

PDIG 2020-2021 Final Report: Cycle 2 and 3 Math Tasks
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1. Project description:

The goal of this project was to create a rich bank of meaningful tasks to use in cycle 2 and cycle 3 math. After having gone to the Math Summer Institute, we were inspired to create a task bank that could be used from the beginning of cycle 2 until the end of cycle 3. We created these lessons and activities using the information from the books published by the Dixon, Nolan, Adams, (DNA) Mathematics team, and from Summer Institute lessons and activities. We aligned these activities with the Quebec Education Plan (QEP) and the progressions of learning. We felt strongly that by having something consistent that would be familiar to the students across cycles, it would not only help their success, but their confidence, their ability to think about math and their ability to question math. All of these skills are things that can be practiced by using meaningful tasks.

What worked well:

Having both taught cycle two and three math for over five years and attending many professional development sessions about math, including the Math Summer Institute, we have a common understanding of the instructional shifts that need to occur in all mathematics classrooms.

In order to help us achieve our project goals, we spent the first planning day identifying the essential skills in both cycles in order to make an outline for the rest of the project and keep us on track. As a way to ensure our project would be user-friendly and to encourage other teachers to use the lessons, we organized the body of work into a virtual classroom. This model would allow teachers to open up lessons directly from a single Google Slide and have easy access to everything they need to implement the lesson in their class. This wasn't part of our original project outline, but we felt it was well-worth the time in order to facilitate the lives of teachers using the tools.

Another aspect of our project that worked well was the one-page lesson template we created at the beginning. We spent a lot of time discussing the aspects we wanted included in each lesson, such as the learning goals, common misconceptions,

assessing and advancing questions, anticipated student responses, and vocabulary. This page also included the list of tasks for each concept. Each mathematical concept within a unit included a diagnostic task, a pre-unit task, a check-in task, and a post-unit task. Having this template allowed us to be consistent and kept us accountable for the information we wanted to convey to teachers.

Challenges:

We had many ideas and goals for our Math Task project, and although we were successful at meeting some of them, we realized that what we had envisioned for this project was beyond the span of five days in one school year. It was due to this reason that we re-applied to finish our project in the 2021-2022 school year.

It was challenging to keep our focus on the goals we set out in the application because when reading through the math textbook and deciding on essential skills, there were a lot more than we originally anticipated. This is because the students are not being provided with adequate resources for each skill that is introduced in the textbook in one year.

Another challenge that we faced was wanting to ensure that other teachers would actually implement yet another new resource in their classroom, especially one that may challenge the way they are already teaching math. We had lengthy discussions about how to make the lessons user-friendly and how to make sure that our colleagues would not have an increased workload due to our lessons. For this reason, we spent a lot of time creating the exact tools needed for each task. For example, we even attached a copy of a place value chart that matched the learning goals. This small piece of a lesson took approximately one hour to complete because we needed to create it from scratch so that it matched the vocabulary in the lessons. Consistency is a big part of instructional shifts in math and we couldn't find an already created tool we liked.

Synthesis of our journal entries:

Our journal entries shared our thoughts, questions, concerns, ideas, feedback, rationale, and solutions, as well as outlined the highlights of how our meetings progressed.

2. Project Goals

The goals of our PDIG project included:

- To analyze the QEP for cycle 2 and 3 math and identify essential skills.
- Creating a template for the overview page that will accompany each topic.
- Identifying vocabulary relating to each concept.
- Identifying common misconceptions students have about these concepts.
- Creating questions that can be asked to redirect student thinking
- Creating an outline of the different tasks that can be used to assess student understanding.
- Determining the essential knowledge students are expected to grasp at the end of each unit.
- Creating a platform (digital task bank) that will be user friendly for all teachers.

Goals that were met:

We are very proud of the goals that we did meet throughout this process. We analyzed the QEP in depth, took notes, had discussions and spoke with a math specialist. We successfully created a template using Google Slides for the overview page for each topic. We researched and decided upon common vocabulary, after spending many hours reading through the DNA Math books. We researched common misconceptions and thought deeply about how we could question these students in order to advance or assess their thinking. We also made videos to demonstrate these misconceptions for teachers and drew pictures of anticipated student work.

We started with the topic of place value and did research in order to decide which concepts within place value we were going to create tasks for. We decided on value and position, decomposing, comparing and rounding. For each of these concepts, we created a template page. We created many tasks associated with these skills, including diagnostic, pre-unit, check-in and post-unit along with all the resources needed to implement the lesson. Creating these resources was more time consuming than we originally thought. As previously mentioned, one of our main goals was to make this project user-friendly, so we decided to dedicate more time to this step.

Another time-consuming goal that we met was to determine the essential knowledge students are expected to grasp at the end of each unit. In order to do this, we looked through the textbooks, read the DNA Math books, referenced the QEP and Progressions of Learning, as well as read the book *Teaching Student-Centered Mathematics* by Van De Walle. This step was challenging as we wanted to ensure we used consistent vocabulary throughout.

Finally, we created our *Digital Task Lounge* on Google Slides. This task lounge is a place to organize our work, is visually appealing (hoping to entice more teachers to visit) and is linked to everything needed in order to use the lessons in our classrooms.

Goals that were partially met:

As mentioned in the challenges sections, we bit off a bit more than we could chew with this project. We had big goals and were originally confident that we could meet them all, but once we started working, we decided to make sure we create the best possible tools for our colleagues instead of rushing to finish the project completely.

We created many tasks related to the place value topics we had outlined and we ensured that each task had a list of materials and included links to all the printables or slideshows teachers would need. We did not fully complete this part of the project as the number of skills just within the concept of place value was far greater than we anticipated. Because we decided to develop more tasks than we had originally planned, we quickly made the decision to postpone the fraction and decimals concepts and reapply for another PDIG project in order to complete the project to the best of our abilities.

3. Project Outcomes

We have gained a lot by working together throughout this project. Since one of us is a cycle two teacher and one of us is a cycle three teacher, we were able to identify possible learning gaps when students move up to the next year. Because the QEP covers so much material each year, this project really helped us zero in on the most important skills for each year and where teachers should be investing the majority of their teaching time. Planning the lessons as a team allowed us to consider how the

learning progressed across the cycles. It also enabled us to realistically see how challenging certain concepts may be in other cycles, allowing us to better understand how and when we should lead into these activities.

Going through this process also helped us gain a better understanding of how to improve our math practices. It gave us the opportunity to discuss the practices and instructional shifts we've been learning at the Summer Institute and discuss the realities of our students' needs. The lessons we have developed were strategically and specifically designed to meet the needs of our students and to help students take accountability for their own learning.

4. Reinvestment

We will be sharing the results of the project and the resources created with all members of our staff who teach math at the cycle two and three levels. Ideally, we would do this through a presentation of the research behind the project as well as how to use the tasks effectively in class. During our common presence on Tuesdays after school, we will also take the time to meet with each cycle team and model a task to ensure they feel comfortable implementing it in their own classrooms. We will also make ourselves available at any time to provide support and answer questions about the project. In order to accomplish this, on the final day of our PDIG, we presented the project to our principal as well as the research behind it. He will be scheduling a time for us to present to the rest of the staff as we outline above.

After this has been implemented within our school, we'd like to reach out to our school board math consultant and possibly present the project to cycle two and three math teachers across the school board. We often have mandatory math workshops and we believe this project would be the perfect thing to be presented on one of these days. A member of this PDIG team is still a current participant of the Summer Math Institute and results could be shared with colleagues within a cycle but from various school boards in her third year.

We strongly believe our project will benefit the entire English educational community, not just students and teachers. Another gap that we begin noticing in cycle two and three is that parents are now struggling to help their child and a lot of students are requiring extra at-school support such as tutoring and homework programs. We are

hoping that by having a common vocabulary throughout the last four years of elementary school, students will have a stronger understanding and be more comfortable completing work on their own.

We will be improving this project next year with a follow-up PDIG application in order to continue where we left off. We are extremely proud of the work we have accomplished in just five work days and have already implemented these tasks in our own classrooms. We look forward to sharing our project with our colleagues and expanding our task bank.

Supporting Documents:

As mentioned in the report, all our resources were compiled into what we call the *Digital Task Lounge*. Everything needed for our project can be found by exploring the lounge.

Link to the task lounge:

<https://docs.google.com/presentation/d/1gmOPKqle8ml6XC1PE0u6UqRCnAuK53z5iQXxbKjjRAA/edit?usp=sharing>