

Learning Journeys

Supporting Every Student's Success in Mathematics



A support document for the implementation of
Seeing Through the Eyes of Jesus:
Growing Success for Students
in Catholic Schools

OCTOBER 2014

AN EOCCC RESOURCE

Working Together for Catholic Education

WWW.EOCCC.ORG

FOR IMMEDIATE RELEASE

EOCCC Releases Resource on how Teaching and Learning Mathematics, Assessment and Catholic Values Link Together

October, 2014 - Almost universally, educators report they find it easy to incorporate Catholicity into their social studies, science, media and art lessons.

However, it's no surprise to learn that it's seemingly more difficult to connect faith with long division and calculus. Math educators struggle to make connections between their faith and mathematics.

That's why the EOCCC has initiated a new project that captures how the teaching and learning of mathematics can be synthesized with the Catholic values, virtues and teachings which make our schools unique.

The project, *Learning Journeys: Supporting Every Student's Success in Mathematics*, targets all teachers of mathematics, but particularly those who are beginning to use the inquiry process in their instructional and assessment practices and want to embed Catholic values, virtues, and teachings.

“The project is important because feedback from teachers indicated that they struggled to incorporate Catholicity into their math instruction, and when they did manage to make connections, it tended to be somewhat superficial,” explains project co-lead Rory Donohue.

“With this project, we hope to demonstrate and affirm that teachers continuously embed Catholic teachings in many ways: through collaborative planning; through the necessity of differentiating instruction tailored to the needs of the child; through the judicious use of assessment *for, as* and *of* learning, and; through Student Voice and self-reflection to guide instructional practice.”

The project consists of a resource explaining the rationale, including the personal learning journeys of educators. New to this resource are five documentation panels, capturing the teaching and learning in five classrooms (across all divisions) revealing the thinking of both educators and students as they journey together on a math inquiry. Each of the five panels has been constructed in the following way: One section outlines the lesson or inquiry in which the students are engaged; a second section reveals the thinking of the educator and the students as they are engaged in the learning, and; a third section demonstrates how each stage of the learning connects with the three questions which were the focus of the project:

- What does effective mathematics instruction look like?
- How do the principles of *Growing Success* inform instructional practices?
- How does our Catholic faith inform our instructional practice in mathematics?

"Our goal is that this document would be used in Catholic Professional Learning Cycles to help educators incorporate Catholicity into their mathematics instruction, and to see how they are already doing that through the inquiry model, and also by incorporating assessment *for*, *as* and *of* learning to guide their practice," explains project co-lead H  l  ne Coulombe.

Each of the five panels, plus the supporting document linking the work to ‘*Seeing Through the Eyes of Jesus*’, will be included in the resource package.

For more information:

Lorne Keon, EOCCC Executive Director

Phone: 613-735-1310 Email: lkeon@rccdsb.edu.on.ca

Learning Journeys
Supporting Every Student's Success in Mathematics

Acknowledgments:

Project Leads:

Hélène Coulombe Coordinator: Elementary Student Success Department,
Ottawa Catholic School Board

Rory Donohue Principal: St. Joseph Catholic School, Calabogie
Renfrew County Catholic District School Board

Writers:

Michelle Boudreau Educator: St. Steven Catholic School
Ottawa Catholic School Board

Lori Bryden Coordinator: Student Services
Algonquin and Lakeshore Catholic District School Board

Michelle Bryden Educator: St. John Elementary School
Catholic District School Board of Eastern Ontario

Meghan Button Educator: Guardian Angels Catholic School
Ottawa Catholic School Board

Marilu Deal Educator: All Saints Catholic High School
Ottawa Catholic School Board

Andrew Paquin Educator: St. Patrick Catholic School, Harrowsmith
Algonquin and Lakeshore Catholic District School Board

Reviewers:

Joan Barry Vice-Principal: St. Bernard Catholic School
Ottawa Catholic School Board

Anthony Cosentino Resource Teacher: Religious Education and Family Life
Renfrew County Catholic District School Board

Learning Journeys

Supporting Every Student's Success in Mathematics

We begin with prayer to support our learning journey.

Be shepherds of God's flock that is under your care, watching over them—not because you must, but because you are willing, as God wants you to be... eager to serve.

(1 Peter 5:2)

God our Creator,

Help us take the time to discover the gifts that You have given to us
and to those entrusted to our care.

Give us wisdom, O Lord, to see the beauty
and potential of each person created in Your likeness.

May we work to inspire our colleagues
and students to reach their full potential.

Give us courage, O Lord, to recognize and support
those who may be lost in their learning journey.

May we serve learners in a supportive environment
where all will experience confidence and success.

Give us patience, O Lord, to listen deeply to learning stories
for insight to discern directions and paths to follow.

May we construct meaning within community and build relationships
with all who are in need
with Your word and love as our guide.

We make this prayer in Jesus' name.

Amen

Learning Journeys

Supporting Every Student's Success in Mathematics

We begin with song to support our learning journey.

The following song was written for educators. It reminds us to ask questions, to take the time to discover and to explore. While learning and growing together with students in our faith-based learning communities, we give ourselves permission to slow down, reflect, question and stand in wonder at the learning journey we've taken so far.

Stand in Wonder

(song lyrics)

You're standing at a door unable to get in
So many things remain unresolved in your heart
You can't wrap your mind around all that I am
You're curious about the stirring in your soul
I can't right now give you the answers
I can't right now give you the key, but for now

(Chorus1)

Enjoy the journey, stand in awe,
Discover yourself; discover your world
Stand in wonder, discover Me.
I'll counsel as you question, I'll guide as you explore
As we work together, you'll discover so much more
Let me challenge your thinking, be patient as you learn
One day you will see it was all about the journey

(Chorus2)

Enjoy the journey, stand in awe
Discover yourself; discover your world
Stand in wonder, stand in wonder, stand in wonder, discover Me.

Music and Lyrics written by Eliane Guité and Torie Apedaile.

Please Note: Song tracks mentioned in Learning Journeys: *Supporting Every Student's Success in Mathematics*, may be downloaded on the EOCCC website.

http://www.eoccc.org/Content/Through_the_Eyes_of_Jesus/?both&listview

Learning Journeys

Supporting Every Student's Success in Mathematics

Table of Contents:

Setting the Context for Learning Journeys	p. 7
Opportunity for Professional Dialogue #1: Examining a Theory of Action	p. 12
Learning Journeys Why does this resource focus on learning journeys?	p. 13
Opportunity for Professional Dialogue #2: Personal Learning Journeys	p. 19
Examining Our Beliefs: Moving the Learning Journey Forward How can we reflect what we believe in our schools and classrooms?	p. 20
Do I believe that every child is capable of success in mathematics, regardless of his or her personal circumstances?	p. 21
Do you believe that the environment influences how a learner learns?	p. 25
What would it mean for Catholic educators to see through the eyes of Jesus?	p. 27
Do I believe that the fundamental principles of <i>Growing Success</i> support each student's learning to reach his/her God-given potential?	p. 27
Opportunity for Professional Dialogue #3: Making Connections	p. 32
Learning Journeys What is a Learning Panel? How might it be used to support professional learning?	p. 33
Using this Resource: Getting Started	p. 38
Opportunity for Professional Dialogue #4: Discovering the Learning Panels	p. 41
Opportunity for Professional Dialogue #5: Learning Together: Using Other Resources to Build Understanding	p. 42
We conclude...	p. 43
Appendix A: Catholic Professional Learning Cycle	p. 45
Appendix B: Ontario Catholic School Graduate Expectations	p. 46
Appendix C: Theological and Cardinal Virtues Reference Sheet	p. 48
Appendix D: Catholic Social Teaching – Key Principles	p. 49
Appendix E: Scriptural References: Learning Journeys	p. 50
Appendix F: Resources	p. 52
Appendix G: Fundamental Principles (excerpt from <i>Growing Success</i>)	p. 60
Appendix H: Definitions from Glossary of <i>Growing Success</i>	p. 61
LEARNING PANELS – Kindergarten, Primary, Junior, Intermediate, Secondary	Separate Attachment

Setting the Context for *Learning*

Journeys:

This resource targets all formal and informal leaders interested in mathematics in Catholic schools. It seeks to help educators synthesize their understanding of mathematics instruction with the Catholic teachings, values and virtues which make Catholic schools distinctive. Feedback from educators indicated that they struggle to incorporate Catholicity into their mathematics instruction and when connections were made, educators felt they lacked authenticity, and at times, seemed superficial.

Trust in the Lord with all your heart, and do not lean on your own understanding. In all our ways acknowledge him, and he will make straight your paths,

Proverbs 3:5-6

I sought the Lord, He answered me and delivered me from all my fears.

Psalms 34:4

This resource demonstrates and affirms that educators continuously embed Catholic teachings in many ways: through...

- collaborative planning,
- designing learning tasks that allow each student to engage in the mathematics,
- the proactive differentiation of instruction tailored to the needs of each student,
- the intentional use of assessment *for*, *as* and *of* learning strategies,
- the intentional use of student voice and metacognition to reveal thinking and inform instructional decisions.

In 2013, Catholic educators from Eastern Ontario shared their insights on the implementation of *Growing Success* (2010)¹ in Catholic schools in order to create the document **Seeing Through the Eyes of Jesus: Growing Success for Students in Catholic Schools**. This companion document to *Growing Success* provided educators with tools for planning, assessment, instruction and evaluation through a Catholic lens. Authentic assessment and evaluation for Catholic schools must embrace a very distinct Catholic flavour as it responds to what, when, why and how to assess. **Seeing Through the Eyes of Jesus** was designed to be used by educators as a resource within a Catholic Professional Learning Cycle (CPLC)² to help ensure that Catholicity was not simply an addendum at the end of a learning task or unit. It sought to

¹ *Growing Success. Assessment, Evaluation and Reporting in Ontario Schools*. (Ontario Ministry of Education, 2010)

² *Catholic Professional Learning Cycle*. (EOCCC, 2012)

Learning Journeys

Supporting Every Student's Success in Mathematics

accomplish this by proposing a means of infusing Catholic values, virtues, teaching and morality throughout all stages of the learning journey.

This approach set out in **Seeing Through the Eyes of Jesus** (and the CPLC process) invites Catholic educators to enter into a learning covenant with students based on unconditional love, compassion and reverence for the dignity of the child as a learner. From planning, design, assessment, instruction, evaluation to reporting, educators have at the center, the needs of each individual student, especially those who are most in need of our care and support.

Learning Journeys *Supporting Every Student's Success in Mathematics* continues with the principles set out in **Seeing Through the Eyes of Jesus**. It has been developed by Catholic educators as a vehicle to promote discussion and to generate thinking regarding planning, assessment, instruction and evaluation, specifically in the area of mathematics through a distinctive Catholic lens.

The contents of this resource draw on the expertise of representatives and writers from Eastern Ontario's four Catholic School Boards, who came together to discuss three questions:

- **How do Catholic teachings inform assessment and instructional practices?**
- **How do the principles of 'Growing Success' inform instructional practices?**
- **What constitutes effective mathematics instruction?**

The summary of their discussion is captured within a triple Venn diagram on page 9. The centre of the diagram synthesizes the connections between the three questions and constitutes the purpose for writing this resource:

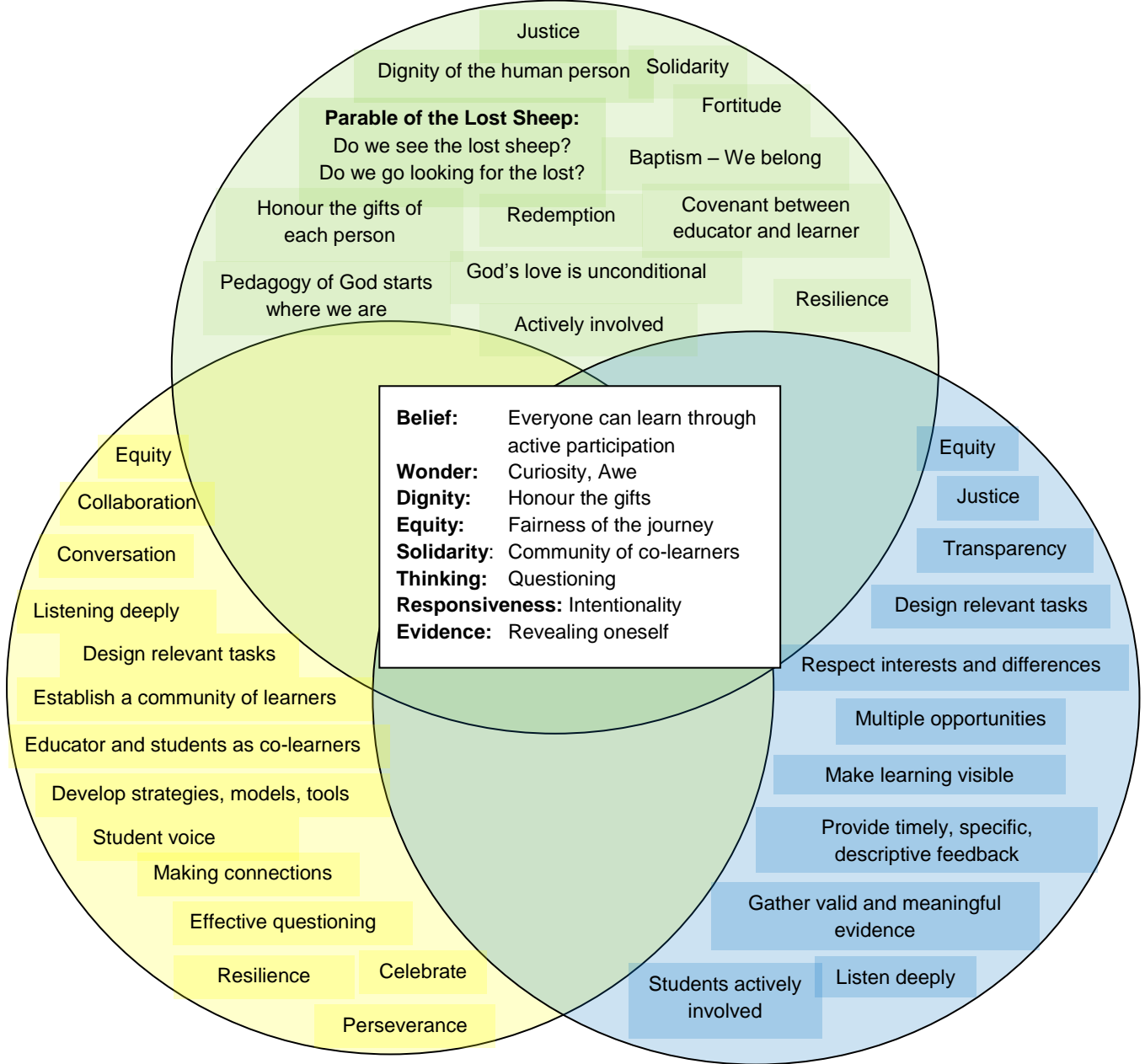
- A **belief** that everyone can learn mathematics by being actively involved,
- Capturing a sense of **wonder**, curiosity, awe,
- Respecting the **dignity** of all persons by honouring all of their unique gifts,
- Ensuring **equity** and understanding fairness is not sameness within the learning journey,
- Establishing **solidarity** through a community of co-learners,
- Revealing the **uniqueness of thinking** through effective questioning and reflection,
- Ensuring **responsiveness** by intentionally knowing the learners and aligning strategies to areas of strength and need,
- Gathering **evidence** of learning where everyone feels safe in revealing one's thinking.

The graphic on the following page captures the thinking of educators as they began their journey in writing this resource.

Learning Journeys

Supporting Every Student's Success in Mathematics

How do Catholic teachings inform assessment and instructional practices?



What constitutes effective mathematics instruction?

How do the principles of 'Growing Success' inform instructional practices?

Learning Journeys

Supporting Every Student's Success in Mathematics

Learning Journeys *Supporting Every Student's Success in Mathematics* will reference the theory of action from its companion document **Seeing Through the Eyes of Jesus** (EOCCC, 2013). An additional, or complementary theory of action emerged in response to the three questions on page 9, and in working with Catholic educators. This theory of action was refined during the writing of the **Learning Journeys** resource document.

In its simplest form:

If Catholic educators...

- **use Catholic teachings to inform assessment and instructional practices,**
- **design and nurture faith-based communities for all learners, focusing on the principles of '*Growing Success*',**
- **understand what constitutes effective mathematics instruction,**

...then each student will feel supported in his/her mathematical journey as a valued member of a Catholic learning community.

The full version of the theory of action, found on page 11, reveals a glimpse of the ideas discussed in **Learning Journeys**.

Theory of Action: Learning Journeys

If Catholic educators use Catholic teachings to inform assessment and instructional practices,

- and approach learning and assessment from a growth-mindset which builds upon students' strengths as learners and the educator's strengths as teacher,
- and show compassion and genuine interest in student learning and well-being,
- and understand that each learner has unique God-given potential and each is at a different place in the learning journey,
- and if we communicate and report achievement respectfully to uphold the dignity of each learner while providing a safe learning environment that is non-judgemental and allows for honest feedback,

If Catholic educators design and nurture faith-based communities for all learners, focusing on the principles of 'Growing Success' to inform their instructional practices,

- and build a community of learners who work in communion and journey together,
- and build a society of learners that emphasizes the spirit of collegiality for the good of all students,
- and provide opportunities for developing professional relationships where educators can share their successes and challenges,
- and develop reflective thinking practices through which each learner comes to know who they are as gift and Child of God,

If educators understand what constitutes effective mathematics instruction,

- and design rich relevant tasks where there is a seamless link between assessment and instruction
- and models the fortitude required to continue attempting to solve problems
- and promote intentional questioning that respects learning styles and promotes inclusion, thereby creating a community where each learner feels valued,
- and encourage each student to develop his/her voice and to persevere with all tasks,
- and respect an inquiry model which celebrates the learning journey of both student and educator,
- and support groupings of mixed talents and abilities where each may share his/her gifts,
- and believe that each learner regardless of his/her circumstances has the ability to be successful in mathematics,

Then, each student will feel supported in his/her mathematical journey as a valued member of a Catholic learning community,

- where each student believes that he or she can learn mathematics and is inspired to be an active participant,
- where each student accepts himself/herself and others as unique creations of God and honours everyone's learning strengths,
- where each student understands that fairness is not sameness within the learning journey,
- where each student is inspired by the wonder and awe of the mathematical journey and the potential to grown in knowledge and faith,
- where each student takes risks and shows the courage to share his/her thinking within this community of co-learners,
- where each student has grown to be a reflective and creative thinker, a reflective communicator and a collaborative contributor.

Opportunity for Professional Dialogue #1

If Catholic educators...

- use Catholic teachings to inform assessment and instructional practices,
- design and nurture faith-based communities for all learners, focusing on the principles of '*Growing Success*',
- understand what constitutes effective mathematics instruction,

then each student will feel supported in his/her mathematical journey as a valued member of a Catholic learning community.

Examining a Theory of Action: A personal reflection to begin the exploration of this resource

Read over the **Learning Journeys** Theory of Action found on page 11.

Use a double highlighting strategy:

- Use **one colour** to highlight the phrases that resonate with you because you believe these to be true.
 - Think of an example or a situation to support this statement.
- Use a **second colour** to highlight phrases that challenge your thinking.
 - Reflect on the reasons why these statements challenge you. Record your reasoning.
- Keep this reflection as you explore this resource.
- How might examples or statements in **Learning Journeys** support or change your thinking?

Learning Journeys

Supporting Every Student's Success in Mathematics

Learning Journeys: Why does this resource focus on learning journeys?

A common theme that emerged during the writing of this resource was that all educators hold vivid memories of their mathematical experiences. It became clear that these early experiences with mathematics strongly influence how one sees his/her ability as both student and as educator of mathematics. Every one of us has a personal story. It becomes part of who we are yet the journey twists and turns through encounters, experiences and reflection. Educators committed to the purpose of this resource, shared his/her learning journey with us to reveal a mindset of sometimes inadequacy, sometimes joy but always of growth and transformation over time.

These experiences have been written with courage as testimonials to you, the reader. Respect them. Learn from them. They have been shared with you as a glimpse of a personal journey to support you in your learning journey. As you read each one, reflect upon your own perceptions about your mathematical ability as a learner and as an educator. Think about the learning journey of the students entrusted to your care.

Personal Learning Journey 1

"I am a Mathematical Thinker – Now!"

"I have never considered myself a 'mathematical thinker'. I have always felt that my strengths as an educator lie in my language skills. When I was a student, I struggled with math and recall many nights trying to complete math homework that ended in tears of frustration. I could just not see what my teacher wanted me to see. I held on to the belief that I "just couldn't do it" for over 30 years. However, now that I have been teaching math using the inquiry model I can honestly say that I **am** a mathematical thinker; I see math everywhere! I am excited and eager to explore the mathematical wonderings in the Kindergarten environment with my students and be an active learner and facilitator of knowledge!"

Educator: Kindergarten

Learning Journeys

Supporting Every Student's Success in Mathematics

Personal Learning Journey 2

"I used to dread teaching Math!"

"The math block was the period during the day which my students exhibited the least amount of engagement. The problem was that I was teaching math to my students the same way it had been taught to me. It was teacher-led and the students' job was to passively receive information and then use it, independently, in low-level questions that did not relate to them in any meaningful way.

I realized that something had to change. I now act more as a facilitator than the resident expert in the class. I use prompts that engage students and inspire wonder. I foster collaborative problem solving through the careful selection of student groupings. I encourage students to use the tools and strategies that are most meaningful to them. math is much more fun and meaningful now, both for my students and for me."

Educator: Intermediate Division

Personal Learning Journey 3

"A 4/5/6/7 Combined Grade!"

"I don't feel comfortable teaching mathematics using the resource available."

"I was unsure how I would possibly teach the mathematics curriculum to four grades given the range of abilities. My own personal frustrations and anxieties about learning mathematics heightened my concern. I was very fortunate to work with a principal who was very supportive, encouraging and accommodating when I approached him for resources and professional learning opportunities. The way I thought about and taught math morphed as the year progressed. I was like a sponge, just wanting to soak up all information passed on to me. I was constantly learning and honing my skills. I felt more confident facilitating learning through big ideas within meaningful questions rather than specific expectations and textbook chapters. Students enjoyed learning through inquiry and investigations. They also appreciated the individualized learning journey they were on this year, which was driven by personalized learning goals and my high expectations."

Occasional Teacher

Personal Learning Journey 4

"This Dragon Called Math"

"I have this vivid memory of standing at the blackboard in grade five for what seemed to be an eternity. I could hear whispers behind me, but couldn't make out what was being said. A part of me thought it was other students snickering and the other part of me thought it was my friends trying to whisper the answer to the two-digit multiplication question. A voice broke through "If you can't do it, sit down." I put down the chalk and shuffled back to my desk. I was angry at that teacher for a long time.

My mathematics journey started out as one of avoidance and anxiety. In elementary school I was racked with worry in every math class and did poorly. I would barely scrape by with 50's and I am convinced that most of the time teachers were being 'kind' with a 50. High school was much the same, except after grade 10 I could, for the most part, avoid math. I opted for any course that didn't involve math.

In University I took a Physical Education degree. I was required to take one math course. I knew I had to be smart about this. I had to choose wisely. I asked around and chose a course that would be the least demanding and provided me the most opportunity to work with my friends. It was then I realized I had become very good at avoiding this 'dragon' called math. I was eventually accepted into teacher's college for Intermediate/Senior – Physical Education and History. The total math course/instruction I had to endure was one Saturday afternoon! Relief!

I was eventually offered my first teaching job. The conversation went like this, "We would like to offer you the job. You will be teaching grade 7 and 8 History, Science and Art." Amazing! "Oh and one more course – Grade 9 Essentials Math." Terror! No one turns down their first job! I called my parents to tell them. They were happy, but thought I was joking about the math assignment. I assured them I wasn't. For a good week I was paralyzed with fear. This 'dragon' was causing me anxiety again, and essentially affecting my quality of life.

I knew I had to do something. From that point on I took every professional learning opportunity I could get my hands on. I went to OAME; learned how to use manipulatives and joined book studies. At first I was lost. I felt like I was back in class again and everyone was speaking a foreign language. Eventually I began to fit in. I learned slowly and surely - *but I learned*.

I eventually took my Intermediate math qualification and it was there that I had an instructor that revealed to me that math is not simply rules and procedures, but a dynamic and exciting subject. I was genuinely hooked and have been ever since.

I was not a great math teacher when I first started. It took time and still today I have bad days. The difference now is that I am excited to teach math. I have a genuine curiosity for the subject and my students can see that. I talk less in class. I let students lead because now I am not afraid of where they will take us because I know we can handle it together. I share my story with them in the hopes that I can be that teacher that can expose mathematics as a dynamic and exciting subject."

Mathematics Instructional Coach

Personal Learning Journey 5

"I Enjoyed Math Class and Felt Confident"

"As a student, I enjoyed math class and felt confident about my early abilities to easily follow the algorithms and calculate successfully. I was able to correctly answer the two word problems found at the bottom of any 1970s textbook after a page filled with operations-type tasks (e.g. $24 + 39$). I don't remember that I was challenged to solve many rich tasks, however. Things seemed quite straight-forward to me with few challenges. Math was about getting the right answer - the faster, the better.

I do clearly remember **Grade 4** when fractions appeared for the first time. Mrs. C then turned my idea of numbers upside down - what was this? $1/4$ must be bigger than $1/2$, right? After all, 4 was bigger than 2. That was what I knew up to this point. Without manipulatives or drawings to construct understanding, I recall how confusing this was to me and I first experienced a moment when math didn't make sense to me. If something did not make sense to me in the classroom, I was able to grapple with it outside of class and make sense of it somehow. I know that I did have an intrinsic drive to "make sense" of it somehow which, in retrospect, was a good thing.

Even in **high school and university**, I collaborated willingly with other students who also would work towards understanding and we supported each other's learning, often outside the classroom. I did have confidence (perhaps from my earlier successes) that I could work and successfully find out the answer. Grade 13 Calculus might have been my biggest challenge!

Interesting that my **father was known to be "good at math"**, while my mother did not feel confident in her math problem-solving abilities, based on school experiences. I was perceived to be like my father (to have the math "gene"), while my younger sister was to follow in my mother's footsteps. While supporting my sister's math learning at home, she would say, "Why didn't the teacher explain it this way? I get it now." I knew even then that there was something important to learn here as an educator. She could learn as we all can.

As a beginning teacher, I felt equally skilled teaching the "core" subjects of language and mathematics. It never occurred to me that other teachers may not feel the same way. I embraced learning more about it and was not afraid of the math content. However, I don't believe that I gave much thought to *Knowledge of Mathematics for Teaching (D. Ball)* at the time or how to better provide opportunities where students construct their own math knowledge and understanding.

While on yard duty one day, a bright, motivated Gr. 7 student who I had taught in Grade 3 shared with me that she "no longer got fractions", remembering our learning from our year together. **This impacted me as a teacher** because I realized that she thought that she had once had it and now lost it. Interesting! If she had deeply understood what we had done together in Grade 3 (a basic use of some manipulatives and drawings at this point in my career), could she lose it? Had she ever truly understood fractions in a variety of contexts? What had taken place in her learning in the subsequent years? What were we as educators doing to foster this intelligent student's learning in this area? She was willing to learn, but we were clearly missing something."

Learning Journeys

Supporting Every Student's Success in Mathematics

Communicating the Order of God's Universe!

Personal Learning Journey 6

"As a child, I loved to read. I do not remember learning to read. I entered Grade 1 an avid reader. Reading transported me somewhere else, engaging me so deeply, I needed reminders to come for supper and turn out the light at night. But mathematics—I have vivid memories of bland worksheets and timed tests, even in the Primary grades. And then somewhere around Grade 5 or 6, I got lost in the algorithms I was expected to know.

I do remember asking 'Why?' about mathematical rules but explanations were either withheld or had no more meaning than the rules. It never got better. High school math was a blur of chalkboard examples and feeling more and more incompetent. Everyone said "That's okay; you're just not a math person" and that was the end of my formal mathematics education.

As a Primary teacher, there were few challenges to my math incompetence but in hindsight, I know I replicated the dull, 'school math' activities of my own childhood. It was only when I had to teach Junior mathematics that I realized that the limitations of my understanding and more importantly, my negative feelings toward mathematics were profoundly impacting my students' understanding and disposition toward mathematics. Time to rehabilitate my childhood mathematics experience!

Almost 15 years later, with a great deal of focused work, I have come to love mathematics: its precision, its beauty and the very real way it allows us to communicate the order of God's universe."

K – 6 Consultant (Mathematics)

"I Can Do This!"

Personal Learning Journey 7

"Going through elementary school I was in the remedial class. Numbers seemed to jump around on the page and I could not remember how to solve the equations. It did not get any better as I got older, however, I was determined to stick with the Advanced Math in high school, even if I was squeaking by. In grade 10, my teacher yelled at me in front of the whole class, claiming I was stupid because I did not get it. All I had to do was plug numbers into the formula and how could I not get it? I was called into the guidance counsellor's office and they wanted to look at my options because they feared I was not going to pass high school. I didn't listen to them. I worked like crazy and set my dream to be a teacher so I could help others who were struggling and give them a chance. I wanted to help.

I passed high school and got accepted into university. In my first year, I was tested and diagnosed with three different learning disabilities. With some assistance, I graduated university cum laude and pursued an Education degree where I graduated summa cum laude. I met some very influential people along the way and they showed me new ways to learn mathematics. It does not have to be plugging numbers into formulas. Math is about patterns and problem solving. There is more than one way of answering a question and it is my job to help students experience those ways!"

Educator: Primary Division

Learning Journeys
Supporting Every Student's Success in Mathematics

Personal Learning Journey 8

"I Loved Math!"

"I was one of those students in high school who loved math. I'd get mad at myself if I didn't get 100%. But back then it was all about practice, practice, practice and I worked through every problem in the textbook – and borrowed multiple textbooks from the library and did those problems too! I was good at memorizing.

Life throws turns in our path and I ended up obtaining a Physical Education degree and starting my own fitness business. As a second career I went back to an Education degree and landed my first job teaching mathematics at grades 7 and 8. Easy – right? Wrong!

I couldn't figure out why students weren't 'getting' the math. It came so easily to me. So I became a fanatic learner – a sponge! I learned how young children develop number sense and how it grows and spirals from infancy to adulthood. I learned the importance of learning using manipulatives. I realized the first time I really understood factoring polynomials was by using Alge tiles! Who knew? I even re-learned the concept of repeated addition being multiplication and repeated multiplication being exponential notation! I actually understood how algorithms for the area of triangles and circles were constructed! I learned the beauty of patterns and saw mathematics everywhere in real life – in art, music, nature, architecture, shopping and sports!

I learned how to design open up tasks and enjoy not knowing the answers, but to enjoy the ride of debate and possibilities. I love and appreciate the power of mathematics more than ever before.

But...it surprises me to admit that when I participate in a professional learning session and we are asked to 'do math', my stomach gets nervous about it. Everyone sees me as a "math" person. What if I can't do the problem solving? This must be how some students feel! I want to make sure they love math too!"

Curriculum Coordinator

After reading these personal learning stories, do any of them surprise you?

Are there any connections between your journey and the journeys of these educators?

How might these stories inspire you on your mathematics learning adventure?

Opportunity for Professional Dialogue #2

Your word is a lamp to my feet and a light to my path.

Psalm 119:105

Then they said to him, "Please inquire of God to learn whether our journey will be successful." Judges 18:5

Discuss your thoughts about one of the *Personal Learning Journeys* or share your own learning journey in mathematics.

Reflect upon the following guiding questions:

- Reflect on the scriptural passages to deepen your understanding of learning journeys.
- As Catholic educators, why is it important to examine one's own feelings and beliefs about mathematics?
- How has your own learning journey influenced your view of yourself as a learner and educator of mathematics?
- How will your own learning journey influence the students you teach or the staff you lead in your school?

Examining our Beliefs: Moving the Learning Journey Forward

How can we reflect what we believe in our schools and classrooms?

It must have seemed very strange and, indeed, almost radical for people to hear Jesus in his Sermon on the Mount, as He taught about the qualities which made someone virtuous in God's eyes. Nowhere in the Sermon does He mention the traditional rituals by which the People of God demonstrated their fidelity to the Father. Nowhere does He distinguish between people based on the rigid hierarchy which had been established in that society, or by the quality or quantity of the offerings they were capable of making to God.

"Seeing the crowds, he went up on the mountain, and when he sat down, his disciples came to him. And he opened his mouth and taught them, saying: "Blessed are the poor in spirit, for theirs is the kingdom of heaven. Blessed are those who mourn, for they shall be comforted. Blessed are the meek, for they shall inherit the earth."

Matthew 5:1-48

On the contrary, the Beatitudes are presented to us, the followers of Christ, as an affirmation of who we are as children of God; each made, in our own unique way, in God's image and likeness. These most beautiful of Christ's teachings are not posed as a threat or menace for actions which are contrary to God's love; rather they express that within each of us there is some spark of the Divine. Through nourishing and careful cultivation, we allow these attitudes to become the virtues by which we strive to live out our beatific purpose. Our offering to God is witnessed through the gentle manner in which we serve others; through making God's requirement of love for one another our greatest desire; through relying on each other as a source of comfort in times of trial; and yes, through having the courage and fortitude to continue on the path of what is just and right, even in the face of challenge and, at times, derision. In the light of our faith, we are called to press on in our journey with our students.

Learning Journeys encapsulates our beliefs as Catholics that there is The Divine in each of our students. Each of our students has an inherent value which does not have to be earned. As such, we strive to respect every child and student as a unique learner who is, indeed, capable of learning mathematics. Each comes to us at a different place on the journey. Each has been endowed with a particular set of gifts and talents, and it is our vocation as Catholic educators to honour that child by identifying, and starting from where they are on this journey. We walk together, as educators and students, hand in hand in that learning journey.

If this is what we believe, we will see it, hear it and feel it in our Catholic schools.

Examining our Beliefs: Moving the Learning Journey Forward

Do I believe that every child is capable of success in mathematics, regardless of his or her personal circumstances?

It is a myth that some people are naturally good at mathematics while some are not. There is no math gene! Each learner can learn and grow to his/her full potential. As Catholic educators we believe that each student entrusted to our care has unique learning strengths and needs. We know that each person is created in the divine image by a God whose perfect

*"We have different gifts,
according to the grace
given to each of us..."*

Romans 12: 5-6

plans for us fit who we are and who we are for others. Each has been furnished with gifts for a unique and irreplaceable role in the human family. It is our duty to help prepare our students in every subject area to more fully embrace this role as they journey with us. We must instill in our students a "growth mindset" - the belief that although each person may differ from others in every way, everyone can learn and grow through effort and experience (Dweck, 2006)³.

We personalize each student's learning experience, providing assessment and instruction that is tailored to each individual's learning needs. We celebrate each learner's unique patterns of learning and individual accomplishments within our diverse faith-filled classrooms and schools. We believe that the performance of all students is strengthened when the diversity of the class is recognized and valued. Being committed to inclusion means empowering all students to use their voices and experiences in building their knowledge and understanding.

³ Dweck. *Mindset: The New Psychology of Success*. 2006

Learning Journeys

Supporting Every Student's Success in Mathematics

We hold true to the shared beliefs in ***Learning for All***⁴, namely that:

- All students can succeed.
- Each student has his or her own unique patterns of learning.
- Successful instructional practices are founded on evidence-based research, tempered by experience.
- Universal design and differentiated instruction are effective and interconnected means of meeting the learning or productivity needs of any group of students.
- Classroom teachers are the key educators for a student's literacy and numeracy development.
- Classroom teachers need the support of the larger community to create a learning environment that supports all students.
- Fairness is not sameness.

What does it mean to believe that 'all students can succeed' in mathematics?

Reflective practitioners look at the intentional decisions they make in order to support each student's learning journey. The alignment of planning, assessment, instruction, gathering evidence, evaluation and reporting allows the educator to become more efficient and effective. For students, this alignment makes the learning transparent.

John Hattie, author of *Visible Learning for Teachers: Maximizing Impact on Learning* (2012) challenged the participants' thinking at a 2012 Toronto conference when he stated that, "Placing a label on a student gives the teacher an excuse for not teaching that child." What impact does this statement have on our beliefs that every child can learn mathematics? Do we consider **all** students as unique individuals gifted by God or do we see categories of students? Do we see students with special needs, English language learners, First Nations, Métis and Inuit learners as distinct 'categories' in our classrooms or as a member of the classroom community? What about students labelled as gifted learners, or learners who take time to process information, learners who prefer to work in silence as opposed to working with a group? How do we meet the needs of each student? Are not all students unique and part of the learning community to be cared for under the watchful eye of the shepherd?

⁴ Ontario Ministry of Education. *Learning for All: A Guide to Effective Assessment and Instruction for All Students, Kindergarten to Grade 12*, 2013.

Learning Journeys

Supporting Every Student's Success in Mathematics

Such watchful care involves precision and personalization. One example can be found within the Kindergarten panel in **Learning Journeys**. Here, the educator team designs a provocation to suit the very specific requirements of a student with special needs. This particular student thrived and surpassed learning goals, but many students embraced the same challenge and grew the inquiry in different directions based on their needs and interests.

What are examples of highly effective strategies in mathematics instruction that are 'necessary for some' students, but 'good for all'?

Listed below are strategies to support success in every student's mathematical journey. Discuss with a colleague how the implementation of these strategies aligns with your own personal learning journey and experiences:

- Slow down the pace of instruction to match the pace of learning.
 - Feel comfortable taking time and anchoring learning on big ideas. A concept unlearned is a future gap.
 - The consolidation phase is vital in mathematics.
- Design 'low floor-high ceiling' tasks to ensure each student can enter into an inquiry. "Students work at different paces and can take work to different depths at different times." (Jo Boaler, <http://youcubed.org>)
 - Tasks are accessible to all students (low floor/high ceiling), but they extend to very high levels. These tasks are very visual and lead to rich mathematical discussions.
- Facilitate structures and strategies to give students time to debate mathematical concepts – listening deeply to each other's ideas, responding and challenging each other.
- Intentionally group students for inquiry in a variety of ways aligned to a specific purpose.
 - Consider ability groupings, introverted/extroverted groupings, student choice, topics of shared interest, different strategies for solving problems.
- Increase wait time allowing for processing and think time. Allow students to listen to mathematical thinking.
- Use a 'no hands-up' strategy. Everyone should be expected to share their ideas when called upon, especially if they have had the opportunity to share ideas with a peer first.
- Offer choice (i.e. the space to work in, whom to work with, choice within an inquiry, how to demonstrate learning).

Learning Journeys

Supporting Every Student's Success in Mathematics

- Support the use of manipulatives for all learners throughout all divisions to move the learning from concrete to abstract.
- Use visuals as problem sets so students can infer and construct meaning. Visual representations increase the accessibility of mathematics for students for whom language may be a barrier, as well as promoting opportunities to develop language specific to the concept being explored.
- Ask probing and provoking questions rather than giving information to students. Give feedback by asking a question rather than telling.
- Support the mindful implementation of technology as a tool, as needed, to support thinking, collaboration and gathering of evidence. Understand the pedagogy that underlies the mathematical concept to ensure that technology is supporting the learner. For example, using virtual manipulatives on an interactive whiteboard requires an abstract level of understanding. Hands on experiences, such as counting objects, will support the student in developing a concrete level of understanding.
- Come to know students and their learning gaps. Use flexible, guided groupings to address specific gaps.
- Facilitate structures and strategies to allow students to access previous learning (i.e. anchor charts, student work samples, learning walls).
- Facilitate structures and strategies which allow students to demonstrate their learning in a variety of ways.
- Transfer highly effective strategies from a literacy approach to mathematics instruction:
 - Intentionally incorporate reading comprehension strategies: making connections, asking questions, inferring and predicting, visualizing, determining importance, synthesizing, metacognitive monitoring,
 - Intentionally use elements of the gradual release of responsibility as deemed necessary: model a *think-aloud*, shared practice, guided practice, independent practice.

Examining our Beliefs: Moving the Learning Journey Forward

Do you believe that the environment influences how a learner learns?

As Catholic educators, do we see Jesus in the eyes of each student entrusted to our care? Do we accept and advocate for every student, set high expectations, and walk with each student as he or she grows within his or her unique learning journey? (**Seeing Through the Eyes of Jesus**, 2013, p. 7)

"And what do we teach our children? We teach them that two and two make four, and that Paris is the capital of France. When will we also teach them what they are? We should say to each of them: Do you know what you are? You are a marvel. You are unique. In all the years that have passed, there has never been another child like you.... You may become a Shakespeare, a Michelangelo, a Beethoven. You have the capacity for anything. Yes, you are a marvel."

Pablo Casals,
Neurodiversity in the Classroom

How might a community of learners support a mindset of reverence and dignity for each learner in a classroom and in a school?

Researchers in education maintain that the key to learning is not just the physical space provided for students but the social space as well. The learning environment is "the third teacher" that can either enhance the kind of learning that optimizes our students' potential to respond creatively and meaningfully to future challenges or detract from it. (Ontario Ministry of Education, *The Third Teacher*, 2013). When students are comfortable and feel secure in their learning environment, their true potential will be reflected in their performance.

"Inclusion is not about bringing people into what already exists; it is making a new space, a better space for everyone." (Ontario's *Equity and Inclusive Education Strategy*, 2009)

Sir Ken Robinson challenges educators to look at the learning space with 21st Century eyes. "Does it work for what we know about learning today, or just for what we know about learning in the past?" (Ontario Ministry of Education, *The Third Teacher*, 2013). As Catholic educators we are further challenged to look at the learning environment through the lens of a faith-based learning environment. How do we as Catholic educators design a faith-filled learning environment to include, support and recognize each student's unique talents and gifts?

Learning Journeys

Supporting Every Student's Success in Mathematics

We need to think about creating classroom environments that give children the opportunity for wonder, mystery and discovery; an environment that speaks to young children's inherent curiosity and innate yearning for exploration in a classroom where children are passionate about learning and love school. (Ontario Ministry of Education, *The Third Teacher*, 2013).

"In our culture, we believe that every child is born with gifts....what will our schools do to uncover and develop the gifts of our children?"

Aboriginal Consultation participant

"Every person needs a place that is furnished with hope."

Maya Angelou

Examining our Beliefs: Moving the Learning Journey Forward

What would it mean for Catholic educators to see through the eyes of Jesus? (Excerpt: **Seeing Through the Eyes of Jesus**. 2013. EOCCC. p. 7)

“Christ models an invitation that is unconditional. All are welcome, worthy and capable. Seeing through the eyes of Jesus enables us to teach each other with heartfelt understanding. It implies modelling our actions on those of Christ, living out his compassionate

“The root word of assessment means ‘to sit beside’ – to guide and coach. Within the Catholic context, the mindset of assessment fosters a desire for our students to achieve their full academic, personal and spiritual potential within a safe and caring environment that responds to the unique needs and talents of each student. Thus, assessment and evaluation is to take students from where they are... and to allow them to blossom into a fully alive - fully human person.”

Planting Seeds for Success:

Exploring Learning Skills and Work Habits from a Catholic Perspective. Revised: Grades 1 to 12.
2011. EOCCC.

ways and seeing with eyes of compassion and hope. If we were to see through the eyes of Jesus, we would accept and advocate for every student, set high expectations, and walk with each student as he/she grows within his/her unique learning journey. We would accept the mystery of God's ongoing creation in each child, accepting the challenges, and sometimes frustrations, as opportunities to grow in skill and in reliance on the grace that transforms us into educators who love unconditionally. Seeing someone through the eyes of Jesus means coming to know a person for who he/she is and envisioning who he/she will become.”

Do I believe that the fundamental principles of *Growing Success* support each student's learning to reach his/her God-given potential?

This resource uses the term "Excellence" to indicate each learner's unique capacity to grow in their God-given potential. The journey to excellence will be different for every student, reflecting their strengths and struggles. We know this journey is infused with grace, calling us both as educators and learners to listen and respond to God's invitation to teach, learn and grow.

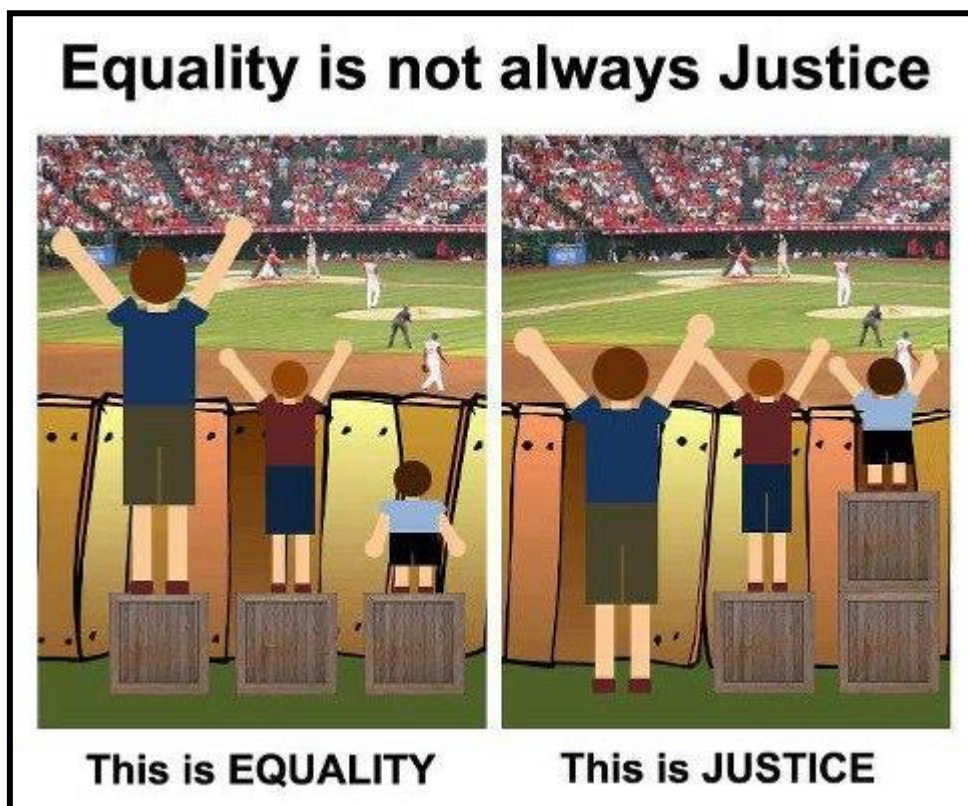
To truly understand that the purpose of assessment is to improve student learning and allow each student to achieve their potential requires that we value the dignity of each child. We understand fairness and equity does not mean the same thing as ‘sameness’. We not only

Learning Journeys

Supporting Every Student's Success in Mathematics

understand it, we embrace it. This motivates us to find ways to model justice in our teaching and learning of mathematics through inquiry.

The cartoon below sends a clear message about equity and justice. Consider showing this graphic to students to provoke thinking. What message might they glean from this cartoon?



Retrieved July 28: <http://eyeonsocietynb.wordpress.com/2013/06/28/equity-vs-justice-the-dilemma-of-bilingualism-in-the-new-brunswick-health-system/>

Learning Journeys *Supporting Every Student's Success in Mathematics* will reference the theory of action from its companion document **Seeing Through the Eyes of Jesus** (EOCCC, 2013).

Excerpt: Seeing Through the Eyes of Jesus (EOCCC, 2013, pg. 20-21).

The implementation of assessment and evaluation practices is a complex process. The proposed theory of action has been generated by educators from Eastern Ontario as a means of organizing their thoughts and reflections. The theory will continue to evolve and change as deeper understanding grows.

Learning Journeys

Supporting Every Student's Success in Mathematics

The theory of action is organized using four essential 'if' statements:

If Catholic educators **establish** a faith-based professional learning community,

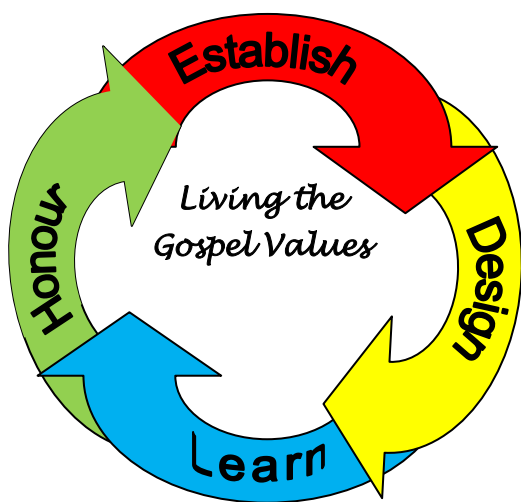
If Catholic educators **design** faith-based communities for all learners,

If educators and students **learn** and grow together,

If Catholic educators **honour** and respect growth over time,

Then each student will feel a sense of belonging as a valued member of a Catholic learning community – learning about and practicing **living Gospel values**.

The key words from the theory of action, **establish**, **design**, **learn**, **honour** and **living Gospel values** have been highlighted and embedded into this graphic.



The complexity of each essential statement is further uncovered on page 30 outlining the full theory of action.

Learning Journeys

Supporting Every Student's Success in Mathematics



Excerpt from: **Seeing Through The Eyes of Jesus:**
Growing Success for Students in Catholic Schools

A Theory of Action for Catholic Educators

If Catholic educators establish a faith-based professional learning community,

- and understand the workings of an effective community of professional learners,
- and explore the power and gift of collaboration,
- and design rich learning experiences for all learners,

If Catholic educators design faith-based communities for all learners,

- and educators and students are collaborative partners in assessment and instruction,
- and learning goals are the anchors for learning,
- and success for all is constructed by describing success,
- and students act as a resource for each other through peer and self-assessment,

If Catholic educators and students learn and grow together,

- in a safe learning environment where inquiry fuels wonder and curiosity about God's creations,
- and are challenged by questions, engaging in rich learning conversations,
- and intentionally gather evidence of learning,

If Catholic educators honour and respect growth over time,

- and select, analyze and interpret a body of evidence that accurately reflects what each student knows and can do in order to determine a grade,
- and if we communicate and report achievement clearly to uphold the dignity of each learner,

Then, each student will feel a sense of belonging as a valued member of a Catholic learning community,

- where each student feels safe, understood, respected, and valued,
- where each student accepts himself/herself and others as unique and beautiful creations of God,
- where each student has grown to be a reflective and creative thinker, a reflective communicator and a collaborative contributor,
- where, as discerning believers, each student learns and practices living the Gospel values.

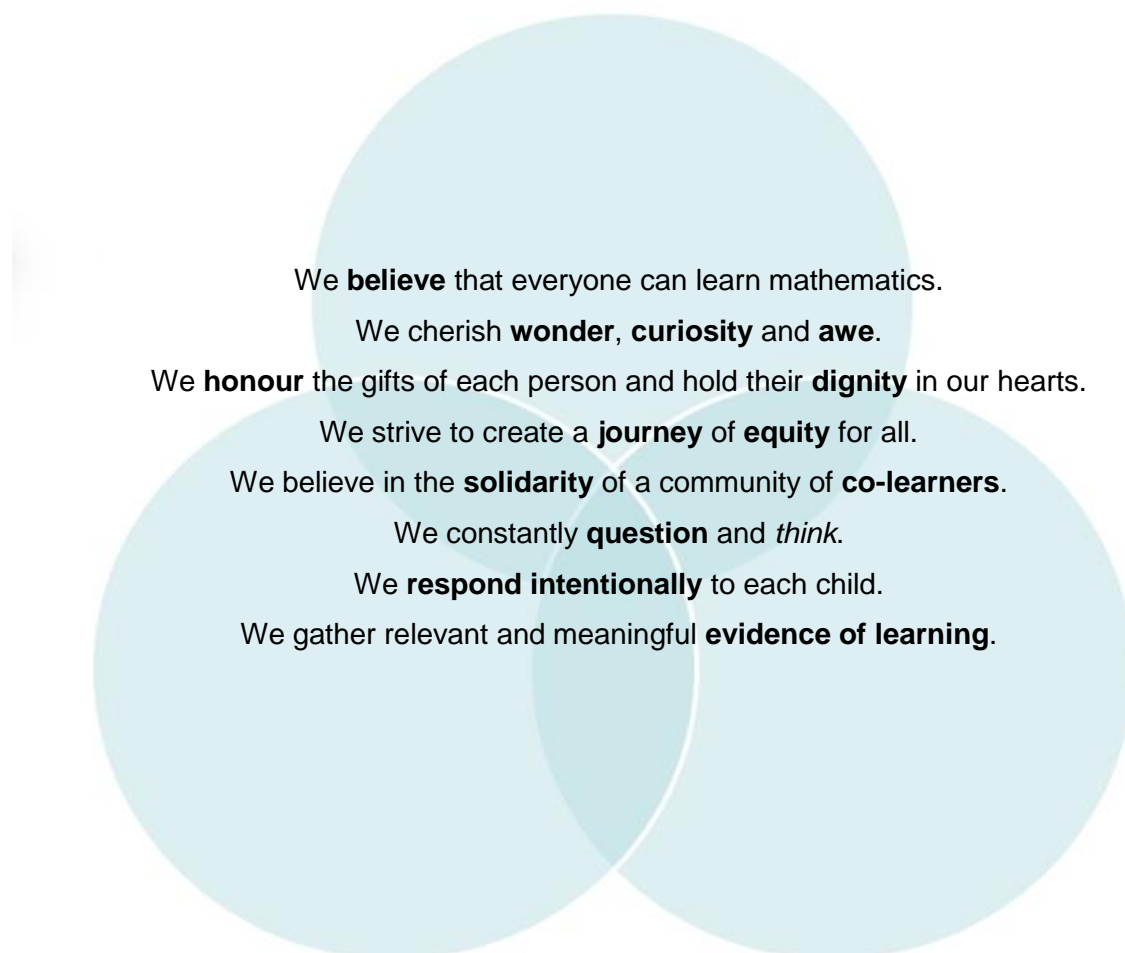
Learning Journeys

Supporting Every Student's Success in Mathematics

The two theories of action offered in **Learning Journeys** are complimentary to each other. The thinking constructed in **Seeing Through the Eyes of Jesus** reveals the power of establishing faith-based professional learning communities and bringing the relational and covenantal nature of collaboration to the students. The recognition that assessment practices allow both educators and students to learn and grow together honours and respects growth over time.

The theory of action in **Learning Journeys** is truly an application of the earlier version. As educators in Eastern Ontario continue to investigate their wonderings about assessment and evaluation in specific content areas, such as, mathematics, deeper understanding and connections continue to be constructed. The interconnectedness of the three questions brings our minds to a moment of consolidation.

- **How do Catholic teachings inform assessment and instructional practices?**
- **How do the principles of 'Growing Success' inform instructional practices?**
- **What constitutes effective mathematics instruction?**



Opportunity for Professional Dialogue #3

What connections might you make between the parable, the Scripture passages and the key ideas found in **Learning Journeys** *Supporting Every Student's Success in Mathematics*?

The Parable of the Lost Sheep

Now the tax collectors and sinners were all gathering around to hear Jesus. But the Pharisees and the teachers of the law muttered, "This man welcomes sinners and eats with them."

Then Jesus told them this parable: "Suppose one of you has a hundred sheep and loses one of them. Doesn't he leave the ninety-nine in the open country and go after the lost sheep until he finds it? And when he finds it, he joyfully puts it on his shoulders and goes home. Then he calls his friends and neighbors together and says, 'Rejoice with me; I have found my lost sheep.' I tell you that in the same way there will be more rejoicing in heaven over one sinner who repents than over ninety-nine righteous persons who do not need to repent.

Luke 15: 3-7

"God promised that he would personally shepherd his people and lead them to safety."

Isaiah 40:11

And God said, "I will look for those that are lost and bring back the ones that wander off."

Ezekiel 34:16

"Be shepherds of God's flock that is under your care, watching over them-not because you must, but because you are willing, as God wants you to be....eager to serve."

1 Peter 5:2

Learning Journeys

Supporting Every Student's Success in Mathematics

*Learning Journeys:

What is a Learning Panel? How might it be used to support professional learning? (*Learning Panels Kindergarten-Secondary, see separate attachment)

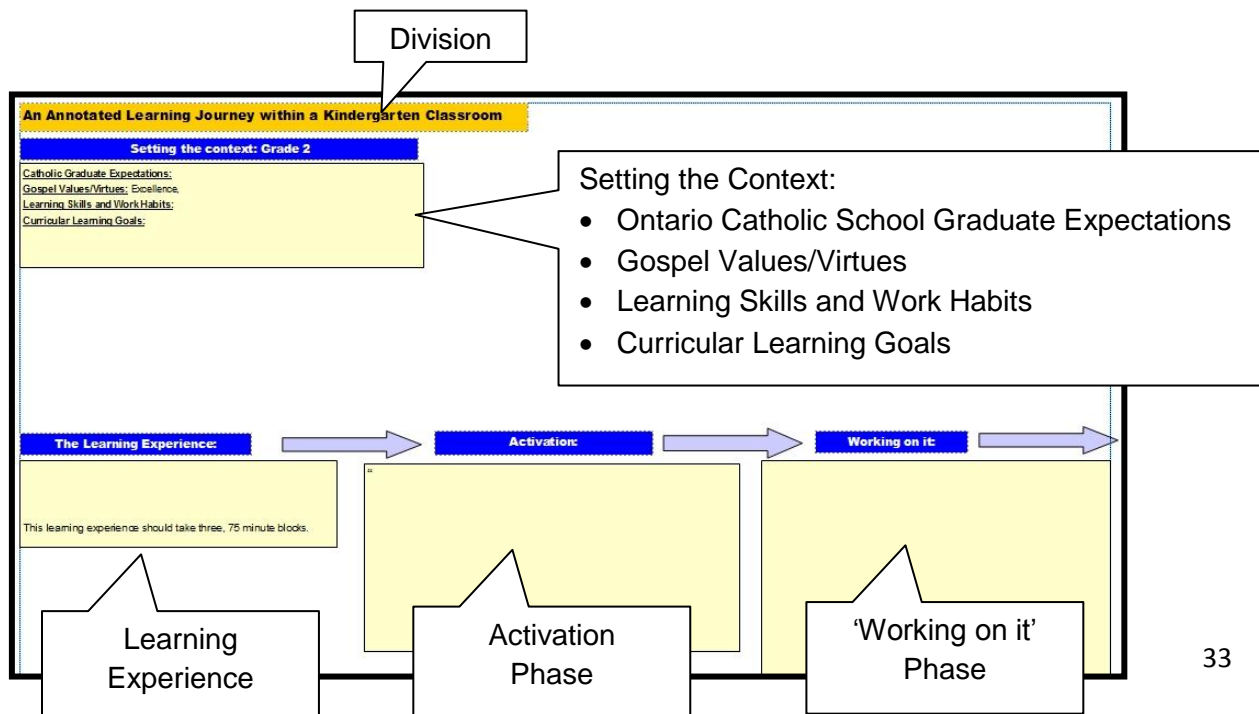
When educators get together and share their stories and insights there is so much learning that transpires! How could this be documented? The concept of a Learning Panel emerged by listening to educators discuss the three questions of this resource. The responses to these questions are spun and woven through the threads of professional conversations and from observing students *at work* – the work of exploring and uncovering mathematical ideas.

Included in this resource you will find five Learning Panels: each representing a classroom in a Kindergarten, Primary, Junior, Intermediate and Secondary Division. They are meant to show a glimpse of an educator's thinking at one moment in time – sharing one learning experience.

Reading a Learning Panel:

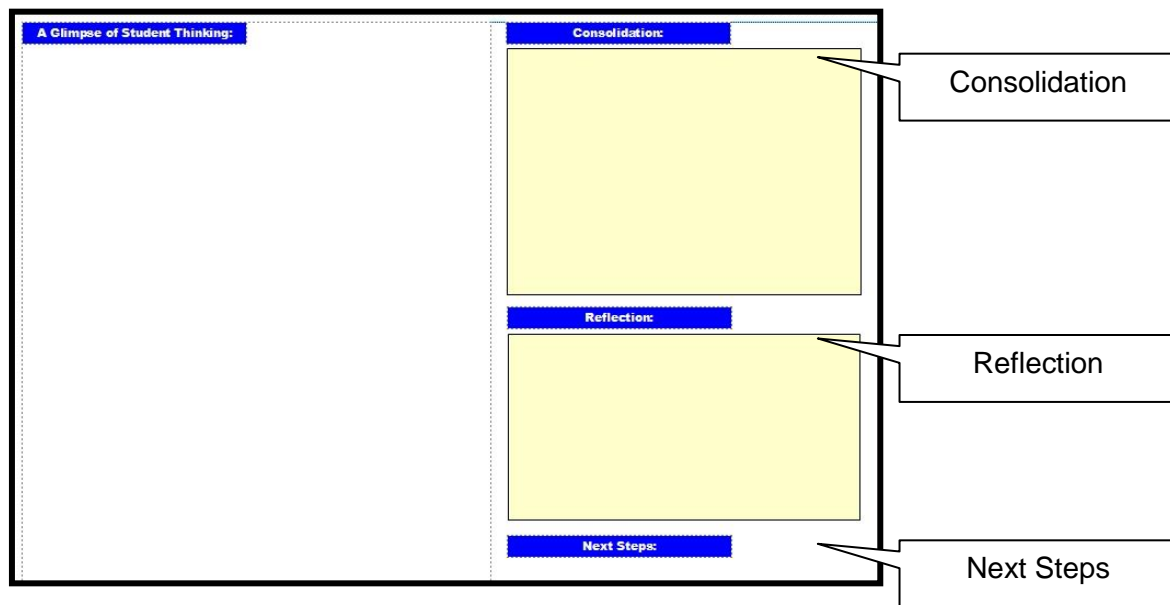
Before you look at a Learning Panel for the first time, it is recommended that you take a few moments to review the colour coding and 'unpack' the panel according to your learning style. This will allow you to understand the purpose of the various colours and features to maximize your understanding of the content.

The first graphic shows the flow of the **pale yellow** boxes. This represents the learning experience over time: setting the context, the task or the learning experience, the activation phase, the 'working on it' phase, the consolidation phase, including reflection and next steps.

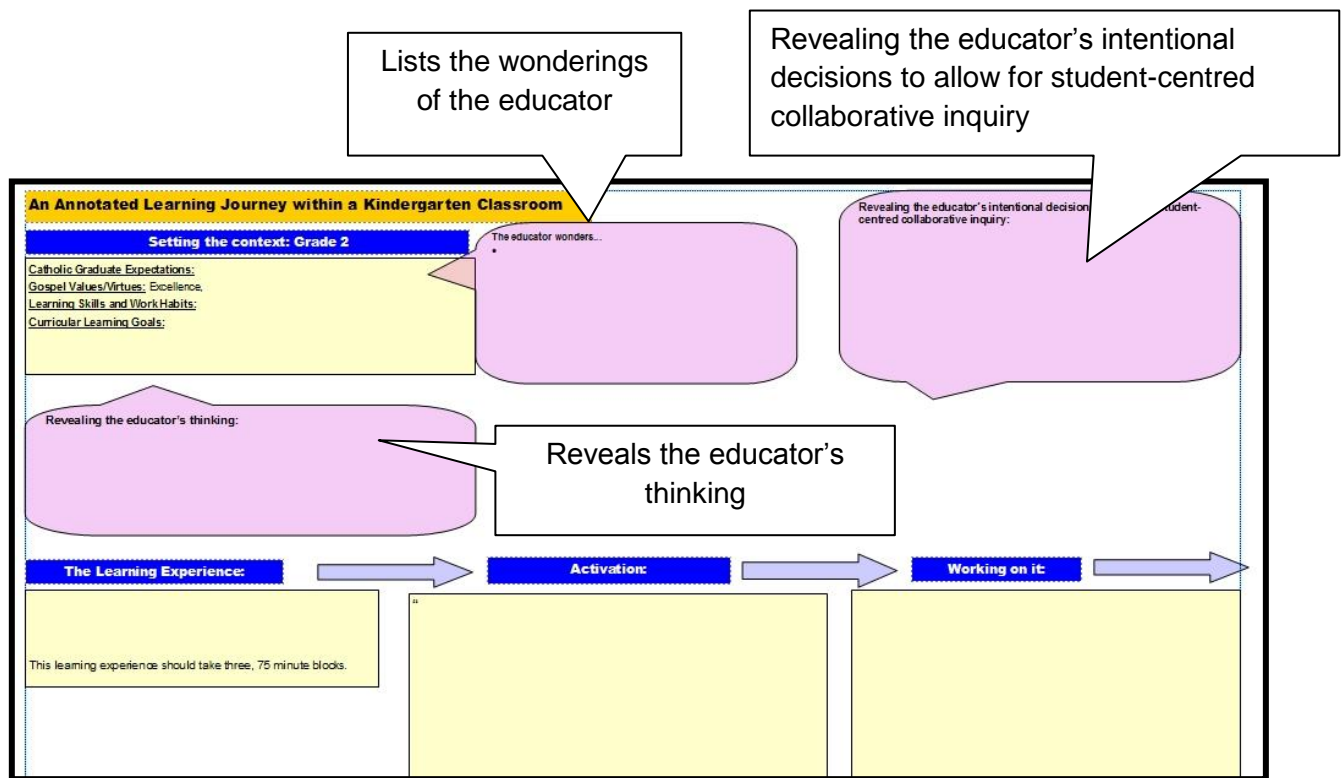


Learning Journeys

Supporting Every Student's Success in Mathematics

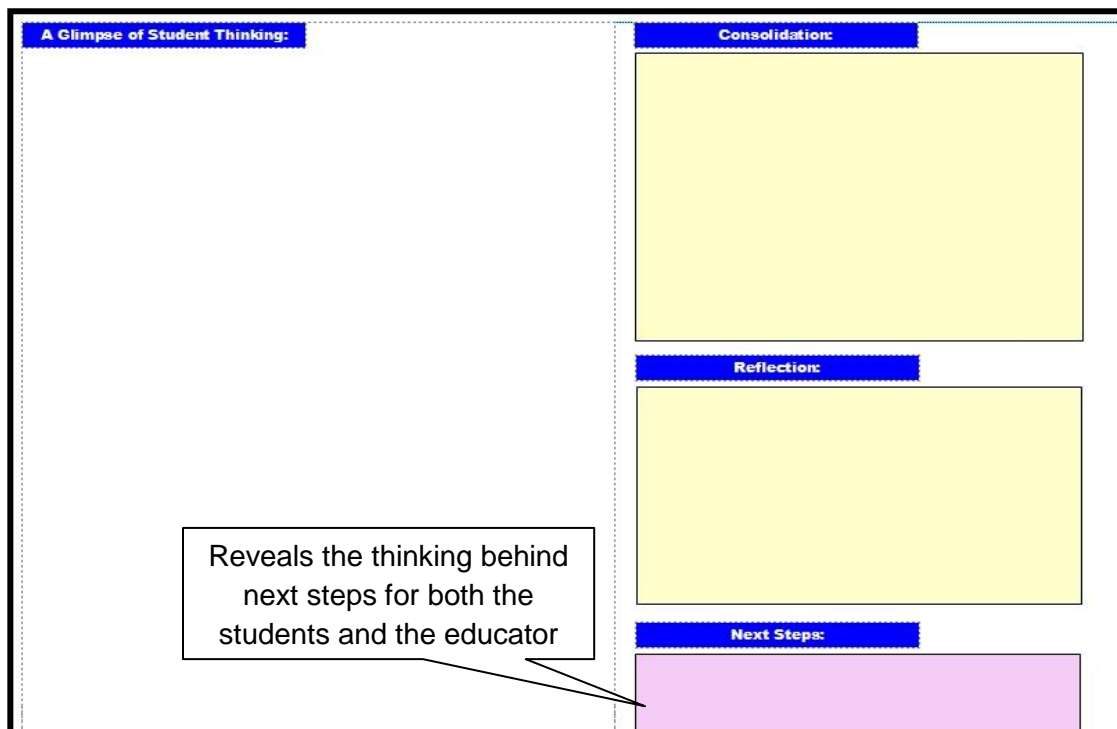


The next information set to consider in the Learning Panel are the **purple** thought bubbles. These represent the thinking of the educators including wonderings, intentional assessment and instructional decisions and their reflections.



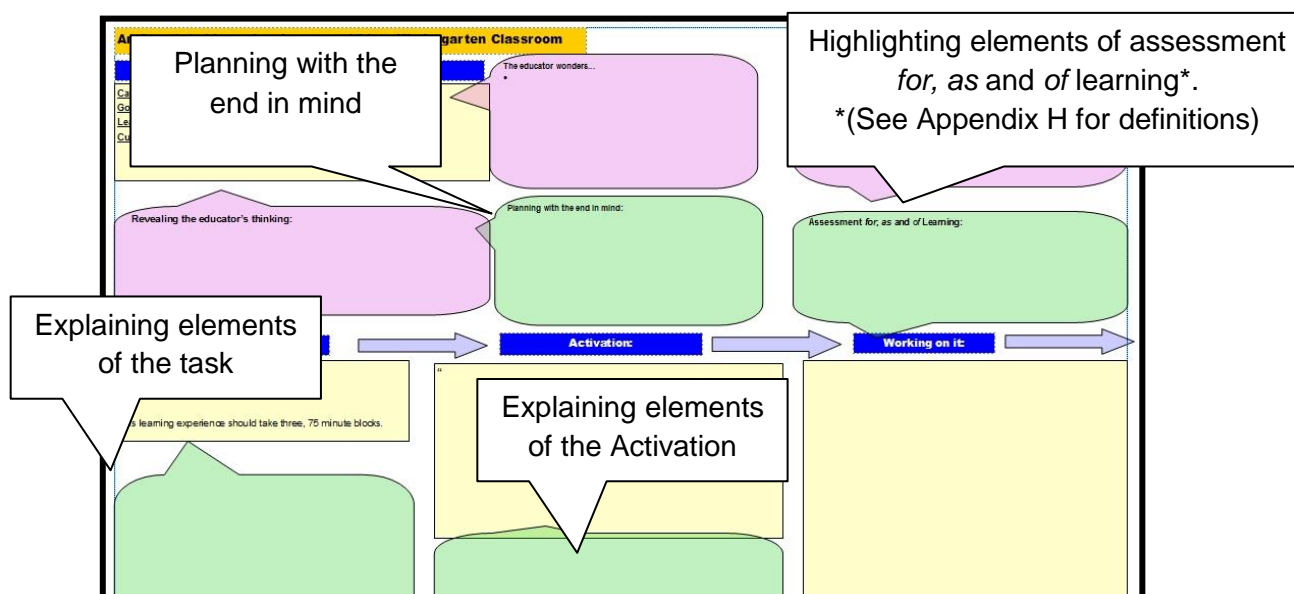
Learning Journeys

Supporting Every Student's Success in Mathematics



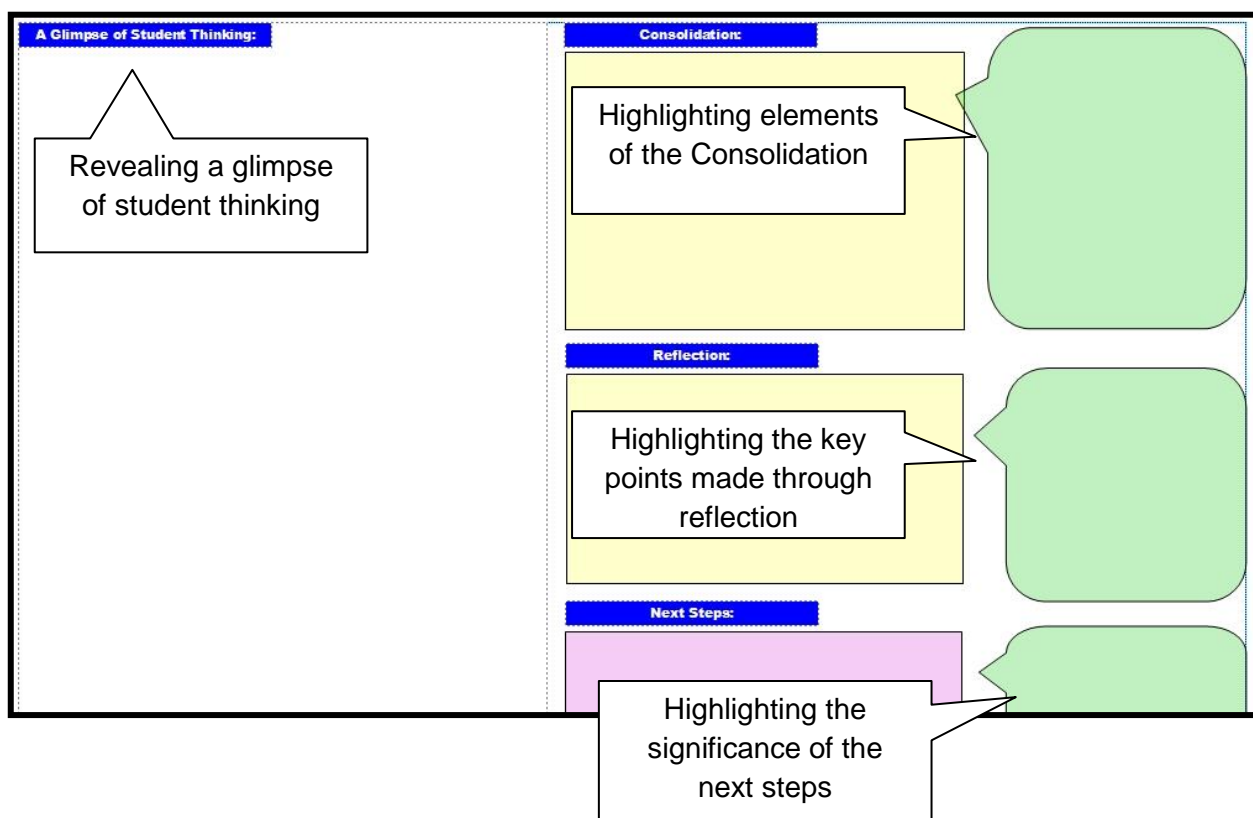
The final boxes to consider are the annotations in **green**. These statements refer back to and highlight responses to the three key questions:

- How do Catholic teachings inform assessment and instructional practices?
- How do the principles of '*Growing Success*' inform instructional practices?
- What constitutes effective mathematics instruction?



Learning Journeys

Supporting Every Student's Success in Mathematics



It is recommended that you choose one Learning Panel. (See page 41 “*Opportunity for Professional Dialogue #4*” for a recommended process). Once you, and perhaps a colleague, have explored one, read the remaining panels, regardless of the division with which you are most comfortable; discuss trends, patterns and insights that have been shared. Refer back to the Theory of Action on page 11.

On the back of each Learning Panel, additional information aligned to several of the key concepts portrayed within the panel is listed. An extensive listing of additional resources can be found in Appendix F, pg.52.

Learning Journeys

Supporting Every Student's Success in Mathematics

Overview of the Learning Panels:

The chart below gives an overview of the key concepts represented in the five Learning Panels.

Kindergarten	Primary	Junior	Intermediate	Secondary (Grade 9 Applied)
Strand Focus: Measurement Big Idea: Proportional Reasoning	Strand Focus: Number Sense and Numeration Big Idea: Proportional Reasoning	Strand Focus: Data Management Number Sense and Numeration	Strand Focus: Data Management and Probability	Strand Focus: Number Sense and Algebra Overall Expectation: Solve Problems Involving Proportional Reasoning
Learning Panel: <ul style="list-style-type: none"> planning starting with the profile of one student with special needs inquiry peer-to-peer conversations listening deeply to students educator observations balance of explicit instruction/guided groupings differentiation 	Learning Panel: <ul style="list-style-type: none"> open-ended problem/parallel task use of manipulatives "ink your thinking" math talk open-ended problem/parallel task a culture of high expectations questioning/conferencing differentiation 	Learning Panel: <ul style="list-style-type: none"> building a collaborative learning culture at the beginning of the year cross-strand/ cross-curricular connections authentic purpose peer-to-peer conversations listening deeply to students educator observations balance of explicit instruction/guided groupings 	Learning Panel: <ul style="list-style-type: none"> focus on fairness and justice learning through a game situation focus on the process of problem solving building perseverance willingness to take the time to learn gallery walk as consolidation strategy 	Learning Panel: <ul style="list-style-type: none"> assessment of learning process of co-constructing criteria student choice power of collaboration self- and peer-assessment
Back Pages: <ul style="list-style-type: none"> Contextual Information Learning Environment Documenting Student Learning 	Back Pages: <ul style="list-style-type: none"> Contextual Information Learning Tasks Asking Effective Questions Gathering Evidence of Learning 	Back Pages: <ul style="list-style-type: none"> Contextual Information Instructional Groupings Student Voice Cross-curricular Connections 	Back Pages: <ul style="list-style-type: none"> Contextual Information The Effective Use of Manipulatives Effective Feedback Ways to Consolidate Learning 	Back Pages: <ul style="list-style-type: none"> Contextual Information The Power and Gift of Collaboration Making the Learning Transparent Differentiating Instruction

Learning Journeys

Supporting Every Student's Success in Mathematics

Using this Resource: Getting Started

Formal or informal leaders who wish to use **Learning Journeys** *Supporting Every Student's Success in Mathematics* to support professional learning may choose to form a collaborative inquiry group and follow the Catholic Professional Learning Cycle* (EOCCC, 2012: Plan/Envision; Act/Sow; Observe/Nurture; Reflect/Discern) as a process to engage in deep learning conversations. (*See Appendix A, pg. 45)

Consider a few questions to reflect on the process of forming the learning community⁵:

- What student need or educator need, in the area of mathematics, has brought the group of educators together?
- Who will be part of the learning team?
- What experience do team members have with collaborative inquiry?
- What is the timeframe for working through a cycle?
- Has the team identified an initial learning goal?
- How will the learning be woven into classroom practice and how will the learning from the classroom be brought back to the team?
- What evidence will the group accept as evidence of success?
- How will the evidence of learning, both of educators and students, be monitored to look for trends and patterns of change?
- How might ideas from **Learning Journeys** be implemented?
 - How might the complexities of ideas including effective instruction in mathematics, plus layering of assessment and evaluation principles, be discussed through a Catholic lens?
 - Will only certain parts of the theory of action be discussed?
 - Will the entire theory of action be explored as an overview of assessment and evaluation principles within a Catholic context?
 - Will the focus be on effective instruction in mathematics?
- How might members of the learning community describe their learning journeys regarding these ideas?

⁵ Adapted from *Catholic Professional Learning Cycle Manual*. EOCCC, 2012.p. 10

Learning Journeys

Supporting Every Student's Success in Mathematics

It is suggested that:

- Groups are formed based on common needs and inquiry intentions. Respecting the learning journey of all educators is a vital component of success.
- Schools with large staffs should consider working in smaller groups, but plan to reflect and report back to the whole group periodically. Learning in small groups allows for everyone to have a voice in discussions. Bringing learning back to a larger group allows for ideas to grow and members to gain insights from all members of the community.
- Varied and flexible groupings are encouraged throughout the year to promote a school-wide exchange of ideas. Respect and honour the diversity of thinking. Encourage cross grade/cross panel discussions to view the learning journey of students through their eyes. Consider using technology to connect with peers at other sites or schools.
- Smaller schools are encouraged to seek out groups with similar inquiry intentions and establish networked learning communities. Teaching in isolation hinders inquiry and does not allow for shared practice and capacity building.
- Include all members of the extended school community (i.e. supervisory officers, administrators, teachers, early childhood educators, educational assistants, etc.) bringing multiple perspectives to the group leading to rich, authentic conversation and collaboration.
- Invite a facilitator/ a 'knowledgeable other'/ a 'thought partner' to guide the process for groups that are working through a collaborative cycle for the first time. Consider using a digital platform or community, such as an on-line collaborative site, a blog or a web-site to document the learning journey of the group and provide all stakeholders with a voice.

Learning Journeys
Supporting Every Student's Success in Mathematics

Using this Resource: Facilitating Discussion

There are many ways to use the features of this resource to facilitate discussion:

- Create your own triple Venn diagram and explore the three questions discussed in this resource,
- Initiate discussion using the learning panels, the learning panel narratives or the theory of action as a starting point or as a comparison to what is already being explored in Catholic boards/schools/classrooms,
- Invite participants to share their own learning journeys as a learner or educator of mathematics,
- Engage in learning experiences suggested within the learning panels,
- Engage in learning conversations using the “Opportunities for Professional Dialogue” options that reinforce the content within the resource,
- Activate thinking by choosing an appropriate scriptural reference or a quotation,
- Make connections using the suggested Links to the Ontario Catholic School Graduate Expectations and Gospel values to support meaning-making for Catholic educators,
- Activate or deepen learning by using one or several additional resources listed at the end of each component,
- Frame a prayer or a discussion using one of the songs listed within the resource.

Learning Journeys
Supporting Every Student's Success in Mathematics

Opportunity for Professional Dialogue #4

How might **Learning Journeys** *Supporting Every Student's Success in Mathematics* support the work of Catholic educators?

How might the Learning Panels support collective and individual professional learning?

Each annotated Learning Panel captures the learning story of one classroom within one division, at one moment in time. The annotations capture a glimpse of the educator's and students' thinking while responding to the three questions of this resource:

- **How do Catholic teachings inform assessment and instructional practices?**
- **How do the principles of 'Growing Success' inform instructional practices?**
- **What constitutes effective mathematics instruction?**

Part A: Choose one Learning Panel as a starting point.

Read and discuss this Learning Panel with a colleague.

What connections can be made between the content in the reading and the above key questions?

Part B: Read and discuss the information on the back pages of the Learning Panel.

How might this additional information support your understanding?

Part C: Read all five Learning Panels.

Discuss common threads that weave through all five Learning Panels.

Part D: Reflect on your learning. Refer back on of the Theories of Action on page 11 or page 30.

Discuss your wonderings and possible next steps in your own learning journey.

Opportunity for Professional Dialogue #5

**How will we use the power of collaboration to respond to the question,
“What constitutes effective Mathematics instruction?”**

“We are angels with only one wing; we can only fly while embracing each other.”

Luciano de Crescenzo

The power of collective capacity is that it enables ordinary people to accomplish extraordinary things, for two reasons. One is that knowledge about effective practice becomes more widely available and accessible on a daily basis. The second reason is more powerful still — working together generates commitment.

All Systems Go: The Change Imperative for Whole System Reform. Fullan, 2010

The focus of this resource is on learning journeys. Where are you on your own personal learning journey about effective mathematics instruction?

Ask a colleague; form a group at your school; ask a grade partner from another school and explore one or several of the many available resources offered by the Ministry of Education or explore a commercial resource. (See Appendix F, pg 52, Resources, for a variety of suggestions in different formats).

Use the **Catholic Professional Learning Cycle** (Appendix A, pg 45) to guide the process.

Be a risk-taker. Try something new in your school or classroom. *Listen deeply to students at work.* Ask questions to generate conversations with students in order to reveal and validate their thinking. Gather and document this evidence of learning. Share this with a colleague; share it with students!

**How might this process support your own
learning journey in mathematics?**

Learning Journeys

Supporting Every Student's Success in Mathematics

We conclude by connecting scripture with song to support our learning journey.

“Those who trust in the Lord will find new strength. They will soar high on wings like eagles; they will run and not grow weary, they will walk and not faint.” Isaiah 40:31

The lyrics of the song below show the growth in a student-educator relationship.

Planting Seeds of Hope

Written from a
student's
perspective

I've been asked to understand, I've been expected to succeed,
But I'm not as smart or able, so the problem must be me.
I've listened and I've tried but I just don't think I can
reach these expectations unless someone takes me by the hand.
And then there were those teachers
Who seemed different than the rest.
Who showed a lot of patience when I put them to the test.
Who took the time and sat with me, who planted seeds of hope,
So I could start to see how I learn, who I am, and who I can become.

God help me love, like You, each child,
Though the process might be slow.
God help me plant the seeds
and trust that You will make them grow
(1 Cor. 3)

The thinking of
an educator
revealed

God help me find a way to serve the needs of every child.
To see and discern, what will open up their hearts and minds.
To sit with them and listen, and to plant those seeds of hope.
So You can help them see,
how they learn, who they are,
and who they can become.

Together as
partners in
learning

So You can help us see,
how we learn, who we are
and who we can become

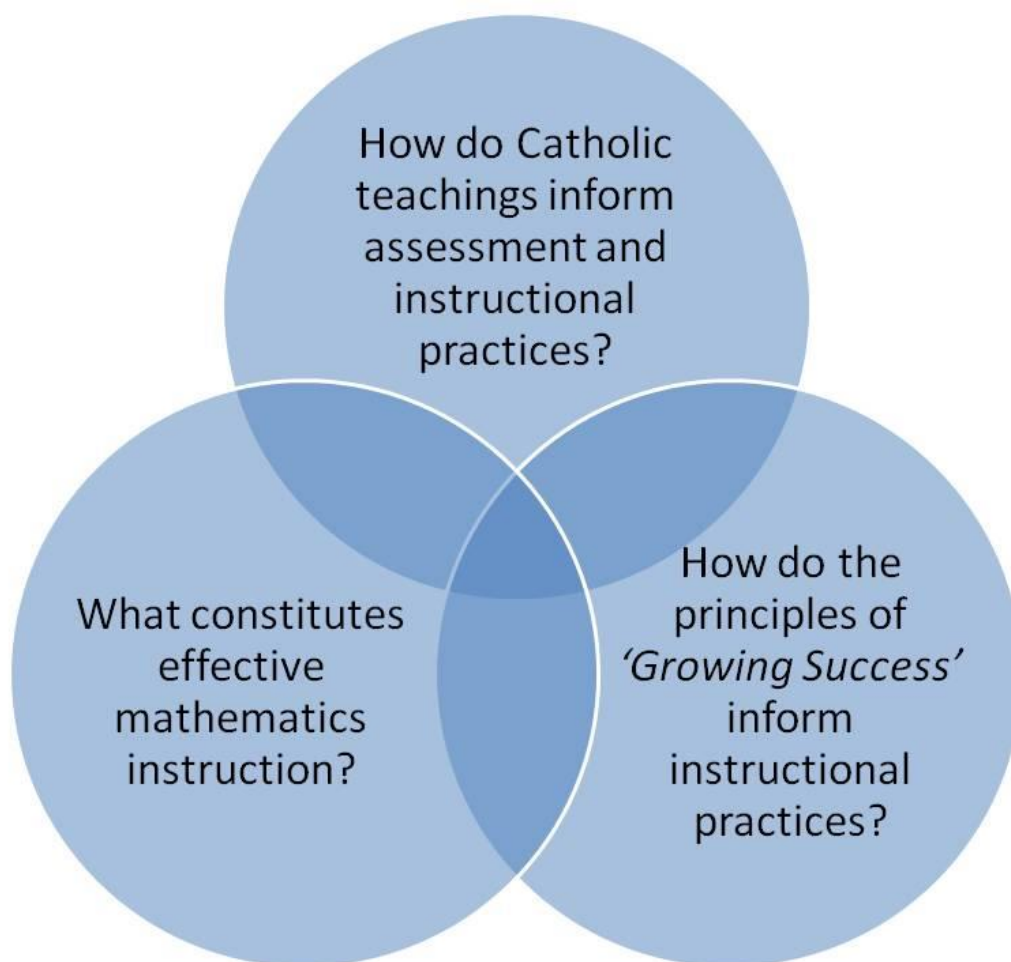
Eliane Guité & Tori Apedaile

http://www.eoccc.org/content/pdf/Final_Planting_Seeds-2011-Gr1-12-REV.pdf

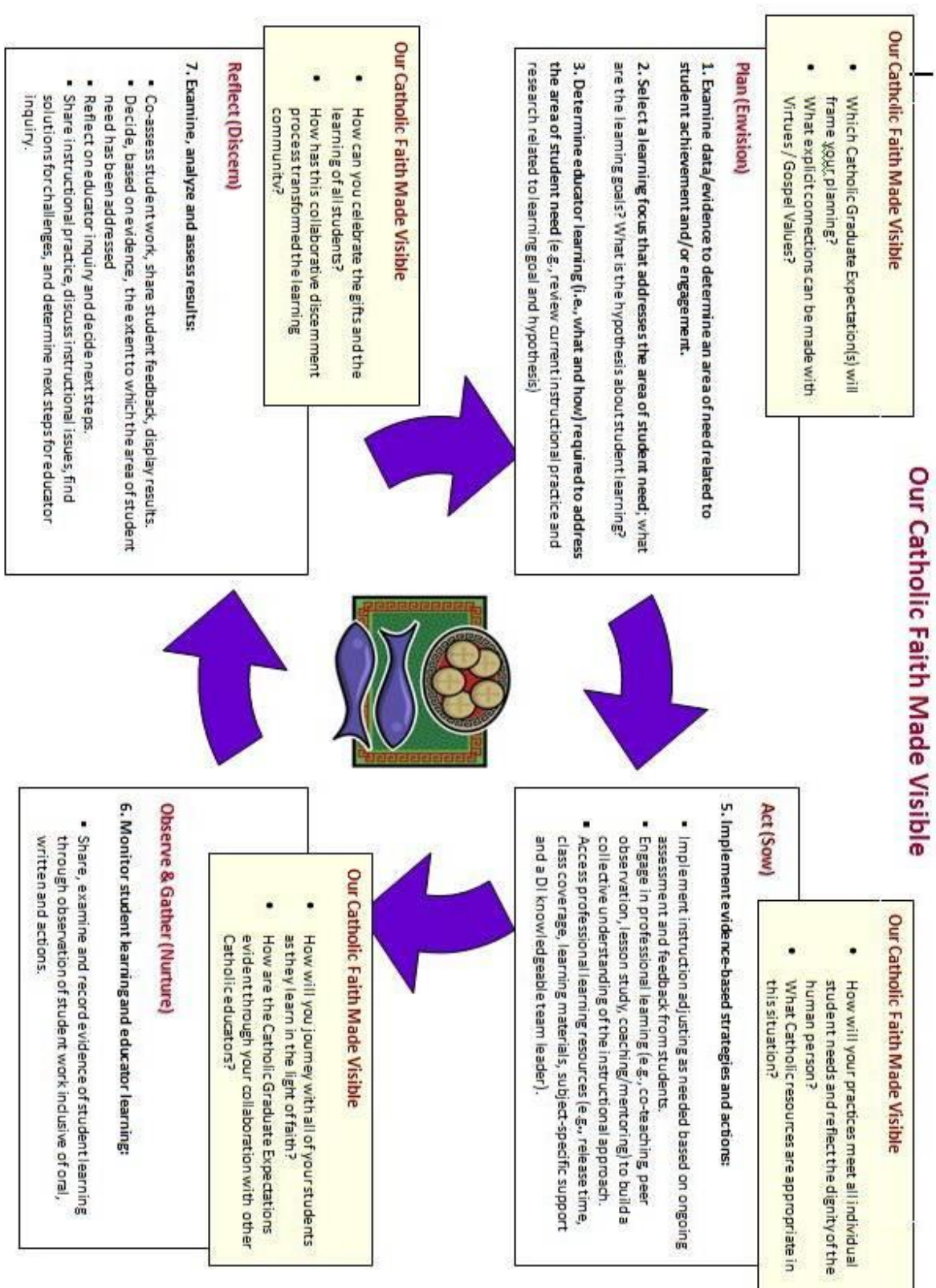
Learning Journeys

Supporting Every Student's Success in Mathematics

Appendices



Catholic Professional Learning Cycle



Learning Journeys
Supporting Every Student's Success in Mathematics

Appendix B

Ontario Catholic School Graduate Expectations

A Discerning Believer Formed in the Catholic Faith Community

- CGE1a Illustrates a basic understanding of the saving story of our Christian faith.
- CGE1b Participates in the sacramental life of the church and demonstrates an understanding of the centrality of the Eucharist to our Catholic story.
- CGE1c Actively reflects on God's Word as communicated through the Hebrew and Christian scriptures.
- CGE1d Develops attitudes and values founded on Catholic social teaching and acts to promote social responsibility, human solidarity and the common good.
- CGE1e Speaks the language of life... "recognizing that life is an unearned gift and that a person entrusted with life does not own it but that one is called to protect and cherish it." (Witnesses to Faith)
- CGE1f Seeks intimacy with God and celebrates communion with God, others and creation through prayer and worship.
- CGE1g Understands that one's purpose or call in life comes from God and strives to discern and live out this call throughout life's journey.
- CGE1h Respects the faith traditions, world religions and the life-journeys of all people of good will.
- CGE1i Integrates faith with life.
- CGE1j Recognizes that "sin, human weakness, conflict and forgiveness are part of the human journey" and that the cross, the ultimate sign of forgiveness is at the heart of redemption. (Witnesses to Faith)

An Effective Communicator

- CGE2a Listens actively and critically to understand and learn in light of gospel values.
- CGE2b Reads, understands and uses written materials effectively.
- CGE2c Presents information and ideas clearly and honestly and with sensitivity to others.
- CGE2d Writes and speaks fluently one or both of Canada's official languages.
- CGE2e Uses and integrates the Catholic faith tradition, in the critical analysis of the arts, media, technology and information systems to enhance the quality of life.

A Reflective, Creative and Holistic Thinker

- CGE3a Recognizes there is more grace in our world than sin and that hope is essential in facing all challenges.
- CGE3b Creates, adapts, evaluates new ideas in light of the common good.
- CGE3c Thinks reflectively and creatively to evaluate situations and solve problems.
- CGE3d Makes decisions in light of gospel values with an informed moral conscience.
- CGE3e Adopts a holistic approach to life by integrating learning from various subject areas and experience.
- CGE3f Examines, evaluates and applies knowledge of interdependent systems (physical, political, ethical, socio-economic and ecological) for the development of a just and compassionate society.

A Self-Directed, Responsible, Lifelong Learner

- CGE4a Demonstrates a confident and positive sense of self and respect for the dignity and welfare of others.
- CGE4b Demonstrates flexibility and adaptability.
- CGE4c Takes initiative and demonstrates Christian leadership.

Learning Journeys

Supporting Every Student's Success in Mathematics

- CGE4d Responds to, manages and constructively influences change in a discerning manner.
- CGE4e Sets appropriate goals and priorities in school, work and personal life.
- CGE4f Applies effective communication, decision-making, problem-solving, time and resource management skills.
- CGE4g Examines and reflects on one's personal values, abilities and aspirations influencing life's choices and opportunities.
- CGE4h Participates in leisure and fitness activities for a balanced and healthy lifestyle.

A Collaborative Contributor

- CGE5a Works effectively as an interdependent team member.
- CGE5b Thinks critically about the meaning and purpose of work.
- CGE5c Develops one's God-given potential and makes a meaningful contribution to society.
- CGE5d Finds meaning, dignity, fulfillment and vocation in work which contributes to the common good.
- CGE5e Respects the rights, responsibilities and contributions of self and others.
- CGE5f Exercises Christian leadership in the achievement of individual and group goals.
- CGE5g Achieves excellence, originality, and integrity in one's own work and supports these qualities in the work of others.
- CGE5h Applies skills for employability, self-employment and entrepreneurship relative to Christian vocation.

A Caring Family Member

- CGE6a Relates to family members in a loving, compassionate and respectful manner.
- CGE6b Recognizes human intimacy and sexuality as God given gifts, to be used as the creator intended.
- CGE6c Values and honours the important role of the family in society.
- CGE6d Values and nurtures opportunities for family prayer.
- CGE6e Ministers to family, school, parish and wider community through service.

A Responsible Citizen

- CGE7a Acts morally and legally as a person formed in Catholic traditions
- CGE7b Accepts accountability for one's own actions.
- CGE7c Seeks and grants forgiveness.
- CGE7d Promotes the sacredness of life.
- CGE7e Witnesses Catholic social teaching by promoting equality, democracy, and solidarity for a just, peaceful and compassionate society.
- CGE7f Respects and affirms the diversity and interdependence of the world's peoples and cultures.
- CGE7g Respects and understands the history, cultural heritage and pluralism of today's contemporary society.
- CGE7h Exercises the rights and responsibilities of Canadian citizenship.
- CGE7i Respects the environment and uses resources wisely.
- CGE7j Contributes to the common good.

Theological and Cardinal Virtues Reference Sheet

Theological Virtues: The three theological virtues (Faith, Hope and Love) are God's gift to us at baptism. As we nurture our faith and practice these virtues, they guide our character as it develops over a lifetime of discipleship.

<p style="text-align: center;">Faith – <i>A new way of seeing, a shared way of believing</i></p> <p style="text-align: center;">I believe in God, who loves me; I pray and worship, I show my faith in love for others.</p>
<p style="text-align: center;">Hope – <i>Trusting God's promises in prayer and work for justice</i></p> <p style="text-align: center;">I trust in God's promises, I pray, I work for peace and justice.</p>
<p style="text-align: center;">Love - <i>Loving God above all things and others as God loves them</i></p> <p style="text-align: center;">I worship God above all else, I practice kindness and try to give, like Jesus.</p>

Cardinal Virtues: Prudence, Justice, Temperance, Fortitude are the four cardinal virtues – practices on which all other virtues hinge (*cardo*, meaning *hinge* in Latin). These practices are learned and developed over time.

<p style="text-align: center;">Prudence – <i>Seeking, judging, acting – with confidence and love</i></p> <p style="text-align: center;">I look for the most loving solution, and carry it out with joy.</p>
<p style="text-align: center;">Justice – <i>Seeking the good, meeting obligations to God and neighbour</i></p> <p style="text-align: center;">I give God my worship, and show my neighbor mercy and fairness.</p>
<p style="text-align: center;">Temperance – <i>Enjoying life's pleasures in keeping with the Gospel</i></p> <p style="text-align: center;">I practice balance and self-control, I make healthy friendships, I am honest about who I am</p>
<p style="text-align: center;">Fortitude – <i>Practicing the good and just in challenging situations, patience with obstacles.</i></p> <p style="text-align: center;">I practice doing what is right with patience, even when it is difficult.</p>

Catholic Social Teaching - Key Principles

<p style="text-align: center;">Justice</p> <p style="text-align: center;"><i>Living in right relationship with God and neighbour.</i></p>
<p style="text-align: center;">Dignity of the Human Person</p> <p style="text-align: center;"><i>All human persons – from conception until natural death...</i></p> <ul style="list-style-type: none"> · <i>have a supreme and sacred dignity among God's creatures;</i> · <i>are created in the image and likeness of God.</i>
<p style="text-align: center;">The Common Good</p> <p style="text-align: center;"><i>Everyone's right to what is necessary for a truly human life.</i></p>
<p style="text-align: center;">Solidarity</p> <p style="text-align: center;"><i>Commitment to the good of my neighbour.</i></p>
<p style="text-align: center;">Subsidiarity</p> <p style="text-align: center;"><i>Freedom and duty to make responsible decisions at the lowest appropriate level.</i></p>
<p style="text-align: center;">Preferential Option for the Poor</p> <p style="text-align: center;"><i>Putting the needs of the poor first.</i></p>
<p style="text-align: center;">Dignity of the Worker</p> <p style="text-align: center;"><i>Sharers in God's creative plan for the world.</i></p>
<p style="text-align: center;">Peace</p> <p style="text-align: center;"><i>The tranquility of order, the work of justice, the effect of charity.</i></p>
<p style="text-align: center;">The Right to Private Property</p> <p style="text-align: center;"><i>Freedom to invest wages in land and possessions.</i></p>
<p style="text-align: center;">Universal Destination of Goods (Distribution)</p> <p style="text-align: center;"><i>The goods of the earth were made by God for all to share.</i></p>
<p style="text-align: center;">Environmental Stewardship</p> <p style="text-align: center;"><i>Responsible care for God's creation to sustain present and future generations everywhere.</i></p>

Scriptural References: Learning Journeys

“Be shepherds of God’s flock that is under your care, watching over them—not because you must, but because you are willing, as God wants you to be... eager to serve.” (1 Peter 5:2) p. 4 & 32

“Trust in the Lord with all your heart, and do not lean on your own understanding. In all our ways acknowledge him, and he will make straight your paths,” (Proverbs 3:5-6) p. 7

“I sought the Lord, He answered me and delivered me from all my fears.” (Psalm 34:4), p. 7

“Your word is a lamp to my feet and a light to my path. (Psalm 119:105), p. 19

“Then they said to him, ‘Please inquire of God to learn whether our journey will be successful.’” (Judges 18:5), p. 19

“Seeing the crowds, he went up on the mountain, and when he sat down, his disciples came to him. And he opened his mouth and taught them, saying: “Blessed are the poor in spirit, for theirs is the kingdom of heaven. Blessed are those who mourn, for they shall be comforted. Blessed are the meek, for they shall inherit the earth.” (Matthew 5: 1-48), p. 20

“We have different gifts, according to the grace given to each of us...” (Romans 12: 5-6), p. 21

“Now the tax collectors and sinners were all gathering around to hear Jesus. But the Pharisees and the teachers of the law muttered, ‘This man welcomes sinners and eats with them.’ Then Jesus told them this parable: ‘Suppose one of you has a hundred sheep and loses one of them. Doesn’t he leave the ninety-nine in the open country and go after the lost sheep until he finds it? And when he finds it, he joyfully puts it on his shoulders and goes home. Then he calls his friends and neighbors together and says, ‘Rejoice with me; I have found my lost sheep.’ I tell you that in the same way there will be more rejoicing in heaven over one sinner who repents than over ninety-nine righteous persons who do not need to repent.” (Luke 15: 3-7), p. 32

“God promised that he would personally shepherd his people and lead them to safety.” (Isaiah 40:11), p. 32

Learning Journeys

Supporting Every Student's Success in Mathematics

"And God said, "I will look for those that are lost and bring back the ones that wander off."
(Ezekiel 34:16), p. 32

"Those who trust in the Lord will find new strength. They will soar high on wings like eagles; they will run and not grow weary, they will walk and not faint." (Isaiah 40:31), p. 43

"For surely I know the plans I have for you," says the Lord. "Plans for your welfare and not for your harm, to give you a future with hope." (Jer 29:11)

"Do not fear, for I have redeemed you. I have called you by name. You are mine. (Is 43:1b)

"Do not consider the things of old. I am about to do a new thing; now it springs forth, do you not perceive it? (Is 43:19)

"See, I have inscribed you on the palms of my hands." (Is 49: 16a)

"As the Father has loved me, so I have loved you. Abide in my love." (Jn 15:9)

"Then Jesus went about all the cities and villages, teaching in their synagogues, and proclaiming the good news of the Kingdom, and curing every disease and every sickness. When he saw the crowds, he had compassion for them, because they were harassed and helpless, like sheep without a shepherd." (Mt 9: 35-36)

"The members of the body that seem to be weaker are indispensable, and those members of the body that we think less honourable we clothe with greater honour, and our less respectable members are treated with greater respect; whereas our more respectable members do not need this. But God has so arranged the body, giving greater honour to the inferior member, that there may be no dissension within the body, but the members may have the same care for one another. If one member suffers, all suffer together with it; if one member is honoured, all rejoice together with it. Now you are the body of Christ, and individually members of it." (1Cor 12: 22-27).

Resources

Catholic Curriculum Websites:

Catholic Principals' Council of Ontario

Website: <http://www.cpco.on.ca/>

Catholic Curriculum Corporation

Website: <http://catholiccurriculumcorp.org/>

Curriculum Support for Catholic Schools 2.0. EOCCC, 2005.

Website: <http://www.eoccc.org/content/csfcs/index.htm>

Eastern Ontario Catholic Curriculum Corporation

Website: www.eoccc.org

Institute for Catholic Education

Website: www.iceont.ca/

Northern Ontario Catholic Curriculum Cooperative

Website: www.noccc.on.ca/

Ontario English Catholic Teachers Association

Website: <http://www.oecta.on.ca>

Ontario Catholic School Graduate Expectations. ICE, 2012

Website: <http://www.iceont.ca/page13015019.aspx>

Our Language, Our Story. EOCCC, 2009

Website: <http://www.ourlanguageourstory.org/>

Planting Seeds for Success: Exploring Learning Skills and Work Habits from a Catholic Perspective, Grades 1 to 12

Website: <http://www.eoccc.org/>

Seeing Through the Eyes of Jesus: Growing Success for Students in Catholic Schools, Grades 1 to 12

Website: <http://www.eoccc.org/>

Resources

EduGains is the web portal to resources developed and provided through the Ministry of Education and focused on learning – student learning and educator learning from Kindergarten to Grade 12. The grouping of resources includes: Math Gains, Math Resources, Assessment and Evaluation, Differentiated Instruction, ELL Gains, Financial Literacy, International Languages, Kindergarten, Literacy, LNS, Professional Learning Cycle, and Ministry Digital Resources.

Eudgains home page: <http://www.edugains.ca/newsite/index.html>

Math Gains: <http://www.edugains.ca/newsite/math/index.html>

Video Resources with accompanying viewing guides from AER Gains Video Library:

Planning Assessment with Instruction (8 segments)

Website: <http://www.edugains.ca/newsite/aer2/aervideo/planningassessmentwithinstruction.html>

Learning Goals and Success Criteria (6 segments)

Website: <http://www.edugains.ca/newsite/aer2/aervideo/learninggoals.html>

Questioning (6 segments)

Website: <http://www.edugains.ca/newsite/aer2/aervideo/questioning.html>

Descriptive feedback (5 segments)

Website: <http://www.edugains.ca/newsite/aer2/aervideo/descriptivefeedback.html>

Self-assessment (5 segments)

Website: <http://www.edugains.ca/newsite/aer2/aervideo/selfassessment.html>

Resources

Capacity Building Series: Although many of the Ministry monographs are labelled for educators of primary or junior classrooms the ideas and concepts are relevant from Kindergarten to Grade 12. Listed below are some of the monographs connected to the ideas found in **Learning Journeys: *Supporting Every Student's Success in Mathematics***

Website: <http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html>

Paying Attention to Mathematics Education: Seven Foundational Principles for Improving Mathematics, K to 12

<http://www.edu.gov.on.ca/eng/teachers/studentssuccess/FoundationPrincipals.pdf>

Paying Attention to Algebraic Reasoning: A Support for Paying Attention to Mathematics Education

<http://www.edu.gov.on.ca/eng/literacynumeracy/PayingAttentiontoAlgebra.pdf>

Paying Attention to Proportional Reasoning: A Support for Paying Attention to Mathematics Education

<http://www.edu.gov.on.ca/eng/teachers/studentssuccess/ProportionReason.pdf>

Paying Attention to Spatial Reasoning: A Support for Paying Attention to Mathematics Education

<http://www.edu.gov.on.ca/eng/literacynumeracy/LNSPayingAttention.pdf>

Mathematics Resource Inventory (November 2012) * This document contains live links to resources that support the implementation of the Ontario Mathematics Curriculum.

<http://www.edugains.ca/resourcesLNS/MathResources/MathematicsResourceInventory.pdf>

Dynamic Learning:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_DynamicLearning.pdf

The Third Teacher:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_ThirdTeacher.pdf

Asking Effective Questions:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_AskingEffectiveQuestions.pdf

Learning Journeys

Supporting Every Student's Success in Mathematics

Student Voice: Transforming Relationships

<http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html>

Culturally Responsive Pedagogy: Towards Equity and Inclusivity in Ontario Schools

<http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html>

Pedagogical Documentation:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_Pedagogical.pdf

Collaborative Teacher Inquiry:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_Collaborative_Teacher_Inquiry.pdf

Getting Started with Student Inquiry:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_StudentInquiry.pdf

Inquiry-based Learning

<http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/capacityBuilding.html>

Grand Conversations in the Primary Classroom:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_Grand_Conversations.pdf

Grand Conversations in the Junior Classroom:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_Grand_Conversations_Junior.pdf

Student Self-assessment:

<http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/StudentSelfAssessment.pdf>

Teacher Moderation:

http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/Teacher_Moderation.pdf

Resources

Webcasts/Additional Resources for Educators

This site provides access to archived webcasts. Listed below are some titles that may be of interest to educators interested in exploring elements of **Learning Journeys: Supporting Every Student's Success in Mathematics**

Website: <http://www.curriculum.org/content/webcasts>

Jo Boaler: Mindset in Mathematics

<http://www.curriculum.org/k-12/en/projects/jo-boaler>

Leaders in Educational Thought: Special Edition on Mathematics <http://www.curriculum.org/k-12/en/projects/leaders-in-educational-thought-special-edition-on-mathematics>

Linking Today's Understanding to Tomorrow's Learning: Proportional Reasoning

<http://learnteachlead.ca/en/projects/linking-todays-understanding-to-tomorrows-learning>

Planning for Mathematical Understanding: Fractions Across the Junior Grades

<http://www.curriculum.org/k-12/en/projects/planning-for-understanding-in-mathematics-fractions-across-the-junior-grades>

Math Study Groups: Learning in a Collaborative Culture of Inquiry, Study, Action

<http://www.curriculum.org/k-12/en/projects/math-study-groups-learning-in-a-collaborative-culture-of-inquiry-study-action>

Creating the Conditions for Learning Mathematics

<http://www.curriculum.org/k-12/en/projects/creating-the-conditions-for-learning-mathematics>

Planning for Authentic, Integrated Learning

<http://www.curriculum.org/content/30/planning-for-authentic-integrated-learning>

Conversations for Learning

<http://www.curriculum.org/content/30/conversations-for-learning>

Students of Mystery: The Student Work Study Initiative

<http://www.curriculum.org/content/30/students-of-mystery-a-student-work-study-teacher-initiative>

Discovering Voice

<http://resources.curriculum.org/secretariat/discovering/>

From The Eye of the Learner: From Study Work to Teacher Practice

<http://resources.curriculum.org/secretariat/eyes/index.shtml>

Resources

Text Resources:

Barr, Robert D. and Gibson, Emily L. (2013) *Building a Culture of Hope: Enriching Schools with Optimism and Opportunity*. Bloomington, IN: Solution Tree Press

Beatty, R. Bruce. C. (2011). *From Patterns to Algebra*, Toronto, Ont: Nelson Educational

Canadian Catholic Trustees' Association. (2002). *Build Bethlehem Everywhere*. Toronto: CCSTA

City, E., Elmore, R., Fiarman, S., Teitel, L. (2009). *Instructional Rounds in Education: a Network Approach to Improving Teaching and Learning*. Cambridge, MA: Harvard Press.

Clements, D. (2009). *Learning and Teaching Math: The Learning Trajectories Approach*. New York, NY: Routledge.

Covey, S. (1989). *The 7 Habits of Highly Effective People*. New York: Simon & Schuster.

Davies, A. (2007). *Making Classroom Assessment Work*. Courtney, BC: Connections Publishing.

Dweck, C. (2006). *Mindset: The New Psychology of Success*. New York: Random House Publishing.

Fox, M. and Shimabukuro, G. (2012). *Building a Spiritual Community Among Educators: Processes to Explore the Catholic Identity of Your School*. Arlington, VA: National Catholic Education Association.

Fraser, S. (2012) *Authentic Childhood: Experiencing Reggio Emilia in the Classroom, Third Edition*. Toronto, ON: Nelson

Fullan, Michael. (2010). *All Systems Go: The Change Imperative for Whole System Reform*. Thousand Oaks, California: Corwin.

Harring, Bernard. (1997). *The Virtues of an Authentic Life: A Celebration of Spiritual Maturity*. Missouri: Liguori Publications.

Learning Journeys

Supporting Every Student's Success in Mathematics

Harrington, D. Kavangh, J. (1998). *Prayer for Parish Groups: Preparing and leading prayer for group meetings*. Winona, Minnesota: St. Mary's Press.

Harvard Project Zero: Thinking Routines. Available at:

http://www.visiblethinkingpz.org/VisibleThinking_html_files/03_ThinkingRoutines/03c_CoreRoutines.html

Hattie, J. (2012). *Visible Learning for Teachers*. New York: Routledge.

Katz, S. Dack, L. (2013). *Intentional Interruptions: Breaking Down Learning Barriers to Transform Professional Practice*. Thousand Oakes, California: Corwin

Kuklthau, C. C., Manitoes, L. K., & Caspari, A. K. (2007). *Guided Inquiry: Learning in the 21st Century*. Westport, CT & London: Libraries Unlimited.

Moss, M., & Brookhart, S. (2009). *Advancing Formative Assessment in Every classroom: A Guide for Instructional Leaders*. Alexandria, VA: ASCD.

Ontario Ministry of Education. (2003). *Early Math Strategy: The Report of the Expert Panel on Early Mathematics in Ontario*.

Ontario. Ministry of Education. (2010). *Growing Success: Assessment, Evaluation and Reporting in Ontario Schools. First Edition, covering Grade 1 to 12*. Toronto.

Ontario. Ministry of Education. (2013). *Learning for All: A Guide for Effective Assessment and Instruction for All Students, Kindergarten to Grade 12*. Toronto.

Ontario. Ministry of Education. (2009). *Realizing the Promise of Diversity: Ontario's Equity and Inclusive Education Strategy*. Toronto.

Ontario. Ministry of Education. (2010). *Reporting Student Learning: Guidelines for Effective Teacher-Parent-Student Communication*. Toronto.

Ontario. Ministry of Education. (2013). *School Effectiveness Framework: A support for school improvement and student success*. Toronto.

Ontario Ministry of Education. (2004). *Teaching and Learning Mathematics: The Report of the Expert Panel on Mathematics in Grades 4 to 6 in Ontario*.

Learning Journeys

Supporting Every Student's Success in Mathematics

Parrish, S. (2010). *Number Talks: Helping Children Build Mental Math and Computation Strategies*. Sausalito, California: Math Solutions.

Shimabukuro, G. and Fox, M. (2010). *Building a Spiritual Community Among Faculty: Staff Development Processes for Educators in Catholic Schools*. Arlington, VA: National Catholic Education Association.

Small, M. (2013). *Big Ideas from Dr. Small, (K-3; 4-8, 9-12)*. Toronto, Ont: Nelson Educational

Small, M. (2013). *Eyes on Math: A Visual Approach to Teaching Math Concepts*. New York, NY: Teachers College Press.

Small, M. (2012). *Good Questions: Great Ways to Differentiate Mathematics Instruction*. New York, NY: Teachers College Press.

Small, M. (2009). *Making Math Meaningful to Canadian Students, K to 8*. Toronto, Ont: Nelson.

Small, M. (2014). *Uncomplicating Alegria to Meet Common Core Standards in Math, K-7*. New York, NY: Teachers College Press.

Small, M. (2014). *Uncomplicating Fractions to Meet Common Core Standards in Math, K-7*. New York, NY: Teachers College Press.

Van de Walle, J. Lovin, L. Karp, K. Williams, J. (2013) *Teaching Student-Centred Mathematics: Developmentally Appropriate Instruction for Pre K-2 (Vol. I); Grades 3-5 (Vol. II); Grades 6-8 (Vol. III)*. Toronto, Ont: Pearson Education.

Walsh, J.A., Sattes, B. D. (2011). *Thinking Through Quality Questions: Deepening Student Engagement*. Thousand Oaks, California: Corwin.

Wiggins, G., & McTighe, J. (2005). *Understanding by Design*. Alexandria, VA: ASCD.

Zwiers, J., & Crawford, M. (2011). *Academic Conversations: Classroom Talk that Fosters Critical Thinking and Content Understandings*. Portland, Maine: Stenhouse.

Growing Success: FUNDAMENTAL PRINCIPLES

The primary purpose of assessment and evaluation is to improve student learning. The following seven fundamental principles lay the foundation for rich and challenging practice. When these principles are fully understood and observed by all teachers, they will guide the collection of meaningful information that will help inform instructional decisions, promote student engagement, and improve student learning.

The Seven Fundamental Principles

To ensure that assessment, evaluation, and reporting are **valid and reliable**, and that they lead to the improvement of learning for all students, teachers use practices and procedures that:

- ... are fair, transparent, and equitable for all students;
- ... support all students, including those with special education needs, those who are learning the language of instruction (English or French), and those who are First Nation, Métis, or Inuit;
- ... are carefully planned to relate to the curriculum expectations and learning goals and, as much as possible, to the interests, learning styles and preferences, needs, and experiences of all students;
- ... are communicated clearly to students and parents at the beginning of the school year or course and at other appropriate points throughout the school year or course;
- ... are ongoing, varied in nature, and administered over a period of time to provide multiple opportunities for students to demonstrate the full range of their learning;
- ... provide ongoing descriptive feedback that is clear, specific, meaningful, and timely to support improved learning and achievement;
- ... develop students' self-assessment skills to enable them to assess their own learning, set specific goals, and plan next steps for their learning.

Definitions from Glossary of *Growing Success*

Assessment: The process of gathering, from a variety of sources, information that accurately reflects how well a student is achieving the curriculum expectations in a subject or course.

Assessment *as* learning: The process of developing and supporting student metacognition. Students are actively engaged in this assessment process: that is, they monitor their own learning; use assessment feedback from teacher, self, and peers to determine next steps; and set individual learning goals. Assessment ***as*** learning requires students to have a clear understanding of the learning goals and the success criteria. Assessment ***as*** learning focuses on the role of the student as the critical connector between assessment and learning. (Adapted from Western and Northern Canadian Protocol for Collaboration in Education, 2006, p. 41.)

Assessment *for* learning: The ongoing process of gathering and interpreting evidence about student learning for the purpose of determining where students are in their learning, where they need to go, and how best to get there. The information gathered is used by teachers to provide feedback and adjust instruction and by students to focus their learning. Assessment ***for*** learning is a high-yield instructional strategy that takes place while the student is still learning and serves to promote learning. (Adapted from Assessment Reform Group, 2002.)

Assessment *of* learning: The process of collecting and interpreting evidence for the purpose of summarizing learning at a given point in time, to make judgements about the quality of student learning on the basis of established criteria, and to assign a value to represent that quality. The information gathered may be used to communicate the student's achievement to parents, their teachers, students themselves, and others. It occurs at or near the end of a cycle of learning.

Evaluation: The process of judging the quality of student learning on the basis of established criteria and assigning a value to represent that quality. Evaluation is based on assessments of learning that provide data on student achievement at strategic times throughout the grade/subject/course, often at the end of a period of learning.

Learning Journeys

Supporting Every Student's Success in Mathematics

Professional judgement: Judgement that is informed by professional knowledge of curriculum expectations, context, evidence of learning, methods of instruction and assessment, and the criteria and standards that indicate success in student learning. In professional practice, judgement involves a purposeful and systematic thinking process that evolves in terms of accuracy and insight with ongoing reflection and self-correction.

Reliability: The degree to which an assessment or evaluation is consistent and stable in measuring what it is intended to measure. An assessment or evaluation is considered reliable when the same results occur regardless of when or where the assessment or evaluation occurs or who does the scoring

Validity: The degree to which an assessment or evaluation actually measures what it claims to measure and the extent to which inferences, conclusions, and decisions made on the basis of the results are appropriate and meaningful.

Eastern Ontario Catholic Curriculum Corporation

464 Isabella Street, Suite #205

Pembroke, ON K8A 5T9

www.eoccc.org

Tel: 613-735-1310 Fax: 613-735-7410