

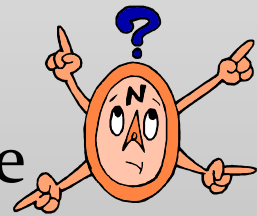
Implementing Preventive Maintenance in our Schools



BACKGROUND:

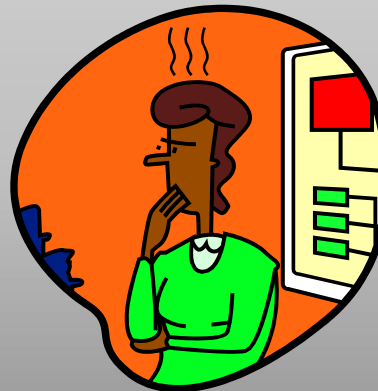


- Nearly two decades ago, legislation was passed requiring school districts to prolong the life expectancy of their schools while maintaining an adequate quality learning environment.
- At that point in time, it became evident that there were major disparities in the quality of care in our schools. Something needed to be done. The cost for capital maintenance repair projects was getting out-of-control and often needed urgent attention because of a lack of knowledge on how to maintain and manage our school facilities.



The dilemma...

- How to ascribe adequate maintenance care and proper facility management while establishing minimum standards in all of our schools...





A solution... AS 14.11.011(b)(4)

Ensure each district has a Preventive Maintenance plan that:

- i. includes a Preventive Maintenance (PM) management program;
- ii. addresses energy management;
- iii. includes a regular custodial care program;
- iv. includes preventive maintenance training;
- v. includes renewal and replacement schedules.



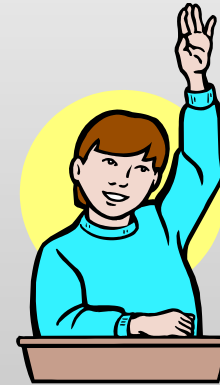
Quiz

- Who is responsible for the development and implementation of the district's Preventive Maintenance Program in our schools?
 - a) District Superintendent
 - b) State DEED Facilities
 - c) District School Board
 - d) District Maintenance Team
 - e) Bond Reimbursement Grant and Review Committee



Answer

- a) ~~District Superintendent~~
- b) ~~State DEED Facilities~~
- c) District School Board ✓
- d) ~~District Maintenance Team~~
- e) ~~Bond Reimbursement Grant and Review Committee~~





- AS 14.14.090 Duties of school boards

In addition to other duties, a school board shall

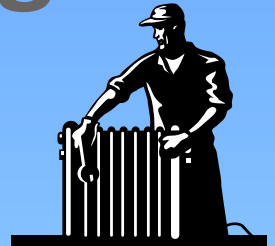
(10) provide for the development and implementation of a preventative maintenance program for school facilities; in this paragraph, "preventative maintenance" means scheduled maintenance actions that prevent the premature failure or extend the useful life of a facility, or a facility's systems and components, and that are cost-effective on a life-cycle basis.

Preventive Maintenance Program



What is Preventive Maintenance (PM)?

- In a nutshell, Preventive Maintenance is labor conducted to keep equipment working and / or extend the life of the equipment.

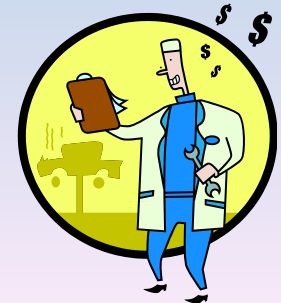


What is Corrective Maintenance (CM)?

- Corrective Maintenance, sometimes called “repair,” is conducted to get equipment working again.



(aka “putting out fires”)



What is Predictive Maintenance?

- Predictive Maintenance is conducted prior to equipment failure; it is oftentimes based on observation of imminent trouble or impending failure. Therefore, Predictive Maintenance prevents equipment failures before occurrence. By contrast, PM is routine or time-based.

Quiz (1 of 2)



- An individual buys an incandescent light bulb. The manufacturing company mentions that the life span of the bulb is 3 years. An example of Preventive Maintenance is:
 - a) Replace the light bulb just before the 3 years
 - b) Upon noticing flickering after 2 years, replace the bulb before it fails
 - c) Ignore flickering and replace bulb after failure

Answer

- a) Replace the light bulb just before the 3 years ✓
- ~~b) Noticing flickering after 2 years, replace the bulb before it fails~~
- ~~c) Ignore flickering and replace bulb after failure~~



Quiz (2 of 2)



- Name examples of Preventive Maintenance (PM) for your car.



- Name examples of Corrective Maintenance (CM) for your car.

An ounce of prevention is worth a pound of cure...



PM on a vehicle



- Check tire pressure and rotate tires seasonally
- Check on spare tire and flat tire tools
- Check all fluid levels (windshield wiper, engine, transmission, differential oil, engine coolant, gas, etc.)
- Change engine oil, air filter, spark plugs, belts, etc.
- Test, exercise emergency brake
- Check lights
- Etc.

Smart Investment





CM on a vehicle



- Repair / replace prematurely worn out tires
- Replace busted engine / transmission / differential
- Repair “frozen” emergency brake
- Etc.

Neglect is an expensive proposal



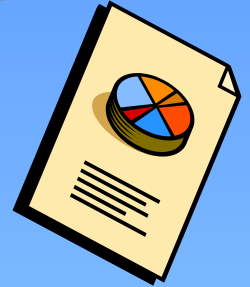
Not so Smart Investment



So how do we develop a PM program for our schools?

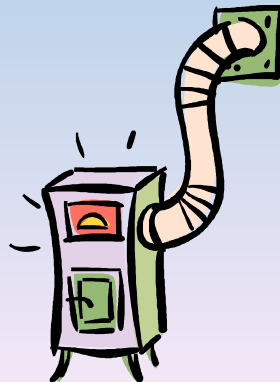


1. First, conduct an audit of buildings, grounds, and equipment.
2. From the audit, select structural items, pieces of equipment and systems requiring PM. Heating and cooling systems are a good place to start, but planners should think creatively because there may be other components that would be good candidates for PM.
3. Planners should now decide on frequency and type of inspections. Manufacturers' manuals are a good place to start.



PM Program Development (...continued)

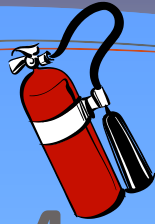
4. Format information gathered so that PM tasks can be scheduled easily. Ideally, because of reporting requirements, scheduling is handled by a Computerized Maintenance Management Program (CMMP).



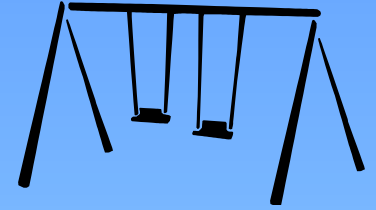
Quiz

- Name examples of Preventive Maintenance (PM) systems / items for a school.

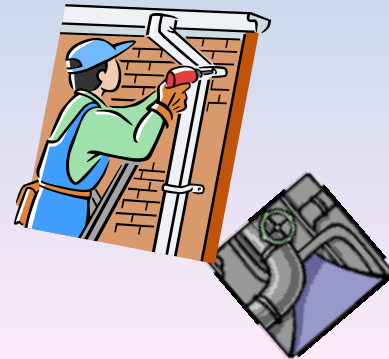
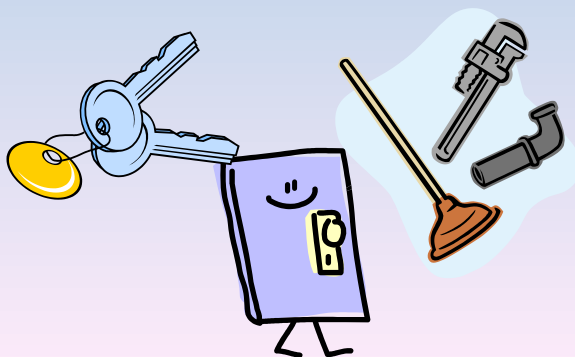




PM systems / items

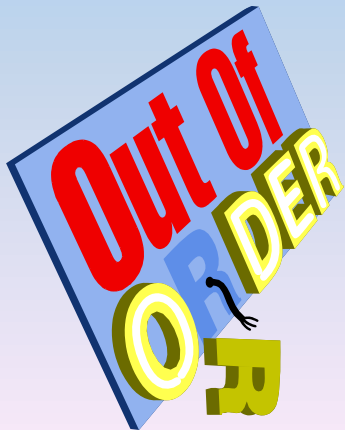


Air handler; boiler; playground equipment;
automatic doors; lighting; security systems;
alarm systems; doors and windows;
gas / fuel connections; emergency generators;
backflow devices; fire extinguishers; hot water heaters;
roofs, gutters; drains; fire system certification;
Etc.



Samples of PM Work Orders

(WO)





High School

WORK ORDER: 0000520953 - Mech Sys Circulating Pump 180 day 46002001

Equipment: 00016188 Mech Sys Circulating Pumps ALL 12 Location: 460, High School Job Plan: 0000001160 Mech Sys Circulating Pump 180 day Work Type: PM Asset: Equip LD: All are Grundfos and located in the mechanical room. P-H1 and P-H2 for boiler circulation. P-H3 and P-H4 for building heating circulation. P-H5 and P-H6 for fan room heating circulation. P-H7 for domestic hot water circulation. P-H8 and P-H8A for sprinkler line re-circulation. P-H9 and P-H9A for sprinkler tank re-circulation. P-H10 for water service circulation.	Target Start Date: 6/1/2013 Target Completion Date: 6/28/2013 Date Reported: 5/22/2013 Assigned To: Status Code: COMP Actual Finish Date:
-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	----------------------------------------------------------------------------------------------------------------------------------------------------------

Job Plan

- 1 Adhere to recommended safety practices and procedures for all maintenance actions. Consult your maintenance manuals for more detailed job descriptions and details.
- 5 Check for proper operation of pump.
- 10 Check for leaks on suction and discharge piping, seals, packing glands, etc.; make minor adjustments as required. If a suction strainer exists, clean it as needed.
- 15 Check pump and motor operation for excessive vibration, noise and overheating.
- 20 If applicable, check for misalignment and adjust as necessary.
- 25 Lubricate pump and motor if applicable (this does not apply to permanently lubricated pumps).
- 30 Clean exterior of pump, motor and surrounding area.

If corrective maintenance or other follow-up work is needed, please start a new work order – do not use this PM work order.

Labor

Hours Entered to Date: 0.25

Person	Start Date/Time	Finish Date/Time	Hours/Minutes

Materials and Services

Costs Entered to Date: \$0

Vendor	Description	Cost	Type (circle)

Parts Svc Shipping Trvl

Parts Svc Shipping Trvl



enerator Bldg at Elementary School

WORK ORDER: 0000521049 - Mech Sys Kerosene Heater ToyoStove 30 day 46002007

Equipment: 00018850 Mech Sys Direct-Vent Heater ToyoStove Laser 73	Target Start Date: 6/1/2013
Location: 460\ Generator Bldg at Elementary School	Target Completion Date: 6/28/2013
Job Plan: 0000001176 Mech Sys Kerosene Heater ToyoStove 30 day	Date Reported: 5/22/2013
Work Type: PM	Assigned To:
Asset:	Status Code: COMP
Equip LD: Operating instructions available online: http://www.rural-energy.net/docs/om_t73.pdf .	Actual Finish Date:

Job Plan

- 1 Adhere to recommended safety practices and procedures for all maintenance actions. Consult your maintenance manuals for more detailed job descriptions and details.
- 5 CAUTION: Turn off and unplug heater. Allow to cool completely before cleaning or maintenance.
- 10 WEEKLY: Clean louvers with a damp cloth. Check flue pipe joint to make sure connection is firm. Clean circulation fan cover and flue pipe area with vacuum cleaner. Check for any sign of fuel leakage along the fuel line and at all joints.
- 15 MONTHLY: Clean fuel strainer according to manufacturer's instructions.
- 20 Plug in the heater and turn it on. Ensure that the clock is set and active to enable the automatic (daily) igniter and burner cleaning cycle. If clock is not active, start the cleaning cycle manually each week.

If corrective maintenance or other follow-up work is needed, please start a new work order – do not use this PM work order.

Labor

Hours Entered to Date: 0.25

Person	Start Date/Time	Finish Date/Time	Hours/Minutes
--------	-----------------	------------------	---------------

Materials and Services

Costs Entered to Date: \$0

Vendor	Description	Cost	Type (circle)
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Parts Svc Shipping Trvl

Parts Svc Shipping Trvl



Elementary School

WORK ORDER: 0000524914 - Elect Sys Emergency Lighting 30 day 46001001

Equipment: 00015697 Elect Sys Emergency Lighting	Target Start Date: 8/1/2013
Location: 4600 Elementary School	Target Completion Date: 8/28/2013
Job Plan: 0000001005 Elect Sys Emergency Lighting 30 day	Date Reported: 7/24/2013
Work Type: PM	Assigned To:
Asset:	Status Code: WSCH
Equip LD:	Actual Finish Date:

Job Plan

- 1 *CAUTION: ELECTRICAL SHOCK MAY CAUSE SEVERE PERSONAL INJURY OR DEATH. SHUT DOWN AND LOCK OUT ANY ELECTRICAL SYSTEM PRIOR TO PERFORMING MAINTENANCE TASKS.
- 5 Adhere to recommended safety practices and procedures for all maintenance actions. Consult your maintenance manuals for more detailed job descriptions and details.
- 10 Inspect all emergency lighting units throughout the building.
- 15 Clean exterior of cabinet and light heads. Operate the test button to ensure that all lamps light properly. Replace any lamps as required.
- 20 For hardwired systems, check wiring for obvious defects.
- 25 For battery-powered systems, inspect battery and battery charging system to ensure that batteries are at a full rate of charge. Replace any battery that is not fully charged. At least twice each year, clean interior of cabinet, top of battery, and battery terminal; inspect cabinet, relay, relay contacts, pilot light, wiring, and general conditions; for wet-cell batteries, apply anti-corrosion coating to battery terminals.
- 30 Ensure that lamp heads are adjusted for maximum area lighting.

If corrective maintenance or other follow-up work is needed, please start a new work order – do not use this PM work order.

Labor

Hours Entered to Date: 0

Person	Start Date/Time	Finish Date/Time	Hours/Minutes

Materials and Services

Costs Entered to Date: \$0

Vendor	Description	Cost	Type (circle)

Parts Svc Shipping Trvl

Parts Svc Shipping Trvl



Warm Storage/Shop/Garage

WORK ORDER: 0000514966 - Elect Sys Grnd Fault Crc Interrupt 30 day 46002005

Equipment: 00018493 Elect Sys Ground Fault Circuit Interrupters	Target Start Date: 5/1/2013
Location: 460 Warm Storage/Shop/Garage	Target Completion Date: 5/28/2013
Job Plan: 0000001003 Elect Sys GF Circuit Interrupters 30 day	Date Reported: 4/24/2013
Work Type: PM	Assigned To:
Asset:	Status Code: COMP
Equip LD:	Actual Finish Date:

Job Plan

- 1 *CAUTION: ELECTRICAL SHOCK MAY CAUSE SEVERE PERSONAL INJURY OR DEATH. SHUT DOWN AND LOCK OUT ANY ELECTRICAL SYSTEM PRIOR TO PERFORMING MAINTENANCE TASKS.
- 5 Adhere to recommended safety practices and procedures for all maintenance actions. Consult your maintenance manuals for more detailed job descriptions and details.
- 10 Manually test all ground fault circuit interrupters (GFCI) to ensure that they are working properly.

If corrective maintenance or other follow-up work is needed, please start a new work order – do not use this PM work order.

Labor

Hours Entered to Date: 0.17

Person	Start Date/Time	Finish Date/Time	Hours/Minutes

Materials and Services

Costs Entered to Date: \$0

Vendor	Description	Cost	Type (circle)
			Parts Svc Shipping Trvl
			Parts Svc Shipping Trvl

PM WO Program Reporting

- As a means to account for facilities maintenance, DEED seeks the following PM reports, both during CIP submittals, and also during the scheduled 5-year cycle school district site visits. These reports give a written appreciation of the district's maintenance efforts / performance.
- a) Maintenance Hours by Month and Work Type
 - b) Comparison of Completed WO to all WO Initiated
 - c) Summary of Incomplete WO by Age and Status
 - d) Comparison of Scheduled to Unscheduled Maintenance
 - e) Unscheduled Maintenance Trends



School District 46 - Maintenance Hours by Month and Work Type - 7/1/2012 through 6/30/2013

	AD	CM	CP	GM	PM	PM*	SR	TH	TN	VM	Total Hours	Hours Available	Unreported Hours
Jul-12				16.00	51.25			520.00			587.25	647.49	60.24
Aug-12	1.08				74.12			0.50	20.00		95.70	158.74	63.04
Sep-12	1.00	8.00			33.22						42.22	167.12	124.90
Oct-12	0.40				26.17				8.00		34.57	159.61	125.04
Nov-12	0.32	1.00			88.43			2.03			91.78	182.02	90.24
Dec-12	0.59	0.08		159.43	154.90						315.00	166.07	-148.93
Jan-13	0.64			0.17	60.58						61.39	158.64	97.25
Feb-13	0.56	4.00			97.62			3.00			105.18	183.97	78.79
Mar-13	0.40	2.00			272.26						274.66	153.96	-120.70
Apr-13	0.48				415.92		5.00				421.40	166.65	-254.75
May-13		4.00			177.44						181.44	189.05	7.61
Jun-13		8.00	24.00	180.00	243.67	4.00				30.00	489.67	793.85	304.18
Total Hours	5.47	27.08	24.00	355.60	1,695.58	4.00	5.00	525.53	28.00	30.00	2,700.26	3,127.17	426.91

Work Types: AD=Administrative Labor CM=Corrective Maintenance CP=Capital Project EM=Emergency Maintenance EV=Event Report GM=General Maintenance PM=Preventive Maintenance SR=Snow and Ice Removal/Nature SS=School Support TH=Housing TN=Training TR=Travel Time VM=Vehicle Maintenance VN=Vandalism/Crime

* In some cases, hours are reported under work types other than what was entered in the work order. All work for buildings or equipment identified as housing will appear in the TH column. All work done on vehicles will appear in the VM column. Work orders that have a work type of PM but were NOT created by SERRC based on a pre-established schedule are shown in a separate column with the heading 'PM*' (except for housing and vehicles).

Work Order Data as of 8/18/2013, 2:03:09PM

Note: Work order hours are reported in the work order month, which may not be when the work was done.

**Comparison of Completed Work Orders
to All Work Orders Initiated**
7/1/2011 through 6/30/2012

<u>Month</u>	<u>Initiated</u>	<u>Completed</u>	<u>Remaining</u>
July 2011	260	260	0
August 2011	52	49	3
September 2011	278	243	35
October 2011	197	180	17
November 2011	197	174	23
December 2011	275	224	51
January 2012	307	259	48
February 2012	185	136	49
March 2012	257	202	55
April 2012	196	135	61
May 2012	189	85	104
June 2012	351	170	181
	2,744	2,117	627

Summary of Incomplete Work Orders by Age and Status

7/1/2011 through 6/30/2012

Status		Current	31-60	61-90	91-120	Over 120	Total
APPR	Approved	8	6	7	0	18	39
INPRG	In Progress	7	1	2	0	3	13
UNABLE	Unable to Complete	0	0	0	0	10	10
WMATL	Waiting for Material	2	0	0	0	0	2
WSCH	Waiting to Be Scheduled	164	97	52	0	250	563
		181	104	61	0	281	627

District

Comparison of Scheduled to Unscheduled Maintenance

7/1/2011 through 6/30/2012

<u>Month</u>	<u>Scheduled Maintenance WO Hours</u>	<u>Unscheduled Maintenance WO Hours</u>	<u>Total WO Hours</u>	<u>Percent Scheduled</u>	<u>Crime & Nature* WO Hours</u>
July 2011	482.00	306.00	788.00	61%	
August 2011	14.92	212.50	227.42	7%	
September 2011	196.93	115.50	312.43	63%	
October 2011	110.75	11.70	122.45	90%	
November 2011	89.55	11.40	100.95	89%	8.25
December 2011	195.00	30.00	225.00	87%	
January 2012	302.90	67.50	370.40	82%	
February 2012	115.88	22.25	138.13	84%	0.50
March 2012	190.47	1.30	191.77	99%	
April 2012	130.88	0.00	130.88	100%	15.00
May 2012	122.15	180.00	302.15	40%	
June 2012	217.83	36.50	254.33	86%	
	2,169.26	994.65	3,163.91	69%	23.75

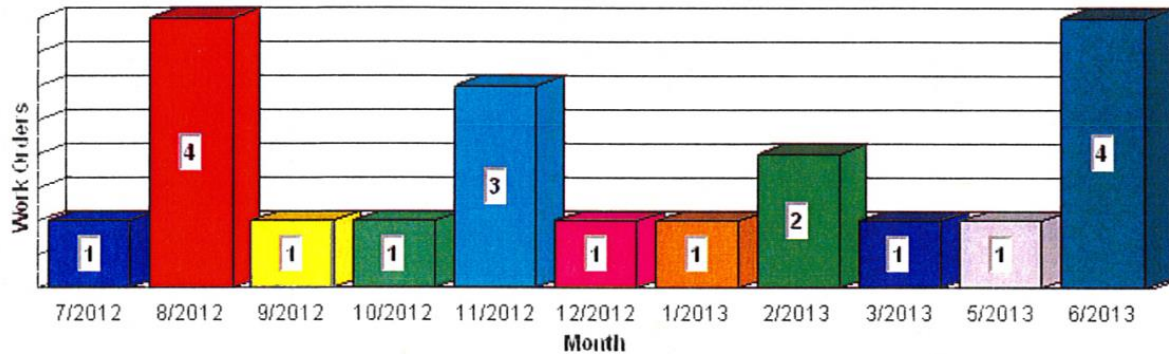
Unscheduled Maintenance Trends



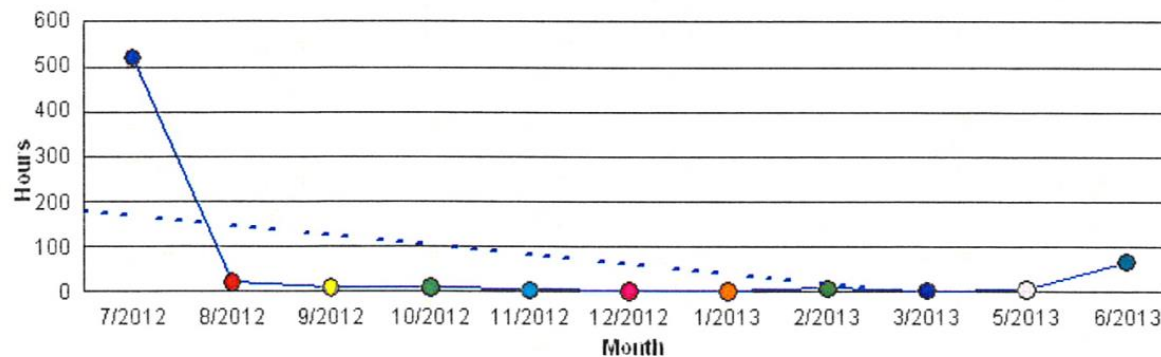
7/1/2012 through 6/30/2013

Month	Unsched. Maint. Work Orders	Unsched. Maint. WO Hours	Unsched. Maint. WO Costs
July 2012	1	520.00	\$108,270.00
August 2012	4	20.50	\$1,198.19
September 2012	1	8.00	\$143.52
October 2012	1	8.00	\$508.52
November 2012	3	3.03	\$2,135.59
December 2012	1	0.08	\$3.58
January 2013	1	0.17	\$7.61
February 2013	2	7.00	\$288.27
March 2013	1	2.00	\$77.01
May 2013	1	4.00	\$179.00
June 2013	4	66.00	\$1,613.32
	20	638.78	\$114,424.61

Number of Work Orders by Month



Work Order Hours by Month



Solid line connects hours by month. Dashed line shows a trend analysis of the hours.

Quiz (1 of 2)

- Which report would enable us to find out how many labor hours were spent on Teacher Housing last year?
 - a) Maintenance Hours by Month and Work Type
 - b) Comparison of Completed WO to all WO Initiated
 - c) Summary of Incomplete WO by Age and Status
 - d) Comparison of Scheduled to Unscheduled Maintenance
 - e) Unscheduled Maintenance Trends



Answer

- a) Maintenance Hours by Month and Work Type
- ~~b) Comparison of Completed WO to all WO Initiated~~
- ~~c) Summary of Incomplete WO by Age and Status~~
- ~~d) Comparison of Scheduled to Unscheduled Maintenance~~
- ~~e) Unscheduled Maintenance Trends~~

Quiz (2 of 2)

- Which report would enable us to find out how much funds were expended on non-preventive maintenance in July 2012?
 - a) Maintenance Hours by Month and Work Type
 - b) Comparison of Completed WO to all WO Initiated
 - c) Summary of Incomplete WO by Age and Status
 - d) Comparison of Scheduled to Unscheduled Maintenance
 - e) Unscheduled Maintenance Trends



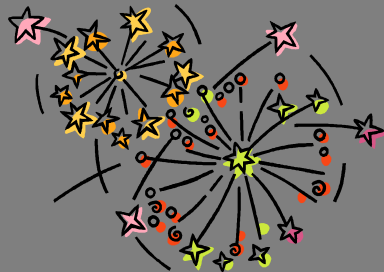
Answer

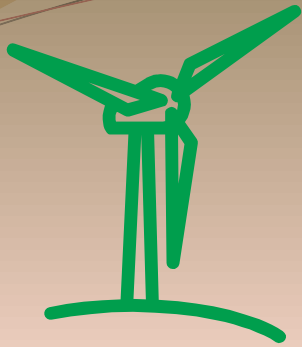
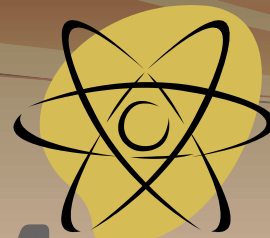
- a) ~~Maintenance Hours by Month and Work Type~~
- b) ~~Comparison of Completed WO to all WO Initiated~~
- c) ~~Summary of Incomplete WO by Age and Status~~
- d) ~~Comparison of Scheduled to Unscheduled Maintenance~~
- e) ~~Unscheduled Maintenance Trends~~



Congratulations!

- You've made it through the most time consuming portion of DEED's PM Plan: the PM Program.
- Let us now move on to the second portion of the Plan, which:
 - i. — ~~addresses a Preventive Maintenance (PM) management program;~~
 - ii. addresses energy management;**





Energy Management



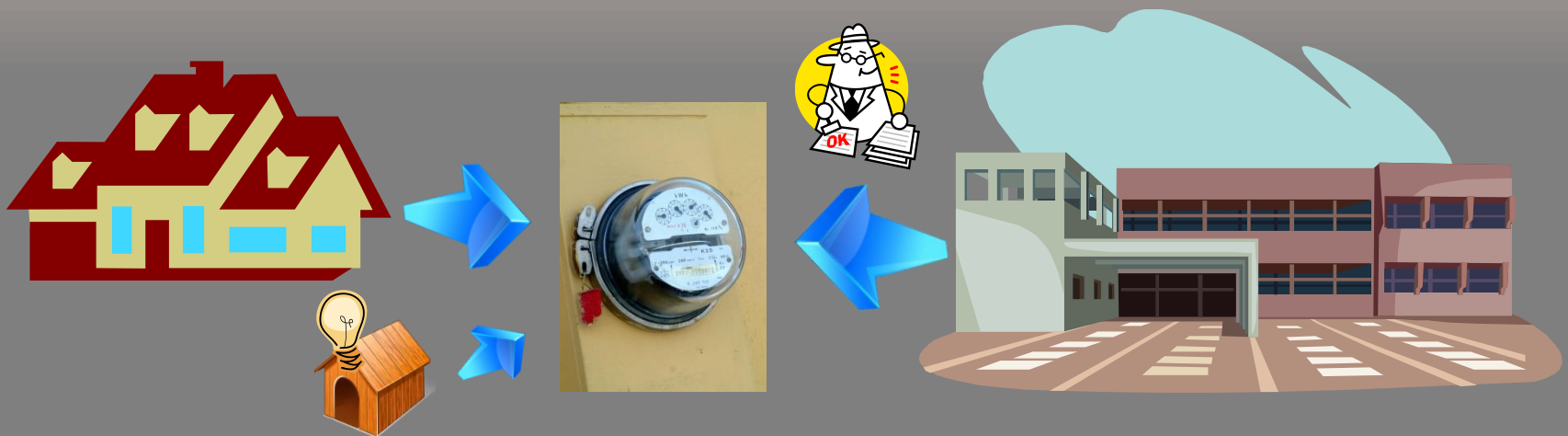
What is Energy Management?

- Energy Management includes planning and operation of energy-related production and consumption units.



What is DEED looking for in PM Energy Management?

- A plan that includes recording energy consumption for all utilities on a monthly basis for each building; *for facilities constructed before December 15, 2004, a district may record energy consumption for utilities on a monthly basis when multiple buildings are served by one utility plant.*



Quiz

- Name utilities that need to be accounted for in our schools.





Answer



Oil;

Propane;



Natural Gas;



Gasoline;

Electricity;



Coal;

Waste Heat Recovery;

Refuse;

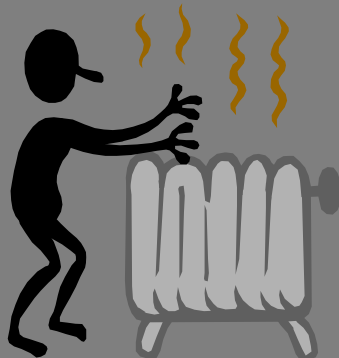
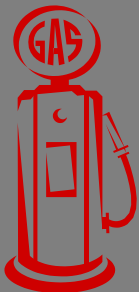
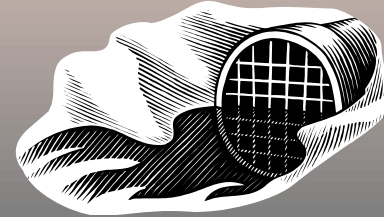
Cord of wood;

Water;

Wood pellets;

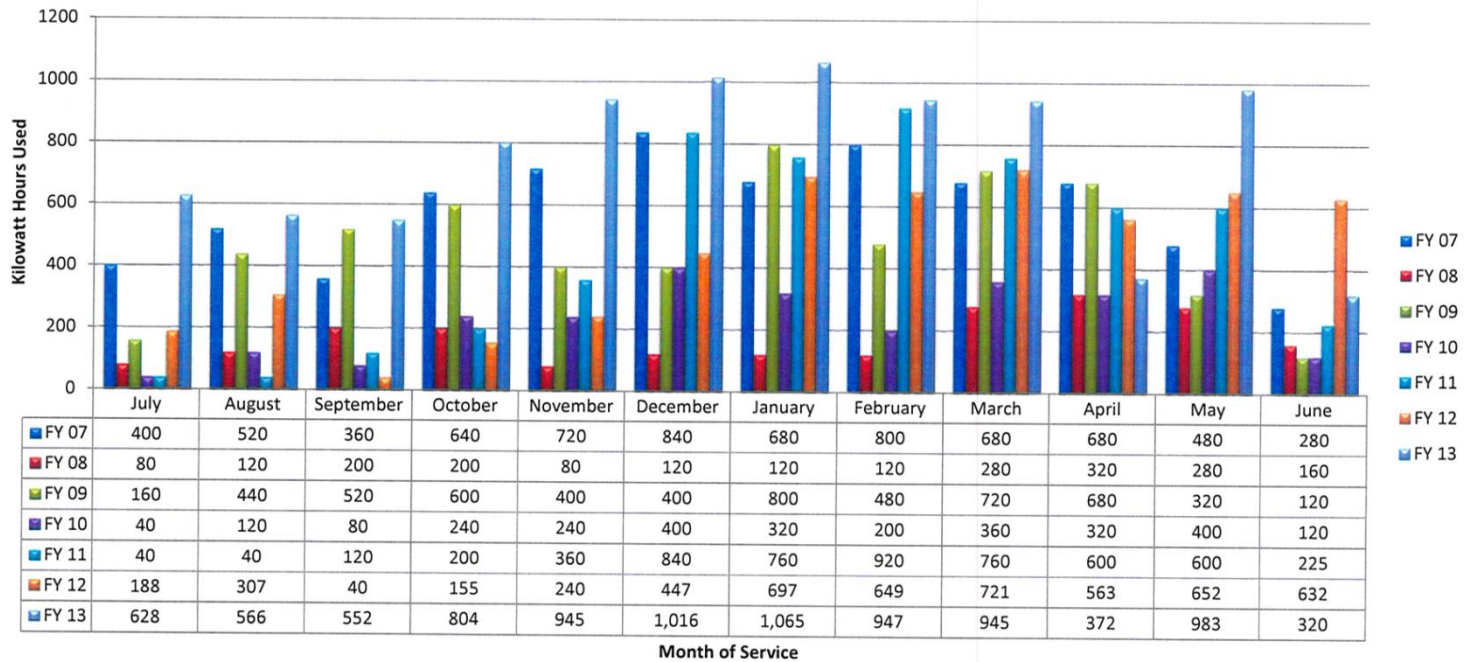
Waste water treatment;

Etc.



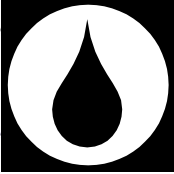
Samples of Energy Reports

FY 07 - FY 13 Auto Shop Electric Consumption

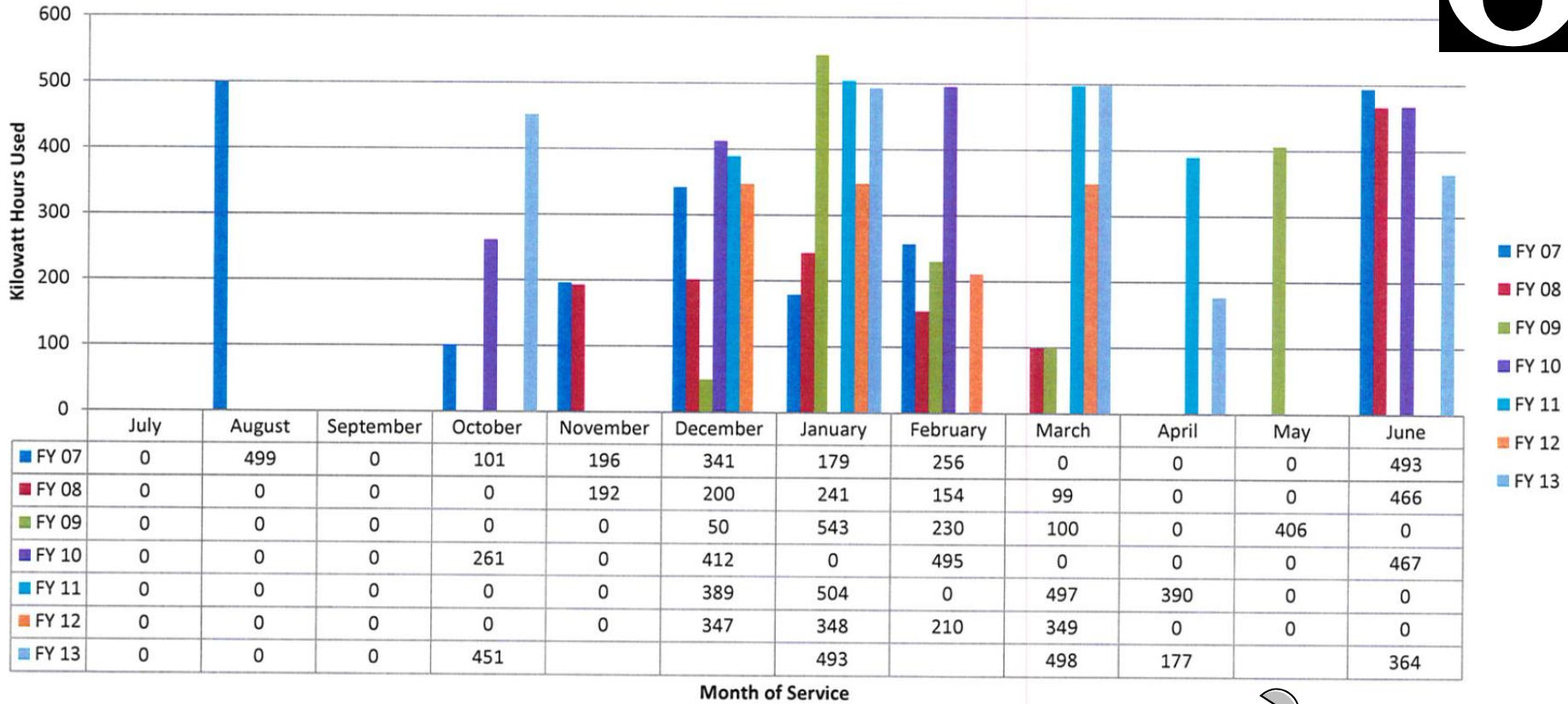


Year	Total Kilowatts	Monthly Average
FY 07	7,080	590
FY 08	2,080	173
FY 09	5,640	470
FY 10	2,840	237
FY 11	5,465	455
FY 12	5,291	529
FY 13	9,143	762

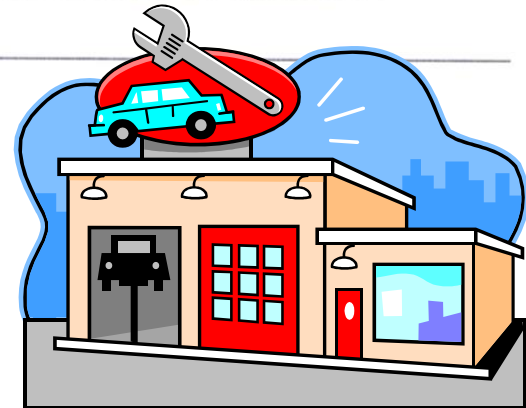


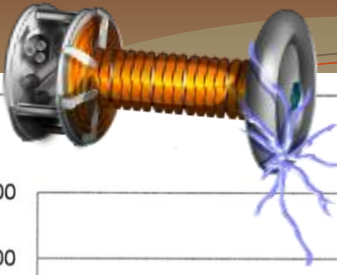


FY 07 - FY 13 Auto Shop Fuel Consumption

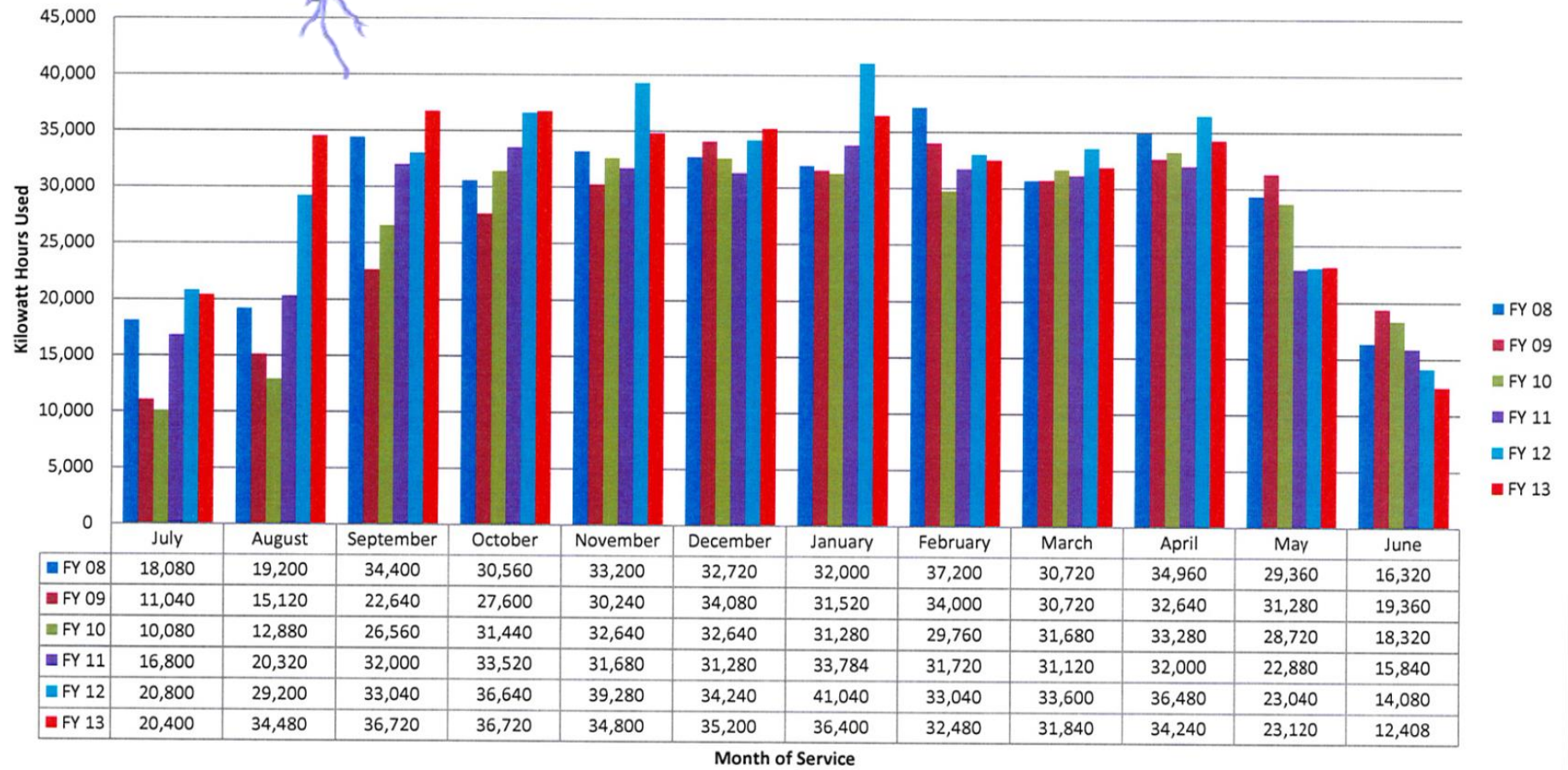


Year	Total Kilowatts	Monthly Average
FY 07	2,065	172
FY 08	1,352	113
FY 09	1,328	111
FY 10	1,635	136
FY 11	1,780	148
FY 12	1,253	104
FY 13	1,983	165





School Building FY '07 - FY '13 Electric Consumption

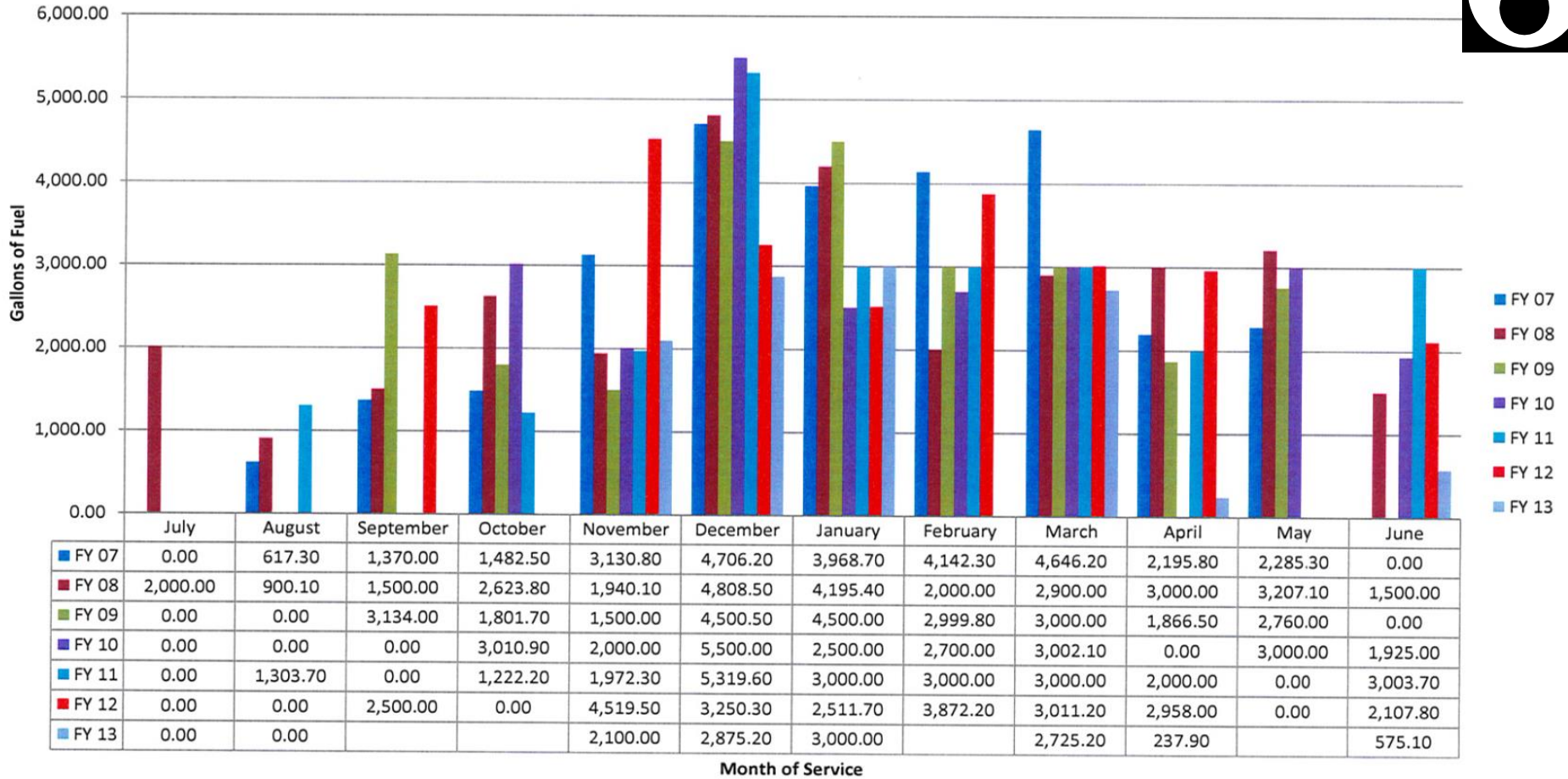


Year	Total Kilowatts	Monthly Average
FY 07	417,360	34,780
FY 08	348,720	29,060
FY 09	320,240	26,687
FY 10	319,280	26,607
FY 11	332,944	27,745
FY 12	374,480	31,207
FY 13	368,808	30,734

Edg. closed FY '09 - FY '10 (Partially opened and used FY '11)



FY 07 - FY 13 School Building Fuel Consumption



Year	Total Gallons Used	Monthly Average
FY 07	28,545	2,379
FY 08	30,575	2,548
FY 09	26,063	2,172
FY 10	23,638	1,970
FY 11	23,822	1,985
FY 12	24,731	2,061
FY 13	11,513	959

Bldg. closed FY '09 - FY '10 (Partially opened and used FY '11)



Heat Recovery - School Bldg.

Fuel Consumption	Gallons
	FY 13
July	0
August	0
September	502
October	453
November	92
December	92
January	259 <i>↗</i>
February	153
March	675
April	1,004
May	719 <i>} Wow</i>
June	173
TOTAL	4,122
AVERAGE/MO.	412

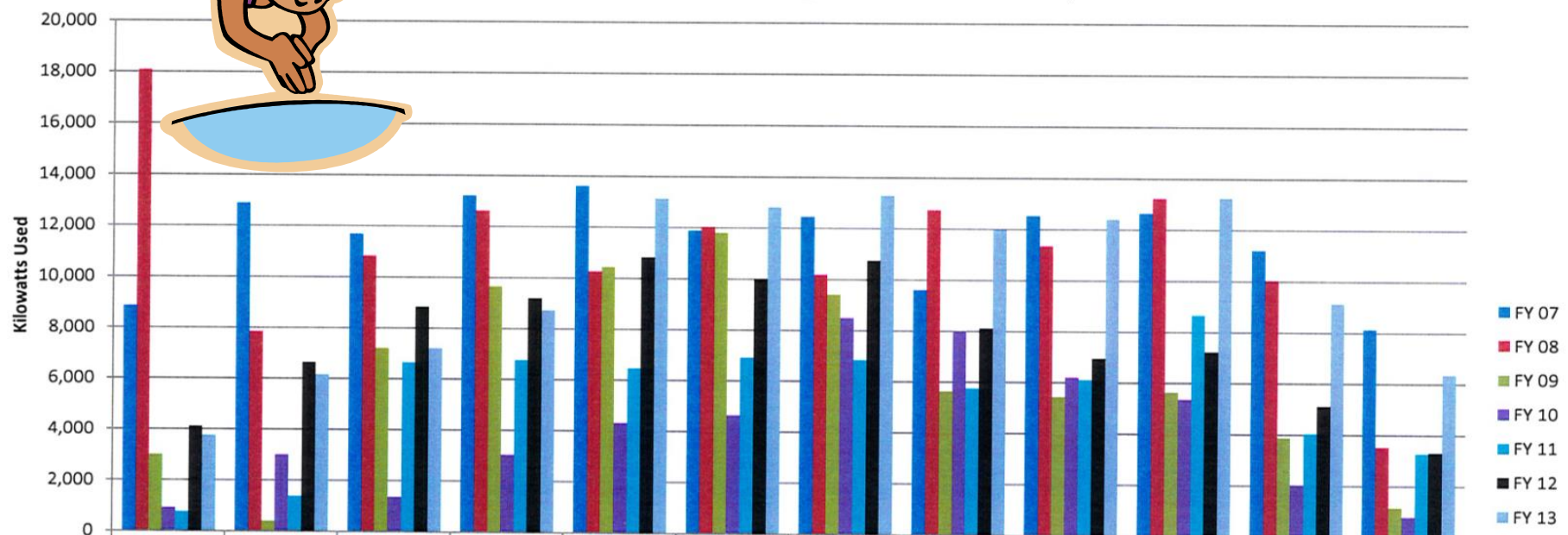
Heat Recovery School Bldg.

July	0
August	0
September	\$2,113
October	\$1,871
November	\$378
December	\$378
January	\$1,094
February	\$647
March	\$2,850
April	\$4,213
May	\$3,014
June	\$726
TOTAL	\$17,285
AVERAGE/MO.	\$1,728.49





FY 07 - FY 13 Pool Building Electric Consumption



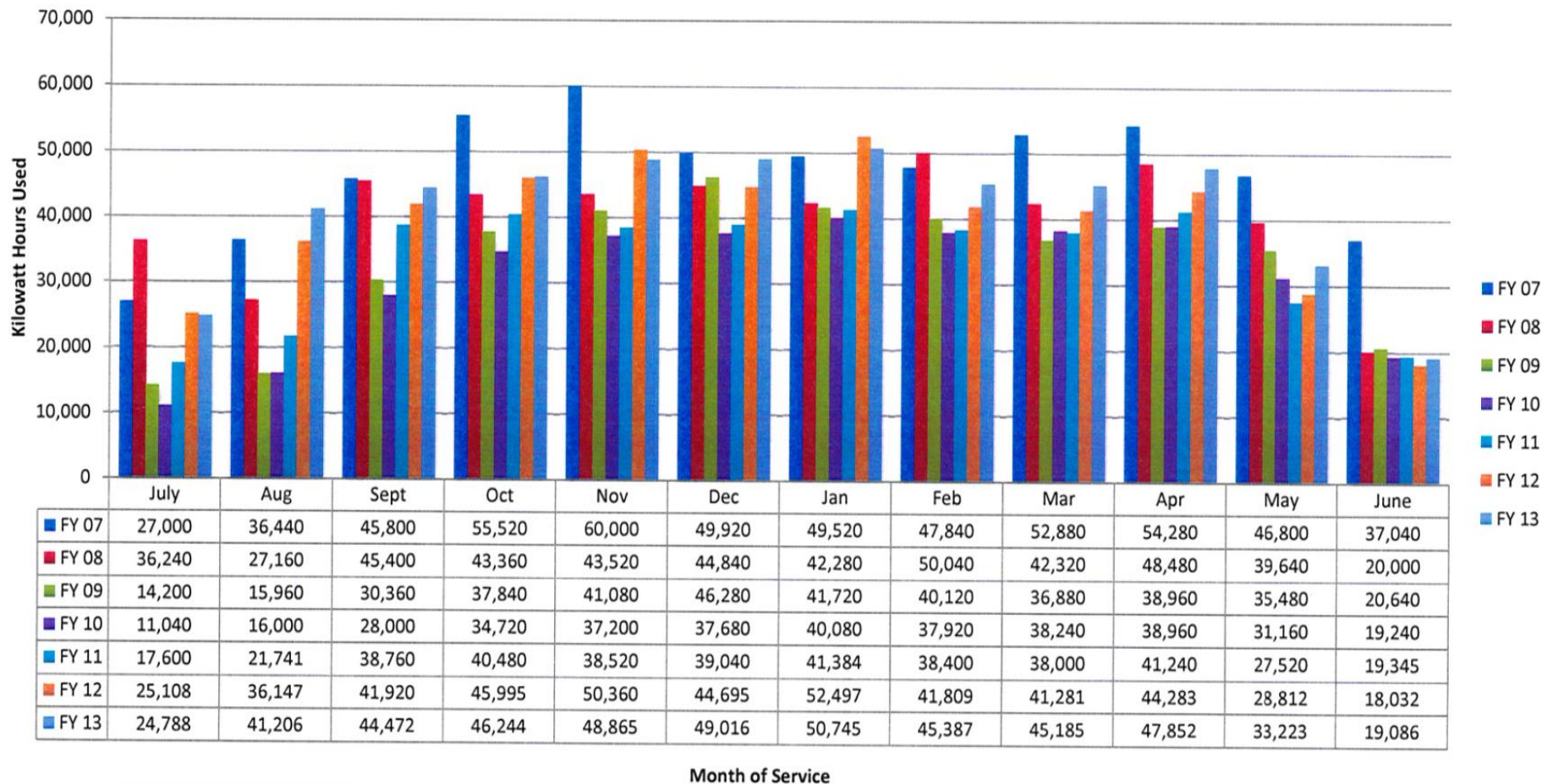
	July	August	September	October	November	December	January	February	March	April	May	June
FY 07	8,840	12,880	11,680	13,200	13,600	11,880	12,440	9,600	12,520	12,640	11,200	8,120
FY 08	18,080	7,840	10,800	12,600	10,240	12,000	10,160	12,720	11,320	13,200	10,000	3,520
FY 09	3,000	400	7,200	9,640	10,440	11,800	9,400	5,640	5,440	5,640	3,880	1,160
FY 10	920	3,000	1,360	3,040	4,320	4,640	8,480	7,960	6,200	5,360	2,040	800
FY 11	760	1,381	6,640	6,760	6,480	6,920	6,840	5,760	6,120	8,640	4,040	3,280
FY 12	4,120	6,640	8,840	9,200	10,840	10,008	10,760	8,120	6,960	7,240	5,120	3,320
FY 13	3,760	6,160	7,200	8,720	13,120	12,800	13,280	11,960	12,400	13,240	9,120	6,358

Month of Service

Year	Total Kilowatts	Monthly Average
FY 07	138,600	11,550
FY 08	132,480	11,040
FY 09	73,640	6,137
FY 10	48,120	4,010
FY 11	63,621	5,302
FY 12	118,118	7,597
FY 13	118,118	9,843



FY 07 - FY 13 ELECTRIC CONSUMPTION DISTRICT-WIDE

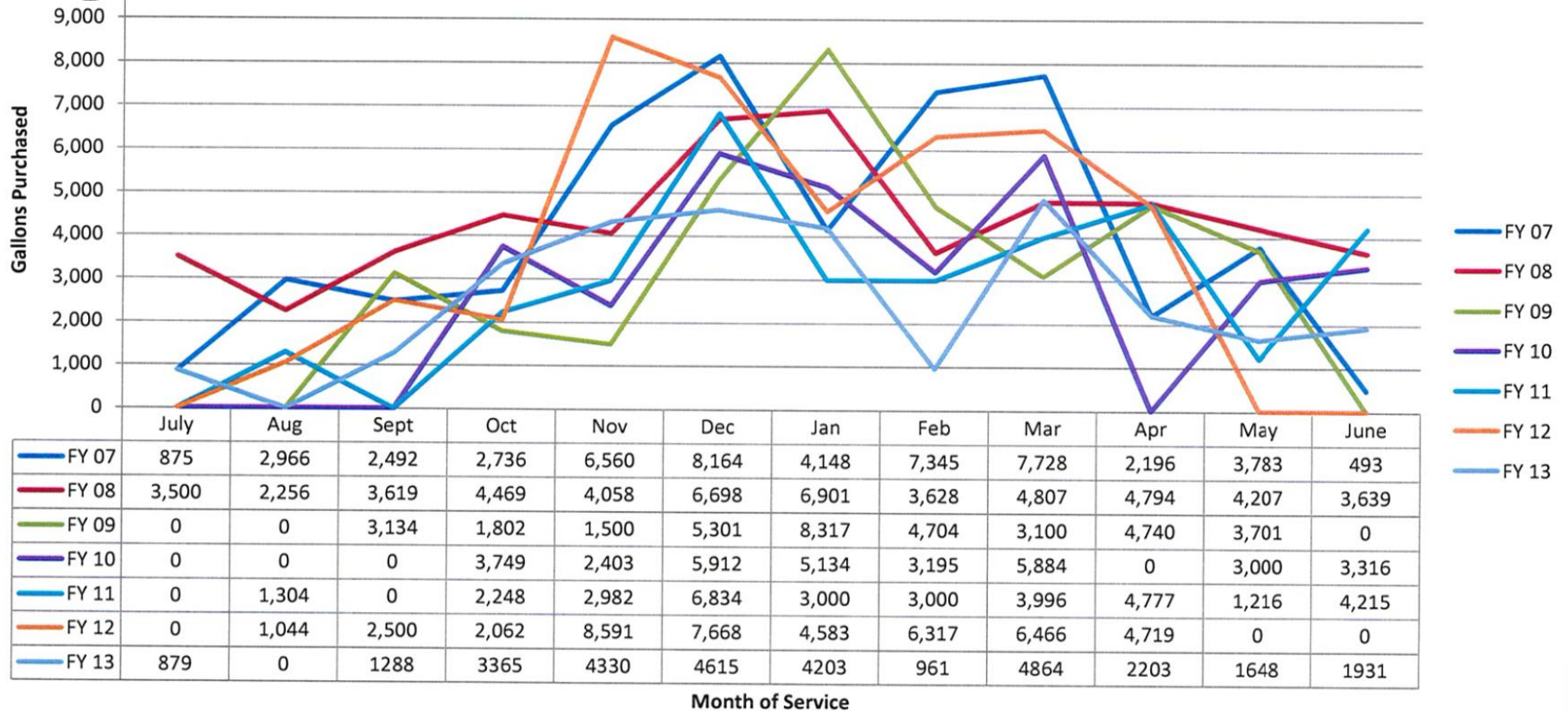


Year	Total Kilowatts	Monthly Average
FY 07	563,040	46,920
FY 08	483,280	40,273
FY 09	399,520	33,293
FY 10	370,240	30,853
FY 11	402,030	33,503
FY 12	470,939	39,245
FY 13	496,069	41,339





FY 07 - FY 13 FUEL CONSUMPTION - DISTRICT WIDE



Year	Total Gallons Used	Monthly Average
FY 07	49,487	4,124
FY 08	52,575	4,381
FY 09	36,297	3,025
FY 10	32,593	2,716
FY 11	33,571	2,798
FY 12	43,949	3,662
FY 13	30,287	2,524



Quiz

True or False

The monthly recording of energy costs of all utilities, for each building, meets DEED's basic requirements for the Utilities section of the PM Program.

- a) True
- b) False



Answer

- a) ~~True~~
- b) False

Consumption



Cost

DEED's regulation pertains to consumption, not cost. (However, most districts establish a correlation between consumption and cost, in order to be used as a managerial budgetary tool).

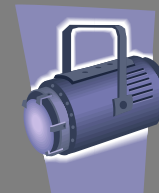
Quiz

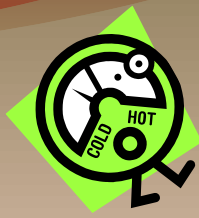
DEED's PM Energy Management plan is a basic tool that can assist school districts mitigate energy consumption.

What other steps may be taken to accomplish more efficient energy management?



- Establish an energy policy with specific goals and objectives.
- Assign someone to be responsible for the district's energy management program (plan + policy) and give energy manager access to top-level administrators.
- Conduct energy audits in all buildings to identify energy-inefficient units.
- Institute performance contracting when replacing older, energy-inefficient equipment (i.e., contracts requiring desired results rather than simply a list of needed products).
- Reward schools that decrease energy use
- Install motion detectors that turn lights on when a room is occupied (and off when unoccupied).





- Install energy-efficient equipment including power factor correction units, electronic ballasts, high-efficiency lamps, nights setbacks, and variable speed drives for large motors and pumps.



Small variable-frequency drive



A Honeywell electronic thermostat in a retail store



Modern ballast for powering 4 F32T8 office lamps



A modern retrofit LED lamp with "bulb" shape, complete with aluminium heatsink, a light diffusing dome and E27 screw base, using a built-in power supply working on mains voltage

Custodial Program

- It is now time for part III of DEED's PM Plan:
 - ~~i. addresses a Preventive Maintenance (PM) management program;~~
 - ~~ii. addresses energy management;~~
 - iii. addresses a regular custodial care program;**



What is Custodial Care?



Custodial care is the professional cleaning of buildings. A custodian's primary responsibility is as a cleaner, but also oftentimes carry additional basic maintenance and security duties. Most of the work performed by custodians is indoors, but sometimes it can be outdoors. Because school buildings are usually cleaned while they are empty, most custodians work evening hours. The work can be physically demanding and sometimes dirty and unpleasant. Custodial work is oftentimes undervalued and unacknowledged, though vital to any productive learning environment.

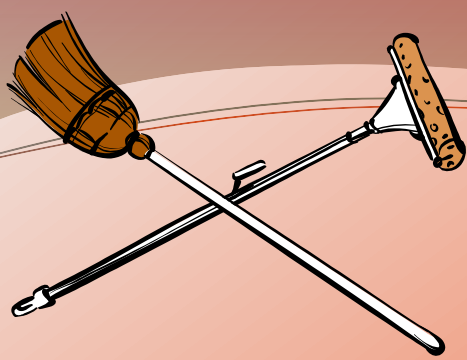
"It's the little stuff that really matters!"



What is DEED seeking in PM Custodial Care ?

- A custodial program that includes a schedule of activities for each building based on type of work and scope of effort.

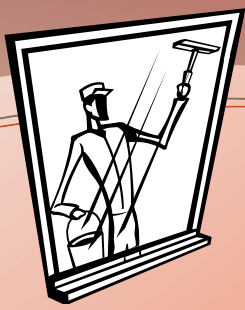
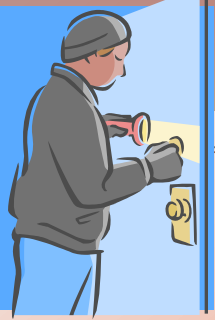




Quiz

- Name duties performed by custodians

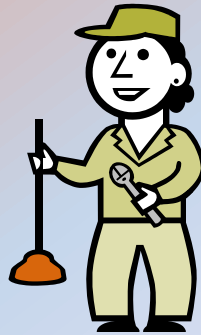




Answer



- Gather and empty trash and trash bins
- Clean building floors by sweeping, mopping, or vacuuming
- Clean bathrooms and stock them with soap, toilet paper, and other supplies
- Keep buildings secure by locking doors
- Clean spills and other hazards using sponges and squeegees
- Wash windows, walls, and glass
- Order cleaning supplies
- Make minor repairs to the building, such as changing light bulbs
- Notify managers when the building needs major repairs



- Mow lawns
- Sweep walkways
- Shovel snow
- Etc.





Samples of Custodial Care Program Extracts



The Simpsons character



Groundskeeper Willie

Gender	Male
Job	Groundskeeper at Springfield Elementary School

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Custodial Procedures Guidelines



IMPORTANCE OF THE CUSTODIAN'S JOB

The process of teaching children in school involves not only the teacher, but support staff and parents whose services contribute directly or indirectly to their educational growth. In the course of the day-to-day work, it may seem that it is an endless job of cleaning rooms that will be dirty again tomorrow. As true as this may be, it should be remembered that how well you do your job can affect not only the health and safety of the children, but the morale and atmosphere of the entire school. Custodians are responsible primarily for cleaning the school building. Buildings, equipment, and grounds are in your care. Operations and preventative maintenance includes security to prevent vandalism and theft. The community, teachers, and pupils take pride in a well kept attractive school and will help you keep it that way.

PUBLIC RELATIONS

The principal or head teacher needs the assistance of professional custodians. The district realizes the importance of the custodian's position and appreciates the fact that a clean, well-kept, properly heated and ventilated building favorably affects the teachers in their teaching and the children in their learning. You can gain good will for the school through efficiency and a friendly attitude toward pupils, teachers, and visitors. The public expects all district employees to be dependable, courteous and cheerful.

Custodians are a part of the school's team. As a team member, you are expected to support all staff in a manner which will reinforce their efforts in the performance of their duties. When it is necessary for custodians to go into a classroom during class time, please enter very quietly and do whatever is necessary with as little commotion as possible.

GROUNDS

It is a daily duty to do the following:

1. **Remove ice and snow from required areas immediately.** Sand and ice melt should be applied to prevent injury.
2. Remove paper, cans, and trash from the grounds.
3. Keep the playground equipment in safe condition. Any hazard to the children should be repaired or reported immediately.

LIGHTS

Custodians are responsible for proper lighting in the schools. This responsibility includes the following:

1. Replace burned out bulbs and tubes by using standardized energy efficient lights prescribed by the district.

2. Turn lights off in unoccupied rooms.
3. Turn out all lights, except for security lights and check that outside lights are on before leaving the school at night.
4. Check the lighting control time clocks "weekly" for proper operation.
5. Know the location of all light switches, fuse boxes, and breaker boxes.
6. Clean fixtures and lens annually.
7. Replace burned out light bulbs and tubes with new bulbs of the same size (wattage).
8. Be sure your non-conductive (wooden or fiberglass) ladder is of the proper height and is safe.
9. Handle fixtures properly to avoid shocks or cuts.

Note:

Code requires that exit and emergency lights be lit at all times, day or night.

Change both tubes on fluorescent fixtures-never only one. This will increase the life of the ballast, give better light, and reduce the frequency of tube changes.

6. Clean pipes underneath sinks daily as part of the procedure.
7. Do not use lime de-scaler on counter tops.

Mirrors

Mirrors in rest rooms are easy to keep clean by spraying lightly with glass cleaner or germicidal/detergent solution and wiping dry and/or polishing with a clean, lint free cloth or paper towel. Never use an abrasive cleaner or acid or dirty cloth on mirror. These may mar or scratch surface. Avoid using excessive water as it may get into the frame backing and damage the silvering.

Urinals and Toilet Bowls

Wear rubber gloves at all times. This is for your personal protection.

To clean inside bowl:

1. Flush toilet and/or urinal.
2. Use hospital disinfectant from dispensing system-follow manufacturer's instructions.
3. Use cotton swab (poodle tail) and/or toilet brush and swab inside of bowl using solution.
4. Scrub as necessary-be sure to swab solution up and under the flush rim. Scrub thoroughly.
5. Flush toilet or urinal and rinse swab or brush in clean water before proceeding to next fixture.

To clean seat and outside of fixtures using sprayer:

1. Spray germicidal/disinfectant solution on toilet seat (both sides), and all of the outside surfaces of the fixtures (toilets and urinals).
2. Let stand a minute or so.
3. Wipe dry with paper towels starting with the top of the seat, then underside and finally the balance of the fixture down to the floor.

Note: This procedure is the most effective way to sanitize a fixture, because you are always using clean solution with no chance of cross-contamination. Also, plastic spray bottles or one (1) gallon pressure sprayers can be used.

Note: Be sure to spray plunger with disinfectant after use. Keep in a bucket when not in use.

Bathroom Walls and Partitions:

1. Spray or damp dust with a germicidal/detergent solution on surfaces such as ledges, partitions, dispensers, wainscoting, shelves, areas around urinals and toilets, and lower walls as necessary.
2. Use either sprayers or bucket with germicidal/detergent solution, paper towels, clean cloths or a brush.
3. Wipe dry, if necessary, with paper towels or clean cloth to prevent streaks and spotting.

STANDARDS FOR CLEAN CLASSROOMS

1. EXCEPTIONAL

- floor coverings and bright and clean
- litter containers clean with little waste
- chalkboards and trays only showing day's use
- no dust on vertical surfaces
- furniture clean and orderly
- glass clean and sparkling
- GENERAL IMPRESSION IS ONE OF ORDERLY SPOTLESSNESS

2. EXCEEDS STANDARD * *

- floor coverings clean
- litter containers clean with little waste
- chalkboards and trays only showing day's use
- little dust accumulation
- furniture orderly
- glass clean and sparkling
- GENERAL IMPRESSION IS ONE OF ORDINARY TIDINESS

3. MEETS STANDARDS

- floor coverings clean
- litter containers have little waste
- chalkboards and trays only showing day's use
- some dust accumulation on others surfaces
- furniture orderly
- glass clean and sparkling
- GENERAL IMPRESSION IS ONE OF CASUAL INATTENTION

4. MARGINAL

- floor coverings dull
- litter containers often full or overflowing
- chalkboards and trays will be dusty and streaked
- dust accumulation will be evident
- furniture will be in disarray
- glass will show some streaks and hand prints
- GENERAL IMPRESSION IS ONE OF MODERATE DINGINESS

5. UNACCEPTABLE

- floor coverings will be dull and dusty showing spots and marks
- litter containers will be full to overflowing
- chalkboards and trays will be dusty and streaked dust and dust balls will be evident



- furniture will be dusty, marked and in disarray
- glass will be dirty and hand printed
- GENERAL IMPRESSION IS ONE OF UNKEMPT NEGLECT

NOTES:

* These standards and frequencies of cleaning are based on normal working circumstances. Variables such as inclement weather, special events, staffing shortages, and unusual work loads may impact schedules.

MASTER CUSTODIAL SCHEDULE



Services	Daily	Weekly	Monthly	Annually	As Needed
Trash pick-up	X				
Recycle pick-up	Alternate days				X
Sweep, wet mop, disinfect restroom floors	X				
Clean, disinfect restroom fixtures	X				
Restock restroom supplies	X				
Dust mop all hard surface floors	X				
Vacuum entry mats and carpet in traffic areas	X				
Clean tables, counters, floors, sinks in break rooms	X				
Clean, disinfect drinking fountains	X				
Sweep, clean loading dock areas	X				
Change kitchen or coffee station liners	X				
Sweep, vacuum stairwells		X			
Vacuum traffic areas	X				
Vacuum non-traffic areas		X			
Detail vacuum			X		
Low dusting (Below 5 feet)		X			
High dusting (Above 5 feet)			X		
Wet mop stairs			X		
Change trash liners					X
Extraction of all carpet areas				Twice Annually	

Services	Daily	Weekly	Monthly	Annually	As Needed
Wet scrub and wax floors				Twice Annually	
Clean ceiling vents				X	
Clean, dust upholstered furniture				X	
Window blind cleaning				X	
Unlock buildings	X				
Clean entry glass	X				
Litter patrol around building, parking areas	X				
Sweep and clean building entry	X				
Replace light bulbs & tubes					X
Clean Fluorescent Fixtures and Diffusers				X	
Respond to emergencies					X
Unplug drains					X
Deliver recycle and garbage barrels					X
Clean spills					X
Inclement weather duty					X
Vandalism, transient debris clean-up					X
Clean gym/multipurpose floor	X				
Restore finish to gym/MP floor					X

Maintenance Training Program

- Part IV of DEED's PM Plan:
 - ~~i. addresses a Preventive Maintenance (PM) management program;~~
 - ~~ii. addresses energy management;~~
 - ~~iii. addresses a regular custodial care program;~~
 - iv. addresses a maintenance training program;**

What is training?

- Training is the acquisition of knowledge, skills, and competencies as a result of the teaching of vocational or practical skills and knowledge. Training provides learning opportunities designed specifically to help an employee do his / her job better.



What is DEED seeking in PM Training ?

- a maintenance training program that specifies training for custodial and maintenance staff and records training received by each person





Quiz

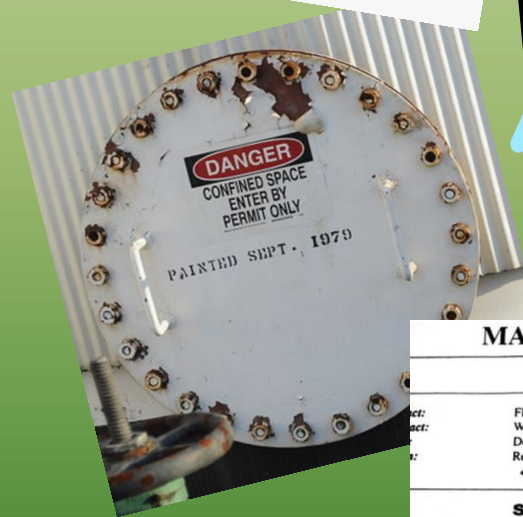


- Name examples of training for custodial and maintenance staff





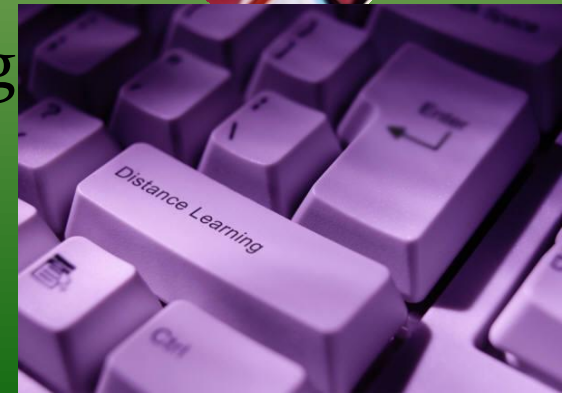
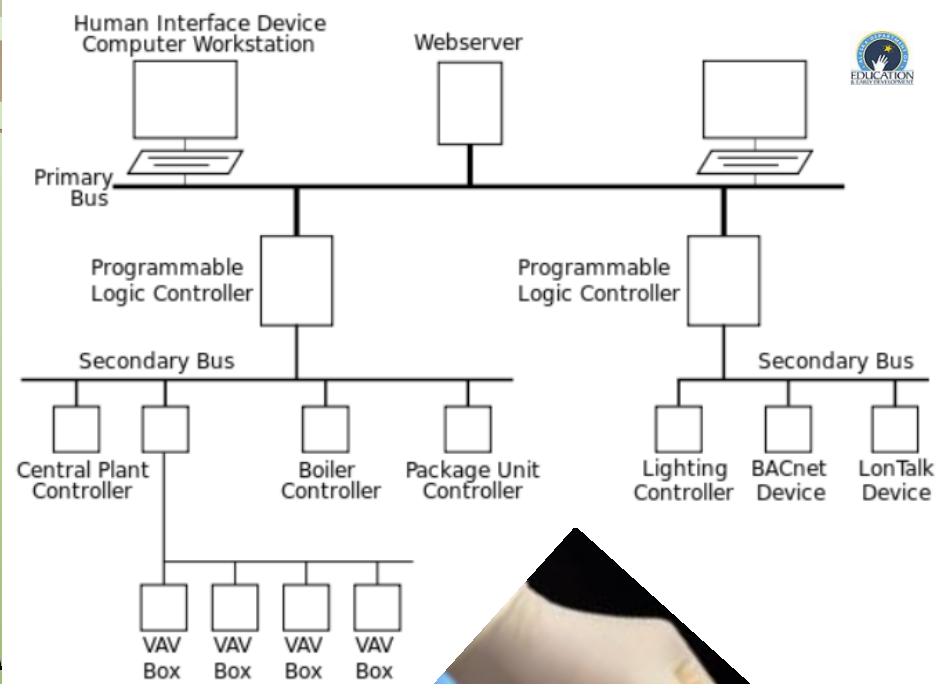
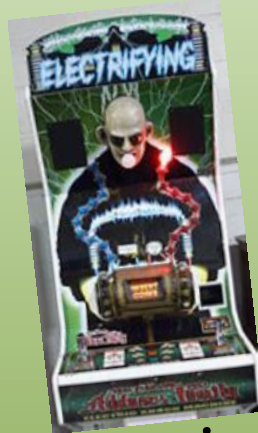
Answer



- Boiler operation
- Fire extinguisher
- Fire alarm
- Lockout / tagout procedures
- Confined space
- Roof and system repairs
- Asbestos / lead awareness
- Material Safety Data Sheets (MSDS)
- Ladder safety

MATERIAL SAFETY DATA	
SECTION 4 - FIRST AID	
Effect:	Flush with large amounts of water for at least 15 minutes. Do not induce vomiting; drink plenty of water.
First Aid:	Wash affected area gently with soap and water. Skin cream or ointment should not be used. Do not induce vomiting; drink plenty of water. Remove affected person to clean fresh air.
Prevention:	**If any of the symptoms persist, seek medical attention immediately.
SECTION 5 - FIRE FIGHTING MEASURES	
Flammability:	Non-combustible
Extinguishing media:	Use extinguishing media appropriate to the surrounding fire.
Hazards:	None
Special equipment:	Wear full bunker gear including positive pressure self-contained breathing apparatus.
SECTION 6 - ACCIDENTAL RELEASE MEASURES	
Procedures:	Avoid creating airborne dust. Follow routine housekeeping procedures. Use HEPA filtered vacuum or HEPA filtered vacuum with local exhaust. If sweeping is necessary, use a dust suppressant. Do not use compressed air for clean-up. Personnel should wear an approved respirator. Avoid clean-up procedures that could result in exposure to dust.
SECTION 7 - HANDLING AND STORAGE	
Handling:	Limit use of power tools unless in conjunction with local exhaust ventilation. Frequently clean the work area with HEPA filtered vacuum or HEPA filtered vacuum with local exhaust. Do not use compressed air for clean-up of debris. Do not use compressed air for clean-up of debris.

- Blood Borne pathogens
- Electrical safety
- Water treatment
- Waste treatment
- Generator
- Heavy equipment operation
- Back safety
- Building Automation System (BAS)
- Direct Digital Controls (DDC)
- Heating / Ventilation / Air Conditioning
- Etc.



Samples of Training Program Extracts

Custodial Training

Name	Safety/Physical Orientation	Policy/General Orientation	Housekeeping Orientation	Asbestos Awareness	Blood Borne Pathogens	Carpet Spotting & Shampooing	Chalkboard/Whiteboard Cleaning	Counter Top Cleaning	Damp Mopping	Drinking Fountains	Dust Mopping	Electrical Safety	Emergency/Disaster Plans	Floor Stripping & Sealing	Hand Washing	Interior Entrances	Ladder Safety	Landscape Maintenance	Locker Cleaning	Material Safety Data Sheets	Police Cleaning	Proper Body Mechanics	Shower Cleaning	Sink Cleaning	Soap & Dispenser Servicing	Toilet Cleaning	Trash Can Cleaning	Vacuuming	Vent Dusting	Wall Washing	Window Sill & Ledge Cleaning	Window Washing - Inside	Window Washing - Outside		
	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				X	X	X		X	X	X	X	X	X	X	X	X	
	X	X	X		X	X	X	X	X	X		X	X	X	X		X				X	X	X		X	X	X		X	X	X	X	X		



Maintenance/Custodial Training Log (Planned and Completed)

Employee Name	Training Description	Trainer/Vendor	Hours	Training Start	Training End	Completed ?	Certification Expires
i.	Warm Storage Boiler, Electrical, Door System	APEX general Contractor	3	8/23/10	8/23/10	Yes	N/A
	Warm Storage Boiler, Electrical, Door System	APEX general Contractor	3	8/23/10	8/23/10	Yes	N/A
	Warm Storage Boiler, Electrical, Door System	APEX general Contractor	3	8/23/10	8/23/10	Yes	N/A
	Warm Storage Boiler, Electrical, Door System	APEX general Contractor	3	8/23/10	8/23/10	Yes	N/A
	Tank Farm Pumps, Bulk Tanks, Saftey system	Pro West Contractors	10	10/1/10	10/4/10	Yes	N/A
	Tank Farm Pumps, Bulk Tanks, Saftey system	Pro West Contractors	10	10/1/10	10/4/10	Yes	N/A
	Tank Farm Pumps, Bulk Tanks, Saftey system	Pro West Contractors	10	10/1/10	10/4/10	Yes	N/A
	Tank Farm Pumps, Bulk Tanks, Saftey system	Pro West Contractors	10	10/1/10	10/4/10	Yes	N/A
	Boiler Maintenance, Upkeep, System Training	Peak Mechanical	25	7/25/11	7/31/11	Yes	N/A
	Boiler Maintenance, Upkeep, System Training	Peak Mechanical	25	7/25/11	7/31/11	Yes	N/A
	Boiler Maintenance, Upkeep, System Training	Peak Mechanical	25	7/25/11	7/31/11	Yes	N/A
	Blood Borne Pathogens	State of Alaska	2	8/15/11	8/15/11	Yes	N/A
	Blood Borne Pathogens	State of Alaska	2	8/15/11	8/15/11	Yes	N/A
	CAT Skid Steer Training	School District	3	7/19/11	7/19/11	Yes	N/A
	Fire Alarm Training	School District	2	7/22/11	7/22/11	Yes	N/A
	Boiler Maintenance and Repair L 2 Boilers	H & L Services	125	5/25/12	6/30/12	Yes	N/A
	Boiler Maintenance and Repair L 2 Boilers	H & L Services	20	5/25/12	6/30/12	Yes	N/A
	Boilers Maintenance and Repair L2 Boilers	H & L Services	15	5/25/12	6/30/12	Yes	N/A
	Boilers Maintenance and Repair L2 Boilers	H & L Services	25	5/25/12	6/30/12	Yes	N/A
	Blood Borne Pathogens	District	2	8/13/12	8/13/12	Yes	N/A
	Blood Borne Pathogens	District	2	8/13/12	8/13/12	Yes	N/A
	Blood Borne Pathogens	District	2	8/13/12	8/13/12	Yes	N/A
	Meta Sys Controls Training and Prevent Maint	Johnson Controls	7	8/8/12	8/8/12	Yes	N/A
	Meta Sys Controls Training and Prevent Maint	Johnson Controls	5	8/7/12	8/8/12	Yes	N/A
	Annual Fire Alarm Testing and Certification	Simplex Grinnell	4	6/25/12	6/26/12	Yes	N/A
	Annual Fire Alarm Testing and Certification	Simplex Grinnell	5	6/25/12	6/26/12	Yes	N/A
	Backup Generator Operations Training	Quality Electric	25	11/1/12	11/16/12	Yes	N/A
	Backup Generator Operations Training	Quality Electric	25	11/1/12	11/16/12	Yes	N/A
	Backup Generator Operations Training	Quality Electric	25	11/1/13	11/16/13	Yes	N/A
	Backup Generator Operations Training	Quality Electric	25	11/1/13	11/16/13	Yes	N/A
	Annual Fire Alarm Testing and Certification	Simplex Grinnell	5	6/28/13	6/29/13	Yes	N/A
	Annual Fire Alarm Testing and Certification	Simplex Grinnell	5	6/28/13	6/29/13	Yes	N/A
	Annual Fire Alarm Testing and Certification	Simplex Grinnell	5	6/28/13	6/29/13	Yes	N/A
	Heavy Equipment/Snow Removal Equip Service and Maintenance	NC Machinery	6	3/13/13	3/14/13	Yes	N/A
	Blood Borne Pathogens	District	2	8/15/13	8/15/13	Yes	N/A
	Blood Borne Pathogens	District	2	8/15/13	8/15/13	Yes	N/A
	Blood Borne Pathogens	District	2	8/15/13	8/15/13	Yes	N/A
	Boiler Maintenance and Repair School Boilers	H & L Services	15	6/5/13	6/25/13	Yes	N/A
	Boiler Maintenance and Repair School Boilers	Ha & L Services	5	6/5/13	6/25/13	Yes	N/A
	Boiler Maintenance and Repair School Boilers	H & L Services	5	6/5/13	6/25/13	Yes	N/A

Maintenance/Custodial Training Log and Schedule

School District

Employee Name	Training Description	Trainer/Vendor	Hours	Training Start	Training End	Completed ?	Certification Expires
	New Boiler Installation and Operation	Schmloch Engineering Inc.	25	11/19/12	11/28/12	Yes	N/A
	Roof System and Repair	Darrel Moler Construction	1.5	2/18/13	2/18/13	Yes	N/A
	Electrical Preventative Maintenance and Troubleshooting	American Trainco	16	2/21/13	2/22/13	Yes	N/A
	OSHA and Building Safety	AMLJIA Insurance	3.75	3/13/13	3/13/13		N/A
	New Boiler Operation and Maintenance	Schmloch Engineering Inc.	3.25	3/27/13	3/27/13	Yes	N/A
	School Air Quality Management	IAQ Management Webniar	3.25	3/28/13	3/28/13	Yes	N/A
	Mat Mover Repair and Operation	Porter Inc.	11.5	6/28/13	6/19/13	Yes	N/A
	Fire Extinguisher Operation and servicing	Alaska Fire and Safety Equipment	2.25	7/23/13	7/23/13	Yes	N/A
	Fire Alarm Operation and Maintenance	Simplex Grinnell	2.5	8/14/13	8/14/13	Yes	N/A
	Fire Sprinkler System	Simplex Grinnell	1.75	8/14/13	8/14/13	Yes	N/A
	Back Safety	AMLJIA	2	9/6/13	9/6/13		
	Hazard Communication	AMLJIA	2	10/4/13	10/4/13		
	Hazard Communication	AMLJIA	2	10/4/13	10/4/13		
	Defensive Driving	AMLJIA	2	11/1/13	11/1/13		
	Fire & Explosion Hazards	AMLJIA	2	12/6/13	12/6/13		
	Hand and Power Tool Safety	AMLJIA	2	1/3/14	1/3/14		
	Confined Space Entry	AMLJIA	2	2/7/14	2/7/14		
	HVAC Electrical Controls & Air Distribution	American Trainco	16	2/24/14	2/25/14		
	Lockout/Tagout Training	AMLJIA	2	3/7/14	3/7/14		
	Playground Safety	AMLJIA	2	4/4/14	4/4/14		
	Respiratory Protection	AMLJIA	2	5/2/14	5/2/14		
	Working in Extereme Temperature	AMLJIA	2	6/6/14	6/6/14		

School District - Maintenance Hours by Month and Work Type - 7/1/2012 through 6/30/2013

	AD	CM	CP	EX	GM	PM	PM*	SR	SS	TH	TN	TR	VM	VN	Total Hours	Hours Available	Unreported Hours
Jul-12	9.00	40.50	10.00	16.50	18.00	22.75			2.25	19.50	6.00				144.50	157.50	13.00
Aug-12	17.00	13.20	40.25	3.50	44.25	23.00	4.50			8.00	14.50		2.00		170.20	148.00	-22.20
Sep-12		2.25	24.25	6.50	6.75	20.00							3.50		63.25	85.50	22.25
Oct-12	0.50	57.50				33.48					4.50				95.98	85.50	-10.48
Nov-12	0.50	6.00		5.50	3.25	30.69					25.00				70.94	90.00	19.06
Dec-12	9.50	20.75		5.75	25.33	42.84		3.50							107.67	127.50	19.83
Jan-13	17.42	31.00		6.25	3.00	33.58		11.25	16.00						118.50	85.50	-33.00
Feb-13	7.50	21.25		4.25	5.50	28.54		6.50	7.25		17.50	13.75			112.04	63.00	-49.04
Mar-13	13.00	37.25		6.75	11.00	35.63	2.50	4.25			10.25			1.25	121.88	109.50	-12.38
Apr-13	0.50	26.75		14.25	6.25	31.29	2.25		1.25	1.50					84.04	90.00	5.96
May-13	5.50	29.75		8.00	44.00	31.41			8.00						126.66	99.00	-27.66
Jun-13	3.75	5.50		2.50	10.15	39.42					11.50				72.82	75.00	2.18
Total Hours	84.17	291.70	74.50	79.75	177.48	372.63	9.25	25.50	34.75	29.00	89.25	13.75	5.50	1.25	1,288.48	1,216.00	-72.48

Work Types: AD=Administrative Labor CM=Corrective Maintenance CP=Capital Project EM=Emergency Maintenance EV=Event Report GM=General Maintenance PM=Preventive Maintenance SR=Snow and Ice Removal/Nature SS=School Support TH=Housing TN=Training TR=Travel Time VM=Vehicle Maintenance VN=Vandalism/Crime

* In some cases, hours are reported under work types other than what was entered in the work order. All work for buildings or equipment identified as housing will appear in the TH column. All work done on vehicles will appear in the VM column. Work orders that have a work type of PM but were NOT created by SERRC based on a pre-established schedule are shown in a separate column with the heading 'PM*' (except for housing and vehicles).

Work Order Data as of 8/25/2013, 7:32:03PM

Note: Work order hours are reported in the work order month, which may not be when the work was done.

Note: The FY13 Hours Available are based the Maintenance Technician/Custodian's hours for a full day when school is closed and 4.5 hours per day on school days.

Quiz



The purpose of staff training is to:

- a) ensure that staff stay safe (e.g., OSHA training)
- b) teach staff how to deal with changing needs (e.g., caring for newly installed floors)
- c) provide a stimulating experience to people who perform repetitive tasks (thereby improving staff morale and retention rates)
- d) prepare staff for future promotions
- e) all of the above

Answer



- a) ensure that your staff stay safe (e.g., OSHA training)
- b) teach staff how to deal with changing needs (e.g. caring for newly installed floors)
- c) provide a stimulating experience to people who perform repetitive tasks (thereby improving staff morale and retention rates)
- d) prepare staff for future promotions
- e) all of the above

Renewal and Replacement Schedule

- And last but not least, let us discuss part V of DEED's PM Plan:
 - ~~i. addresses a Preventive Maintenance (PM) management program;~~
 - ~~ii. addresses energy management;~~
 - ~~iii. addresses a regular custodial care program;~~
 - ~~iv. addresses a maintenance training program;~~
 - v. addresses a renewal and replacement schedule.**

What is a Renewal and Replacement (R&R) schedule?

- A Renewal and Replacement (R&R) schedule is composed of basic building system appraisals (e.g. exterior doors, roof systems, plumbing fixtures). Each system is given:
 - i. an estimated remaining life span
 - ii. an estimated time of replacement
 - iii. an estimated cost replacement



What is DEED seeking in PM R&R schedules?



- for each school facility of permanent construction over 1,000 gross square feet, identifies the construction cost of major building systems, including electrical, mechanical, structural and other components
- evaluates and establishes the life expectancy of those systems
- compares the life-expectancy to the age of those systems;
- compares the life-expectancy to the age and condition of the systems
- uses the data to forecast a R&R year and cost for each system

Samples of Renewal and Replacement Schedules



CIP FY 2015		Building System Appraisal (List taken from Appendix A of EED Preventive Maintenance Handbook)			Current Dollar Value of Systems/Components that require Renewal or Replacement during Year (in thousands of dollars)						Deferred Project	Attach Survey if included in CIP	Total Costs by System (in dollars)	
Facility or Building		System	Year Installed	Remaining Life Span	Year work req'd	Year 1	Year 2	Year 3	Year 4	Year 5				Year 6
Name and/or Number		Site Improvements				2015	2016	2017	2018	2019	2020			
EED #	460	Site Utilities												
Dist. #		Foundation/Substruct.	1974	9	2024									\$ 1,999,603
721.06 per sq. ft.		Superstructure	1974	9	2024									\$ 2,658,984
Gross Square Footage		Exterior Wall System	2008	18	2033									\$ 1,774,282
27,055		Exterior Windows	2008	23	2038									\$ 469,175
Number of Stories		Exterior Doors	2008	13	2028									\$ 93,580
1 (partial 2nd)		Roof Systems	2008	13	2028									\$ 905,186
Building or Facility Use		Interior Partitions	1974	9	2024									\$ 1,027,113
Elementary School		Interior Doors	2008	23	2038									\$ 318,334
Replacement Value		Interior Floor Finishes	2008	8	2023									\$ 1,063,203
\$19,508,319		Interior Wall Finishes	2008	18	2033									\$ 404,557
NOTES		Interior Ceiling Finishes	2008	18	2033									\$ 679,501
Orig/perm 140' X 193' main school facility. Major renovation in 2008.		Specialties	2004	29	2044									\$ 519,524
		Conveying Systems	2008	33	2048									\$ -
		Plumbing piping	2008	23	2038									\$ 682,791
		Plumbing Fixtures	2008	23	2038									\$ 334,568
		Fire Protect./Suppres.	2008	23	2038									\$ 500,388
		HVAC Distribution	2008	33	2048									\$ 985,170
		HVAC Equipment	2004	19	2034									\$ 2,229,801
		HVAC Controls	2008	13	2028									\$ 419,429
		Electrical Serv./Gen.	1974	-1	2014	397						X		\$ 396,994
		Electrical Distribution	1974	9	2024									\$ 476,978
		Electrical Lighting	2008	18	2033									\$ 1,090,515
		Special Electrical	2000	0	2015	479						X		\$ 478,929
Facility Cost Index		Equip and Furnishings												\$ 19,508,605
4.49E-05		Totals				876	-	-	-	-	-		\$ 875,923	Six Year Total

**Cell: D3**

Comment: Site Improvements: New ball field and two new wooden basketball courts in 2008.

Cell: D4

Comment: Site Utilities: Bulk fuel tanks replaced in 2010.

Cell: D6

Comment: Superstructure: New stairs, decks, and ramps in 2006-07 at a cost of \$459,747.

Cell: D7

Comment: Exterior Wall System: New metal siding in 2008.

Cell: D8

Comment: Exterior Windows: All or most were replaced in 2008.

Cell: D9

Comment: Exterior Doors: All or most were replaced in 2008.

Cell: D10

Comment: Roof Systems: New EPDM roof in 2008.

Cell: D11

Comment: Interior Partitions: Some new in 1984 and 2008.

Cell: D12

Comment: Interior Doors: Over half replaced in 2008. Others replaced in 2000.

Cell: D13

Comment: Interior Floor Finishes: Replaced in classrooms, corridors, commons in 2008. Other areas in 2000?

Cell: D15

Comment: Interior Ceiling Finishes: New gym ceiling in 2008. Other areas renovated in 2000 with new paint in 2008.

Cell: D17

Comment: Conveying Systems: Dumbwaiter from kitchen to storage above installed in 2008.

Cell: D19

Comment: Plumbing Fixtures: Most replaced in 2008.

Renewal Replacement Schedule -

mentary School

Cell: D22

Comment: HVAC Equipment: New boilers, circulating pumps, hot water makers, fuel tanks, expansion tanks, and glycol make up tank installed in 2004. New cabinet/unit heaters, oil-fired hot water heater, pumps, AHUs, exhaust fans, etc. in 2008.

Cell: D23

Comment: HVAC Controls: DDC controls in 2008.

Cell: D24

Comment: Electrical Serv./Gen.: New 125 KW backup generator installed in 2012 (located in adjacent 417 gsf generator building).

Cell: D26

Comment: Electrical Lighting System: HE Williams Inc. lighting fixtures (including exit signs) in gym and cafeteria installed in 2004.

Cell: D27

Comment: Special Electrical System: EV - Step Up to Electro-Voice Call system and gym sound system installed in 2004. New fire alarm system in 2008. Other special electrical components replaced at various times.

Quiz



- R&R Schedules assist districts...
 - a) estimate when facility systems will need to be replaced
 - b) estimate the replacement cost of facility systems
 - c) track when facility systems get replaced
 - d) all of the above

Answer

- a) estimate when facility systems will need to be replaced
- b) estimate the replacement cost of facility systems
- c) track when facility systems get replaced
- d) all of the above



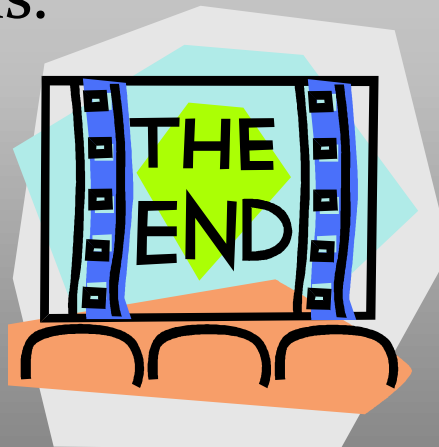
Congratulations!



We have now covered the 5 basic requirements for Preventive Maintenance. Basically,

1. The PM program helps school districts keep their multiple school systems working while extending the life of associated equipment.
2. The Energy Management plan enables school districts to monitor their energy consumption, develop policies, and identify issues on how to mitigate use, etc.

3. The Custodial Care program delivers the proper tool for quality care and cleanliness in our districts.
4. The PM Training program empowers the custodial and maintenance workforce with the proper knowledge, skills, and competencies to do quality work.
5. The Renewal and Replacement Schedule enables school districts to forecast the replacement of individual systems.



Thank You

Dziękuję

תודה

Tesekkürler

Gracias

ขอบคุณ

Köszönettel

Obrigado!

Hvala

Bedankt

Eυχαριστώ

Thank you
For all the work that
You do
For our students!

شكراً

Merci

Vielen Dank

Grazie





Alaska Association of School Business Officials

DEED Preventive Maintenance Presentation

December 8-11, 2013