughout the building were inspired by local places or community values.

As a space for Early Childhood – 2nd graders, the goal from the outset was to create a warm, welcoming, playful environment that enriches each student's learning experience. This rich experience begins at the heart of the school: Town Square.

Inspired by the local historic town square a few miles from the site, the school's Town Square serves as a central commons. Students gather

in this space to eat, play, learn, and be social. The non-core classrooms such as music, art, gym, and SmartLab all surround this central space.

A main feature of the Town Square is the "collaboration tree," shown in the image to the right. The canopy of colorful leaves has acoustical properties to help mitigate noise within this large open space. An interactive base or "tree trunk" includes a Lego station, interactive screen, seating area, and meeting table to encourage creativity and exploration for the young learners.

Town Square and its surrounding rooms are all considered the "public zone" of the building, which can be accessed by the community outside of school hours. Figure 4.1 shows the Early Childhood wing of the building and highlights the academic wing, where Kindergarten – 2nd grade are mixed together among the three pods.

These academic areas are easily separated from the public zone for safety and security considerations, as well as clarity in building organization.





## PROJECT DATA

### TYPE

Primary School (4K-2), New Construction

### CLIENT

East Troy Community School District

### LOCATION

2109 Townline Road, East Troy, WI

### MAX PROJECTED ENROLLMENT

500 students

### SQUARE FOOTAGE

73,945

### COMPLETION DATE

August 2017



Classrooms +  
Breakout



## CONNECTEDNESS<sup>5</sup>

School classrooms have the opportunity and obligation to serve as safe environments, facilitating connectedness between students and teachers. Being connected allows students' brains to function, form paths, and most importantly, learn.

It's critically important to create opportunities for connectedness, not just in sanctioned classrooms, but in various spaces throughout school, allowing every space to be an environment ripe for learning and growing.

Academic  
Hallway



Fig.4.2

**THE GROWTH OF LEARNERS.** The environment of a school shouldn't be solely focused on intellectual development. Social and emotional development plays a vital role in the growth of lifelong learners and meaningful contributors to community and society.

Feeling connected to others begins with understanding and appreciating one's own role within a larger system. That ability for self-awareness is rooted in safety and comfort. When a school environment fosters a feeling of safety and connectedness, students' brains can function, form patterns, show empathy, and of course, learn!<sup>5</sup>

Academic environments should be planned with this in mind. In part, security is addressed with the integration of strategic sight lines to aid in passive supervision. Team teaching, which is discussed further on the following pages, was a key driver to the development of learning environments in this example.

By organizing cubbies into alcoves, corridors are free to host teaching, learning, and collaboration as an extension of the classroom.

The images to the left illustrate the way flooring finish changes and shapes of soffits help create suggestions of space without the need for enclosing rooms.

5 REFERENCE | Gorrell, Cheryl A., "Safe Learning Environments." Presentation, DLR Architects, Kansas City, MO, July 10, 2019.

Fig. 4.3 Key

- Classroom
- Corridor
- Resource Alcove
- Cubbies

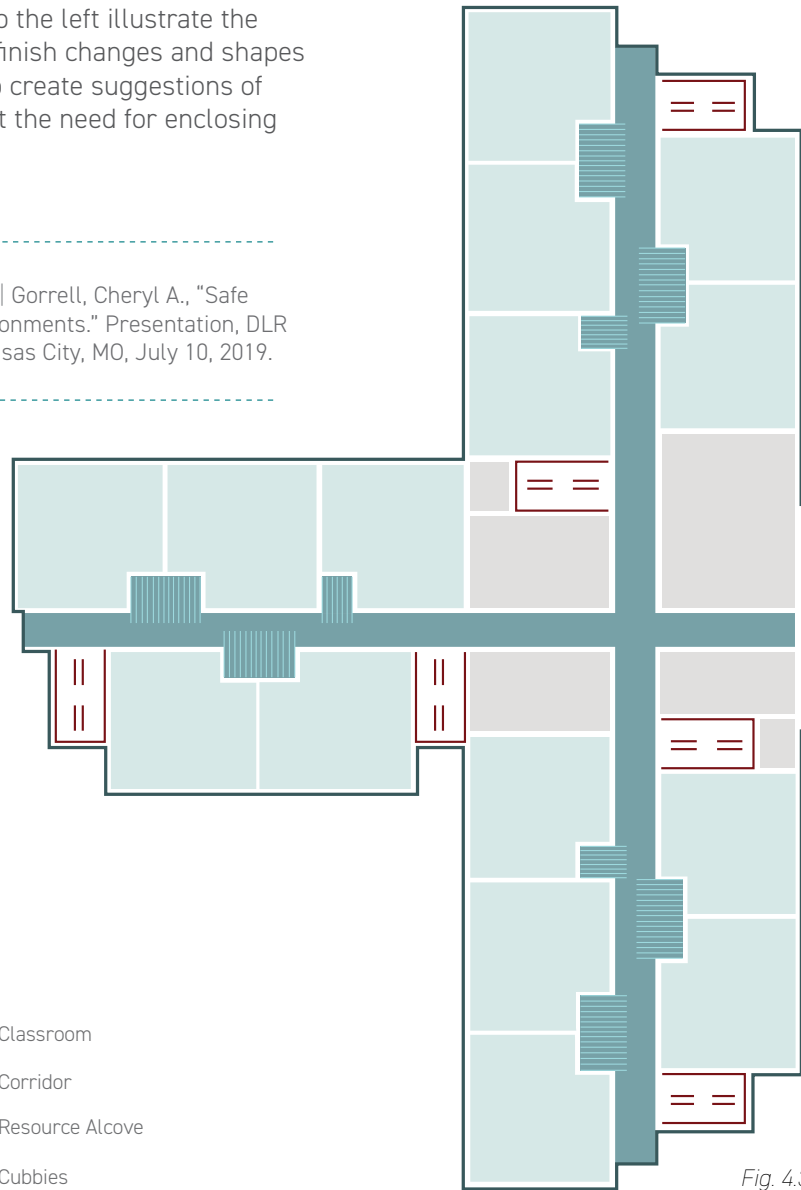


Fig. 4.3

● Student  
○ Teacher

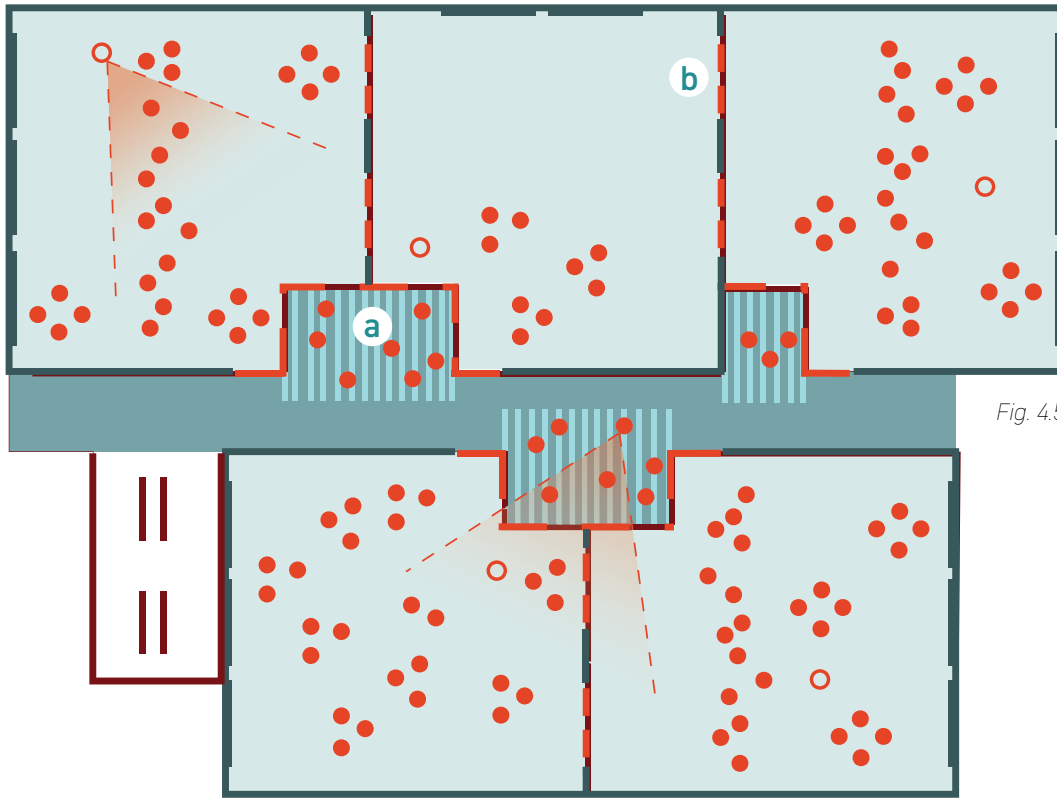


Fig. 4.5

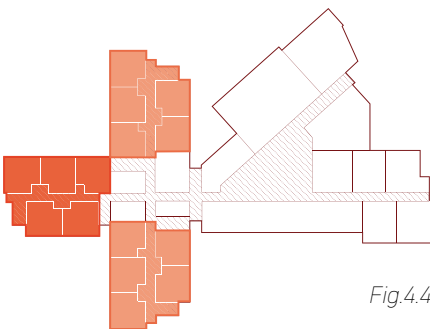
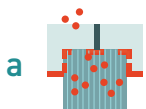


Fig.4.4

## Key Learning Unit Elements



*Corridor breakout space with windows to classrooms*



*Glass overhead doors between classrooms*

**DEVELOPMENT AND PLAY.** For younger students, much of their learning is centered around play. As demonstrated in the three columns to the right, organizing students into various group sizes, allows for various connections between classrooms, and ensures visual supervision. It's easy to imagine the breadth of activity that could take place with this type of spacial flexibility. Mobile furniture allows organized rows of desks to be quickly cleared for floor activities, and vice versa.

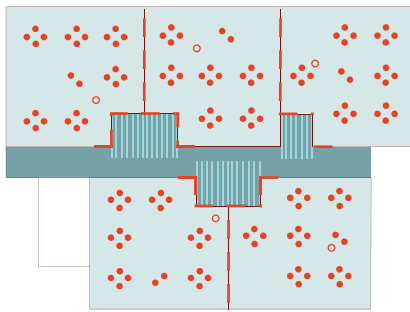
A learning pod, as shown in Fig. 4.4, includes five classrooms consisting of a mix of grades from Kindergarten – 2nd Grade. Team teaching is encouraged by administrators and is being explored by several staff members. This allows for blurring of subjects, encourages socialization of students, and opens the potential

to cross-disciplinary learning at a very young age. Teachers can open the overhead doors between classrooms to facilitate this learning style and connect their classes.

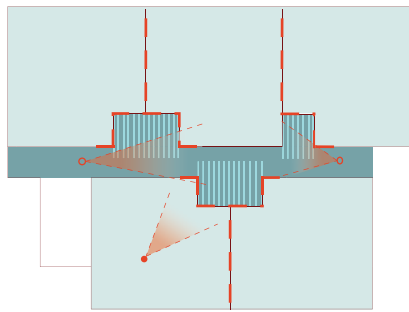
Children's development follows a similar pattern, but age is not always an accurate predictor of each child's actual development. Mixed-age learning environments, in this case with physically connected classrooms, have a positive influence on the social and emotional factors of development.<sup>6</sup>

<sup>6</sup> REFERENCE | Gorrell, Cheryl A., "Safe Learning Environments." Presentation, DLR Architects, Kansas City, MO, July 10, 2019.

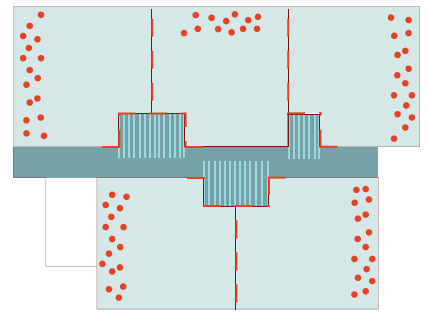




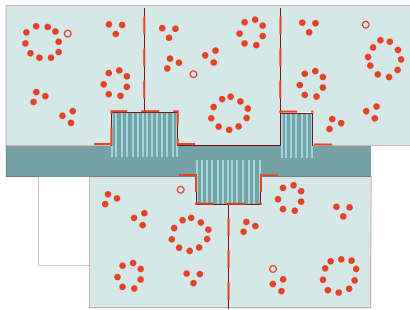
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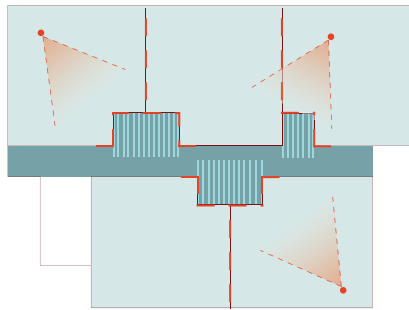
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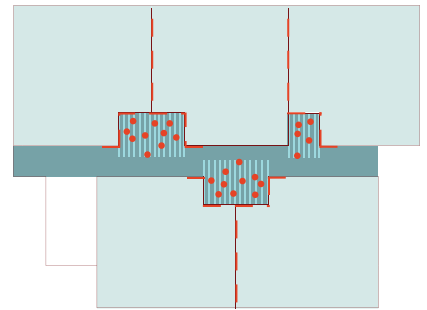
C1



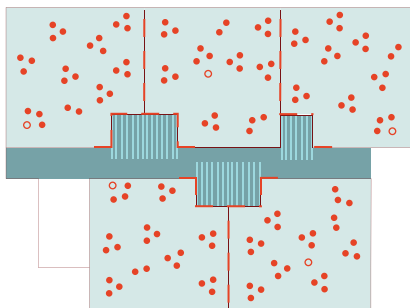
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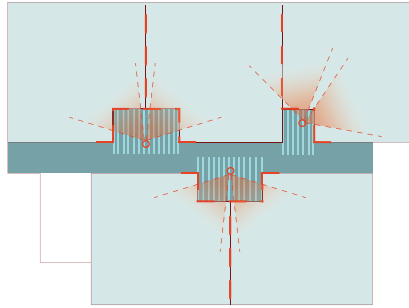
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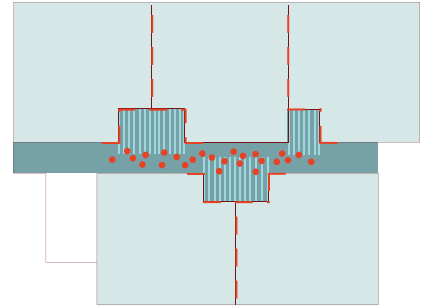
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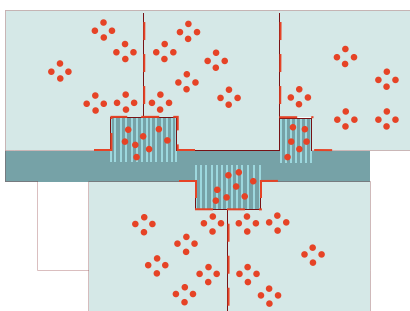
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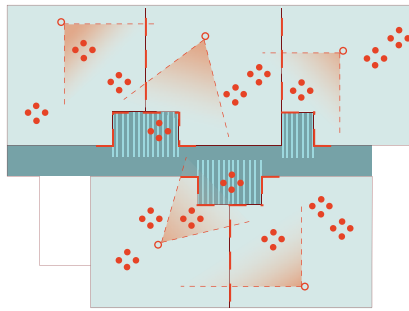
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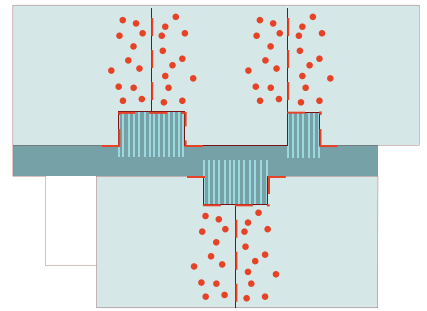
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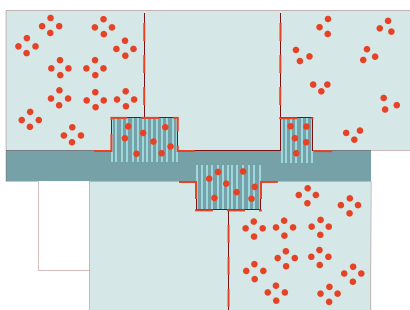
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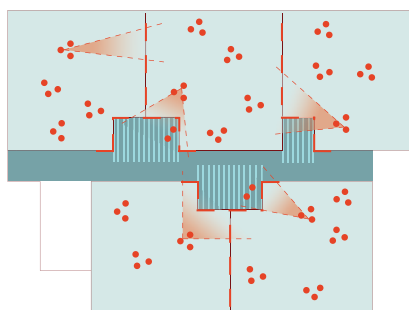
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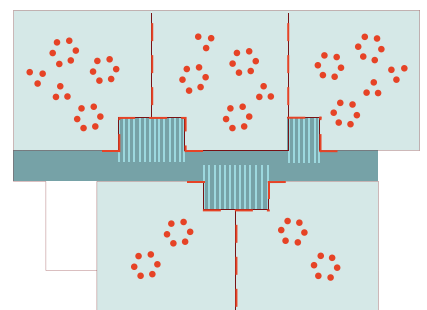
C4



A5



B5



C5

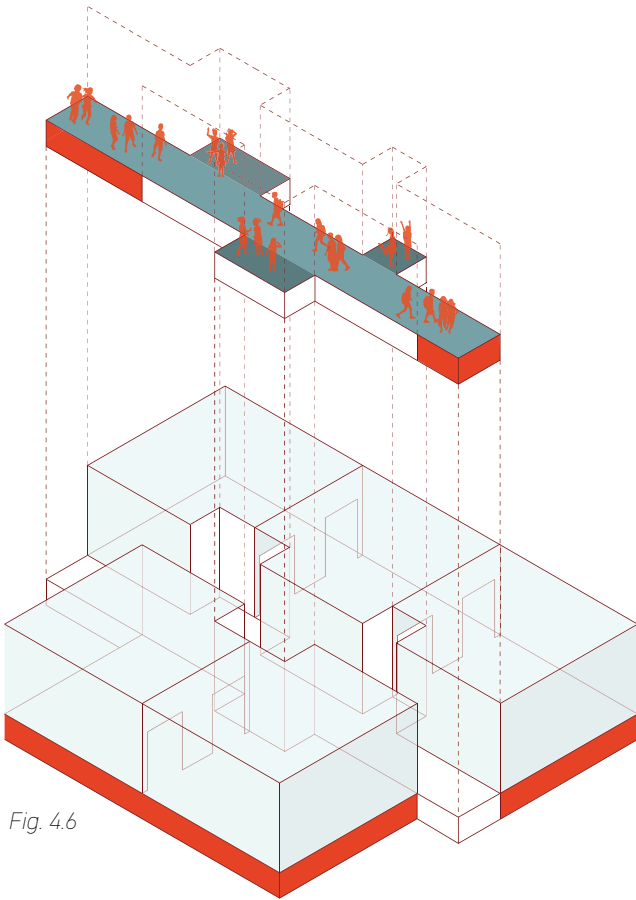


Fig. 4.6

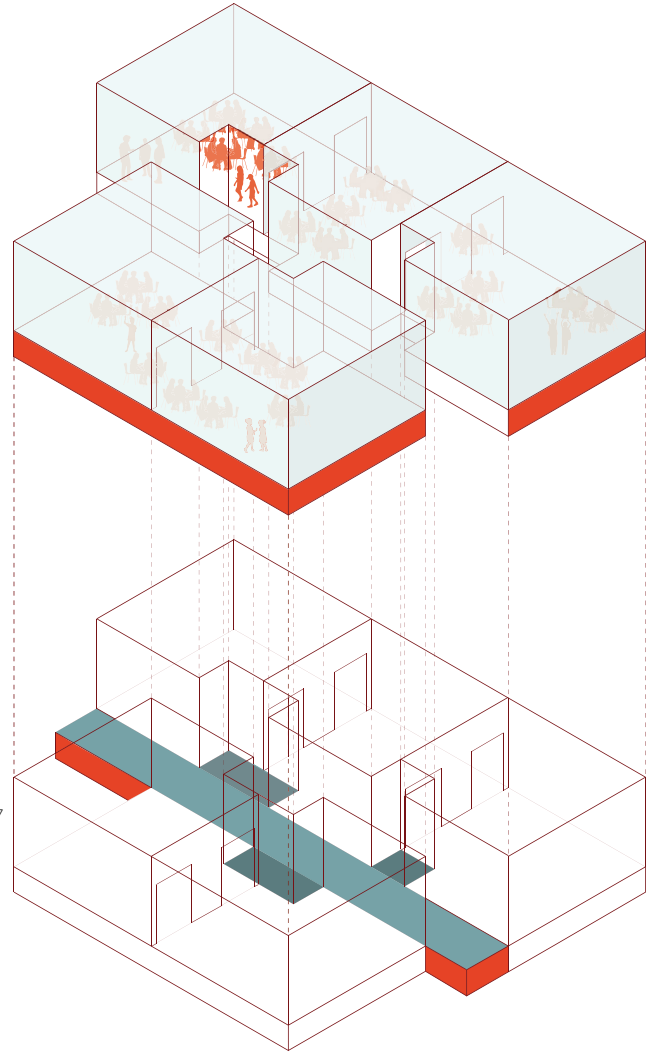


Fig. 4.7



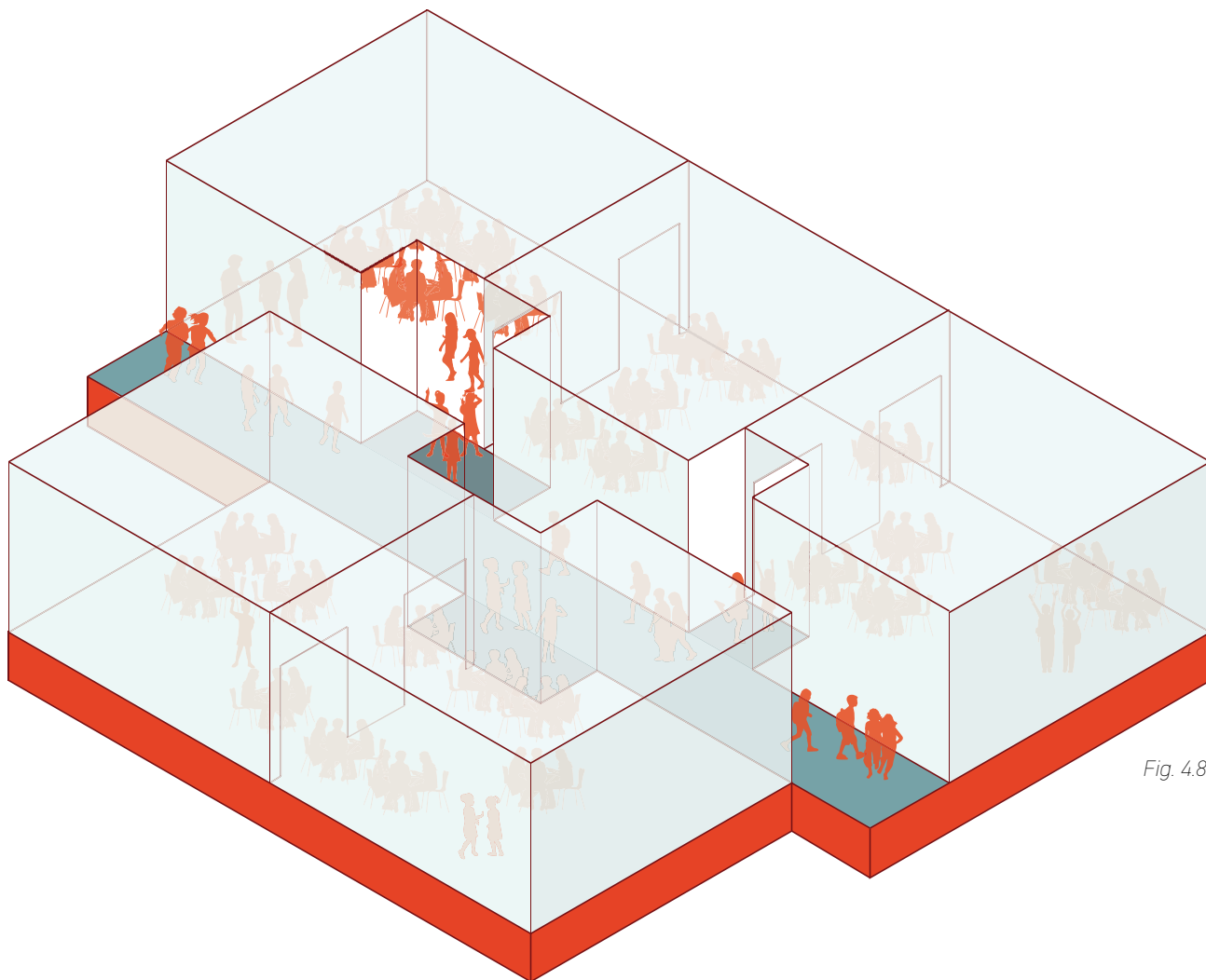


Fig. 4.8

**DYNAMIC AND LIVELY.** Areas carved out of classrooms create pockets of space, or alcoves, for learning within the corridor. Students earn the privilege to utilize these spaces for quiet reading or small-group work. By allowing even the youngest students some agency in their school day, they develop respect and self-discipline among other personal skills. The images to the left show the amount of physical connection between classrooms and the amount of visual connection between classrooms and corridors.

Rather than serving as just a conduit between rooms, clogged by mass movement during brief chaotic passing periods, corridors with learning alcoves become dynamic and lively spaces filled with activity throughout the school day.

Figure 4.9 illustrates the need for balancing the amount of transparency with the realities of distractibility. The overhead doors, which connect classrooms, have transparent panels at the top and translucent panels at the bottom. This allows a standing teacher to see through and across to other spaces, while distractions beyond the doors are limited for seated students.



Fig. 4.9





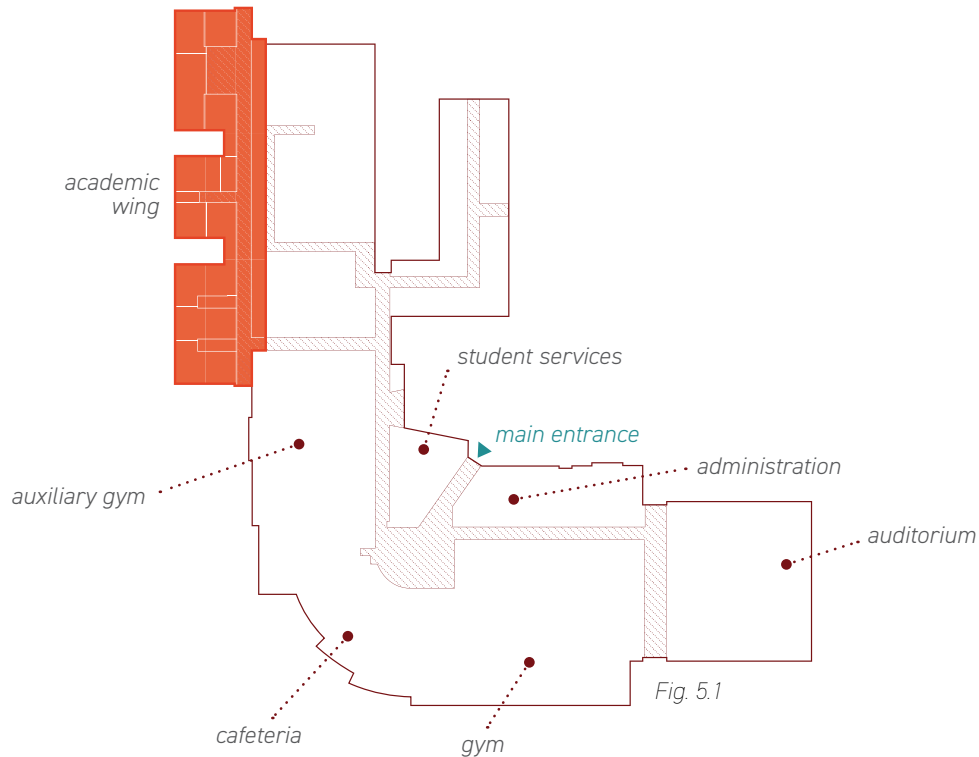






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# port washington **high school**



**TOTAL TRANSFORMATION.** Spanning several years and totaling almost 300,000 square feet of addition and renovation, this extensive project transformed Port Washington High School into a like-new school. The main objective was to modernize learning environments throughout, while honoring and preserving the rich history of the school and community. Attention to detail helped bridge important themes of the school across all 300,000 square feet. Interior design elements paired energizing colors and patterns with warm wood tones to unite the natural site and context with the dynamic, social learning experience.

Care was taken to distribute informal learning areas around the whole building—in both academic and non-academic areas. The intention was to build a collegiate culture where students are encouraged to utilize all parts of the building while developing independence. Just inside the front door, the commons, shown in the image to the right, serves as one of those informal gathering areas. Adjacent to the cafeteria and gym, it serves a social function during lunch periods and outside of school hours. During the school day, however, students gather here for group work, independent study, or one-on-one instruction.

---

*The intention was to build a collegiate culture where students are encouraged to utilize all parts of the building while developing independence.*

---





## PROJECT DATA

### TYPE

High School (9-12), Addition + Renovation

### CLIENT

Port Washington-Sauville School District

### LOCATION

427 W. Jackson Street, Port Washington, WI

### MAX PROJECTED ENROLLMENT

850 students

### SQUARE FOOTAGE

298,550

### COMPLETION DATE

May 2019



### DYNAMIC EDUCATION<sup>7</sup>

PASSIVE	5% lecture
	10% reading
	20% audio + visual
	30% demonstration
<hr/>	
ACTIVE	50% discussion
	75% practice doing
	90% teach others

Fig. 5.2

*Learning retention rates show the need for flexible learning environments, as education today is characterized by constant change and activity to promote progress.*

### DYNAMIC LEARNING ENVIRONMENTS.

The style and organization of the classrooms and collaboration areas at Port Washington High School attempt to respond to research linking dynamic, flexible learning environments to higher learning retention rates (Fig. 5.2).

Figure 5.3 shows a diagrammatic floor plan where the three classroom “pods” vary significantly. This is because the school is organized by department, grouping subject types together. The architecture responds to the unique learning and collaboration needs for each subject.

The pod at the top of Fig. 5.3 is designed for collaborative subjects like math and foreign language, with four or five classrooms linked by a central resource space. These classrooms benefit from sliding glass doors that open onto the collaboration space, effectively expanding the environment of a single classroom, or allowing for multiple classrooms to work together in a fluid environment.

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7 REFERENCE | Kimball. “Evolution of the Learning Environment.” Kimball Learning - White Paper, n.d., 1-5.

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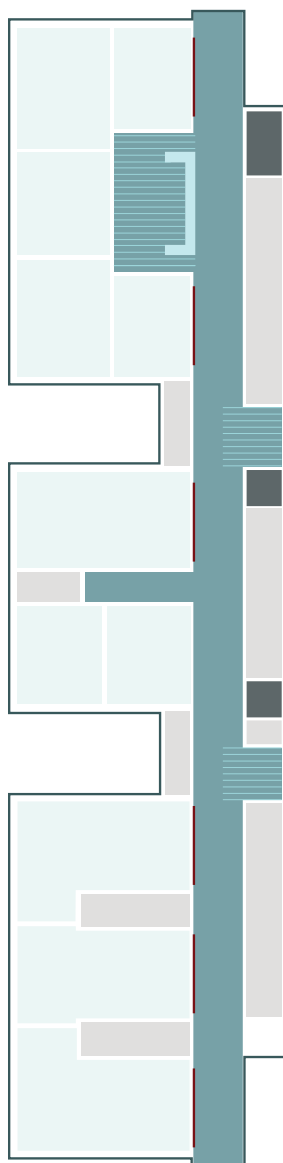


Fig. 5.3

The main academic corridor acts as a zipper, connecting the various learning environments together while also offering a variety of supplemental learning spaces separate from any one subject area.

Along the corridor, alcoves for informal gathering are carved out—complete with flexible furniture and technology where appropriate. Access to small group instruction rooms is also offered from the corridor. At the ends of the corridor, exterior views break up the length of this narrow and tightly sited three-story academic wing.

Fig 5.3 Key

- Classroom
- Corridor
- Collaboration Space
- Small Group Instruction
- Lockers



● Student  
○ Teacher

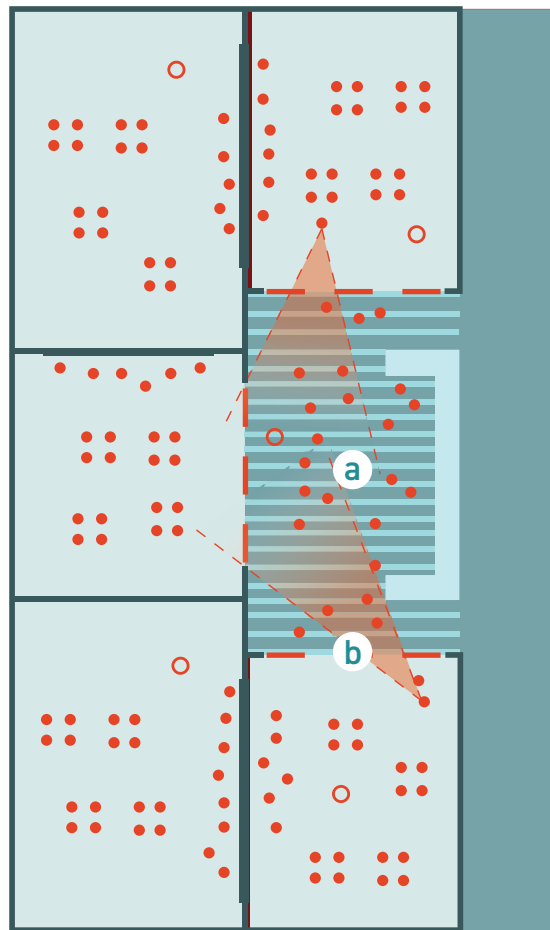




Fig. 5.5

## Key Learning Unit Elements

- a**  Collaboration Space shared by classrooms
- b**  Sliding glass doors between classroom and corridor

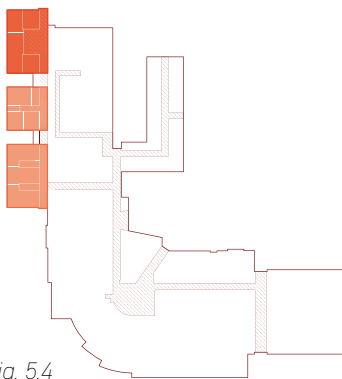


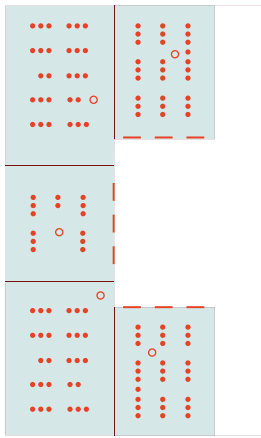
Fig. 5.4

**ACTIVATION.** Organizing a grouping of classrooms around a central collaboration area builds community and fosters the development of relationships between and among students and teachers. The grouping of five classrooms diagrammed in Fig. 5.5 offers many possibilities of activation to accommodate various modes and models of teaching and learning as illustrated in Column A to the right.

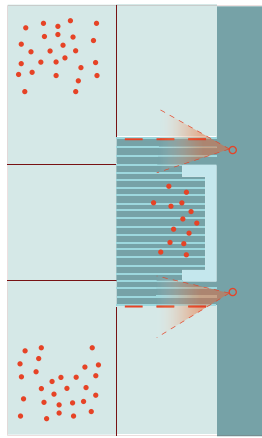
Three of the five classrooms have sliding glass doors, and Column B illustrates how much visibility is afforded with this treatment. Columns C and D explore the ways in which the classroom and collaboration environments adapt and flex. Large groups are accommodated with ease, offering many teaching surfaces and resources while students are

supported on flexible furniture. Diagram C4 illustrates an example of how this environment can successfully support individual classroom needs while other classes share the collaboration space.

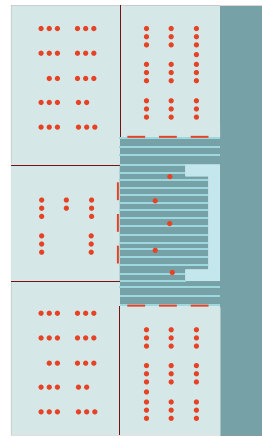
*Creating a grouping of classrooms around a central collaboration area builds community and fosters the development of relationships between and among students and teachers.*



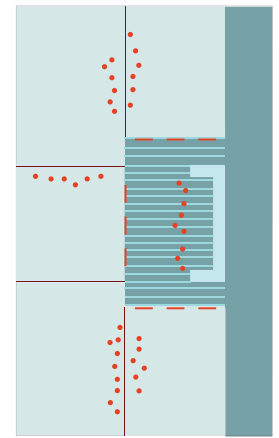
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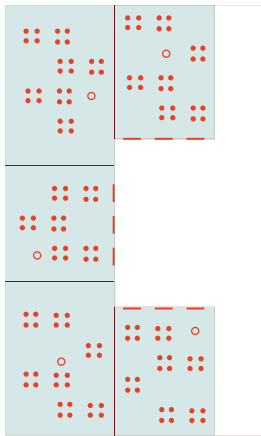
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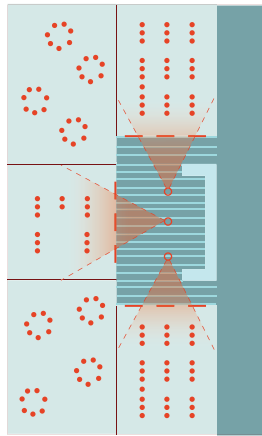
C1



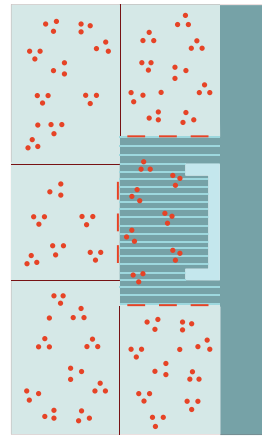
D1



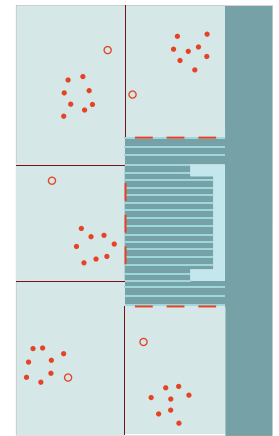
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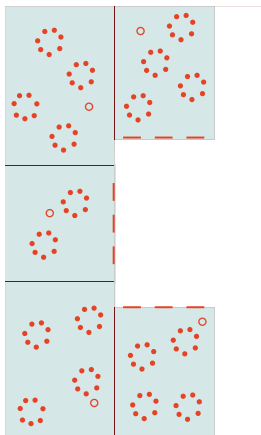
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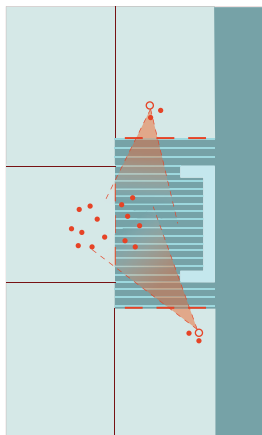
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D2



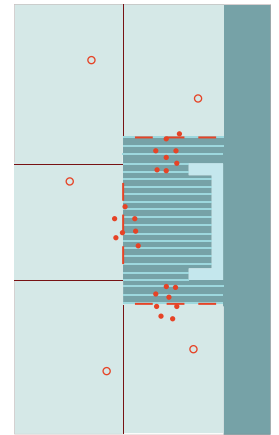
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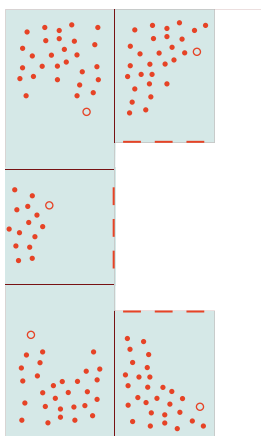
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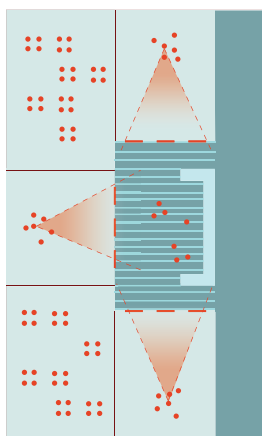
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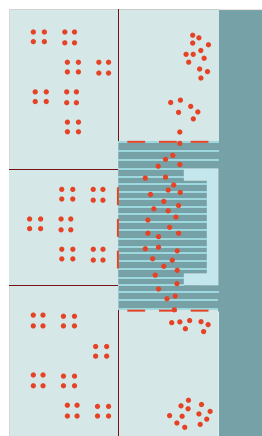
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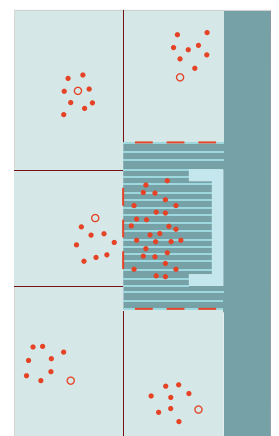
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B4



C4



D4

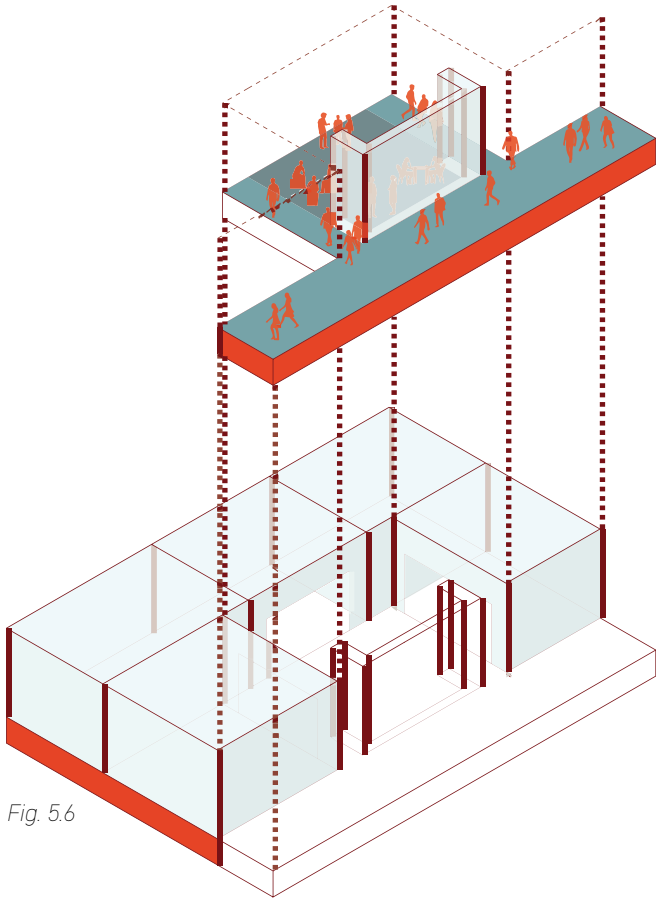


Fig. 5.6

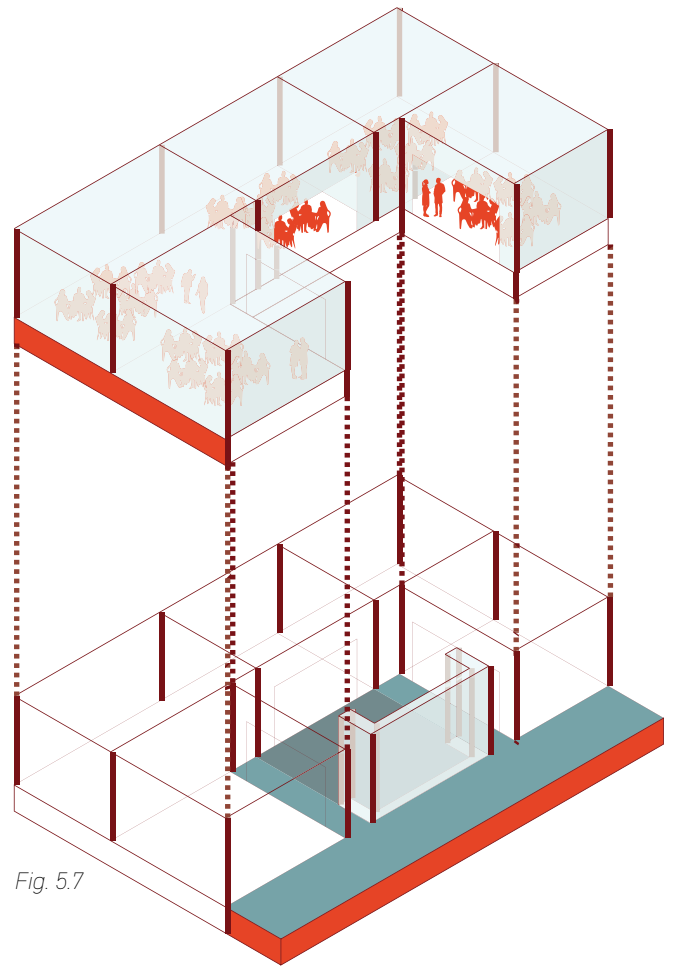


Fig. 5.7





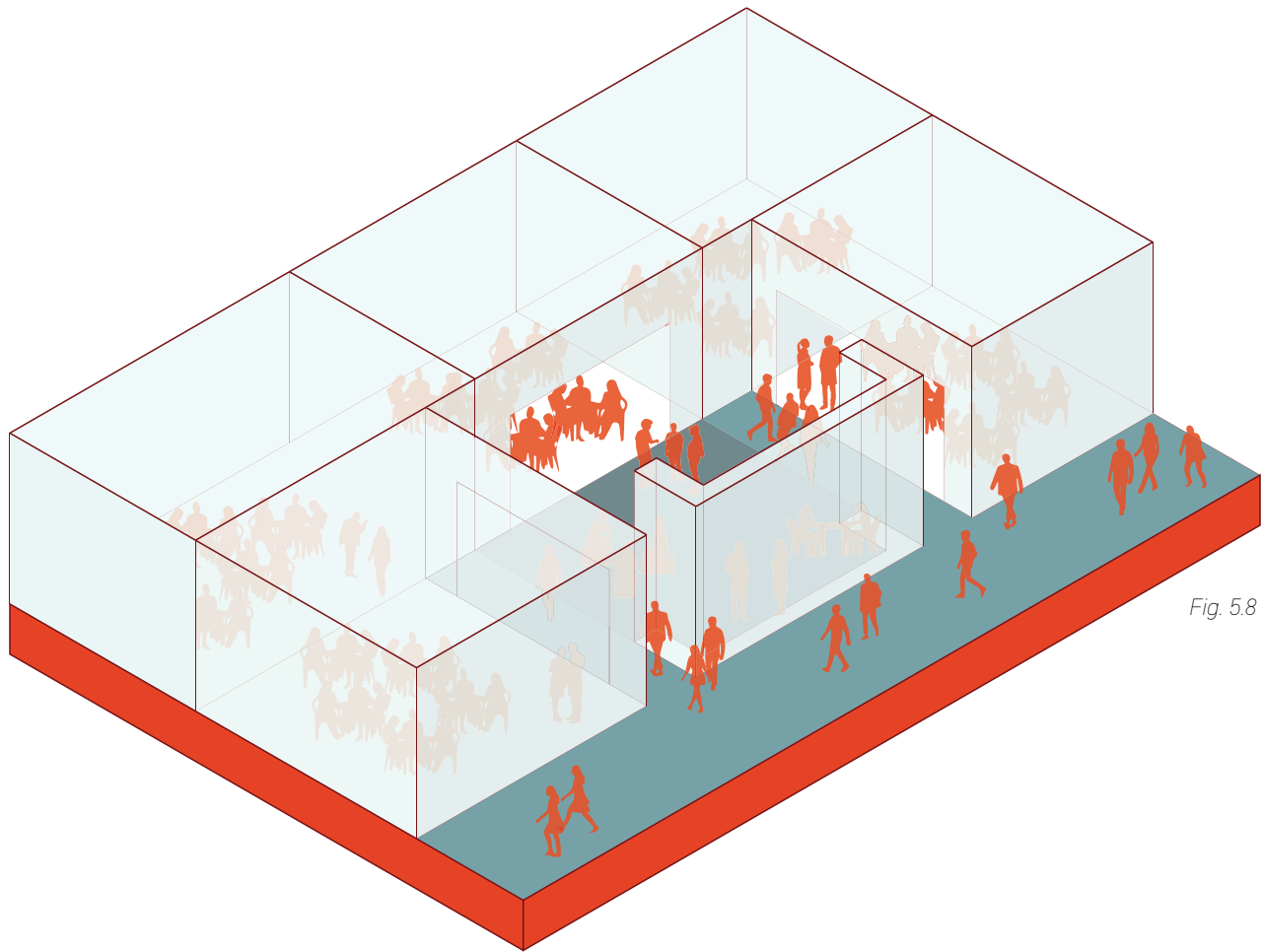


Fig. 5.8

**CONTRACT AND EXPAND.** Organizing spaces around a central collaboration provides the ability to easily contract and expand without obstruction. The ability to expand allows multiple full classrooms to learn together. Contraction allows a classroom to break into small groups, spreading throughout the collaboration area and even into the adjacent corridor. Because so many different learning environments exist throughout the building, students have autonomy and choice when finding a functional learning environment that meets their needs.

Just as the classroom environments contract and expand, so too does the main corridor diagrammed in Fig. 5.9. The corridor becomes a dynamic environment for teaching and learning when students and teachers feel comfortable, welcome, and have the resources they need to jump in and get to work.

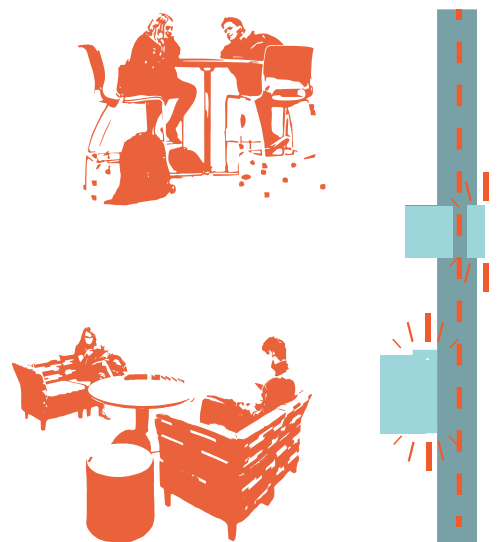


Fig. 5.9



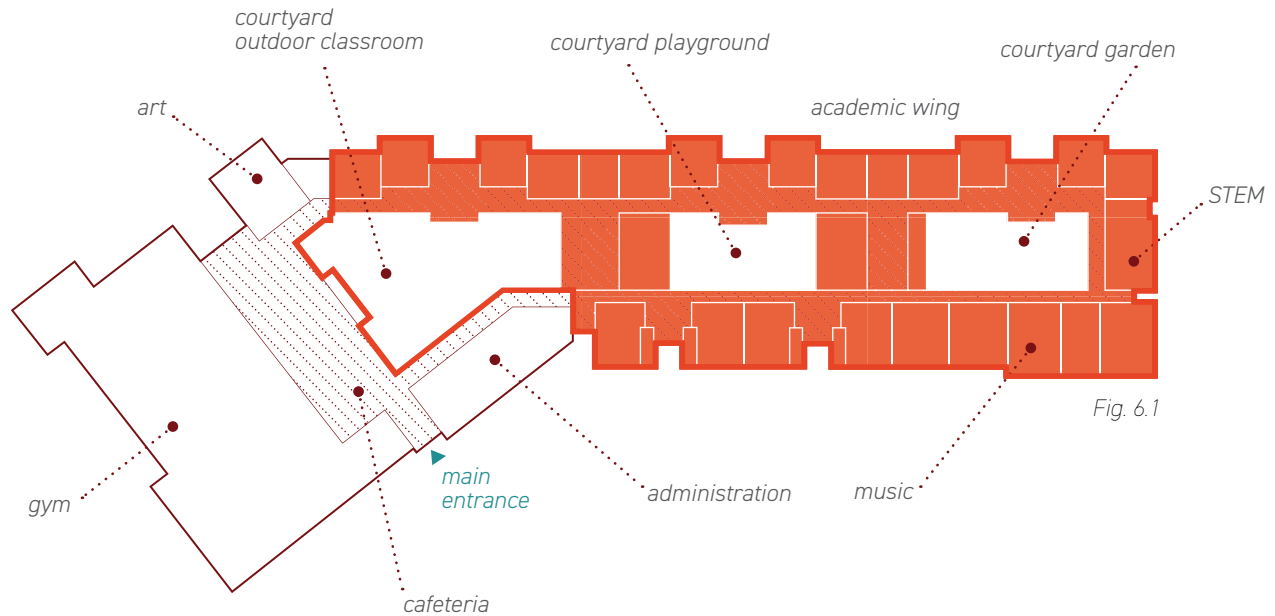








# forest edge elementary school



**EDGE OF TOMORROW.** Continuing a long history of sustainable construction practices in Wisconsin, Forest Edge Elementary is planned to be the first net-zero school building constructed in the state. A net-zero energy, or net-zero carbon, building uses a combination of energy efficiency strategies and on-site energy generation to achieve no net carbon emissions to operate the building over a 12-month period. Reflecting this progressive commitment of Oregon School District, the new elementary school will inspire innovation and sustainability by creating a learning environment that allows teachers to

leverage its net-zero properties as an educational tool.

Through its site orientation, the building embraces its location within a growing neighborhood, opening the doors of the main entry to the neighborhood and extending a dedicated pedestrian plaza to welcome students, parents, and community members to the school. By elongating the building along an east-west axis, production of south-facing photovoltaic solar panels are maximized, generating a majority of the building's electrical demand. The north side of the building is nestled against a heavily forested

area, allowing core classrooms, the discovery center, and cafeteria to look out at the elevated natural landscape.

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*The new elementary school will inspire innovation and sustainability by creating a learning environment that allows teachers to leverage its net-zero properties.*

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Cafeteria



## PROJECT DATA

### TYPE

Elementary (K-6), New Construction

### CLIENT

Oregon School District

### LOCATION

4848 Brassica Road, Fitchburg, WI

### MAX PROJECTED ENROLLMENT

600 students

### SQUARE FOOTAGE

126,580

### COMPLETION DATE

August 2020





## AGENCY IN EDUCATION

When students are given autonomy over their learning, it becomes authentic in that they have agency to pursue ideas that are their own. This develops a connection to the work which essentially then requires them to develop new understanding.



Fig 6.2

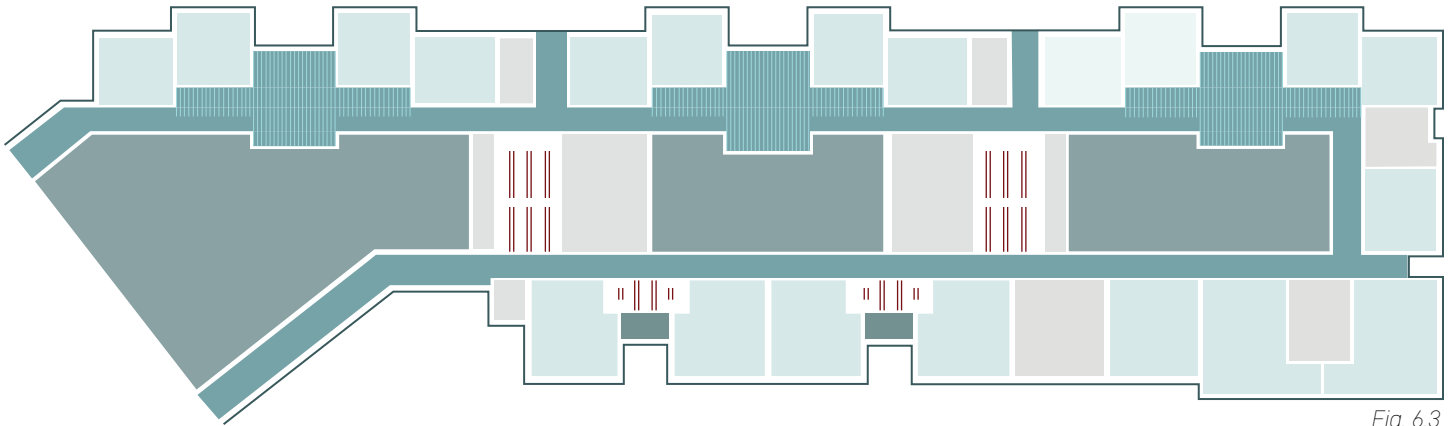


Fig. 6.3

### CONNECTING IN AND OUT.

Connectivity and architectural and material transitions are major themes throughout the design. Outdoor learning rooms are bordered by walls of various volumes, creating distinctive spaces inside and outside the building. Classroom and collaboration spaces open to glassy views of the outdoor learning rooms, generating visual connectivity between each environment. One of these outdoor rooms contains a student garden, fostering a deeper understanding of growth and development of the natural world.

Each outdoor learning room is located and sized to provide ample natural light to each classroom resource

area. Within these resource spaces, both small-group and large-group collaboration is fostered through the placement of embedded resources. Every resource environment is branded with different natural energy sources (life, light, thermal, wind), and students are empowered to explore projects within their science curriculum that align with these elements. Flexible furniture allows multiple groups of various sizes to gather and provides students with autonomy to arrange themselves to best suit each learning activity. Interaction with the building itself is encouraged through physical portals providing clear transitions between spaces and habitable walls that provide seating within long corridors.

### Fig. 6.3 Key

- Classroom
- Exterior courtyard
- Corridor
- Collaboration Space
- Cubbies



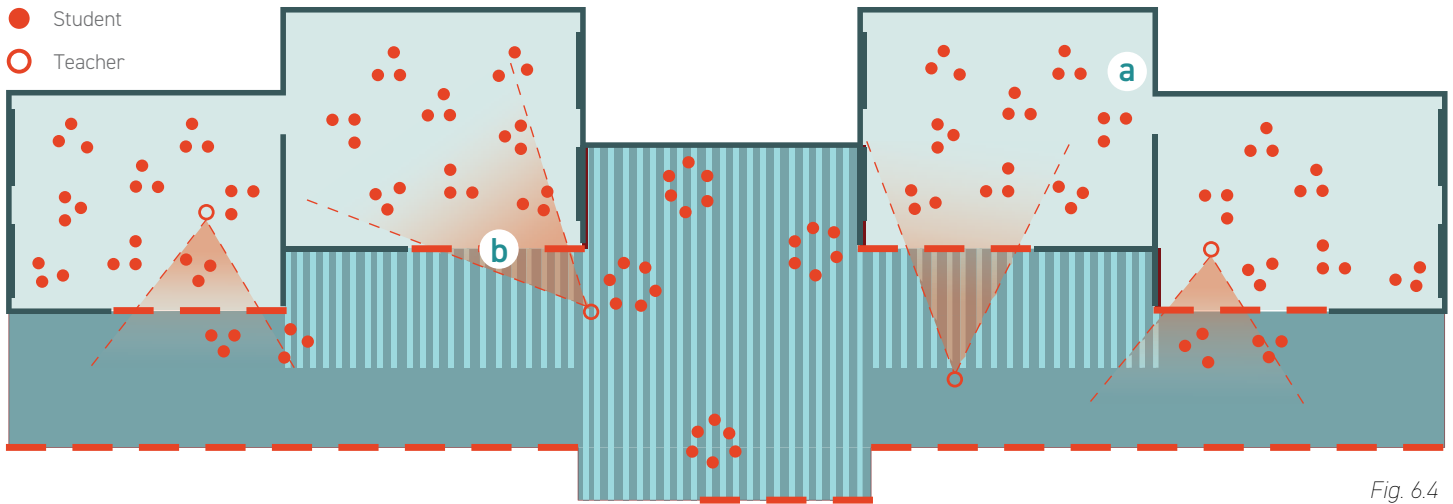


Fig. 6.4

**EXCEPTIONAL LEARNING SPACES.** Each collection of classrooms is referred to as a grove. This reinforces the relationship between students and their peers and the connection between individuals and the natural environment. Groves were initially envisioned to house a single grade level, but as collaboration expands between grades there is flexibility for groves to be arranged around curriculum or staff teaming focuses. Additional resource spaces are shared by multiple groves, located a short distance away from the main collaboration space to provide students with mental distance and focus in each varied environment.

Column A on the right illustrates various ways that students could be arranged for different activities within a grove. Diagram A1 represents a more traditional instruction for four classes of 24 students, while Diagram A6 shows a full grove collaboration with nearly 100 students gathered in a single space. Column B illustrates the visual connections between classrooms and collaboration zones and how one or more staff members might supervise students in various locations.

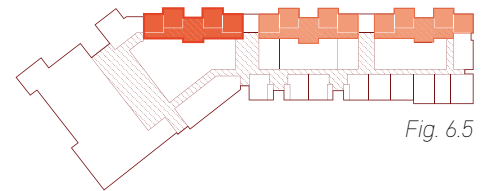


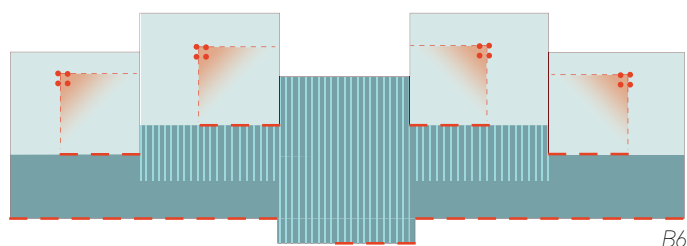
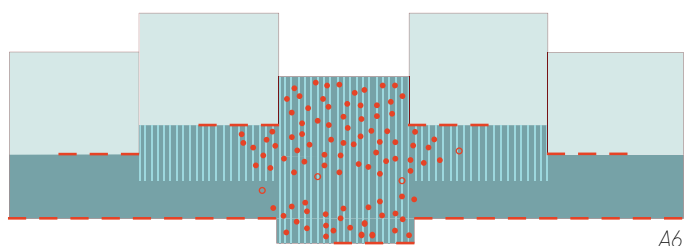
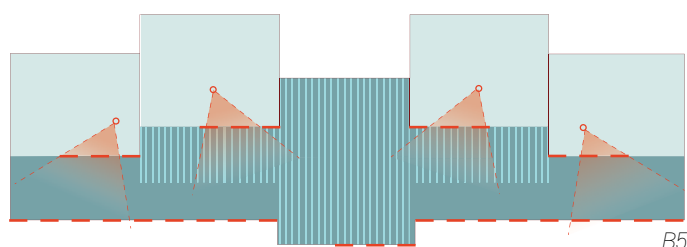
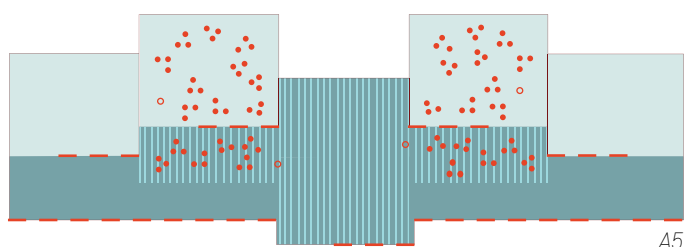
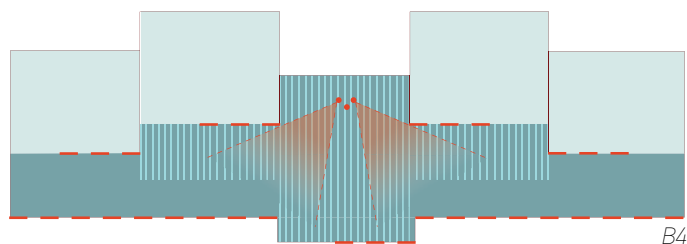
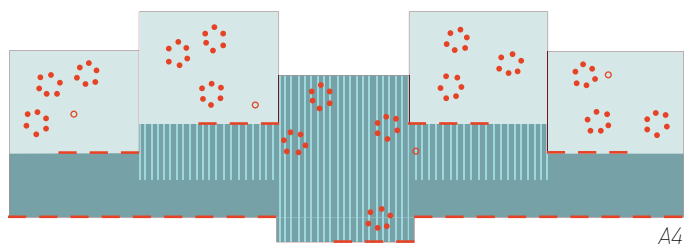
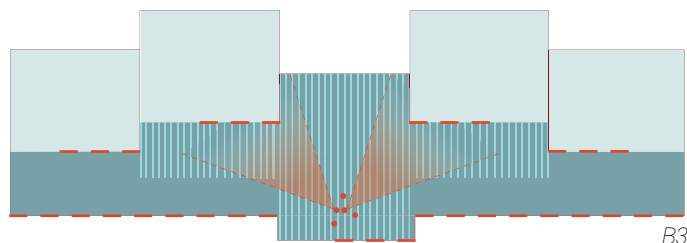
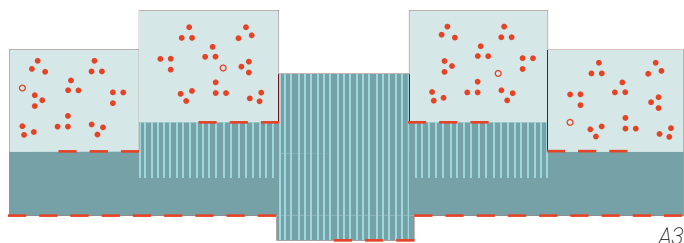
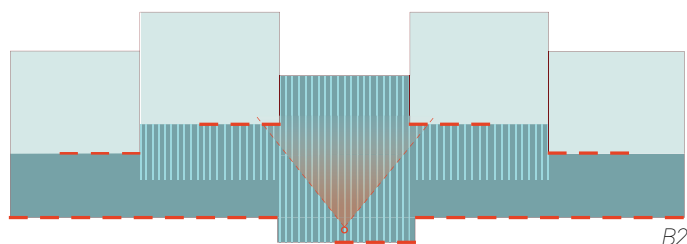
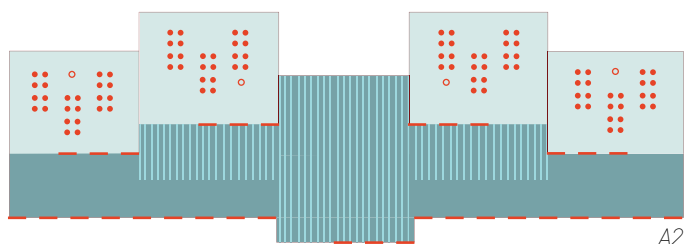
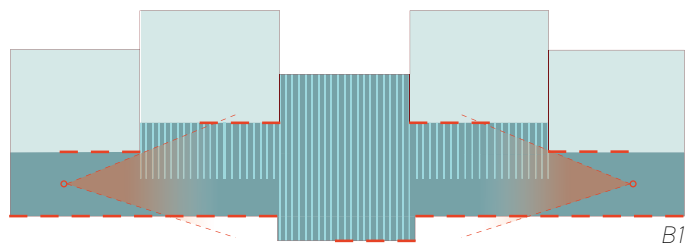
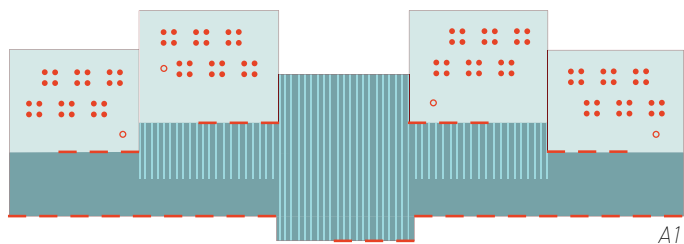


Fig. 6.5

### Key Learning Unit Elements

- a**  *Door connecting two classrooms*
- b**  *Glass door and oversized sidelight between classroom and corridor*





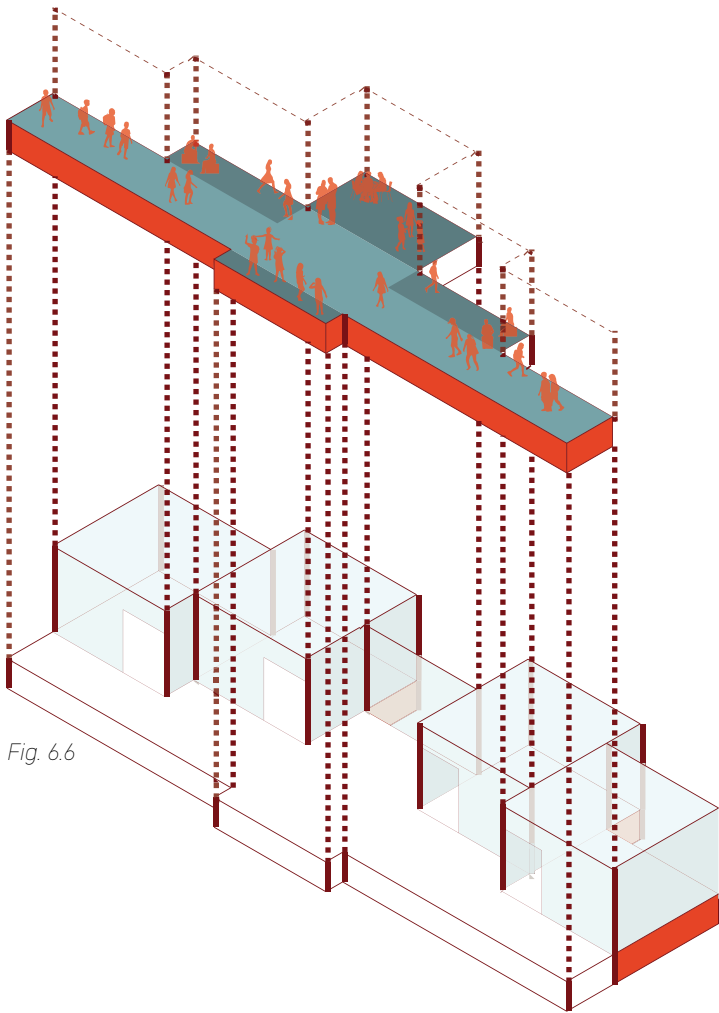


Fig. 6.6

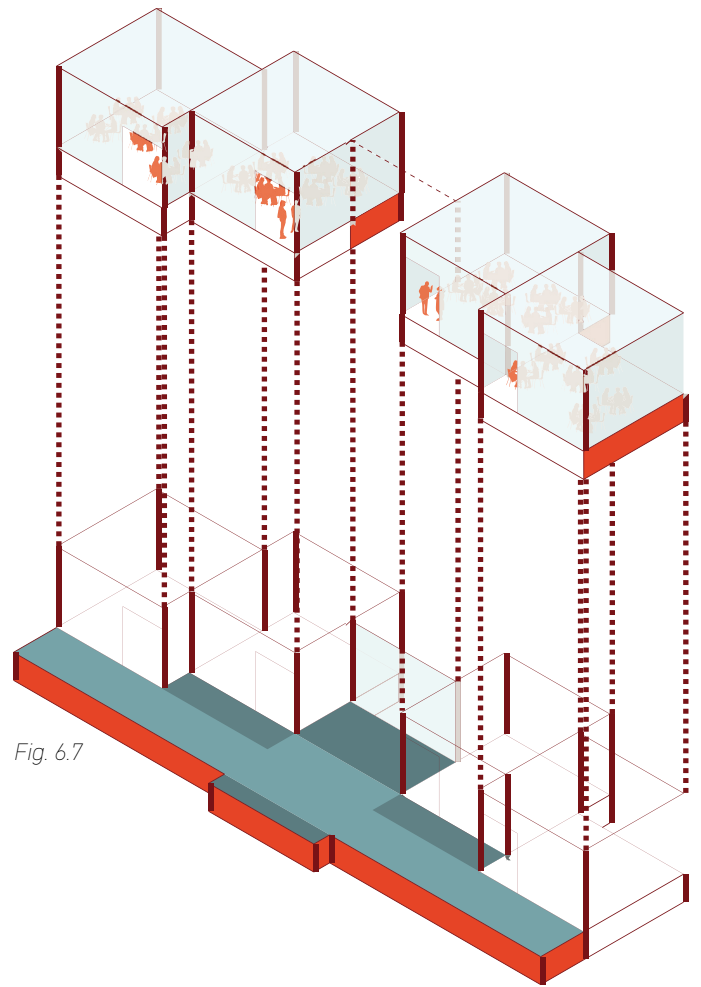
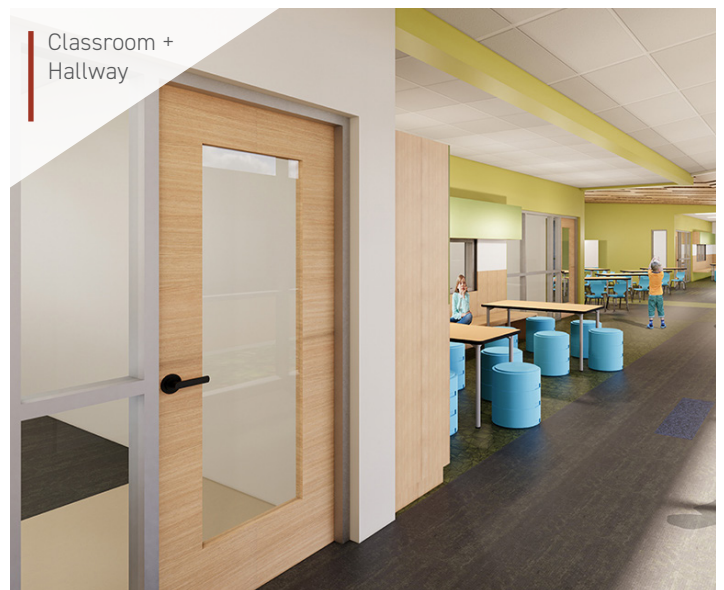


Fig. 6.7



Collaboration



Classroom +  
Hallway

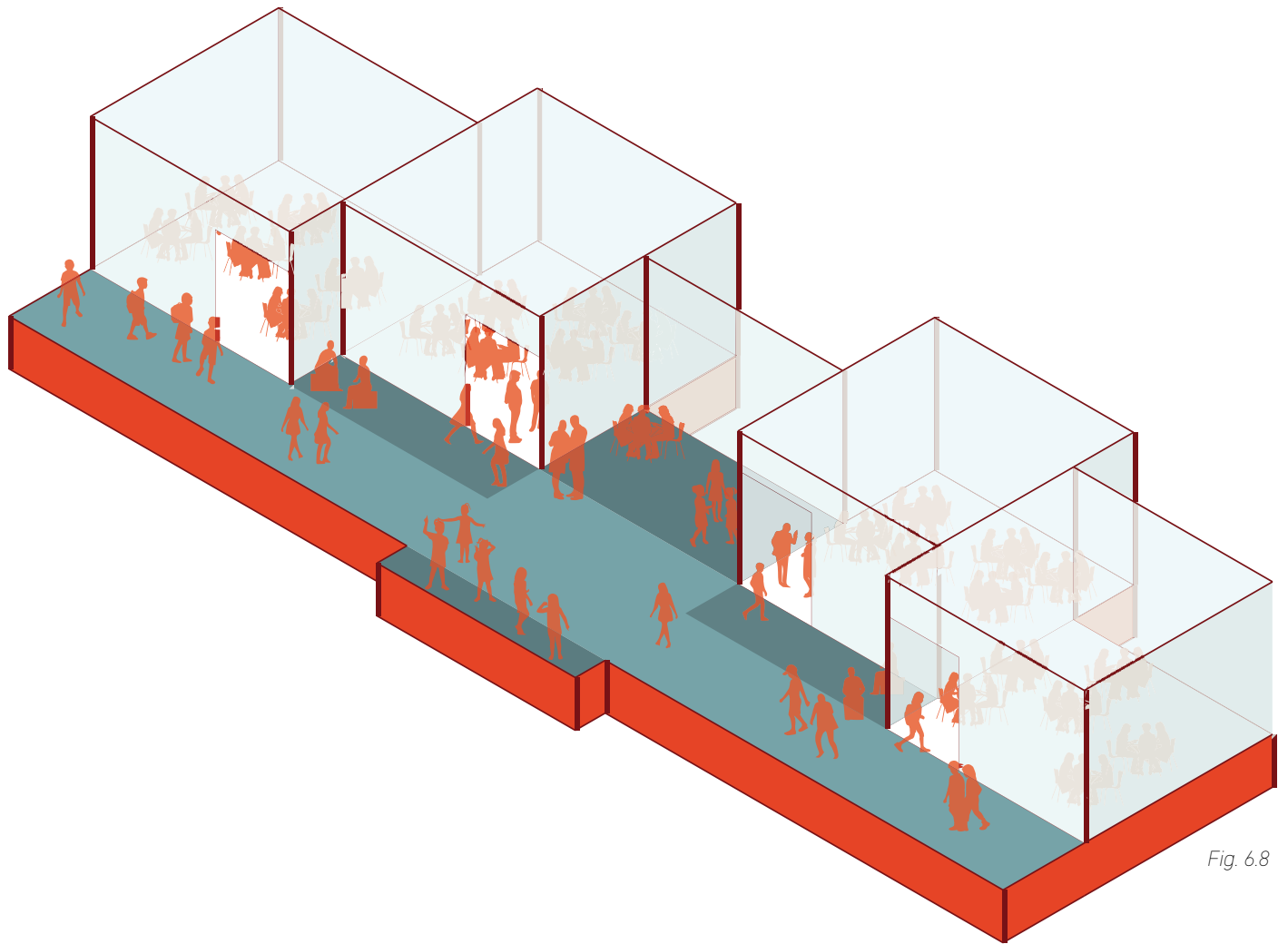


Fig. 6.8

### ENERGY GROUNDED IN NATURE.

One of the key design priorities throughout the project was to incorporate ample daylight to each core academic space. Not only does daylight provide positive impacts to student academic performance and general health, but for this specific project, natural lighting connects with the school's net-zero goals, helping to reduce energy use. This is best illustrated by the main collaboration spaces within each classroom grove. Figure 6.9 shows a section cut through the space from north to south and gives a sense of how providing daylight from multiple sources can activate every zone within the space.



Fig. 6.9













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