

# **PDIG REIMAGINING ASSESSMENT IN GRADE 11 MATH**

## **Final Report**

### **Members of the Project**

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### **The Goal of the PDIG**

This PDIG was designed to research and develop innovative approaches to assessment in mathematics. Moving away from pencil and paper tests allows teachers to broaden their pedagogical content knowledge, permitting them to better see and understand student thinking and the way in which students do mathematics. The end result of the project is a series of tried and tested projects which other teachers can implement in their own classrooms, a process we hope will allow these teachers to develop new skills of their own, as well as an understanding of technological tools which can also be used elsewhere in the curriculum. Lastly, by exploring the materials developed in this project, teachers will hopefully become more comfortable with alternative methods of assessment and begin to develop projects of their own, leading to increased student engagement and achievement across the curriculum.

### **How the Project Progressed**

The project progressed well: we managed to create and test a project for each section of the curriculum. Unfortunately we found we would need additional time to be able to review and improve each project in order to create an ideal assessment of student learning. The time required to create each project was greater than we initially anticipated, especially the time needed to investigate the topics surrounding the chosen projects and to create the assessment materials which accompany them.

We were also impacted by the unavoidable absence of some of the project members and the impact of COVID related absences and delays. This meant that the progress of certain areas of the project, such as implementing them with students, was delayed.

The first project took 3 days to create and thankfully once we had done one project the second one was a lot quicker. In addition to the two projects constructed from scratch, we also took ideas we had used in the past and improved upon them so that they could be included in the final project submission. One challenge that we faced was coming up with an innovative idea which related the

math to their real lives that was also engaging. We tried to overcome this by choosing topics which are pertinent to their current lives.

## Project Goals

In this section we have listed the goals for each day of the project and stated how we met or did not meet these goals.

### Day 1

#### Goals

Establish the goals of the project and the way in which the project will progress. Establish the roles of the members of the project team. Establish a measurement for the success of the project. Begin research into ways for developing new materials for assessment. Produce a timeline for the project.

#### Result

The first day was a success, we established what we wanted to do:

Fully develop at least two alternative situational problems/LESSs and ensure that each has been tested and revised by at least one teacher, in the following descending order:

Financial Mathematics - I Auto Save Some Money  
Graph Theory - Choice Board - <https://youtu.be/so2hyczuJ9o>  
Probability - Casino  
Voting Theory - Every Vote Matters? Or FlipGrid?  
Probability & Game Theory - Board Games  
Optimization - Make your own project

How can we assess the course without needing an exam?

### Day 2

#### Goals

Separate the curriculum into themes and topics for assessment. Look at available technological tools. Begin planning the implementation of the research from the first session.

#### Results

We settled on a timeline of:

Finance - Plan November 16, December 14th Review January 18th, AM  
Graph Theory - Plan January 18th PM, February 17 Review March 14th AM  
Probability or Voting - Plan March 14 PM, April 11th

## Day 3

### Goals

Complete research into alternative methods of assessment to show student thinking and learning.

### Result

Use of consultants for current research. We talked to the LBPSB Science, Social Studies, Robotics and EdTech consultants for current resources. We also spoke with an expert in 3D printing and prototyping.

## Day 4

### Goals

Build the first assessment material based on research.

### Result

This was completed and the end result can be [found here](#).

## Day 5

### Goals

Review how the assessment material went and how the project was received. Continue research into innovative assessment methods. Begin planning for the next material and produce the next material for the next theme.

### Result

This was completed and we moved onto our next topic.

## Day 6

### Goals

Development of final materials. Updating projects. Production of assessment rubrics for use by others using technological tools. Production of report and website

### Result

All of this material can be found in our [shared folder](#) and on the [website](#) that we put together for the project.

## Project Outcomes

The teachers who participated in this project gained a thorough knowledge of the following areas:

- The use of **project-based learning** to teach a topic

- The use of **alternative assessment** methods for gathering evidence of learning
- How to **integrate STEAM** into the teaching of Grade 11 CST Math
- How to **develop assessment materials** which allow students to learn about the world around them.

The PDIG also produced the following projects:

### **I Auto Save Some Money**

In this project students simulate the process of financing or leasing a car. This project explores the concepts and processes around the Financial Mathematics section of the Progression of Learning. The end result of the project is a better understanding of the real world applications of Financial Mathematics.

### **τ Fast τ Furious | 3D Racers**

In this project students learn the process of 3D printing and designing objects. Once their items are designed using the concepts and processes surrounding Equivalent and Similar solids, they can vote on the class favourites before printing these designs and racing them in a head to head competition.

## **Reinvestment**

The resources that we created as a part of this PDIG will allow other teachers of the Grade 11 CST Math course to implement project-based learning in their classes and to use alternative assessment techniques. The students in these classes will benefit from fewer high stakes assessments and will also be able to see examples of practical applications of the mathematical concepts which are addressed within the course. By reducing the number of high stakes assessments, we also benefit the wider community by reducing the stress and anxiety level which can be generated by these assessment methods.

We would hope that others in the education community will use these assessments in their classes and that they will perhaps be inspired to create alternative assessments of their own.

## **The Materials**

[Google Drive Folder of materials](#)

[Website of Resources](#)