

GRAY Matter

The Greening of CRS

by Assistant Head of School Elizabeth Clayton



This has been an exciting year at CRS for environmental initiatives. Our new 7/8 science building is full of “green” features; we hope you read all about them in an interview with CRS Alumnus (and Project Manager) Matt Ayers in this spring’s Current. Classrooms have been changing their daily routines with an eye towards becoming more environmentally friendly. Examples include first and third grades purchasing and using mugs all year for drinks at snack instead of using paper cups, some grades have also begun using cloth towels (washed often) instead of paper towels in the classroom, and most classrooms re-use paper until there is not an inch left for writing. Faculty and staff are using both sides of the paper when photocopying, we are sending out as much information as

possible via email rather than traditional mail, and our new single-stream recycling program is in full swing.

This year, CRS began a single-stream recycling program in which all recyclable materials are mixed together and collected by an outside contractor. No sorting, beyond separating that which is recyclable from that which is not, is necessary. Various kinds of paper, plastic, glass, cans and foil are collected together in our blue recycling bins. In searching for a company to partner with, lots of research was done by members of the CRS Sustainability Committee/Green Team. Last fall, a group of staff members and parents toured the Casella Waste Systems facility and were very impressed with what they saw.

Every classroom and common space at CRS (including the dining room) has at least one blue recycling bin where students, teachers, and staff members put all recyclable materials. Teachers remind students at snack, lunch, and throughout the day to place certain materials in the recycling and others in the trash. In many classrooms, recycling is included in the list of classroom jobs that students are responsible for throughout the year. Each building has a few large collection bins to which students bring the recycling from their classrooms and office areas. In the Early Childhood Building, third graders take on the job of collecting from the classrooms and common areas, and in the Community Building, the sixth grade takes on the task of collecting the recycling from the offices and common areas. Finally, the building bins are emptied into the main recycling dumpster behind the Activity Center and BP Trucking hauls it all off to the Casella facility. With this new program, we are able to recycle more than ever before!

This new recycling program is just one of the many changes that has taken place this year. In the following Gray Matter articles, you’ll be able to read about lots of other successful programs and great ideas related to a more sustainable and environmentally friendly CRS.



Schools Can Be Sustainable

by Fifth Grade Student Noelle Henderson



I have just returned from visiting my sister at the Island School in Eleuthera, Bahamas, where she and 48 other high-school kids are studying for 14 weeks. They are learning about the ocean environment and the people of the Bahamas and how to live in an environmentally sustainable way on an island. One of the main things they focus on at the Island School is trying to minimize their carbon footprint, which is a fancy way of saying that they try to be as nice to the earth as they can. In my four-day visit I learned a lot about how they are trying to live sustainably. Here are a few examples:

The teachers and kids hardly ever take showers, and when they do, they only have around one minute rinses with cold water. The only water they have is rainwater, which they capture in big tanks, and they do not get much rain down in the Bahamas. Instead they take ocean rinses, which they called “ORCs”, and use organic shampoo and conditioner to wash their hair because it doesn’t pollute the water. They also have different bathroom practices. At the Island School there is a saying, “If it’s yellow let it mellow, but if it’s brown flush it down.” Since they don’t have lots of extra water, they try to use as little of it as possible, and flushing uses a lot of water. (Flushing uses about 20 gallons of water per person every day—that’s a lot!) Don’t worry, they do flush the toilets at some point. Flushing is not the end of the story, however. Human waste is used to water the “poo-poo garden” that makes the campus look beautiful.

The Island School tries to minimize energy use by turning off the lights that are not being used. They also use compact fluorescent light bulbs--the ones that are swirly on top--to reduce their energy consumption. To create electricity, they have a wind generator and solar panels. Their goal is to be 90% energy self-sufficient soon. Right now they

produce about 56% of their energy needs each day, so they are making just over half of what they use. The rest they have to purchase. The students measure the energy they use and generate daily and report it to the group at evening circle time.

The Island School has an aquaponics system that they use to raise fish like talapia and cobia as well as lettuce and other vegetables. The wastewater from the talapia tanks is used to water the plants. As the water passes through the root system of the plants, it is filtered and is then reused for water for the fish tanks. This is called a closed system. It might seem gross that they use fish waste water to water the food that they eat, but the truth is that the talapia water has nutrients that help the lettuce and vegetables grow healthily. I have to say that this was the best lettuce I have ever tasted!

Left-over food scraps are fed to pigs, composted, or used to raise worms. Nothing is wasted. You can look all over the campus and not see one trash can, which shows how much they don’t want to generate any trash. The students also recycle cans and bottles. They don’t have a lot of bottles and cans, however, because they grow or catch most of their food. They do not use a lot of paper. Everything is sent back and forth between teachers and students electronically, and if they do use paper they always use both sides of the paper. This is something that we should all try to do as much as we can.

One last thing: all of the Island School students learn to scuba dive and free dive and take kayak trips so that they also learn to enjoy the beauty around them. I think that helps them want to take care of the land even more.

Although some of these things would not be possible to do at Charles River School, it is still very interesting to see how a school can be so eco-friendly. For more information about the Island School, see www.islandschool.org.

EDP = R_{EDUCE} R_{EUSE} R_{ECYCLE}

by CRS parent Tara Zadeh



The Extended Day Program at CRS has always been about the three R's - Reduce, Reuse and Recycle. While making the afternoons fun for the students, Jeannette Pratt-Tello, who has been teaching EDP at CRS for 11 years, has worked to impress upon her students the value of caring about the planet by finding a new purpose for disposable items and reducing waste. The EDP environment is rich with teachable moments to promote the value of not wasting materials and creating new uses for "experienced" supplies.

Everywhere you look in EDP, you'll see evidence of reusing and recycling. There's a book swap shelf where students can leave a book or take a book to give it another life, games refreshed from older students outgrown toys, computer paper donated by the box, poster art from old calendars, yarn and fabric decorations. Much of what you see in the EDP room is enjoying a "second life"! Everything has a potential for another purpose, so not much goes to waste. A paper towel roll doesn't only hold paper towels in EDP – next it will become a tower on a skyscraper, and the day after, perhaps it may be a flute or tossed into the

gerbil habitat to be chewed into nesting litter. Jeanette Pratt-Tello has long been interested in the environment and teaching kids that they have an impact on the planet today and a responsibility for the earth tomorrow. "It's not just taping toilet tubes together, but creative process, and thinking outside the box with form and function. Maybe one day some of these kids will be thinking outside the box to solve some of our global environmental problems."

One EDP favorite, the recycle construction cart, is filled with leftovers from group projects as well as cast-offs from classrooms and homes. On any given day you might find yarn, ribbon, fabric, various cardboard boxes, beads, envelopes, tissue paper, wallpaper and paper samples. Jeanette and co-teacher Jacqui Cilley are always amazed and entertained with the creations kids put together from the cart! "We hope our parents are equally as charmed by these creative projects when they go home to their final resting spot," chuckles Jeanette. Another favorite EDP project is turning old vinyl LP's into flowerpots or pencil holders using metallic markers and the hot oven. "I had a huge moment of satisfaction while attending a faculty/trustee dinner in a CRS

family home when I spotted one of our beautifully transformed record projects proudly displayed on a prominent bookshelf," Jeanette beamed.

EDP is also famous for using recycled products for the annual auctions to help raise funds for the school. One year, a discarded lamp and shade were transformed by EDP students into a one of a kind artistic treasure! Everyone helped. Even parents were known to come in at the end of a busy day, sit down, and get caught up in the rebirth of the lamp. After weeks of carefully gluing colorful jigsaw puzzle pieces around the lamp base and shade, EDP rendered a unique art piece that caused a frenzied stir at auction time!

As a parent, I am glad to know that while the kids in EDP think that they are just having fun making art that will later hang on my refrigerator, they are also learning that most of what we dispose of can be reused. So, before you put your cereal box or wrapping paper into your home recycling bin, think about donating it to EDP for their next art project. If Jeanette and Jacqui can't reuse it, you know it will be recycled!

Celebrating Earth Day at CRS

by Music Teacher Mica Moellering



As I was leaving Foster Hall after last year’s Earth Day all-school assembly where I had just enjoyed earth-themed music and skits, a parent nonchalantly noted that it might be nice, in the future, to be outside on Earth Day. It seems obvious, but we hadn’t done it in the recent past. So this year, CRS headed outside for Earth Day!

Grades six, seven and eight traveled by bus to Tangerini’s Spring Street Farm, a 67-acre working family farm in Millis, MA. Both students and faculty worked incredibly hard as volunteers helping to get the farm ready for the coming season. They raked and fertilized rhubarb plants, divided and planted vegetable seedlings, planted potatoes, trimmed raspberry bushes and tied up and fertilized apple trees. By all reports, it was difficult, tiring work but rewarding as well.

Back at CRS, Grades PreK through five participated in the “Earth

Day Extravaganza.” Students traveled around the CRS campus in mixed age groups visiting four Earth-related stations. CRS faculty members and wonderful parent volunteers ran each station, giving their valuable energy and time to make this day run smoothly.

At the first station, “Plant In The Earth,” students planted marigold seeds in individual pots and decorated flags to be placed in the soil. When the marigolds have grown large enough, some will be donated to local senior centers and some will be planted at CRS. Through posters displayed at this station and conversations while they worked, students learned about the water cycle and about how plants get nutrients from the soil. This station was planned and run almost entirely by CRS parents. A special thanks goes out to Karen Ketterer and Liz Sheehan for donating clay pots, seeds and soil for this event.

At the second station, “Art About

The Earth,” art teacher Mary Sullivan organized the creation of an incredible two-dimensional habitat that revolves around a pond community. Students designed creatures to live in the habitat as well as the plant life that would grow there. The mural teems with horses, fish, birds, butterflies, and individual tissue flowers. According to Mary, the goal was to “have a single piece of art that represents the efforts of the whole school... like the way people have to come together to actually save the earth.” The mural was then hung in Foster Hall for the last few weeks of school.

At the third station, “Play On The Earth,” Paula Converse and Victor Velazquez each ran a group activity. Paula played Earth Day-related games, including a sort of “Mother-May-I,” where the students advanced if they could answer “yes” to questions about energy saving and making a greener Earth. Victor took his groups into the



surrounding land to clean up litter. Third grader Jared Bo said, “I think cleaning up the litter on the sides of the fields was lots of fun. I found an ancient CRS ball, a lot of litter, and one good leaf.” 5th grader Adut Ayuel added, “We found a lot of golf balls. Every time I turned around we found golf balls!”

At the fourth station, “Eat On The Earth,” Brendan Johnson organized the assembling of homemade granola. Students chose from several toppings to make their own individual cups, including oats, dried cranberries, sunflower seeds, golden raisins and molasses. 5th graders Casey Carroll Rothschild and Sarah Evantash loved the granola. Sarah said, “It was easy to make and good afterwards. I put in too much molasses so it was really sweet.” Casey agreed, adding, “It was really gooey. I put in coconut and oats.” While the students put together their individual granola samples, Brendan also spoke with the kids about local

farming and eating naturally.

The day ended up with a delicious barbeque outside courtesy of Brendan and Sage Dining. Students sat at the picnic tables and spread out on the grass around the playground. What better way to wrap up Earth Day than to sit outside, soaking up the sun, enjoying

the breeze and celebrating the nature around us? Thanks so much to everyone who participated and to the faculty and parents who worked so hard to put it together. It was a great day – for the students and the planet.



The Green Team at CRS

by CRS parent John Bergdoll with CRS parent Tedie Bastian



With the support of the faculty and parents at CRS, the new CRS Sustainability Committee/Green Team has been able to raise awareness of the importance of sustainability. The Sustainability Committee/Green Team has developed initiatives to create positive sustainable outcomes. The Green Team has spearheaded programs that have reduced costs, enhanced the quality of life of those in the school community, and strengthened our school’s standing in the community. Green Team initiatives this year include: No Idle Zone signs, campus-wide single-stream recycling, sustainability building features/benefits signage, reserved parking for hybrid vehicles at the CRS Fair, composting in the CRS kitchen, kid-friendly and environmentally safe cleaning chemicals, and sustainability suggestion boxes.

One of the early accomplishments of the Sustainability Committee/Green Team was the launching of the “No Idle Zone” in the carpool pick up line. Five permanent signs were posted along the car pool lane next to the athletic field. These signs serve as a reminder of one way we can all help ensure cleaner air in our community and around our school by simply turning off your vehicle’s engine when waiting to pick up your child.

By reducing idling you will:

- Protect students, school staff and drivers from

- harmful exhaust fumes
- Reduce air pollutants that contribute to smog and global warming
- Reduce fuel consumption
- Reduce engine wear and tear
- Save money on fuel and engine repairs

What’s so bad about idling?

1. Idling is bad for your health – idling contributes particulates and other pollutants to the atmosphere. Exhaust fumes from cars, trucks and buses contain fine particles that can trigger asthma attacks. These pollutants are a health risk to everyone, but particularly to children because they breathe faster and inhale more air per kilogram of body weight than adults. Children are particularly vulnerable because their lungs are still developing and they breathe 50 percent more, by volume, than adults. These exhaust fumes are produced unnecessarily when vehicles idle.

2. Idling is bad for the environment – idling adds to greenhouse gas emissions that contribute to climate change and smog. Idling for 30 minutes burns nearly a half-gallon of gasoline and produces 10 lbs of CO₂. (Source: Idling Myths)



3. Idling is bad for your pocketbook – idling gets ZERO miles per gallon. After TEN SECONDS of idling, you are using more fuel than restarting the engine. (Source: Idling Myths)

The Chair of the Sustainability Committee/Green Team also spearheaded an energy audit of the 7/8 building that will bring substantive change in energy efficiency and substantial energy cost savings (a projected 30% energy cost savings). The energy audit for the 7/8 building took place on Veteran's Day. The purpose of an energy audit is to discover building inefficiencies, provide options to remedy the inefficiencies and indicate projected energy cost savings if the solutions are implemented. The basement, roof and all the rooms were examined, using 'blower door tests' and infrared testing.

David Dean and John Bergdoll were present during the walk-through as energy inefficiencies were spotted and pointed out. The auditor indicated that they found many things they expected to find with a building of this age (part of the building was built in 1877), and some unexpected discoveries as well. A comprehensive report submitted by the auditor explains the building inefficiencies and pricing for the solutions and projected energy cost savings if the

recommendations are implemented. CRS is free to make its own improvements using contractors of their choice. The energy audit report serves as a good blueprint of what building energy problems exist and provides a definite plan of action that will save the school money in energy bills.

Finally, the Sustainability Committee/Green Team would like your input! The Energy and Environmental Suggestion Boxes that you can find around the school are a way for parents and students at CRS to add their ideas to the conversation about making CRS a more environmentally friendly and sustainable school. So far, the suggestion boxes, located in high traffic areas, have been a wonderful source for students' sustainable ideas and suggestions about how the Charles River School community can become more sustainable.



Solar Power for a Sustainable Future

by 8th Grade Student Nathan Perry



The world puts out far too many pollutants to sustain itself indefinitely. Due to the greenhouse effect, the world is quickly approaching a point of no return at which the Earth will become too hot to sustain human life. One of the things that puts the human race in its current predicament is the fact that we spew 750 metric tons of carbon dioxide emissions into the air every second. Due to the extreme level of pollution emitted by current fossil fuel power plants and internal combustion engine cars, we must find efficient, zero-emission alternative energy sources.

One such energy source is the photovoltaic cell, better known as the solar panel. Solar panels emit no pollutants, but are expensive to buy and somewhat inefficient. In order to make solar panels a more viable energy alternative, companies like AVA Solar and Nanosolar are reducing cost while improving efficiency. Nanosolar claims to be the first company to produce cells that can provide energy at less than \$1 per watt, which is the cost at which

solar becomes less expensive than coal.

A simple way to reduce cost in a solar panel is simply to use fewer of them. One would think that by using fewer solar panels, one would generate less power. This is untrue. By focusing more sunlight onto a solar panel, its efficiency increases proportionally to the amount of sunlight that is focused on it. Solar panels' efficiency can be increased by a huge factor with just a \$1.00 roll of reflective Mylar (positioned to reflect sunlight at a solar panel), a few electric motors (to adjust the position of the Mylar), and a simple computer program that tracks the progress of the sun across the sky and adjusts the position of the Mylar accordingly.

Solar power does not necessarily have to come in the form of a photovoltaic cell; it can work in a similar manner to a conventional power plant. One such power system uses mirrors to focus sunlight onto a large tank of water. The water heats up and turns to steam, which turns a turbine, generating

electricity. This alternative is somewhat easier to manufacture than solar panels; the only thing it needs in great profusion is mirrors, as opposed to nearly pure silicon and a somewhat complex layering process. The main downside to this method of electricity generation is the amount of moving parts, since the mirrors need to follow the sun in order to get optimum efficiency.

Solar power is one of the most favorable alternative energy sources because of the profusion of energy that hits the Earth in the form of sunlight. It could meet all of our energy needs if only 1/8,000,000 of the Earth's land was used to harness solar energy. This technology has huge implications and could potentially stop global warming, but we have to decide to use it over fossil fuels before we reach the point of no return. If we do, we will have a completely sustainable energy future and will be able to prosper and grow as we have for the last several thousand years.