

Inquiry-based learning is simple in concept, but complex and demanding in execution. Although no two schools do it exactly alike, all schools that commit to it require enlightened leadership, collaborative planning and implementation, academic rigour, and meaningful assessment of student growth.

Education Canada guest editor George Pearson profiles three different school settings, all committed to inquiry-based learning and all drawing inspiration and pedagogical support from the Galileo Educational Network. Sharon Friesen, co-founder and president of the Galileo Educational Network, provides an introduction.

PHOTOS ON THIS PAGE COURTESY OF THE GREYSTONE CENTENNIAL MIDDLE SCHOOL.



Inquiry-based Learning: Three Alberta Schools That Know What It Takes



EN BREF Les constats récents des recherches en sciences de l'apprentissage poussent les éducateurs à créer des environnements d'apprentissage adaptés au 21^e siècle, affirme Sharon Friesen, cofondatrice et chef de la direction du réseau Galileo Educational Network, Université de Calgary. Le réseau Galileo travaille, en personne et en ligne, avec des enseignants, gestionnaires d'école, fournisseurs de perfectionnement professionnel de conseils et commissions scolaires, et administrateurs de conseils et commissions scolaires en vue d'effectuer de la recherche et de mettre au point des pratiques et environnements d'apprentissage, ainsi que de les instaurer. Les écoles du réseau doivent respecter six principes : encadrer l'intellect par des approches d'apprentissage fondé sur l'enquête, infuser les technologies numériques, assurer une évaluation de qualité, honorer la collaboration et le travail d'équipe, favoriser les connaissances pédagogiques, ainsi que fournir aux enseignants une préparation pratique préalable stimulant la réflexion. Nous présentons ici trois écoles albertaines du réseau Galileo : l'école primaire Glendale, Calgary Board of Education; l'école Calgary Girls' School, école à charte; et l'école intermédiaire Greystone Centennial, Parkland School Division (du côté ouest d'Edmonton).

SHARON FRIESEN

Galileo Educational Network: Creating, Researching, and Supporting 21st Century Learning

Any knowledge that doesn't lead to new questions quickly dies out. It fails to maintain the temperature required for sustaining life. In the most extreme cases, cases well known from ancient and modern history, it even poses a lethal threat to society.¹

NEW TIMES, NEW WAYS

School and classroom structures designed to meet the needs of the industrial past cannot "maintain the temperature required for sustaining life." Recent learning sciences research findings compel educators to invent new learning environments better suited to meet the demands of the 21st century. These new learning environments require different approaches to the design of curriculum, teaching, and assessment.

No longer is the simple coverage of subject content adequate for today's learners. No field of endeavour is untouched by digital technologies. Access to late-breaking news is instantaneous. The latest information in science and medicine is as likely to be available online to the laity as to experts. Anyone with Web access can create an open forum for debate, commentary, and personal exploration of events formerly controlled by conventional media. Unlikely people are instantly connected and connect-able across time and space. Problems no longer come neatly packaged, defined-in-advance and amenable to the confident application of familiar strategies. Real problems erupt unexpectedly, demanding creative attention in rapidly evolving contexts that once seemed stable, unshakable, and knowable.²

Students need to be able to work creatively with concepts to generate new ideas, new theories, new products, and new knowledge. The goal of education is better conceived of as ensuring students have the competencies required to fully participate in and make meaningful contributions locally, provincially, nationally, and/or globally, not for someday in the future, but now.

GALILEO EDUCATIONAL NETWORK

Galileo³ was established in 1999 as an independent, charitable organization with a mandate to create and support 21st century learning and leadership by creating researched images of instructional practices and teacher and student learning through the four pillars of (1) leading and learning, (2) capacity building, (3) effective infusion of technology, and (4) research and development. To meet this challenge, Galileo mentors and researchers sought out district leaders, school principals, and teachers who were interested in creating new structures and practices to meet the learning needs of 21st century learners and the needs of a knowledge society.

Working collaboratively, face to face, and online with over 2,000 teachers, 200 school administrators, 300 district level professional development providers and 50 district administrators, Galileo mentors and researchers have been able to create robust research and images of practice⁴ for 21st century learning, teaching, and leading. Galileo has demonstrated that when teachers (1) design authentic, academically robust work for students, (2) focus instruction on helping students develop the competencies necessary to build on, not just consume or borrow, other people's ideas, (3) weave assessment into the fabric of daily teaching and learning, and (4) design learning that requires students to use digital technologies to think with, there is a statistically significant increase in students' intellectual engagement⁵ and achievement.

This is a problem presented to students at Calgary Girls' School as part of their inquiry-based learning.



TRADING PENNIES

Four-year-old Alexis has just learned that she can make a very good living doing various chores around the house. She hopes one day that she can buy herself an Iguana, something her mother would NEVER buy for her. In the week she made her bed for ten pennies every day. She also cleaned the windows and got paid from her mother, making three pennies for each window. Since then, she has been brainstorming all sorts of chores that she do around the house.

With all these pennies, Alexis is struggling to keep her money in a safe place. Her pockets are overflowing with copper coins! Alexis is very clever though; when her dad tells her to give him ten copper pennies for one dime, she says "NO WAY! I'm not going to give you ten and get only one back."

Now Alexis has 1,234 pennies that she carries around with her to keep them safe. They are causing her trouble. Her pants have almost fallen down on several occasions. Furthermore, with all these pennies in her pockets, she is a much slower runner and can't keep up with her friends. She comes to you for help because she knows you are in Grade 4 and can help her find a solution. How can you explain to her that she can exchange her pennies for bills and other coins? Be sure to show her in three ways: with writing, with labeled diagrams, and with practice money that you made.

This is a solution suggested by one of the students.

Dear Alexis,
It's okay to give your dad 10 copper pennies for one dime because a dime is the same amount as 10 pennies except only in one coin. For example if your mom says give her 25 pennies for one quarter it's just like getting 25 pennies but in one coin. So it's okay to give your dad 10 copper pennies for one dime and besides your pockets won't be filled to the top.



Galileo developed an online professional learning environment, Intelligence Online (IO), (www.iomembership.com) through which it provides teachers with a researched design process for designing and developing robust discipline-based inquiry work. The IO environment makes it easy for teachers to collaborate with other teachers, to provide input or receive feedback, to create a personal discussion group with colleagues, and to publish all or parts of their planning.

GALILEO PRINCIPLES

Schools working with Galileo Educational Network commit themselves to six principles:

Principle 1: Stewarding the intellect through inquiry-based learning approaches

We promote inquiry as the stance that is foundational for all aspects of life of a school community. It's based on the belief that understanding is constructed when students and teachers work together to pose and solve problems that arise in the course of authentic, intellectually engaging, collaborative activity. In an inquiry-oriented classroom, a student's innate imagination, curiosity and drive to understand the world is respected and cultivated. These learning communities are dedicated to robust, collaborative, discipline-based inquiry, which fosters intellectual habits of thought and meaning-making in all students.

Principle 2: Infusing digital technologies

Knowledge within every discipline is either created or furthered with the use of digital technologies. When we take the stewardship of the intellect seriously as an educational charge, students are given the opportunity to think differently each time they use digital technologies.

Principle 3: Providing high-quality assessment

The primary purpose of assessment is to improve student learning. As such, it must be tied to meaningful, authentic work. The intent of high-quality assessment is to improve, not just audit, student performances of learning and understanding; therefore, a range of authentic formative assessment practices are utilized to create strong, self-directed learners. Teachers work collaboratively with students to co-create criteria for learning performances. Students are provided with the strategies, skills and opportunities to assess their own learning and to provide meaningful feedback to their peers. Students learn to set goals, identify their next learning steps, and develop strategies to improve their learning and understanding.

Principle 4: Honouring collaboration and teamwork

Building relationships and planning a method of learning together allows students and teachers to understand individual and collective motives, roles, and beliefs. Effective dialogue is of central importance, resulting in a group ethic that fosters a sense of belonging, trust, and purposefulness. In addition to its work in the classroom, Galileo consults regularly with a variety of provincial, national, and international organizations to create, promote, and disseminate innovative teaching and learning practices.

Principle 5: Fostering scholarship of teaching

Ongoing, effective professional learning plays an essential role in the improvement of student learning and has a positive impact on school culture. Teachers receive direct mentoring in curriculum content, instructional strategies, and the effective use of teaching with digital technologies.

There is a commitment to making teaching public, by collaborating with colleagues and the broader outside community. Working collaboratively, teachers systematically inquire into various aspects of their teaching. They meet regularly with each other to critically examine, question, discuss various aspects of teaching, and provide feedback and feed forward to and with each other. Through this process teachers develop an understanding of "knowledge-practice relationships as well as how inquiry produces knowledge, how inquiry relates to practice, and what teachers learn from inquiry within communities".⁶ Teachers also commit making a contribution to their profession through publishing and presenting.

Principle 6: Providing practical thought-provoking preparation for pre-service teachers

Galileo develops strategies to bring pre-service teachers into the profession through an inquiry-based approach. Established teachers serve as mentors in study groups, seminars, and in other professional and academic activities, while university faculty share their expertise via direct and active participation in support of school improvement. Galileo mentors, teachers, university faculty, and pre-service teachers work as a team to support kindergarten to Grade 12 student learning. |

SHARON FRIESEN is co-founder and president of the Galileo Educational Network and an associate professor in educational leadership, Faculty of Education at the University of Calgary.

Notes

- 1 Szyborska, W. (1996). The poet and the world. Nobel lecture, December 7, 1996. Retrieved September 3, 2009 from http://nobelprize.org/nobel_prizes/literature/laureates/1996/szyborska-lecture.html
- 2 Clifford, P. & Friesen, S. (2003). Leadership and the new literacies. Paper presented via videoconference at *QUEST Conference*. Retrieved September 3, 2009 from www.galileo.org/research/publications/leadership_new_literacies.pdf
- 3 Galileo is a registered charity under the Income Tax Act of Canada and the Societies Act of Alberta.
- 4 Articulated by S. Friesen in *Teaching effectiveness: A framework and rubric*. Retrieved September 3, 2009 from www.cca-ace.ca/media/en/WDYD/IST_Teaching_EN.pdf Friesen, S. (2009). *Teaching effectiveness: A framework and rubric*. Toronto, ON: Canadian Education Association.
- 5 Intellectual Engagement refers a serious emotional and cognitive investment in learning, using higher order thinking skills to increase understanding, solve complex problems or construct new knowledge. (Willms, D., Friesen, S. & Milton, P. (2009). *What did you do in school today? Transforming classrooms through social, academic and intellectual engagement*. Toronto, ON: Canadian Education Association.)
- 6 Cochran-Smith, M. & Lytle, S.L. (2001). Beyond certainty: Taking an inquiry stance on practice. In Lieberman, A. & Miller, L. (Eds.), *Teachers caught in the action*. New York: Teachers College Press.

Link to Galileo Network website: www.galileo.org



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Glendale Students Know What Learning Looks Like

AT GLENDALE SCHOOL IN THE CALGARY BOARD OF EDUCATION, Grade 1 students worried that they were too distracted with their studies and other activities to remember to water their plant, Daisy. So they made other arrangements.

Now Ralph gets the job done – Ralph the Robot, that is. Ralph remembers to do the watering at the right time and alerts passersby beforehand with music and lights so they don't get watered as well.

The students invented and built Ralph as part of their study of robotics, a subject that all Glendale students address each year in their inquiry-based curriculum. When in their robotics mode, students spend long periods of sustained, uninterrupted classes – usually three weeks of three classes per week – designing, planning, constructing, testing, and reporting on a device that responds to a real-life need.

The study of robotics, a science not familiar to most teachers, became “an opportunity to adopt the stance of a learner,” says Susan Marinucci, who joined Glendale ten years ago as a teacher. She later became assistant principal and then principal before leaving a few months ago to become principal of another school in the Calgary Board. She recalls one of the Glendale teachers showing off her students' work at an industry presentation and explaining robotics as “a very strong and authentic way to keep adults (me) mindful of how very hard learning can be. In our daily practice we expect young learners to print, speak, read, and/or complete complicated mathematical logarithms as commonplace school expectations. When I am teaching robotics I AM with them, designing, problem solving, struggling, puzzling, building and, yes, enjoying the complicated work the medium requires.”

There is also a commitment to the arts. Students “don't just throw a pot,” says Ms. Marinucci. For example, an artist may come to the school over a period of days or weeks and share not only examples of his or her work, but also what it's like to make one's living as an artist and how art lives in the community and the world. Artists and other experts may connect with the classroom through Skype, video conferencing, Flip video cameras, or face-to-face visits.

STUDENTS GO TO THE SOURCE: IMAM, AMBASSADOR, GEOLOGIST

When a Grade 6 class was examining Canada's presence in Afghanistan, the teacher recognized a need to better understand Islam. Students exchanged e-mails with an imam, who paid the class a visit and invited them all to the mosque. His tour with them included the prayer room, seldom seen by outsiders to the faith. The Afghanistan investigation also included e-mailing the Canadian ambassador to Afghanistan. During last year's presidential campaign in the United States, students watched the Obama phenomenon develop and discussed comparisons to the Canadian political system. When the students studied minerals, a geologist took them to three locations for a close-up look. And when Alberta Bill 44 was proposed (and later passed) a mighty discussion ensued about a clause in that legislation, which requires school boards to give parents written notice when controversial topics are going to be covered in the curriculum, so they can withdraw their children from the discussion.

Rather than absorbing volumes of predigested information, much of it distant from their own experience, Glendale students are learning how to learn. This is part of the school's ethos, Ms. Marinucci explains, and teachers and students explore and learn together. “We don't ask students to name all the rivers in Canada, but they definitely know where to find all kinds of information about those rivers.” There clearly is a place for examination results in the evaluation of student learning, she says, but if exams are the sole measurement of that learning, “lots of gifted but struggling learners will never be at the top of the curve.”

Inquiry topics students explored last year included:

- What does it mean to be normal?
- Fueling the planet (what we are eating and what it means for our planet)
- Living well together (understanding other cultures)
- Worlds together, worlds apart (students as global citizens)
- Moonstruck (learning about the moon)
- What is childhood?
- Music (students experience the joy of making music)

Designing and guiding student inquiries is challenging for teachers at the best of times. Glendale provides a number of supports, such as a 48-hour off-site staff retreat on a Friday and Saturday (teachers receive lieu day for the Saturday) to encourage the sharing of ideas and strategies. All teaching staff and nearly all support staff attend the session. A web expert is available weekly to help teachers post their work. All teachers are provided access to an online collaborative planning tool, Intelligence Online, developed through a partnership between Galileo Educational Network and Axia Netmedia, giving them access to online experts versed in inquiry-based learning and field or discipline experts. Glendale also provides for face-to-face consultations with Galileo, based at the University of Calgary.

Ms. Marinucci has a long history with Galileo, beginning with a four-month secondment in 1999 when the Galileo Project, as it was then known, occupied a state-of-the-art school in a neighbouring school district, operating as a kind of laboratory school. When the education minister insisted that the initiative be housed where it could be available to schools and teachers province-wide, Galileo moved to the University of Calgary and Ms. Marinucci returned to the Calgary Board of Education. She was placed in a teaching position at Glendale, then an “average” school in a middle-class neighbourhood and the place chosen by Donna Michaels, then-chief superintendent of the Calgary board, to test the inquiry-style learning espoused by Galileo. Her proposal was met with “some initial suspicion,” Ms. Marinucci says, but resistance softened when it became clear that funding from the Alberta Initiative for School Improvement (AIS) would cover the costs and the needed technology. That was the beginning of Glendale’s inquiry-based curriculum.

TEACHERS ‘FASCINATED’ BY INQUIRY, DON’T WANT TO LEAVE

The Glendale teaching staff normally numbers 12, including a music teacher and a resource specialist (both less than 1.0 fulltime equivalent). The average number of years of teaching experience is six. Teachers “are personally and professionally fascinated” by Glendale’s inquiry-based program, Ms. Marinucci says, and generally want to stay well beyond the three-years-and-out stint favoured by the school system. While it takes longer than three years for teachers to become fully immersed in the inquiry approach and skilled in deploying it, she would prefer that teachers would eventually move on to teach at other schools – and take the Good News about inquiry-based learning with them.

To fill openings when they do occur, Glendale looks for “matches of willingness to learn, life experience, ability to engage in relationships with students, disciplines, community, colleagues, interest in ‘getting/thinking out of the box’ both literally and figuratively,” says Ms. Marinucci. Many of



PHOTOS COURTESY OF GLENDALE SCHOOL.

the Glendale teachers have degrees that would qualify them elsewhere as specialists, such as physical education, Spanish and English literature, and they also have varied work experience outside of education.

In the fall, the teaching staff is augmented by 15 or 16 second-year master teachers from the University of Calgary, often outnumbering the Glendale staff. Since Glendale takes a full cadre of student teachers, the supervising professor does not have to move from school to school to observe them. As a result, the professor becomes a kind of resident resource: developing relationships with Glendale teachers, doing demonstrations with students and conducting classes for student teachers and school staff.

The school, located in the southwest Calgary community of Glendale, is within two kilometres of more than 40 “schools of choice,” including private and charter schools that offer specialties in sports, language, traditional learning, religious and gender-based programs, says Ms. Marinucci. With the proliferation of private and charter schools in Calgary, the Calgary Board of Education has broadened its own offerings to mirror, as much as possible, the choices offered outside the public system. In recent years, enrolment from Glendale’s immediate catchment has diminished as families grew older, real estate values shot up and younger families sought housing in the suburbs. As a result, Glendale has been able to accommodate families from outside the area seeking progressive schools but who balk at paying \$5,000 and more in tuition and fees. Today about 80 percent of Glendale students are from outside its traditional catchment area. The student body has changed from almost totally Anglo-Saxon 10 years ago to a rich mix of students from all races, religions and abilities.

An unintended outgrowth of Calgary’s varied assortment of schools is the anxiety of parents over selecting the right school for their child. “Many moms would say how much easier it was for their mother when all they had to do was just walk your child to the little school across the street,” says Ms. Marinucci.

To avoid mismatches, Glendale takes pains to tell parents of prospective students what they can expect from the school. “I clearly tell parents ‘your children will be using technology to demonstrate their learning. If you don’t want your child to use a computer or keyboard, this is not the program for you,’” says Ms. Marinucci. She is equally clear about identifying the school’s “deliverables”: teaching through authentic, inquiry-based projects, including a unit on robotics each year; student teachers as a regular part of the learning community; arts-infused education; a commitment to the environment, including a number of full-school projects; drawing on the expertise of outside resources, either in person or remotely; and twice-a-year demonstrations of learning that are planned and run by students.

The result, she says, is that “Glendale students know what learning looks like.” |

Link to Glendale School website: <http://schools.cbe.ab.ca/b143>

Link to Intelligence Online website: www.iomembership.com/portal



PHOTOS COURTESY OF CALGARY GIRLS' SCHOOL.



Calgary Girls' School: 600 Computers for 600 Scientists

WHEN CALGARY GIRLS' SCHOOL (CGS), a charter school including grades four through nine, opened with 188 students in 2003, it was aligned with Alberta Education's charter-school mandate at that time to offer parents a broad range of school choices.

Today the Alberta charter school mandate is to focus on innovation and research, and CGS, now in its seventh year – the last three a full house at 600 students – is fully prepared to follow the new mandate.

For the first time, all 600 girls have a laptop computer as they plunge into another year of inquiry-based studies in a learning environment that the CGS principal, Caroline Parker, calls “a bit of a dream” because it reflects the kind of school she and her staff would build if they just had the means to do so – and they do, for the most part.

The school took the leap into one student-one computer because, says Ms. Parker, at one computer for every three students last year “we were worried that teachers were going to have to scale back because they couldn't get enough access for their kids.” The computers are MacBooks, which can be leased from the school (\$345 for the year, including insurance) or purchased from the Apple Store. All of them were imaged for use at CGS. Some sites are blocked, “but we have more open access than some of the large jurisdictions have,” says Ms. Parker. “We want to operate from a position of engendering responsibility and personal ethics from the girls as to how they treat the network and what they access when they're in our building and working on school assignments.” At the same time “we will be Big Brother if we need to be, because we have promised parents that we will keep their kids safe when they're at school just the same as when they're being supervised in their activity in the building.”

When the idea was floated to parents at a meeting, some parents were concerned that the kind of teaching they valued would change, says Ms. Parker, who reassured them that the girls would interact with one another as they always had and that the inquiry work would continue – now with even greater access to resources on the web.

That kind of access will boost the girls' capacity to do research for the inquiry projects, large and small, that permeate the CGS curriculum. A few years ago, for example, a large-scale inquiry project focused on a sour gas well planned for a location just outside Calgary. Oil and gas production affects the local and provincial economy and many of the school's families are employed in that industry. At the same time, Ms. Parker points out, there are safety concerns connected to sour gas wells. So the students identified and researched a range of factors, applied scientific methods to calculate risks, and invited experts in to answer questions. In the end they produced a safety pamphlet for distribution in the community.

“IT ISN'T ENOUGH THAT STUDENTS ARE ABLE TO SOLVE A MATH PROBLEM BY FOLLOWING A SERIES OF STEPS. THEY MUST BE ABLE TO EXPLAIN AND JUSTIFY THEIR ANSWERS. THIS IS TRUE IN ALL SUBJECT AREAS. ... OUR DESIRE IS TO SLOW DOWN, TO GO DEEPLY INTO A TOPIC RATHER THAN TO SKATE ON THE SURFACE.”

SLOW DOWN, GO DEEPLY INTO A TOPIC

"Our belief about learning is that there must be deep understanding of concepts and ideas," says Ms. Parker. "It isn't enough that students are able to solve a math problem by following a series of steps. They must be able to explain and justify their answers. This is true in all subject areas. ... Our desire is to slow down, to go deeply into a topic rather than to skate on the surface."

So instead of telling students how to determine the amount of salt in a saline solution that he held up for them to see, a Grade 5 science teacher asked the students how they might figure that out for themselves. He asked them to think about it on their own, and then in a small group (collaboration is integral to the CGS way of doing things). After they had done this, they were to send him an e-mail describing their approach so that he could, over the weekend, marshal the necessary supplies and equipment to test their theories, which they would then discuss and compare in class. The purpose was not to see which approach was correct or worked best, but to examine the processes (evaporate the water? how? in what kind of container? pour the solution through a coffee filter?) by which students attempted to find an answer.

"That kind of construction of science knowledge," says Ms. Parker, "based on a real problem they were facing, is a very different kind of understanding than handing girls a definition of evaporation or solubility or something else that could live in a textbook. We try to find a really alive space where there is a provocation evolving."

The teacher evaluates this kind of student work by examining the notes the student has taken, as well as the observations the student makes about the process and findings. Scientists keep close observation of what happens in a process like this, says Ms. Parker, including speculation as to why something did or did not work. That kind of reflection in a journal allows a teacher to appraise the student's thinking. "To me, there's way more information that lives in evaluating that kind of work than a score on a test."

The inquiry approach to learning is especially demanding for teachers, Ms. Parker admits. At the same time, the atmosphere is energized by the collaboration that is expected of CGS teachers. "We're very upfront that collaboration takes a lot of time. It takes way more time ... than being that teacher who is teaching in a portable by themselves. I've been that teacher." But workload takes on a different character "when you really believe in the work and you feel that everybody around you believes in the work. I have never been on a staff like this. I am so privileged to be with this group of teachers because they are so committed to the work we do."

The number one reason parents send their daughters to CGS is because it's a single-gender school, says Ms. Parker. The school teaches a curriculum (GO GIRLS!) designed to foster independent voice and self-esteem. "Having a gender-specific setting allows us to take up the day-to-day issues that adolescent girls face. We spend a lot of time helping girls work through friendship problems and to that end girls become more self-aware. We deconstruct images of women in the media and try to infuse images of strong women into all that we do so that girls understand that there is a legacy of strong women who came before them."



PHOTOS COURTESY OF CALGARY GIRLS' SCHOOL.

TEST RESULTS ARE GOOD, BUT THEY DON'T TELL IT ALL

CGS girls take the same provincial achievement tests as other schools. They perform well, says Ms. Parker, and generally surpass the results of other girls in the province, especially in math and science. "What doesn't show is the qualitative experience of girls in our school and how much more confident they become about speaking and giving voice to their ideas."

The 25 teachers on the CGS staff are not members of the Alberta Teachers' Association and this gives the school flexibility in staffing that ATA schools do not have. (Ms. Parker, a former ATA member, is quick to add that the ATA has been beneficial to her own career and that she is not putting the organization down.) For example, the CGS dance instructor, who has her own studio and also teaches at the University of Calgary, is not a certificated teacher. The CGS resource teacher, a former principal with the Calgary Board of Education, is certificated but was hired on a nonstandard contract rather than a normal professional teaching contract.

CGS has installed its own version of merit pay. In addition to writing goals as all Alberta teachers are required to write, CGS teachers write a goal that is specific to the school's charter, related to girls and learning, and propose how they wish to address that goal through conferences, reading, research, or in some other way. At the end of the year they reflect on the goal and in most cases, says Ms. Parker, they are granted merit pay. "The intent of merit pay is to be used toward professional development, so we don't get teachers competing against one another. There is a finite amount of money. Everyone is entitled to apply for merit pay, but it's not 'she gets more because her test scores are higher.'"

The relationship with the Galileo Educational Network dates back to the school's origins. Ms. Parker calls Galileo co-founder Sharon Friesen "an incredible mentor to our staff ... a critical friend who can evoke questions about what kind of work we want to do with girls, and what really counts, what's important for kids to know in the 21st century."

Bringing the hard questions to the surface is vital to keeping the learning climate real and vibrant, Ms. Parker says. "You don't get to have this kind of 'well, just let me figure out in my reflections today what this is all about and then I can teach it.' It's not like that. You figure it out because the kids are there and they keep on coming and you figure it out as you're going through." |

Link to CGS website: www.calgarygirlsschool.com



PHOTOS COURTESY OF GREYSTONE CENTENNIAL MIDDLE SCHOOL.



Greystone: A Family Lives Here

AT GREYSTONE CENTENNIAL MIDDLE SCHOOL west of Edmonton, Alberta, students don't move from classroom to classroom or teacher to teacher (sometimes referred to as "pop tart" scheduling). Instead they stay with same group of teachers for as long as possible in any given day, in much the same mode as an elementary school schedule.

This approach to program delivery gives students more time to develop their multi-discipline inquiries, as well as collaborate with classmates at various stages of their studies. The teachers work together too, offering support to one another and sharing responsibility for guiding students' individual and group efforts.

"We know that deep questioning, deep involvement, and investigating the curriculum takes time," says Greystone principal Carolyn Cameron. "You can't just have a bell going off every 50 minutes, pack it up and away you go to your next class and next segment of learning." That's not about students learning," she adds, "it's about a teacher covering content. Just because a teacher has touched upon something doesn't mean real learning has taken place."

Greystone is one of two middle schools in Parkland School Division, on the western edge of Edmonton. About 500 students attend the school, which encompasses Grades 5-9. It's organized into two "loops": a three-year loop (Grades 5-7) and a two-year loop (Grades 8 and 9). The same teachers stay with a group throughout the three-year or two-year cycle.

The school opened in 2005 in a new building with lots of flexible spaces and a newly structured program. (The other middle school in Parkland School Division does not have loops.) A nucleus of teachers who had previously taught together in a multi-age kindergarten to Grade 3 program and a team-taught double class of Grade 7 students at another school proposed the loops and the expansion of grade levels, a departure from the more traditional 7-9 junior high structure. It was a way for students to "really get connected with their teachers," says Ms. Cameron, who had been one of those teachers.

Her master's degree program at the University of Portland (Oregon) was focused on project-based learning through integrated, student-directed inquiry. She was assistant principal at Greystone when it opened and became principal during the school's third year.

MAKING MEANINGFUL CONNECTIONS WITH THE CONTENT

"Using an inquiry focus fits extremely well with our curriculum, particularly in the areas of math and social studies," says Ms. Cameron. "So much of our curriculum requires students to use critical thinking processes and to explore topics more deeply in order to make meaningful connections with the content. ... I really don't see any mismatch between what we are working toward and what Alberta Education expects of our students. The only mismatch that currently exists is how our provincial achievement tests can possibly measure all of the rich, deep learning that takes place in an inquiry classroom."

Those provincial achievement tests do show that students have scored strong results in language arts. At the time this story was written, Ms. Cameron was awaiting results from last year's Grade 9s because they were the first group of students tested in Grade 6 at Greystone and she was eager to compare the data. Greystone is also collecting grade-level achievement data as well as baseline data based on the new report card format, plus a parent satisfaction survey.

Teaching in an inquiry and project-based framework requires a motivated, flexible, and versatile staff. Working as a team requires constant collaboration. Both require a lot of time spent in planning, implementing, and follow-up.

"When you've got staff that are very engaged and excited to learn along with the kids, and to develop their skill set, you know it's a perfect place to work," says Ms. Cameron. To nurture the staff, Greystone called upon outside learning specialists. Margaretha Ebberts of Edmonton



public schools, helped develop the science inquiry program. Nancy Doda, a middle-school expert from the U.S., helped teachers at Greystone, Woodhaven, and Broxton Park (the other Parkland School Division middle schools), to understand and respond to the unique developmental needs of adolescent learners.

Last year, Greystone connected with Galileo Educational Network. "I thought it was a really good fit for the kinds of things we were working on here," says Ms. Cameron. "I really like the connection they make to the world outside the school. They're excellent at helping us integrate technology as well." A Galileo consultant, Candace Saar, works alongside Greystone teachers in and out of their classes. "She takes them from where they're at and where their level of understanding is and moves forward. It's not like heading out for PD [professional development] and trying to make sense of it and bring it back."

Maternity leaves have been a challenge to developing staff continuity in the past several years, but Ms. Cameron sees this year being "the most settled yet." She is enthusiastic about the high level of collaboration between teachers as well as intensified reflection on the quality of learning going on in the school. The staff, she says, "is taking collaboration and professionalism to the next level, where they want to make the time to not only meet in their grade-level groups but to meet between two grade-level groups so they can listen to each other's project ideas and provide feedback."

Finding the time to talk is a challenge. "The only thing I keep asking our school division for is more time for our teachers to plan," says Ms. Cameron. "We've tried to do some creative things, but it's tough."

Even so, she says there is no comparison between the learning climate at Greystone today and more conventional settings in which lead to "a lot of kids get lost moving from class to class. You can't get to all the kids when you're teaching 250 kids, and they're kind of cycling through; it's like a herd of cattle."

PARENT SUPPORT HAS GROWN SINCE THE BEGINNING

Getting from there to here had its rough spots, especially in the first year. "I would not do that year again, because it was all 500 kids coming in new and trying to get things done differently, and establish the trust and relationships with families, [trying to convince them] that what we were doing was good for their kids," she says.

Just how much that trust has grown was illustrated by parents' strong support for the new report card that was introduced last year. It emphasizes performance-based assessments that teachers felt were needed to reflect the work they were doing in the classroom. Ms. Cameron fully supported the teachers' call for a new report card, but thought its introduction should be phased in, starting with Grade 5 or Grades 5 and 6. "This was a big task to undertake in one year. Report cards are the highly public face of what we do in our classrooms. The most significant thing you can do to draw attention to the changes you are making in a school is to change how you are reporting the learning to parents."

But in meetings held by teachers last year to describe the new report cards to parents, it became clear they supported the change. So the new report cards were installed for all grade levels.

How do students feel about Greystone? "The kids talk about this feeling kind of like a family. I don't think this is typical of all middle schools. Our kids, we can't get them out of here at the end of the day, they really love being here," says Ms. Cameron. "In fact, the end of the year is usually an extremely emotional time for our Grade 9s. They cry, they hug, they cry some more and they take a million pictures of each other and our staff. They just don't want to go. It is really something to see."

For Ms. Cameron, there are a lot more things to do. While the teacher-as-generalist approach is developing well in the lower loop, it's much more challenging to design the learning environment for Grades 8 and 9, especially the latter. "We're trying with our nines to find ways to [integrate subject areas] ... certain things go together better like humanities and social studies." And there's a lot more data to gather, evaluate and act upon.

Ms. Cameron is confident Greystone has the right people for the job. "Once in a career, if you are lucky, the planets line up as they did when we began this school," she says. A core group of teachers came to Greystone having previously taught together, and shared similar backgrounds and philosophy. Some of them had taken the same course on project-based learning (in which they all designed their ideal learning environment). "To have those people come in, to have the principal who opened this school and the superintendent completely supportive of that kind of teaching and learning, and encourage all of us to continue to move forward with it, how often does that happen?" asks Ms. Cameron. "You know, I'll probably never be able to go to another school after this one; everything we believe in, we're able to work toward achieving with the kids and with the teachers."

She's also excited about the prospect of Greystone grads going to a high school that has received approval from Alberta Education to participate in the High School Flexibility Enhancement Pilot. This project will allow the high school to try out flexible timetabling to enable students to learn at their own pace and foster an aptitude for self-directed learning. Gerry Fijal, project manager from Alberta Education, asked the high school administration team and lead teachers at a panel meeting whether they thought parents would support the project. Mrs. Cameron related that one of the high school staff members responded, "You know we're getting kids coming from middle schools who have already laid the foundation for us to do what we're doing." |

Link to Greystone website: www.psd70.ab.ca/greystone