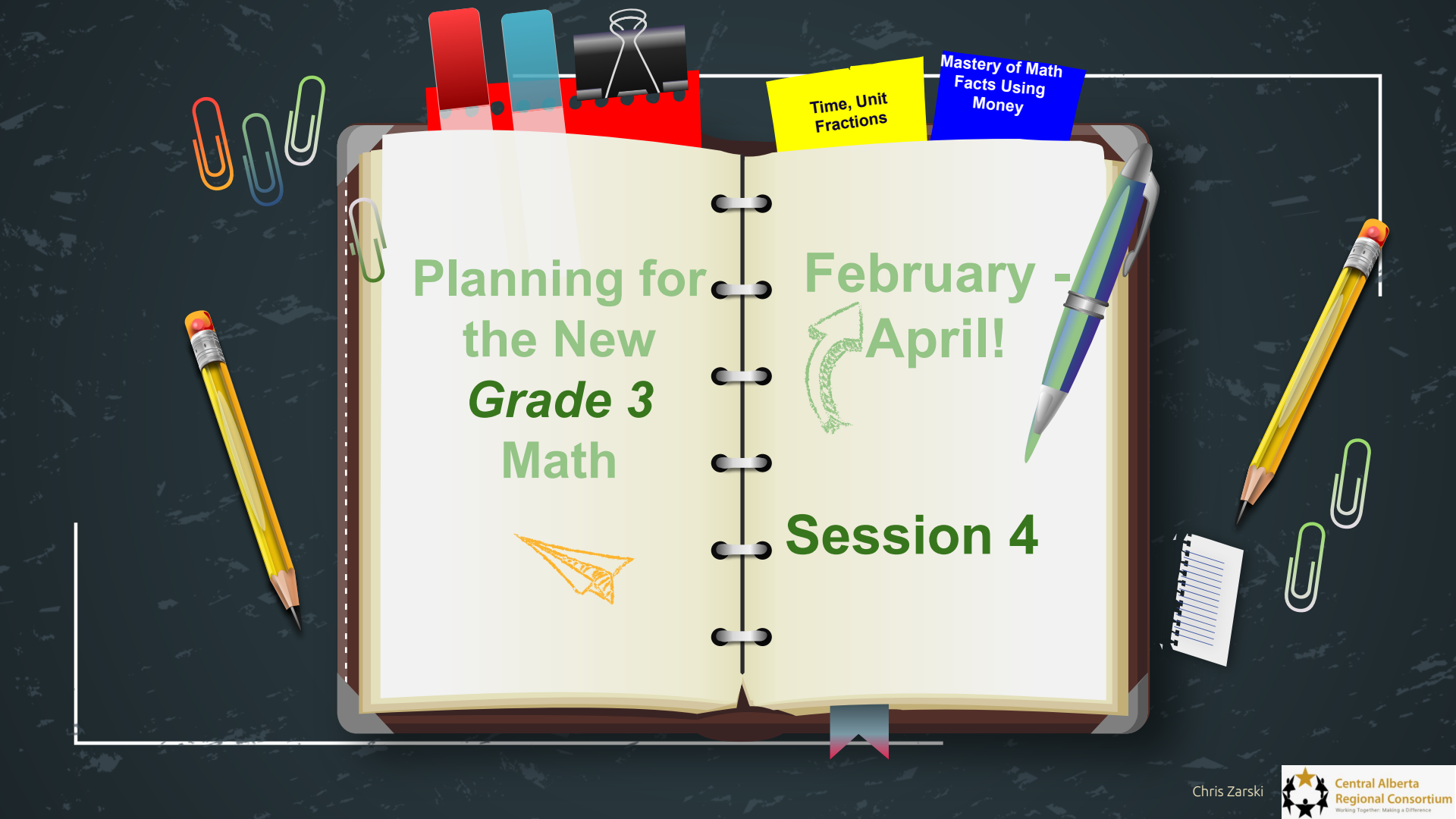

Chris Zarski
Central Alberta Regional Consortium
Working Together: Making a Difference


TREATY 6
ACKNOWLEDGEMENT
We acknowledge that we are on Treaty 6 Territory, a traditional meeting grounds, gathering place, and travelling route to the Cree, Saulteaux, Blackfoot, Métis, Dene and Nakota Sioux. We acknowledge all the many first nations, Métis and Inuit whose footsteps have marked these lands for centuries.

Bev Facey HS

February

3N2. Students apply addition and subtraction within 1000.(100-1 000)

- Addition and subtraction strategies can be chosen based on the nature of the numbers.
- Standard algorithms are universal tools for addition and subtraction and may be used for any natural numbers independently of their nature.

3N3.1Students analyze and apply strategies for multiplication and division within 100.

- Quantities can be composed and decomposed through multiplication and division.

3N3.2 Students analyze and apply strategies for multiplication and division within 100.

- Sharing and grouping situations can be interpreted as multiplication or division.(5x5 Mastery)
- Multiplication and division strategies can be supported by addition and subtraction.

3N3.3 Students analyze and apply strategies for multiplication and division within 100.

- Multiplication number facts have related division facts.

3N4 Students interpret fractions in relation to one whole.

- Fractions are numbers between natural numbers.

February

- Fractions can represent part-to- whole relationships.
- A unit fraction describes the size of the equal parts of a fraction. (begin with Unit Fractions linked to money)
- The size of the parts and the total number of equal parts in the whole are inversely related.

Needs and Wants; Savings

Mastery of 5x5 and now working towards the 10 x 10 Learner Outcome

Watch the November video as we unpacked how we might use money to leverage their understanding and learning of math facts, arrays, how we can connect this to the unit fraction. Unit fractions are foundational - skip count by them, add them by repeated counting to see how we get to the whole; apply this to time.

February

3M1. 1 Students determine length using standard units.

- Length is measured in standard units according to the metric system and the imperial system.
- Length can be expressed in various units according to context and desired precision.

3M1.2 Students determine length using standard units.

- Length remains the same when decomposed or rearranged.

3M1.3 Students determine length using standard units.

- Length can be estimated when less accuracy is required.

3T1. Students tell time using clocks.

- Clocks are standard measuring tools used to communicate time.

Ongoing - use for number (skip counting, link to unit fractions, link to angles)

3P1.1 Students analyze patterns in numerical sequences.

- A sequence is a list of terms arranged in a certain order.
- Sequences may be finite or infinite

3P1.2 Students analyze patterns in numerical sequences.

- A sequence can progress according to a pattern.

Ongoing - begin with money

Another form of Measurement

March	April

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

3N1. Students interpret place value within 100 000. (10 000 - 100 000)

- Place value is the basis for the base-10 system.
- Place value determines the value of a digit based on its place in a number, relative to the one's place.
- Place value is used to read, write, and compare numbers.

3N3.1 Students acquire an understanding of multiplication and division within 100.

- Quantities can be composed and decomposed through multiplication and division.

3N3.2 Students acquire an understanding of multiplication and division within 100.

- Sharing and grouping situations can be interpreted as multiplication or division.
- Multiplication and division strategies can be supported by addition and subtraction.

3N3.3 A multiplication table shows both multiplication and division facts.

- Multiplication number facts have related division facts.

3N3.2 Students acquire an understanding of multiplication and division within 100.

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3N4 Students interpret fractions in relation to one whole.

- Fractions are numbers between natural numbers.
- Fractions can represent part-to- whole relationships.
- A unit fraction describes the size of the equal parts of a fraction.
- The size of the parts and the total number of equal parts in the whole are inversely related.

March

3N4 Students interpret fractions in relation to one whole. (begin with unit fractions)

- Fractions are numbers between natural numbers.
- Fractions can represent part-to-whole relationships.
- A unit fraction describes the size of the equal parts of a fraction.
- The size of the parts and the total number of equal parts in the whole are inversely related.

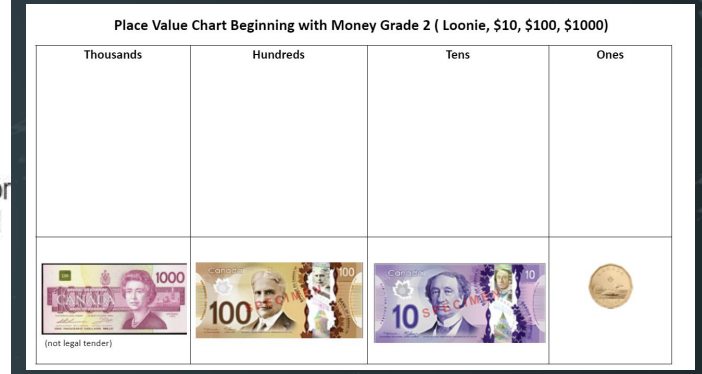
March	April
Time: Duration is described and quantified with time.	
3T1. Students tell time using clocks. • Clocks are standard measuring tools used to communicate time. Ongoing - use for number (skip counting, link to unit fractions, link to angles)	3T1. Students tell time using clocks. • Clocks are standard measuring tools used to communicate time. Ongoing - use for number (skip counting, link to unit fractions, link to angles)
Patterns: Awareness of patterns supports problem solving in various situations.	
3P1.1 Students analyze patterns in numerical sequences. • A sequence is a list of terms arranged in a certain order. • Sequences may be finite or infinite 3P1.2 Students analyze patterns in numerical sequences. • A sequence can progress according to a pattern.	

How can processes be established for addition and subtraction?

3N2 Students apply strategies for addition and subtraction within 1000.

Knowledge	Understanding	Skills & Procedures
Recall of addition and subtraction number facts facilitates addition and subtraction strategies. Standard algorithms for addition and subtraction are conventional procedures based on place value. Estimation can be used to support addition and subtraction in everyday situations, including o when an exact sum or o difference is not needed to check if an answer is reasonable	Addition and subtraction strategies can be chosen based on the nature of the numbers. Standard algorithms for addition and subtraction may be used for any natural numbers.	Relate strategies for the addition and subtraction of two-digit numbers to strategies for the addition and subtraction of three-digit numbers. Model regrouping by place value for addition and subtraction. Explain the standard algorithms for addition and subtraction of natural numbers. Add and subtract natural numbers using standard algorithms. Estimate sums and differences. Solve problems using addition and subtraction.

Practice Converting and Trading with the Money Mat Thousand, Hundred, Tens, Ones



Abacus

What are the unit fractions for each of these values?

Fraction Blocks

- Go to www.brainingcamp.com
- Click on Redeem Code
- Enter – WINTER23

Cuisenaire Rods

Money

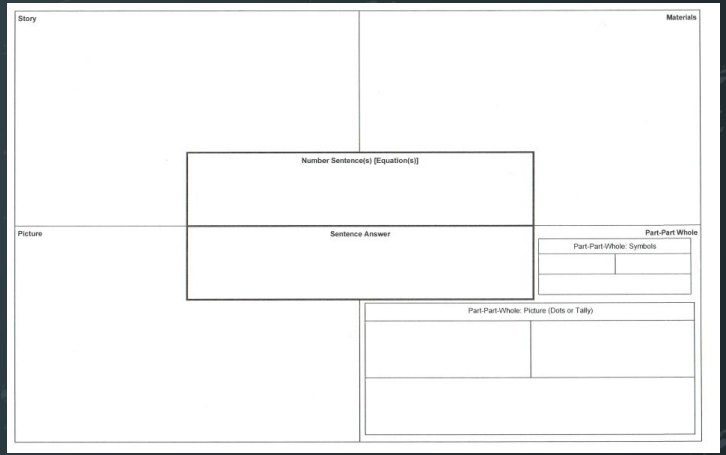
How can multiplication and division provide new perspectives of number?

3N3.1 Students analyze and apply strategies for multiplication and division within 100.

Knowledge	Understanding	Skills & Procedures
Multiplication and division are inverse mathematical operations. Multiplication is repeated addition. Multiplication can be interpreted in various ways according to context, such as ▫ ▫ equal ▫ groups an array an area Division can be interpreted in various ways according to context, such as ▫ ▫ equal sharing equal grouping repeated subtraction The order in which two quantities are multiplied does not affect the product (commutative property). The order in which two numbers are divided affects the quotient. Multiplication or division by 1 results in the same number (identity property).	Quantities can be composed and decomposed through multiplication and division.	Compose a product using equal groups of objects. Relate multiplication to repeated addition. Relate multiplication to skip counting. Investigate multiplication by 0. Model a quotient by partitioning a quantity into equal groups or groups of a certain size, with or without remainders. Visualize and model products and quotients as arrays. Recognize interpretations of multiplication and division in various contexts.

Digital Tool Kit

Number Sentence Mat



Partial Product Finder

Foldable

1 group of _____ is the same as

2 groups of ____ is the same as

3 groups of ____ is the same as

4 groups of ____ is the same as

5 groups of ____ is the same as

6 groups of ____ is the same as

7 groups of ____ is the same as

8 groups of ____ is the same as

9 groups of ____ is the same as

10 groups of ____ is the same as

Pictures Groups

Repeated Addition

Arrays

Using a Grid

Number Line

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40

40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

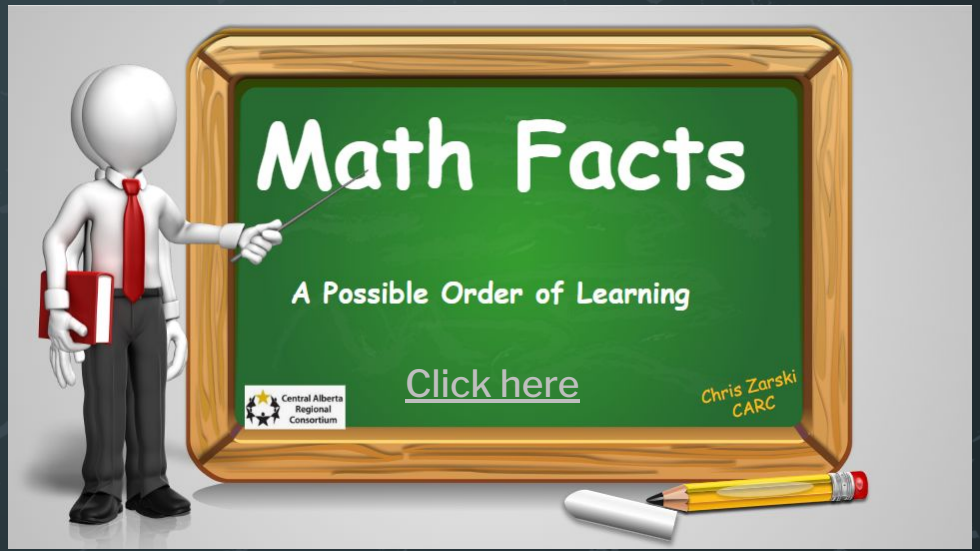
60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80

80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Grade 3		
3N3.2 Students analyze and apply strategies for multiplication and division within 100.		
Knowledge	Understanding	Skills & Procedures
Numbers can be multiplied or divided in parts (distributive property). Multiplication strategies include • repeated addition • multiplying in parts • compensation Division strategies include • repeated subtraction • partitioning the dividend Products can be expressed symbolically using the multiplication sign, ×, factors, and the equal sign. Quotients can be expressed symbolically using the division sign, ÷, dividend, divisor, and the equal sign. A missing quantity in a product or quotient can be represented in different ways, including • $a \times b = \square$ • $a \times \square = c$ • $\square \times b = c$ • $e \div f = \square$ • $e \div \square = g$ • $\square \div f = g$ A remainder is the quantity left over after division.	Sharing and grouping situations can be interpreted as multiplication or division. Multiplication and division strategies can be supported by addition and subtraction.	Investigate multiplication and division strategies. Multiply and divide within 100. Verify a product or quotient using inverse operations. Determine a missing quantity in a product or quotient in a variety of ways. Express multiplication and division symbolically. Explain the meaning of the remainder in various situations. Solve problems using multiplication and division in sharing or grouping situations.

The inside of the Foldable allows for multiple representations.

3N3.3 Students analyze and apply strategies for multiplication and division within 100.		
Knowledge	Understanding	Skills & Procedures
A multiplication table shows both multiplication and division facts. Fact families are groups of related multiplication and division number facts.	Multiplication number facts have related division facts.	Examine patterns in multiplication and division, including patterns in multiplication tables and skip counting. Recognize families of related multiplication and division number facts. Recall multiplication number facts, with factors to 10, and related division facts.



How can fractions contribute to a sense of number?

3N4 Students interpret fractions in relation to one whole.

Knowledge	Understanding	Skills & Procedures
The same fraction can represent ▫ equal parts of one whole ▫ length, shape, or object equal groups of one whole ▫ quantity equal parts of each equal group in one whole quantity The name of a fraction describes its composition as a number of unit fractions. Fraction notation, $(\frac{a}{b})$, relates the numerator, *a*, a number of equal parts, to the denominator, *b*, the total number of equal parts in the whole. Equal numerators or equal denominators can facilitate the comparison of fractions. A fraction with a numerator that is equal to its denominator is one whole. Each fraction is associated with a point on the number line.	Fractions are numbers between natural numbers. Fractions can represent part-to-whole relationships. A unit fraction describes the size of the equal parts of a fraction. The size of the parts and the total number of equal parts in the whole are inversely related.	Model fractions of a whole quantity, length, shape, or object, in various ways, limited to denominators of 12 or less. Visualize fractions as compositions of a unit fraction. Identify the numerator and denominator of a fraction in various representations. Name a given fraction. Express fractions, including one whole, symbolically, limited to denominators of 12 or less. Relate various representations of the same fraction, limited to denominators of 12 or less. Compare the same fraction of different-sized wholes. Compare different fractions of the same whole that have the same denominator. Compare different fractions of the same whole that have the same numerator and different denominators. Express the relationship between two fractions of the same whole, using <, >, or =. Relate a fraction less than one to its position on the number line, limited to denominators of 12 or less. Compare fractions to benchmarks of 0, $\frac{1}{2}$, and 1.

Review session 3 for identifying and counting by unit fractions.

In what ways can length be communicated?		
3M1.1 Students determine length using standard units.		
Knowledge	Understanding	Skills & Procedures
The basic unit of length in the metric system is the metre. Metric units are named using prefixes that indicate the relationship to the basic unit, including ▫ milli: one thousand millimetres in one metre ▫ centi: one hundred centimetres in one metre ▫ deci: ten decimetres in one metre Metric units are abbreviated for convenience, including ▫ m: metre ▫ dm: ▫ decimetre cm: centimetre mm: millimetre Standard measuring tools show iterations of a standard unit from an origin. Units of length in the imperial system include inch, foot, and yard, related in these ways: ▫ 12 inches in one foot 36 inches in one yard 3 feet in one yard Approximate conversions between metric and imperial are useful in real-world situations, including ▫ $2\frac{1}{2}$ centimetres are approximately 1 inch	Length is measured in standard units according to the metric system and the imperial system. Length can be expressed in various units according to context and desired precision.	Relate millimetres, centimetres, and metres. Relate inches to feet and yards. Justify the choice of millimetres, centimetres, or metres to measure various lengths. Measure lengths of straight lines and curves, with millimetres, centimetres, or metres. Recognize length expressed in metric or imperial units. Approximate a measurement in inches, feet, or yards using centimetres or metres.

Students need a strong understanding of unit fractions before we go to the Measurement units.

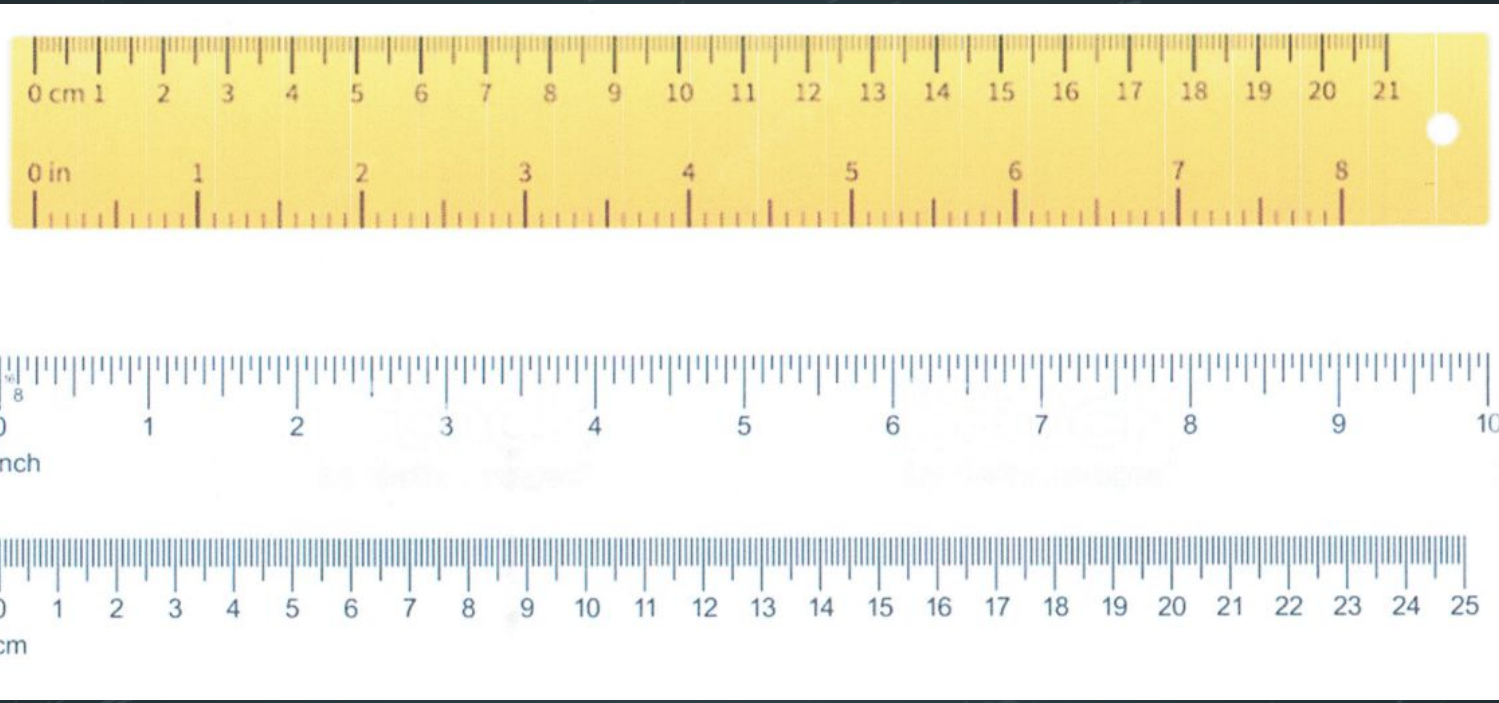
Counting by ½, ¼, ⅛, 1/12 is important

Formatives in the folder

Additional one's at K5 as well as K5 (metric)

Imperial Measure

Don't forget to check the Math Kits Grade 3 www.movingforwardcurriculum.ca website for imperial and metric rulers.


0 cm 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21
0 in 1 2 3 4 5 6 7 8
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0 1 2 3 4 5 6 7 8 9 10
inch
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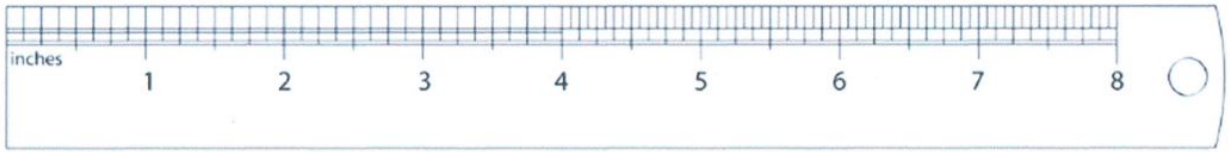
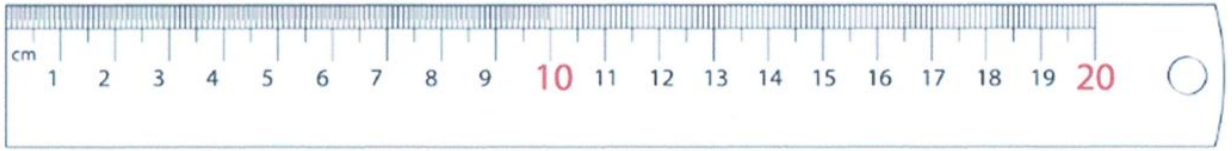
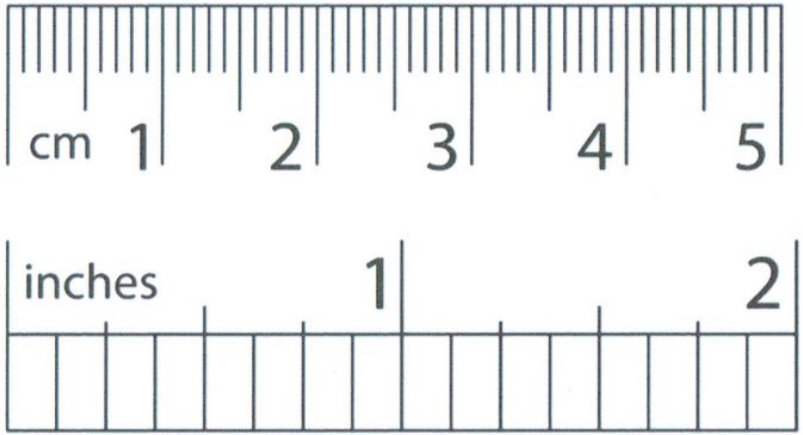
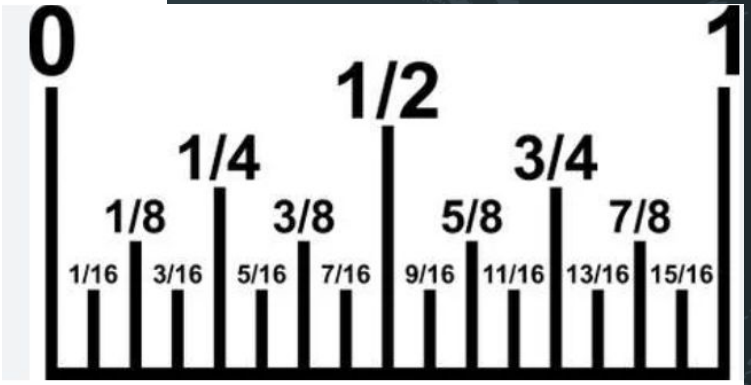
cm







The importance of knowing how to count by unit fractions.



3M1.2 Students determine length using standard units.		
Knowledge	Understanding	Skills & Procedures
The perimeter of a polygon is the sum of the lengths of its sides.	Length remains the same when decomposed or rearranged.	Determine the perimeter of polygons. Determine the length of an unknown side given the perimeter of a polygon.

Place shapes on grid paper; draw arrays on grid paper; Use Cuisenaire Rods
Nrich

3M1.3 Students determine length using standard units.		
Knowledge	Understanding	Skills & Procedures
A benchmark is a known length to which another length can be compared. Length can be estimated using a personal or familiar referent.	Length can be estimated when less accuracy is required.	Identify referents for a centimetre and a metre. Estimate length by comparing to a benchmark. Estimate length by visualizing the iteration of a referent for a centimetre or metre.

Finger width vs personal height, table height etc.

How can diverse representations of patterns contribute to interpretation of change?

3P1.1 Students analyze patterns in numerical sequences.

Knowledge	Understanding	Skills & Procedures
Ordinal numbers can indicate position in a sequence. Finite sequences, such as a countdown, have a definite end. Infinite sequences, such as the natural numbers, never end.	A sequence is a list of terms arranged in a certain order. Sequences may be finite or infinite.	Recognize familiar numerical sequences, including the sequence of even or odd numbers. Describe position in a sequence using ordinal numbers. Differentiate between finite and infinite sequences.

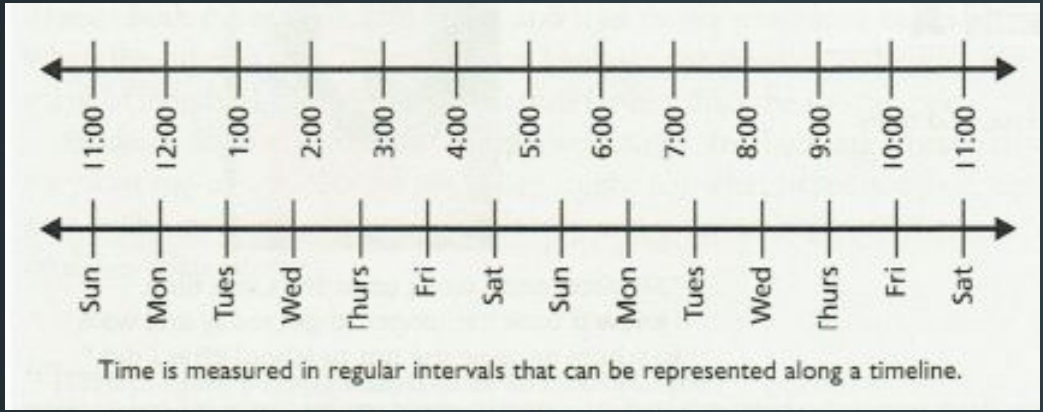
3P1.2 Students analyze patterns in numerical sequences.

Knowledge	Understanding	Skills & Procedures
Numerical sequences can be constructed using addition, subtraction, multiplication, or division.	A sequence can progress according to a pattern.	Recognize skip-counting sequences in various representations, including rows or columns of a multiplication table. Determine any missing term in a skip-counting sequence using multiplication.

Measuring *time* and telling *time* are different processes. Measuring *time* is like measuring length. Time, as a measurement is about ‘duration’ (how long it takes an even from beginning to end). We can measure duration in second, minutes, hours, days, weeks years etc. so knowing a variety of tool that help us measure time is helpful. Standard clocks, stop watches and non-standard hour glass, egg timer etc.

Small, M.(2017). *Making math meaningful*. Nelson Education Ltd. p.541

Time as a linear model



Time is measured in regular intervals that can be represented along a timeline.

Small, M.(2017). *Making math meaningful*. Nelson Education Ltd. p.541

Standard Units of Time

MINUTES (min)

Defining a Minute

A *minute* is equal to 60 seconds. It is also $\frac{1}{60}$ of an hour.

Minute Referents

To help students get a feel for 1 minute, a teacher might use an estimating activity. First, students watch as the teacher times 1 minute. Then they put their heads down, and they raise their hands when they think 1 minute is over.

Other activities that will help students establish personal referents include problems such as the following:

- How many times can you write your name in 1 minute?
- How many times can you clap your hands in 1 minute?
- How high can you count in 1 minute?
- How far can you go saying the letters of the alphabet in 1 minute?

HOURS (h)

Defining an Hour

An *hour* is equal to 60 minutes.

Hour Referents

To help students establish personal referents for 1 hour, a teacher might pose problems such as the following:

- What takes you about 1 hour to do?
- How far could you walk in 1 hour?

Familiar referents for 1 hour might include the amount of time students spend in math class, the length of a favourite TV show, or how long they have for lunch and recess.

SECONDS (s)

Defining a Second

A *second* is the basic SI unit of time

Second Referents

To help students establish personal referents for seconds, a teacher might pose problems such as the following:

- What is something that takes about 1 second to do?
- What is something that takes about 10 seconds to do?
- How many seconds does it take you to walk 100 m? to run 100 m?

Small, M.(2017). *Making math meaningful*. Nelson Education Ltd. p.544

How can duration be communicated?

3T1 Students tell time using clocks.

Knowledge	Understanding	Skills & Procedures
Clocks relate seconds to minutes and hours according to a base-60 system. The basic unit of time is the second. One second is $\frac{1}{60}$ of a minute. One minute is $\frac{1}{60}$ of an hour. Analog and digital clocks represent time of day. Time of day can be expressed as a duration relative to 12:00 in two 12-hour cycles. Time of day can be expressed as a duration relative to 0:00 in one 24-hour cycle in some contexts, including French-language contexts.	Clocks are standard measuring tools used to communicate time.	Investigate relationships between seconds, minutes, and hours using an analog clock. Relate minutes past the hour to minutes until the next hour. Describe time of day as a.m. or p.m. relative to 12-hour cycles of day and night. Tell time using analog and digital clocks. Express time of day in relation to one 24-hour cycle.

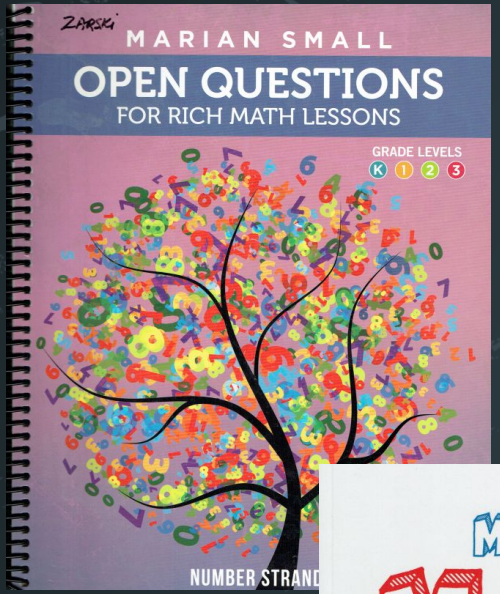
Need to understand *Unit Fraction* before we do seconds, minutes, hours etc.

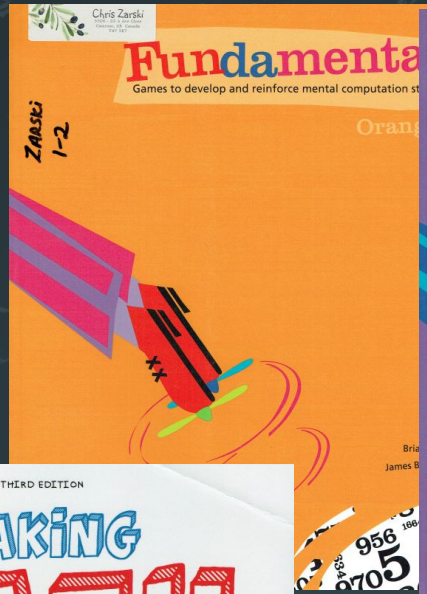
Important that students understand what the 'unit' is in each context:

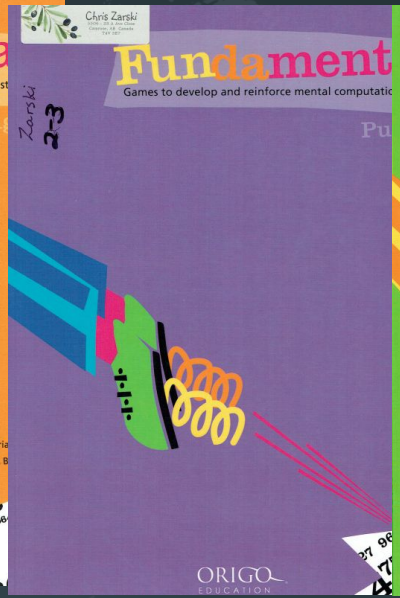
Mathigon

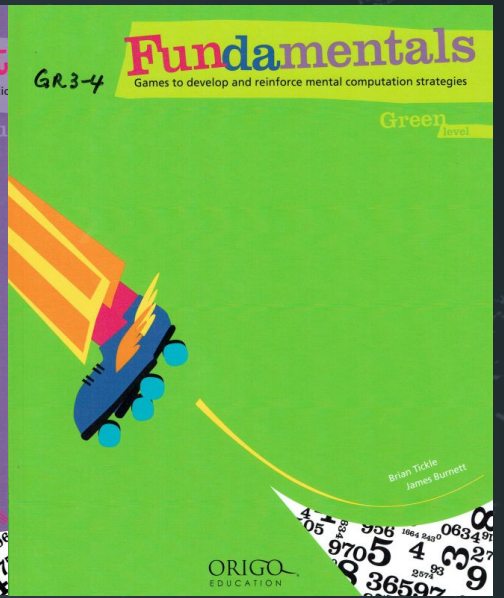
Brainingcamp.com

K5 Formatives

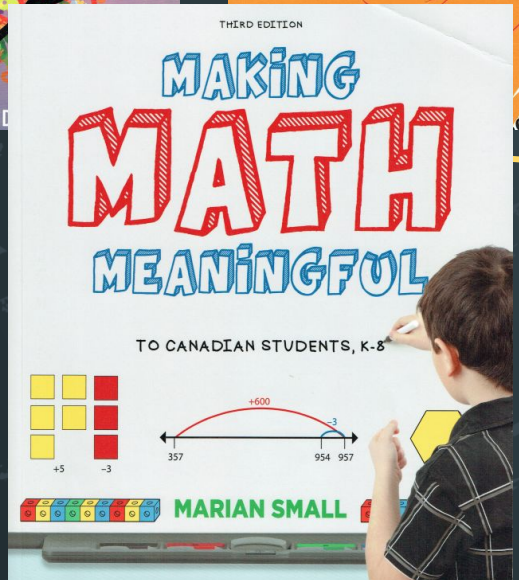








Rubicon



Origo

Any questions?