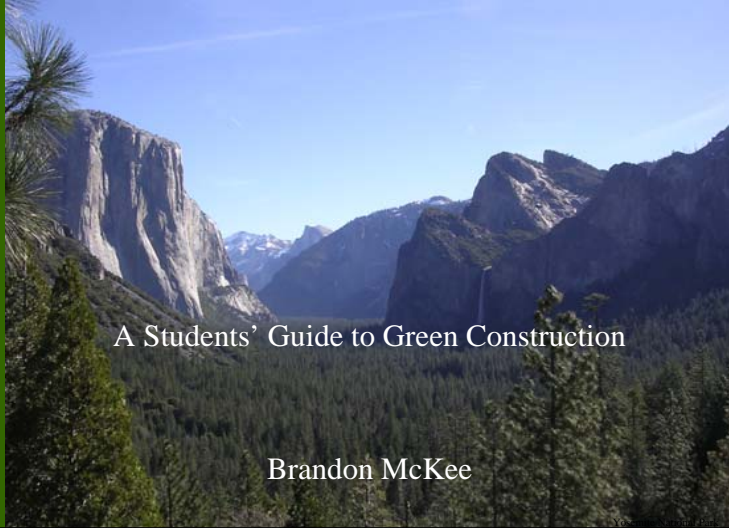
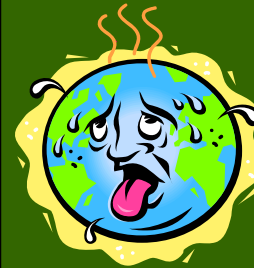


Why Build Green?



Building Industry Facts

- Each year buildings are responsible for:
 - Producing 38% of CO2 emissions
 - Gasses known to cause global warming



Building Industry Facts

- Each year buildings are responsible for:
 - Consuming 67.9% of electricity
 - & 39.4% of all energy produced



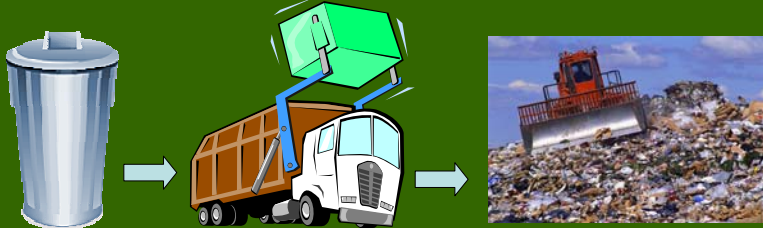
Building Industry Facts

- Each year buildings are responsible for:
 - Draining 12% of fresh water



Building Industry Facts

- Each year buildings are responsible for:
 - Sending 136 million tons of waste to landfills
 - Only 20 – 30% of waste is recycled
 - Average person – 2.8 pounds/day



Did You Know?

- We spend 90% of our lifetimes indoors.



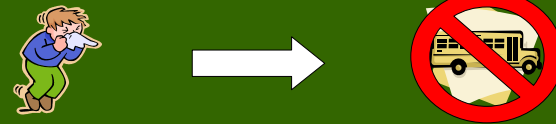
Did You Know?

- Indoor air pollution may be 2-5 times higher and sometimes 100 times higher than outdoors.
 - Pollution indoors includes : cleaning products, dust, personal care products, furniture and building materials



Did You Know?

- Asthma is the most common childhood chronic disease.
 - Over 6 million children have asthma
 - An estimated 14 million school days are missed because of asthma
 - Indoor pollution can trigger asthma – dust, mold, dander & secondhand smoke



Discussion #1

- With your group, discuss potential solutions to these problems caused by buildings.
 - Air pollution
 - Energy consumption
 - Draining fresh water
 - Filling landfills
 - Indoor air pollution
- Can you think of any issues this school has with these topics?

Green Building and LEED

- U.S. Green Building Council (USGBC) – non profit, based in Washington D.C.
- Committee based
- Organized to promote:
 - Sustainable site planning
 - Indoor environmental quality
 - Energy efficiency
 - Conservation of materials
 - Safeguarding water
- Created the Leadership in Energy & Environmental Design (LEED) rating system



LEED



- LEED was created to:
 - Define what is “Green”
 - Provide a standard of measurement
 - Prevent false green claims
 - Raise consumer awareness
 - Stimulate competition in the marketplace

LEED® Rating System

- Four levels of certification
 - Certified (26-32 points)
 - Silver (33-38 points)
 - Gold (39-51 points)
 - Platinum (52-69 points)



- 6 categories worth 69 points
 - Sustainable Sites (14 points)
 - Water Efficiency (5)
 - Energy & Atmosphere (17)
 - Materials & Resources (13)
 - Indoor Environmental Quality (15)
 - Innovation & Design Process (5)

What Makes a Building Green?

- Incorporating elements into design such as:
 - Waterless or low flow plumbing fixtures
 - Certified Wood Products – Eliminates clear cutting
 - High efficiency lighting fixtures
 - Low VOC emitting paints and products
 - Close to public/alternative transportation
 - Day lighting
 - Solar panels – photovoltaic cells



Yukon™ Waterless Urinal
- Waterless CO



Photovoltaic (Solar) cells

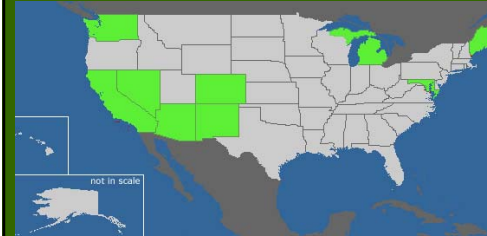


Low/ no VOC paints from
Sherman-Williams



Bicycle racks to reduce automobile use

States with Green Construction Legislation










(9) - States Requiring Green Construction on State/Public Funded Projects



(23) - States with Legislation Pending or Incentives for Green Construction

Government Required LEED

The following government agencies require LEED construction

-  General Services Administration (GSA)
-  U.S. Air Force
-  U.S. Navy
-  U.S. Army Corps of Engineers
-  Department of State
-  Department of Energy (DOE)
-  Environmental Protection Agency (EPA)



Green Buildings in Our Area



David L. Lawrence Convention Center



Gold



PNC Firstside Center



Silver



Pittsburgh Glass Center



Gold



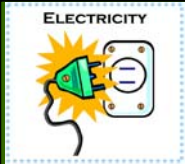
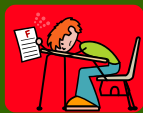
REI - South Side



Silver

Benefits of Green Schools

- Green schools can:
 - Use less energy
 - Use less water
 - Reduce greenhouse gas emissions
 - Provide more natural light and ventilation
 - Improve student and teacher health
 - Improve test scores and productivity
 - Teach you, parents and teachers about a healthier environment



Energy Benefits

The average energy costs annually on traditional schools is \$1.15/SF
 On average, green schools use 33% less energy and electricity than traditional schools.

Exercise: Find the average energy savings if our school was green.

Answer:

$$245,325\text{SF} \times \$1.15 = \$282,123.75 / \text{Year}$$

$$\text{Potential savings} - \$282,123.75 \times .33 = \mathbf{\$93,100.33 / \text{Year}}$$

Water Saving Benefits



The average water costs annually on traditional schools is
 \$0.06 / SF

On average, green schools use 32% less water and create less waste water than traditional schools.

Exercise: Find the average water savings if our school was green.

Answer:

$$245,325\text{SF} \times \$0.06 = \$14,719.50 / \text{Year}$$

$$\text{Potential savings} - \$14,719.50 \times .33 = \mathbf{\$4,710.24 / \text{Year}}$$

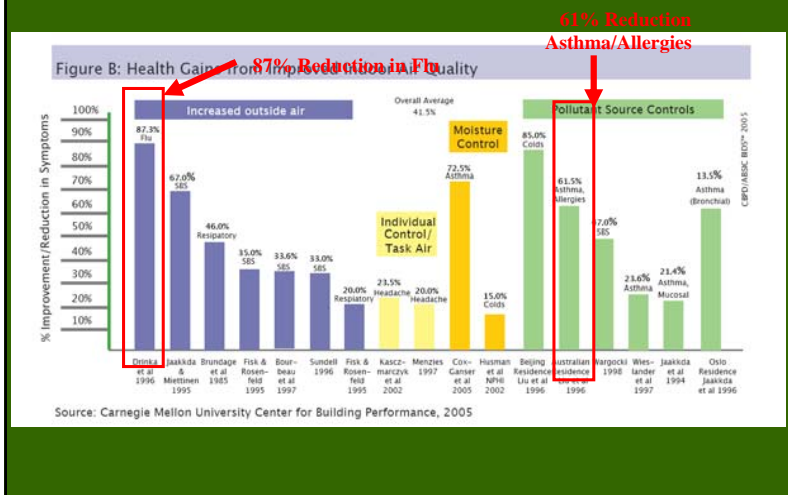


Air Pollution Benefits

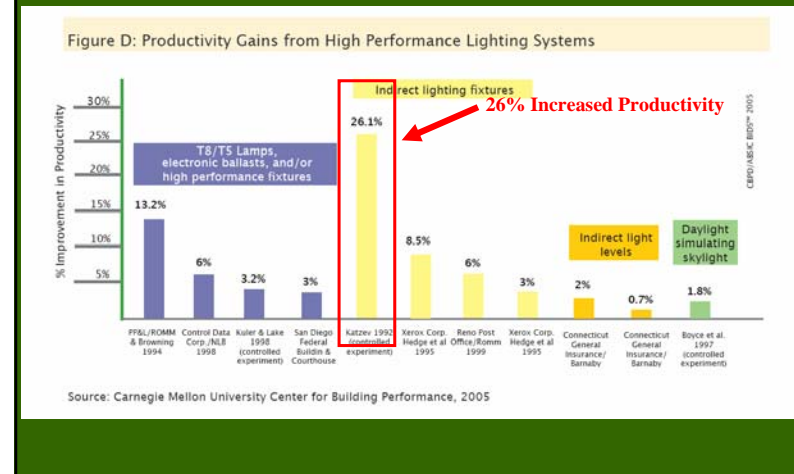
It is estimated that a green school could reduce the following emissions annually.

- 585,000 pounds of carbon dioxide (CO2)
- 1,300 pounds of sulfur dioxide (SO2)
- 1,200 pounds of nitrogen dioxide (NO2)

Health Benefits



Productivity Benefits



Green Saving Summary

Green schools costs on average 2% more initially than traditional schools.

Let us look at the payback period on this investment from only water and energy savings on our school.

Cost to go green $\$38,846,057 \times 0.02 = \$776,921$

Energy savings $\$93,100 / \text{Year}$

Water savings $\$4,710 / \text{Year}$

$\$97,810 / \text{Year}$ total potential savings

Payback period $\$776,921 / \$97,810$ annually = **7.9 Years**

Green School Case Studies

- Case Study #1 - Fossil Ridge High School - Fort Collins, Colorado
- Case Study #2 - Clearview Elementary School - Hanover, Pennsylvania

Case Study #1 Fossil Ridge High School Fort Collins, Colorado

State of the art 290,000 SF for 1,800 students

\$0 - Additional cost for LEED

60% - More energy efficient

\$11,500 - Annual water savings

75% - Waste recycled

Low VOC furnishings



LEED Silver 2005



Case Study #2 Clearview Elementary School Hanover, Pennsylvania

43,600 SF for 350 students

2.15% - Additional cost for LEED

7 Year - Payback period from energy savings alone

Uses 40% less energy than traditional school

50% of building materials recycled



LEED Gold 2002



Discussion #2

- With your group, discuss how to spread awareness about the benefits and advantages of LEED and building green schools and buildings.

Green Schools Video

- The following video was produced to spread awareness and create interest in high performance green schools.

[Better Places to Learn](#)

Sources

Information contained in the preceding presentation was compiled from the following sources.

- Build It Green www.builditgreen.org
- Governors Green Council www.gggc.state.pa.us
- Green Building Pages www.greenbuildingpages.com
- Greening America's Schools by Gregory Kats www.cap-e.com
- U.S. Environmental Protection Agency www.epa.gov
- U.S. Department of Energy www.energy.gov
- United States Green Building Council (USGBC) www.usgbc.org