COURSE OUTLINE – MYP YEAR 5 MATHEMATICS

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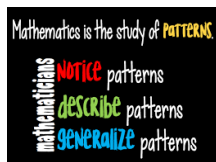
Course Overview & Expectations:

MYP Year 5 Mathematics is course is to prepare students to become numerate and to provide students with the mathematical understanding and critical thinking skills identified for further learning either in Foundations of Math 11, Pre-Calculus 11, or DP Math 11. An important idea in this course is that representing and analyzing situations allows us to notice and wonder about the relationships. Through inquiry into the concepts of relationships and communications, 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.
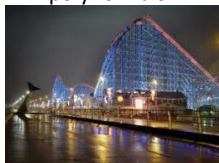
Learning:
Through engaging with this course, students should UNDERSTAND…

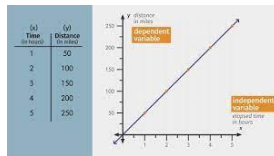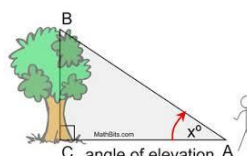|				
Algebra allows us to generalize relationships through abstract thinking.	The meanings of, and connections between, each operation extend to powers and polynomials.	Constant rate of change is an essential attribute of linear relations and has meaning in different representations and contexts.	Trigonometry involves using proportional reasoning to solve indirect measurement problems.	Representing and analyzing situations allows us to notice and wonder about relationships.
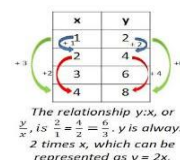
Through engaging with this course, students will KNOW…

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 Graphically and Algebraically
By understanding the system of taxation, we can legally and logically minimize the amount of tax we have to pay.	**Logic**, Systems	Finance

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 *as* learning, or assessment *for* learning. **Formative assessments could include;**	Summative assessment is assessment *of* 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

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