

## **Project Name:**

**Sky's the limit—Planting towards a brighter dawn**

## **Project Statement:**

Serving more than 6,400 students from 18 surrounding apartment complexes, the school this project is located in a typical campus in the compact old city of Nanjing. Apart from the sports field and three atriums, there are no other green spaces on campus for students. Considering the spontaneous use of the unused roof by the students and the potential stress relief period during school hours, the team of landscape architects and students proposed to the school that the roof can be transformed into an outdoor classroom for co-curricular activity (CCA) courses.

After a pre-design survey, two terms of indoor courses were conducted by the design team as an initial iteration of the CCA course modules. The design elements were thus identified and organized on the unified rooftop covered by a turquoise galvanized steel frame.

Over the year since the outdoor classroom was built, the design team has taught 30 lessons to students, covering observation, planting, and crafting modules. The rotation of over forty species of plants provides a lasting effect along with seasonal changes to the venue, and the students' handmade items such as steppingstones and plant posters create a sense of belonging.

## **Project Narrative for Built Projects:**

The project is located on the roof of a school in the Gulou district of Nanjing, and an elementary or secondary school typically serves several surrounding communities in such old city districts. The school where this project is located serves 6400 students from the surrounding 18 apartment complexes. The campus consists of two blocks of academic buildings, a canteen, and a gymnasium, with no green space available for students except for the outdoor playground and three atriums.

The design team visited the school several times in 2020 and found students spontaneously moving around on the unused roof, with the two terraces facing the playground becoming a place to have fun away from teachers' supervision after class, while the small group of students wrote slogans on the untrimmed waterproof layer. When asked why they played there, the students said that it was the easiest place to get to during the ten-minute recess, although there was nothing there. Every school day the students arrive at 7:00 and leave at 18:00. Apart from two compulsory exercise sessions in the morning and afternoon, and lunchtime, students are in class. The only course that has not been regulated much is the weekly co-curricular activity course.

In 2021, the design team took over the indoor CCA course for two terms in order to better understand the students' perceptions and to find ways of balancing the school's expectations of students' development with their needs for rest in school. Based on previous interviews and surveys, the indoor course was designed to con-

tain three modules: an observation module, a planting module, and a crafting module. In the 'Knowing Succulents' lesson, for example, the method of distinguishing between different types of succulents was introduced, and the students were able to distinguish the different succulents by touching them and trying to transplant them. After one term, the design team found that the modules, which included succulent transplanting, learning traditional crafts, and growing mushrooms, gave the students real experience and were much more engaging than just an introduction, and the students were able to develop in many ways and relax physically and mentally during these modules.

The design team thus conceptualized a proposal to transform the unused roof into an outdoor classroom that would not only enhance the experience of students visiting the site during recess but also transform the process of maintenance and renewal of the site into an outdoor CCA course, thus invigorating the site and providing a place for students to relax in the long term. Nine design features were identified in the proposal, based on classroom records from two previous terms, to support three types of modules: observation, planting and crafting. To ensure the performance of the outdoor classroom over the long term, these features were guided by three principles.

1. Maintenance in CCA courses embedded, i.e. the subsequent maintenance of the site can be completed through the CCA Course.
2. Self-electricity support, i.e. electricity is provided by solar panels to reduce the cost of subsequent use.
3. Material reuse, i.e. the materials needed for the subsequent renewal of the site are unused materials from the school/students' homes.

The proposal was further developed according to the roof and the 9 features were arranged in a unified space. The 336m<sup>2</sup> roof consists of five parts: the northern corridor area, the northern terrace area, the central pass, the southern corridor area, and the southern terrace area. A turquoise galvanized steel frame connects the northern and southern corridor areas to the terrace area respectively, covered with lightweight PP hollow sheets and wire mesh as walls and roofs. Providinges support for the solar panels; a greenhouse of the same material is provided in the north terrace to accommodate some of the plants over the winter. In the corridor areas and terrace areas, benches, planting boxes in various forms as well as tables and hand-washing sinks made fromof recycled barrels are placed. Toolboxes, hydroponic systems, and the monitor screen are placed in the central pass. The different enclosures allow the outdoor classroom to be prepared for changing weather conditions.

The construction was conducted during Winter Break and all materials were preci-

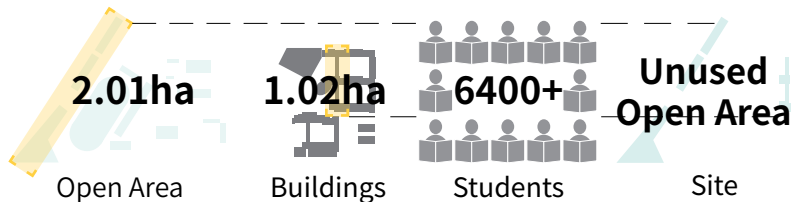
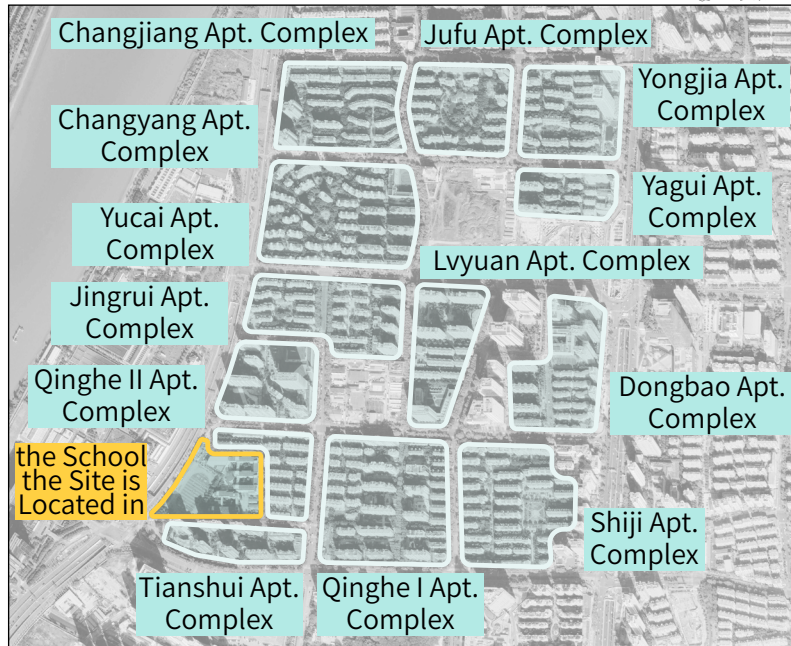
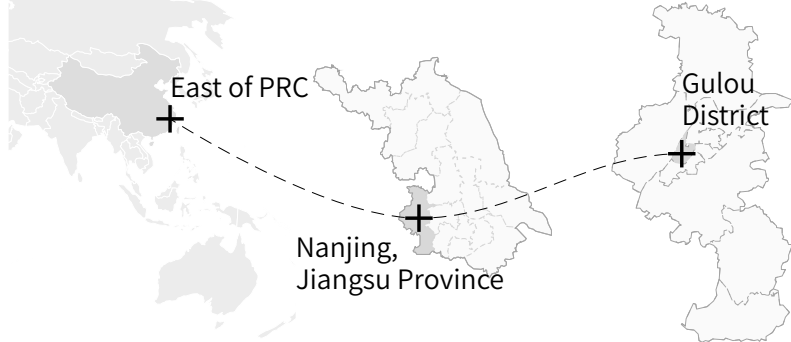
sely gathered, assembled, and transported by crane to the roof for installation, minimizing the impact on the surrounding community. The color and painting of the frame were tested on-site to optimize its performance in different lighting conditions.

In 2022, the design team began teaching the CCA course in the completed outdoor classroom, with each CCA course typically consisting of 1-2 modules, alternating between a planting module and a crafting module to ensure the long-lasting quality and seasonal variation of the vegetation and decorations on the site. A rotation of over forty plants involves students in soil management, daily care and harvesting, and weekly changes in plant growth link them to the site. Fennel was grown in the south wing terrace area, and students smell it every week from winter to spring. In April, students share ruby red strawberries with sparrows, and rotting ones are put in the compost bin; when there are no crops to pick, pulling and watering becomes a fun activity for the students. Natural materials and unused materials take on a new life in the craft module. Useless tiles and leaves from the schoolyard are used to decorate concrete steppingstones; leftover plant material is used to make posters and wreath. Since spring 2023 the outdoor classroom has been extended to the green space on the campus boundary. In continuation of the previous design features, the railroad tie walkway directs people to the accessible site on the original landfill. In the first lesson here, the students collected building debris and built planting ponds.

This project explores an approach to the regeneration of overloaded schools in a compact city area by exploring the possibility of coupling the quality of the landscape with the needs of the users through the long-term intervention of the design team, providing a space for students under constant pressure to relieve stress.

# 1. Lack of Ground, Lack of Time

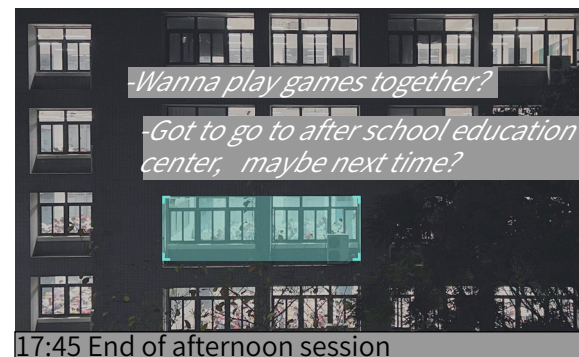
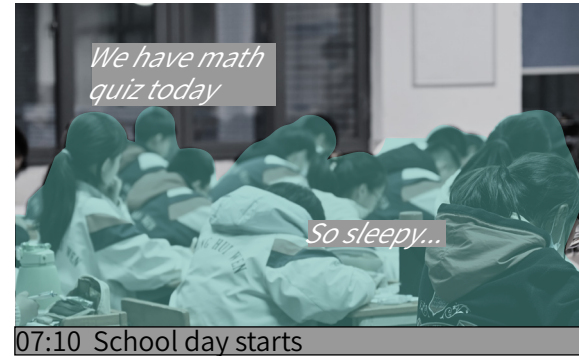
## 1.1 Site Location



Servicing 6400+ students from nearby 18 apartment complexes, the school lacks open area.

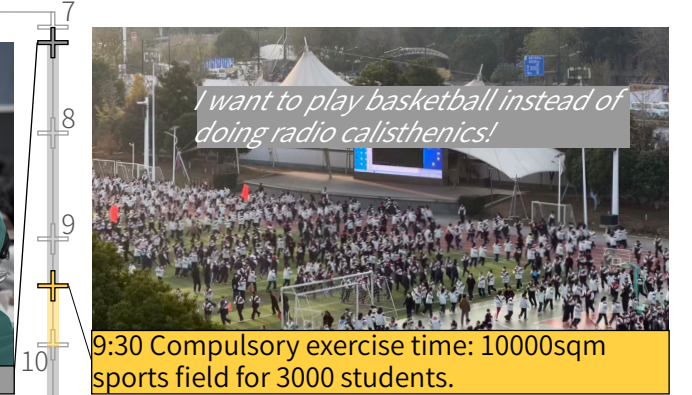
## 1.2 One Day at School:

07:00 Arrival at school



Daily Study Time: 8-12 hours  
Daily Relax Time: 3-4 hours  
Co-curricular Course: 1 Hour

Meanwhile, the school schedule can't provide students with enough rest during school hours. CCA course is the only potential period to serve as the stress reliever.

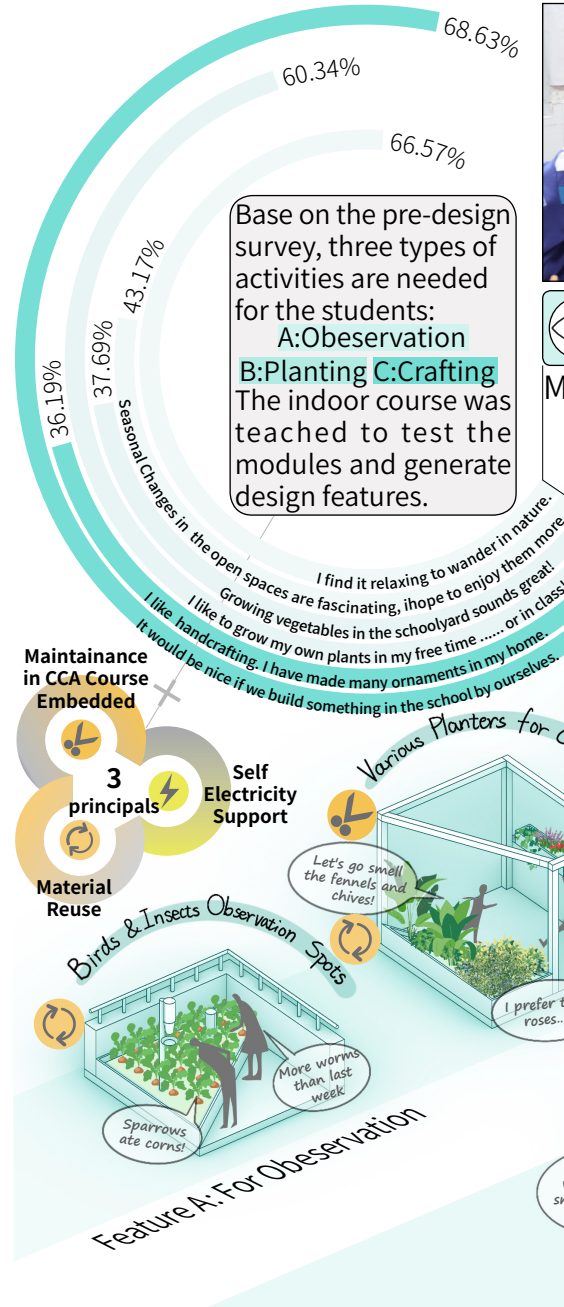


Before 24:00: Tutoring center/homework



# 2.CCA Course Based Design: An Openair Classroom

## 2.1Pre-Design Survey



## 2.2Design Iteration: The Indoor Course



Finding students' needs: ① various subjects to observe; ② various angels of view; ③ various obeservation forms

**Module A: Obeservation**



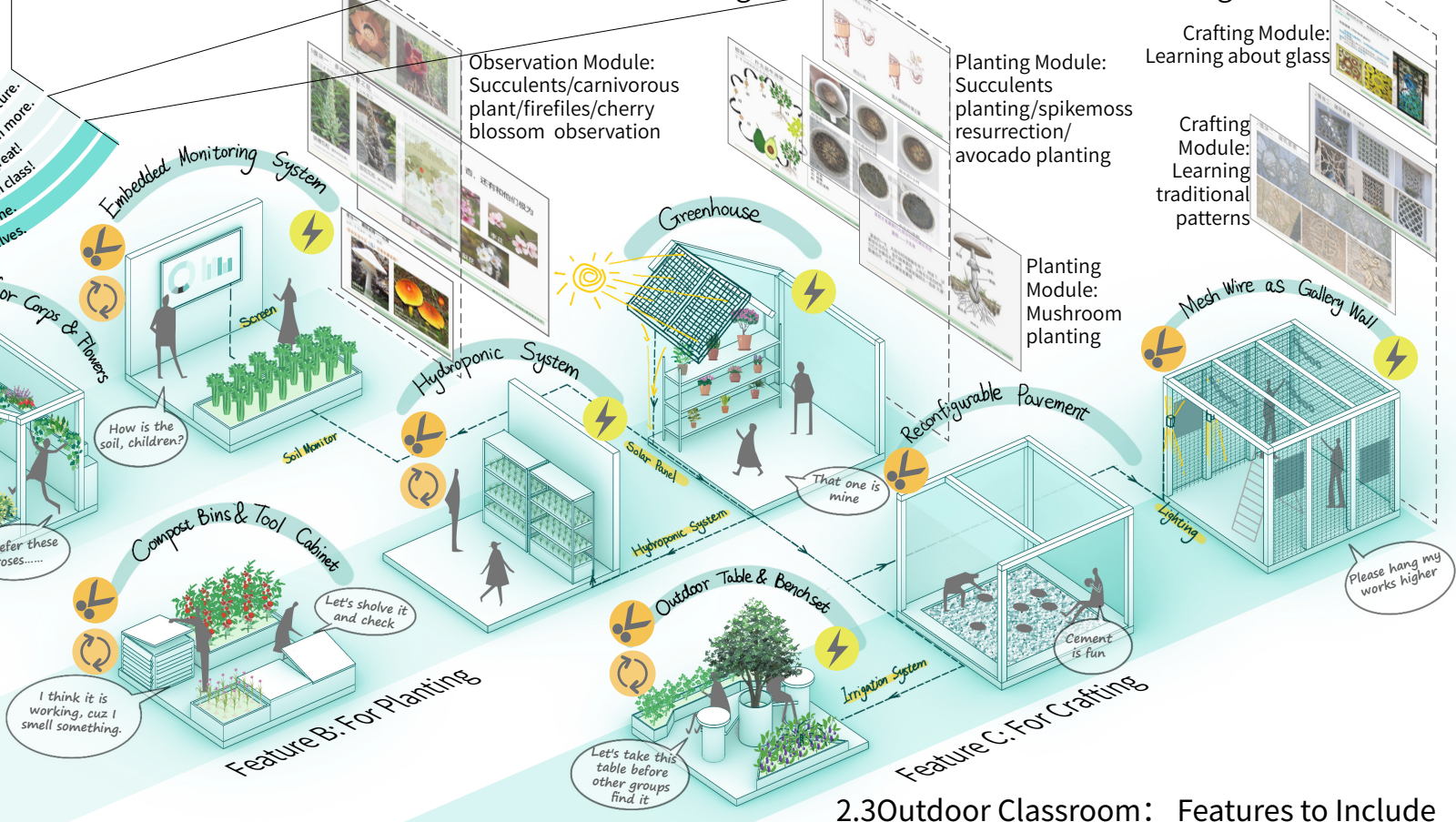
Finding students' needs: ① place to overwinter plants; ② diverse planting method; ③ plants' full life engagement

**Module B: Planting**



Finding students' needs: ① place for crafting; ② place for exhibition; ③ low technical requirements

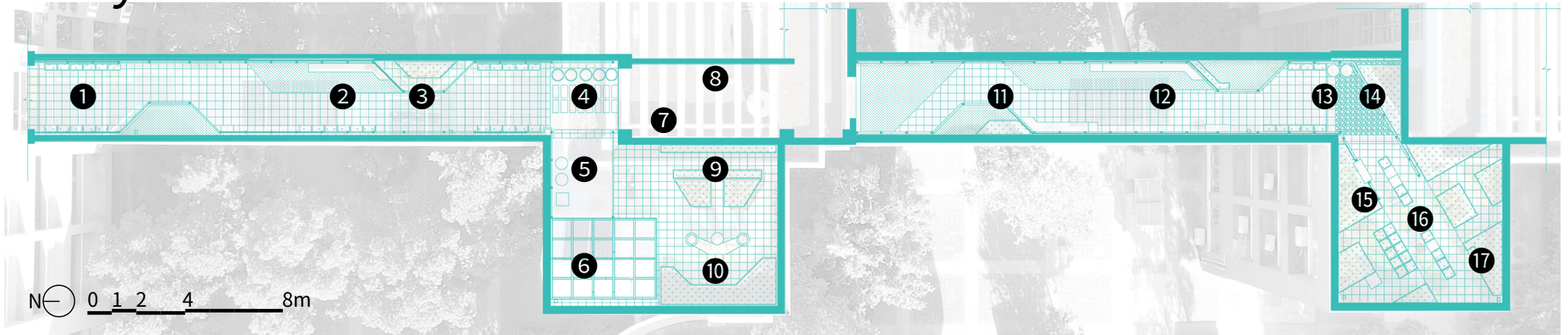
**Module C: Crafting**



## 2.3Outdoor Classroom: Features to Include



# 3.Layout



- ❶ Northern wire mesh gallery
- ❷ Northern benches area
- ❸ Northern flower box set
- ❹ Reconfigurable pavement area
- ❺ Northern barrel sink

- ❻ Greenhouse
- ❼ Toolbox & hydroponic system
- ❽ Monitor screen
- ❾ Northern rotation planting box
- ❿ Tables & bench set

- ❶❶ Southern flower box set
- ❶❷ Southern benches area
- ❶❸ Southern barrel sink
- ❶❹ Southern wire mesh gallery
- ❶❺ Southern rotation planting box

- ❶❶❶ Composting Bin
- ❶❶❷ Outdoor toolbox

Total Area: 336m<sup>2</sup>

Central Passing(Indoor) Area:36m<sup>2</sup>

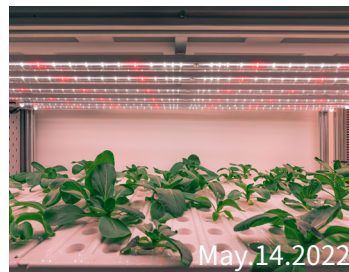
Outdoor Area: 300m<sup>2</sup>

Construction Cost: 4,017,00 CNY(66,950USD)





The site is unified by a turquoise galvanized steel frame and the nine features are strategically arranged in the original northern/southern corridors/terraces, and the central pass section.



- 1. Northern corridor
- 2. Central pass
- 3. Monitor screen
- 4. Hydroponic System



The different degrees of enclosure ensures that the outdoor classroom can be used in all weather conditions.

- 5. Tables & bench set
- 6. Greenhouse covered with PP hollow sheet
- 7. Greenhouse interior
- 8. Northern part night view







Mar.14.2023



Apr.05.2023



Apr.05.2023



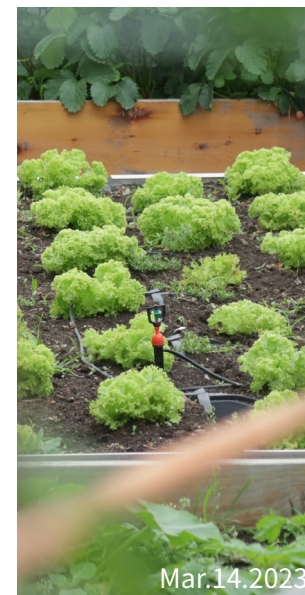
Apr.05.2023



Apr.28.2023



Mar.14.2023



Mar.14.2023

- |   |   |   |
|---|---|---|
| 1 | 2 | 3 |
|   | 4 |   |
- 1.Southern corridor
  - 2.Diverse planting forms
  - 3.Flower boxes set
  - 4.Planting box on parapet



Apr.28.2023



Mar.14.2023



Apr.28.2023

- |   |    |
|---|----|
| 5 | 6  |
| 7 | 8  |
| 9 | 10 |
- 5.Roses blooming
  - 6.Southern wire mesh gallery,with flowers in bloom
  - 7.Sourth rotation planting box
  8. Lettuce growing
  - 9.Rapeseed in bloom
  - 10.Rapeseed,seed-bearing



# 4.Observation Module



1	4	6
2	3	5
		7

The rich vegetation not only provides a variety of subjects to observe: leaves, flowers, fruit, and even soil and insects, it also leads to different forms of observation. Students watch, touch, smell, and eat the plants in the grounds. Fennel was grown in the south wing terrace area, and students smell it every week from winter to spring. In April, students share ruby red strawberries with sparrows, and rotting ones are put in the compost bin; when there are no crops to pick, pulling and watering becomes a fun activity for the students.

- 1.Stem & root tuber observation in the very early spring
- 2.Students smelling the fennel
- 3.Touch & identify: texture of plants
4. Finding worms in the soil
- 5.Tasting carrots
- 6.Find strawberries
- 7.Strawberries packed for friends



# 5.Planting Module

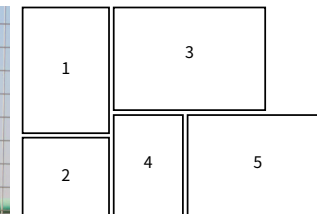


From seedling raising to watering and fertilizing, the weekly courses regulate the maintenance of plants on the site. These activities greatly enhance student engagement while providing seasonal landscape changes.

1	3	5
2	4	6

- 1.Seedlings raising through hydroponic system
- 2.Routine watering by students
3. Plug seedlings raising
4. Spring farming
5. Planting succulents
- 6.Soil scarification





- 1.Composting debris from plants on site
- 2.Harvesting Chinese cabbage
- 3.Spring planting course
4. Wedding before spring planting
- 5.Group of students working together on spring planting course





# 6.Crafting Module



Sep.04.2022



Sep.04.2022



Sep.04.2022



Oct.24.2022



Oct.24.2022



Oct.24.2022



Apr.03.2023



Apr.03.2023



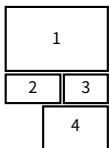
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1		4	
2	3	5	6
7		8	9

- 1.Making concrete steppingstone
- 2&3.Decorating & final result
4. Making roof ornament
- 5&6.Process & final result
- 7.Trimed branches wreath making
- 8&9. Working together



## 7.What's Next?



- 1.Learning plants in campus
- 2&3.Students making plant posters together
- 4.Plant posters hung in the greenhouse



After 1 year of teaching, the design team has also renewed a vacant lot on the campus boundary and students turned the landfill into a planting pond.



- 5.Renewd school boundary
- 6.Building planting ponds
- 7.First class on the ground
- 8.Collecting landfills