
BUILDING HEALTHY SCHOOLS:
A NEW VISION FOR GREEN DESIGN


VMDO ARCHITECTS

# THE CHANGING FACE OF GREEN

## ADDRESSING HEALTH & WELLNESS

“The large majority of schools are built not to optimize health and comfort, but rather to achieve a minimum required level of design performance at the lowest cost.”

– Gregory Kats, president, Capital - E

Taste

Healthy Eating

Wellness

Energy + Attention

"The average person has about 10,000 taste buds and they're replaced every 2 weeks or so."

– Kids Health, "What Are Taste Buds?"


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# DESIGNING FOR HEALTH

## BUCKINGHAM COUNTY PRIMARY & ELEMENTARY

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# DESIGNING FOR HEALTH

## BUCKINGHAM COUNTY PRIMARY & ELEMENTARY

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# FOOD CULTURE

EVOLUTION OF FOOD CULTURE OVER TIME

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# FOOD CULTURE

EVOLUTION OF FOOD CULTURE OVER TIME

## USDA National School Lunch Program: 1946

"The biggest bargain in the family food budget these days is the lunches the youngsters get in the Los Angeles City schools cafeterias. This is made possible through the U.S. Department of Agriculture's surplus food program.

Thanks to the plan, a hamburger, containing a good-size portion of Grade A meat, sells for 15 cents in our schools. A grilled cheese sandwich, with butter on both pieces of the bread, costs 10 cents in our cafeterias…"

*Los Angeles Times*
*January 1958*

## School Lunch Today – Nothing Has Changed: 1946 to Present

"Beginning as charity for the feeding of poor children,
developing as a convenient service for pupils and faculty,
and finally attaining its present status as an indispensible feature of
the health and teaching programs for all school children,
school feeding retains today the purposes of its three-fold origin."

*N.L. Englehardt,*
*Columbia University*

Childhood obesity has more than tripled in the last 30 years alone.

Today's 10 year olds are the first generation expected to have a shorter life expectancy than their parents.

# WHY ACT NOW

Why should we care about school design and how it relates to food culture?

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# CHILDHOOD OBESITY

## FACING THE FACTS

# CHILDHOOD OBESITY

HAS MORE THAN TRIPLED IN THE LAST 30 YEARS

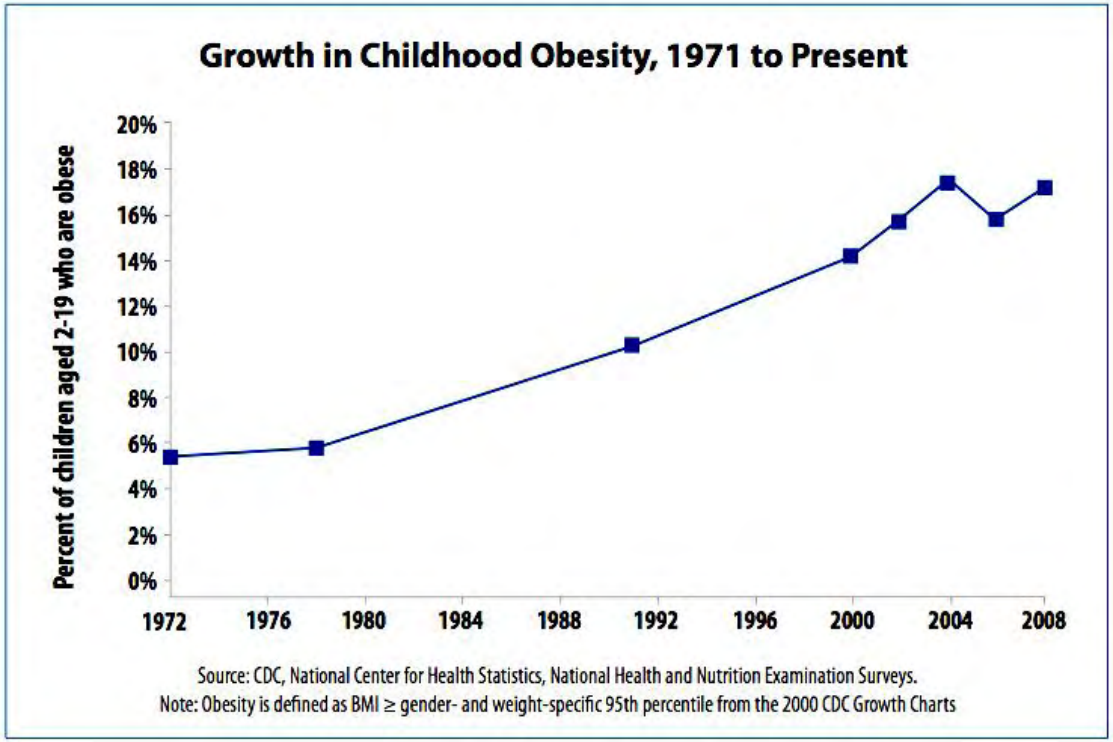
AFFECTS 20% OF U.S. CHILDREN (AGES 6-11) AND 18% OF U.S. ADOLESCENTS (AGES 12-19)

ACCOUNTS FOR $14 BILLION PER YEAR IN DIRECT HEALTH CARE COSTS

1 IN 3 LOW-INCOME CHILDREN ARE OBESE OR OVERWEIGHT BEFORE THEIR 5TH BIRTHDAY

THIS COULD BE THE FIRST TIME IN U.S. HISTORY THE CURRENT GENERATION WILL HAVE LIFE SPANS SHORTER THAN THEIR PARENTS

## Percentage of Obese Children Ages 2-19 in the U.S.




| Restaurant | 2009 ad spend (in millions) | Ages 2-5 | Ages 6-11 | Ages 12-17 |
|---|---|---|---|---|
| McDonald's | $898.1 | 309 | 368 | 284 |
| Subway | $424.6 | 97 | 127 | 177 |
| Wendy's | $282.6 | 46 | 58 | 113 |
| Burger King | $281.6 | 152 | 185 | 189 |
| KFC | $268.9 | 62 | 78 | 146 |
| Taco Bell | $243.4 | 50 | 69 | 140 |
| Pizza Hut | $221.8 | 54 | 69 | 125 |
| Sonic | $185.1 | 27 | 37 | 68 |
| Domino's | $180.8 | 35 | 46 | 85 |
| Dunkin' Donuts | $120.9 | 11 | 15 | 28 |
| Dairy Queen | $77.6 | 20 | 27 | 48 |
| Starbucks | $28.9 | -- | -- | -- |
| All fast food | $4,217.7 | 1,021 | 1,272 | 1,723 |

Source: The Nielson Company (2010)

**Food & Health Spending:** ↗

- The food industry spends over **$4 BILLION / year** in marketing aimed at children.
- Childhood obesity accounts for **$14 BILLION / year** in health care costs.

**Preventative Spending:** →

- The American Recovery & Reinvestment Act of 2009 included **~$500 MILLION** in funding for prevention and wellness in support of reducing obesity rates.
- The 2010 Healthy, Hunger-Free Kids Act calls for healthier school food. Schools will receive another **6 CENTS / meal** in federal funding.

One-third of a child's eating habits can be influenced by what he/she eats at school.

Most schools can only afford to serve highly processed foods that hurt children’s health and keep them from performing well in school.

**How can we create change and engage communities in healthy practices?**

# WHY PARTNERSHIPS

Why tackle this project collaboratively?

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# COLLABORATION

EDUCATORS, ARCHITECTS, SCIENTISTS

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Perspective

# Designer Schools: The Role of School Space and Architecture in Obesity Prevention

*Nicholas Gorman,* Jeffery A. Lackney,† Kimberly Rollings,‡ and Terry T.-K. Huang§*

**Abstract**

GORMAN, NICHOLAS, JEFFERY A. LACKNEY, KIMBERLY ROLLINGS, AND TERRY T.-K. HUANG. Designer schools: the role of school space and architecture in obesity prevention. *Obesity.* 2007;15:2521–2530.

Spatial features of obesogenic environments studied on a broad community level have been associated with childhood overweight and obesity, but little research has focused on the effects of the design of micro spaces, such as schools, on individual health behaviors. This article aims to generate thinking and research on the link between school space and architecture and obesity prevention by reviewing and synthesizing available literature in architecture, environmental psychology, and obesity research, in an effort to propose promising ideas for school space design and redesign. The school environment is defined through 5 dimensions: physical, legal, policy, social, and cultural domains. Theories underlying environmental interventions and documented associations between the environment and health behaviors and outcomes are reviewed to illustrate how existing environmental research could translate to obesity prevention. Design strategies aimed at promoting physical activity and healthful eating are proposed, with particular emphasis on the design of cafeterias, activity spaces, connectivity with the larger community, and student health centers.

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**Key words: childhood obesity, environmental factors, prevention, public health, energy balance**

## Introduction

Efforts to identify factors contributing to rising obesity rates in the United States and beyond have implicated the burgeoning obesogenic environment as a key determinant of obesity-related health behaviors (1). Given the potential for long-term individual benefit and large population-level impact, prevention among school-age children has become critical (2). In today's society, schools are no exceptions: exposure to laborsaving technologies and access to unhealthful foods abound. Walks or bike rides to schools are increasingly displaced by car rides, as convenience and safety concerns prevail (3–5). Once at school, students have ready access to fast food and vending machines due to partnerships meant to offset school budget shortcomings (4,6,7). The lack of time, funding, access, and planning and increased competition with various academic demands have also reduced in-school opportunities for physical activity and healthful eating (2,6). The combination of these and other factors have resulted in an environment that steers health behaviors away from physical activity and healthful diets (2,8).

The role of school space design and redesign in obesity prevention is an area that merits consideration, as school sites have served as promising venues for both research and intervention efforts (9). School-based obesity interventions have demonstrated encouraging but often modest short-term results (10–13), an observation that underscores the need for new directions in school-based prevention efforts. Although the research community has begun studying the role of the larger environment on children's diets and physical activity, little research has focused on the intersection of school architecture and design and individual health behaviors within schools. Previous work on school designs, intended to influence outcomes such as attention or scholastic performance, documents the profound impact physical space can have on student behavior and development, providing much insight into how school space might be designed or redesigned to prevent obesity (14).



***"If we can make healthy eating and physical activity the easy and default option in the school environment, we will help children practice a healthy lifestyle without making it seem like work. Over time, healthy lifestyles become healthy habits that endure. The key to obesity prevention is to work across multiple levels, from individual children to parents, schools, and the community, simultaneously."***

**Dr. Terry T-K Huang, PhD, MPH, CPH**

## Shared Team Goals:

- **Help Prevent and Reduce the Incidence of Childhood Obesity**
- **Encourage Activity/Movement and Healthy Eating**
- **Inspire Life-Long Healthy Practices**
- **Study Effects of Healthy Design Guidelines**
- **Help Buckingham Become a Model Healthy School & Community**

# THE DINING COMMONS :

# ONE BIG CLASSROOM

- A PLACE FOR FOODSMART KIDS
- A PLACE OF OPEN SOURCE EXCHANGE
- A LEARNING LAB AND LOUNGE
- A DEMONSTRATION KITCHEN
- A SOCIAL HALL

**WHERE NATURE IS THE TEACHER**

**THE DINING COMMONS** design guidelines represent a new direction in design research. As part of this effort, architects, public health researchers, and educators engage directly with the large-scale complex environmental health issue of our time: childhood obesity. The outlined design guidelines illustrate the outcome of the collaborative partnership generated by the Carter G. Woodson Education Complex (Buckingham County, VA) – a K-5 renovation/addition project completed in Summer 2012, with follow-up studies conducted by academic institutions and research groups from across the country.

This design-research partnership marks a powerful moment in school design and research fields as experts from disparate yet interrelated disciplines engage with the large-scale, strategic health problem of childhood obesity by seeking to understand the political, social, economic, ecological, and infrastructural agendas that make up the school food environment. The design guidelines herein optimistically propose that the interoperability between the dining commons as a learning space and as a healthy food service environment will be capable of delivering individual and collective shifts in attitudes and behaviors – a new architectural paradigm that promotes health by design.

**VMDO ARCHITECTS** is an award-winning firm located in Charlottesville, VA. VMDO is dedicated to helping institutions and communities envision pivotal educational projects that translate into meaningful buildings of lasting value. Dedicated to designing environments that positively shape the way people live, work, and play, VMDO recognizes the impact that thoughtful and imaginative design can have on learners, teachers, parents, and the supporting community.

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INSIGHTS

NO MORE CHILDHOOD OBESITY

**HEALTHY BY DESIGN**

ARCHITECTURE'S NEW TERRAIN

**DINING COMMONS**

PROMOTING HEALTHY + ACTIVE

FOODSMART KIDS

VS


VMDO ARCHITECTS

# COLLABORATION AT BUCKINGHAM

WORKING TOGETHER TO FIND SOLUTIONS

# HEALTHY EATING DESIGN GUIDELINES FOR SCHOOL ARCHITECTURE©

Team: University of Virginia / University of Nebraska Medical Center / VMDO Architects

## DESIGN SPECIFICATION CHECKLIST

### 1 : COMMERCIAL KITCHEN ZONE

**Design an open commercial kitchen to facilitate the procurement, preparation and storage of fresh, organic,whole foods that are prepared in a manner to preserve nutritional value.**

| | DESIGN STRATEGIES |
|---|---|
| | Articulate the kitchen area as a "demonstration" kitchen with an open view to food preparation stations from servery and seating zones. |
| | Create dedicated display and storage areas for fresh and preserved fruits and vegetables. |
| | Design freezer and refrigeration capacity to accommodate seasonally available, locally-sourced food, including food from federally subsidized school programs such as Farm-to-Schools. |
| | Provide kitchen equipment such as ovens, tilt skillets and steamers that allows for a variety of cooking methods for fresh foods. |
| | Avoid deep fat fryers. |
| | Provide kitchen equipment that allows for a variety of processing and preservation methods, such as canning and freezing of fresh foods. |
| | Provide storage bins for a variety of whole grains and whole grain flours. |
| | Provide flash-freezing capacity for fresh local foods |
| | Provide sufficient counter or work space for processing of fresh foods. |

### 2 : TEACHING KITCHEN ZONES

**Design complementary hands-on teaching kitchen areas for students and extra-curricular organization use.**

| | DESIGN STRATEGIES |
|---|---|
| | Create a visual and/or physical connection to the commercial teaching kitchen, seating area and outdoor school gardens. |
| | Provide areas conducive to teaching, presentation and demonstration cooking. |
| | Create teaching kitchen as a hands-on learning environment with equipment that is safe and accessible to children. |
| | Create an outdoor kitchen area conducive to traditional (historical) and experimental teaching and cooking (i.e. open fire cooking, solar oven). |
| | Provide outdoor kitchen with access to potable water. |

# 3 : SERVING ZONES

**Design the servery to function efficiently to maximize dining time for students, while effectively encouraging the selection and enjoyment of healthy foods and beverages.**

| | DESIGN STRATEGIES |
|---|---|
| | Provide server space for healthy grab-and-go meal options in the snack or express line. |
| | Provide space behind the servery counter, for packaged snacks to be served on request only. |
| | Utilize mobile hot and cold servery equipment carts for flexibility and a variety of arrangements (e.g. freestanding fresh salad and fruit station in seating areas) |
| | Avoid servery equipment that serves exclusively competitive foods (e.g. self-serve ice cream freezers). |
| | Provide age-appropriate self-service food preparation stations (e.g., juicing, microwaving, toasting, etc.) |
| | Place healthy foods at eye level of children, and specify food service equipment that allows one to do so. |
| | Include servery lines in sufficient quantity to ensure efficient user flow, thereby ensuring all students have adequate time to eat. Coordinate with district Wellness Policy. |
| | Provide visual circulation cues to support efficient flow through servery areas. |
| | Situate disposal areas to avoid conflicts with users entering the servery or dining areas. |
| | Arrange disposal areas along dining area exit route, when possible. |
| | Provide express check-out lanes for students choosing healthy meals, with no sugary or salty products such as sweetened beverages, chips, and desserts. |
| | Place healthy foods at eye level of students, and specify food service equipment that allows one to do so. |
| | Position servery equipment to accommodate nutritious foods (e.g., broccoli) at the beginning of the server line. |
| | Design space by cafeteria register to allow for display of healthy foods and minimizes child access of foods high in fat and sugar. |
| | Provide servery equipment that can accommodate changeable food descriptors/labels. |
| | Provide servery equipment that provides space for multiple healthy choices in each food category(celery AND carrots) |
| | Provide servery equipment with closed sides and tops when sale of "unhealthy" options is required. (i.e. ice cream) |
| | Position salad bars away from walls for 360 degree circulation. |
| | Positions salad bars near the check-out register. |
| | Provide servery counter space that can accommodate fruit bowls for serving fresh fruits and vegetables. |
| | Provide space for serving trays. |

## 4 : DINING ZONES

**Re-conceive dining areas as places of enjoyment and relaxation, conceived in such a way as to fully support healthy food initiatives.**

| DESIGN STRATEGIES |
| --- |
| Create visual access between dining areas and other food spaces (e.g. school garden and/or commercial kitchen) |
| Create a variety of seating options and social arrangements, recognizing that not all individuals will be comfortable in a given configuration. |
| Provide outdoor seating areas designed for the local climate (i.e. covered or shaded, as necessary) and connected to the interior dining area. |
| Design dining areas to recognized national standard for seating capacity, to avoid overcrowding. |
| Provide comfortable seating. |
| Provide small refrigerators in every classroom, for storage of packed snacks, lunches, and beverages. |
| Provide staff refrigerators in proximity to anticipated staff eating areas. |

## 5 : AESTHETICS OF HEALTHY FOOD ENVIRONMENTS

**Design spaces to provide a relaxing atmosphere conducive to the enjoyment of food and social interaction.**

| DESIGN STRATEGIES |
| --- |
| Feature fresh, preserved, or prepared food in public spaces. |
| Incorporate appealing colors and lighting. |
| Provide targeted acoustic treatments with high noise reduction coefficients in public gathering spaces such as dining areas. |
| Incorporate integrated audio capabilities which allow music to be played in selected areas. |

## 6 : EDUCATIONAL SIGNAGE, WAYFINDING AND MARKETING

**Deploy graphic design and signage elements throughout the school environment in order to reinforce the healthy eating message.**

| DESIGN STRATEGIES |
| --- |
| Incorporate visible and educational indicators of school (or municipal) water quality. |
| Design architectural interiors to provide dedicated space for healthy nutrition marketing (e.g., corridors, stairways, servery, dining areas, etc.) |
| Provide daily/weekly/monthly menu signage at the entry to the dining area, servery zone and throughout the seating zone |
| Provide educational (nutritional) information on food choices. Highlight information on seasonal fresh foods incorporated into the school food program. |
| Locate educational (nutritional) signage so that it is visible from the "point of choice" in server zone. |
| Pre-screen "healthy" nutritional marketing to eliminate potential competitive foods (e.g. chocolate "Got Milk?" posters) |

## 7 : WATER ACCESS AND VENDING MACHINES

**Design an open commercial kitchen to facilitate the procurement, preparation and storage of fresh, organic,whole foods that are prepared in a manner to preserve nutritional value.**

### DESIGN STRATEGIES

- Place "unhealthy" vending machines away from dining and primary traffic areas (visually & spatially)
- Provide ready access to potable water and cups in dining areas.
- Place drinking fountains in outdoor activity areas.
- Place drinking fountains near social/public areas.
- Provide potable water in every classroom.
- Incorporate advanced filtration system for the school's potable water supply.
- Provide free potable water sources at a rate of 1 per 100 occupants.
- Provide at least 50% water sources conducive to filling water bottles.
- Provide storage space for re-fillable water containers.
- Replace vending machine content with healthy food and beverage options.

## 8 : ON-SITE FOOD PRODUCTION

**Provide spaces for on-site food cultivation and production, coordinated with curricular and extracurricular activities.**

### DESIGN STRATEGIES

- Create a school garden.
- Create a school farming facility (producing, for example, tilapia, honey, or eggs)
- Create a greenhouse facility for educational purposes and/or support of the school garden.
- Utilize edible plantings for landscaping.
- Include on-site food production resources (e.g. garden, greenhouse) in construction documents for building facility where possible.

## 9 : INTEGRATED HEALTHY FOOD EDUCATION FACILITIES

**Identify and provide programming opportunities to extend healthy food messaging throughout the school.**

### DESIGN STRATEGIES

- Provide a school Wellness Center readily accessible to students, designed to support nutritional counseling, and integrated with related school functions such as health educators or school nurse.
- Design science labs conducive to food-related experiments (e.g. "Soils Lab").
- Maintain a library collection dedicated to healthy eating and nutrition.
- Design food spaces to support curricular, extra-curricular, and community education.
- Provide dedicated space for educational materials in clear view of all students.
- Incorporate internet access or kiosk for nutritional information and research.

# 10 : INTEGRATED HEALTHY FOOD COMMUNITY

**Support healthy eating and local food production in the community.**

| DESIGN STRATEGIES | PRINCIPLE* |
|---|---|
| Design food spaces for flexibility and multiple uses by school, affiliates, and community groups. | 5 |
| Provide community garden space for local use. | 5 |
| Provide mobile/modular modules that enable rapid re-configuration of the dining area. | 5 |
| Host Community Farmers' Market on school grounds. | 5 |

PRINCIPLE* = Corresponding 'core' health promotion principle for each design strategy

1 = Provide equipment and spaces that facilitate the incorporation of fresh and healthy food choices into the school and its community.

2 = Provide facilities to directly engage the school community in food production and preparation.

3 = Apply evidence- and theory-based behavioral science principles to 'nudge' the school community towards healthy-eating behaviors and attitudes.

4 = Use building and landscape features to promote awareness of healthy and sustainable food practices.

5 = Conceive and articulate school spaces as community assets to multiply the benefits of school-based healthy food initiatives.

# WHY CHOOSE HEALTH

How can we optimize school environments for health?

**PRINCIPLE 1:**
Facilitate Incorporation of Fresh & Healthy Food Choices

**PRINCIPLE 2:**
Engage School Community in Food Production

**PRINCIPLE 3:**
"Nudge" School Community Towards Healthy Eating Behaviors

**PRINCIPLE 4:**
Promote Awareness of Healthy & Sustainable Food

**PRINCIPLE 5:**
Articulate School Spaces as Community Assets

# PRINCIPLE 1

## FACILITATE INCORPORATION OF FRESH & HEALTHY FOOD CHOICES

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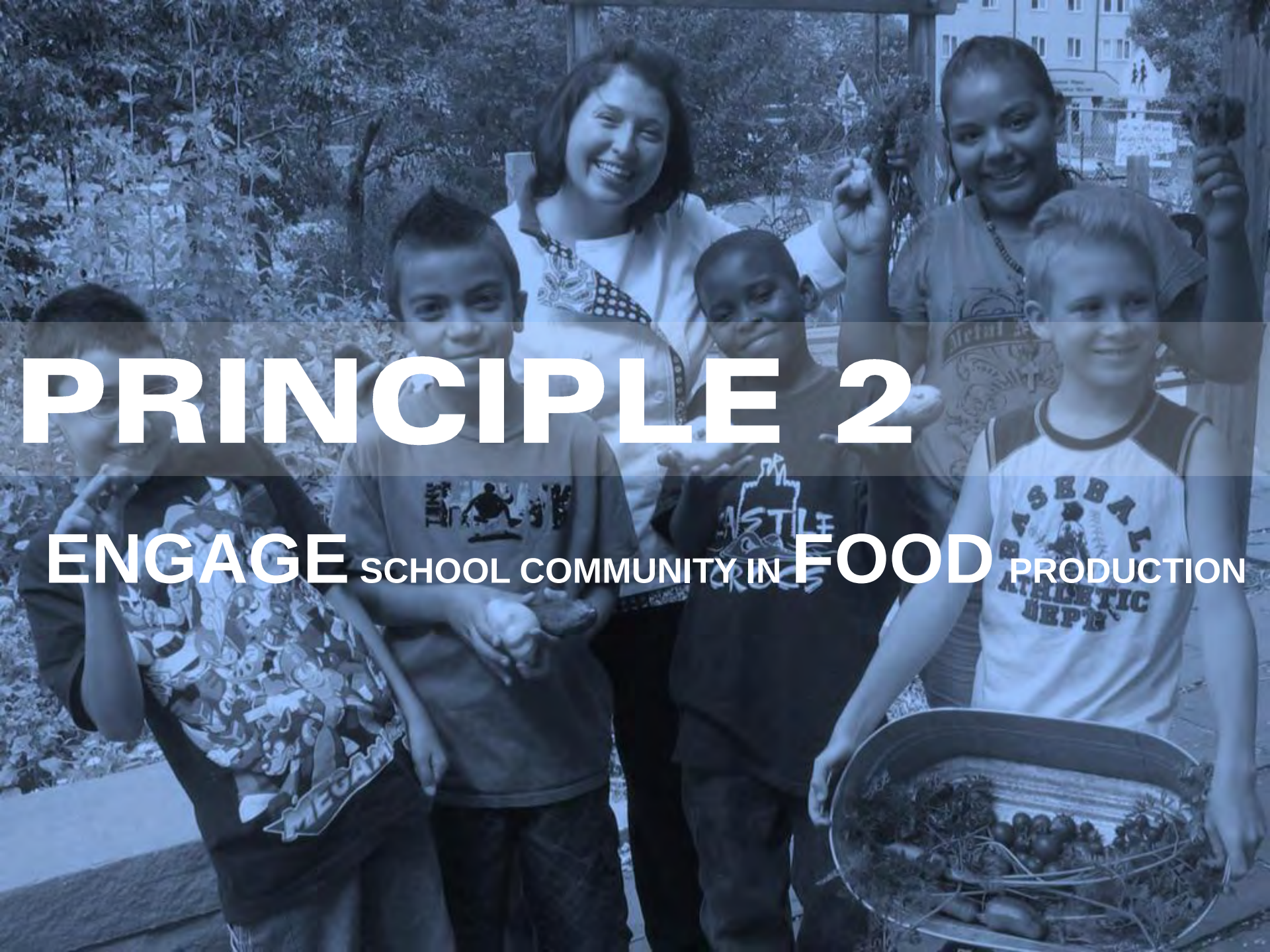
# PRINCIPLE 1

## INCORPORATE FRESH & HEALTHY FOOD CHOICES

VMDO ARCHITECTS

# PRINCIPLE 1

## INCORPORATE FRESH & HEALTHY FOOD CHOICES



# PRINCIPLE 2

## ENGAGE SCHOOL COMMUNITY IN FOOD PRODUCTION

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# PRINCIPLE 2

## ENGAGE SCHOOL COMMUNITY IN FOOD PRODUCTION


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PRINCIPLE 2

ENGAGE SCHOOL COMMUNITY IN FOOD PRODUCTION

# PRINCIPLE 3

## “NUDGE” SCHOOL COMMUNITY TOWARDS HEALTHY EATING BEHAVIORS


EAT HEALTHY
TO HYDRATE!

**Op-Chart**

BRIAN WANSINK,
DAVID R. JUST
and JOE McKENDRY

# Lunch Line Redesign

School cafeterias are much criticized for offering the kind of snack foods and desserts that contribute to childhood obesity. But banning junk food from cafeterias, as some schools have tried, or serving only escarole or tofu, can backfire. Students then skip lunch, bring in their own snacks or head out for fast food. We've even seen some pizzas delivered to a side door.

Children and teenagers resist heavy-handed nutritional policies — and the food that is associated with the heavy hand. No food is nutritious, after all, until it is actually eaten.

A smarter lunchroom wouldn't be draconian. Rather, it would nudge students toward making better choices on their own by changing the way their options are presented. One school we have observed in upstate New York, for instance, tripled the number of salads students bought simply by moving the salad bar away from the wall and placing it in front of the cash registers.

Experiments that we and other researchers have done in cafeterias at high schools, middle schools and summer camp programs, as well as in laboratories, have revealed many ways to use behavioral psychology to coax children to eat better. Here are a dozen such strategies that work without requiring drastic or expensive changes in school menus.

Placing nutritious foods like broccoli at the beginning of the lunch line, rather than in the middle, increased the amount students purchased by 10 percent to 15 percent.

Giving healthy food choices more descriptive names — for example, "creamy corn" rather than "corn" — increased their sales by 27 percent.

Students given a choice between carrots and celery were much more likely to eat their vegetables than students forced to take only carrots.

Keeping ice cream in a freezer with a closed opaque top significantly reduced ice cream sales.

Decreasing the size of bowls from 18 ounces to 14 ounces reduced the size of the average cereal serving at breakfast by 24 percent.

Requiring or encouraging the use of cafeteria trays increased vegetable consumption: students without trays eat 21 percent less salad but no less ice cream.

**New York Times Op-Ed**
**Oct 21, 2010**

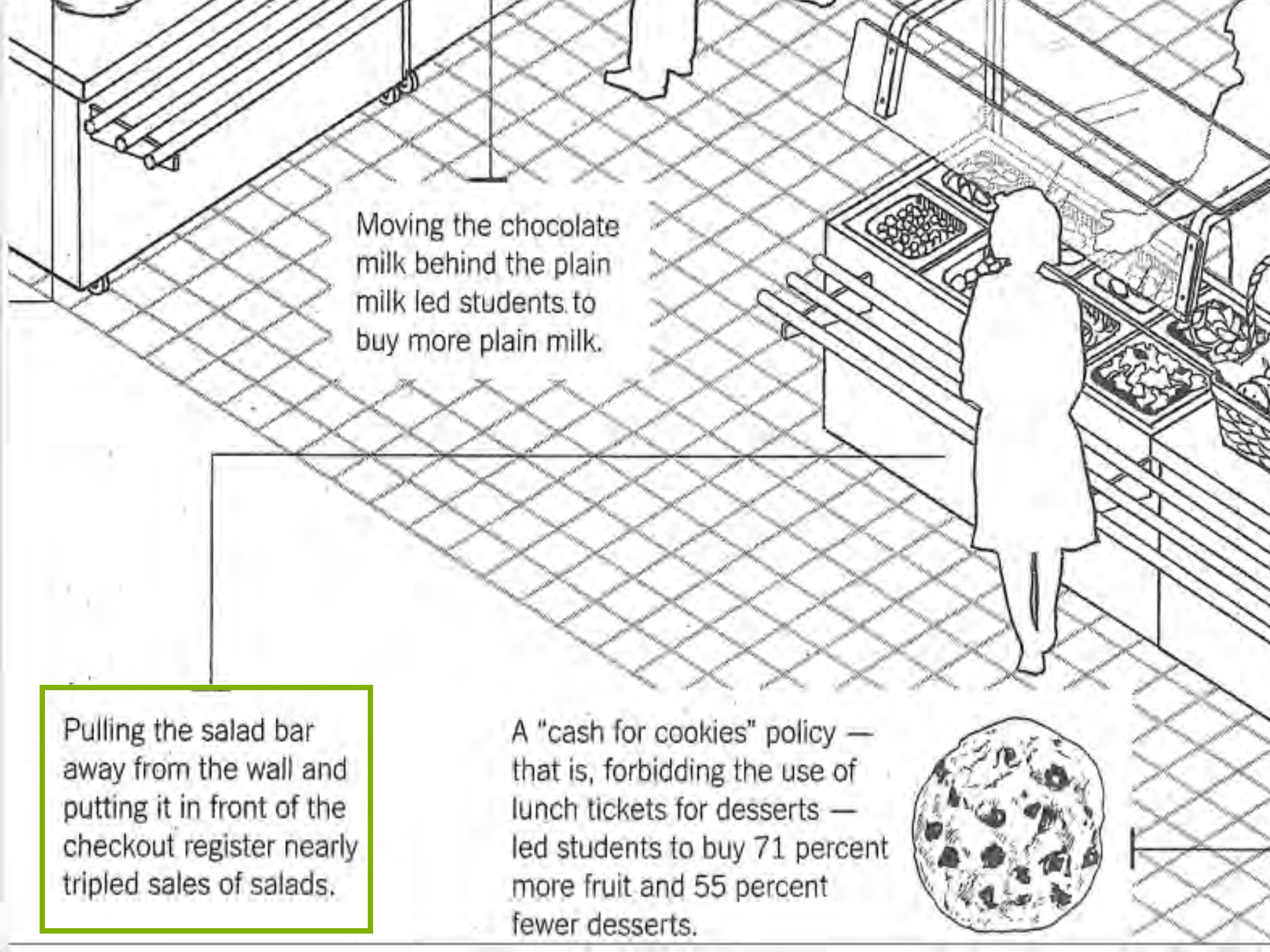
Creating a speedy "healthy express" checkout line for students who were not buying desserts and chips doubled the sales of healthy sandwiches.

Putting apples and oranges in a fruit bowl, rather than a stainless steel pan, more than doubled fruit sales.

Moving the chocolate milk behind the plain milk led students to buy more plain milk.

Pulling the salad bar away from the wall and putting it in front of the checkout register nearly tripled sales of salads.

A "cash for cookies" policy — that is, forbidding the use of lunch tickets for desserts — led students to buy 71 percent more fruit and 55 percent fewer desserts.



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Food isn't nutritious until it is eaten. We don't improve school lunches by making children take healthier items. When healthy foods are forced upon them, children will resist and dislike not only the heavy-handed approach but also the food associated with that heavy hand. We improve school lunches by ***nudging*** children to make the right choices on their own. That way, when they take the apple instead of the cookie, it was *their* idea.

# PRINCIPLE 4

## PROMOTE AWARENESS OF HEALTHY AND SUSTAINABLE FOOD


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# PRINCIPLE 4

## PROMOTE AWARENESS OF HEALTHY AND SUSTAINABLE FOOD

## WATER HYDRATES!

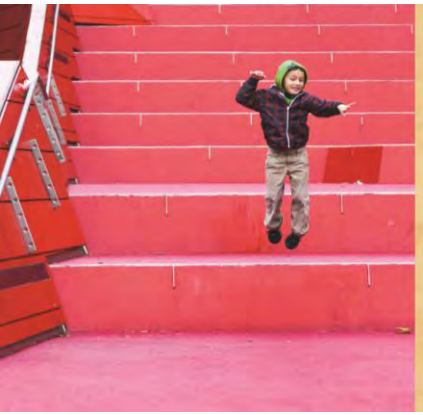
Hydration is all about water!
Take drinks of water whenever you are thirsty to keep your body healthy.

How many ounces of water did you drink today?


## RECYCLING SAVES WATER

Recycling one pound of paper saves about 3.5 gallons of water!

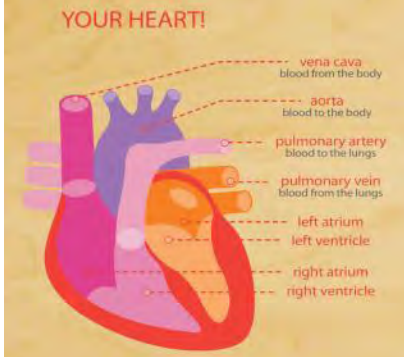
How often do you recycle?



## HOP ON UP!

Get out of your chairs!
Jump up! Jump down!
And hop on up the stairs!

**Using the stairs burns twice as many calories as walking!**



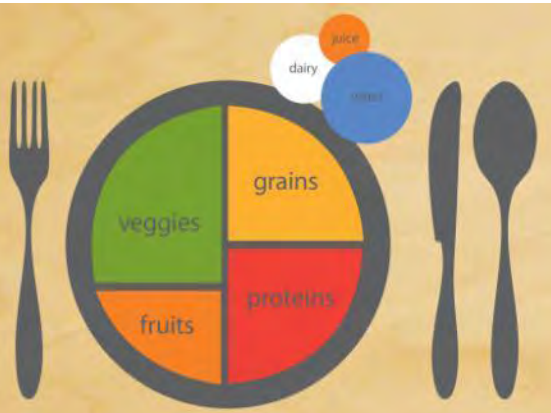

## HEALTHY HEART!

Walking up stairs requires 8-11 calories of energy per minute. Using stairs burns twice the amount of calories than walking!

Aerobic exercise gets your heart pumping faster, which strengthens your heart. Does your pulse (heartbeat) change after taking the stairs?


## THE EDIBLE GARDEN

Fruits contain seeds. Seeds grow into plants. Plant roots take in water and minerals from the soil to nourish leaves and flowers. Leaves take in sunlight and air to make sugars for the plant. Flowers turn into fruit. And the cycle begins again!




## YOUR HEALTHY PLATE!

**dairy**
milk, yogurt, cheese

**vegetables**
broccoli, carrots, cucumbers, and peas

**whole grains**
brown rice and whole-wheat bread

**proteins**
fish, poultry, beans, and nuts

**fruits and juices**
peaches, bananas, apples, oranges


ECO-LITE
ENVIRONMENTAL FEATURES
Light Louvers in Classrooms
Natural Daylight from Windows
Stormwater Management
Water Source Heat Pump
Non-Toxic Materials
Recycling Programs
Natural Local Materials
Buckingham Slate
Kyanite
Regional Lumber
Can you apply these sustainable practices to your own home?
HEALTH & WELLBEING
FOODSMART KIDS
The Dining Commons is located at the heart of the school creating a social center around food education.
THE DINING COMMONS:
ONE BIG CLASSROOM
Food Lab
Kitchen Lab
Corner Bakery
Community Meeting Hall
Food & Nutritional Displays
Open Servery
Outdoor Dining Terrace
How often do you eat food you've grown and prepared out of your own garden?
WHERE ARE THE FOOD-BASED LEARNING SPACES?
KITCHEN GARDEN
TEACHING KITCHEN
OPEN KITCHEN
OUTDOOR CLASSROOM
CAFETERIA
CORNER BAKERY
COMMUNITY MEETING HALL
FOOD LAB / LOUNGE
COMPOSTING TRAY DROP
SOCIAL HALL

# PRINCIPLE 5

## ARTICULATE SCHOOL SPACES AS COMMUNITY ASSETS

VMDO ARCHITECTS

# PRINCIPLE 5

## ARTICULATE SCHOOL SPACES AS COMMUNITY ASSETS

# CREATING CHANGE

How can we improve the health of our children and future generations?

# SCHOOL MATTERS

## BUCKINGHAM COUNTY, VIRGINIA

## CARTER G. WOODSON EDUCATION COMPLEX

## PERSPECTIVES

### EDUCATOR : MS. PENNIE ALLEN, PRINCIPAL, PRIMARY SCHOOL

**Q.** As an educator, what changes have you observed in children over the last ten years?
**ALLEN:** I have noticed that many children are [physically] larger and that they don't get outside as much. I am concerned about the amount of time children play video games or watch television and about poor eating habits.

**Q.** What are some major challenges that kids face today? How do these challenges affect learning?
**ALLEN:** I see lots of single parent homes and unemployed parents. I also see that today's parents try to make their children happy instead of setting limits and teaching responsibility and stewardship. Kids have a lot of stress in their lives. As a result, we see anger issues, attention problems, and lack of academic progress. Students who don't have clear limits and strong parental guidance have less self confidence and often perform poorly at school.

**Q.** What are some unique characteristics of a rural school in a small school district vs. an urban school in a large school district?
**ALLEN:** Transportation is an issue. There is also a scarcity of opportunities for students to be physically active. We have a youth league program with soccer, baseball, football, and cheerleading, but this is not an option for many families who struggle with vehicle problems or don't have money for gas. Our younger generation of parents do not plant gardens and find less healthy food cheaper and more convenient.

**Q.** What benefits and/or challenges do the students in Buckingham County have as a result of living in a rural community?
**ALLEN:** In terms of benefits, families are often close by and students have the opportunity to get to know grandparents and extended family members. There are many churches that are available for support. We have youth recreation programs. Challenges are that many children come from single parent families and often grandparents have to provide financial support and raise their grandchildren. When it comes to nutrition and the importance of exercise, most young parents don't understand how important it is to teach these ideas at an early age. Many parents and grandparents have poor health habits themselves and as a result suffer the consequences of heart disease, high blood pressure, diabetes, and cancer. Today's children are forming bad habits in the area of nutrition and exercise based on family cultures.

**Q.** How do these benefits and challenges translate into the new school design?
**ALLEN:** Our school has the wonderful opportunity to set an example for the community by showcasing the benefits of good nutrition and exercise. Our use of the outdoor spaces for gardening and the food lab and teaching kitchen for hands-on learning related to nutrition will provide real problem solving experiences for kids that will result in unforgettable learning.

## ACTIONS

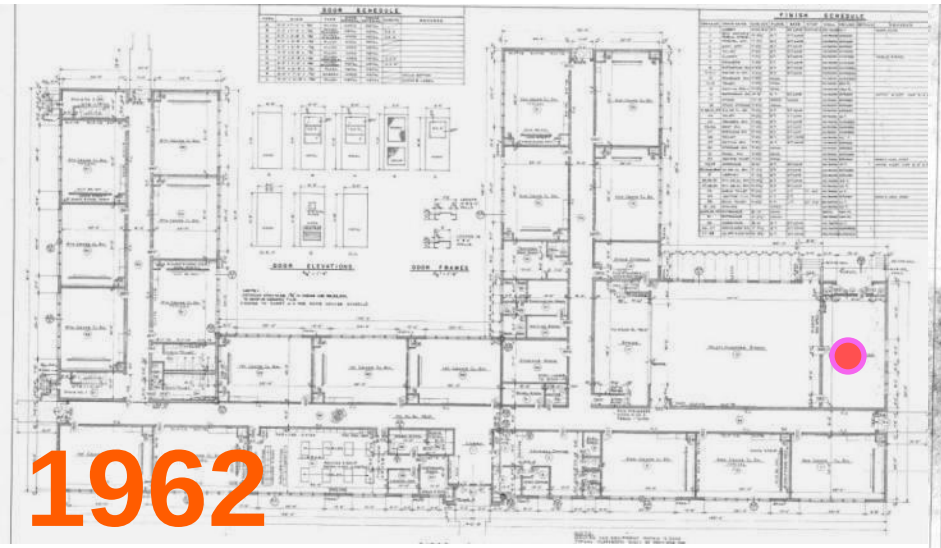
- INCORPORATE MORE MOVEMENT DURING THE DAY
- PROVIDE AFTER-SCHOOL PROGRAMS WITH RECREATIONAL CHOICES
- RENOVATE SCHOOLS BASED ON HEALTHY DESIGN GUIDELINES
- BUILD SCHOOL GARDENS
- TEACH HEALTHY FOOD CHOICES

**Q.** When did you, as an educator, realize that the physical school environment is so important for students' health, well-being, and ability to learn? How are you able to share these ideas with your colleagues and community?
**ALLEN:** Dr. Gary Blair, Buckingham's Superintendent during the remodeling of the school buildings, had a vision to improve the lives of our community's children. I was inspired by him. Reading The Third Teacher, working with the passionate architects at VMDO, and participating in a research project with Dr. Matthew Trowbridge from the University of Virginia enabled me to connect these concepts to my own life and see how the building could have a major impact on our community. My own father died of heart disease at a very early age, and my daughter works as a nurse in a local hospital where many of her patients suffer from preventable diseases. I have come to believe that we can change lives through prevention and partnerships. In addition, we have begun to share these great ideas about health and movement by hosting gardening workshops and training students to give tours of the new facility. In celebration of our new home, teachers are encouraging students to present ideas about movement, nutrition, conservation, and our own history to the community.

**Q.** How can the built environment, such as a school, make a healthy impact on children's lives?
**ALLEN:** Paying attention to indoor air quality and using a team approach will have a major impact on the children and adults that work in the building. I also believe strongly that when adults are modeling good nutrition choices and exercising, then children will learn these good habits. "Nudging" kids to make good choices by featuring appetizing graphics of healthy fruits and vegetables and making these choices more convenient and easily accessible will establish patterns of healthy behavior at an early age. Having a facility that is conducive to exercise will allow more opportunities for movement. Even our chairs [by VS] are designed to allow kids to move!

**Q.** You have supported a primary research collaborative to study the efficacy of the school design as it relates to childhood obesity. What is your hope for the outcome of this research?
**ALLEN:** My hope is that through this research Buckingham will become a model rural community whose children grow up learning the impact of exercise and nutrition and will have fewer health problems and lead more productive lives.

**Q.** Statistics show a dramatic increase in childhood obesity rates. In your opinion, what are the top five strategies school districts could use to improve the situation?
**ALLEN:** More movement during the instructional day, teaching healthy food choices, more after-school programs with recreation choices, gardening, school building renovation.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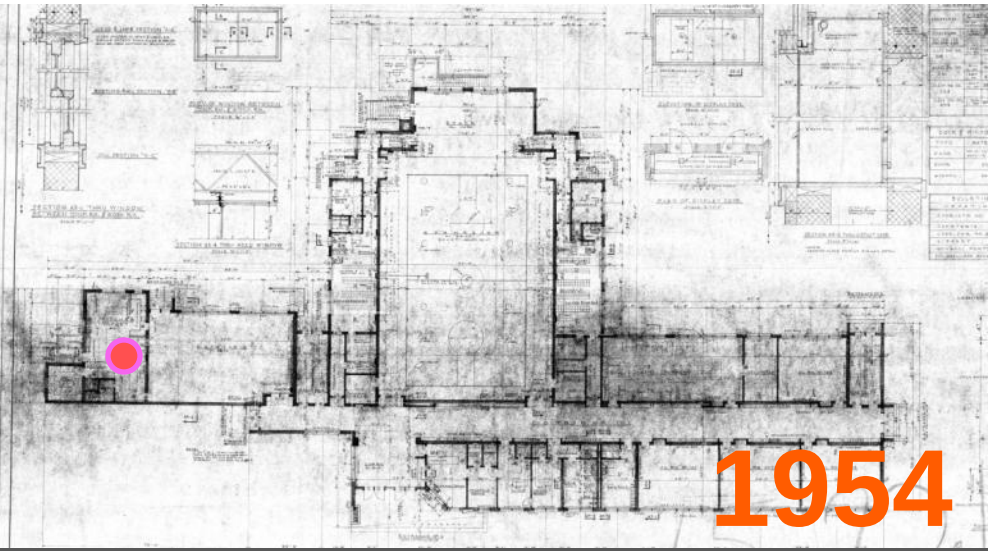
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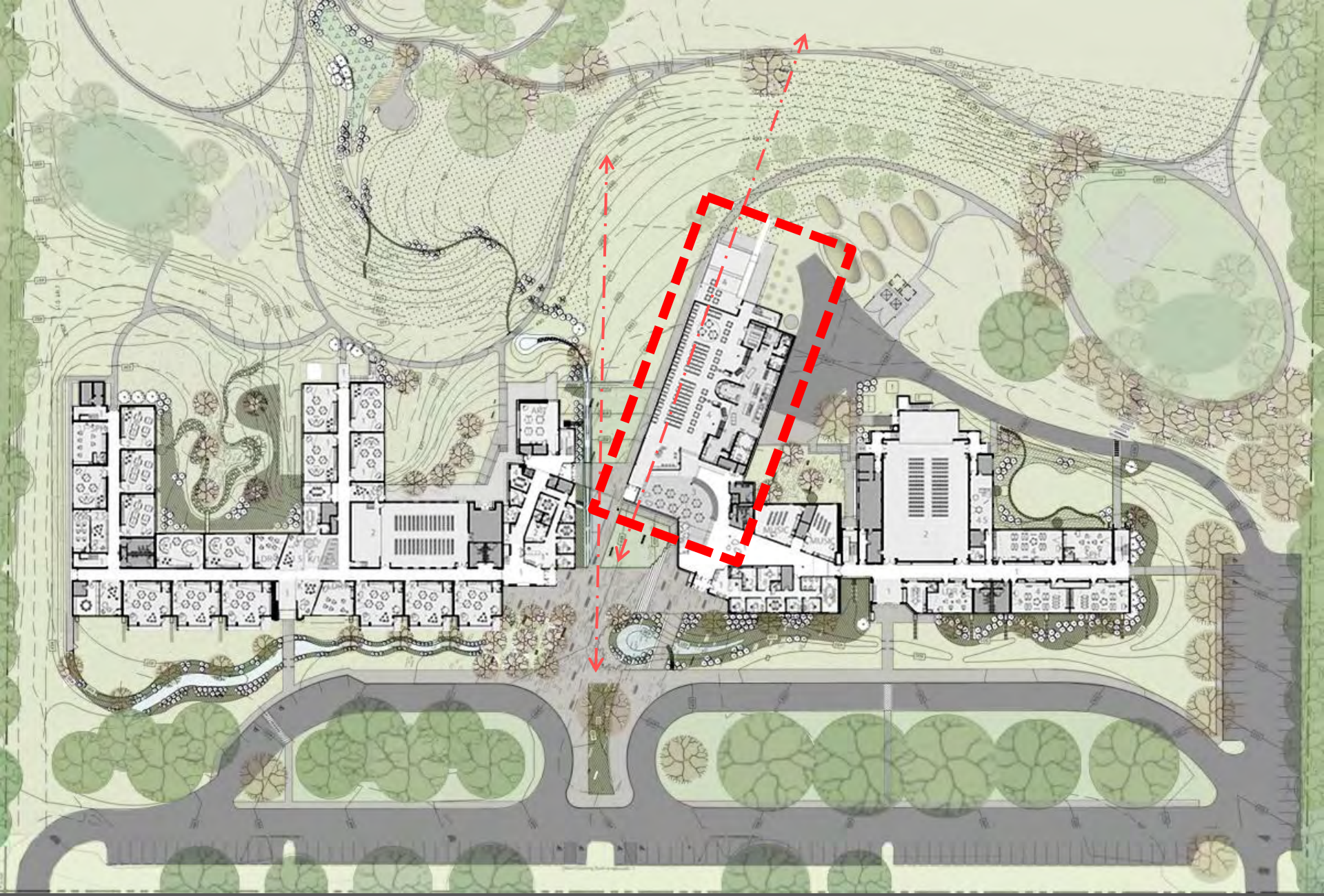


VMDO ARCHITECTS

# TODAY'S CAFETERIAS

## CAFETERIA AT THE CENTER


VMDO ARCHITECTS

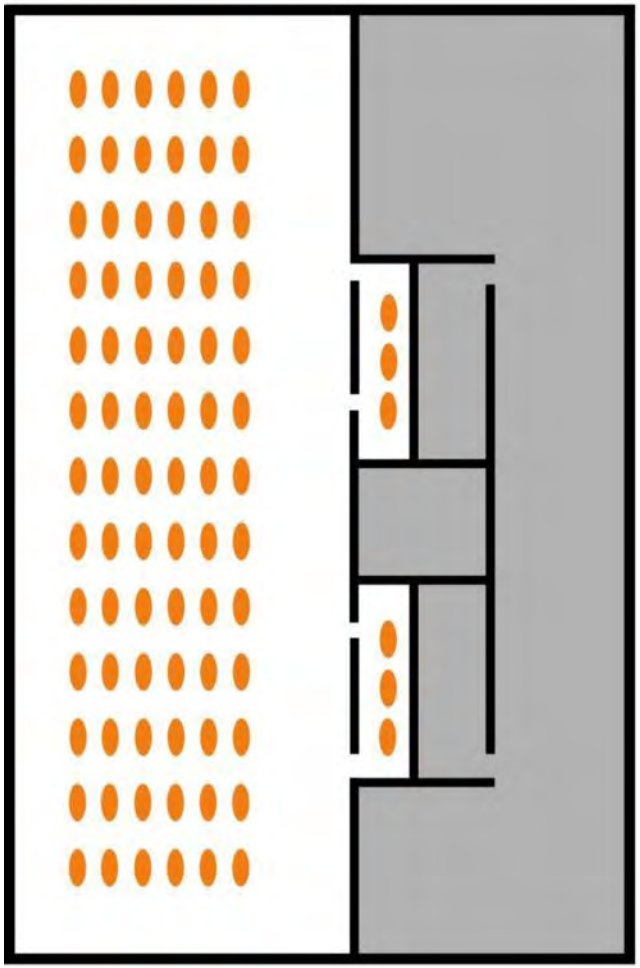
# VINTAGE CAFETERIAS

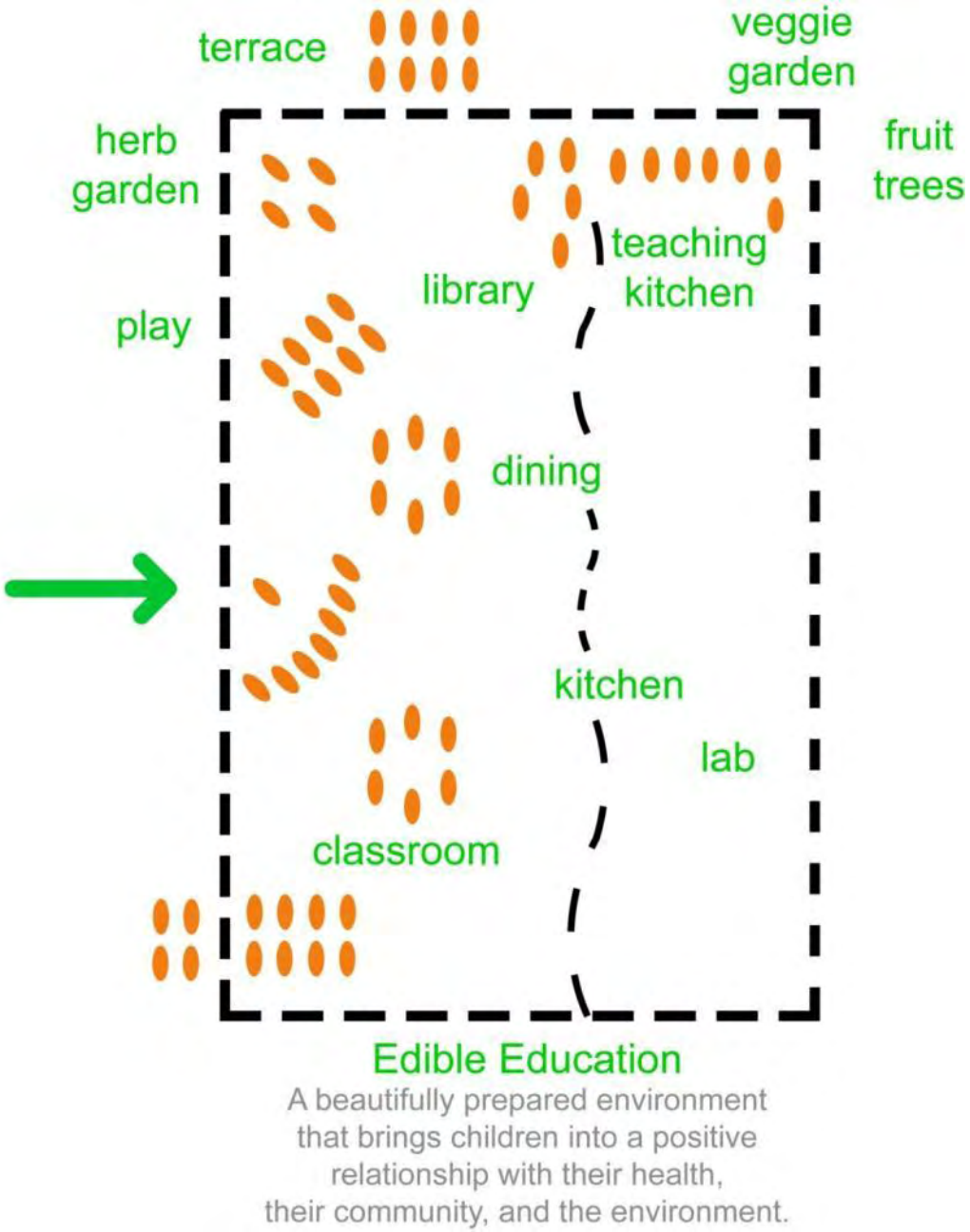
## CAFETERIAS OF THE PAST


VMDO ARCHITECTS

# TODAY'S CAFETERIAS

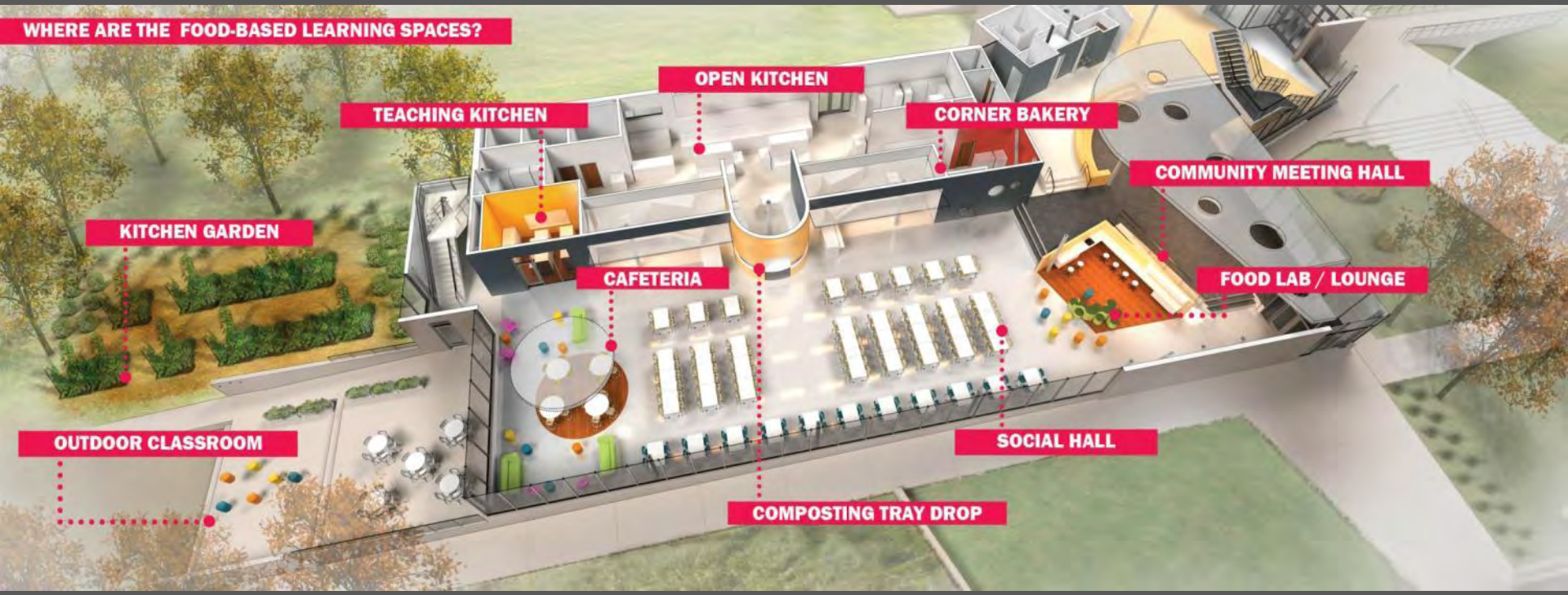
## MULTIPURPOSE LEARNING AREAS






**Edible Education**

A beautifully prepared environment that brings children into a positive relationship with their health, their community, and the environment.




# CAFETERIA AS CLASSROOM

## MULTIPURPOSE LEARNING AREAS


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## SHARED LEARNING / COMMUNITY SPACE


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## SHARED LEARNING / COMMUNITY SPACE


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

SHARED LEARNING / COMMUNITY SPACE


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## FOOD LAB AND BAKERY


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## FOOD LAB AND BAKERY


VMDO ARCHITECTS

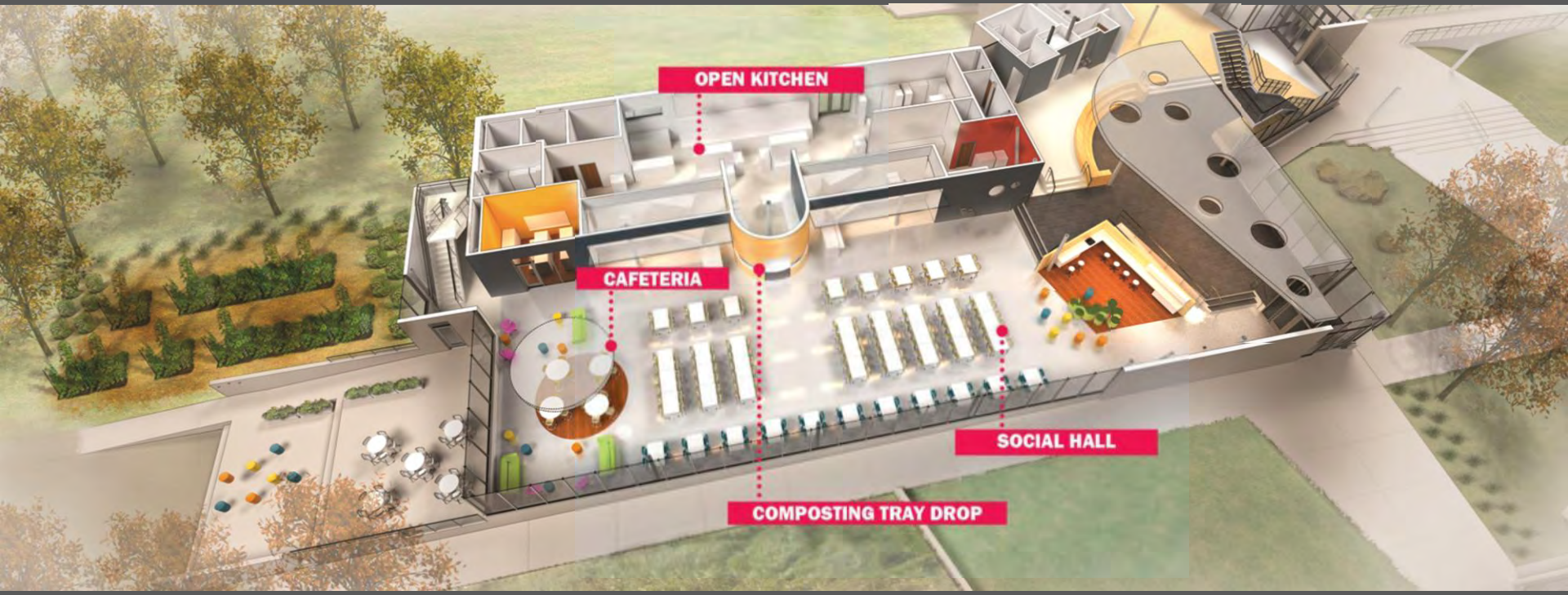
# CAFETERIA AS CLASSROOM

## FOOD LAB AND BAKERY

VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## FOOD LAB AND BAKERY




VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## INTERACTIVE CAFETERIA

VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## INTERACTIVE CAFETERIA



VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## INTERACTIVE CAFETERIA

VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## INTERACTIVE CAFETERIA


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## KITCHEN LAB


VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## KITCHEN LAB



VMDO ARCHITECTS

# CAFETERIA AS CLASSROOM

## KITCHEN LAB


VMDO ARCHITECTS

# ACTIVE LEARNING ENVIRONMENT

## OUTDOOR EDUCATIONAL LANDSCAPE

## Carter G. Woodson Education Complex

This activity-oriented outdoor learning environment is designed for hands-on experiential learning, natural play, physical activity, food production and ecological lessons within the natural surroundings. Active design features are tailored to children in grades K-5 and function as health promoting community assets for parents, families and partner organizations.

### PHYSICAL ACTIVITY ZONES

1. Slate + Grass Piazza
2. Gymnasia + Fitness Rooms
3. K-2 Play Terrace + Water Station
4. 3-5 Play Terrace + Water Station
5. Tot Lot Natural Play Area
6. Eco-Walks / Jogging Paths
7. Recreational Sport Fields
8. Open Play Area + Grass Surface
9. Community Room
10. K-2 Exercise + Meditation Loop 4 laps = 1/4 mile
11. 3-5 Exercise + Meditation Loop 5 laps = 1/2 mile
12. Woodland Hub
13. Monumental Slate Stair
14. Weekend + Off Peak Bicycle Loops

### FOODSMART KIDS® ACTIVITY ZONES

1. Dining Commons + Food Lab
2. Teaching Kitchen Lab
3. Kitchen Gardens
4. Edible Community Gardens
5. Great Lawn + Grab-n-Go Berry Patch
6. Fruit Tree Allée
7. Nut Tree Circle
8. Compost Demonstration Garden
9. Picnic Knoll
10. Outdoor Dining + Garden Classroom

### ECO-ACTIVITY ZONES

1. Bioswales + Cleansing Biotopes
2. Slate Channel + Waterfall Scupper
3. River Rock Stream + Native Meadow Grasses
4. Frog Bog Wetland + Observation Deck
5. K-2 Science Garden
6. Arts Terrace + Garden Courtyard
7. Sonata Terrace + Garden Courtyard
8. Pollinator Bee + Bug Garden
9. Pervious Parking Garden

**Healthy by Design**

VMDO ARCHITECTS

# ACTIVE LEARNING ENVIRONMENT

OUTDOOR EDUCATIONAL LANDSCAPE

VMDO ARCHITECTS

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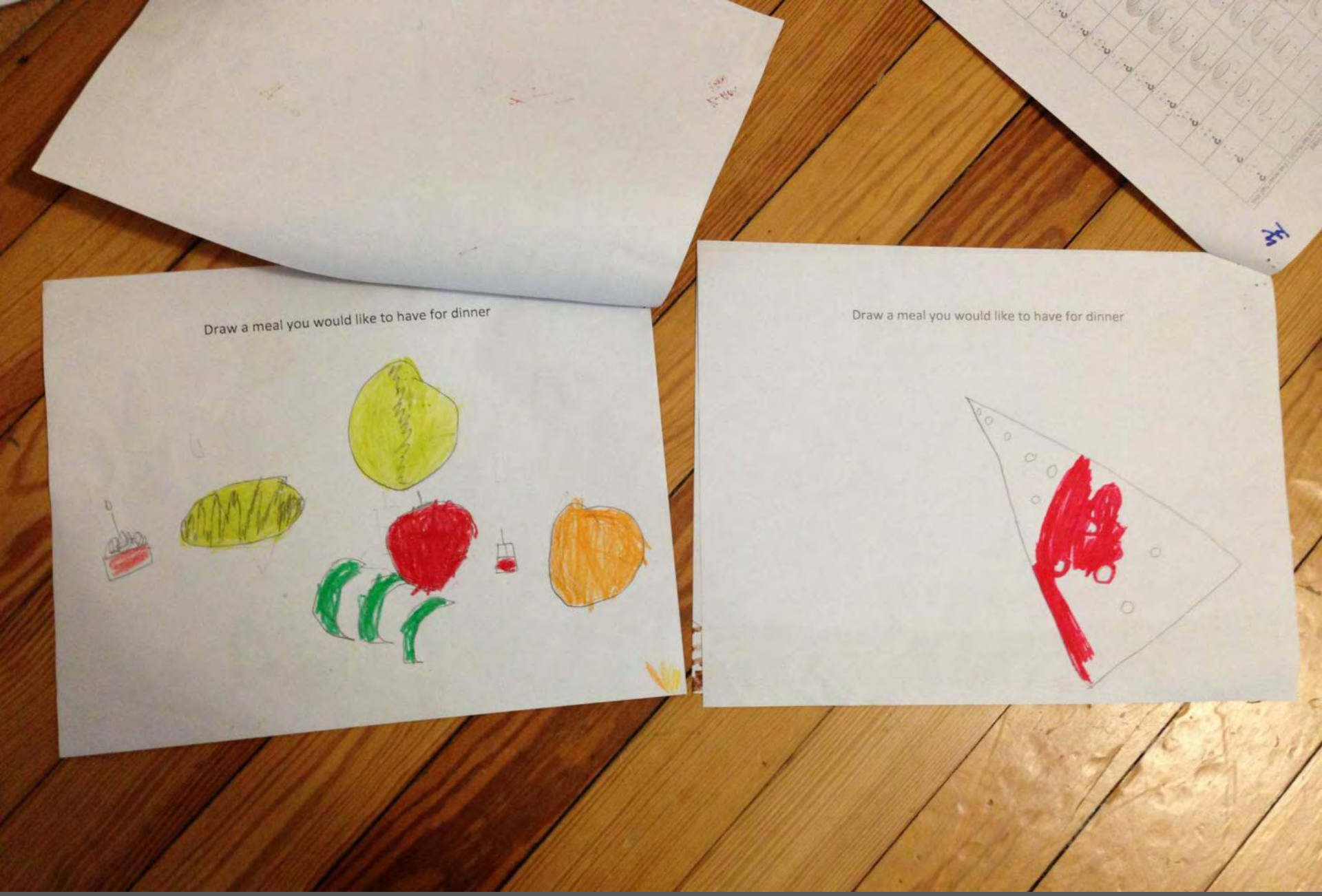
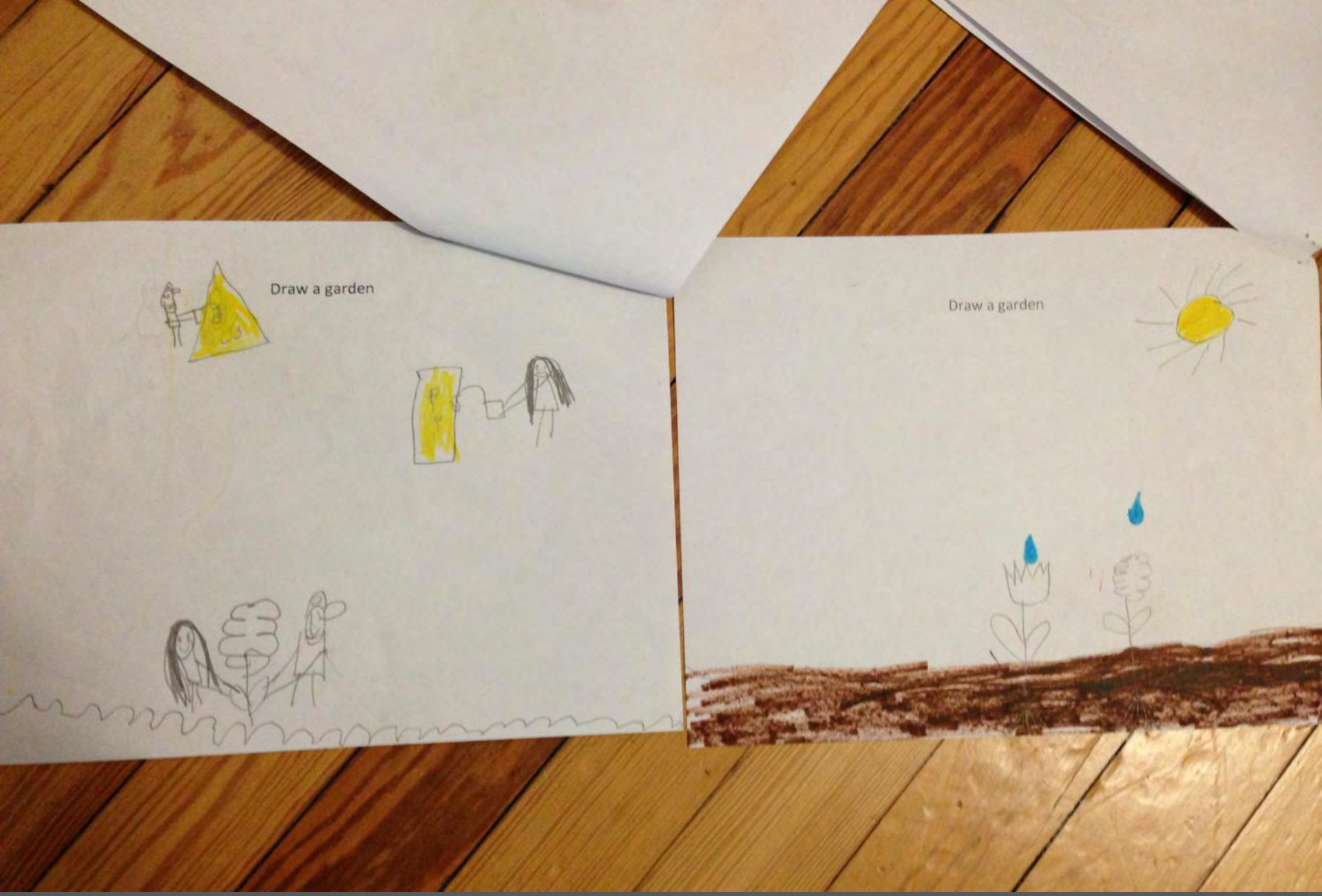
# ACTIVE LEARNING ENVIRONMENT

## OUTDOOR EDUCATIONAL LANDSCAPE




# FOOD EDUCATION

DESIGN AS CATALYST FOR CHANGE


Draw a garden
Draw a garden

## Awards & Recognition (so far)

2013 Project of Distinction, CEFPI

2013 Outstanding Project, Learning by Design

2012 Prize for Design Research and Scholarship, Virginia Society AIA

3rd Prize in the Childhood Obesity Challenge, American Journal of Preventative Medicine

2012 Virginia School Boards Association, Gold Design Award & People's Choice Award


PRIMARY SCHOOL


NEST


DEN
CANOPY


LAB


BUCKINGHAM COUNTY PRIMARY SCHOOL