

Villanova College is bringing science to life



By Wallace Pidgeon

Who knew science and math could be so much fun? And be brought to life with practical experience outside the classroom? The Grade 8 Science and Math students at Villanova College's Middle School do.

Last week, Grade 8 students left the classroom, shared their bikes and participated in an outdoor bike lab ? and this was no ordinary bike ride.

This was a field research and data collection exercise, the kind of practical and real life experience that is part of the learning culture at Villanova College.

Teachers Gianpiero De Rose and Qb Mascarenhas are only two of the many faculty members who are committed to bringing Math and Science to life by integrating the STEM pathway learning curriculum into various outside the classroom learning experiences.

STEM represents the disciplines of Science, Technology, Engineering and Mathematics. Practical, real-life experiences create a ?cool? factor that inspire a love for learning in these budding engineers, mathematicians and scientists.

?Engaging kids in active learning,? explained Mr. Mascarenhas, Villanova College's Upper School Physics Teacher. ?The STEM program is based on engaging [more students] in math and science using technology and practical applications.?

Mr. Mascarenhas brings over a decade's worth of practical engineering experience from industry.

The practical application of math and science is not lost on Mr. DeRose who teaches Grade 7 and 8 Science and Math.

?STEM is about escaping the textbook and trying to give students real-world experiences,? added DeRose.

The outdoor bike lab is one of many practical labs students are exposed to.

?We start the year off with our mechanisms unit which is the physics unit for our elementary curriculum and we have just finished studying simple machines; wheels and axles, gears, and inclined planes,? he explained. ?So, in keeping with the philosophy of giving our curriculum real word application, we feel this lab is a great teaching opportunity. Most kids have a bike or, at the very least, have ridden a bike but don't understand how it works.

?This lab takes students' prior knowledge from classroom teaching and has them apply it to real-world scenarios. It is important to take learning outside the classroom because the more we, as teachers, challenge students to think in unconventional ways, the more significant the learning experience. Teaching isn't about filling [students'] heads with information. It can, and should, be so much

more than that.?

With the hope that none of the students think that math or science is 'boring' the entire Villanova College student experience is engaging and motivates students to learn.

Not surprising the inspiration for an outdoor bike lab came to Mr. De Rose outside the classroom on the annual field trip to Ottawa and Montreal two years ago. During a bike tour along the Rideau Canal, Mr. De Rose realized that his students really didn't capture the whole premise around gear ratios and mechanical advantage.

Siena Thalassinos and Antonio Peluso were partners and they soon understood this activity as being about more than just riding a bike ? it was a math and science experiment.

'The bike lab in science class is to see the differences in gears, the difficulties in riding on different surfaces, seeing if it's easier or harder to do,' Siena explained.

'It's basically mechanical advantage,' Antonio added. 'We are trying to find what gear ratio has more of a mechanical advantage in different terrains.'

The exercise is about finding out if there is a gear relationship to the level of difficulty.

'We want to see different ratios of gears and how they work and if riding is easier or harder on a lower gear,' continued Siena.

In class, Mr. DeRose has taught the students that mechanical advantage is designed most of the time to make things easier. Now, outside the classroom, the students are experiencing the effects firsthand. This is STEM in action.

Next May, when Villanova College's Grade 8 class travels to Ottawa they will truly see how these concepts are put it into practice on their bike tour around the Rideau Canal.