COURSE OUTLINE – MYP YEAR 3 MATHEMATICS

Course Overview & Expectations:

MYP Year 3 Mathematics is integrated into the course of Mathematics 8 prescribed by BC Ministry of Education. This course is designed to provide students with the foundation of mathematical understanding and critical thinking skills required to successfully complete subsequent high school math courses. Students will develop computational fluency, find relationships between 2D and 3D objects, and demonstrate linear relationships in many ways as well as identifying and making generalizations. Students will also analyse data and compare the quantities of ratios, rates, and percents.

Learning:
Through engaging with this course, students should UNDERSTAND…

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Number represents, describes, and compares the quantities of ratios, rates, and percents.	Computational fluency and flexibility extend to operations with fractions.	Discrete linear relationships can be represented in many connected ways and used to identify and make generalizations.	The relationship between surface area and volume of 3D objects can be used to describe, measure, and compare spatial relationships.	Analyzing data by determining averages is one way to make sense of large data sets and enables us to compare and interpret.
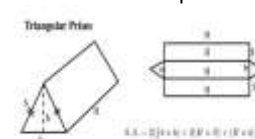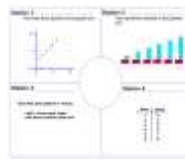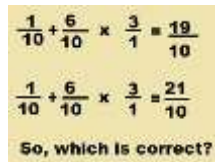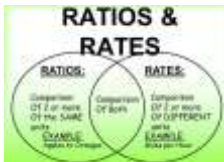
Through engaging with this course, students will KNOW…

Statement of Inquiry	Key Concept/Concepts	Unit Title/Topic
Making use of historically developed patterns can help us in understanding spatial relationships in our world.	**Relationships**, Representation	Square Numbers and the Pythagorean Relationship
Forms take shape and occupy space in the real world	**Form,** Space	Surface Area and Volume
Measurements can increase our understanding of shapes in the natural world.	**Form,** Measurement	Operations with Fractions
Preservation of equality is fundamental to mathematical relationships.	**Relationships**, Equivalence	Graphing and Solving Linear Relations
Proportional reasoning can help us compare quantities and solve real-life problems	**Logic,** Quantity	Ratio, Rates and Proportional reasoning
Logic dictates the quantity available for consumption.	**Logic,** Quantity	Financial Literacy
Logic can be applied to model and justify decisions.	**Logic**	Statistics and Probability

Through engaging with this course, students will DO…

CURRICULAR COMPETENCIES	EXAMPLES
Reasoning and analyzing	• use reasoning and logic to explore, analyze, and apply the Pythagorean relationship • model views and nets of 3-D objects in real contexts • demonstrate and apply mental math strategies to estimate perfect squares, cubes and square roots and cube roots reasonably
Understanding and solving	• apply multiple strategies to solve problems in both abstract situations and real contexts • visualize to explore operation with fractions
Communicating and representing	• use mathematical vocabulary and language to contribute to discussions about adding, subtracting, multiplying, dividing and order of operation with fractions • communicate thinking about ratios, rates, and proportional reasoning in many ways • communicate thinking about percents less than 1 and greater than 100 in many ways
Connecting and reflecting	• connect the concept of linear relations to other mathematical concepts, other areas, and to my interests • use mathematical arguments to support my choices

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

Below are some examples of how we develop ATL skills in Math:

Category Skill indicator	Examples
Thinking skills	Consider ideas from multiple perspectives, apply skills and knowledge in unfamiliar situations, make connections between subject groups and disciplines
Social skills	Practise empathy, help others to succeed, take responsibility for one's own actions, plan short- and long-term assignments; meet deadlines, give and receive meaningful feedback
Communication skills	Give and receive meaningful feedback, negotiate ideas and knowledge with peers and teachers, take effective notes in class, make effective summary notes for studying, exercise leadership and take on a variety of roles within groups
Self-management skills	Bring necessary equipment and supplies to class, keep an organized and logical system of information files/notebooks, practise strategies to overcome distractions, practise "bouncing back" after adversity, identify strengths and weaknesses of personal learning strategies (self-assessment)
Research skills	Make connections between various sources of information, collect and analyse data to identify solutions and make informed decisions

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, handouts	Tests, Projects
B: Investigating Patterns	Class activities, class discussions	Guided inquiry pattern assessments
C: Communicating	Class discussions, group work, group projects	Tests, Projects
D: Applying Mathematics in Real Life Contexts	Class activities, group work, in-class projects	Tests, Projects

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

Grade Descriptors:

Grade 7

Produces high-quality work that frequently uses mathematics insightfully. Communicates comprehensive, nuanced understanding of concepts and contexts demonstrating proficient application of mathematical techniques and terminology. Consistently demonstrates sophisticated analytical thinking and logical processes when problem-solving and investigating. Frequently transfers mathematical knowledge and applies skills, with independence and expertise, in a variety of complex classroom and real-world situations.

Grade 6

Produces high-quality, occasionally insightful mathematical work. Communicates extensive understanding of concepts and contexts demonstrating proficient application of mathematical techniques and terminology. Demonstrates analytical thinking and logical processes, frequently with sophistication when problem-solving and investigating. Transfers mathematical knowledge and applies skills, often with independence, in a variety of familiar and unfamiliar classroom and real-world situations.

Grade 5

Produces generally high-quality mathematical work. Communicates good understanding of concepts and contexts demonstrating proficient application of mathematical techniques and terminology. Demonstrates analytical thinking and logical processes, sometimes with sophistication, when problem-solving and investigating. Usually transfers mathematical knowledge and applies skills, with some independence, in familiar classroom and real-world situations.

Grade 4

Produces good-quality mathematical work. Communicates basic understanding of most concepts and contexts with evidence of appropriate application of mathematical techniques and terminology, with few misunderstandings and minor gaps. Often demonstrates analytical thinking when problem-solving and investigating. Transfers some mathematical knowledge and applies skills in familiar classroom situations, but requires support in unfamiliar situations.

Grade 3

Produces mathematical work of an acceptable quality. Communicates basic understanding of many concepts and contexts with occasional evidence of appropriate application of mathematical techniques and terminology, with occasional significant misunderstandings or gaps. Begins to demonstrate some analytical thinking when problem-solving and investigating. Begins to transfer mathematical knowledge and apply skills, requiring support even in familiar classroom situations.

Grade 2

Produces mathematical work of limited quality. Communicates limited understanding of some concepts and contexts. Demonstrates limited evidence of mathematical thinking. Limited evidence of transfer of mathematical knowledge and application of skills.

Grade 1

Produces work of a very limited quality. Conveys many significant misunderstandings or lacks understanding of most concepts and contexts. Very rarely demonstrates evidence of mathematical thinking. Very inflexible, rarely shows evidence of knowledge or skills.

Assessment Rubrics:

Criterion A: Knowing and understanding

At the end of year 3, students should be able to:

     i. select appropriate mathematics when solving problems in both familiar and unfamiliar situations
     ii. apply the selected mathematics successfully when solving problems
     iii. solve problems correctly in a variety of contexts.

Achievement level	Level descriptor
0	The student **does not** reach a standard described by any of the descriptors below.
1-2	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	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	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	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

At the end of year 3, students should be able to:

     i.   select and apply mathematical problem-solving techniques to discover complex patterns
     ii.   describe patterns as relationships and/or general rules consistent with findings
     iii.   verify and justify and/or general rules.

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

Criterion C: Communicating

At the end of year 5, students should be able to:

    i.   use appropriate mathematical language (notation, symbols, and terminology) in both oral and written explanations
    ii.   use appropriate forms of mathematical representation to present information
    iii.   move between different forms of mathematical representation
    iv.   communicate complete, coherent and concise mathematical lines of reasoning
    v.   organize information using a logical structure.

Achievement level	Level descriptor
0	The student **does not** reach a standard described by any of the descriptors below.
1-2	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	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 **able to be understood** • **adequately organize** information using a logical structure.
5-6	The student is able to: • **usually** use **appropriate** mathematical language • **usually** use **appropriate forms** of mathematical representation to present information **correctly** • move between different forms of mathematical representation **with some success** • **communicate** through lines of reasoning that are **not always complete and coherent** • **present** work that is **usually organized** using a logical structure.
7-8	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 and coherent** • **present** work that is **consistently organized** using a logical structure.

Criterion D: Applying Mathematics in real life contexts

At the end of year 5, students should be able to:

    i.   identify relevant elements of authentic real-life situations
    ii.   select appropriate mathematical strategies when solving authentic real-life situations
    iii.   apply the selected mathematical strategies successfully to reach a solution
    iv.   explain the degree of accuracy of a solution
    v.   explain whether a solution makes sense in the context of the authentic real-life situation.

Achievement level	Level descriptor
0	The student **does not** reach a standard described by any of the descriptors below.
1-2	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	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	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 • **describe** the degree of accuracy of the solution • **discuss** whether the solution makes sense in the context of the authentic real-life situation.
7-8	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 • **explain** the degree of accuracy of the solution • **explain** whether the solution makes sense in the context of the authentic real-life situation.