

## What's the Buzz?

East High School environmental teachers Kate Larson and Adam Puderbaugh are "working with their students on a yearlong project within their curriculum where the kids are designing their own home with sustainable materials in a green way." Look for more to come on this and other projects!

"The lights have been installed in the gym and they made the gym so much brighter. You would have thought our P.E. teacher won the lottery. Thanks for your continued support to make our building more energy efficient."

~ Wayne Knutson, Principal, Park Avenue

### We want to hear from you!

Share your energy-related questions, comments, suggestions or projects and they may be included in our *Energy Report Card*. Do you have a co-worker or student with a green attitude? Just send the information about who, what, where, when and how to [lisa.simpson@dmps.k12.ia.us](mailto:lisa.simpson@dmps.k12.ia.us).

## Did You Know?

ENERGY STAR® products use less energy, save money and help protect the environment. There are more than 60 categories of products ranging from appliances, heating and cooling, water heaters systems, home electronics, lighting and more. Click below to learn more.

Source: [www.energystar.gov](http://www.energystar.gov)



## Renovating Our Schools



Carver: New construction completed 2007

Renovations to maximize energy efficiency are ongoing throughout the district. Some renovations are more obvious, like Jackson Elementary, which is closed for an entire school year. Other renovations are completed in phases so the building can remain open and occupied, like Roosevelt High School. Geothermal systems are scheduled for both schools.

The process involved in renovating the district's schools to ensure energy efficiency and sustainability starts with our commitment to create a sustainable design, which is shared with the architects and engineers.

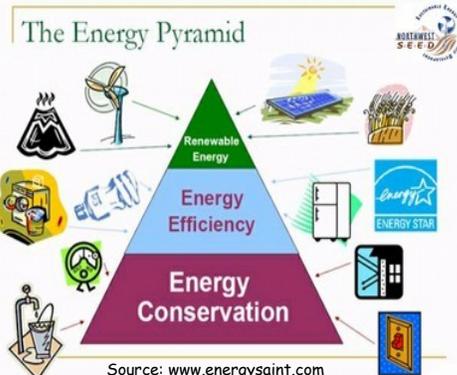
- The district has technical standards that specify lighting, windows, roofing, and HVAC systems the architect will incorporate into the designs for energy efficiency.
- The district's project manager, Taylor Ohde Kitchell, monitors renovations to ensure contractors follow the intended design.
- Johnson Controls and the mechanical contractor will then test the mechanical systems and program the HVAC to ensure proper operations.
- The team performs building checks and commissioning.
- Upon completion of the project, energy conservation experts from The Weidt Group verify the finished project meets specifications and will qualify for the anticipated savings and incentives from the utility provider.
- After the building resumes operations, the energy consumption and costs are compared to data prior to renovation. These comparisons allow the district to benchmark performance and verify energy consumption reduction and energy cost savings.

The energy costs and use per square foot for renovated buildings comparing fiscal year 2008-2009 to the baseline fiscal year of 1999-2000 are available on the DMPs Web site: [www.dmps.k12.ia.us](http://www.dmps.k12.ia.us).

## Energy Efficiency & Conservation

The Energy Pyramid illustrates the many steps we can take to use less energy and use it more wisely:

- Changing behaviors to save energy, such as turning off lights or computers when leaving the room, is called energy conservation.
- Replacing equipment or installing technology to save energy, such as installing a high-efficiency boiler or replacing windows, are examples of energy efficiency.
- Geothermal, wind, and solar are examples of renewable energy.



# ENERGY REPORT CARD

## Fixtures —

The energy-efficiency advantages of using T8 fluorescent lamps are longer lamp life, lower lumen depreciation, and longer operating hours, making them more cost effective. CFLs use 75 percent less energy and last about 10 times longer than incandescent bulbs.

Source: ENERGYSTAR®



Illustrations of T8 fluorescent lamp & a compact fluorescent lamp

## Occupancy Sensors —

The use of occupancy sensors allows fixtures to automatically turn off when a room is unoccupied, saving energy. Sensors also function as a security measure.

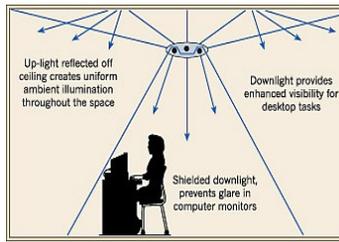


Illustration of occupancy sensor

## Daylighting —

Daylighting is the practice of positioning windows or other openings and reflective surfaces so that during the day natural light provides effective internal lighting. Energy savings can be achieved either from the reduced use of artificial (electric) lighting or from passive solar heating.

Source: Wikipedia



Picture source: www.ecmweb.com

## Direct/Indirect Lighting —

Lighting that is mixed from direct sources and indirect reflection. Fixtures of different types are installed that may emit light both up to the ceiling and down to the workspace.

Source: www.schorsch.com

## Lighting

Lighting represents approximately 35 percent of the energy usage in school buildings according to the DOE Energy Information Administration. To save energy, the district has standardized lighting fixtures utilizing T8 fluorescent lamps and compact fluorescent bulbs. Other lighting strategies, such as the use of occupancy sensors, direct/indirect lighting and daylighting, also contribute to energy savings.

**Aggressively pursuing funding for energy efficiency, Des Moines Public Schools has received \$1,487,097 in rebates from 2001 to 2009 as part of MidAmerican Energy Efficiency Participation.**



## Partner With MidAmerican Energy — Commercial New Construction Program

Des Moines Public Schools has made a commitment to bring all schools in the district to 21st-century standards. This commitment resulted in the implementation of cost-saving, energy-efficiency strategies. As part of Mid-American Energy's Commercial New Construction Program (available also for major renovations), The Weidt Group, working as a consultant for MidAmerican Energy, assists the district with energy-efficiency strategies throughout renovation. By participating in Mid-American's Energy Efficiency programs, the district has received **\$1,487,097 in rebates** for 2001 through 2009. These rebates have provided for ongoing energy-efficiency projects, reducing the need for a larger up-front capital investment.

Energy-efficiency strategies included in renovations:

- Building Envelope — wall and roof insulation, roof replacement, windows and doors.
- Lighting — standard fixtures, occupancy sensors, direct and indirect light, day lighting.
- HVAC — may include geothermal, boiler, or heat pumps appropriate to the building.
- CO<sub>2</sub> sensors — reduces ventilation rates during unoccupied periods.
- Steam trap replacements — A scheduled maintenance program can reduce energy costs 10 percent.
- ERV (Energy Recovery Ventilation) — All renovation projects include ERVs to optimize consumption and provide proper ventilation.

To learn more about energy rebates and programs available through MidAmerican Energy, visit their Web site at [www.midamericanenergy.com](http://www.midamericanenergy.com).

# ENERGY REPORT CARD



Preparation for a geothermal well field at Jackson

There are 20 geothermal systems in Des Moines Public Schools, including Jackson and Roosevelt.



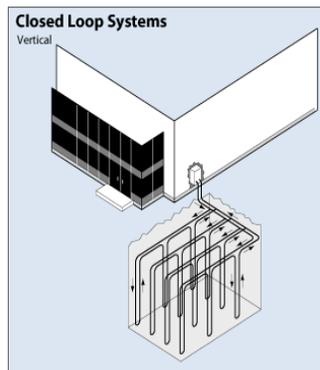
After installation of geothermal well field at Samuelson

Geothermal heat pumps are similar to ordinary heat pumps, but use the Earth's natural temperatures to heat and cool circulated water instead of using mechanical equipment to provide heat and air. Because they use the Earth's natural heat, they are among the most efficient and comfortable heating and cooling technologies currently available according to ENERGY STAR®.

"ENERGY STAR® qualified geothermal heat pumps use about 30 percent less energy than a standard heat pump."

Source: [www.energystar.gov](http://www.energystar.gov)

## Geothermal Systems



Source: [energysavers.gov](http://energysavers.gov)

### Cost-saving benefits:

- Competitive installation costs
- Lower energy costs by 25-40%
- Utility incentives/rebates
- Domestic hot water available at low or no cost in summer
- Lower maintenance costs

### Environmental benefits:

- No emissions (no fuel burned)
- Requires less electricity
- No danger of groundwater contamination

Source: [www.johnsoncontrols.com](http://www.johnsoncontrols.com)



Central Campus window replacement



## Building Envelope

"The building envelope is the separation between the interior and the exterior environments of a building. It serves as the outer shell to protect the indoor environment as well as to facilitate its climate control."

Source: Wikipedia

The envelope consists of the building's foundation, walls, roof, windows and doors, controlling the flow of energy allowing the building to provide comfort for the occupants and respond efficiently to heating, cooling, ventilating and natural lighting needs.

Source: Department of Energy, EERE

- Roofing: exterior finishes with high reflectivity help reduce cooling loads by reflecting the sun, waterproofing to prevent moisture issues.
- Insulation: adding more insulation in walls and roofs can significantly reduce air conditioning and heating costs.
- Doors: weather strip all doors and windows to prevent drafts resulting in heating and cooling loss.
- Windows: low-E glass with argon gas, incorporate daylighting and filter direct rays from the sun.

# ENERGY REPORT CARD



Looking for ideas for a science fair project? Try one of these Web sites:

Department of Energy

The NEED Project

Are you interested in some competition? Visit these Web sites:

Department of Energy — competitions and contests for energy technologies

Environmental Protection Agency — awards and competitions for high school students

## Indoor Air Quality (IAQ)

“Many energy-efficiency upgrades can improve the quality of a school’s indoor environment, protecting and even enhancing IAQ without sacrificing energy performance. These upgrades that can lead to cost savings are not only compatible with promoting IAQ, but they can actually improve a school’s IAQ.”

Source: www.EPA.com



Image source: www.ehow.com

Energy-related questions? You can e-mail them to [lisa.simpson@dmps.k12.ia.us](mailto:lisa.simpson@dmps.k12.ia.us).

## YEAR-TO-DATE SITE ENERGY USAGE REPORT

July 1, 2009 – September 30, 2009

(measured in kBtu/sq ft)

Ranked Lowest to Highest Energy User

Site	% Chg as compared to '08-'09	kBtu/SqFt	Site	% Chg as compared to '08-'09	kBtu/SqFt
McCombs			Callanan	-25%	6
Greenhouse	-47%	1	Hanawalt	-9%	6
Facility Mgmt	-23%	2	Park Ave	-2%	7
Wright	-21%	2	North	-1%	7
♦ McKee		2	Weeks	3%	7
Windsor	-34%	3	Jefferson	-19%	7
Pleasant Hill	-55%	3	Garton	-18%	7
Mann	6%	3	Carver	-1%	7
Hillis	-11%	3	Capitol View	-27%	7
Cowles	-22%	3	Moulton	-46%	7
Howe	9%	3	• Central Campus		7
Aviation Lab	-16%	4	Cattell	-8%	7
Madison	-35%	4	Hoyt	-24%	8
Perkins	-8%	4	Wakonda	-17%	8
Casady	2%	4	McKinley	-15%	8
Samuelson	-43%	4	East Academy	-19%	8
Lincoln South	-26%	4	River Plaza	-19%	9
• King		4	Welcome Center	-12%	9
Stowe	-18%	4	Smouse	-17%	9
Goodrell	-21%	5	Lovejoy	-2%	9
Hubbell	-8%	5	♦ Central Academy		9
South Union	0%	5	Studebaker	-28%	9
Morris	-19%	5	River Woods	-19%	10
Harding	-17%	5	East	-6%	10
Greenwood	-19%	5	Merrill	33%	10
Hiatt	-35%	5	Downtown School	-14%	10
Oak Park	-9%	6	Hoover/Meredith	-1%	10
• Roosevelt		6	Lincoln	-9%	11
Phillips	-15%	6	Edmunds	-8%	11
Monroe	-24%	6	McCombs	-25%	11
Jackson	-39%	6	Van Meter	-33%	13
Brubaker	-18%	6	Brody	-21%	15
Willard	-18%	6	Walnut Street	-10%	16
Findley	-24%	6			

- Buildings under construction prior year
- Buildings occupied during renovations
- ♦ Building unoccupied part of comparison YTD

Visit [www.dmps.k12.ia.us](http://www.dmps.k12.ia.us) for more details about the district’s energy mission and building performance.

