

COURSE OUTLINE – MYP YEAR 5 MATHEMATICS (Enriched)

$$\begin{cases} 2x_1 + x_2 = 7 \\ x_1 + x_2 - 3x_3 = -10 \\ 6x_2 - 2x_3 + x_4 = 7 \\ 2x_3 - 3x_4 = 13 \end{cases}$$

Course Overview & Expectations:

The Enriched MYP Year 5 Mathematics consists of all topics in Foundations of Mathematics and Pre-Calculus 10 and some important topics in Pre-Calculus 11 prescribed by the BC Ministry of Education. This course is designed to not only help students develop proficiency in numeracy but also provide students with the mathematical understanding and critical thinking skills, all of which are necessary for further learning either in DP math 11 or Pre-Calculus 11. The key concepts covered in this course involve Form, Relationship and Logic. Through inquiry into these key concepts, this course will assist students to develop the ability to conjecture, reason logically, employ quantitative and spatial information, and apply a variety of mathematical methods to solve problems and make decisions confidently and independently. This course is more challenging; therefore, students are expected to have developed solid fundamental math skills through MYP Year 3 & 4 Mathematics learning.

Learning:

Through engaging with this course, students should UNDERSTAND...

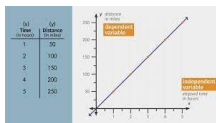
Algebra allows us to generalize relationships through abstract thinking.



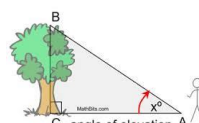
The meanings of, and connections between, each operation extend to powers and polynomials.



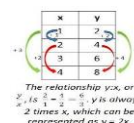
Constant rate of change is an essential attribute of linear relations and has meaning in different representations and contexts.



Trigonometry involves using proportional reasoning to solve indirect measurement problems.



Representing and analyzing situations allows us to notice and wonder about relationships.



Through engaging with this course, students will KNOW...

Statement of Inquiry	Key Concept/Concepts	Unit Title/Topic
Information about inaccessible heights can be determined safely and efficiently.	Relationships , Model, Space	Trigonometry
Discovering mathematical patterns using logic can lead to a better understanding of how physical systems work.	Logic , Pattern, Change	Exponents (Integral Exponents)
It is important that humans farm in a responsible manner to minimize the impact on the environment.	Relationships , Model, Pattern	Arithmetic Sequences and Series
By changing the form of an expression or question, we can simplify or solve complex models.	Form , Equivalence, Model	Polynomial Expressions
By representing data in different forms, it allows us to discover relationships in our world.	Relationships , Model, Change	Linear Relations
There is a need to relate variables that are around us and represent them in different forms.	Form , Equivalence, Representation	Linear Equations and Graphs
Simultaneous equations inform and give a better understanding of systems and their consequences.	Relationships , Justification, Representation	Solving System of Linear Equations
By understanding the system of taxation, we can legally and logically minimize the amount of tax we have to pay.	Logic , System	Finance
Quadratic equations give opportunities to maximize and minimize sets of variables in the world around us.	Relationships , Model, Representation	Quadratic Equations

Through engaging with this course, students will DO...

CURRICULAR COMPETENCIES	EXAMPLES
Reasoning and analyzing	- Develop thinking strategies to solve problems - Explore, analyze, and apply mathematical ideas using reason, tech (graphing calculator or Desmos), & other tools - Estimate reasonably and demonstrate fluent, flexible, and strategic thinking about numbers - Model with mathematics in situational contexts - Thinking creatively and with curiosity and wonder when exploring problems
Understanding and solving	- Develop, demonstrate, and apply conceptual understanding of mathematical ideas through play, story, inquiry, and problem solving - Visualize to explore and illustrate mathematical concepts and relationships - Apply flexible and strategic approaches to solve problems - Solve problems with persistence and a positive disposition
Communicating and representing	- Explain and justify mathematical ideas and decisions in many ways - Represent mathematical ideas in concrete, pictorial, and symbolic forms - Use mathematical vocabulary and language to contribute to discussions in the classroom - Take risks when offering ideas in classroom discourse
Connecting and reflecting	- Reflect on mathematical thinking - Connect mathematical concepts with each other, with other areas, and with personal interests - Use mistakes as opportunities to advance learning - Incorporate First Peoples worldviews, perspectives, knowledge, and practices to make connections with mathematical concepts

Through this course, students will develop the following Approaches to Learning skills...

Category Skill	Examples
Thinking skills	Use prioritization and order of precedence in problem-solving. For example: draw justifiable conclusions and generalizations from investigating patterns.
Social skills	Help others to create success for themselves during group work. For example: give and receive meaningful feedback; negotiate ideas and knowledge with peers and teachers; collaborate with peers.
Communication skills	Organize and interpret data using both analogue and digital tools. For example: a regular journal during the investigation to maintain a record of reflections.
Self-management skills	Practise focus and concentration while solving multiple problems. For example: plan short- and long-term assignments; meet deadlines; use class time wisely; concentrate on task with perseverance and resilience.
Research skills	Use a variety of technologies and media platforms, including social media and online networks, to source information.

Assessment:

Throughout this course, students will demonstrate their learning...

The MYP Mathematics course will focus on developing skills related to 4 criteria based objectives.	Formative assessment is assessment <i>as</i> learning, or assessment <i>for</i> learning. Formative assessments could include;	Summative assessment is assessment <i>of</i> learning. Summative assessments could include;
A: Knowing and Understanding	Class instructions, class discussions, quizzes, worksheets	Tests, Projects
B: Investigating Patterns	Class activities, class discussions	Structured pattern assessments before the concepts are taught
C: Communicating	Class discussions, group work, group investigation activities	Tests, Projects
D: Applying Mathematics in Real Life Contexts	Class activities, group work	Tests, Projects

Assessment Rubrics:

Criterion A: Knowing and understanding

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • select appropriate mathematics when solving simple problems in familiar situations • apply the selected mathematics successfully when solving these problems • generally solve these problems correctly in a variety of contexts.
3-4	Developing	The student is able to: • select appropriate mathematics when solving more complex problems in familiar situations • apply the selected mathematics successfully when solving these problems • generally solve these problems correctly in a variety of contexts.
5-6	Proficient	The student is able to: • select appropriate mathematics when solving challenging problems in familiar situations • apply the selected mathematics successfully when solving these problems • generally solve these problems correctly in a variety of contexts.
7-8	Extending	The student is able to: • select appropriate mathematics when solving challenging problems in both familiar and unfamiliar situations • apply the selected mathematics successfully when solving these problems • generally solve these problems correctly in a variety of contexts.

Criterion B: Investigating patterns

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • apply, with teacher support, mathematical problem-solving techniques to discover simple patterns • state predictions consistent with patterns.
3-4	Developing	The student is able to: • apply mathematical problem-solving techniques to discover simple patterns • suggest general rules consistent with findings.
5-6	Proficient	The student is able to: • select and apply mathematical problem-solving techniques to discover complex patterns • describe patterns as general rules consistent with findings • verify the validity of these general rules.
7-8	Extending	The student is able to: • select and apply mathematical problem-solving techniques to discover complex patterns • describe patterns as general rules consistent with correct findings • prove, or verify and justify these general rules.

Criterion C: Communicating

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • use limited mathematical language • use limited forms of mathematical representation to present information • communicate through lines of reasoning that are difficult to interpret.
3-4	Developing	The student is able to: • use some appropriate mathematical language • use appropriate forms of mathematical representation to present information adequately • communicate through lines of reasoning that are complete • adequately organize information using a logical structure.
5-6	Proficient	The student is able to: • usually use appropriate mathematical language • usually use different forms of mathematical representation to present information correctly • usually move between different forms of mathematical representation • communicate through lines of reasoning that are complete and coherent • present work that is usually organized using a logical structure.
7-8	Extending	The student is able to: • consistently use appropriate mathematical language • use appropriate forms of mathematical representation to consistently present information correctly • move effectively between different forms of mathematical representation • communicate through lines of reasoning that are complete, coherent, and concise • present work that is consistently organized using a logical structure.

Criterion D: Applying Mathematics in real life contexts

Achievement level	Proficiency Scale	Level descriptor
0		The student does not reach a standard described by any of the descriptors below.
1-2	Emerging	The student is able to: • identify some of the elements of the authentic real-life situation • apply mathematical strategies to find a solution to the authentic real-life situation, with limited success.
3-4	Developing	The student is able to: • identify the relevant elements of the authentic real-life situation • select, with some success, adequate mathematical strategies to model the authentic real-life situation • apply mathematical strategies to reach a solution to the authentic real-life situation • describe whether the solution makes sense in the context of the authentic real-life situation.
5-6	Proficient	The student is able to: • identify the relevant elements of the authentic real-life situation • select adequate mathematical strategies to model the authentic real-life situation • apply the selected mathematical strategies to reach a valid solution to the authentic real-life situation • explain the degree of accuracy of the solution • explain whether the solution makes sense in the context of the authentic real-life situation.
7-8	Extending	The student is able to: • identify the relevant elements of the authentic real-life situation • select appropriate mathematical strategies to model the authentic real-life situation • apply the selected mathematical strategies to reach a correct solution to the authentic real-life situation • justify the degree of accuracy of the solution • justify whether the solution makes sense in the context of the authentic real-life situation.

Academic Honesty and Personal Integrity

The faculty at Carson Graham expects our students to complete academic and nonacademic work that is authentic and respectful of intellectual property. All students are expected to adhere to the school's Policy for Academic Integrity. Ignorance of the standards related to academic honesty and student integrity is not an excuse for dishonesty, plagiarism and malpractice. You are expected to familiarize yourself with the policy.

<https://www.sd44.ca/school/carson/About/schoolpolicies/Documents/Carson%20Graham%20Academic%20Honesty%20Policy%20reviewed%20December%202018.pdf>