

Renewable energy workshops light up the imagination of Blessed Sacrament students

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ABOVE: From left to right, Darien Lomas, Lewie Fintas and Logan VanNieuwenhuizen look up from their work constructing a model of an upright wind turbine during the design challenge in Sarah Gardiner's Grade 7/8 classroom on Friday.

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"The world is going to run out of non-renewable energy sources and we need to develop renewable sources to replace them," the Blessed Sacrament School student said while he and fellow classmates Lewie Fintas and Logan VanNieuwenhuizen prepared to attach the blades to their model on Friday afternoon. "And it creates less pollution."



AT THE LEFT: Ann Cummings, an educator with TREC Education, explains why LEDs or compact fluorescents are much more energy efficient than incandescent bulbs.

Construction of model wind turbines in Sarah Gardiner's Grade 7/8 classroom was just one of several hands-on activities led by educators from TREC Education at the Burford school during their two-day visit last week. Over Thursday and Friday, the three-person team visited all of the students, from Primary to Grade 8, where they conducted age-appropriate lessons focused on wind and solar energy.

TREC Education is a charitable organization which was created to run the educational programs developed by the TREC Renewable Energy Co-operative. TREC began delivering environmental education

programming in 2003 by offering public tours of its community-owned wind turbine in downtown Toronto. Since then the organization's educational activities have blossomed into a multi-faceted program offering curriculum-linked workshops to students, green career presentations, and community outreach initiatives to inform the public about renewable energy.

Blessed Sacrament Principal Denise O'Brien first became aware of the group in September during a family visit to the Paris Fair. She was immediately impressed with how engaged the young people who had gathered by the TREC booth were, and how interesting and educational the hands-on presentation was.

A few telephone calls and emails later, and the visit to Burford was arranged.

AT THE RIGHT: In a hands-on experiment in the Grade 6/7 classroom, students watched as wind, simulated by a fan, created the power needed to light a light bulb. Pictured, from left to right, are Sarah Allgood, Mia Pelletier, Lucas Charters and Sarah Jean Stark.

Darien's group got the idea to construct a vertical wind turbine from Lewie, whose father has built a few versions of the real thing. He explained that vertical turbines are designed to work well with low wind, making them ideal in many areas around Burford. Another advantage is that they don't need a lot of land space, he added.

"It's been fun," Logan chimed in. "And I've learned a lot. If I ever build my own solar energy system, I'll know how it works and how to wire it."

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A few desks away from the boys, Caitlyn Norris, Michaela Clark and Sarah Henry continued to experiment to find just the right blade angle for their wind turbine. Their first attempt didn't work so well. After a little tinkering, they discovered an angle they were happy with in terms of its efficiency in producing energy.

"The angle of the blades on wind turbines really affects the air dynamics, and the students discovered that for themselves," Josh Padolsky, one of the Trek educators explained. "That's truly learning by doing."

He continued by pointing out another group of girls who had gotten creative and installed shovel-like scoops on the ends of their blades in an effort to move more air, thereby increasing the amount of energy produced.

As part of the design challenge for both wind and solar energy apparatus, the students charted the energy producing efficiency of their models. They also went through the paperwork rigours that a real home owner or businessman would have to undertake, submitting blueprints and an energy plan to Mr. Padolsky for approval in his mock role as "design commissioner" before they began.

There were several surprises. For example, when charting the efficiency of their solar energy designs, a number of groups discovered that having the panels at an 80 degree angle to the light - i.e. the sun in the real environment - worked slightly better than 90 degrees. It is an observation that is borne out in the field in many situations, for reasons that baffle any layman's understanding.



TREC Education program coordinator Kelly Park talks with a group of students as they watch wind being converted into electricity to light a light bulb.

Also, in the case of wind turbines, it's a delicate balancing act between the surface area of the blades and their weight. Depending on the design, structures with relatively small blades can be more efficient than machines with much larger - but heavier - moving parts. It explains the popularity of the tall, skinny machines on wind turbine "farms" that dot the local landscape, particularly as one approaches Lake Erie.

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For Mr. Padolsky, one of the biggest surprises was the quality of the questions and understanding of the students at Blessed Sacrament.

"They kept pushing higher and higher," he said. "I've been in Grade 9 classrooms where the understanding of the concepts hasn't been as fully developed."

On Thursday, TREC program coordinator Kelly Park and educator Ann Cummings worked in the Grade 5/6 classroom doing a variety of experiments in which the students discovered how wind energy can be captured to make light. Along the way they learned that the reason LED (light emitting diode) lights are much more energy efficient than traditional, incandescent bulbs is that LEDs create light by hydro stimulating a chemical reaction. Incandescent bulbs create light by virtue of the power heating up filaments, but the heat - i.e. the energy - is largely wasted.

Like Mr. Padolsky, Mrs. Park and Mrs. Cummings were very impressed with understanding of the students. Mrs. Cummings didn't have to ask twice when she invited the young people to suggest the two biggest advantages of using LED or other energy efficient lights such as compact fluorescents over incandescent bulbs.

"Less global warming and you save money," one student immediately - and correctly - answered.

One of the goals of the TREC program is that the students take home what they learn to share with their families, Mrs. Park said. Also, the program empowers young people by showing them that they can make a difference.

"Our hope is that the kids will be inspired to develop better energy habits and new ideas for conserving our resources such as water and electricity. We can do small things ourselves."

After a little experimentation, this group of girls in the Grade 7/8 class discovered just the right angle at which to set the blades on their model wind turbine for maximum energy-producing efficiency. Pictured, from left to right, are Caitlyn Norris, Michaela Clark and Sarah Henry.



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In general, today’s young people are a lot more aware of the problem of global warming and the wisdom of developing green energy sources, she continued. That’s particularly so in the Burford area which boasts a good number of both solar installations in particular, and a few wind turbines as well.

“The students have seen solar energy arrays on rooftops or at farms in the countryside, or they know someone who has a job in the green energy field,” she noted.

Mrs. Gardiner said that the impact the TREC workshop had on her students was very obvious.

“The kids are getting it,” she said, adding that the value of programs like this for the world as a whole is immense.

“With the right exposure, our young people are learning that, if we don’t take care of the planet, there won’t be a planet. They are getting out of the fossil fuel mindset. They are learning in a very hands-on way that the energy that is all around us in abundance in forms such as the wind and the sun can be turned into clean power that we can all use.”

From the point of view of a teacher working in a small, rural school, one of the biggest advantages of bringing in an organization like TREK to assist in programming is that they are able to provide resources that just wouldn’t be available otherwise, she added.

Mrs. O’Brien agreed.

“Teaching units on energy and energy conservation can be a challenge in any school,” she said. “Schools just don’t have sets of solar panels where the students can make and do and learn, for example.”

Last week’s TREC Education workshops complemented the very popular “Scientists in Schools” sessions which Mrs. O’Brien introduced to Blessed Sacrament last year. Both programs make the curriculum connection with units on energy, which are typically taught in January.

Mrs. Gardiner is looking forward to the possible return of TREC Education to Blessed Sacrament in the future. The organization’s educators took some of the students’ models back with them to Toronto where they may be used as part of a travelling display featuring student work from across the province.

More information about TREC Education can be found by visiting www.treceducation.ca

