DESIGNING LEARNING ENVIRONMENTS FOR THE WHOLE CHILD

BOB MOJE, FAIA, LEED AP
VMDO ARCHITECTS

CONTINUING EDUCATION AIA

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Course Description

With the advent of new technologies, educational philosophies, and research strategies, we live in a time where it is possible to educate each child while still meeting educational requirements.

This opportunity for individualized learning has major implications for teachers, parents, and school administrators and particularly for the school environments in which children learn and play.

This session will analyze design factors – flexibility of spaces, nature as teacher, and healthy design guidelines, among others – that should be constantly scrutinized in order to support the academic, civic, creative, emotional, and physical development of K-12 students.

Learning Objectives

At the end of the this course, participants will be able to:

1. Understand 5 components that make up a "whole child" and how the design of learning environments can enhance each of those aspects.

2. Investigate how the health of children is at risk by the materials and chemicals used in their environments.

3. Evaluate how research can be used and applied in the design process to measure the effectiveness of design strategies.

4. Assess how the design of children's learning environments can enhance and help children cope with an increasingly stressful world.


SOCIAL / CIVIC
CREATIVITY
EMOTIONAL
WELLBEING
HEALTH / PLAY
ACADEMICS

ACADEMICS

Manassas Park Pre-K, VA
VMDO Architects

Manassas Park Pre-K, VA
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Manassas Park Elementary, VA
VMDO Architects

Manassas Park Elementary, VA
VMDO Architects

Buckingham County Primary School, VA
VMDO Architects

Buckingham County Primary School, VA
VMDO Architects

CREATIVITY

SOS Children's Villages Lavezzorio Community Center, IL
Studio Gang Architects

Kindergarten Sighartstein, Austria
Kadawittfeldarchitektur

Guarderia Els Colors, Spain
RCR Arquitectes

Buckingham County Primary School, VA
VMDO Architects

SOCIAL / CIVIC

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Manassas Park Pre-K, VA
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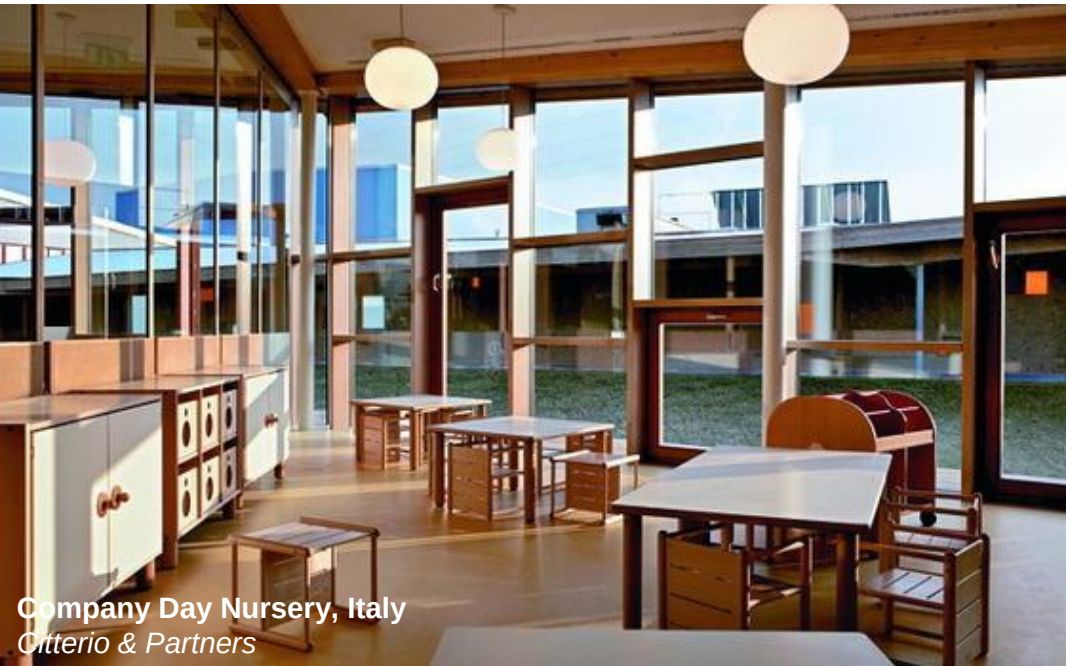
Creche & Nursey School, Italy
C + S Associati



Company Day Nursery, Italy
Citterio & Partners

EMOTIONAL
WELLBEING

Buckingham County Primary School, VA
VMDO Architects

Buckingham County Primary School, VA
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Vittra School Brotorp, Sweeden
Rosan Bosch

Manassas Park Pre-K, VA
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HEALTH / PLAY

Manassas Park Pre-K, VA
VMDO Architects

Manassas Park Pre-K, VA
VMDO Architects

Northwestern Memorial Hospital Early Childhood Education, IL
Hitchcock Design Group

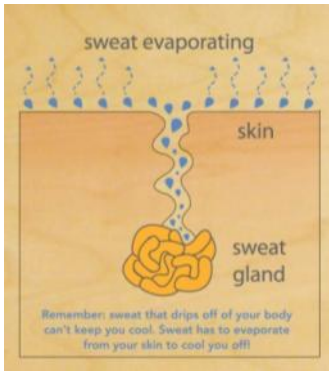
Fuji Kindergarten, Japan
Tezuka Architects

Buckingham County Primary School, VA
VMDO Architects

WATER HYDRATES!

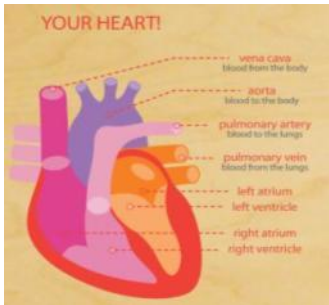
Hydration is all about water!
Take drinks of water whenever you are thirsty to keep your body healthy.

How many ounces of water did you drink today?



SWEATING IS COOL!

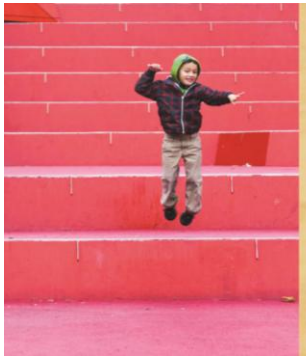
When you exercise and get hot you can sweat (perspiration). Sweat is made mostly from water and when it evaporates from your skin, it cools your body off (thermoregulation)!



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?



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!

Buckingham County Primary School, VA
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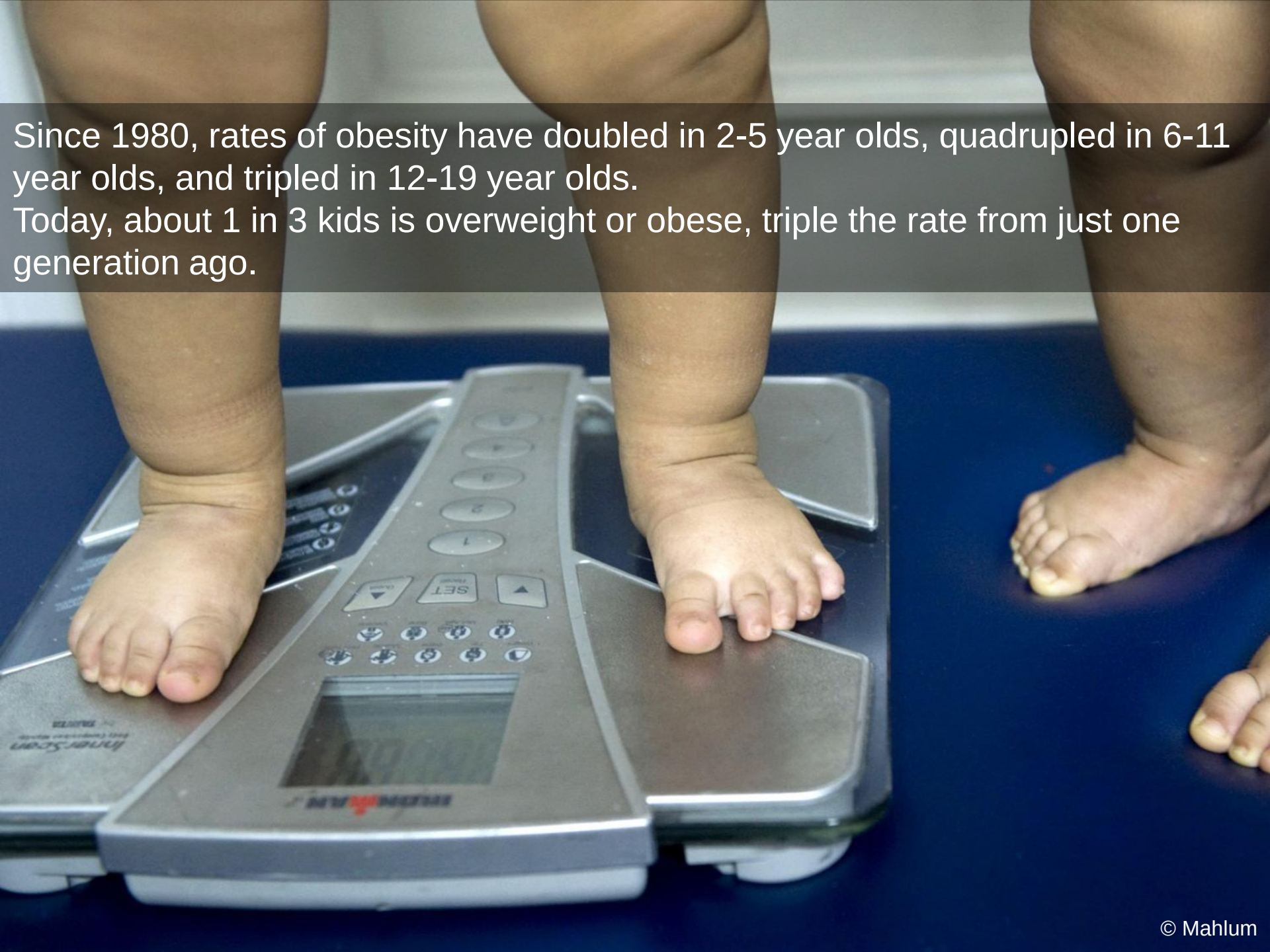
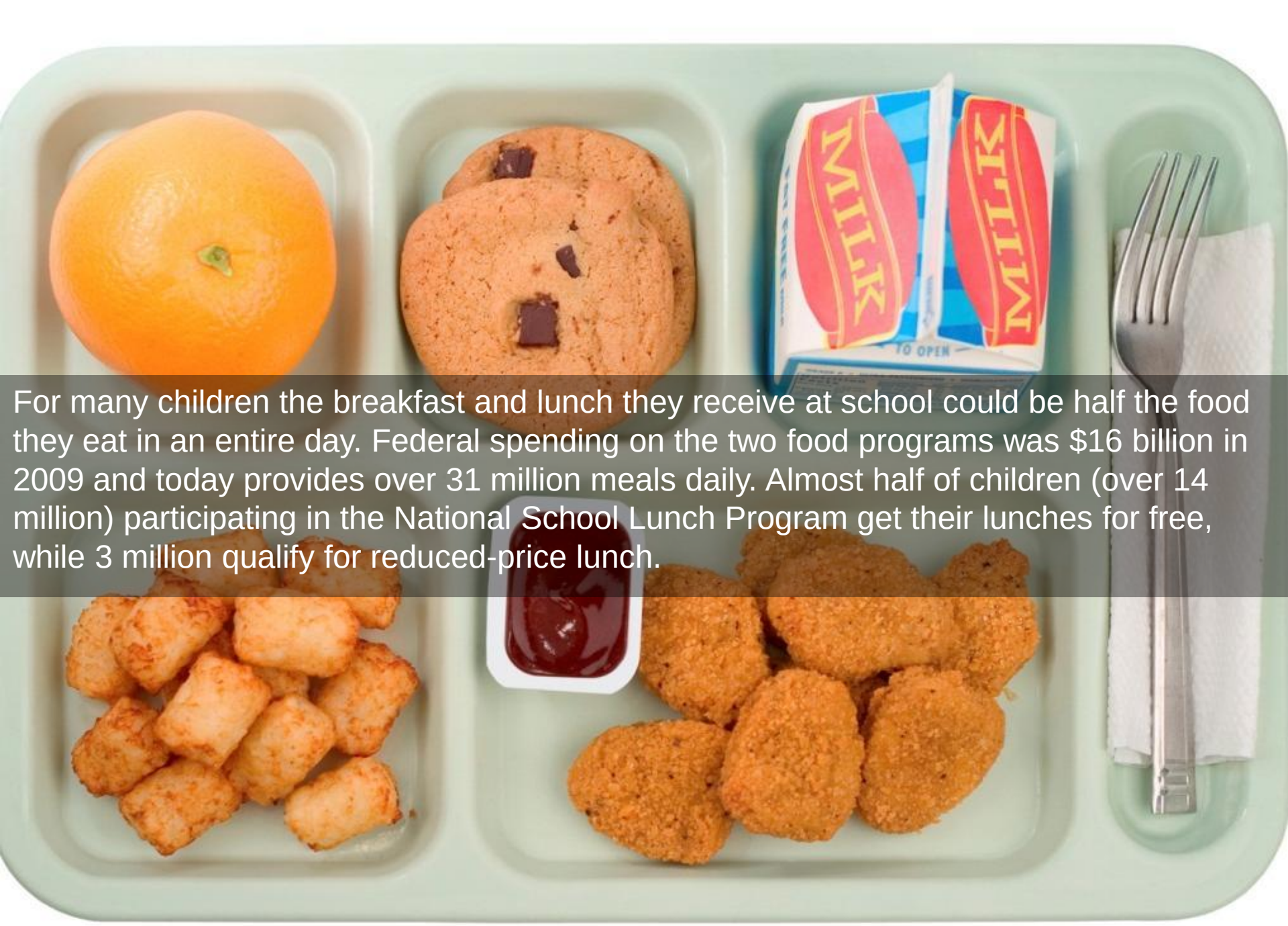
SOCIAL / CIVIC
CREATIVITY
EMOTIONAL
WELLBEING
HEALTH / PLAY
ACADEMICS

CHILDHOOD (HEALTH) AT RISK

The U.S. is one of the wealthiest countries in the world yet has one of the highest obesity rates.
One-third of the U.S. population is obese and another third is overweight.


Since 1980, rates of obesity have doubled in 2-5 year olds, quadrupled in 6-11 year olds, and tripled in 12-19 year olds.
Today, about 1 in 3 kids is overweight or obese, triple the rate from just one generation ago.
SET
© Mahlum

In 2005, U.S. schools served nearly 5 billion lunches.
If the trays were lined up side to side they would wrap the globe 57 times.

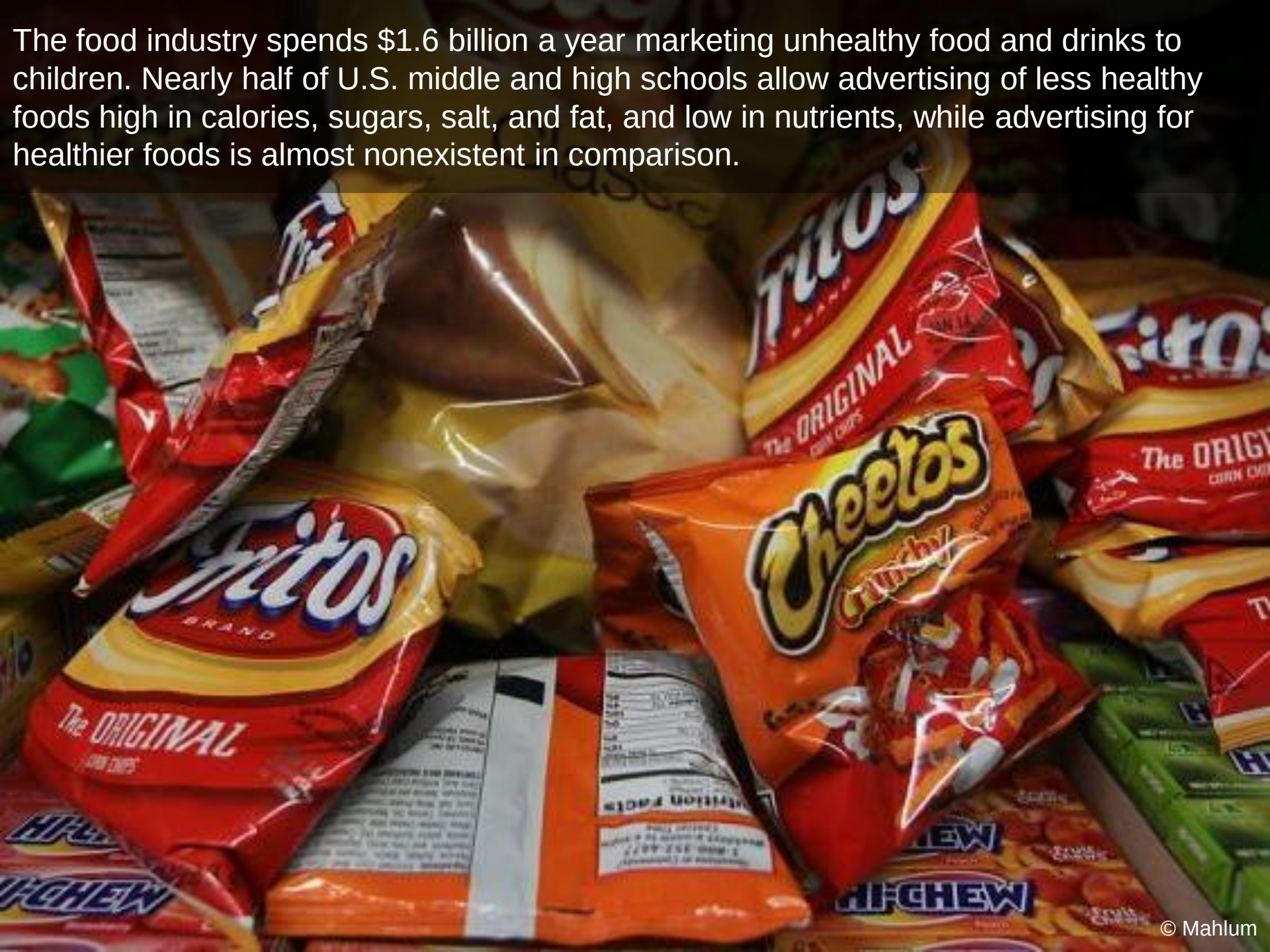


For many children the breakfast and lunch they receive at school could be half the food they eat in an entire day. Federal spending on the two food programs was $16 billion in 2009 and today provides over 31 million meals daily. Almost half of children (over 14 million) participating in the National School Lunch Program get their lunches for free, while 3 million qualify for reduced-price lunch.

There is no federal law requiring Physical Education in American schools. Only 4% of elementary schools, 8% of middle schools, and 2% of high schools provide daily physical education or its equivalent. Most adolescents fall short of the Physical Activity Guidelines for Americans recommendation of at least 60 minutes of aerobic physical activity each day.

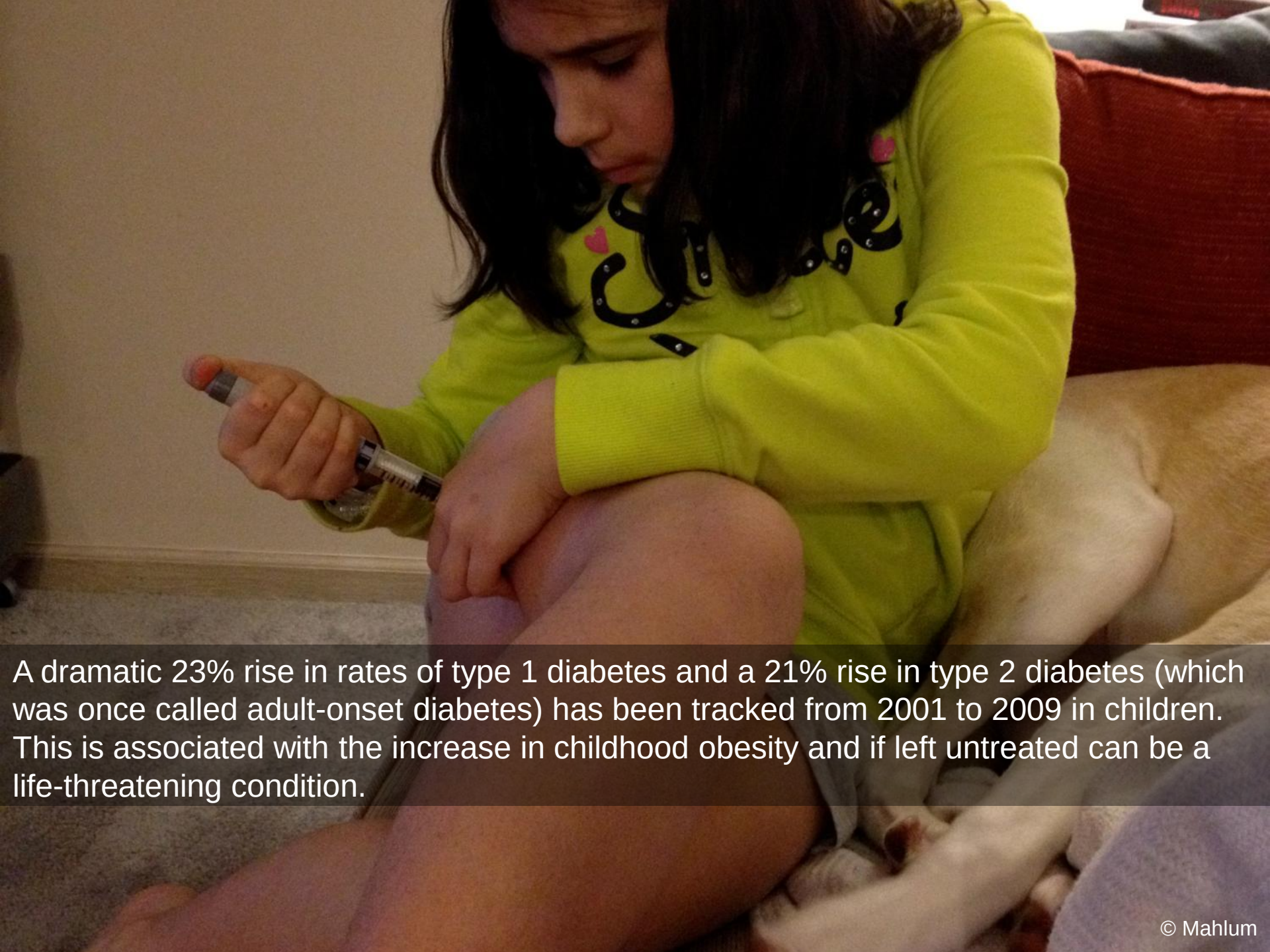
Screen time is a major factor contributing to childhood obesity. It takes away from the time children spend being physically active, leads to increased snacking in front of the TV, and influences children with advertisements for unhealthy foods.

The food industry spends $1.6 billion a year marketing unhealthy food and drinks to children. Nearly half of U.S. middle and high schools allow advertising of less healthy foods high in calories, sugars, salt, and fat, and low in nutrients, while advertising for healthier foods is almost nonexistent in comparison.



Obese children are more likely than non-obese children to experience chronic illnesses, to miss school days, and to be teased by their peers. These factors can lead to an impaired quality of life, reduced economic productivity, and shorter life expectancy

An estimated 6.5 million children under age 18 (8.9%) are now diagnosed with asthma. The rate has more than doubled since 1980. Children with serious asthma are more likely to be overweight because extra weight can make it harder to breathe and can inflame the respiratory tract.



A dramatic 23% rise in rates of type 1 diabetes and a 21% rise in type 2 diabetes (which was once called adult-onset diabetes) has been tracked from 2001 to 2009 in children. This is associated with the increase in childhood obesity and if left untreated can be a life-threatening condition.

Obesity-associated chronic disease already accounts for 70% of U.S. health costs.
Over $14 billion is spent annually on healthcare related to childhood obesity.
Obese children are more likely to become obese adults, increasing our national healthcare expenditures.


For the first time in U.S. history, this generation of children may not live as long as their parents
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“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

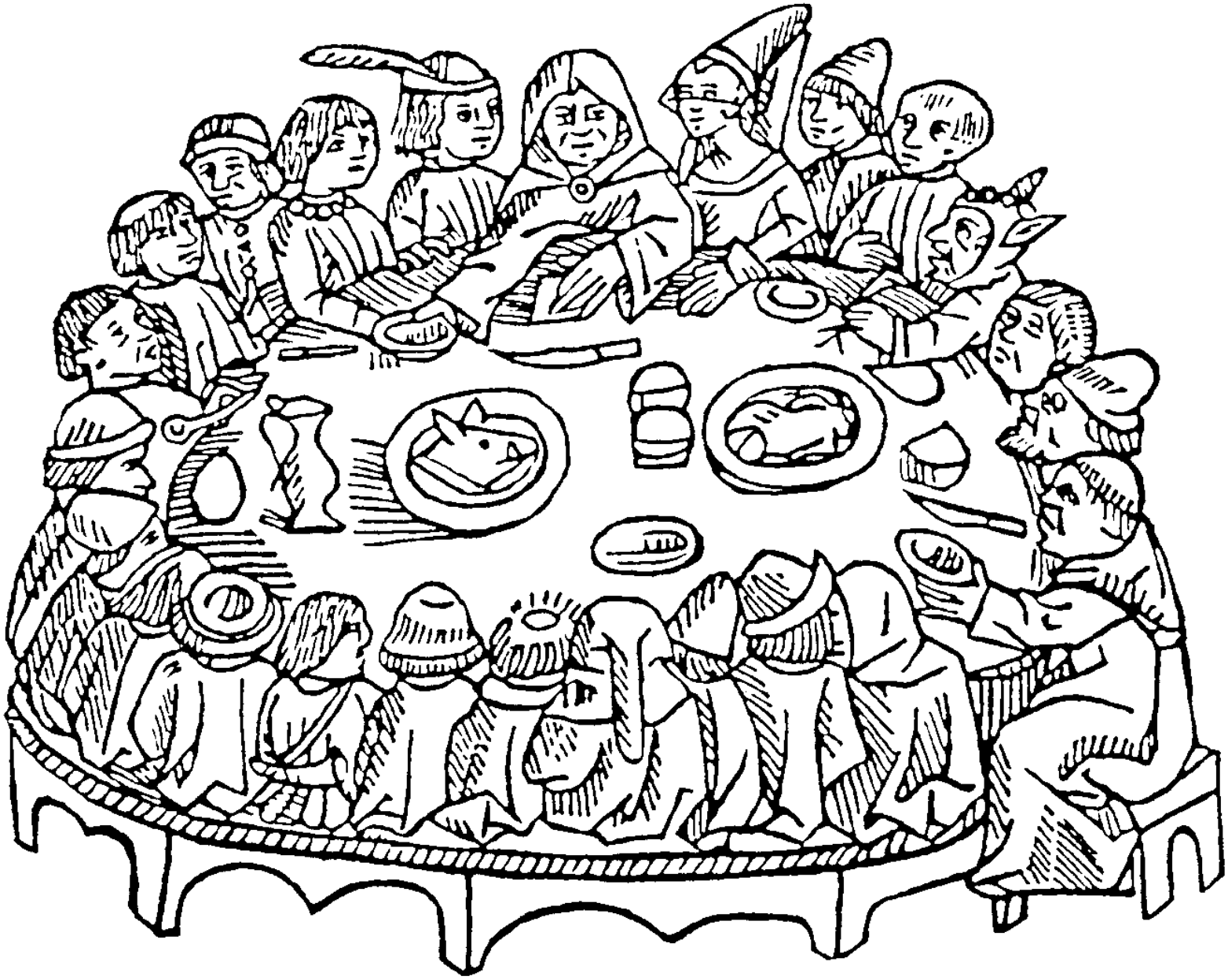
Healthy Eating

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?”

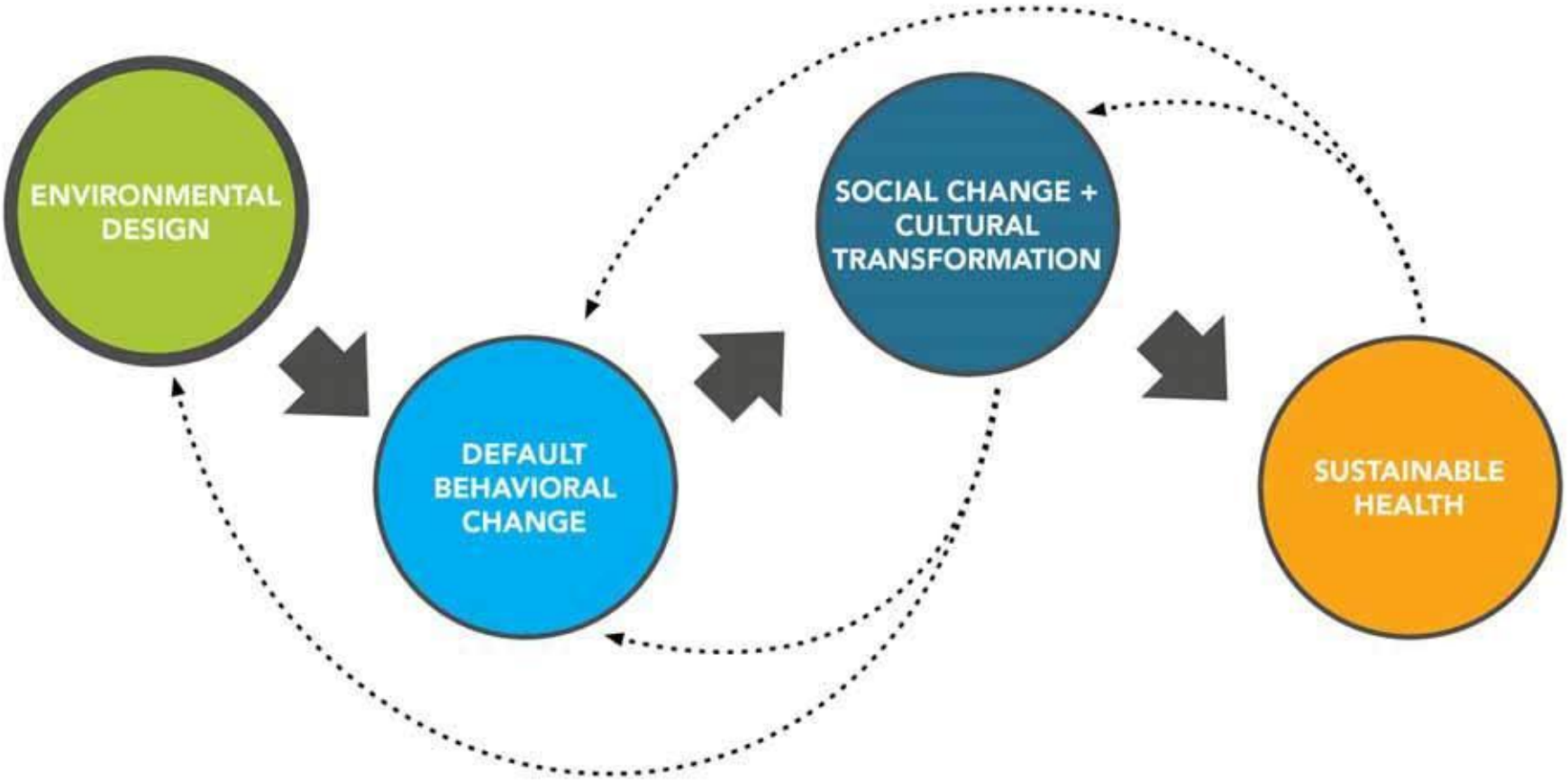


“How School Lunch Became the Latest Political Battleground”–

NYT Magazine, 10/7/14

THEORETICAL SYSTEMS FRAMEWORK FOR CONVERGENCE OF

ARCHITECTURE + PUBLIC HEALTH



TIME SERIES QUASI-EXPERIMENTAL DESIGNS CAN BE A POWERFUL TOOL TO TEST THIS FRAMEWORK

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.

Received for review November 14, 2006.
Accepted in final form March 12, 2007.
The costs of publication of this article were defrayed, in part, by the payment of page charges. This article must, therefore, be hereby marked "advertisement" in accordance with 18 U.S.C. Section 1734 solely to indicate this fact.

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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

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.

VMDO Design / Research Collaborative Participants:

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Terry Huang (University of Nebraska)
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INSIGHTS

NO MORE CHILDHOOD OBESITY

HEALTHY BY DESIGN

ARCHITECTURE'S NEW TERRAIN

DINING COMMONS

PROMOTING HEALTHY + ACTIVE

FOODSMART KIDS

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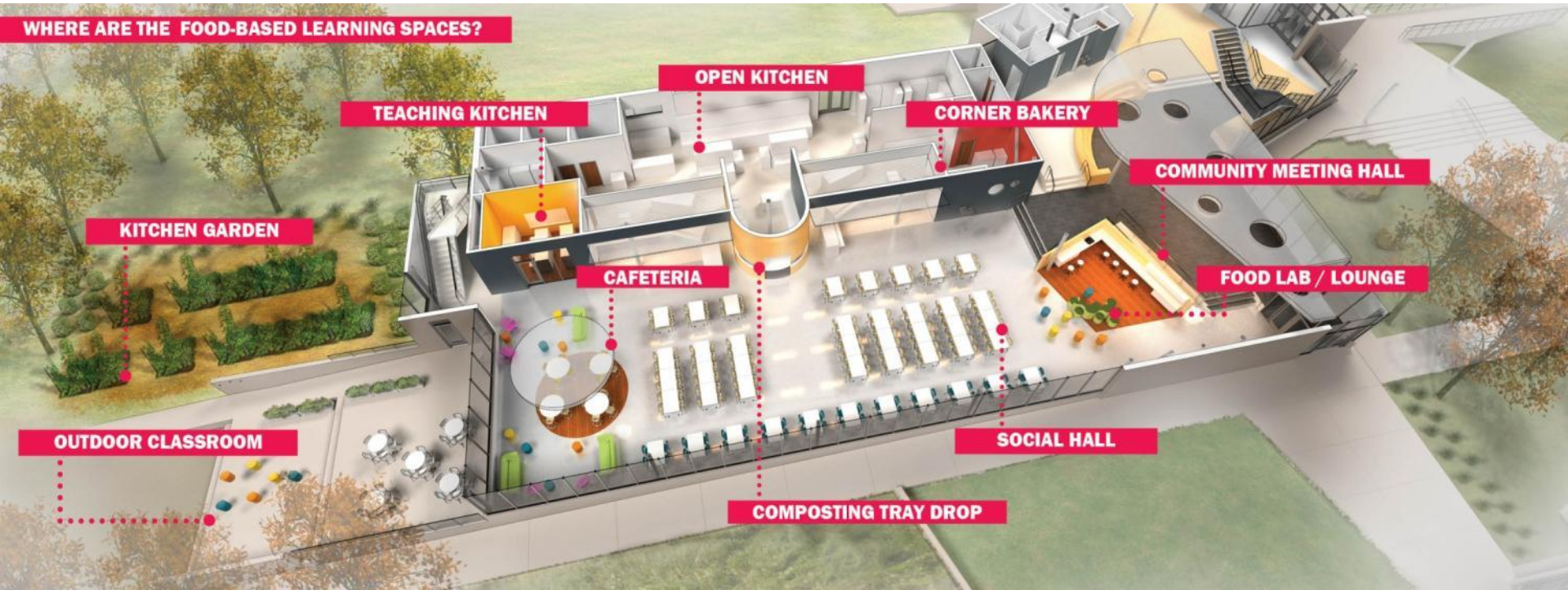


STOP IGNORING THE EVIDENCE

HEALTHY EATING DESIGN GUIDELINES FOR SCHOOL ARCHITECTURE©

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.

A NEW DIRECTION IN DESIGN FOR FOODSMART KIDS™

EVIDENCE-BASED DESIGN STRATEGIES

Buckingham County Primary School, VA
VMDO Architects

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

INCORPORATE **FRESH** & HEALTHY FOOD **CHOICES**

PRINCIPLE 2

ENGAGE SCHOOL COMMUNITIES IN FOOD PRODUCTION

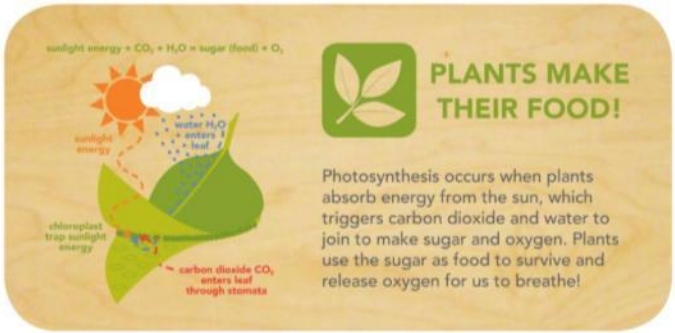
PRINCIPLE 3

“NUDGE” SCHOOL COMMUNITY TOWARDS HEALTHY EATING

PRINCIPLE 4

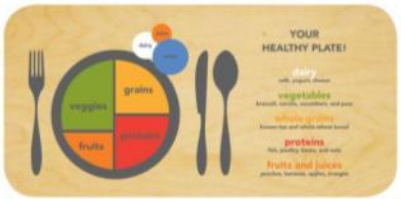
PROMOTE AWARENESS OF HEALTHY FOOD


HOW DOES YOUR EDIBLE GARDEN GROW?
There are many processes and natural resources that go into making the fruits and vegetables that you eat! Learn how plants make food and grow! Can you see all of these processes happening in your garden outside?


sunlight energy + CO_2 + H_2O = sugar (food) + O_2
water H_2O enters leaf
sunlight energy
chloroplast trap sunlight energy
carbon dioxide CO_2 enters leaf through stomata
PLANTS MAKE THEIR FOOD!
Photosynthesis occurs when plants absorb energy from the sun, which triggers carbon dioxide and water to join to make sugar and oxygen. Plants use the sugar as food to survive and release oxygen for us to breathe!


BUCKINGHAM
COMMUNITY SCHOOL GARDEN
Explore the growing life in our edible garden!


FRUITING PLANT
fruit
leaves
stems
seeds
seeds
roots


YOUR HEALTHY PLATE!
veggies
grains
fruits
proteins
dairy
vegetables
whole grains
proteins
fruits and juices


evaporation
water
THE WATER CYCLE
Earth uses and reuses its water supply in a process called the "water cycle." Evaporation is part of this water cycle and occurs when water changes from a liquid (water) to a gas (water vapor).
Clouds are condensed water vapor in liquid form.


YOUR HEART!
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?


OPEN SHADES!
BE ACTIVE!
It's healthy for your brain and body
RECYCLE! REUSE!
OPEN WINDOWS!
Your classroom windows face south. The sunshades on the outside of these windows help block direct sun rays so your room won't get too bright and hot!


NATURE'S LIGHT BULB
Solar tubes capture sunlight with a special lens and deliver the natural sunlight through special tubes into corridors and rooms throughout your school!


KITCHEN LAB

PRINCIPLE 5

ARTICULATE SCHOOL SPACES AS COMMUNITY ASSETS

EDUCATIONAL CAMPUS PLAN

PHYSICAL ACTIVITY ZONES

1. Gymnasia + Fitness Rooms
2. K-2 Play Terrace + Water Station
3. 3-5 Play Terrace + Water Station
4. Tot Lot Natural Play Area
5. Eco-Walks / Jogging Paths
6. Recreational Sport Fields
7. Open Play Area
8. K-2 Exercise Loop
9. 3-5 Exercise Loop
10. Weekend + Off Peak Bicycle Loops

FOODSMART KIDS® 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 Lab

HYDROLOGICAL SYSTEMS

1. Bioswales + Cleansing Biotopes
2. Frog Bog Wetland
3. Slate Channel + Waterfall Scupper
4. River Rock Stream
5. Rainwater Cistern
6. Pervious Parking Garden

ECO ACTIVITY ZONES

1. Native Meadow Grasses
2. Frog Bog Observation Deck
3. K-2 Science Garden
4. Arts Terrace + Garden Courtyard
5. Sonata Terrace + Courtyard
6. Pollinator Bee + Bug Garden
7. Woodland Hub


BUCKINGHAM
COMMUNITY SCHOOL GARDEN


RAIN
GARDENS
BIOSWALES + CLEANSING BIOTOPES


ECOLOGICAL CYCLES
EVERYTHING IS CONNECTED
THE SUN + THE SEASONS
THE PLANT - SEED CYCLE


BUCKINGHAM
COMMUNITY SCHOOL GARDEN
CISTERN


Caitlyn
Michelle
Victoria
Kaylene

PRELIMINARY FINDINGS

SOCIAL AND ORGANIZATIONAL CHANGE

AWARENESS OF AND INFLUENCE OF SPACE

PSYCHO-SOCIAL AND BEHAVIOR OUTCOMES

SOCIAL AND ORGANIZATIONAL CHANGE

NEW SCHOOL POLICIES AND PROGRAMS

GARDENING

HEALTHY PLAY PROGRAM IN PRIMARY SCHOOL

AFTER-SCHOOL NUTRITION PROGRAM, USING TEACHING KITCHEN

HEALTHY EATING MESSAGES INCORPORATED IN MORNING SCHOOL ANNOUNCEMENTS

SOCIAL AND ORGANIZATIONAL CHANGE

NEW TEACHER AND STAFF PROGRAMS

"BIGGEST LOSER" CONTEST

"CROSS-FIT" AFTER-SCHOOL PROGRAM

HEALTHY SNACKS AT TEACHER AND STAFF MEETINGS


SOME STUDENTS
DEMONSTRATE KEEN
AWARENESS OF SPATIAL
ELEMENTS' CONNECTIONS
TO HEALTHY THEMES.

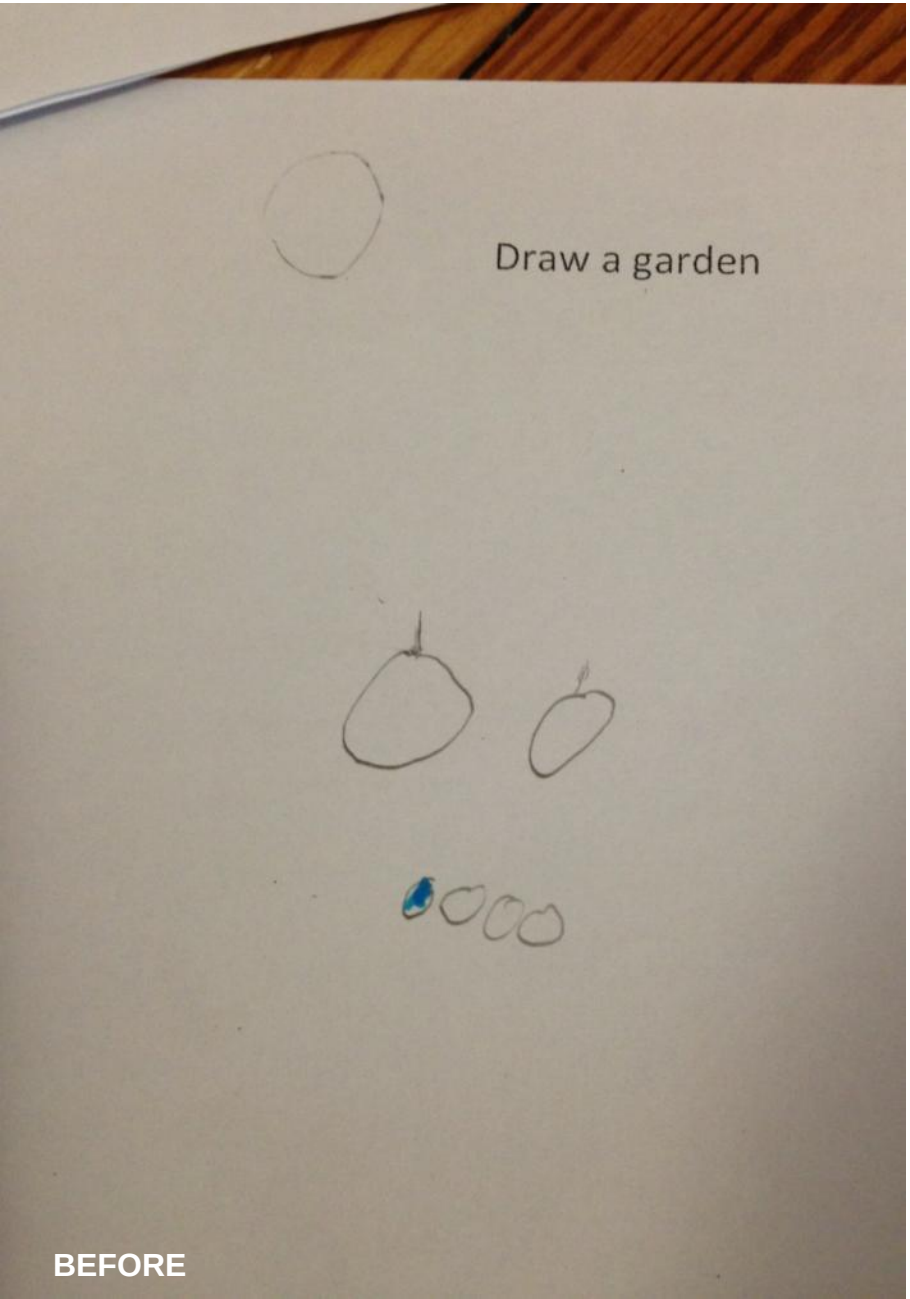
AWARENESS OF AND INFLUENCE OF SPACE

STUDENT MAP OF SCHOOL AT 12 MONTHS POST-OCCUPANCY

STUDENT MAPPING

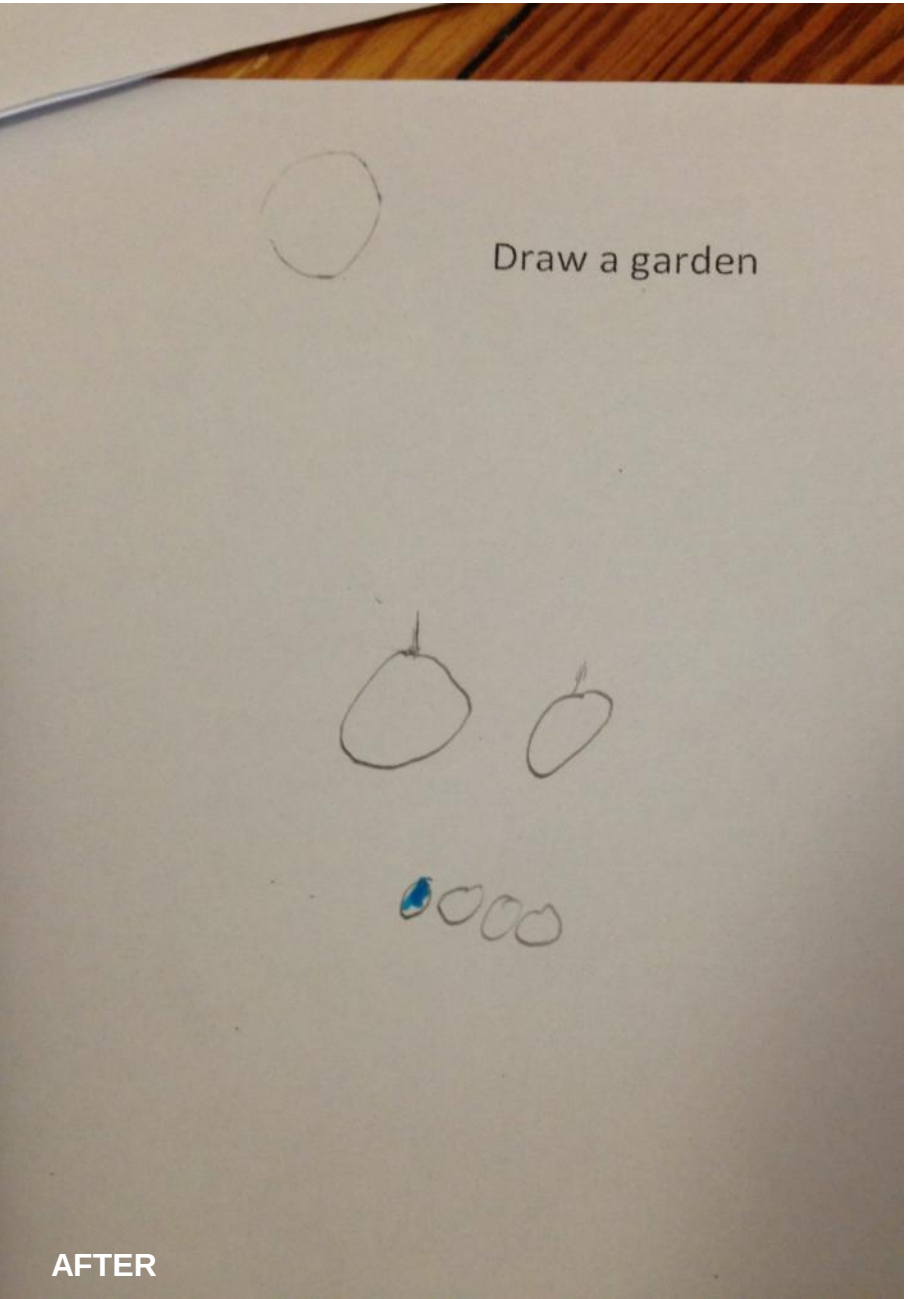
DINING COMMONS AT 12 MONTHS POST-OCCUPANCY

AWARENESS OF AND INFLUENCE OF SPACE

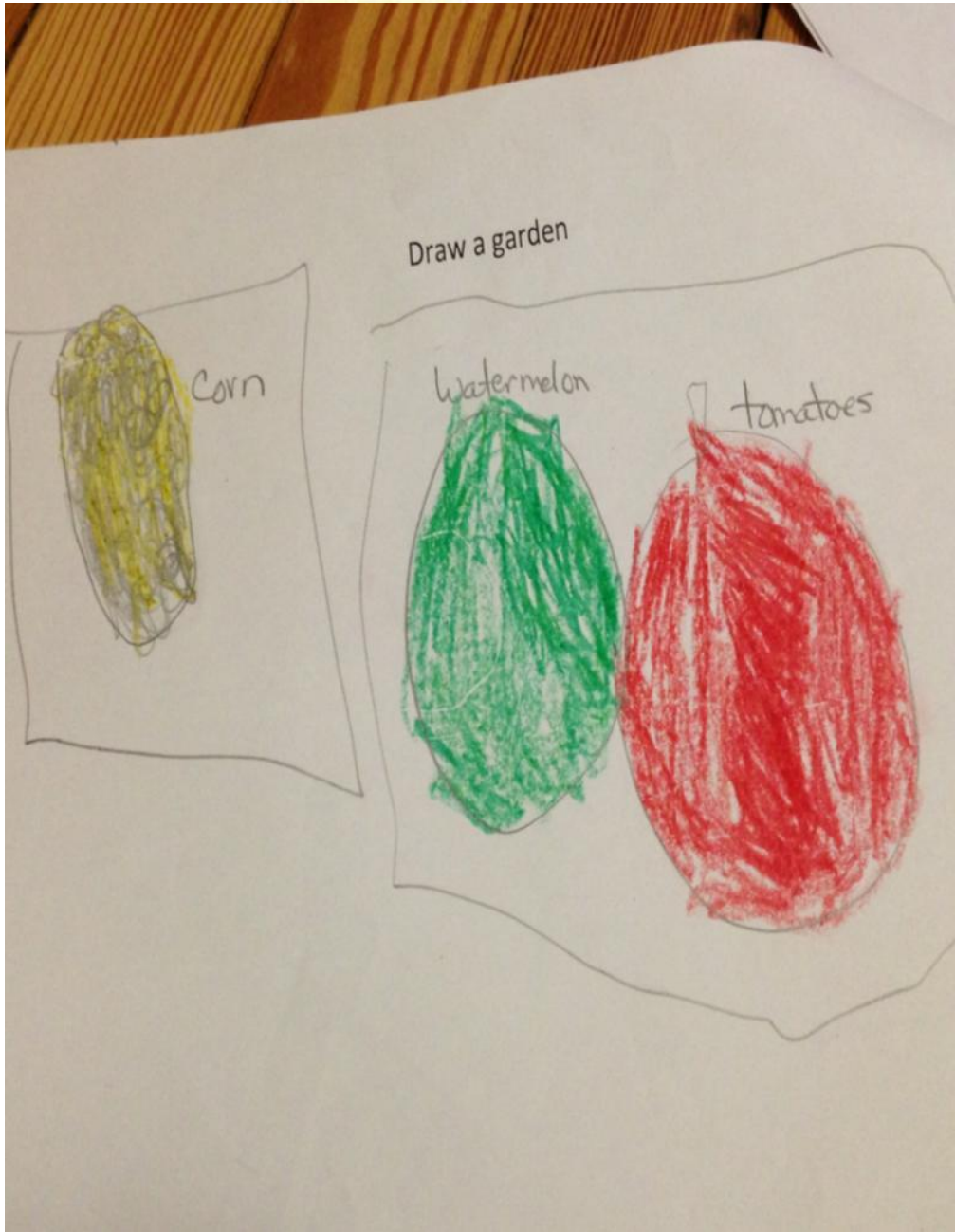


BEFORE

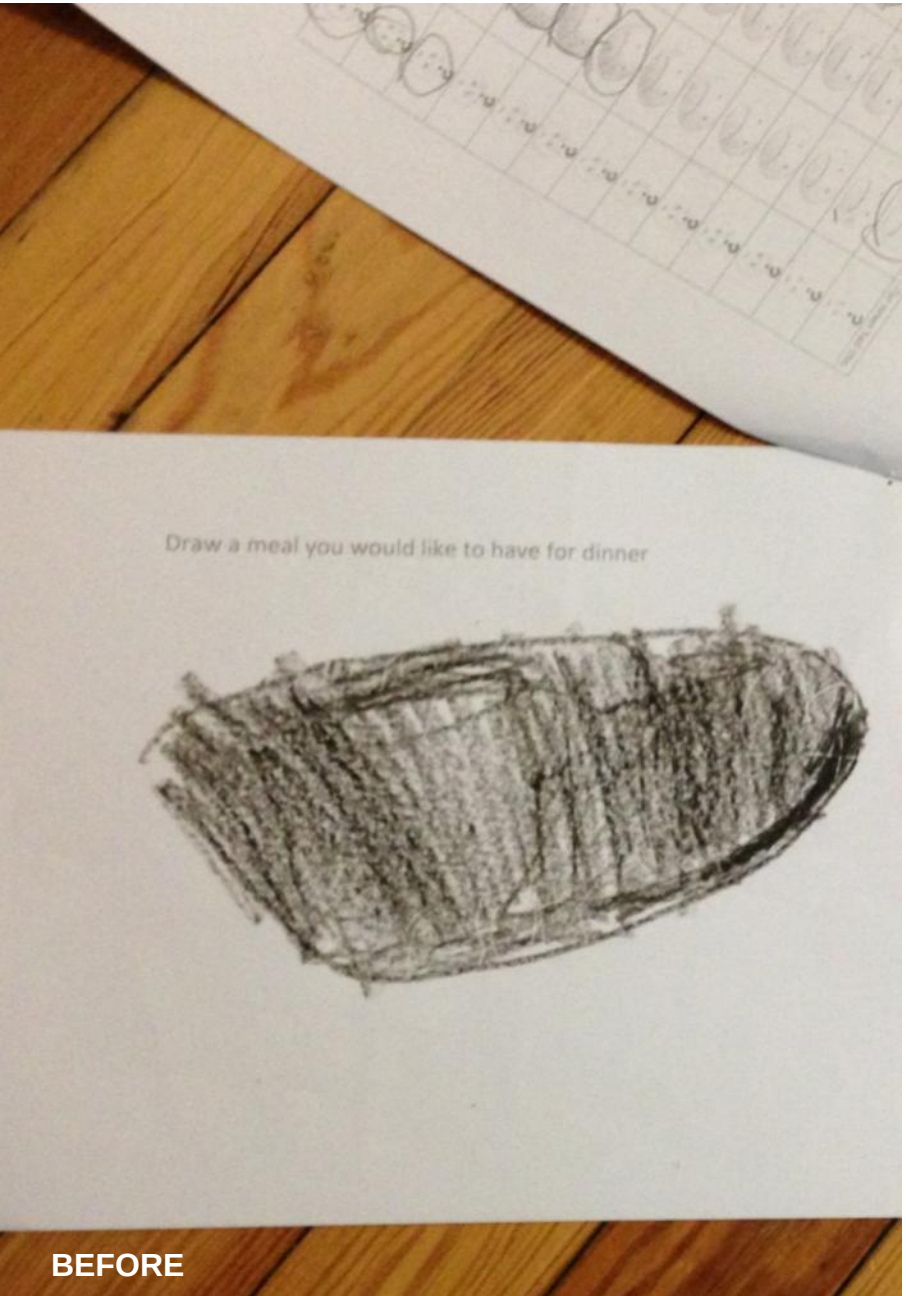
AWARENESS OF AND INFLUENCE OF SPACE



AFTER



AWARENESS OF AND INFLUENCE OF SPACE



BEFORE

AWARENESS OF AND INFLUENCE OF SPACE

AFTER

Granted, and… ~ *thoughts on education by Grant Wiggins*

10
Friday
Oct 2014

A veteran teacher turned coach shadows 2 students for 2 days – a sobering lesson learned

Posted by grantwiggins in Feedback & Formative Assessment, General, Research, Teaching

≈ 285 Comments

The following account comes from a veteran HS teacher who just became a Coach in her building. Because her experience is so vivid and sobering I have kept her identity anonymous. But nothing she describes is any different than my own experience in sitting in HS classes for long periods of time. And this report of course accords fully with the results of our student surveys.

I have made a terrible mistake.

I waited fourteen years to do something that I should have done my first year of teaching: shadow a student for a day. It was so eye-opening that I wish I could go back to every class of students I ever had right now and change a minimum of ten things – the layout, the lesson plan, the checks for understanding. Most of it!

This is the first year I am working in a school but not teaching my own classes; I am the High School Learning Coach, a new position for the school this year. My job is to work with teachers and admins. to improve student learning outcomes.

As part of getting my feet wet, my principal suggested I "be" a student for two days: I was to shadow and complete all the work of a 10^{th} grade student on one day and to do the same for a 12^{th} grade student on another day. My task was to do everything the student was supposed to do: if there was lecture or notes on the board, I copied them as fast I could into my notebook. If there was a Chemistry lab, I did it with my host student. If there was a test, I took it (I passed the Spanish one, but I am certain I failed the business one).

I have made a terrible mistake.

I waited fourteen years to do something that I should have done my first year of teaching …

Shadow a student for a day.

WE MOVE SCHOOLS FORWARD

Publications


VMDO Case Study

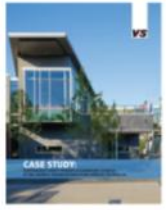
Healthy Eating Design Guidelines for School Architecture

Insights: Healthy by Design Case Study


Article (CDC): Healthy Eating Design Guidelines for School Architecture


Article (ABC News): Fighting Childhood Obesity One School Cafeteria at A Time


Article (Fast Company): 4 Award-Winning Buildings that Nudge People to Lead Healthier Lives



VS America Case Study: These Are No Ordinary Schools


Center for Active Design Case Study

NCCOR Green Health Workshop Report


Article (GreenSource): Healthy Kids Happy Students


Article (McGraw Hill): Designing a Healthy School Environment in a Rural Setting


Article (NPR): Buckingham School Offers a Unique Style of Learning

This concludes The American Institute of Architects
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