Performance Level of La Salette of Ramon in the GRACE-PASS Assessment in Junior High School Mathematics: Basis for Designing an Intervention Program

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ABSTRACT

This study assessed the performance level of Junior High School students from Grades 7 to 10 at La Salette of Ramon, Inc. using the GRACE-PASS Mathematics Assessment administered during the Pretest on September 12, 2024, and the Posttest on March 7, 2025. Anchored on DepEd's policy on formative assessment and the need to strengthen mathematics proficiency among Filipino learners, the study aimed to analyze students' pretest and posttest results, identify the least mastered competencies, and propose instructional and remediation strategies for improving mathematical performance. Utilizing a descriptive-comparative research design, the study examined assessment results of 311 students and employed a paired sample t-test to determine significant differences in performance. Findings revealed statistically significant gains across all grade levels; however, students generally remained within the Developing level, indicating limited mastery of essential mathematical skills. Results showed varying improvements across competencies, with noticeable gains in Geometry and Data & Probability in some grade levels, but persistent gaps in Patterns and Algebra, Measurement, and higher-order reasoning across others. The least mastered competencies involved solving linear inequalities, applying geometric theorems, interpreting rational expressions, and working with rational and radical expressions. Despite upward trends from pretest to posttest, students continued to struggle in meeting proficiency standards, suggesting the need for targeted interventions. The study concludes that while instruction positively contributed to student performance, more focused remediation, differentiated instruction, and competency-based interventions are necessary to elevate students from Developing to Proficient levels and ensure readiness for senior high school mathematics.

Keywords: GRACE-PASS, Mathematics performance, formative assessment, learning competencies, intervention program, remediation strategies, descriptive-comparative research.

INTRODUCTION

According to DepEd Order No. 8, series of 2015, titled "*Policy Guidelines on Classroom Assessment for the K to 12 Basic Education Program*," formative assessment is defined as an ongoing, informal process that significantly enhances both teaching and learning. It enables teachers and students to identify strengths and areas needing improvement. Rather than affecting final grades, formative assessments provide timely feedback, guide instructional adjustments, and promote student self-reflection. This empowers learners to take ownership of their academic progress while allowing educators to deliver targeted interventions based on observed learning needs (Department of Education, 2015).

Mathematics proficiency among Filipino students continues to be a pressing issue, as highlighted by various national and international assessments. The Programme for International Student Assessment (PISA) 2022 results indicated that 15-year-old students in the Philippines scored an average of 355 in Mathematics, significantly below the OECD average of 472. This places the country among the lowest performers globally (OECD, 2023). Alarmingly, only 16% of Filipino students reached at least the basic level of proficiency in

mathematics, suggesting that merely one in five students can independently interpret and represent simple situations mathematically.

In response to these challenges in Mathematics education, the Global Resources for Assessment Curriculum and Evaluation (GRACE), the dedicated research and assessment division of Phoenix Publishing House and Sibs Publishing House Inc., developed the Performance Assessment of Standards and Skills (PASS). This tool supports the Philippine K-12 curriculum by evaluating student performance from Grades 1 to 10. GRACE PASS aims to measure learners' mastery of content and competencies as outlined in the Department of Education's Most Essential Learning Competencies (MELCs). By aligning assessment items with these standards, GRACE PASS ensures content validity and enhances the reliability of performance tracking across grade levels. The tool generates immediate diagnostic feedback, enabling educators to identify class-wide trends and individual learning gaps. This evidence-based approach empowers schools to design targeted remediation strategies, enrichment programs, and differentiated instruction. As emphasized by Phoenix Publishing House, GRACE PASS is not merely an evaluation tool but a comprehensive academic support system that informs instructional planning and strengthens curriculum delivery, ultimately seeking to elevate student achievement in core subjects such as Mathematics.

The GRACE PASS Mathematics results at La Salette of Ramon, Inc. revealed that, despite upward movement in proficiency levels from pretest to posttest across Grades 7 to 10, most students remain in the lower proficiency bands, specifically at the Developing and Approaching Proficiency levels. For example, in Grade 7, while 91% of students improved from the Beginning category, most did not reach Proficient or Advanced. Similarly, in Grades 8 to 10, 100% and 98% movement away from the lowest tier indicates improvement, but not mastery. This suggests that while students are making academic gains, these gains remain insufficient to fully meet expected grade-level standards. The p-value of 0.05 confirms that the observed progress is statistically significant, indicating that it is not due to random chance; however, the quality of this progress raises concerns, as students are still functioning below full proficiency. Therefore, while instruction has positively impacted student learning, the data imply a need for more intensive and focused intervention programs to elevate learners from merely developing levels to actual proficiency and mastery, particularly in preparation for more complex math concepts in senior high school.

Recent studies have underscored the effectiveness of GRACE PASS in evaluating students' competencies. For instance, a study by Baybayan (2025) in Central Mindanao utilized GRACE PASS results alongside curriculum maps and formative assessments to analyze students' performance in mathematics. The findings revealed that 168 students (74.0%) were developing, 42 (18.5%) were beginning, 17 (7.5%) were approaching proficiency, and none were classified as proficient or advanced in Mathematics, particularly in Grade 10. Given the challenges associated with the subject, teachers play a critical role in facilitating student learning and achieving learning goals in mathematics.

The importance of implementing structured intervention programs in Mathematics education has been emphasized in various studies. According to Villasoto (2024), the Department of Education aims to enhance learners' numeracy skills through targeted intervention programs and best practices, supporting sustainable higher-level skills. Additionally, a study by Aguhayon, Tingson, and Pentang (2023) demonstrated that differentiated instruction effectively addresses learning gaps in Mathematics by improving student performance and confidence. Furthermore, Auguis et al. (2024) investigated Math anxiety among Grade 10 students and proposed the "Math Anxiety Termination Program" (MATP) to address issues related to students' experiences and anxiety levels. These studies highlight the necessity of tailored intervention programs to address specific challenges in mathematics education.

Given the ongoing struggle of students to attain full proficiency despite statistically significant gains from pretest to posttest, there is a clear need to analyze current instructional impact, identify persistent learning gaps, and propose responsive strategies. Thus, this study aims to assess the performance levels of Junior High School students from Grades 7 to 10 at La Salette of Ramon, Inc. using the GRACE-PASS Mathematics Assessment results. By addressing its objectives, the study intends to contribute actionable insights that can support more effective teaching approaches and targeted intervention programs in Mathematics.

Research Objectives

This study generally aimed to assess performance level of La Salette of Ramon, Inc. in the GRACE-PASS assessment result for Junior High School Mathematics (S.Y. 2024 - 2025).

Specifically, it sought to achieve the following objectives:

1. To analyze the pretest and posttest performance of Junior High School students from Grades 7 to 10 in the GRACE-PASS Mathematics Assessment results at La Salette of Ramon, Inc.

2. To determine the specific mathematics competencies that were least mastered by students across grade levels based on the assessment results.

3. To create instructional strategies and remediation plans for improving students' performance toward achieving proficiency and mastery levels in Mathematics.

METHODOLOGY

Reasrch Design

This research employed a descriptive-comparative research design to thoroughly examine and analyze the academic performance of students. This methodology was selected to describe existing conditions and determine significant differences in performance before and after an intervention. The descriptive aspect of the study involved gathering detailed data on students' scores from the GRACE-PASS assessment by allowing the researchers to present an accurate picture of their current Mathematical proficiency. Meanwhile, the comparative component focused on evaluating the differences in student performance across two time points: before and after the implementation of a specific intervention program, thereby identifying whether any notable changes occurred as a result (Creswell & Creswell, 2018).

Participants

The participants of this study are the learners of the Grade 7 to Grade 10 of La Salette of Ramon, Inc. for the school year 2024-2025. Sampling was not taken but the whole population for each grade level. Below is the breakdown of the learners by grade level. Participants in this study are junior high school learners with ages ranging from 11 to 17.

Grade Level	Population
7	97
8	72
9	73
10	69
Total	**311**

Statistical Treatment

The study used a paired sample t-test to analyze the statistical significance of differences between pre-test and post-test scores suitable for measuring the same participants twice and accounts for individual variability. It allowed researchers to determine if changes in students' scores were statistically significant or due to chance. The results validated the intervention's effectiveness and informed the design of future Mathematics support programs (Field, 2013).

Instrument

The following instrument was used:

The Research and Development (R&D) team of Global Resources for Assessment Curriculum and Evaluation (GRACE) uses a scientific test development process to create the Performance Assessment of Standards and Skills (PASS), which measures student mastery and readiness from Kindergarten to Grade 10 through multiple-choice tests available in paper or computer formats. PASS identifies learning gaps, evaluates competencies, and provides valuable insights for educators, parents, and administrators to tailor teaching strategies, monitor academic progress, and ensure students build a strong foundation for future educational success.

Reliability

The main purpose for determining the internal consistency indices of PASS tests is to ensure that the items intended to measure proficiency in doing various tasks produce consistent scores. Cronbach's alpha is the typical indicator of internal consistency used in test development. Tavakol and Dennick (2011) say that determining Cronbach's Alpha is important in evaluating assessments and questionnaires. It is mandatory for assessors and researchers to estimate this value to provide evidence of test reliability, i.e. precision of test scores. According to Tang et al. (2014), good internal consistency among test items is indicated by a Cronbach Alpha value between 0.6 and 0.8. Based on the Cronbach's alpha values obtained (PASS tests range from 0.6 to 0.8), the PASS tests, in general, are scientifically reliable assessment instruments. The tables below present the Cronbach's alpha values for each subject.

Table 1. PASS Mathematics Internal Consistency Indices

Grade Level	Cronbach's Alpha (α)	Number of Items
7	0.83	60
8	0.62	60
9	0.64	60
10	0.69	70

Item Parameter

PASS assessment adopts the Item Response Theory (IRT) as the data analysis technique in estimating item characteristics. It is a test theory that describes students' trait level probabilities depending on the examinee's responses and on the characteristics of the items (Embretson & Reise, 2000). The item parameters express characteristics of the item that are important in determining the probabilities of observing different response categories. Item parameters include: 1) (a) item discrimination (the extent to which an item differentiates between students who are high and low on the latent construct); 2) (b) item difficulty (how "difficult" it is to get an item correct); and 3) (c) guessing parameter (other complications, such as how guessing or rater harshness might influence the result) (Pellegrino, Chudowsky, & Glaser, 2001).

Validity

The Performance Assessment of Standards and Skills (PASS) underwent a series of content validation activities through a rigorous process of review and evaluation by a panel of Subject Matter Experts (SMEs). The SMEs are educators and technical experts in their respective fields. SMEs across all the subjects utilized the latest Department of Education's (DepEd) K-12 curriculum guides in selecting the constructs and "power standards" to be assessed based on content objectives and behavioral objectives set by DepEd. These power standards identify a specific set of content domains and learning competencies that must be assessed per grade

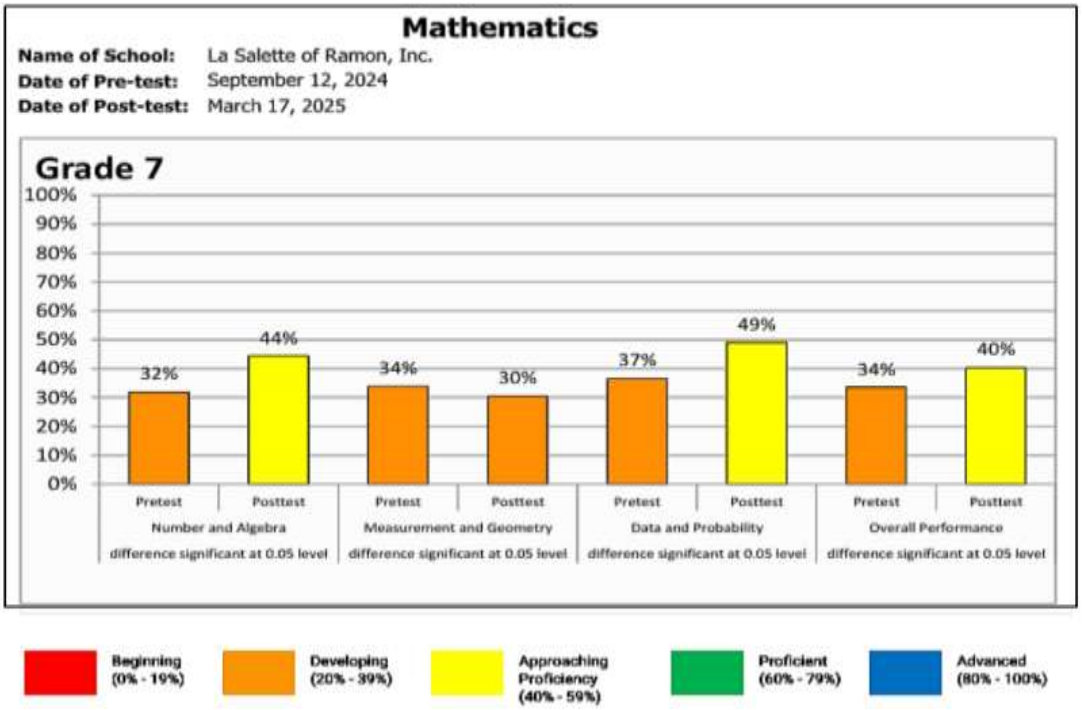
level per subject area. The SMEs specifically ensured the alignment of the items to a certain set of learning competencies measuring higher-order thinking skills based on Anderson and Krathwohl's Cognitive Process Dimension. The identified power standards were then translated to specific domains and set of learning competencies.

RESULTS AND DISCUSSIONS

This presents the data gathered, interpretation, and discussion of the result of the GRACE PASS in Mathematics of Grades 7 to 10 according to the research objectives.

PART I:

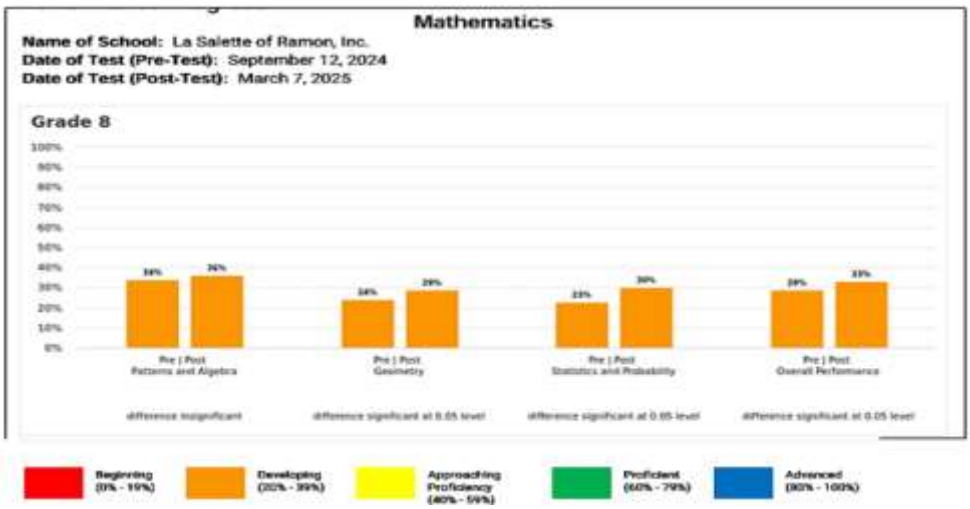
Table 1.1. Pretest and Posttest Performance of Grade 7 Students in the GRACE-PASS Assessment



The performance of Grade 7 students in the GRACE-PASS assessment reveals notable but varied outcomes across the different mathematical learning competencies. In the Number and Algebra learning competency, students improved from a Pretest mean of 32% to a Posttest mean of 44%, indicating a shift from the Developing level to Approaching Proficiency. This suggests that instruction in this competency had a moderate positive impact on learners' understanding of numerical relationships and algebraic thinking. In contrast, performance in Measurement and Geometry declined, with the Pretest score at 34% and the Posttest dropping to 30%, both within the Developing level. This decline may indicate instructional gaps or challenges in addressing spatial reasoning and metric concepts. However, the Data and Probability competency showed a notable gain, with scores increasing from 37% to 49%, moving students from the upper Developing band into Approaching Proficiency. This improvement reflects a better grasp of data interpretation and probability concepts, possibly due to more effective teaching strategies in this area.

The Overall Performance increased from 34% in the Pretest to 40% in the Posttest, representing a transition from Developing to Approaching Proficiency. Although the overall gain of 6 percentage points appears modest, it is considered statistically significant at the 0.05 level, meaning the improvement is meaningful and not due to chance. These results imply that the instructional interventions implemented were effective in facilitating learning progress in key competencies. However, the varying levels of improvement across competencies emphasize the need for targeted and balanced instructional approaches, particularly to address areas that showed decline or limited progress.

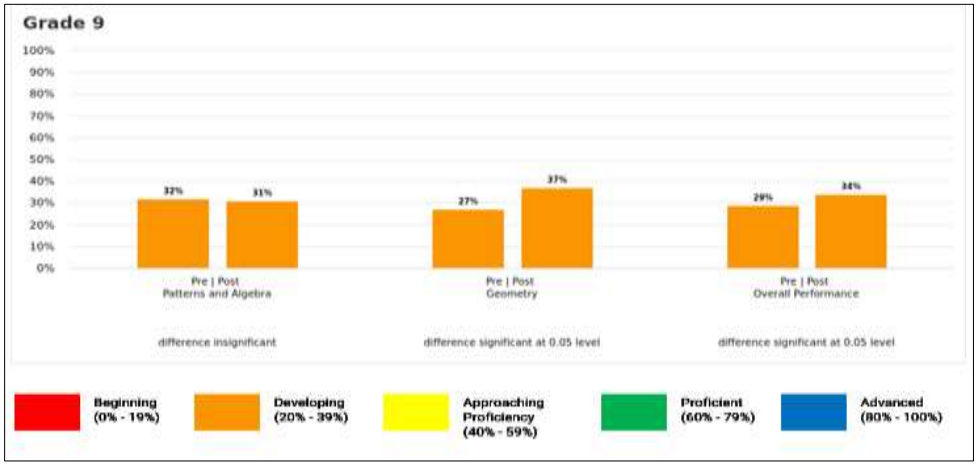
Table 1.2. Pretest and Posttest Performance of Grade 8 Students in the GRACE-PASS Assessment



The results of the GRACE-PASS assessment for Grade 8 students show overall progress, though limited, across the assessed mathematical learning competencies. In Patterns and Algebra, the mean score increased slightly from 34% in the Pretest to 36% in the Posttest. While this reflects a minor improvement, both scores remain within the Developing level, indicating that most students are still struggling to achieve a firm grasp of algebraic patterns and relationships. In the Geometry competency, a more noticeable gain was observed, with scores rising from 24% to 29%, still within the Developing level but showing upward movement in conceptual understanding related to shapes, angles, and spatial reasoning. The Statistics and Probability component followed a similar trend, with students improving from 23% to 30%, which also remains within the Developing category. This indicates gradual progress in understanding and interpreting statistical data and chance events.

The Overall Performance of Grade 8 students increased from 29% to 33%, remaining in the Developing level. Although the gain is modest at 4 percentage points, it is statistically significant at the 0.05 level, signifying a meaningful improvement in student performance due to instructional input. This result implies that while the teaching interventions had a positive effect, they may not have been strong or targeted enough to help students move into the next performance category of Approaching Proficiency. The uniformity of scores across competencies suggests a need for more intensive support and differentiated instruction. Teachers may consider incorporating more interactive and contextual learning experiences to better engage students and strengthen their foundational mathematical skills.

Table 1.3. Pretest and Posttest Performance of Grade 9 Students in the GRACE-PASS Assessment

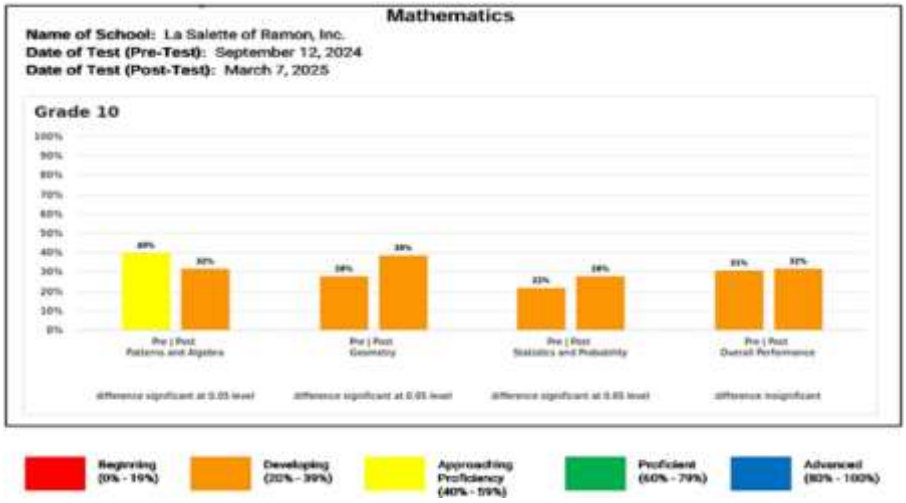


The GRACE-PASS assessment results for Grade 9 students indicate mixed performance across the assessed mathematical learning competencies. In Patterns and Algebra, the mean score slightly declined from 32% in the Pretest to 31% in the Posttest. Both scores fall within the Developing level, suggesting that students

continued to face challenges in understanding algebraic patterns and operations despite instruction. This decline, though small, implies that the instructional strategies used may not have effectively addressed students' misconceptions or learning difficulties in this competency. In contrast, significant improvement was observed in the geometry learning competency, where the mean score increased from 27% to 37%, showing notable progress but still within the Developing level. This 10-point gain suggests that teaching interventions in Geometry were more effective and better aligned with students' learning needs, possibly through more visual or practical learning approaches.

The Overall Performance of Grade 9 students rose from 29% in the Pretest to 34% in the Posttest. While this 5-point increase maintains the group within the Developing level, it is statistically significant at the 0.05 level, indicating that the improvement was meaningful and not due to random variation. This result implies that students made measurable gains in their mathematical understanding, particularly in Geometry, but continued to struggle with abstract reasoning in algebraic concepts. The data highlight the importance of targeted and competency-specific instructional strategies. For better results, teachers may need to reinforce foundational algebra skills and integrate differentiated instruction to accommodate diverse learning styles and promote more consistent progress across all competencies.

Table 1.4. Pretest and Posttest Performance of Grade 10 Students in the GRACE-PASS Assessment.



The GRACE-PASS assessment results for Grade 10 students reflect a combination of gains and setbacks across the mathematical learning competencies. In Patterns and Algebra, students' performance declined from a Pretest score of 40% to a Posttest score of 32%, indicating a regression from the Approaching Proficiency level back to the Developing level. This decrease suggests a significant gap in reinforcing prior knowledge or effectively delivering instruction in algebraic concepts, possibly due to insufficient scaffolding or the complexity of the material relative to students' readiness. On the other hand, improvement was noted in Geometry, where scores increased from 28% to 39%, a positive movement within the Developing category. This growth implies better engagement or more effective instructional strategies in this competency, although students still did not reach the expected proficiency level. Likewise, in Statistics and Probability, performance improved modestly from 22% to 28%, remaining within the Developing range but showing some advancement in understanding data and probability concepts.

The Overall Performance showed a minimal increase from 31% to 32%, staying within the Developing level. Despite the slight numerical gain of just 1 percentage point, the difference is statistically significant at the 0.05 level, which implies that the observed change, while small, reflects a real effect of instruction rather than random variation. However, the overall data suggest that the interventions were less effective for Grade 10 compared to lower grade levels, particularly in reinforcing algebraic understanding. The decline in Patterns and Algebra offsets gains in other areas, highlighting the need for diagnostic teaching approaches and consistent formative assessments. Strengthening support in complex concepts through remediation, peer tutoring, and real-life application of algebra may help in reversing the downward trend and fostering more balanced development across competencies.

PART II:

Table 2.1. The Least Mastered Mathematics Competencies of Grade 7 Students Based on GRACE-PASS Assessment Results

Learning Competencies	Performance
Number and Algebra	45%
Describe sets and their subsets, the union of sets, and the intersection of sets; illustrate sets and their subsets, the union of sets, and the intersection of sets, using Venn diagrams	34%
Describe sets and their subsets, the union of sets, and the intersection of sets	24%
Describe given rational numbers as fractions, decimals, or percentages	37%
Measurement and Geometry	31%
Convert units of measure within the International System of Units (SI) and across different systems of measure	32%
Determine the measures of angles and the number of sides of polygons	***16%***
Describe and explain the relationships between angle pairs based on their measures	30%
Data and Probability	49%
Use appropriate graphs to represent organized data: pie graph, bar graph, line graph, and stem-and-leafplot	39%
OVERALL PERFORMANCE	**40%**

The data presented in Table 2.1 revealed the specific areas within Grade 7 Mathematics curriculum where students demonstrated the lowest levels of mastery, based on their performance in the GRACE-PASS assessment. The overall performance across all competencies was 40%, placing the group at the lower end of the Approaching Proficiency level. While this indicates an emerging understanding of mathematical concepts, the assessment results underscore significant deficiencies that require immediate instructional focus.

In the Number and Algebra learning competency, the average performance was 45%, categorized as Approaching Proficiency. Although this shows some conceptual development, specific items revealed inconsistencies. Students scored 34% when interpreting sets using Venn diagrams but only 24% on the same concept without visual aids which highlights a reliance on representation over conceptual understanding. Similarly, only 37% could correctly describe rational numbers in various forms which suggest a lack of fluency in numerical equivalence.

However, the most critical concern arises in the Measurement and Geometry domain, where the overall average was 31%, clearly within the Developing level. Of particular importance is the competency "*Determine the measures of angles and the number of sides of polygons*," where students scored a drastically low 16%, placing them in the Beginning performance level. This indicates a severe gap in geometric understanding, particularly in the ability to apply angle-sum properties and polygon characteristics concepts that are foundational for higher-level geometry. Such a low score suggests that most students are not just struggling, but are far from even the minimum level of mastery expected at this grade. Without significant instructional intervention, this deficiency is likely to hinder their performance in more advanced mathematical topics in future grade levels.

Other competencies in this area, such as converting measurement units (32%) and identifying relationships between angle pairs (30%), also fall short of expectations, but none are as alarming as the result for polygons and angles. This points to the urgent need for targeted remediation using concrete visual tools, guided practice, and real-world applications to develop spatial reasoning and conceptual clarity.

In Data and Probability, students performed slightly better, with a 49% average near the Approaching Proficiency level. While this is encouraging, the competency "Use appropriate graphs to represent organized data" still received a score of only 39%, showing that consistent support is needed across all areas.

While Grade 7 students demonstrated some emerging understanding in data and algebra, their performance in Measurement and Geometry particularly in identifying angle measures and polygon properties represents a

major learning gap. Addressing this through intentional, scaffolded, and differentiated instruction is essential for ensuring readiness for future mathematical learning.

Table 2.2a. The Least Mastered Mathematics Competencies of Grade 8 Students Based on GRACE-PASS Assessment Results in the Learning Content, Patterns and Algebra

Learning Competencies	Performance
Patterns and Algebra	**36%**
Factors completely different types of polynomials (polynomials with common monomial factor, trinomials, and general trinomials) difference of two squares, sum and difference of two cubes, perfect square	27%
Finds the equation of a line given (a) two points; (b) the slope and a point; (c) the slope and its intercepts	36%
Illustrates rational algebraic expressions	33%
Illustrates the slope of a line	24%
Solves problems involving linear functions	28%
Graphs a linear function's (a) domain; (b) range; (c) table of values; (d) intercepts; and (e) slope	22%
Writes the linear equation ax + by = c in the form y = mx + b and vice versa	31%
Simplifies rational algebraic expressions	22%
Solves a system of linear equations in two variables by (a) graphing; (b) substitution; (c) elimination	26%
Finds the slope of a line given two points, equation, and graph	36%
Illustrates linear equations in two variables	***19%***
Illustrates linear inequalities in two variables	25%
Categorizes when a given system of linear equations in two variables has graphs that are parallel, intersecting, and coinciding	26%
Solves problems involving linear inequalities in two variables	***13%***
Solves problems involving systems of linear inequalities in two variables	21%
Beginning (0% - 19%) Developing (20% - 39%) Approaching Proficiency (40% - 59%) Proficient (60% - 79%)	

The GRACE-PASS assessment results for Grade 8 students in the Patterns and Algebra learning content revealed substantial learning gaps, as indicated by an overall performance average of 36%, placing students within the Developing level. This suggests that most learners are struggling to internalize and apply key algebraic concepts that are foundational to Junior High School level in Mathematics. Despite exposure to the content, the data showed that students are not achieving the minimum competency expectations for this grade level.

Several specific competencies stand out for their particularly low performance. Most critically, only 13% of students were able to "*Solve problems involving linear inequalities in two variables,*" which is categorized as Beginning. This is the lowest score across all competencies in this domain, indicating a severe conceptual gap in understanding and applying linear inequalities, an essential part of algebra that supports higher-level problem-solving, graph interpretation, and mathematical reasoning. The complexity of combining algebraic manipulation with graphing skills may contribute to this struggle.

Other competencies with notably low performance include: "Graphs a linear function's domain, range, table of values, intercepts, and slope" (22%), "Simplifies rational algebraic expressions" (22%), "Illustrates linear equations in two variables" (19%), "Solves problems involving systems of linear inequalities in two variables" (21%). These results suggest that many Grade 8 students are not only challenged by symbolic manipulation but also by translating equations into graphical representations skills that are central to the algebra subject/topics. The results point to a lack of integrated understanding between symbolic algebra and graphical interpretation, which can severely limit students' mathematical literacy and readiness for future coursework.

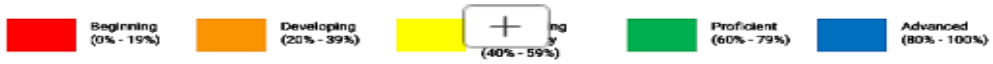
Even moderately better-performing competencies, such as "Finds the slope of a line given two points, equation, and graph" (36%) and "Finds the equation of a line given conditions" (36%), remain within the Developing level, indicating that no single algebraic competency has reached the expected standard of Approaching Proficiency (40% or above) for Grade 8 students.

The data clearly emphasized the need for a systematic, layered instructional approach. Visual aids, graphing tools, real-life application problems, and technology integration may help students build a more intuitive and connected understanding of algebraic concepts. Furthermore, interventions should focus on sequentially

building from basic linear expressions to more complex systems and inequalities, ensuring that foundational skills are firmly established before advancing.

Table 2.2b. The Least Mastered Mathematics Competencies of Grade 8 Students Based on GRACE-PASS Assessment Results in the Learning Content, Geometry and Statistics & Probability, and in Overall

Geometry	**29%**
Determines the relationship between the hypothesis and the conclusion of conditional statements	40%
Illustrates the SAS, ASA, and SSS congruence postulates	33%
Applies theorems on triangle inequalities	44%
Illustrates triangle congruence	38%
Illustrates theorems on triangle inequalities (exterior angle inequality theorem, triangle inequality theorem, hinge theorem)	22%
Proves statements on triangle congruence	21%
Solves corresponding parts of congruent triangles	35%
Proves properties of parallel lines cut by a transversal	24%
Transforms a statement into an equivalent if-then statement	24%
Uses inductive or deductive reasoning in an argument	28%
Proves inequalities in a triangle	21%
Illustrates the need for an axiomatic structure of a mathematical system in general, and in geometry in particular: (a) defined terms; (b) undefined terms; (c) postulates; and (d) theorems	28%
Applies triangle congruence to construct perpendicular lines and angle bisectors	*8%*
Illustrates the equivalences of: (a) the statement and its contrapositive; and (b) the converse and inverse of a statement	25%
Writes a proof (both direct and indirect)	24%
Determines the conditions under which lines and segments are parallel or perpendicular	35%
Determines the inverse, converse, and contrapositive of an if-then statement	31%
Statistics and Probability	**29%**
Solves problems involving probabilities of simple events	47%
Counts the number of occurrences in an experiment: (a) table; (b) tree diagram; (c) systematic listing; and (d) fundamental counting principle	25%
Finds the probability of a simple event	32%
Counts the number of occurrences of an outcome in an experiment: (a) table; (b) tree diagram; (c) systematic listing; and (d) fundamental counting principle	28%
Illustrates an experiment, outcome, sample space, and event	25%
Illustrates an experimental probability and a theoretical probability	28%
OVERALL PERFORMANCE	**33%**



The assessment results for Grade 8 students in the learning content areas of Geometry and Statistics & Probability revealed a consistent pattern of underperformance. The overall performance across these domains was 33%, placing students firmly within the Developing level. This suggests that most learners have not yet attained the conceptual understanding and application skills expected at their grade level, particularly in logic-based reasoning and probabilistic thinking.

In Geometry, the average performance was 29%, indicating significant gaps in students' comprehension of spatial relationships, logical reasoning, and formal proof. One of the most alarming results was in the competency "*Applies triangle congruence to construct perpendicular lines and angle bisectors*", where students scored only 8% classified as Beginning. This extremely low performance signals a critical deficiency in procedural geometry and geometric construction, which are foundational for developing spatial reasoning and logical structure in mathematics. Such a gap indicates that students struggle not only with identifying congruent figures but also with applying those properties to practical geometric tasks.

Other competencies also demonstrated particularly weak mastery:proves statements on triangle congruence (21%), proves inequalities in a triangle (21%), illustrates theorems on triangle inequalities (22%), proves properties of parallel lines cut by a transversal (24%), and writes a proof (both direct and indirect) (24%). These results suggest that students are struggling with formal reasoning, deductive processes, and understanding geometric theorems, all of which are essential for progression in high school mathematics. While there were relatively better performances in a few areas such as "Applies theorems on triangle inequalities" (44%) and "Determines the relationship between the hypothesis and the conclusion of conditional statements" (40%), these are still borderline within the Approaching Proficiency range and do not reflect widespread competence.

In Statistics and Probability, the average performance was also 29%, mirroring the trend seen in Geometry. Although students scored 47% on "Solves problems involving probabilities of simple events," which nears Approaching Proficiency, most other competencies remained in the Developing range:

Counts the number of occurrences using tables, tree diagrams, systematic listing, and counting principles ranged from 25% to 28%: illustrates experimental and theoretical probability (28%), and finds the probability of a simple event (32%). These results indicate a lack of procedural fluency and conceptual clarity in organizing data, calculating probabilities, and distinguishing between theoretical and experimental contexts. The uniformity of low scores across the board in both geometry and probability points to the need for instructional reinforcement that builds on hands-on exploration, guided discovery, and visual reasoning.

The data collectively suggest that Grade 8 students face substantial barriers in mastering Geometry and Probability, particularly where reasoning, constructing, and proving are concerned. These are higher-order skills that require a strong foundation in prior mathematical concepts and an ability to move from concrete understanding to abstract thinking. Teachers are encouraged to use dynamic geometry software, real-life probability experiments, and step-by-step modeling of logical proofs to strengthen students' comprehension and engagement in these topics.

Table 2.3. The Least Mastered Mathematics Competencies of Grade 9 Students Based on GRACE-PASS Assessment Results

Learning Competencies	Performance
Patterns and Algebra	32%
Characterizes the roots of a quadratic equation using the discriminant	33%
Solves problems involving radicals	33%
Transforms the quadratic function defined by $y = ax^2 + bx + c$ into the form $y = a(x - h)^2 + k$	37%
Solves problems involving quadratic functions	25%
Translates into variation statement a relationship between two quantities given by: (a) a table of values; (b) a mathematical equation; (c) a graph, and vice versa	21%
Simplifies radical expressions using the laws of radicals	27%
Solves equations involving radical expressions	15%
Illustrates expressions with rational exponents	14%
Illustrates quadratic inequalities	27%
Performs operations on radical expressions	29%
Solves problems involving quadratic inequalities	32%
Solves problems involving quadratic equations and rational algebraic equations	24%
Solves quadratic equations by: (a) extracting square roots; (b) factoring; (c) completing the square; and (d) using the quadratic formula	32%
Applies the laws involving positive integral exponents to zero and negative integral exponents	27%
Simplifies expressions with rational exponents	7%
Solves equations transformable to quadratic equations (including rational algebraic equations)	22%
Geometry	**37%**
Proves the conditions for similarity of triangles	53%
Applies the theorems to show that given triangles are similar	41%
Proves and applies theorems on the different kinds of parallelogram (rectangle, rhombus, square)	39%
Uses properties to find measures of angles, sides and other quantities involving parallelograms	32%
Illustrates similarity of figures	58%
Identifies quadrilaterals that are parallelograms	36%
Solves problems involving parallelograms, trapezoids and kites	37%
Applies the fundamental theorems of proportionality to solve problems involving proportions	29%
Proves the pythagorean theorem	32%
Proves and applies theorems on trapezoids and kites	30%
Solves problems that involve triangle similarity and right triangles	22%
Proves the midline theorem	34%
Determines the conditions that make a quadrilateral a parallelogram	45%
Solves problems involving oblique triangles	26%
Finds the trigonometric ratios of special angles	33%
Illustrates the six trigonometric ratios: sine, cosine, tangent, secant, cosecant, and cotangent	29%
Uses trigonometric ratios to solve real-life problems involving right triangles	23%
Illustrates angles of elevation and angles of depression	32%
OVERALL PERFORMANCE	**34%**

The GRACE-PASS assessment data for Grade 9 students revealed that learners are significantly underperforming in core areas of Patterns and Algebra and Geometry, with an overall average performance of 34%, firmly within the Developing level. This indicates that students have not yet met the expected competencies for their grade level, particularly in handling complex algebraic operations and geometrical reasoning both foundational for senior high school mathematics.

In Patterns and Algebra, students recorded a mean score of 32%, which reflects persistent challenges in mastering key Grade 9 algebraic competencies. The lowest-performing competencies include "*Simplifies expressions with rational exponents*" (7%), "*Illustrates expressions with rational exponents*" (14%), and "*Solves equations involving radical expressions*" (15%) all within the Beginning level. These extremely low results indicate critical gaps in algebraic manipulation, understanding of exponents, and use of radical

expressions, which are essential not only for succeeding in high school algebra but also for transitioning to advanced mathematics and science subjects.

Another notably weak area is "Translates into variation statement a relationship between two quantities" with only 21%, suggesting that students struggle to link multiple representations of relationships such as equations, graphs, and tables which are central to mathematical modeling. Moreover, the performance in "Solves problems involving quadratic functions" (25%) and "Solves problems involving quadratic equations and rational algebraic equations" (24%) points to an inability to apply theoretical knowledge to problem-solving contexts. Even procedural skills such as solving quadratic equations using different methods only scored 32%, revealing that students may be able to follow steps mechanically but lack deeper conceptual understanding.

In Geometry, students performed slightly better, with an average of 37%, still within the Developing level. While some competencies were stronger such as "Illustrates similarity of figures" (58%) and "Proves the conditions for similarity of triangles" (53%) these remain exceptions rather than the norm. Many other competencies hovered below or around 30%, including: "Solves problems involving triangle similarity and right triangles" (22%), "Uses trigonometric ratios to solve real-life problems involving right triangles" (23%), "Solves problems involving oblique triangles" (26%) and "Illustrates the six trigonometric ratios" (29%). These results detailed a weak grasp of trigonometry and geometric problem-solving, both of which are central components of the Grade 9 curriculum. The inability to connect geometric theorems to real-life problems or abstract reasoning is particularly concerning, as these skills are essential for critical thinking and practical application in fields such as engineering, architecture, and technology.

Despite a few areas of relative strength such as "Determines the conditions that make a quadrilateral a parallelogram" (45%) and "Applies the theorems to show that given triangles are similar" (41%), the overall performance signifies the need for focused intervention. Students need more structured opportunities to visualize, manipulate, and experiment with mathematical ideas. Instruction should emphasize conceptual understanding, multiple representations (verbal, visual, algebraic, and numeric), and step-by-step practice with immediate feedback.

Table 2.4. Least Mastered Mathematics Competencies of Grade 10 Students Based on GRACE-PASS Assessment Results

Learning Competencies	Performance
Patterns and Algebra	33%
Illustrates other types of sequences (e.g., harmonic, Fibonacci)	27%
Determines geometric means and nth term of a geometric sequence	28%
Illustrates an arithmetic sequence	30%
Determines arithmetic means and nth term of an arithmetic sequence	29%
Generates patterns	32%
Illustrates a geometric sequence	30%
Proves and applies the rational root theorem	28%
Solves polynomial equations	25%
Finds the sum of the terms of a given arithmetic sequence	35%
Proves rational root theorem	20%
Solves problems involving polynomial functions	37%
Proves and applies the remainder theorem and the factor theorem	22%
Finds the sum of the terms of a given finite or infinite geometric sequence	33%
Solves problems involving polynomials and polynomial equations	23%
Differentiates a finite geometric sequence from an infinite geometric sequence	25%
Performs division of polynomials using long division and synthetic division	25%
Geometry	40%
Solves problems on circles	31%
Proves and applies theorems on secants, tangents, and segments	28%
Solves problems involving geometric figures on the coordinate plane	29%
Proves theorems on secants, tangents, and segments	13%
Statistics and Probability	28%
Illustrates the combination of objects	49%
Illustrates events, and union and intersection of events	41%
Solves problems involving combinations	20%
Solves problems involving permutations	26%
Illustrates the following measures of position: quartiles, deciles and percentiles	30%
Interprets measures of position	41%
Calculates a specified measure of position (e.g. 90th percentile) of a set of data	26%
Solves problems involving probability	25%
Illustrates events, union, and intersection of events	25%
Illustrates the probability of a union of two events	23%
Illustrates the permutation of objects	22%
Uses appropriate measures of position and other statistical methods in analyzing and interpreting research data	20%
Illustrates mutually exclusive events	39%
OVERALL PERFORMANCE	33%

Beginning (0% - 19%) | Developing (20% - 39%) | Approaching Proficiency (40% - 59%) | Proficient (60% - 79%) | Advanced (80% - 100%)

The GRACE-PASS assessment results for Grade 10 students revealed continuing challenges across all core areas of mathematics. With an overall performance of 33%, students remain at the Developing level, indicating that many have yet to demonstrate mastery of the grade-level expectations in Patterns and Algebra, Geometry, and Statistics and Probability. In Patterns and Algebra, students averaged 33%, showing weak performance in both foundational and higher-order algebraic competencies. Alarmingly low scores were recorded in "Proves rational root theorem" (20%), "Proves and applies the remainder and factor theorems" (22%), and "Solves polynomial equations" (25%), suggesting that students struggle significantly with algebraic reasoning and symbolic manipulation. Even basic tasks, such as illustrating arithmetic or geometric sequences and generating patterns, yielded scores around 30%, reinforcing the idea that both conceptual understanding and procedural fluency are lacking.

In Geometry, the average score was 40%, the highest among the three domains, but this still only meets the Approaching Proficiency level. Students performed slightly better in identifying and applying geometric properties, such as solving problems involving geometric figures and identifying circle elements. However, the extremely low score of 13% in "Proves theorems on secants, tangents, and segments" highlights a deep struggle with formal geometric reasoning and proof construction. This result indicates that many students may not fully grasp the logic, structure, and application of geometric theorems, an essential part of upper secondary geometry.

The most concerning results appear in Statistics and Probability, where students scored an average of 28%, solidly within the Developing range. While a few competencies, such as illustrating combinations (49%) and interpreting events and their union or intersection (41%), showed some progress, the majority of results were far below proficiency. Students scored only 20% in both "Solves problems involving combinations" and "Uses appropriate measures of position in analyzing and interpreting research data," highlighting a lack of readiness in applying statistical tools for real-life data interpretation. Other topics like permutations, probability, and statistical measures of position also yielded scores in the low to mid-20% range, further confirming limited mastery in this area.

Overall, the data suggest that Grade 10 students are entering the critical transition to higher education with major learning gaps across all domains of mathematics. There is an urgent need for targeted remediation, scaffolded instruction, and the integration of contextual learning to strengthen both procedural skills and conceptual depth. Without immediate and sustained support, these foundational weaknesses may hinder their success in senior high school and in subjects that require mathematical reasoning, such as research, business, science, and technology.

PART III:

This part highlights the intervention plans according to grade level.

Intervention Plan For Grade 7

Standard / Learning Competency	Goal	Tier	Strategy	In-Charge	Additional Data Sources	Timeline	Estimated Budget	Monitoring Scheme
Describe sets and their subsets, union and intersection; illustrate using Venn diagrams	Students will accurately describe sets, subsets, unions, and intersections and illustrate them through Venn diagrams with at least 90% accuracy	2	Hands-on activities using colored paper and Venn templates; pair work to construct and interpret diagrams	Math Teacher	Previous quizzes, classwork samples	6 weeks, 2x/week, 30 minutes	₱500 (colored paper, markers, printing)	Weekly checking of outputs; teacher observation checklist; short formative quizzes

Describe given rational numbers as fractions, decimals, or percentages	Students will correctly convert rational numbers between fractions, decimals, and percentages with 95% accuracy	2	Use conversion charts, interactive number line activities, real-life examples (money, discounts)	Math Teacher	Diagnostic tests, homework	5 weeks, 2x/week, 30 minutes	₱300 (printing of charts, activity sheets)	Bi-weekly worksheet review; conversion drills; progress tracking sheet
Convert units within SI and across different systems of measure	Students will convert units within SI and between SI and customary units correctly in 4 out of 5 problems	2	Step-by-step conversion method; use measurement tools (rulers, weighing scale) in demonstrations	Math Teacher	Unit tests, practical exercises	5 weeks, 2x/week, 30 minutes	₱700 (measurement tools, printed materials)	Skills check every session; practical demonstration tasks; teacher observation
Determine measures of angles and number of sides of polygons	Students will identify angle measures and polygon sides with 90% accuracy	2	Use protractors for angle measurement; hands-on polygon construction using paper strips and rulers	Math Teacher	Classwork, quizzes	4 weeks, 2x/week, 30 minutes	₱600 (protractors, paper strips, rulers)	Weekly performance tasks; angle-identification quizzes; collected student outputs
Describe and explain relationships between angle pairs based on their measures	Students will explain complementary, supplementary, vertical, and adjacent angles with correct examples	2	Use visual aids and interactive whiteboard simulations; small-group discussions and practice problems	Math Teacher	Assessments, student explanations	4 weeks, 2x/week, 30 minutes	₱400 (printed diagrams, whiteboard markers)	Teacher log of student participation; short written explanations; exit slips
Use appropriate graphs to represent organized data (pie, bar, line, stem-and-leaf plot)	Students will create and interpret various graphs with 90% accuracy	2	Use real classroom survey data; guide students in manually creating graphs and using digital tools	Math Teacher	Project work, tests	6 weeks, 2x/week, 30 minutes	₱800 (graphing paper, colored pens, printing)	Review of completed graphs; rubric-based project scoring; periodic graph quizzes
Tier 1 = Intensive Intervention, Tier 2 = Targeted Support, Tier 3 = Enhancement								

Intervention Plan For Grade 8

Standard / Learning Competency	Goal	Tier	Strategy	In-Charge	Additional Data Sources	Timeline	Estimated Budget	Monitoring Scheme
Factors different types of polynomials	Students will factor and identify polynomial types with 90% accuracy in formative assessments	2	Stepwise factoring guides, visual aids, drills, peer tutoring	Math Teacher	Quizzes, classwork	6 weeks, 2x/week, 30–40 mins	₱500 (printed guides, worksheets)	Weekly drills; teacher observation log; short quizzes
Finds equation of a line; illustrates slope; writes linear equations	Students will find linear equations, compute slope, and convert forms with 90% accuracy	2	Guided practice with graphs, real-life applications, conversion drills, peer teaching	Math Teacher	Homework, quizzes	6 weeks, 2x/week, 30–40 mins	₱400 (graph paper, markers)	Checking of worksheets; slope exercises; progress charts
Solves problems involving linear functions and graphs	Students will solve and graph components of linear functions correctly in 4/5 exercises	2	Real-world scenarios, graphing workshops (manual and digital), step-by-step graphing	Math Teacher	Performance tasks, classwork	6 weeks, 2x/week, 30–40 mins	₱600 (graphing materials, printing)	Rubric-based graph checks; unit tests; student portfolios
Simplifies and illustrates rational algebraic expressions	Students will simplify and illustrate rational expressions with 90–95% accuracy	2	Visual fraction models, stepwise simplification, group problem-solving	Math Teacher	Classwork samples, assessments	6 weeks, 2x/week, 30–40 mins	₱300 (visual models, worksheets)	Weekly formative tests; teacher checklists
Solves systems of linear equations; categorizes systems	Students will solve systems and categorize graphs with 90–95% accuracy	2	Stepwise instruction per method (graphing, substitution, elimination), group activities	Math Teacher	Tests, quizzes	6 weeks, 2x/week, 30–40 mins	₱450 (graph paper, printed activities)	Performance tasks; method-specific quizzes; paired evaluation
Illustrates/solves linear inequalities and systems	Students will illustrate and solve inequalities with 90% accuracy	2	Graphing exercises, visual aids, scaffolded problem-solving	Math Teacher	Classwork, performance tasks	6 weeks, 2x/week, 30–40 mins	₱350 (colored pens, worksheets)	Task-based assessment; random checking; exit tickets

Determines relationships & transforms statements	Students will transform statements correctly with 90–95% accuracy	2	If-then examples, rewriting tasks, logic diagrams, group discussions	Math Teacher	Quizzes, classwork	5 weeks, 2x/week, 30–40 mins	₱300 (logic diagram sheets)	Quizzes; group output scoring; teacher evaluation
Uses inductive and deductive reasoning	Students will apply both reasoning types with 90% accuracy	2	Reasoning exercises, real-life problems, group debates	Math Teacher	Formative assessments	5 weeks, 2x/week, 30–40 mins	₱300 (activity sheets)	Observation of reasoning tasks; written reflections
Illustrates/proves triangle congruence; solves parts	Students will illustrate congruence and write simple proofs with 90–95% accuracy	2	Triangle models, scaffolded proofs, group practice, templates	Math Teacher	Written work, quizzes	6 weeks, 2x/week, 30–40 mins	₱600 (triangle cutouts, rulers)	Rubric for proof-writing; quiz results; teacher feedback
Applies theorems on triangle inequalities	Students will apply and prove triangle inequalities with 90–95% accuracy	2	Diagram analysis, real-life scenarios, scaffolded proofs	Math Teacher	Tests, quizzes	6 weeks, 2x/week, 30–40 mins	₱350 (diagram cards, worksheets)	Assessment of diagrams; quiz monitoring; practice tasks
Proves properties of parallel lines cut by a transversal	Students will prove properties and identify conditions with 90–85% accuracy	2	Visual aids, guided proof steps, problem solving with diagrams	Math Teacher	Classwork, assessments	5 weeks, 2x/week, 30–40 mins	₱400 (printed diagrams)	Proof rubrics; seatwork checking; daily drills
Constructs perpendicular lines and angle bisectors	Students will construct accurately with 90% accuracy	2	Hands-on constructions using ruler and compass, guided demo	Math Teacher	Practical tasks, observations	6 weeks, 2x/week, 30–40 mins	₱700 (compasses, rulers, bond paper)	Construction checks; practical test; teacher observation
Illustrates axiomatic structure in geometry	Students will explain components of the axiomatic structure with 95% accuracy	2	Diagrams, basic definitions, mini-presentations	Math Teacher	Quizzes, class discussions	4 weeks, 2x/week, 30–40 mins	₱300 (chart paper, markers)	Recitation scoring; short quizzes; presentation rubric
Writes direct and indirect	Students will write simple	2	Stepwise templates, examples,	Math Teacher	Assignments, quizzes	6 weeks, 2x/week, 30–40	₱350 (proof templates,	Notebook check; proof-writing drills; rubric

proofs	proofs with 90% accuracy		peer critique			mins	printing)	scoring
Solves probability problems & counting principles	Students will solve probability problems with 90–95% accuracy	2	Real-life probability tasks, dice/coin experiments, tree diagrams	Math Teacher	Homework, quizzes	6 weeks, 2x/week, 30–40 mins	₱500 (dice, coins, activity cards)	Experiment logs; worksheet checks; concept quizzes
Illustrates sample space, events, experimental vs theoretical probability	Students will distinguish probability types with 95% accuracy	2	Simple experiments, models, comparison activities	Math Teacher	Quizzes, observations	5 weeks, 2x/week, 30–40 mins	₱450 (experiment materials)	Performance tasks; observation notes; short assessment
Tier 1 = Intensive Intervention, Tier 2 = Targeted Support, Tier 3 = Enhancement								

Intervention Plan For Grade 9

Standard / Learning Competency	Goal	Tier	Strategy	In-Charge	Additional Data Sources	Timeline	Estimated Budget	Monitoring Scheme
Characterizes roots using discriminant; solves quadratic equations (factoring, square roots, completing the square, quadratic formula); solves quadratic/rational equations; solves equations transformable to quadratics	Students will solve and characterize quadratic equations with 95% accuracy in formative assessments	1	Stepwise method review; visual aids for discriminant; scaffolded problem sets; peer tutoring	Math Teacher	Quizzes, classwork, previous tests	8 weeks, 2x/week, 30–40 mins	₱700 (printed worksheets, visual aids)	Weekly quizzes; teacher observation; error analysis sheets
Solves quadratic functions/inequalities; transforms quadratic functions (standard ↔ vertex form)	Students will solve and graph quadratic functions and inequalities with 95% accuracy	1	Graphing tools; function tables; transformation guides; real-life applications	Math Teacher	Homework, performance tasks	7 weeks, 2x/week, 30–40 mins	₱500 (graphing paper, digital printouts)	Graphing performance tasks; rubric-based checking; formative quizzes
Simplifies/operates on radicals;	Students will simplify and operate	1	Visual models (fraction	Math Teacher	Classwork, formative assessment	7 weeks, 2x/week, 30–40	₱400 (visual charts,	Daily exercises; teacher checklist; mini-assessment

solves radical equations; illustrates rational exponents and simplifies	on radical and rational exponent expressions with 95% accuracy		bars, exponent charts); stepwise simplification; scaffolded practice		s	mins	worksheets)	s
Translates relationships into variation statements using tables, equations, and graphs	Students will translate variation statements with 95% accuracy	1	Varied examples (direct/inverse); guided translation drills; peer review	Math Teacher	Quizzes, classwork	5 weeks, 2x/week, 30–40 mins	₱300 (activity sheets, printing)	Worksheet checks; quick quizzes; student reflection logs
Proves triangle similarity conditions; applies similarity theorems; illustrates similar figures; solves problems on similarity and right triangles	Students will prove and apply similarity theorems with 95% accuracy	2	Visual proofs; diagram-based tasks; real-life applications; teamwork	Math Teacher	Quizzes, tests	6 weeks, 2x/week, 30–40 mins	₱450 (triangle cutouts, diagrams)	Proof rubrics; similarity tasks; group work assessment
Proves and applies theorems on parallelograms, trapezoids, kites; identifies quadrilaterals; solves related problems; determines conditions for parallelograms; applies proportionality and midline theorems	Students will prove properties and solve quadrilateral problems with 95% accuracy	2	Hands-on models; diagram analysis; scaffolded proofs; collaborative problem-solving	Math Teacher	Classwork, assessments	7 weeks, 2x/week, 30–40 mins	₱550 (model materials, worksheets)	Checking of written proofs; classwork evaluation; periodic quizzes
Finds and uses trigonometric ratios; illustrates six trig ratios; solves right triangle problems;	Students will calculate and apply trigonometric ratios with 95% accuracy	1	Unit circle visuals; ratio tables; real-life application problems; interactive practice	Math Teacher	Quizzes, performance tasks	6 weeks, 2x/week, 30–40 mins	₱600 (unit circle printouts, activity sheets)	Practical exercises; performance tasks; skill-check quizzes

illustrates angles of elevation and depression								
Proves Pythagorean Theorem; solves problems involving oblique triangles	Students will prove and solve triangle problems with 95% accuracy	2	Visual proofs; guided problem-solving; peer teaching activities	Math Teacher	Tests, quizzes	6 weeks, 2x/week, 30–40 mins	₱450 (geometric models, printouts)	Proof rubrics; problem-solving checks; notebook inspection
Tier 1 = Intensive Intervention, Tier 2 = Targeted Support, Tier 3 = Enhancement								

Intervention Plan For Grade 10

Standard / Learning Competency	Goal	Tier	Strategy	In-Charge	Additional Data Sources	Timeline	Estimated Budget	Monitoring Scheme
Illustrates arithmetic sequences; determines arithmetic means and nth term; sums arithmetic sequences; generates patterns	Students will identify, generate, and solve arithmetic sequence problems with 95% accuracy	1	Pattern recognition tasks; formula derivation; guided practice on nth term and sum problems	Math Teacher	Quizzes, classwork, previous tests	6 weeks, 2x/week, 30–40 mins	₱500 (visual aids, printed worksheets)	Weekly quizzes; seatwork checking; observation notes
Illustrates geometric sequences (finite/infinite); determines geometric means, nth term, and sums	Students will solve geometric sequence problems including sum formulas with 95% accuracy	1	Visual sequence models; stepwise formula practice; graphing sequences; real-life applications	Math Teacher	Homework, quizzes	6 weeks, 2x/week, 30–40 mins	₱500 (sequence charts, graphing sheets)	Output inspection; short tests; progressive performance checks
Proves and applies Remainder, Factor, and Rational Root Theorems; solves polynomial equations	Students will prove and apply theorems and solve polynomial equations with 95% accuracy	1	Scaffolded theorem proofs; worked examples; polynomial division (long & synthetic) practice	Math Teacher	Tests, assignments	7 weeks, 2x/week, 30–40 mins	₱600 (proof templates, problem sets)	Proof evaluation; quizzes; assignment analysis
Performs division of polynomials (long/synthetic); differentiates finite/infinite	Students will perform polynomial division and distinguish sequence types with	1	Step-by-step demonstrations; guided exercises; comparison charts	Math Teacher	Classwork, quizzes	6 weeks, 2x/week, 30–40 mins	₱400 (activity sheets, printed charts)	Checking of division exercises; formative assessments; learner progress logs

geometric sequences	95% accuracy							
Solves problems on circles; proves and applies theorems on secants, tangents, segments	Students will solve circle problems and prove related theorems with 95% accuracy	1	Visual diagrams; guided proofs; real-life circle problem applications	Math Teacher	Classwork, formative assessments	6 weeks, 2x/week, 30–40 mins	₱600 (compasses, printed diagrams)	Proof rubrics; problem-solving checks; output monitoring
Solves problems involving geometric figures on the coordinate plane	Students will solve coordinate geometry problems with 95% accuracy	1	Graphing tools; formula practice (distance, midpoint, slope); scaffolded problem sets	Math Teacher	Tests, quizzes	6 weeks, 2x/week, 30–40 mins	₱500 (graph paper, tool printouts)	Graph inspection; quizzes; teacher observation checklist
Illustrates combinations, permutations, events, unions, intersections; solves related problems	Students will illustrate and solve counting and probability problems with 95% accuracy	1	Tree diagrams; Venn diagram activities; hands-on counting tasks; real-life examples	Math Teacher	Homework, quizzes	7 weeks, 2x/week, 30–40 mins	₱550 (manipulatives, printed problem sets)	Weekly problem sets; quizzes; observation during activities
Illustrates and interprets measures of position (quartiles, deciles, percentiles); calculates specified measures	Students will calculate and interpret measures of position with 95% accuracy	1	Use actual data sets; stepwise guides; graph interpretation tasks	Math Teacher	Classwork, formative assessments	5 weeks, 2x/week, 30–40 mins	₱350 (data printouts, worksheets)	Activity logs; accuracy checks; statistical output review
Uses measures of position and statistical methods in research data analysis	Students will apply measures of position and statistical tools with 95% accuracy	1	Guided data analysis mini-projects; simplified research interpretation tasks	Math Teacher	Project work, quizzes	5 weeks, 2x/week, 30–40 mins	₱400 (project sheets, data sets)	Project rubric scoring; quiz checks; teacher monitoring logs
Illustrates mutually exclusive events and calculates probability of unions of two events	Students will distinguish mutually exclusive events and compute union probabilities with 95% accuracy	1	Venn diagram exercises; scaffolded probability problem-solving	Math Teacher	Quizzes, classwork	5 weeks, 2x/week, 30–40 mins	₱300 (Venn diagram templates, worksheets)	Output review; probability drills; formative quizzes

Tier 1 = Intensive Intervention, Tier 2 = Targeted Support, Tier 3 = Enhancement

CONCLUSION

Based on the analysis of the GRACE-PASS assessment results, the following conclusions have been drawn.

1. The GRACE-PASS assessment revealed statistically significant improvement from pretest to posttest across Grades 7 to Grade 10. However, most students remained within the *Developing* proficiency level which indicatees that while learning gains occurred, they were not sufficient to meet grade-level expectations.

2. Across all grade levels, students consistently struggled the most with *Patterns and Algebra* and *Geometry* competencies. Notably low performance was observed in:

   - ✧ Grade 7: Measurement and Geometry (e.g., determining angles and sides of polygons – 16%)
   - ✧ Grade 8: Linear inequalities and graphing linear functions (as low as 13%–22%)
   - ✧ Grade 9: Rational exponents and radical expressions (as low as 7%–15%)
   - ✧ Grade 10: Theorems in Geometry and statistical applications (as low as 13%–22%)

RECOMMENDATIONS

In line with the conclusions and identified learning gaps, the following recommendations are proposed to improve students' performance in Mathematics.

1. To address the persistently low performance in key Mathematics areas, it is recommended that instruction be intensified in the least mastered competencies across all grade levels. Specifically, teachers should focus on *Measurement and Geometry* in Grade 7, particularly in determining angles and polygon properties; *Linear Inequalities, Rational Expressions,* and *Graphing* in Grade 8; *Radical Expressions, Rational Exponents,* and *Quadratic Equations* in Grade 9; and *Polynomial Theorems, Geometric Proofs,* and *Statistical Analysis* in Grade 10. These areas consistently showed the lowest scores and require targeted remediation to build foundational understanding.

2. Differentiated instruction must be employed to accommodate the varying learning needs and styles of students. Teachers should utilize instructional strategies such as visual aids, manipulatives, real-life applications, and interactive discussions to ensure that abstract concepts become more accessible. Grouping students based on their performance in specific competencies can also enable more focused intervention and maximize learning outcomes.

3. A structured intervention program should be developed and institutionalized at the school level. This program may include after-school tutorials, Saturday enrichment classes, or summer bridging sessions that specifically address competencies identified as least mastered in the GRACE-PASS results. These sessions should be strategically scheduled and designed with clear learning objectives aligned to the MELCs.

4. The integration of technology and hands-on tools is crucial in enhancing students' conceptual understanding. The use of dynamic software like GeoGebra for geometry, graphing calculators, and math apps can provide interactive and engaging learning experiences. These tools allow students to visualize abstract mathematical concepts and apply them in problem-solving contexts.

5. Continuous professional development programs should be provided to mathematics teachers to equip them with effective pedagogical strategies, especially in delivering difficult topics such as proofs, inequalities, and algebraic operations. Training in data-driven instruction will also enable teachers to utilize assessment results effectively in guiding lesson planning and instructional design.

6. Ongoing formative assessments aligned with the GRACE-PASS framework should be implemented to monitor students' progress regularly. These assessments will help identify learning gaps as they emerge and

allow for timely instructional adjustments. Teachers should also provide immediate feedback to students to reinforce strengths and correct misconceptions.

7. Lastly, interventions should not only focus on cognitive skills but also address the affective needs of students. Initiatives that promote a positive attitude toward mathematics, reduce math anxiety, and build learner confidence—such as peer mentoring, recognition programs, and integrating growth mindset principles—can contribute significantly to improved performance and student engagement in mathematics.

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