

## 15 MINUTES, 5 LAWS OF SUSTAINABLE SCHOOLS

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Primary and Secondary Education

Perkins Eastman

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INTRODUCTION

### The Ecological Footprint

MEASURES  
how fast we consume resources and generate waste

COMPARED TO  
how fast nature can absorb our waste and generate new resources.

Carbon footprint    Built-up land    Forest    Cropland & pasture    Fisheries

Energy    Settlements    Timber & paper    Food & fibre    Seafood

www.footprintnetwork.org/ Perkins Eastman

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INTRODUCTION

It now takes the Earth one year and four months to regenerate what we use in a year.

Number of Planet Earths

Years

1960-2005 Ecological Footprint

2005-2030, Scenarios

- Moderate business as usual
- Rapid reduction

Source: number of planet earths, source: years

www.footprintnetwork.org/ Perkins Eastman

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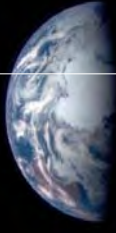
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INTRODUCTION

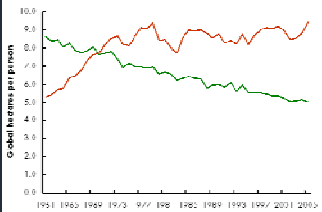


## Why implement sustainability measures at your school?

Because we face two pressing issues as we move toward the middle of this century....

The US "Footprint"

The US "Biocapacity"



Global Income per Person

1951 1960 1969 1973 9/7 198 1982 1989 1993 1997 2001 2010

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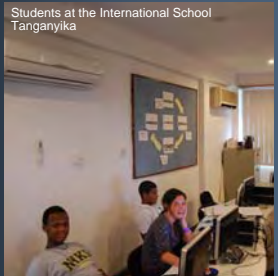
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INTRODUCTION



Scrap metal in Long Island



Students at the International School Tanganyika

## Global Warming is our children's "Cold War"...

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**Bordwell's 5 Laws**  
of Sustainable Schools

1



IT MUST AFFECT THE CLASSROOM

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IT MUST AFFECT THE CLASSROOM



- Indoor air pollution consistently ranks among the top five environmental risks to public health
- Poor indoor air quality can cause illness-requiring absence from school, and can cause acute health symptoms that decrease performance while at school.
- Indoor air quality can reduce a person's ability to perform specific mental tasks requiring concentration, calculation, or memory.

- 20% of the U.S. population spend their days in elementary and secondary schools.
- 50% of our nation's schools have problems linked to indoor air quality.

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IT MUST AFFECT THE CLASSROOM



- Natural light saves energy / promotes learning in schools.
- Good indoor air quality and ventilation maintain health and productivity in offices.
- Natural materials are often less harmful than man-made.
- Green cleaning - keep buildings green and people healthy.



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**Bordwell's 5 Laws**  
*of Sustainable Schools*

2



**IT MUST ACKNOWLEDGE REAL WORLD CONDITIONS**

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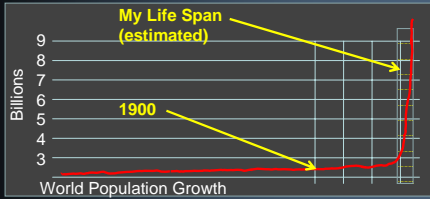
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- 6.72 billion (6,720,000,000). This figure continues to grow at rates that were unprecedented before the 20th century,
- The world's population, on its current growth trajectory, is expected to reach nearly 9 billion by the year 2042.




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### Reduce, Reuse, Recycle

- Compost collection and processing
- Purchasing biodegradable and recycled materials and packaging
- Recycling and reuse of materials
- Reduction of material consumption
- Water Conservation
- Day Lighting

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### Bordwell's 5 Laws of Sustainable Schools

# 3



IT MUST BE PRACTICAL

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IT MUST BE PRACTICAL



- Reduce parking and paved surfaces
- Decrease stormwater runoff leaving the site
- Plant low maintenance native vegetation
- Design for daylighting to reduce energy costs – use light sensors that reduce the amount of artificial lighting when daylighting is sufficient
- Added control systems to HVAC system
- Low water consumption models for replacement fixtures and faucets.

Source, citation, attribution, or other qualifier

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IT MUST BE PRACTICAL

### International School Tanganyika



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IT MUST BE PRACTICAL

### Cairo American College

**Testudo kleinmanni, the Egyptian tortoise.**  
 The Testudo Kleinmanni is one of the Mediterranean tortoise species and one of the most endangered land tortoises in the Mediterranean region.

- Use the turtle pens to create a roof that can reduce heat island effect
- Provides additional cooling insulation on roof.
- Live web "turtle cams" can add a technology dimension

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Cairo American College IT MUST BE PRACTICAL

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**Bordwell's 5 Laws  
of Sustainable Schools**

**4**

**IT IS SYSTEMS DEPENDENT**

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IT IS SYSTEMS DEPENDENT

Mechanical "Systems"

- Water source heat pumps
- Energy recovery "heat wheels"
- Digital direct control system

Building "Systems"

- Light Shelves
- Orientation
- Coordinated with landscape
- Day Lighting

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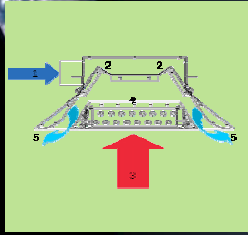
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### Chilled Beams

Primary/ventilation air (1) is introduced into the active chilled beam through a series of nozzles (2).

This induces room air (3) up into the active chilled beam and in turn through a secondary water coil (4).

Induced room air is cooled and/or heated by the water coil to the extent needed to control the room temperature. Induced room air is then mixed with the primary/ventilation air and the mixed air (5) is discharged into the room.



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### Bordwell's 5 Laws of Sustainable Schools

# 5



IT MUST MODEL ALTERNATIVE ENERGIES

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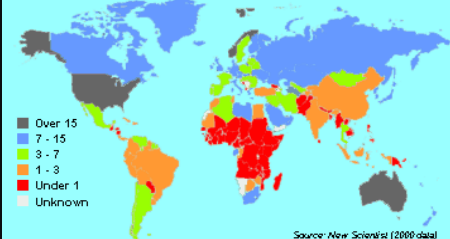
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### Carbon Dioxide emissions - annual tonnes per person



Source: New Scientist (2000 data)

America uses about 15 times more energy per person than does the typical developing country.

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ALTERNATIVE ENERGIES



- Install sensor systems for lighting
- Use vending misers
- Reduce heating and cooling temperatures
- Use renewable energy sources
- Purchase/invest in alternative energy
- Conserve water
- Implement cogeneration
- Build green buildings!

Make Sustainable Technologies part of the program

- Wind
- Solar Hot Water
- Photovoltaic's



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We can all make a difference....

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