Graduation Numeracy Assessment Information Session

Mrs. J. Hu
BSc., BEd., MEd.
Math 10 FMP, Pre-Calc 11, Pre-Calc 11/12

What is the Graduation Numeracy Assessment?

- The Graduation Numeracy Assessment (GNA) is a new provincial assessment and a **graduation requirement for all students**. This assessment first started in January 2018.
- The Graduation Numeracy Assessment is not tied to a specific math course. Rather, **it evaluates a student's numeracy skills and math proficiency** developed over the course of their education.

Why is my participation important?

- The GNA is an interactive and engaging way to assess a student's understanding, application of knowledge and deeper learning.
- ***The GNA assesses student's **ability**, **willingness**, and **perseverance** to **interpret** and **apply mathematical understanding** to **solve problems** in **contextualized situations**, and to **analyze** and **communicate** these solutions in ways **relevant** to the **given context**.***

Who will be writing the numeracy assessment?

- Students will take the assessment in **Grade 10**.
- Current **Grade 10 and Grade 11/12** students who have **not yet completed** the assessment are **automatically registered** and the detailed schedule will be posted in June
- Current **Grade 11/12** students who wish to **improve** their **proficiency score** must contact Mr. Woloshen for registration

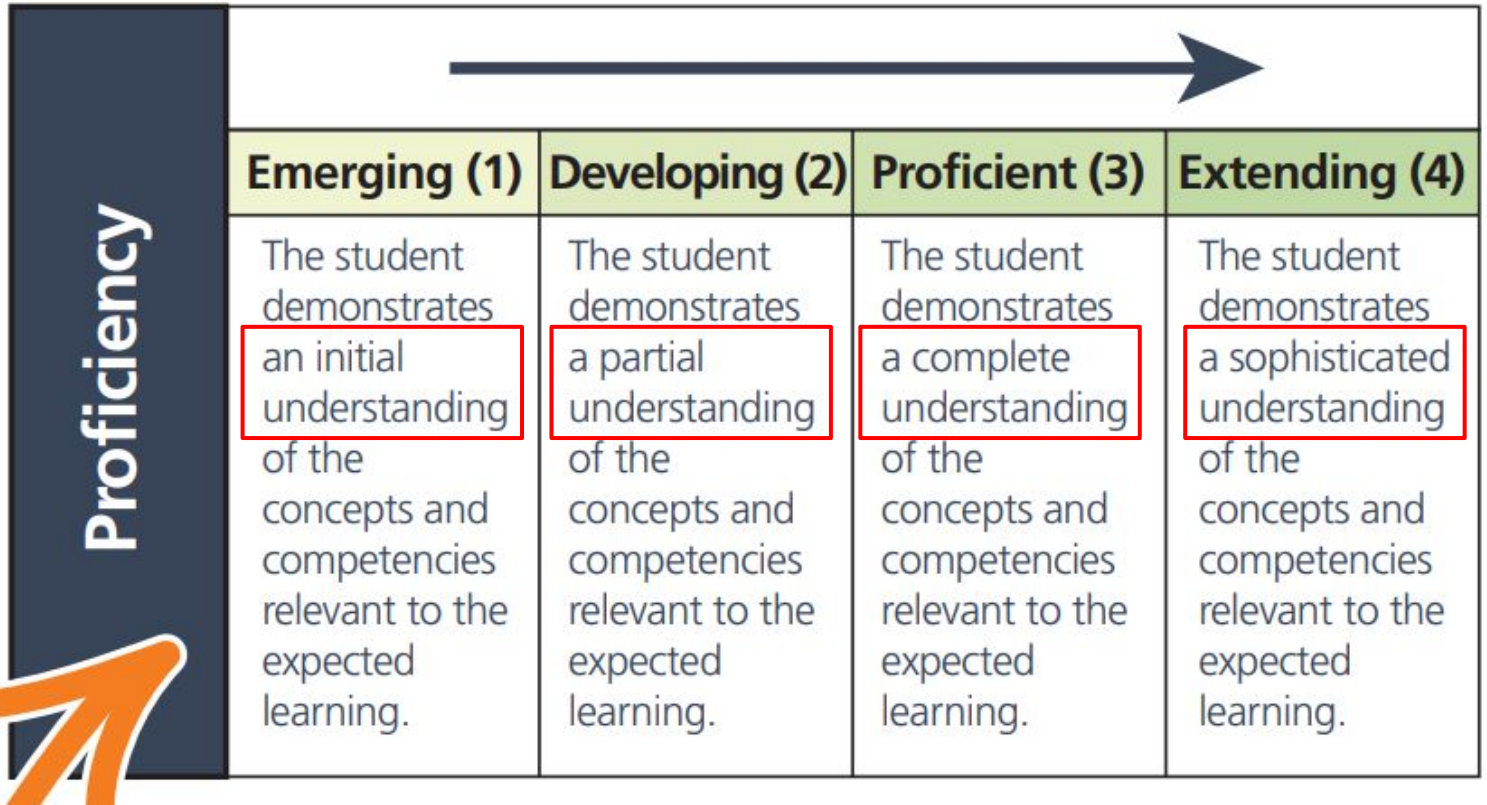
Who will access this score and how will it be used?

- Any **post-secondary** school or **employer** for a job who **requires your school transcript** as part of the admission or application process will have direct access to this score.
- Each post-secondary and employer may include the numeracy assessment score as a **part of the acceptance requirement**.

How will I be scored?

- Results will be reported using a **proficiency scale out of 4**.
- This score will be recorded on your **permanent student transcript** along with all of the other courses you have completed in your previous grades.
- Students can **retake** the Graduation Numeracy Assessment to improve their proficiency score, **up to two times**. Their best level achieved will be counted as their final result.

What do the proficiency categories look like?



What is the GNA exam format?

The exam has two main components, 24 common online questions and 2 student-choice questions.

1. **Common Component - Online Questions**
   These are 24 computer-scored questions completed online by all students. **The 24 questions are based on 4 different topics, 6 questions per topic.**

2. Student-Choice: Written Component

Two extended written response questions are completed on paper. These are deeper questions that require students to present their solutions in context, and provide detailed explanations to justify their thinking. These questions are based on the information and work the student will have completed earlier in the common component. **Students pick 2 of 4 possible questions and take their analysis deeper. Each question is worth 8 points, a total of 16 points.**

Sample Score

Your Raw Scores

This score indicates how you performed on each Task and is not directly convertible to your proficiency level.

	Your Score	Out Of
Online Questions	**19**	**24**
Plan and Design — Students make a recommendation or design a product while working within constraints such as time, space, cost, or people. *Example: Design a plan to reduce a family's monthly water consumption.*	4	6
Reasoned Estimates — Students propose a logical solution based on estimation, while considering multiple factors. *Example: Estimate the population of a historical village based on discovered artifacts.*	5	6
Fair Share — Students decide how best to share something fairly. *Example: Determine a procedure to distribute a group prize.*	5	6
Model — Students analyze data for patterns and then apply their model to another situation, making any necessary refinements. *Example: Predict the likelihood of an event based on a data trend.*	5	6
Extended Written Response Questions	**15**	**16**
Plan and Design — Students make a recommendation or design a product while working within constraints such as time, space, cost, or people. *Example: Design a plan to reduce a family's monthly water consumption.*	7	8
Fair Share — Students decide how best to share something fairly. *Example: Determine a procedure to distribute a group prize.*	8	8

Common and choice components are based on 4 categories:

1. **Plan and Design**

- Ex: design a plan to reduce a family's water consumption
- Proficiencies: percents, proportions, using formulae

2. **Reasoned Estimates**

- Ex: Estimate the population of a historical village based on discovered artifacts
- Proficiencies: percents, areas, proportions, formulae

3. **Fair Share**

- Ex: Determine a procedure to distribute a group prize
- Proficiencies: Working with money, percents, proportions, areas, given formulae

4. **Model**

- Ex: Predict the likelihood of an event based on a data trend
- Proficiencies: Graphing given data, extrapolating information, calculating slope, rate of change, or trend.

Areas of mathematical proficiency assessed:

- Calculating **volume**, **surface area**, **area** and/or **dimensions** with provided information and formulae
- Working with **monetary amounts** and understanding **wages**
- **Proportions***: equivalent fractions and cross-multiplication
- Understanding of **percents*** and working with percents
- **Graphing** a set of data and **extrapolating** information from given data
- **Slope**, rate of change, identifying a trend based on the data

1. **Reasoned Estimates** – These tasks require students to make or use estimates across multiple variables in order to build a logical argument for a possible solution.

Strengths	Weaknesses
• Most were able to enter the problem and demonstrate an understanding of its context. • Most were able to use proportions or percentages. • Several determined the range between a low and high value to determine an average (optimal) solution. • Many followed a logical process which was organized and clearly communicated. (Note: Student communication of problem-solving strategies has improved over previous sessions. This strength was bi-modal: communication was a strength for students who excelled.)	• Some found it difficult to work with large values – not being able to understand appropriate magnitudes of their final answers; large values also contributed to students not recognizing arithmetic errors. Using scientific notation could have been a viable alternative. • Students who did not excel at reasoned estimates typically also did not attempt to describe their logic or provide written support for their calculations. • Many "estimated" answers for an item or populations to several decimal places – not realizing solutions should be integers. • Many responses indicated that students could not recognize when a solution was not reasonable in the context of the problem (e.g. fractions of population or numbers indicated that the population shifted from millions to single digits). • Although these types of questions are designed to give a wide margin for interpretation, this intended ambiguity was seen by some students as insufficient direction in the question. • Some students with limited provincial context had difficulty with vocabulary, meanings and context when presented with questions that referenced First People's culture.

2. **Plan and Design** – These tasks may require students to analyze time, space, cost, and people in order to make a recommendation.

Strengths	Weaknesses
• Most were able to enter the problem. • Most responses were clear and well-organized. • Most understood area and volume.	• Some had difficulty interpreting the meaning of an operating cost compared to a start-up cost. • Some confused volume and surface area. • Students who performed poorly often did not attempt to explain their logic behind their problem-solving process.

3. Fair Share – These tasks require students to decide how to best share something fairly.

Strengths	Weaknesses
• Most communicated their strategy effectively – labelling sections of their solutions – their work was well organized. • Many stated assumptions clearly, showing they understood the context of the question. • Most were able to assess whether their solution was reasonable – they included a written reflection as part of their problem-solving process. • Students who performed well understood and could apply the concept of percentages. • Most interpreted the graph correctly.	• Some responded to the question using their opinion in justifying a fair share, as opposed to applying numeracy skills to determine a solution. • Some did not use information from the question to support their solution. • Some did not understand the context of the questions (concept of tax, interest, asset, or quotas). • Poor mathematical solutions also tended to have poor communication of their logic. • A significant number could not determine a percentage share: dividing rather than multiplying by the percentage. • Some had difficultly applying the concept of a rate (price per unit).

4. Model – These tasks require students to come up with a model or strategy, given a data set; to apply this model or strategy to a new data set; and to refine the model if necessary.

Strengths	Weaknesses
• The majority could enter the questions and identified that there was an identifiable trend (improvements in the athlete's times). • Most could plot data points correctly.	• Many did not understand the meaning of 'extrapolation'. • Some were unable to identify a linear trend, or how to create a line of best fit. • A significant number had difficulty creating scales for graphs. • Many tried to use proportional reasoning or percentage change (ratios between two data points) instead of using an overall trend (an extrapolation of the data). • Some had difficulties plotting irregular intervals of measurements.

Marking Rubric (Constructed Response)

Snapshot

4	Student demonstrates an extensive understanding of the situation. The approach is effective and comprehensive. The solution is supported by relevant evidence, and any errors are minor and do not hinder the solution's reasonableness within context. The reasoning is clearly communicated and addresses all critical and pertinent aspects of the problem.
3	Student demonstrates a strong understanding of the situation. The approach is sensible. The solution addresses all critical aspects of the problem; minor mathematical errors may exist. The reasoning is clearly communicated and references most pertinent aspects of the problem.
2	Student demonstrates a basic understanding of the situation. The approach may be unclear and/or incomplete but is on the right track. The solution may contain mathematical errors. The reasoning may be unclear but aligns with certain critical aspects of the problem.
1	Student demonstrates a limited understanding of the situation. The approach is ineffective or leaves out critical aspects needed to resolve the problem. The solution may contain fundamental mathematical errors. The reasoning is missing or irrelevant.
0*	Student work described by one of the following statements: • *Information simply recopied from the problem.* • *Diagrams or calculations are unrelated to the problem.* • *Any answer without supporting work.* • *Response does not address the purpose of the task.* • *Inappropriate response (contains profanity, inappropriate diagram or language).* • *All work is erased or crossed out.*
NR	No response (answer sheet is blank)

* *Any zero score must include rationale and be approved by the section head.*

Further information: Ministry of Education website

Provincial Graduation Numeracy Assessment:
https://curriculum.gov.bc.ca/assessment/numeracy-assessment

- GNA Parents Brochure
- Pre-Assessment Activities/GNA Video Series
- Online Sample Graduation Numeracy Assessment
- GNA Exam Schedule
- Numeracy Scoring Guide and Student Exemplars*
- Printable Sample Numeracy Assessment /Answer Key
- Calculator Policy

Numeracy Assessment Schedule

- Grade 10 Students: Friday, June 21, 2019

  9:00am - 11:00am

- Grade 11/12 Students: Friday, June 21, 2019

  1:00pm - 3:00pm

- Students are permitted up to 1 additional hour.

Questions?

- Come see Mrs. Hu in **room 280** in the math hallway
- Email Mrs. Hu at **jhu@deltalearns.ca**

Sources

- Graduation Numeracy Assessment Information for Parents and Students December 2018: https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/graduation-numeracy-assessment-brochure.pdf
- Provincial Graduation Numeracy Assessment: https://curriculum.gov.bc.ca/assessment/numeracy-assessment