

**Year-at-a-Glance and Unit Outlines  
MAP4C: Foundations for College  
Mathematics**

**DRAFT**

**Including Rationale for Clusters of Expectations  
and Sequences of Units**

**NOTE: Expectation numbers will change from what they are  
in this draft which is based on an earlier draft of the  
curriculum expectations**

# Grade 12 Foundations for College Mathematics: Content and Reporting Targets

Mathematical Processes across all strands:  
*Problem Solving, Reasoning and Proving, Reflecting, Selecting Tools and Computational Strategies, Connecting, Representing, and Communicating.*

Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
<p><b>Working with One-Variable Data</b></p> <ul style="list-style-type: none"> <li>Contexts include: student interests and/or learning styles, possible careers, and associated educational pathways</li> <li>Use large amounts of data when working with percentiles, interpretations of 19 out of 20</li> <li>misinterpretations</li> </ul> <p><b>Working with Two-Variable Data</b></p> <ul style="list-style-type: none"> <li>Effective surveys</li> <li>Census at School (Stat Can)</li> <li>Compare and distinguish between situations requiring one-variable and two-variable analysis</li> </ul>	<p><b>Working with Two-Variable Data</b></p> <ul style="list-style-type: none"> <li>Activate prior knowledge of linear, and quadratic relationships</li> <li>Explore cause and effect</li> <li>Recognize misinterpretations of data</li> <li>Use real data</li> </ul> <p><b>Numerical and Graphical Models</b></p> <ul style="list-style-type: none"> <li>Use clean data</li> <li>Activate prior knowledge from Grades 9, 10, 11</li> <li>Select and justify choice of model</li> <li>Use a “rates of change” lens to compare and contrast types of relations using:               <ul style="list-style-type: none"> <li>finite differences</li> <li>rate of change triangles on graphs...”growing faster” or “growing slower”</li> </ul> </li> </ul>	<p><b>Exponential Computations, Solving Exponential Equations, and Annuities</b></p> <ul style="list-style-type: none"> <li>Connect points on exponential graphs to coordinates in its table of values and to solutions of equations, and express these in exponential form</li> <li>Investigate and use exponent laws</li> <li>Investigate and evaluate powers of rational exponents</li> <li>Demonstrate an understanding of concepts of Personal Finance</li> <li>Include surveys</li> <li>Use exponential computations here</li> </ul>	<p><b>Renting, Owning, and Designing Budgets</b></p> <ul style="list-style-type: none"> <li>Interpret and compare costs involved in owning and renting</li> <li>Solve problems involving fixed and variable costs</li> </ul>	<p><b>Measurement and Geometry</b></p> <ul style="list-style-type: none"> <li>Perform unit conversions in context</li> <li>Explore significance of optimal dimensions in real 2D and 3D contexts</li> </ul>	<p><b>Trigonometry</b></p> <ul style="list-style-type: none"> <li>Solve problems using primary trig ratios of acute and obtuse triangles</li> <li>Use the sine law and cosine law to solve problems arising from real-world applications</li> </ul>	<p><b>Culminating Project</b></p> <ul style="list-style-type: none"> <li>Gather, interpret, and describe information about mathematics concepts learned and explore occupations, and college programs that use these concepts</li> <li>Prepare and present the results</li> </ul>
<b>Rationale</b>						

### **Starting with Data Management**

- Students coming to this course from Grade 11 Foundations for College Mathematics and Grade 11 Functions and Applications have different prior experiences with data; this is an opportunity to level the playing field
- Since students tend to have a broad range of prior experiences with data management, they can consolidate this knowledge and gain confidence, early in the program, in their readiness to move forward
- A focus on data about the students in the class gives the teacher the information needed to choose contexts and applications connected to students' interests and aspirations, throughout the course; it gives the students a sense of belonging to a learning community. Differentiating instruction based on interests helps students engage in what they are learning.
- Using secondary data from Census at School - Canada and the National Longitudinal Survey of Children and Youth (16-17 year olds) helps students analyze how they compare to students beyond their own class and community

### **Renting, Owning, and Designing Budgets after annuities**

- Mortgages and annuities can be included in students' budget designs
- This unit may be more project-based, thereby providing time for the teacher to help individual students improve their proficiency in exponential computations

### **Exponential Computations, Solving Exponential Equations, and Annuities before Geometry**

- Students may need more time to become proficient in the exponential skills, and this can happen while they work on geometry

### **Separate Geometry and Trigonometry into different units**

- The Trigonometry Unit is designed to be more or less independent of the other units in the course so that the Trigonometry Unit can be scheduled when the weather allows students to go outdoors to take measurements
- A significant amount of time is allocated to optimization problems since they provide an opportunity to make connections to and review other parts of the course

### **Include a Culminating Project connected to careers**

- The project will require each student to focus on one or more specific careers in order to:
  - Gather, interpret, and describe information about applications of data managements in an occupation of your choice, and identify a college program that explores these applications
  - Gather, interpret, and describe information about applications of mathematical modelling in an occupation of your choice, and identify a college program that explores these applications
  - Gather, interpret, and describe information about applications of the mathematics of personal finance in an occupation of your choice, and identify a college program that explores these applications
  - Gather, interpret, and describe information about applications of trigonometry in an occupation of your choice, and identify a college program that explores these applications
  - Pose and solve a problem that might have to solved in the career of your choice

### **Precision Decision**

- Compare and contrast rates of change between different types of models, but not between different intervals within the same model

## Grade 12 Foundations for College Mathematics Year Outline – Planning Tool

- P Number of pre-planned lessons (including instruction, diagnostic and formative assessments, summative assessments other than summative performance tasks)
- J Number of jazz days of time (instructional or assessment)
- T Total number of days
- SP Summative performance task (see Assessment – Grade 9 Applied)

Unit	Cluster of Curriculum Expectations	Overall and Specific Expectations	P	J	T	SP
1	<p>Personalize the course, and capitalize on their interests, post-secondary and career pathways</p> <p>Collect, analyze, and summarize one-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>Distinguish situations requiring one-variable and two-variable data analysis</p> <p>Analyze the use and misuse of data in the media</p>	<p>DM1 collect, analyse, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>DM2 demonstrate an understanding of the applications of data management used by the media and the advertising industry and used in various occupations</p>	8	2	10	
2	<p>Personalize the course, and capitalize on their interests, post-secondary and career pathways</p> <p>Collect, analyze, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>Distinguish situations requiring one-variable and two-variable data analysis</p> <p>Analyze the use and misuse of data in the media</p>	<p>MM2 describe trends based on the interpretation of graphs, compare graphs using initial conditions and rates of change, and solve problems by modelling relationships graphically and algebraically</p> <p>DM1 collect, analyse, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>DM2 demonstrate an understanding of the applications of data management used by the media and the advertising industry and used in various occupations</p>	8	2	10	

<b>Unit</b>	<b>Cluster of Curriculum Expectations</b>	<b>Overall and Specific Expectations</b>	<b>P</b>	<b>J</b>	<b>T</b>	<b>SP</b>
3	<p>Solve exponential equations</p> <p>Investigate the effects of changing parameters when investing in an annuity or a mortgage</p>	<p>MM1 evaluate powers with rational exponents, simplify algebraic expressions involving exponents, and solve problem involving exponential equations graphically and using common bases</p> <p>MM2 describe trends based on the interpretation of graphs, compare graphs using initial conditions and rates of change, and solve problems by modelling relationships graphically and algebraically</p> <p>MM3 make connections between formulae and linear, quadratic, and exponential relations, and solve problems using formulae arising from real-world applications, and describe applications of mathematical modelling in various occupations.</p> <p>PF1 demonstrate an understanding of annuities, including mortgages, and solve related problems using technology</p>	13	2	15	
4	<p>Gather, interpret, and compare information about owning or renting accommodation</p> <p>Prepare budgets based on possible wages connected to career choice and case studies</p> <p>Collect data regarding career choice in a portfolio for use with culminating project</p>	<p>PF2 gather, interpret, and compare information about owning or renting accommodation, and solve problems involving associated costs</p> <p>PF3 design, justify and adjust budgets for individuals and families described in case studies, and describe applications of the mathematics of personal finance</p>	13	2	15	
5	<p>Understand the relationships between imperial and metric units</p> <p>Consolidate understanding of perimeter, area, surface area, and volume through real-life problems</p> <p>Explore optimization of two-dimensional and three-dimensional figures</p>	<p>GT1 solve problems involving measurement and geometry and arising from real-world applications</p> <p>GT2 explain the significance of optimal dimensions in real-world applications, and determine optimal dimensions of two-dimensional shapes and three-dimensional figures</p>	11	2	13	

Unit	Cluster of Curriculum Expectations	Overall and Specific Expectations	P	J	T	SP
6	<p>Consolidate understanding of primary trigonometric ratios, sine and cosine laws for acute triangles, using imperial and/or metric measure as appropriate</p> <p>Extend understanding of primary trigonometric ratios to include obtuse angles</p> <p>Solve problems using the sine or cosine laws for oblique triangles (non-ambiguous cases only)</p>	<p>GT1 solve problems involving measurement and geometry and arising from real-world applications</p> <p>GT2 explain the significance of optimal dimensions in real-world applications, and determine optimal dimensions of two-dimensional shapes and three-dimensional figures</p> <p>GT3 solve problems using primary trigonometric ratios of acute and obtuse angles, the sine law, and the cosine law, including problems arising from real-world applications, and describe applications of trigonometry in various occupations</p>	12	2	14	
7	<p>Prepare a presentation to showcase an occupation that makes use of the material in this course, to describe the education and training needed for the occupation, and to highlight a particulate use of mathematics in this course in the occupation.</p>	<p>MM2 describe trends based on the interpretation of graphs, compare graphs using initial conditions and rates of change, and solve problems by modeling relationships graphically and algebraically</p> <p>MM3 make connections between formulae and linear, quadratic, and exponential relations, and solve problems using formulae arising from real-world applications, and describe applications of mathematical modelling in various occupations</p> <p>PF3 design, justify, and adjust budgets for individuals and families described in case studies, and describe applications of the mathematics of personal finance.</p> <p>GT1 solve problems involving measurement and geometry and arising from real-world applications</p> <p>DM1 collect, analyze, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>DM2 demonstrate an understanding of the applications of data management <i>used by the media and the advertising industry and used in various occupations</i></p>	5		5	
	Summative Performance Tasks		3		3	
	<b>Total Days</b>		<b>73</b>	<b>12</b>	<b>85</b>	

The number of prepared lessons represents the lessons that could be planned ahead based on the range of student readiness, interests, and learning profiles that can be expected in a class. The extra time available for “instructional jazz” can be taken a few minutes at a time within a

pre-planned lesson or taken a whole class at a time, as informed by teachers' observations of student needs.

The reference numbers are intended to indicate which lessons are planned to precede and follow each other. Actual day numbers for particular lessons and separations between terms will need to be adjusted by teachers.

# Unit 1 Foundations for College Mathematics

## Working with Data

### Lesson Outline

<b><u>BIG PICTURE</u></b>			
<p>Students will:</p> <p>Personalize the course, and capitalize on their interests, post-secondary and career pathways</p> <p>Collect, analyze, and summarize one-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data</p> <p>Distinguish situations requiring one-variable and two-variable data analysis</p> <p>Analyze the use and misuse of data in the media</p>			
<b>Day</b>	<b>Lesson Title</b>	<b>Math Learning Goals</b>	<b>Expectations</b>
1		<ul style="list-style-type: none"> <li>Analyze a variety of surveys/questionnaires (e.g. Teen Magazine, Match Making Valentine Questionnaire, Census at Schools, etc.) in order to describe the characteristics of an effective survey/questionnaire</li> </ul>	DM1.2
2		<ul style="list-style-type: none"> <li>Design and critique questionnaires to collect data about the class (e.g. college destination, career interests, personal interests, mathematics background, etc.)</li> <li>Create a class questionnaire in order to conduct a survey about the class (consider incorporating questions from the Census at School questionnaire for later comparisons in Day 6)</li> <li>Assessment of class interests</li> </ul>	DM1.2
3		<ul style="list-style-type: none"> <li>Use examples from the media that include common statistical terms (e.g. percentile, quartile, standard deviation) and expressions in order to review and interpret them.</li> <li>Analyze the class data using the statistical terms and expressions for use by the media</li> </ul>	DM2.1
4-5		<ul style="list-style-type: none"> <li>Interpret statistics presented in the media.</li> <li>Explain how the media misuses statistics.</li> <li>Create a media advertisement from the class data that would promote a certain point of view in order to lobby for a school interest</li> <li>Assess the validity of the conclusions presented by the class media advertisements</li> <li>Assess the validity of the conclusions presented in the media</li> </ul>	DM2.3, 2.4
6-7		<ul style="list-style-type: none"> <li>Analyze data from a secondary source (e.g. Census at School) with technology (e.g. Fathom, spreadsheet, graphing calculator)</li> <li>Validate class analysis of common attributes using the secondary source (e.g. sample size, demographic bias)</li> <li>Look for mathematical relationships in the data</li> <li>Distinguish situations requiring one-variable and two-variable data analysis</li> </ul>	DM2.1, 2.3, 2.4. 1.1, 1.3
8		<ul style="list-style-type: none"> <li>Summative Assessment (e.g. collection of case studies with individual report, data project with report)</li> </ul>	



## Unit 2 Foundations for College Mathematics

### Two-variable data analysis

#### Lesson Outline

##### BIG PICTURE

Students will:

Personalize the course, and capitalize on their interests, post-secondary and career pathways

Collect, analyze, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data

Distinguish situations requiring one-variable and two-variable data analysis

Analyze the use and misuse of data in the media

Day	Lesson Title	Math Learning Goals	Expectations
1		<ul style="list-style-type: none"> <li>Use a scatter plot from Unit 1, Days 6-7 in order to summarize properties (e.g. dependent and independent variables, line of best fit, correlation, etc.)</li> <li>Create a graphical summary of two-variable data using a scatter plot without technology</li> <li>Describe possible interpretations of the line of best fit of a scatter plot and reasons for misinterpretations</li> </ul>	DM1.3, 1.5, 1.7 MM2.1, 2.2
2-3		<ul style="list-style-type: none"> <li>Determine whether the line of best fit for a scatter plot is an appropriate summary of a set of two-variable data</li> <li>Determine an algebraic summary of the relationship between two variables</li> <li>Describe possible interpretations of the line of best fit of a scatter plot and reasons for misinterpretations</li> <li>Make and justify conclusions from the analysis of two-variable data</li> </ul>	DM1.8, 1.7, 1.6, 1.9, MM2.1, 2.2
4		<ul style="list-style-type: none"> <li>Given a scatter plot for which the line of best fit is not an appropriate model of a set of two-variable data, introduce the need to apply other models</li> </ul>	DM2.1
5			
6-7			
8			

## Lesson Outline

### BIG PICTURE

Students will:

Solve exponential equations

Investigate the effects of changing parameters when investing in an annuity or a mortgage

Day	Lesson Title	Math Learning Goals	Expectations
1		<ul style="list-style-type: none"> <li>Graph exponential functions to look at key features of the graph including rate of change</li> <li>Compare exponential functions with linear and quadratic functions in real-world context</li> <li>Explore rates of change using finite differences</li> </ul>	MM 2.1, MM1.6, MM2.3, MM2.4, MM3.3
2		<ul style="list-style-type: none"> <li>Determine, through investigation, the exponents laws for multiplying, dividing and power of a power</li> <li>Simplify and evaluate algebraic expressions containing integer exponents</li> </ul>	MM1.1 MM1.2
3		<ul style="list-style-type: none"> <li>Determine through investigation using a variety of tools and strategies the value of a power with a rational exponent</li> <li>Evaluate numerical expressions involving rational exponents and rational bases</li> <li>Play a game involving powers</li> </ul>	MM1.3, MM1.4
4		<ul style="list-style-type: none"> <li>Solve exponential equations, graphically and numerically</li> <li>Solve problems involving exponential equations</li> </ul>	MM1.5, MM1.7, MM1.6
5		<ul style="list-style-type: none"> <li>Solve equations of the form <math>x^n = a</math> using rational exponents using inverse operations</li> <li>Using a real world formula, determine the value of a variable of degree no higher than three by substituting known values and then solving for the unknown variable</li> <li>Solve problems involving exponential equations</li> </ul>	MM3.1, MM3.2, MM2.6, MM1.6, MM3.4
6		<ul style="list-style-type: none"> <li>Summative task on solving exponential equations and exponent laws and real world applications</li> </ul>	
7		<ul style="list-style-type: none"> <li>Gather and interpret possible investments involving annuities</li> <li>Gather and interpret information about mortgages</li> </ul>	PF1.1, PF1.5
8		<ul style="list-style-type: none"> <li>Solve problems that involve amount, the present value, and the regular payment of an ordinary annuity in situations where the compounding period and the payment period are the same</li> <li>Demonstrate through investigation using technology the advantage of investing early on</li> </ul>	PF1.3, PF1.4
9-10		<ul style="list-style-type: none"> <li>Determine through investigation using technology the effect of changing the conditions (payment, frequency, interest rate, compounding period) keeping the compound period and payment period the same</li> </ul>	PF1.2, MM2.5
11		<ul style="list-style-type: none"> <li>Read and interpret an amortization table for a mortgage</li> <li>Generate and amortization schedule</li> </ul>	PF1.6, PF1.7
12		<ul style="list-style-type: none"> <li>Determine, through investigation using technology the effects of varying payment periods, regular payments and interest rates on the length of time needed to pay off a mortgage.</li> </ul>	PF1.8
13		<ul style="list-style-type: none"> <li>Summative Task</li> <li>Establish the criteria for level 3 of the rubric for the personal finance expectation as a class</li> </ul>	

## Unit 4 Personal Finance

# Foundations for College Mathematics

## Lesson Outline

<b><u>BIG PICTURE</u></b>			
Students will: Gather, interpret, and compare information about owning or renting accommodation Prepare budgets based on possible wages connected to career choice and case studies Collect data regarding career choice in a portfolio for use with culminating project			
<b>Day</b>	<b>Lesson Title</b>	<b>Math Learning Goals</b>	<b>Expectations</b>
1		<ul style="list-style-type: none"> <li>Gather, interpret, and describe information about living costs, and estimate the living costs of different households in the local community</li> <li>Connect career choice with estimated wages and living expenses for a certain time period (this may include a scenario of marital status and number of dependents)</li> </ul>	PF3.1
2		<ul style="list-style-type: none"> <li>Establish residence criteria               <ul style="list-style-type: none"> <li>e.g. Cost, location, pets, laundry facility, parking, public transit, shopping, fitness facilities, school, furnishings, etc</li> </ul> </li> <li>Establish wants versus needs</li> <li>Research in newspapers, Internet</li> <li>Understand advertisement language and intent</li> </ul>	PF2.1
3		<ul style="list-style-type: none"> <li>Gather information about different rental accommodations in the local community (eg. Apartment, condominium, townhouse, detached home, room in a house, mobile home) such as availability, conditions for renting.</li> <li>Establish pros and cons for each of the various options</li> </ul>	PF2.1
4		<ul style="list-style-type: none"> <li>Identify and describe the factors to be considered in determining the affordability of accommodation in the local community, and consider the affordability of accommodation based on circumstances</li> </ul>	PF3.4
5,6		<ul style="list-style-type: none"> <li>Research rental costs               <ul style="list-style-type: none"> <li>e.g. First and last rent, parking fee, laundry, heat and hydro, internet, cable, appliances, hot water tank, water</li> </ul> </li> <li>Survey rental properties and select five possible properties to meet given needs</li> <li>Interpret the information from the five properties to make an informed decision in selecting a rental property that would suit given needs               <ul style="list-style-type: none"> <li>include cost analysis (rental and other associated costs like transportation), convenience factors</li> </ul> </li> </ul>	PF2.1,PF2.3,PF3.4
7		<ul style="list-style-type: none"> <li>Gather and interpret information about procedures and costs involved in buying and owning accommodation in the local community               <ul style="list-style-type: none"> <li>e.g. home inspection, survey, approval of mortgage, lawyer's fees, taxes, location, size of home,...</li> </ul> </li> </ul>	PF2.1
8		<ul style="list-style-type: none"> <li>Survey possible accommodations to purchase               <ul style="list-style-type: none"> <li>e.g. detached, semi-detached, condominium, town house</li> </ul> </li> </ul>	PF2.1,PF2.3

		<ul style="list-style-type: none"> <li>and select five possible properties to meet their needs</li> <li>• Interpret the information from the five properties to make an informed decision in selecting a property to purchase that would suit given needs</li> <li>- include cost analysis (purchase price and other associated costs like transportation), convenience factors</li> </ul>	
9		<ul style="list-style-type: none"> <li>• Compare renting accommodation with owning accommodation by describing the advantages and disadvantages of each</li> <li>• Justify selection of accommodation between the rental choice and the purchase choice for given needs</li> </ul>	PF2.2
10		<ul style="list-style-type: none"> <li>• Design and present a savings plan to facilitate the achievement of a long-term goal</li> </ul>	PF3.2
11		<ul style="list-style-type: none"> <li>• Design, explain, and justify a monthly budget suitable for their scenario</li> </ul>	PF3.3
12, 13		<ul style="list-style-type: none"> <li>• Summative Task</li> <li>• Make adjustments to a budget to accommodate changes in circumstances</li> </ul>	PF3.5

# Unit 5 Geometry Foundations for College Mathematics

## Lesson Outline

<u>BIG PICTURE</u>			
Students will: <ul style="list-style-type: none"> <li>Understand the relationships between imperial and metric units</li> <li>Consolidate understanding of perimeter, area, surface area, and volume through real-life problems</li> <li>Explore optimization of two-dimensional and three-dimensional figures</li> </ul>			
Day	Lesson Title	Math Learning Goals	Expectations
1		<ul style="list-style-type: none"> <li>Explore relationships that exist between inches and centimeters (measuring tools: string, both types of rulers, or tapes)               <ul style="list-style-type: none"> <li>Reading ruler, measuring tape (fraction)</li> <li>Create a scatter plot from the student's data</li> <li>Perform a linear regression and get the equation</li> <li>Connect to the actual conversion (inches &lt;-&gt; centimetres)</li> </ul> </li> </ul>	GT1.1
2		<ul style="list-style-type: none"> <li>Trundle wheel activity for perimeter</li> <li>Converting mixed imperial measurements &lt;-&gt; metric Example convert 5 1/8" to cm</li> </ul>	GT1.1
3		<ul style="list-style-type: none"> <li>Finding the area of rectangles, triangles, and circles, and of related composite shapes, in situations arising from real-world applications</li> <li>Using imperial, metric and conversions when necessary</li> </ul>	GT1.2
4		<ul style="list-style-type: none"> <li>Maximum area for a given perimeter  <b>Problem:</b> Cagney Problem, Why are copper wires round?</li> </ul>	GT2.2,GT2.1
5		<ul style="list-style-type: none"> <li>Minimum perimeter for a given area  <b>Problem:</b> Fencing</li> </ul>	GT2.2,GT2.1
6		<ul style="list-style-type: none"> <li>Jazz Day</li> </ul>	
7		<ul style="list-style-type: none"> <li>Volume problems involving rectangular prisms, triangular prisms, cylinders, and composite figures</li> <li>Using imperial, metric and conversions when necessary <b>Example:</b> Volume of Concrete Pad in cubic meters with initial measurements in feet and inches. Example 8' x 24' x 4"</li> </ul>	GT1.3
8		<ul style="list-style-type: none"> <li>Surface area problems involving rectangular prisms, triangular prisms, cylinders, and composite figures</li> <li>Using imperial, metric and conversions when necessary</li> </ul>	GT1.3
9		<ul style="list-style-type: none"> <li>Maximum volume for a given surface area</li> <li>Using imperial, metric and conversions when necessary</li> </ul>	GT2.3,GT2.1
10		<ul style="list-style-type: none"> <li>Minimum surface area for a given volume</li> </ul>	GT2.3,GT2.1

		<ul style="list-style-type: none"><li>Using imperial, metric and conversions when necessary</li></ul>	
11-13		Summative Task <ul style="list-style-type: none"><li>Packaging Project</li></ul>	

# Unit 6 Trigonometry Foundations for College Mathematics

## Lesson Outline

### BIG PICTURE

Students will:

Consolidate understanding of primary trigonometric ratios, sine and cosine laws for acute triangles, using imperial and/ or metric measure as appropriate

Extend understanding of primary trigonometric ratios to include obtuse angles

Solve problems using the sine or cosine laws for oblique triangles (non-ambiguous cases only)

Day	Lesson Title	Math Learning Goals	Expectations
1		<ul style="list-style-type: none"> <li>Activate prior knowledge through a graffiti exercise                             <ul style="list-style-type: none"> <li>Pythagorean Theorem, sine ratio, cosine ratio, tangent ratio, sine law and cosine law (acute angles)</li> </ul> </li> <li>Solve problems requiring use of the primary trigonometric ratios and involving imperial measurements</li> </ul>	GT3.1
2		<ul style="list-style-type: none"> <li>Explore applications imperial measurements using a Clinometer's activity</li> </ul>	GT3.1
3		<ul style="list-style-type: none"> <li>Solve problems using the sine law for acute triangles using imperial measurements</li> </ul>	GT3.1
4		<ul style="list-style-type: none"> <li>Solve problems using the cosine law for acute triangles using imperial measurements</li> </ul>	GT3.1
5		<ul style="list-style-type: none"> <li>Solve problems using the primary trigonometric ratios, sine law or cosine law of acute triangles using metric or imperial measurements</li> </ul>	GT3.1
6		<ul style="list-style-type: none"> <li>Investigate connections between primary trigonometric ratios of acute angles and obtuse angles</li> <li>Determine the values of the sine ratio, cosine ratio, and tangent ratio for obtuse angles</li> </ul>	GT3.2, GT3.3
7		<ul style="list-style-type: none"> <li>Solve problems involving oblique triangles, including those that arise from real-world applications, using the sine law (non-ambiguous cases only)</li> </ul>	GT3.4
8		<ul style="list-style-type: none"> <li>Solve problems involving oblique triangles, including those that arise from real-world applications, using the cosine law</li> </ul>	GT3.4
9		<ul style="list-style-type: none"> <li>Solve problems involving oblique triangles, including those that arise from real-world applications, using the sine law or cosine law (non-ambiguous cases only)</li> </ul>	GT3.4
10-11		<ul style="list-style-type: none"> <li>Measure the area of a polygon shaped figure requiring use of trigonometry to determine missing sides. Example: (landscaping, construction)</li> </ul>	GT1.2, GT3.4,GT3.1
12		Summative Assessment	

## Unit 7 - CULMINATING PROJECT – 5 days

**Prepare a presentation to showcase an occupation that makes use of the material in this course, to describe the education and training needed for the occupation, and to highlight a particulate use of mathematics in this course in the occupation.**

### Specific expectations – foundation for project

#### MM3.5

Gather, interpret, and describe information about applications of mathematical modeling in occupations, and identify college programs that explore these applications

#### PF3.6

Gather, interpret and, describe information about applications of the mathematics of personal finance in occupations, and identify college programs that explore these applications

#### GT3.5

Gather, interpret, and describe information about applications of trigonometry in occupations, and identify college programs that explore these applications

#### DM2.5

Gather, interpret, and describe information about applications of data management in occupations, and identify college programs that explore these applications

### Overall expectations (Differentiate according to student needs and interests)

#### MM2

Describe trends based on the interpretation of graphs, compare graphs using initial conditions and rates of change, and solve problems by modeling relationships graphically and algebraically

#### MM3

Make connections between formulae and linear, quadratic, and exponential relations, and solve problems using formulae arising from real-world applications, and describe applications of mathematical modelling in various occupations

#### PF3

Design, justify, and adjust budgets for individuals and families described in case studies, and describe applications of the mathematics of personal finance.

#### GT1

Solve problems involving measurement and geometry and arising from real-world applications

#### DM1

Collect, analyze, and summarize two-variable data using a variety of tools and strategies, and interpret and draw conclusions from the data

#### DM2

Demonstrate an understanding of the applications of data management *used by the media and the advertising industry and* used in various occupations

- Students pose and solve a problem, using material from the course and relating to occupation/career selected and provide a rationale for selection of problem
- Presentation : Students choose how they will present (e.g., power point, video, overheads, poster)
- Students work individually on a focus of their choice
- Teacher provides assessment for learning to support students at various phases of the project
  - Conference with students to learn what they are doing and thinking
  - Provide guidance and support for the math concepts involved
  - Provide direction to help them to think about how it might connect to their lives
  - Provide lots of flexibility

**Note: Students can present individually or in a career fair structure**