Unpacking and Planning for for the New Grade 6 Math

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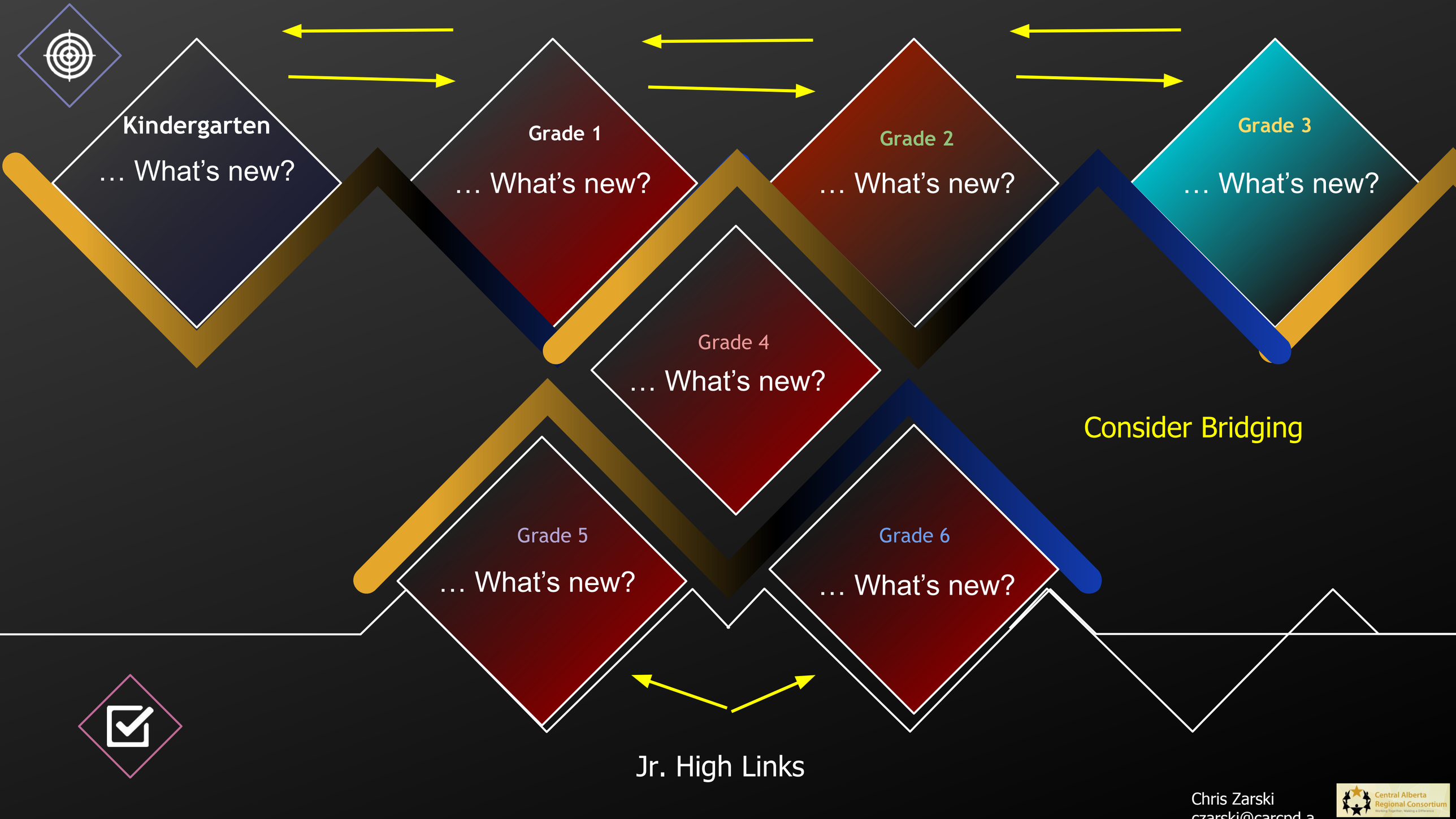
Central Alberta Regional Consortium

In the spirit of reconciliation, we want to acknowledge that this gathering is taking place on traditional lands across the province of Alberta, home to many diverse First Nations, Métis and Inuit peoples. We acknowledge that this land is a traditional meeting ground giving voice to its original peoples and the story of creation of this country in a way that
history has forgotten.

Before we start:

- list the activities/assessments you undertake when you start Grade 6 in any given year.
- Why do you start at these points?



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Organizing Ideas

Organizing Ideas	K	1	2	3	4	5	6
Number							
Algebra							
Geometry							
Coordinate Geometry							
Measurement							
Patterns							
Time							
Statistics							

Grade 6 Document Overview

Architecture and Design of Provincial K–12 Curriculum

Organizing Idea

Guiding Question

Learning Outcome

Knowledge, Understanding, Skills and Procedures

Literacy, Numeracy, and Competencies

Alberta

Document Overview

Numbered Outcomes including Financial Literacy Outcomes

Architecture of the Curriculum

Broad/General Idea or Understanding
More Specific Knowledge, Understandings, and Skills

Broad/General Idea or Understanding

Organizing Idea

Guiding Question
&
Learner Outcome

KUSPs
- Knowledge
- Understanding
- Skills & Processes

Organizing Idea

- statement of the learning
- spans all or most grades
- main concepts

Organizing Idea	Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.								
Guiding Question	How can quantity contribute meaning to daily life?			How can quantity be communicated?			How can quantity contribute to a sense of number?		
Learning Outcome	KN1.1 Children investigate quantities to 10.			1N1.1 Students interpret and explain quantities to 100.			2N 1.1 Students analyze quantity to 1000.		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	Quantity can be represented using objects pictures words numerals	Quantity can be the number of objects in a set.	Recognize a number of familiar objects as a quantity. Represent a quantity in different ways. Relate a numeral to a specific quantity.	A numeral is a symbol or group of symbols used to represent a number. The absence of quantity is represented by 0.	Quantity is expressed in words and numerals based on patterns. Quantity in the world is represented in multiple ways.	Represent quantities using words, numerals, objects, or pictures. Identify a quantity of 0 in familiar situations.	Any number of objects in a set can be represented by a natural number. The values of the places in a four-digit natural number are thousands, hundreds, tens, and ones. Places that have no value within a given number use zero as a placeholder. The number line is a spatial representation of quantity.	There are infinitely many natural numbers. Every digit in a natural number has a value based on its place. Each natural number is associated with exactly one point on the number line.	Represent quantities using words and natural numbers. Identify the digits representing thousands, hundreds, tens, and ones based on place in a natural number. Relate a number, including zero, to its position on the number line.

Organizing Idea Progression

Organizing Idea	K	1	2	3	4	5	6
Matter							
Energy							
Earth Systems							
Living Systems							
Space							
Computer Science							
Scientific Method							

Guiding Question

- informed by the organizing idea and frames the learning outcome
- intended to spark curiosity and wonder about the LO
- identifies more specific concepts

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Learning Outcome

- describes what students are required to know, understand, and be able to do by the end of a grade.
- must be assessed and reported.
- discipline (subject) specific
- key concepts to be learned and assessed are identified.

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KUSPs: Knowledge

- how facts and knowledge fit together in a logical and meaningful order
- organized knowledge to understand concepts, skills, and procedures which can be applied to new situations

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KUSPs: Understanding

- Knowledge includes the facts, symbols, rules, principles, and concepts.

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KUSPs: Skills & Procedures

- what students do to demonstrate their knowledge and understanding

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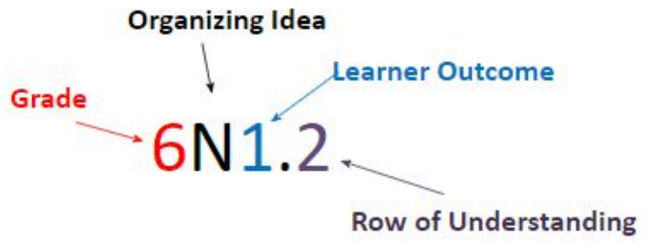
Numbered Outcomes

Mathematics K-6
Numbered Outcomes



Mathematics Kindergarten to Grade 6 Curriculum & Financial Literacy for K-2

	Grade 5			Grade 6		
Organizing Idea	**Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.**					
Guiding Question	**How can the infinite nature of place value enhance insight into number?**			**How can the infinite nature of the number line broaden the perception of number?**		
Learning Outcome	**5N1 Students analyze patterns in place value.**			**6N1.1 Students investigate magnitude with positive and negative numbers.**		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A number expressed with more decimal places is more precise. A zero in the rightmost place of a decimal number does not change the value of the number. There are infinitely many decimal numbers between any two decimal numbers.	Place value symmetry extends infinitely to the left and right of the ones place.	Relate the names of place values that are the same number of places to the left and right of the ones place. Express numbers within 10 000 000, including decimal numbers to thousandths, using words and numerals. Relate a decimal number to its position on the number line. Determine a decimal number between any two other decimal numbers. Compare and order numbers, including decimal numbers. Express the relationship between two numbers, including decimal numbers, using <, >, or =. Round numbers, including decimal numbers, to various places according to context	Negative numbers are to the left of zero on the number line visualized horizontally, and below zero on the number line visualized vertically. Positive numbers can be represented symbolically with or without a positive sign (+). Negative numbers are represented symbolically with a negative sign (−). Zero is neither positive nor negative. Negative numbers communicate meaning in context, including ◦ temperature ◦ debt ◦ elevation Magnitude is a number of units counted or measured from zero on the number line. Every positive number has an opposite negative number with the	Symmetry of the number line extends infinitely to the left and right of zero or above and below zero. Direction relative to zero is indicated symbolically with a positive or negative sign. Magnitude with direction distinguishes between positive and negative numbers.	Identify negative numbers in familiar contexts, including contexts that use vertical or horizontal models of the number line. Express positive and negative numbers symbolically, in context. Relate magnitude to the distance from zero on the number line. Relate positive and negative numbers, including additive inverses, to their positions on horizontal and vertical models of the number line. Compare and order positive and negative numbers. Express the relationship between two numbers, including positive and negative numbers, using <, >, or =.

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Guiding Question	**How can the infinite nature of place value enhance insight into number?**			**How can the infinite nature of the number line broaden the perception of number?**		
				6N1.2 Students investigate magnitude with positive and negative numbers.		
				Knowledge	Understanding	Skills & Procedures
				The set of integers includes all natural numbers, their additive inverses, and zero. The sum of any number and its additive inverse is zero. The sum of two positive numbers is a positive number. The sum of two negative numbers is a negative number. The sum of a positive number and a negative number can be interpreted as the sum of zero and another number.	Any number can be expressed as a sum in infinitely many ways.	Investigate addition of an integer and its additive inverse. Express zero as the sum of integers in multiple ways. Model the sum of two positive integers. Model the sum of two negative integers. Model the sum of a positive and negative integer as the sum of zero and another integer. Add any two integers.
				6N1.3 Students investigate magnitude with positive and negative numbers.		
				Knowledge	Understanding	Skills & Procedures
				Subtracting a number is the same as adding its additive inverse.	The difference of any two numbers can be interpreted as a sum.	Express a difference as a sum.

Mathematics Kindergarten to Grade 6 Curriculum & Financial Literacy for K-2

	Grade 5			Grade 6		
Organizing Idea	**Number: Quantity is measured with numbers that enable counting, labelling, comparing, and operating.**					
Guiding Question	**In what ways can divisibility characterize natural numbers?**			**How can prime factorization and exponentiation provide new perspectives of numbers?**		
Learning Outcome	**5N3 Students determine divisibility of natural numbers.**			**6N3.1 Students analyze numbers using prime factorization and exponentiation.**		
	Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
	A divisibility test can be used to determine factors of a natural number. Division by zero is not possible.	A number is divisible by another number if it can be divided with a remainder of 0.	Investigate divisibility by natural numbers to 10, including 0. Generalize divisibility tests for 2, 3, and 5. Determine factors of natural numbers using divisibility tests.	The order in which three or more numbers are multiplied does not affect the product (associative property). Any composite number can be expressed as a product of smaller numbers (factorization). Prime factorization represents a number as a product of prime numbers. Any composite factor of a number can be determined from its prime factors.	A product can be composed in multiple ways. The prime factors of a number provide a picture of its divisibility.	Compose a product in multiple ways, including with more than two factors. Express the prime factorization of a composite number. Determine common factors for two natural numbers, using prime factorization. Determine divisibility of a natural number from its prime factorization.
				6N3.2 Students analyze numbers using prime factorization and exponentiation.		
				Knowledge	Understanding	Skills & Procedures
				Repeated multiplication of identical factors can be represented symbolically as a power (exponentiation). A power, A^n, includes a base, A, representing the repeated factor, and an exponent, n, indicating the number of repeated factors.	Different representations of a product can provide new perspectives of its divisibility. A power is divisible by its base.	Identify the base and exponent in a power. Express the product of identical factors as a power, including within a prime factorization. Describe the divisibility of numbers represented in various forms.

LINK

Language Conventions in the Curriculum

Language Conventions

Language Convention	Interpretation for Implementation	Example from Curriculum
including/include(s)	A list following "including" or "include(s)" contains **required** knowledge. Students must know all elements of the list in order to achieve the learning outcome.	Subtraction can be applied in various contexts, **including** • comparing two quantities • taking away one quantity from another • finding a part of a whole
such as	A list following "such as" provides a list of **illustrative examples** that support the learning outcome. Teachers may use any of these examples, or they may choose others.	Right angles can be identified using various referents, **such as** • the corner of a piece of paper • the angle between the hands on an analog clock at 3:00 • a capital letter L
content in parentheses	Words in parentheses are **subject-specific terms** for teachers and parents. These words follow the associated age-appropriate terms for students.	A shape can change orientation or position through slides **(translations)**, turns **(rotations)**, or flips **(reflections)**.

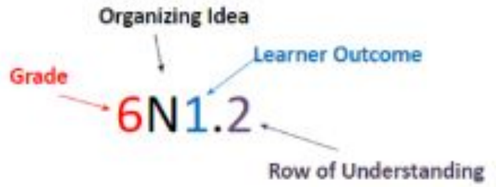
Verbs Are Defined by Context

Kindergarten: Number	Grade 1: Geometry	Grade 3: Number
LO: Children **interpret** compositions of quantities within 10.	**LO:** Students **interpret** shape in two and three dimensions.	**LO:** Students **interpret** fractions in relation to one whole.
Verbs from Associated Skills and Procedures	Verbs from Associated Skills and Procedures	Verbs from Associated Skills and Procedures
Identify **Compose** **Recognize**	**Identify** **Model** **Sort** **Compose** **Decompose** **Investigate**	**Model** **Visualize** **Identify** **Name** **Express** **Compare**

Curriculum Comparison Document

Alberta Grade 6 Mathematics Curriculum Comparison Document

2023 - 2024



Grade 6 Curriculum Comparison to the New Alberta Curriculum

N = Number **P= Patterns** **M = Measurement** **Geometry = G** **Statistics = ST** **Coordinate Geometry = CG**

Outcomes from 2007 Curriculum	**Understandings** from April Draft (New Understandings)	New Curriculum Outcomes, Knowledge, Skills and Procedures	
Number Strand	**NUMBER**		
General Outcome: Develop number sense. **Specific Outcome 1** Demonstrate an understanding of place value, including numbers that are: • greater than one million • less than one thousandth. **Specific Outcome 2** Solve problems involving whole numbers and decimal numbers.	**UNDERSTANDING** Addition and subtraction of numbers in problem-solving contexts is facilitated by standard algorithms.	**LEARNING OUTCOME** 6N2 Students solve problems using standard algorithms for addition and subtraction. **KNOWLEDGE** Standard algorithms are reliable procedures for addition and subtraction. Contexts for problems involving addition and subtraction can include money and metric measurement.	**SKILLS & PROCEDURES** Solve problems in various contexts using standard algorithms for addition and subtraction.
Specific Outcome 3 Demonstrate an understanding of factors and multiples by: • determining multiples and factors of numbers less than 100 • identifying prime and composite numbers	**UNDERSTANDING** A product can be composed in multiple ways. The prime factors of a number provide a picture of its divisibility	**LEARNING OUTCOME** 6N3.1 Students analyze numbers using prime factorization and exponentiation. **KNOWLEDGE** • The order in which three or more numbers are multiplied does not affect the product (associative property). • Any composite number can be expressed as a product of smaller numbers (factorization). • Prime factorization represents a number as a	**SKILLS & PROCEDURES** Compose a product in multiple ways, including with more than two factors. Express the prime factorization of a composite number. Determine common factors for two natural numbers, using prime factorization. Determine divisibility of a natural number from its prime factorization.

N = Number **P= Patterns** **M = Measurement** **Time = T** **Geometry = G** **Algebra = A** **Statistics = ST**

Outcomes from 2007 Curriculum	**Understandings** from April Draft (New **Understandings**)	New Learner Outcomes, Knowledge and Skills & Procedures	
Number Strand	**NUMBER**		
Specific Outcome 1 <REMOVED> Represent and describe whole numbers to 10 000, pictorially and symbolically.	**UNDERSTANDING**	**LEARNING OUTCOME** **KNOWLEDGE**	**SKILLS AND PROCEDURES**
Specific Outcome 2 <REMOVED> Compare and order numbers to 10 000.	**UNDERSTANDING**	**LEARNING OUTCOME** **KNOWLEDGE**	**SKILLS AND PROCEDURES**
Specific Outcome 3 Demonstrate an understanding of addition of numbers with answers to 10 000 and their corresponding subtractions (limited to 3- and 4-digit numerals) by: • using personal strategies for adding and subtracting • estimating sums and differences • solving problems involving addition and subtraction. **Specific Outcome 11** Demonstrate an understanding of addition and subtraction of decimals (limited to	**UNDERSTANDING** Standard algorithms for addition and subtraction may be used for any decimal number..	**LEARNING OUTCOME** **4N2 Students add and subtract within 10 000, including decimal numbers to hundredths.** **KNOWLEDGE** Standard algorithms for addition and subtraction of decimal numbers are conventional procedures based on place value. Estimation can be used to check the reasonableness of a sum or difference.	**SKILLS AND PROCEDURES** Add and subtract numbers, including decimal numbers, using standard algorithms. Assess the reasonableness of a sum or difference by estimation. Solve problems using addition and subtraction, including problems involving money.

• solving problems using multiples and factors.		product of prime numbers. • Any composite factor of a number can be determined from its prime factors.	
	UNDERSTANDING Different representations of a product can provide new perspectives of its divisibility. A power is divisible by its base	**LEARNING OUTCOME** 6N3.2 Students analyze numbers using prime factorization and exponentiation. **KNOWLEDGE** Repeated multiplication of identical factors can be represented symbolically as a power (exponentiation). A power, A, includes a base, A, representing the repeated factor, and an exponent, n, indicating the number of repeated factors. Any repeated prime factor within a prime factorization can be expressed as a power	**SKILLS & PROCEDURES** Identify the base and exponent in a power. Express the product of identical factors as a power, including within a prime factorization. Describe the divisibility of numbers represented in various forms.
Specific Outcome 5 Demonstrate an understanding of ratio, concretely, pictorially and symbolically. **Specific Outcome 6** Demonstrate an understanding of percent (limited to whole numbers), concretely, pictorially and symbolically.	**UNDERSTANDINGS** All equivalent ratios express the same proportional relationship. A rate can be used to extend a given proportional relationship to different quantities.	**LEARNING OUTCOME** 6N8 Students apply equivalence to the interpretation of ratios and rates. **KNOWLEDGE** A proportional relationship exists when one quantity is a multiple of the other. Equivalent ratios can be created by multiplying or dividing both terms of a given ratio by the same number. A proportion is an expression of equivalence between two ratios. A rate describes the proportional relationship represented by a set of equivalent ratios. A unit rate expresses a proportional relationship as a rate with a second term of 1. A percentage represents the ratio of a number to 100. Percent of a number can be determined by multiplying the number by the percent and dividing by 100.	**SKILLS & PROCEDURES** Determine whether two ratios are equivalent. Determine an equivalent ratio using a proportion. Express a unit rate to represent a given rate, including unit price and speed. Relate percentage of a number to a proportion. Determine a percent of a number, limited to percentages within 100%. Solve problems involving ratios, rates, and proportions.
Specific Outcome 7	**UNDERSTANDINGS**	**LEARNING OUTCOME**	**SKILLS & PROCEDURES**

Link

Sample Year at a Glance

The purpose of this document is to provide a possible Year Plan for organizing your units of instruction but more importantly, it provides a possible approach to scaffolding the learning that students will need if they do not have the prerequisite knowledge. Sections highlighted in yellow suggest starting points for addressing the Learner Outcome at a more appropriate entry level. Students will require sufficient time to access prior knowledge so a spiralled approach to the Learner Outcomes will likely be necessary.

Alberta Mathematics Sample Year Plan

Grade 6

What is Mathematics?

Mathematics is a universal language relying on a shared understanding of symbols and procedures to communicate ideas efficiently. It is a powerful tool used every day to solve real-life problems. The beauty of mathematics inspires curiosity about our world and the universe. As a subject, mathematics has historical roots in many cultures and continues to evolve in support of innovations. Mathematics involves learning across various disciplines, including arithmetic, algebra, geometry, statistics, and probability. In all disciplines, procedures may range from counting, calculating, and measuring to analyzing, modelling, and generalizing. Engaging with mathematics allows students to develop logical thinking skills, which contribute to effective decision making and problem solving. Students are able to extend their thinking beyond personal experiences through flexible and collaborative learning opportunities. Experiences with mathematics help students develop appreciation for the patterns and relationships that describe multiple aspects of the world and its future possibilities.Numeracy is a foundational building block of learning and is developed in all subjects in different ways. Central to the development of numeracy, the mathematics curriculum helps students acquire and apply the knowledge and skills necessary to interact with quantitative and spatial information in a variety of situations. Foundational numeracy focuses on counting, comparing, and calculating* with numbers; describing, representing, and measuring shapes and objects; collecting, organizing, and interpreting data; and creating and interpreting diagrams, graphs, and tables. Numeracy skills support real-life pursuits, including telling time, using and managing money, following instructions, finding an address, and reading a schedule. With a focus on numeracy, the mathematics curriculum provides all students with a solid foundation of mathematical knowledge, understanding, and skills to set them up for future success.

Mathematics education is an ongoing process of connecting students' concrete experiences to their comprehension of abstract concepts. A recognition of numbers and their application to counting and comparing form foundational knowledge and skills for students as they encounter a variety of quantitative information in their lives. The development of these skills supports students as they participate in family, community, and cultural activities. As their experiences broaden, students also learn that operations with numbers provide reliable and efficient options to counting and comparing. Students acquire knowledge of basic number facts that can be applied to addition, subtraction, multiplication, and division of larger numbers using commonly recognized algorithms. Students also communicate using conventional mathematical symbols and vocabulary. As students are exposed to more and varied quantitative information, they learn about different number systems and their applications to various situations, such as decimals for money and integers for temperature. In developing algebraic thinking skills, students transfer their understanding of properties of numbers to new or abstract problems.

Sample Year at a Glance: Mathematics - Grade 6

September 2023 ---------- November 2023

September	October	November
6N1.1 Students investigate magnitude with positive and negative numbers. • Symmetry of the number line extends infinitely to the left and right of zero or above and below zero. • Direction relative to zero is indicated symbolically with a positive or negative sign. • Magnitude with direction distinguishes between positive and negative numbers. * Review of math facts (12 x 12) with different strategies should be ongoing	6N1.2 Students investigate magnitude with positive and negative numbers. • Any number can be expressed as a sum in infinitely many ways. (begin with positive numbers) 6N2 Students solve problems using standard algorithms for addition and subtraction. (begin with money - review money, values to hundredths - dollars and cents) • Addition and subtraction of numbers in problem-solving contexts is facilitated by standard algorithms * Review of math facts (12 x 12) with different strategies should be ongoing	6N3.1 Students analyze numbers using prime factorization and exponentiation. • A product can be composed in multiple ways. (start with simple factor trees for example) • The prime factors of a number provide a picture of its divisibility. 6N3.2 Students analyze numbers using prime factorization and exponentiation. • Different representations of a product can provide new perspectives of its divisibility. (link to area diagrams) • A power is divisible by its base * Review of math facts (12 x 12) with different strategies should be ongoing
Geometry: Shapes are defined and related by geometric attributes.		
6G1.1 Students analyze shapes through symmetry and congruence. • Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation. (limit to reflection)	6G1.1 Students analyze shapes through symmetry and congruence. Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation. (include rotation)	
Coordinate Geometry:Location and movement of objects in space can be communicated using a coordinate grid.		

Sample Year at a Glance: Mathematics - Grade 6

September 2023 ---------- November 2023

September	October	November
6CG1.1 Students explain location and movement in relation to position in the Cartesian plane. • Location can be described using the Cartesian plane. • The Cartesian plane is the two-dimensional equivalent of the number line (may start with a quadrant 1 grid first to review plotting points)	6CG1.2 Students explain location and movement in relation to position in the Cartesian plane. • Location can change as a result of movement in space. • Change in location does not imply change in orientation. (students should be able to identify when orientation will be affected but that size does not change)	
Algebra: **Equations express relationships between quantities.**		
6A1.1 Students analyze expressions and solve algebraic equations.(no exponents - review order of operations) • The conventional order of operations can be applied to simplify or evaluate expressions (link to review of math facts 12 x 12)	6A1.1 Students analyze expressions and solve algebraic equations.(no exponents - review order of operations) • The conventional order of operations can be applied to simplify or evaluate expressions (link to review of math facts 12 x 12)	6A1.1 Students analyze expressions and solve algebraic equations.(exponents included) • The conventional order of operations can be applied to simplify or evaluate expressions.
Patterns: Awareness of patterns supports problem solving in various situations.		

Sample Year at a Glance: Mathematics - Grade 6

December 2023 ----------January 2024

December	January	February
Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating.		
6N4 Students apply standard algorithms to multiplication and division of decimal and natural numbers. • Multiplication and division of decimal numbers is facilitated by standard algorithms.(link to money and area models) * Review of math 12 x 12 facts with different strategies should be ongoing	6N4 Students apply standard algorithms to multiplication and division of decimal and natural numbers. • Multiplication and division of decimal numbers is facilitated by standard algorithms. * Review of math 12 x 12 facts with different strategies should be ongoing	6N5 Students relate fractions to quotients.(begin with unit fractions for money, move to equivalent fractions/decimals for money;stay with common denominators initially) • Fractions represent quotients in equal-sharing situations. • All equivalent fractions represent the same quotient 6N6 Students add and subtract fractions with denominators within 100. • Fractions with common denominators have the same units. • Any numbers with the same unit can be compared, added, or subtracted. * Review of math 12 x 12 facts with different strategies should be ongoing.
Algebra: **Equations express relationships between quantities.**		
LINK		6A1.2 Students analyze expressions and solve algebraic equations. • Algebraic properties ensure equivalence of algebraic expressions.

2+2=4

42:9

x

a

b

c

+

+

%

Taking Inventory

September 2022 ---------- 2022

September	October

Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating.

4N1 Students apply place value to decimal numbers (within 100)

- Decimal numbers are numbers between natural numbers
- Decimal numbers are fractions with denominators of 10, 100, etc. (introduce with basic money skills/fractions initially - unit fractions of denominator 10 & 100, number lines)
- The separation between wholes and parts, including dollars and cents, can be represented using decimal notation.(introduce with basic money skills/fractions initially)
- Patterns in place value are used to read and write numbers, including wholes and parts.(relate to money initially)

4N2 Students add and subtract within 10 000, including decimal numbers to hundredths.

- Standard algorithms for addition and subtraction may be used for any decimal numbers (initially whole numbers to 1000)

4N4 Students multiply and divide natural numbers within 10 000.(facts to 100 10x10)

- Multiplication and division strategies can be chosen based on the nature of the numbers

4N5.1 Students apply equivalence to the interpretation of fractions

- There are infinitely many equivalent fractions that

4N1 Students apply place value to decimal numbers (within 100)

- Decimal numbers are numbers between natural numbers
- Decimal numbers are fractions with denominators of 10, 100, etc.
- The separation between wholes and parts, including dollars and cents, can be represented using decimal notation.
- Patterns in place value are used to read and write numbers, including wholes and parts.(relate to money)

4N2 Students add and subtract within 10 000, including decimal numbers to hundredths.

- Standard algorithms for addition and subtraction may be used for any decimal numbers (whole numbers to 1000 - 5000, dollar amounts < $100)

4N4 Students multiply and divide natural numbers within 10 000.(facts 12 x 12)

- Multiplication and division strategies can be chosen based on the nature of the numbers
*this should be ongoing throughout the year

4N3 Students explain properties of prime and composite numbers using multiplication and division

- Different factors can compose the same product.
- Different products can share factors.
- A number divided by one of its factors will result in a remainder of 0.

How can place value facilitate interpretation of number?

4N1 Students apply place value to decimal numbers.

Knowledge	Understanding	Skills & Procedures
For numbers in base-10, each place has one-tenth the value of the place to its left. Multiplying or dividing a number by 10 corresponds to shifting place value one position to the left or right, respectively. The decimal separator is a point in English and a comma in French. Numbers, including decimal numbers, can be composed in various ways using place value. A zero placed to the right of the last digit in a decimal number does not change the value of the number. The word *and* is used to indicate the decimal point when reading a number.	Decimal numbers are numbers between natural numbers. Decimal numbers are fractions with denominators of 10, 100, etc. The separation between wholes and parts, including dollars and cents, can be represented using decimal notation. Patterns in place value are used to read and write numbers, including wholes and parts.	Identify the place value of each digit in a number, including tenths and hundredths. Relate the values of adjacent places, including tenths and hundredths. Determine the value of each digit in a number, including tenths and hundredths. Express numbers, including decimal numbers, using words and numerals. Express various compositions of a number, including decimal numbers, using place value. Recognize decimal notation expressed in English and in French. Round numbers to various places, including tenths. Compare and order numbers, including decimal numbers. Express the relationship between two numbers, including decimal

4N1 Students apply place value to decimal numbers (within 100)

- Decimal numbers are numbers between natural numbers
- Decimal numbers are fractions with denominators of 10, 100, etc. (introduce with basic money skills/fractions initially - unit fractions of denominator 10 & 100, number lines)
- The separation between wholes and parts, including dollars and cents, can be represented using decimal notation.(introduce with basic money skills/fractions initially)
- Patterns in place value are used to read and write numbers, including wholes and parts.(relate to money initially)

2+2=4

Notes: How do you leverage money?

- Work within 100, leave decimals out initially
- Learn money and values
- Put together 2 digit whole number dollar amounts
- Count out bills to end in a 2-digit whole dollar amount
- Make change to a dollar, $5.00, $10.00, change for $100.00
- Addition and subtraction by counting back change
- Compare money amounts
- Describe a 2 digit/3 digit dollar amount in place value terms
- Practice reading and writing 3 digit numbers - relate to $100/$10/loonies
- Regroup money - use mats *** must be comfortable and fluent in money
- Dice rolling, write largest number and smallest number
- Multiply dice
- Subitizing cards
-

How can understanding of addition and subtraction be extended to decimal numbers?		
4N2 Students add and subtract within 10 000, including decimal numbers to hundredths.		
Knowledge	Understanding	Skills & Procedures
Standard algorithms for addition and subtraction of decimal numbers are conventional procedures based on place value. Estimation can be used to check the reasonableness of a sum or difference.	Standard algorithms for addition and subtraction may be used for any decimal numbers.	Add and subtract numbers, including decimal numbers, using standard algorithms. Assess the reasonableness of a sum or difference using estimation. Solve problems using addition and subtraction, including problems involving money.

4N2 Students add and subtract within 10 000, including decimal numbers to hundredths.

- Standard algorithms for addition and subtraction may be used for any decimal numbers (initially whole numbers to 1000)

Notes:

- Could use dominos turned sideways
- Read and write 3 digit numbers
- Compare numbers

How can multiplication and division characterize the composition of numbers?

4N3 Students explain properties of prime and composite numbers using multiplication and division.

Knowledge	Understanding	Skills & Procedures
A factor of a number is a divisor of that number. A number is a multiple of any of its factors. A prime number has factors of only itself and one. A composite number has factors other than one and itself. Zero and one are neither prime nor composite numbers.	Different factors can compose the same product. Different products can share factors. A number divided by one of its factors will result in a remainder of 0.	Determine the factors of a numbe within 100. Describe a number as prime or composite. Determine the first five multiples of a given number within 100. Recognize the greatest common factor (greatest common divisor) of two numbers within 100.

4N3 Students explain properties of prime and composite numbers using multiplication and division

- Different factors can compose the same product.
- Different products can share factors.
- A number divided by one of its factors will result in a remainder of 0.

Notes:

- Skip counting
- Work on number facts 10x10
- Factor composite numbers within 100 (factor trees)
- Money arrays
-

How can multiplication and division be interpreted?

4N4 Students multiply and divide natural numbers within 10 000.

Knowledge	Understanding	Skills & Procedures
Recall of multiplication and division number facts facilitates multiplication and division strategies. Standard algorithms facilitate multiplication and division of natural numbers that have multiple digits. Estimation can be used to check the reasonableness of a product or quotient.	Multiplication and division strategies can be chosen based on the nature of the numbers.	Recall and apply multiplication number facts, with factors to 12,and related division number facts. Investigate patterns in multiplication and division of natural numbers by 10, 100, and 1000. Multiply and divide 3-digit natural numbers by 1-digit natural numbers using personal strategies. Examine standard algorithms for multiplication and division. Multiply and divide 3-digit natural numbers by 1-digit natural numbers using standard algorithms. Divide and express a quotient with or without a remainder. Investigate strategies for estimation of products and quotients. Assess the reasonableness of a product or quotient using estimation. Solve problems using multiplication and division

4N4 Students multiply and divide natural numbers within 10 000.(facts to 100 10x10)

- Multiplication and division strategies can be chosen based on the nature of the numbers

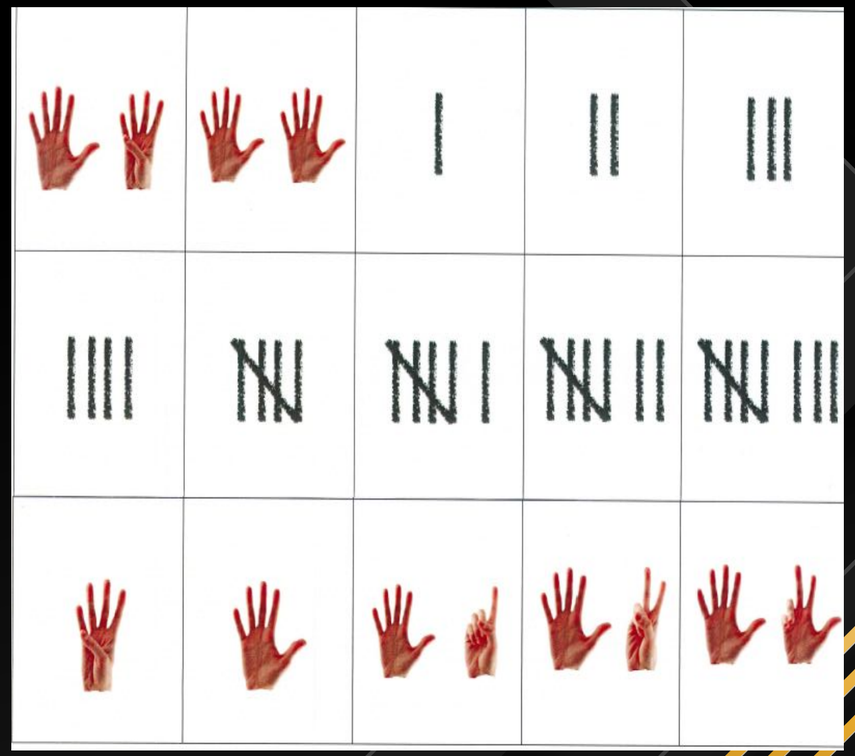
4N5.1 Students apply equivalence to the interpretation of fractions

- There are infinitely many equivalent fractions that

Notes:

- Dice rolling, write largest number and smallest number
- Multiply dice
- Subitizing cards
- Arrays of money
- Multiplication with money amounts
- Closest to 100 grid board

Additional Starting Points



MONEY

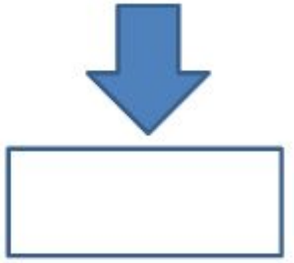
APP


twenty
three
4

Place Value Chart Beginning with Money (Loonie, $5, $10, $50, $100)

	+		+		+		+	

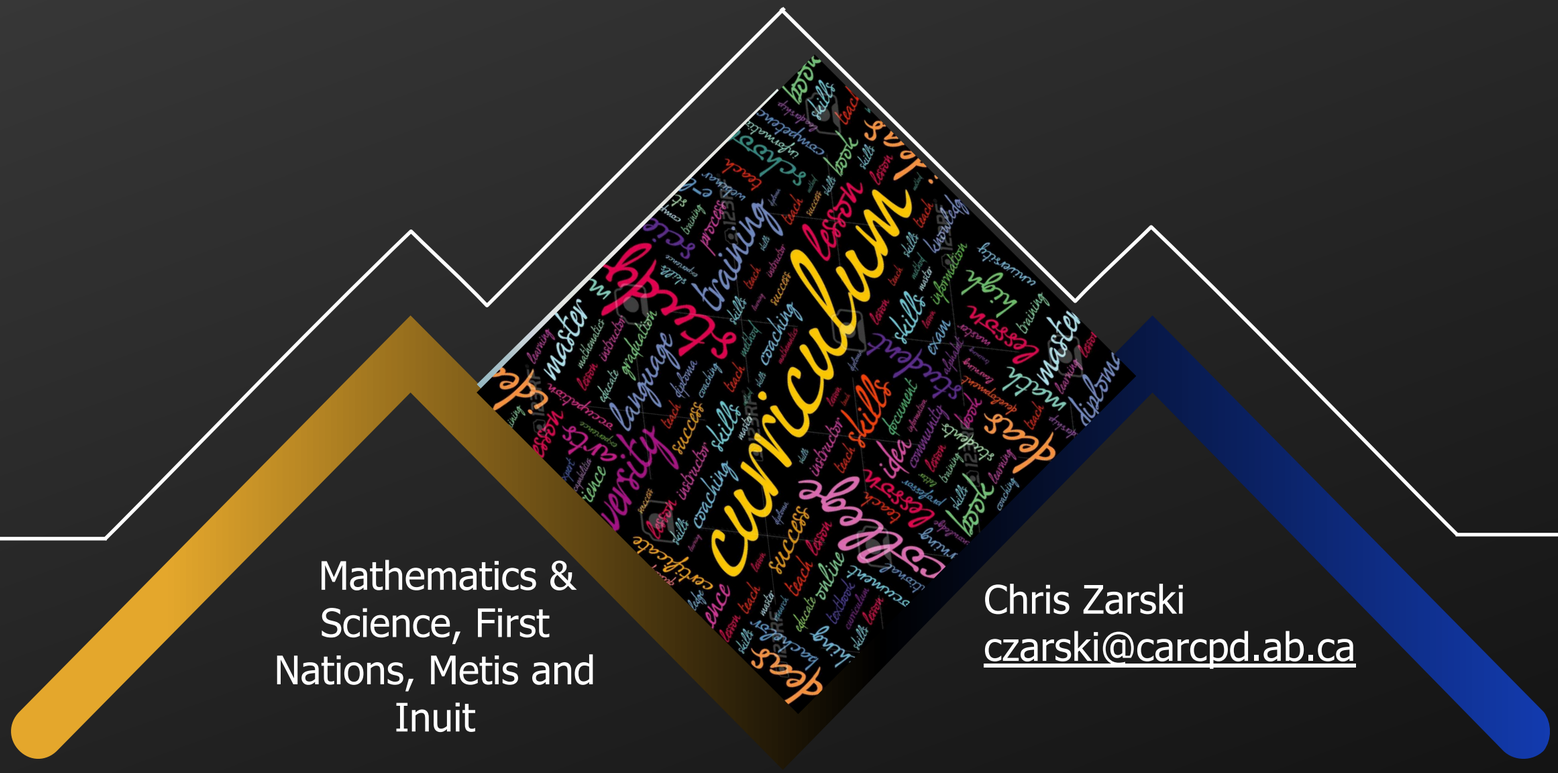


Resource Folder

www.highprairieresources.ca

www.arpdc.ab.ca (still being built and refined)

www.movingforwardcurriculum.ca



Mathematics & Science, First Nations, Metis and Inuit

Chris Zarski
czarski@carcpd.ab.ca

Thank You!

Please don’t hesitate to connect.

YOUR TITLE

1

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text.

2

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text.

3

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text.

4

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text.

GEOMETRIC TITLE

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a gallery. Your text goes here, customize this area with your text.

Here is the second paragraph of the Midnight Geometric Template. This will give you an indication of what your text would look like in this application. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a gallery. Your text goes here, customize this area with your text.

YOUR TITLE

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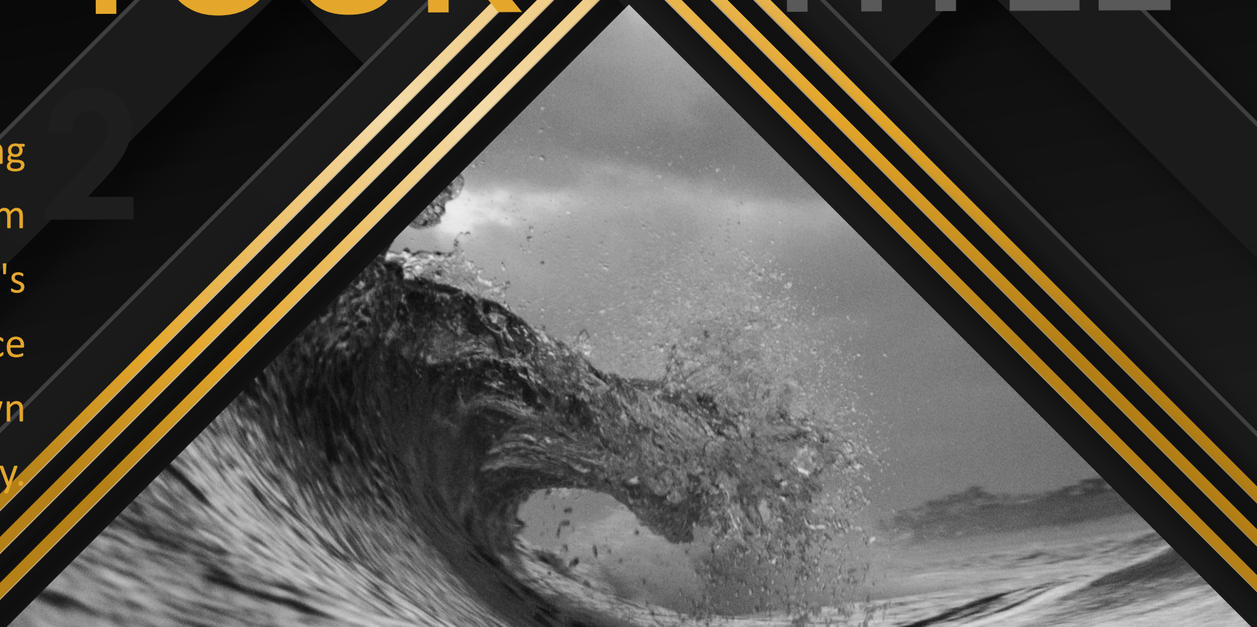
01

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a gallery.

YOUR TITLE

02

Simply dummy text of the printing and typesetting industry. Lorem Ipsum has been the industry's standard dummy text ever since the 1500s, when an unknown printer took a gallery.



MIDNIGHT GEOMETRY

SIMPLE DUMMY TEXT OF THE PRINTING & TYPESETTING INDUSTRY

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