

# MOUNT ARLINGTON SCHOOL POWERSAVE PROGRAM

## GRADE 6 SPEECH TO TOWN COUNCIL & REPORT TO BOARD OF EDUCATION



### LEAD TEAM

This year we had the opportunity to participate in the PowerSave Program sponsored by the Alliance to Save Energy. The \$1000 grant from the New Jersey Sustainable School Program let us explore science and engineering from a practical building-wide experience, and we discovered that much effort is required to maintain and operate a facility. We also learned about energy saving protocol that building managers can implement. We helped to educate and train teachers, staff and students about steps to help save money by limiting the amount of energy required to run classrooms and offices. We also created a database using the temperature readings and light intensity data so that each room can use steps to reduce energy needs on a room by room basis.

To investigate each room in the building, we used a light meter and an infrared temperature meter to determine how well each room met requirement for classrooms and offices. Work spaces need at least 30-50 foot candles of light intensity for comfortable reading conditions. This does not apply to art and science classrooms which require higher light conditions for design and

experiments. Using the data for each room, we created a spreadsheet database and used formulas to calculate the average conditions in all rooms. We then used the data to development the protocol for our light energy saving program.

For the light energy savings protocol, each room was provided a light-switch key that showed the light switch configuration that teachers and students and staff could use to save energy. There are times during the day that natural sunlight and using anywhere between one-third to one half of the lights in the room meet the light foot candle requirements. We also promoted a Last Out, Lights Off campaign.

For heat energy savings protocol, we provided checklists to staff and teachers so that they could monitor student behavior about closing doors to keep heat or cooled air in a room. Teachers can also monitor blinds to keep the heat or cool air inside a room. Then the challenge was on to see which group could best implement the new protocols. We called our program the PowerSave Challenge.

For the PowerSave Challenge we were required to monitor room compliance at least 10 times over the course of the Program. We were pleased to find out that we were the first school out of the 21 participating schools to include the administration along with our 4 teaching teams in the Challenge. From the first year implementation, we learned that changing users' habits is a challenge and takes time to get teachers and students to comply. Rooms were rated as EnergyHogs, EnergySavers, or EnergyStars. The following slide presents a summary of the monitoring challenge by team.

We congratulation Team Integrity which is our Grade 7 and Grade 8 team for achieving the highest compliance rate overall, but it does not surprised us that the older kids understand more about how important it is to save energy costs. We just know that for next year we need more attention and education for the younger students in the building.

Our data also showed that some rooms do not meet the lights out option either due to a room's orientation relative to the sun or an obstruction. For example a

large pine tree now blocks natural sunlight into Room 19. Other rooms that could not use the lights out configuration option were the Art room and Music room.

In addition to lighting and temperature, we also took an inventory of equipment and devices in each room and used a watt meter to determine the energy load. One important consideration about electronics is that many devices have a phantom load and are drawing energy even when powered down. By discovering and monitoring phantom loads, businesses and consumers can save a lot of money. In the near future we will be providing room specific data on energy loads so that teachers can understand the savings they can implement by powering off devices such as SMARTBoards and printers that continuously draw phantom energy.

Another energy saving action that we implemented was a Holiday Shutdown program. Teachers were provided with a detailed checklist to implement prior to each long weekend and vacation breaks. Although we were required to implement the shutdowns only 2 times for the longer breaks, we also implemented for long weekend breaks. The steps for the Holiday Shutdown included the following actions:

- ✓ Lights are turned off at the switch so they do not rely on sensors (currently our school does not have light sensors)
- ✓ Thermostats are adjusted to save energy
- ✓ Blinds/Curtains are drawn to save energy
- ✓ Computer Monitors are turned off so they are not in power save mode (phantom load)
- ✓ Computers in the classrooms, offices, and computer labs are shut down, not just in sleep mode)
- ✓ All other appliances and equipment are turned off (if not networked)
- ✓ Mini-refrigerators are unplugged (this saves a lot of energy but remember to clean them out, and leave the door open and let them drain while they defrost to avoid mildew)

Beyond our hands-on engineering program, the Alliance to Save Energy also provided a series of educational videos and Benchmark quizzes so that we could learn more about energy consumption and demands and energy grids. We learned about the different types of coal plants that go on and off line during peak consumer demands. We were surprised to find out the high peak plants often burn coal under conditions that generate more air pollution. Thus, the action of consumers doing something like running dishwashers and washing machines after high peak hours of 5-7 pm or before peak hour power up of 9 am does help a lot to lessen the chance that the dirtier coal plants are kicked on.

One of the challenges facing all schools is that of aging infrastructure. Mount Arlington School operates with at least 3 separate zones based on different ages of HVAC units and although a computer-based monitoring program to control heating and cooling has been in place for some time, there were major issues this year. We learned that there are classrooms in the core wing that sometimes did not heat properly and were cold at times while the wings off the core area likely had to overwork to compensate. Likewise, in warmer weather these rooms do not have air conditioned units, and again may be causing the wing area units to overwork to compensate. It would be our recommendation that the inner core area be considered for revamping so that the outer wings can function without this temperature differential draw.

In closing, the PowerSave program provided us with the opportunity to discover science and engineering from a practical view. We were able to make connections with the energy lessons and now understand that technology and engineering is applied science. We look forward to participating in the program next year and we recommend we conduct the energy audit at our K-2 school. We would like to also audit the town municipal building.

We would like to thank New Jersey Sustainable Schools and the Alliance for Energy for this program. We also recognize the role our Enrichment Teacher Ms. Crawford and our Science Teacher Mr. Malakuskie had in turn-keying this program

as well as Ms. Forbes our new technology teacher for her assistance with our video production. We also acknowledge the Borough's lead in the New Jersey Sustainable Program and its liaison with the District and remember Mayor Ondish's foresight and vision. This program made science real. The PowerSave program let us make a personal connection to the slogan Think Globally, Act Locally.