Grade 6 Planning Session 2
Review Sept/Oct & Planning for Nov/Dec

Provincial Cohort
October 25, 2023

Presenter: Chris Zarski

Alberta Regional Professional Development Consortia
Adult learning for students' sake

Acknowledgment of Land and People

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 Indigenous, 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.

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Welcome back!

Agenda:

- Review of where we are - Looking at September - November
- Outcomes and Concepts - what does it mean?
- How do the Concepts link to assessment?
- Money and how we might leverage it for our journey to '100 + in decimals', whole numbers between 1000 – 5000, math facts 12x12
- Activities to engage and reinforce learning
- How else can we 'compose products' visually? Cuisenaire Rods
- Exploring the website - where will find the resources?

Central Alberta Regional Consortium

Success Criteria

This session will be successful if, at the end, you will ...

1

Confidence

... feel confident in navigating the new Math curriculum and its associated resources.

2

Direction

... have a sense of direction in moving forward with implementing the new curriculum.

3

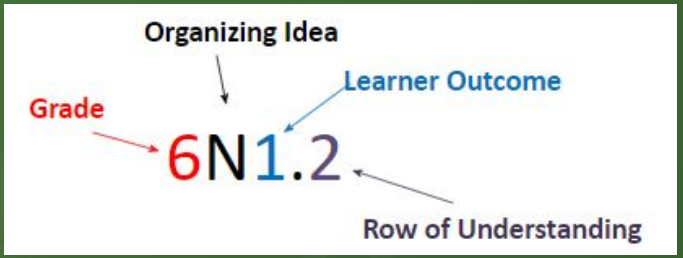
Efficacy

... have a sense of efficacy that you have the skillset and resources to make the implementation work.

Organizing Idea

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

Link



	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.	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	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

A Note on Wording

6N1.1 Students investigate magnitude with positive and negative numbers.
Negative numbers communicate meaning in context, including:

- **temperature**
- **debt**
- **elevation**

6N3.1 Any composite number can be expressed as a product of smaller numbers (factorization).

6M1.2 Students analyze areas of parallelograms and triangles.
Area of composite shapes can be interpreted as the sum of the areas of multiple shapes, such as

- **triangles**
- **parallelograms.**

All that follows “include” must be taught, but other examples can be added.

Parenthesized words are words students need to know but can be interchanged with the alternate wording during discussions. (Age appropriateness)

What follows “such” are examples and don’t have to all be covered or can be replaced with alternatives.

Progressions

Link

Competencies

- Critical Thinking
- Problem Solving
- Research and Managing Information
- Creativity and Innovation
- Communication
- Collaboration
- Citizenship
- Personal Growth and Well-being

Literacy

- Literacy involves acquiring and applying the understanding and skills necessary to decode, evaluate, and logically communicate ideas and build meaning, using oral, written, visual, and multimedia sources.
- Literacy is embedded in learning across all subject areas. It is foundational, allowing students to live, learn, and work as knowledgeable, active participants in a democratic society.
- **The Literacy Progressions** identify knowledge and behaviours that students may demonstrate by the end of each divisional age range.

Numeracy

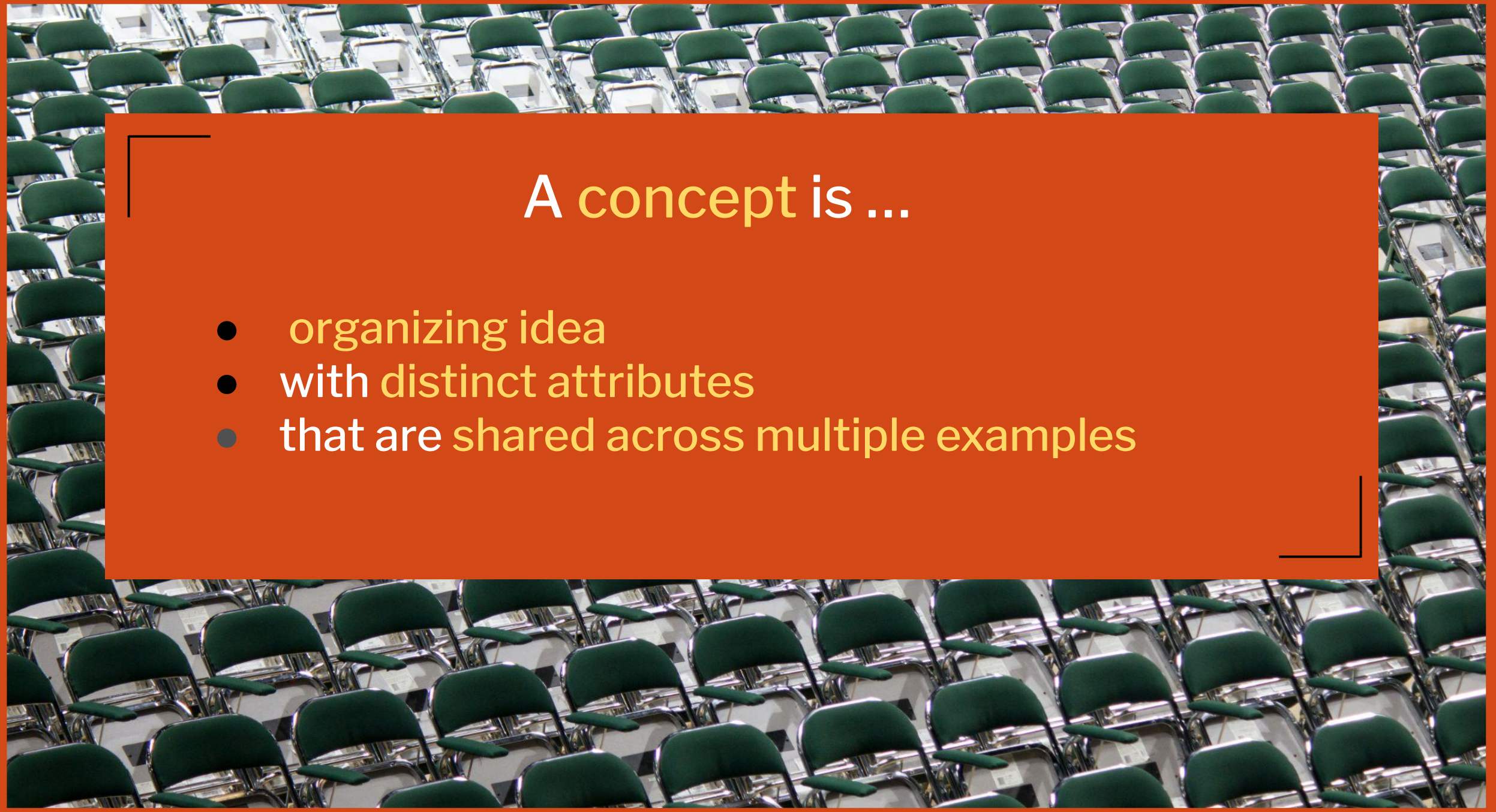
- Numeracy involves acquiring and applying the mathematical knowledge and skills needed to engage with quantitative and spatial information in a variety of situations.
- Numeracy is embedded in learning experiences across all subject areas
- **The Numeracy Progressions** identify knowledge and behaviours that students may demonstrate by the end of each divisional age range.

Looking at the curriculum through the lens of concepts.

¡Concepts

!

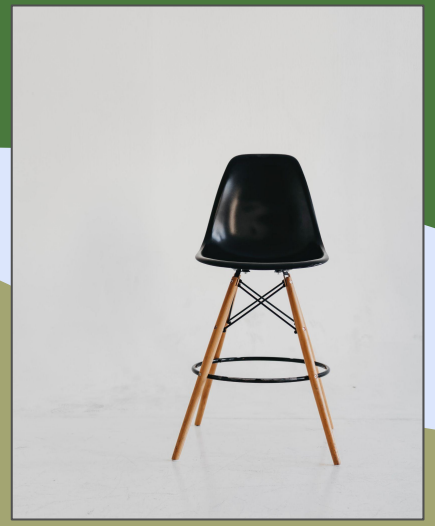
What is a concept?

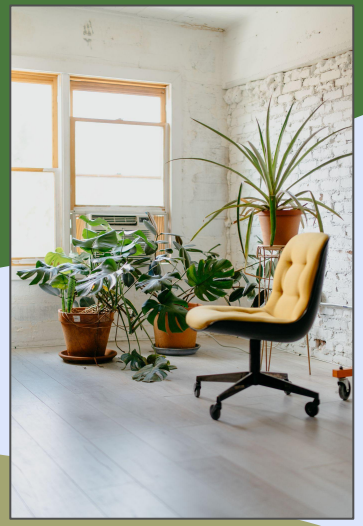


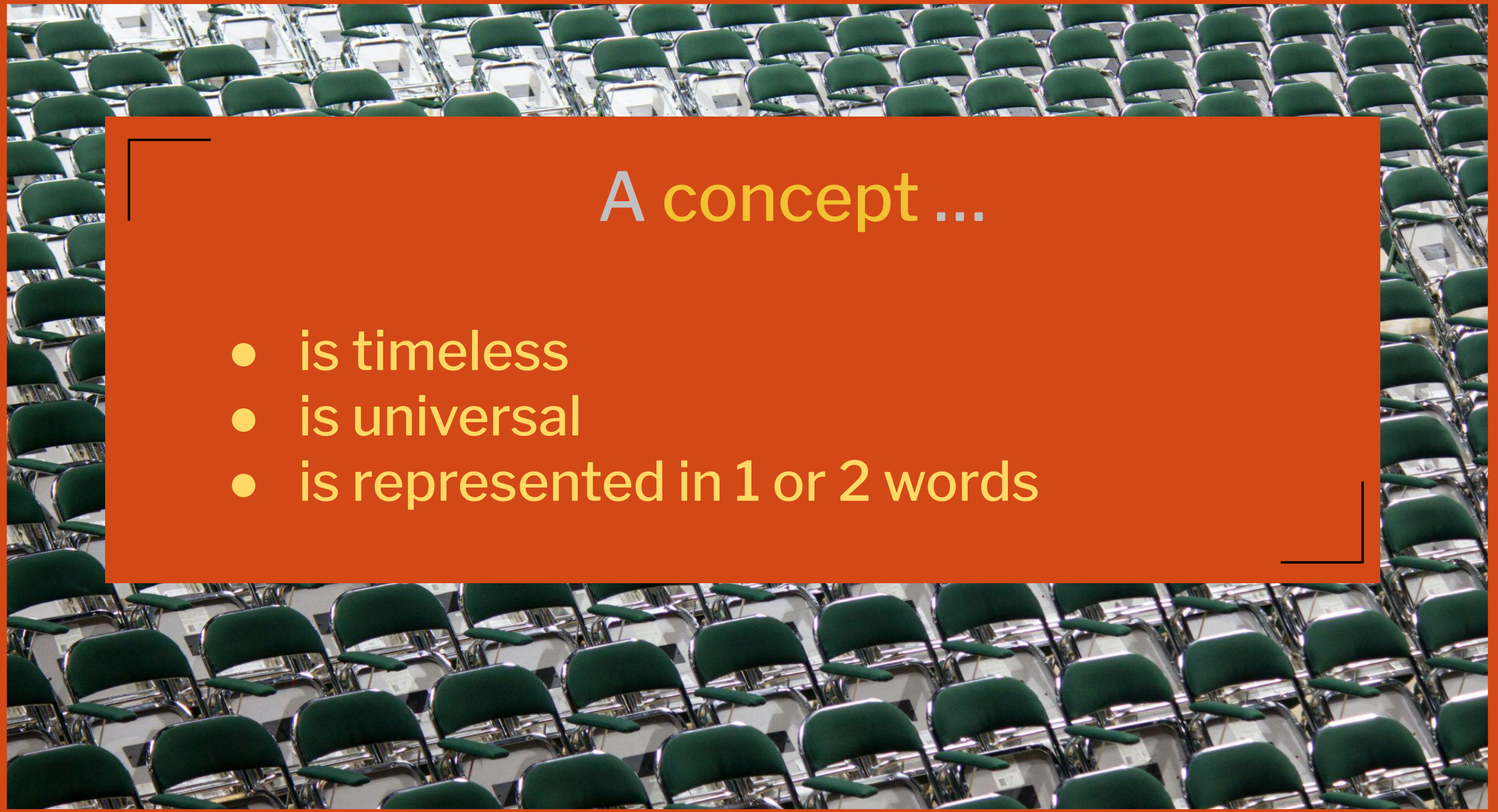
A concept is ...

- organizing idea
- with distinct attributes
- that are shared across multiple examples

Chair is a concept







A concept ...

- is timeless
- is universal
- is represented in 1 or 2 words

Levels of Concepts

Broad/General Idea
or
Understanding

Furniture

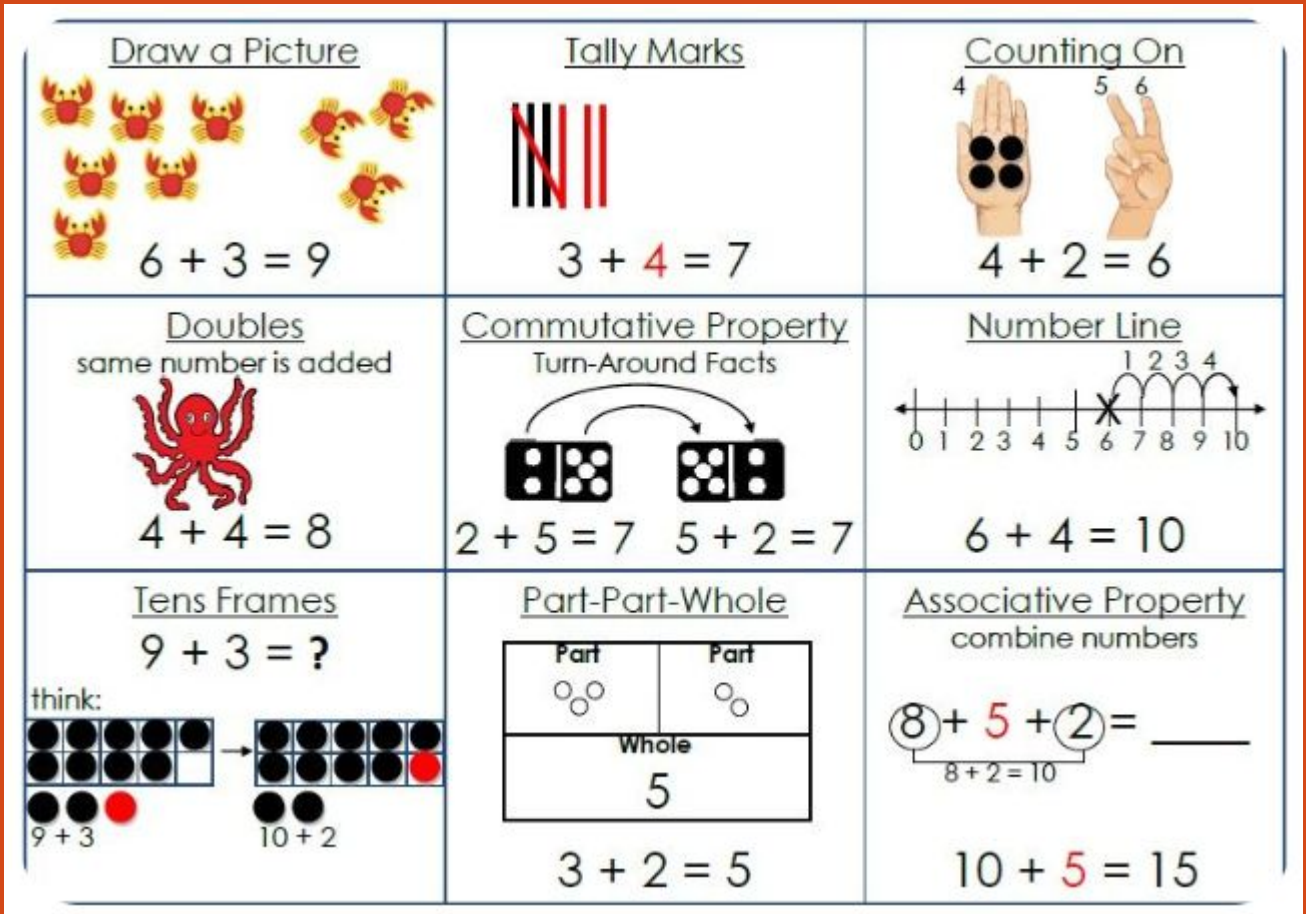
Chair

More Specific Ideas
or
Understandings

Dining Chair


Form
Function
Causation
Change
Change
Connection
Reflection
Responsibility
Perspective

A Conceptual Lens

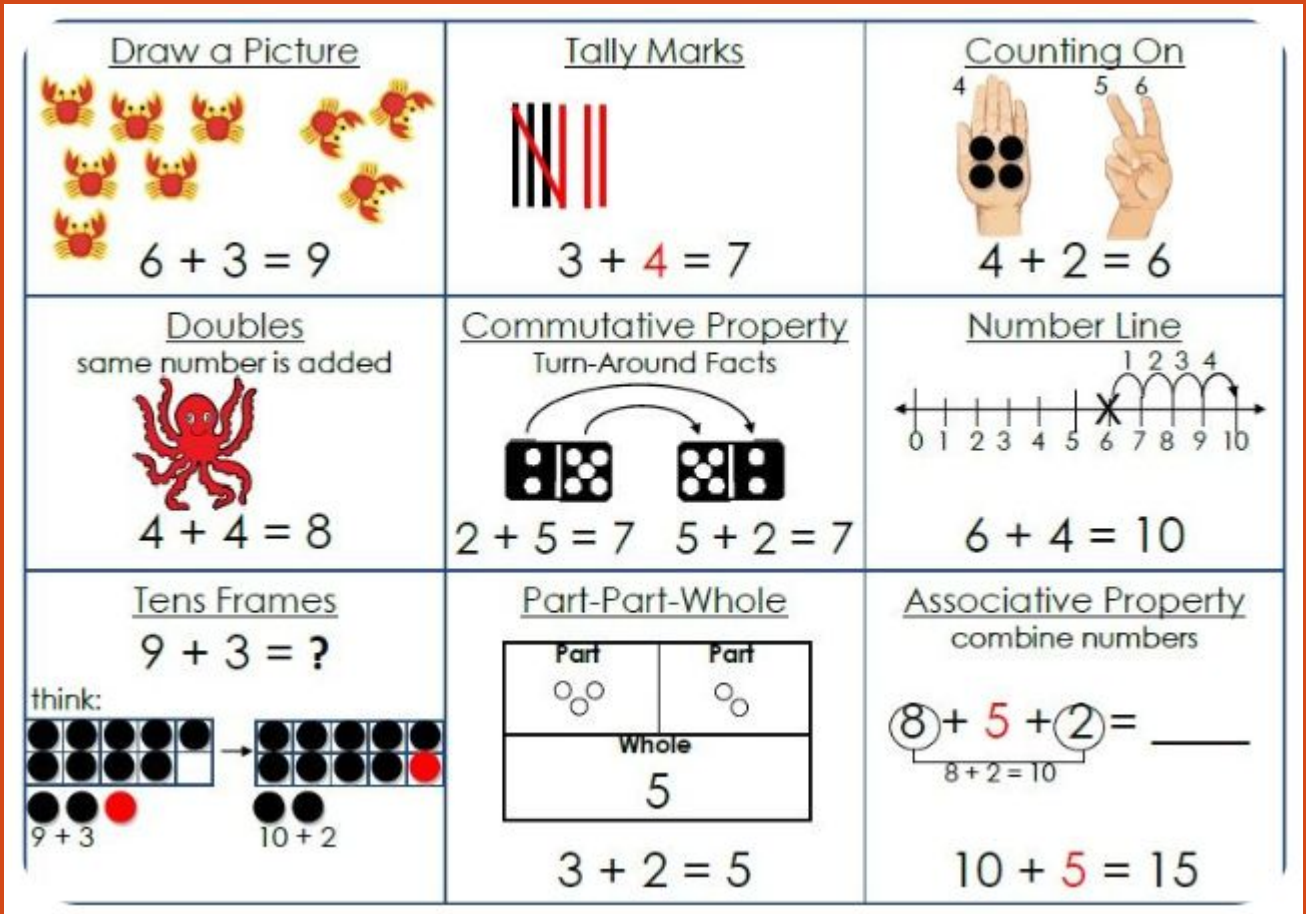


Lens

Math Concepts

- quantity
- addition
- modelling
- representation

A Conceptual Lens



Lens

Competencies

- critical thinking
- design

conceptual lens: concepts

6CG1.2 Students explain location and movement in relation to position in the Cartesian plane.

Knowledge	Understanding	Skills and Procedures
A translation describes a combination of horizontal and vertical movements as a single movement. A reflection describes movement across a line of reflection. A rotation describes an amount of movement around a turn centre along a circular path in either a clockwise or counter-clockwise direction.	Location can change as a result of movement in space. Change in location does not imply change in orientation.	Create an image of a polygon in the Cartesian plane by translating the polygon. Describe the horizontal and vertical components of a given translation. Create an image of a polygon in the Cartesian plane by reflecting the polygon over the *x*-axis or *y*-axis. Describe the line of reflection of a given reflection. Create an image of a polygon in the Cartesian plane by rotating the polygon 90°, 180°, or 270° about one of its vertices, clockwise or counter-clockwise. Describe the angle and direction of a given rotation. Relate the coordinates of a polygon and its image after translation, reflection, or rotation in the Cartesian plane.

conceptual lens: concepts

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Skills & Procedures

Grade 6 Math September - December

- **Model** the sum of two positive integers.
- **Visualize** and **Describe** combination of two transformations that relate symmetrical shapes.
- **Compare** and order positive and negative numbers.
- **Compose** a product in multiple ways, including with more than two factors.
- **Relate** magnitude to the distance from zero on the number line.
- **Verify** symmetry of two shapes by reflecting or rotating one shape onto another.
- **Demonstrate** congruence between two shapes in any orientation by superimposing using hands-on materials or digital applications.
- **Determine** common factors for two natural numbers, using prime factorization.
- **Describe** the divisibility of numbers represented in various forms.
- **Identify** negative numbers in familiar contexts, including contexts that use vertical or horizontal models of the number line.
- **Solve** problems in various contexts using standard algorithms for addition and subtraction.
- **Investigate** addition of an integer and its additive inverse.
- **Express** positive and negative numbers symbolically, in context.
- **Recognize** decimal notation expressed in English and in French.
- **Evaluate** numerical expressions involving operations in parentheses and powers according to the order of operations.

Skills & Procedures

Grade 6 Math September - December

- **Model** the sum of two positive integers. **Is able to model the sum of two positive or negative integers to ____.**
- **Visualize** and **Describe** combination of two transformations that relate symmetrical shapes.
- **Compare** and order positive and negative numbers.
- **Compose** a product in multiple ways, including with more than two factors.
- **Relate** magnitude to the distance from zero on the number line.
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- **Determine** common factors for two natural numbers, using prime factorization.
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- **Investigate** addition of an integer and its additive inverse.
- **Express** positive and negative numbers symbolically, in context.
- **Recognize** decimal notation expressed in English and in French.
- **Evaluate** numerical expressions involving operations in parentheses and powers according to the order of operations.

Sample Year at a Glance: Mathematics - Grade 6

September 2023 ——— **November 2023**

September	October	November
Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating. (use money as concept/manipulative and consider FL)		
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) 6N1.3 Students investigate magnitude with positive and negative numbers. • The difference of any two numbers can be interpreted as a sum. 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)	

Sample Year at a Glance: Mathematics - Grade 6

September 2023 ———		——— November 2023
September	**October**	**November**
Coordinate Geometry:Location and movement of objects in space can be communicated using a coordinate grid.		
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 exponent - 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.(exponent included) • The conventional order of operations can be applied to simplify or evaluate expressions.
Patterns: Awareness of patterns supports problem solving in various situations.		

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.**		
		6A1.2 Students analyze expressions and solve algebraic equations. • Algebraic properties ensure equivalence of algebraic expressions.

DRAFT **Sample Year at a Glance: Mathematics - Grade 6**

December 2022 ----------January 2023		
December	**January**	**February**
Geometry: Shapes are defined and related by geometric attributes.		
	6G1.2 Students analyze shapes through symmetry and congruence. • Congruence is a relationship between two shapes of identical size and shape. • Congruence is not dependent on orientation or location of the shapes	
Coordinate Geometry: Location and movement of objects in space can be communicated using a coordinate grid.		
	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. (review of angles)	

Assessment

We have Number, Time, Algebra and Patterns running at entry levels for September - November.

Given the look at "concepts" form a skill level along with the concept of quantity,

- what does success 'sound' like
- 'look' like

Identify achievement 'indicators' for the three months.

DRAFT **Sample Year at a Glance: Mathematics - Grade 6**

September 2022 ---------- November 2022

September	October	November
Number: Quantity is measured with numbers that enable counting, labelling, comparing and operating. (use money as concept/manipulative and consider FL)		
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) • 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)	

Grade 6 6N1.1 (Sept)

How can the infinite nature of the number line broaden the perception of number?		
6N1.1 Students investigate magnitude with positive and negative numbers.		
Knowledge	Understanding	Skills & Procedures
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 same magnitude. A number and its opposite are called additive inverses.	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 =.

(use money as concept/manipulative and consider FL)

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

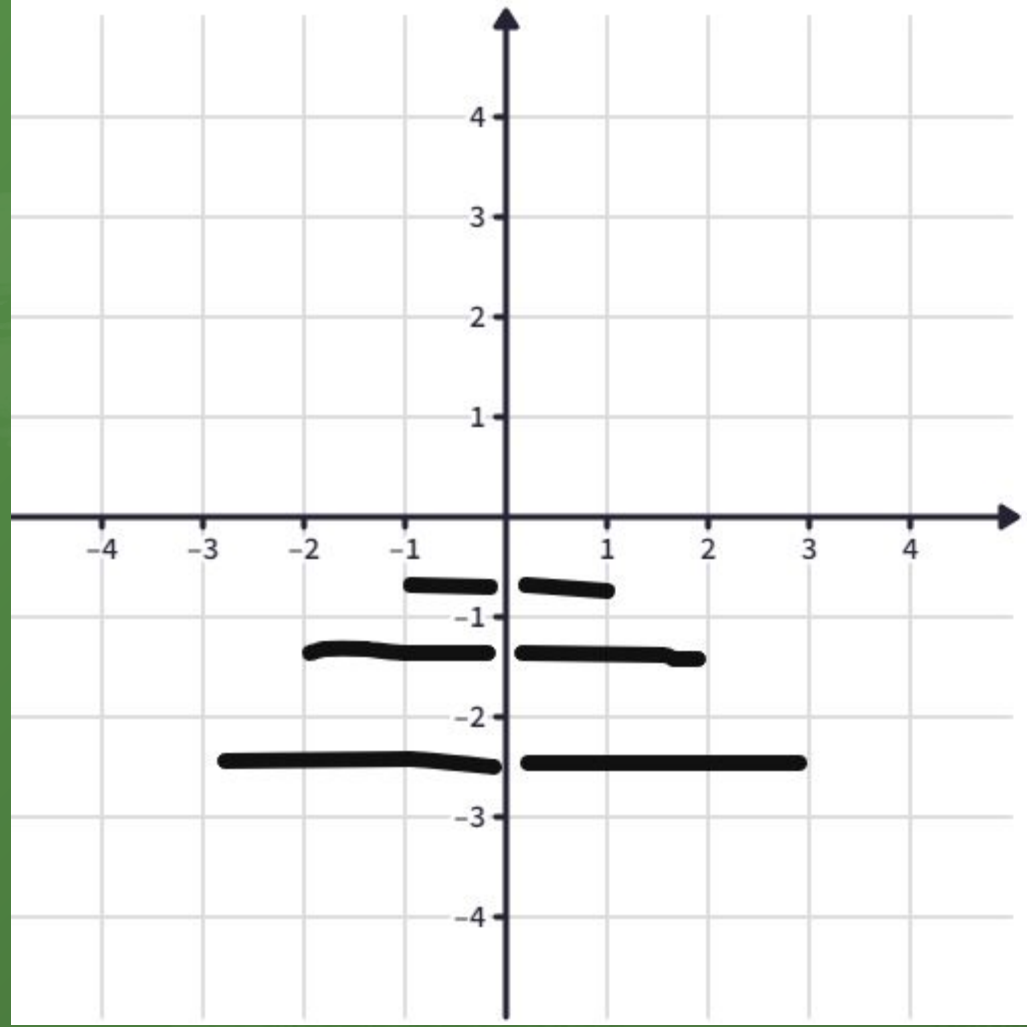
To be completed in the first 2 month and combined with Cartesian Plane

Curriculum Support Document 6N1

6N1.2

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.

Additive Inverse (6) and (-6)The 'zero' here is the additive inverses added to equal zero (often called a 'zero pair')



The sum of any number and its additive inverse is zero.

Zero pair

3 + 5 =

-3 + (-5) =

7 + (-3) =

(-8) + 9 =

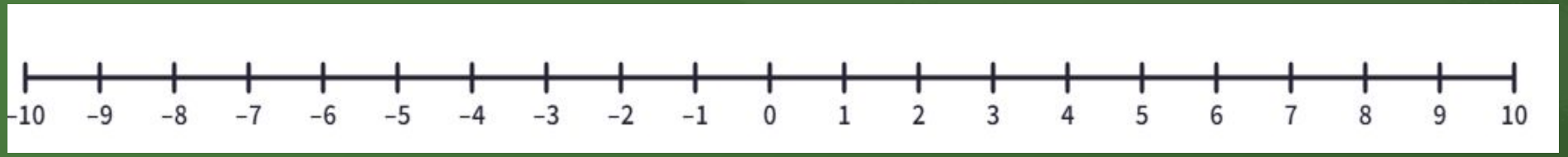
7 - 5 =

(-7) - 5 =

(-7) - (-5) =

Addition sign - go right
Subtraction Sign - go left
Negative sign on a number - change direction

Integers



Grade 6 6N3.1 / 3.2 (Nov)

6N3.1 Students analyze numbers using prime factorization and exponentiation.		
Knowledge	Understanding	Skills & Procedures
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. Any repeated prime factor within a prime factorization can be expressed as a power.	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.

November

6N3.1 Students analyze numbers using prime factorization and exponentiation.

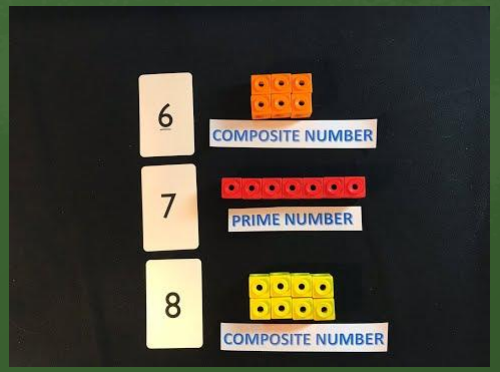
- A product can be composed in multiple ways. (start with simple factor trees for example)
- The prime factors of a number provide a picture of its divisibility.

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

Prime and Composite Numbers can be modeled using Cuisenaire Rods



Factor Tree

Factor Tree (2)

Grade 6 6G1.1 (Sept/Oct)

How can congruence support interpretation of symmetry?		
6G1.1 Students analyze shapes through symmetry and congruence.		
Knowledge	Understanding	Skills & Procedures
Symmetrical shapes can be mapped by any combination of reflections and rotations. A tessellation is the tiling of a plane with symmetrical shapes. Tessellations are evident in First Nations and Métis star blanket designs that convey a specific purpose.	Symmetry is a relationship between two shapes that can be mapped exactly onto each other through reflection or rotation.	Verify symmetry of two shapes by reflecting or rotating one shape onto another. Describe the symmetry between two shapes as reflection symmetry or rotation symmetry. Visualize and describe a combination of two transformations that relate symmetrical shapes. Describe the symmetry modelled in a tessellation. Investigate tessellations found in objects, art, or architecture.

Sept/Oct

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)

MathLinks 8 - (McGrawHill - Nelson Publishers)
Chapter 8 section 12.2

What is the meaning of a star blanket?

It is **used to honour, protect, and celebrate the individual**. Receiving a star blanket brings good dreams, prosperity, and protection. The star does not only represent the Morning Star but it's also known as the Creator's Eye, therefore when the Creator is with you, covering you, you are forever safe.

Images of the Star Blanket

Create a tessellation

Shapes that Tessellate

Grade 6 6CG1.1/1.2 (Sept/Oct)

In what ways can location be communicated?		
6CG1.1 Students explain location and movement in relation to position in the Cartesian plane.		
Knowledge	Understanding	Skills & Procedures
The Cartesian plane is named after French mathematician René Descartes. The Cartesian plane uses coordinates, (x, y), to indicate the location of the point where the vertical line passing through $(x, 0)$ and the horizontal line passing through $(0, y)$ intersect. The x-axis consists of those points whose y-coordinate is zero, and the y-axis consists of those points whose x-coordinate is zero. The x-axis and the y-axis intersect at the origin, $(0, 0)$. An ordered pair is represented symbolically as (x, y). An ordered pair indicates the horizontal distance from the y-axis with the x-coordinate and the vertical distance from the x-axis with the y-coordinate.	Location can be described using the Cartesian plane. The Cartesian plane is the two-dimensional equivalent of the number line.	Relate the axes of the Cartesian plane to intersecting horizontal and vertical representations of the number line. Locate a point in the Cartesian plane given the coordinates of the point. Describe the location of a point in the Cartesian plane using coordinates. Model a polygon in the Cartesian plane using coordinates to indicate the vertices. Describe the location of the vertices of a polygon in the Cartesian plane using coordinates.

Coordinate Geometry:Location and movement of objects in space can be communicated using a coordinate grid.	
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.

Math Makes Sense - (Pearson Publishers)
Chapter 8 Pages 315-334

MathFocus 7 (Nelson Publishing)
Chapter 7 page 280 -302

MathLinks 7 - McGrawHill/Nelson Publishers
Chapter 1
Suggest sections 1.1, 1.3 (rotation around vertex point)1.4

Grade 6 6CG1.2 (Oct)

In what ways can location be communicated?		
6CG1.2 Students explain location and movement in relation to position in the Cartesian plane.		
A translation describes a combination of horizontal and vertical movements as a single movement. A reflection describes movement across a line of reflection. A rotation describes an amount of movement around a turn centre along a circular path in either a clockwise or counter-clockwise direction.	Location can change as a result of movement in space. Change in location does not imply change in orientation.	Create an image of a polygon in the Cartesian plane by translating the polygon. Describe the horizontal and vertical components of a given translation. Create an image of a polygon in the Cartesian plane by reflecting the polygon over the *x*-axis or *y*-axis. Describe the line of reflection of a given reflection. Create an image of a polygon in the Cartesian plane by rotating the polygon 90°, 180°, or 270° about one of its vertices, clockwise or counter-clockwise. Describe the angle and direction of a given rotation. Relate the coordinates of a polygon and its image after translation, reflection, or rotation in the Cartesian plane.

Coordinate Geometry:Location and movement of objects in space can be communicated using a coordinate grid.

6CG1.1 Students explain location and movement in relation to position in the Cartesian plane.	6CG1.2 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)	• Location can change as a result of movement in space. • Change in location does not imply change in orientation.

Grade 6 6A1.1 (Sept-Nov)

6A1.1 Students analyze expressions and solve algebraic equations.		
Knowledge	Understanding	Skills & Procedures
Numerical expressions can include powers. The conventional order of operations includes performing operations in parentheses, followed by evaluating powers before other operations.	The conventional order of operations can be applied to simplify or evaluate expressions.	Evaluate numerical expressions involving operations in parentheses and powers according to the order of operations.

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)

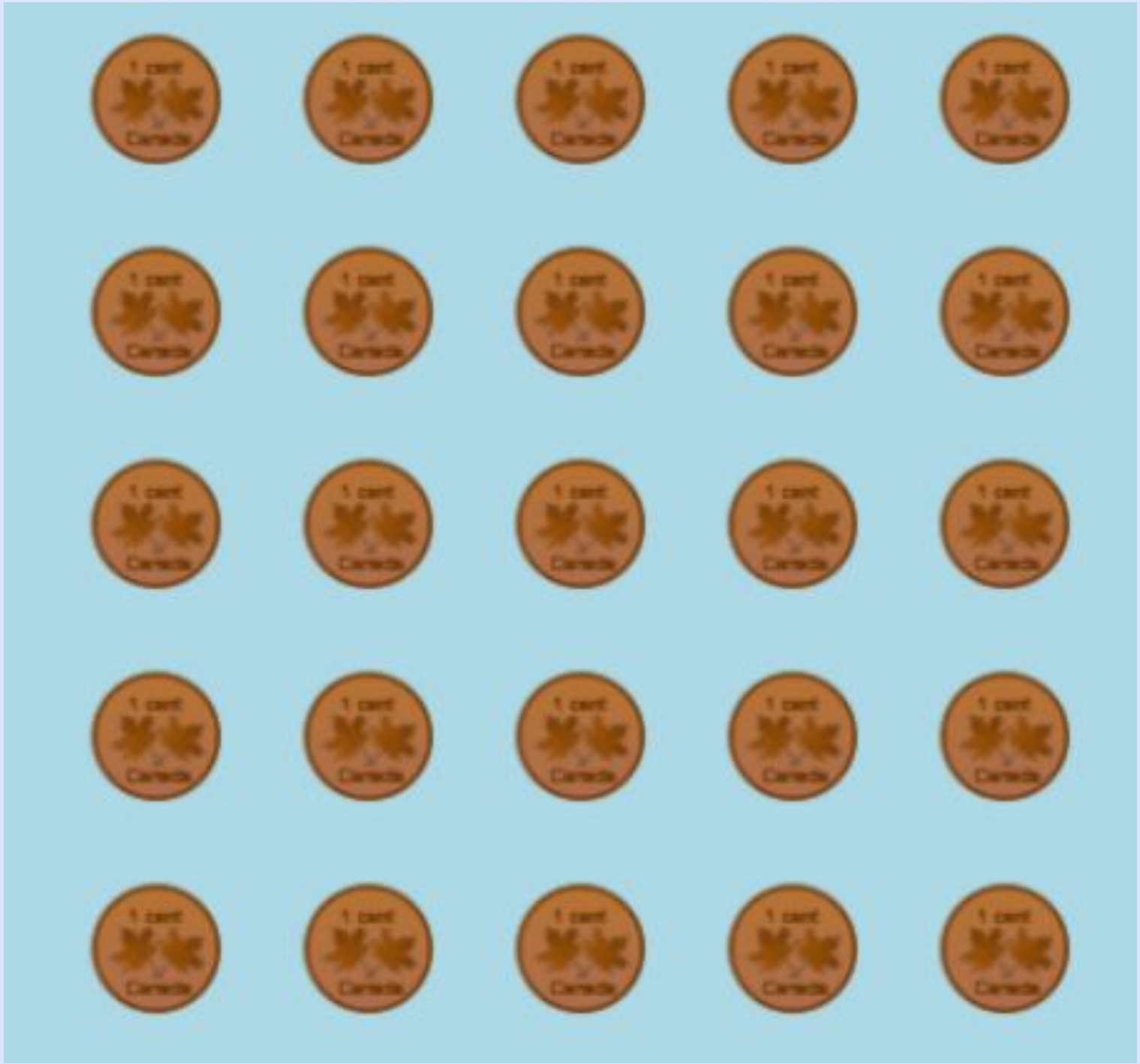
6A1.1 Students analyze expressions and solve algebraic equations.(exponents included)

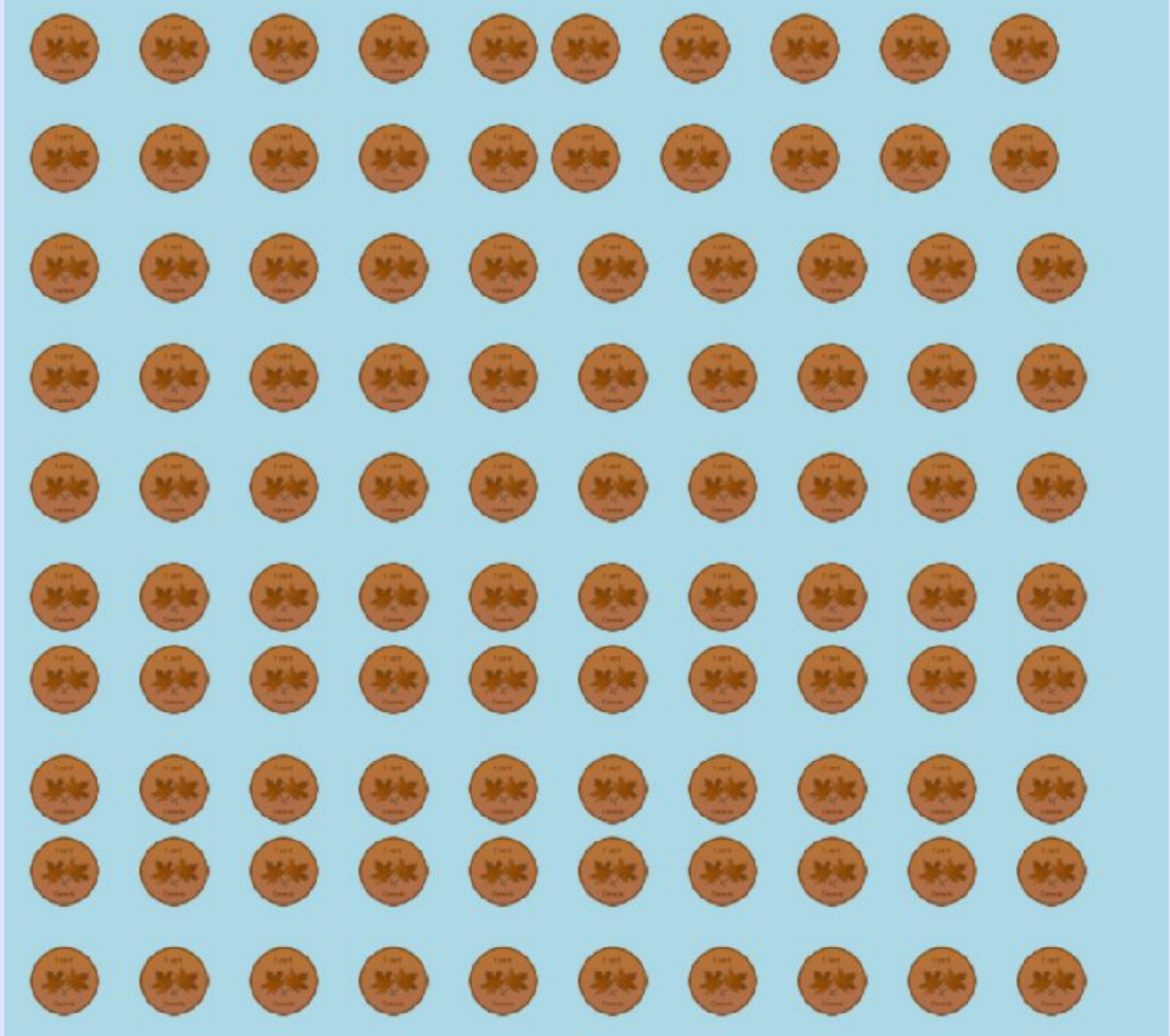
- The conventional order of operations can be applied to simplify or evaluate expressions.

Please excuse my dear aunt Sally!

Bedmas

Mammoth Math Activities


1 cent
Canada



Financial Literacy: Informed financial decision making contributes to the well-being of individuals, groups, and communities.					
What is money?			In what ways can money be used?		
Children explore money.			Students explore money and how it is used for everyday living.		
Knowledge	Understanding	Skills & Procedures	Knowledge	Understanding	Skills & Procedures
Canadian money comes in many forms, such as • coins • bills Canadian coins and bills come in different denominations, such as • loonies • toonies • $5 • $10 Canadian coins and bills have different features, such as • colour • number • images • size	Money has unique features to represent its value.	Explore the value of Canadian coins and bills. Identify features of Canadian coins and bills.	Canadian money comes in many forms, such as • coins • bills • debit cards • credit cards Canadian coins and bills come in different denominations, such as • nickels • dimes • quarters • loonies • toonies • $5 • $10 • $20 • $50 • $100 Images on Canadian coins and bills include • wildlife • sports • boats • emblems • historic figures Money can be • shared • earned • saved • spent • borrowed Goods are things that	Money can be used to exchange for goods and services. Money has value and purpose in everyday living. Money has unique features to represent its value.	Explore the value of Canadian coins and bills. Sort Canadian coins and bills. Identify goods and services that can be exchanged for money.

Counter first

Skip counting by 2, 5, 10, 20, 50, …

Arrays for addition/subtraction equal, not equal

Financial Literacy will start when money is well understood. “spending, saving, earning, wants and needs, budgets, debits, credits…”

Guiding Question	What is money?		
Learning Outcome	Children explore money.		
	Knowledge	Understanding	Skills & Procedures
They begin as our "counters" Shapes Colour - comparative language Canadian Living Things - animals	Canadian money comes in many forms, such as • coins • bills Canadian coins and bills come in different denominations, such as • loonies • toonies • $5 • $10 Canadian coins and bills have different features, such as • colour • number • images • size	Money has unique features to represent its value. Money APP	Explore the value of Canadian coins and bills. Identify features of Canadian coins and bills.

In what ways can money be used?		
Students explore money and how it is used for everyday living.		
Knowledge	Understanding	Skills & Procedures
Canadian money comes in many forms, such as • coins • bills • debit cards • credit cards Canadian coins and bills come in different denominations, such as • nickels • dimes • quarters • loonies • toonies • $5 • $10 • $20 • $50 • $100 Images on Canadian coins and bills include • wildlife • sports • boats • emblems • historic figures Money can be • shared • earned • saved • spent • borrowed Goods are things that are made and produced and can be touched, such as	Money can be used to exchange for goods and services. Money has value and purpose in everyday living. Money has unique features to represent its value.	Explore the value of Canadian coins and bills. Sort Canadian coins and bills. Identify goods and services that can be exchanged for money.

How can personal finances be enhanced?

Students investigate borrowing and investing in a variety of situations.

Knowledge	Understanding	Skills & Procedures
A loan is money that is borrowed with an agreement to pay it back. A loan can come from a variety of sources, such as • banks • financial institutions • family • friends The decision to borrow money may be based on • ability to repay • intended purpose • additional costs • short-term and long-term goals • impact on budget Decisions by banks or financial institutions to loan money may be based on • ability to repay • previous loan history • other existing debts • intended purpose Borrowing money through loans can cost money in the form of interest on the amount borrowed and over the term of the agreement. Interest is a fee paid to the bank or financial institution that loaned the money.	Borrowing money to buy goods and services can have financial risks and benefits. Borrowing money can support financial goals if done appropriately.	Analyze the risks and benefits of borrowing money in a variety of situations. Identify situations where an individual can responsibly take on debt.


On the Road to
Financial Literacy
Don’t forget students need to learn the money before they contextually apply it. Use it as a *Concept* to learn and a *Manipulative* to teach your other outcomes.
FPPT.com

How would you model, exemplify or teach the following using money?

Kindergarten:

- Quantities using objects, words, pictures, numbers
- Counting objects
- Subitize to 5/10
- “like/unlike/more/less/same”/enough/too many/too few
- Compose quantities within 10 in various ways
- “Share” - this is the beginning of fractions
- Describe a shape using words such as flat, curved, straight, or round.
- Sort shapes according to one attribute and describe the sorting rule.
- Measurable attributes can include • length • area • capacity • mass
- “longer • taller • shorter • heavier • lighter • bigger • smaller • big enough • too big • too small”
- Describe the size of an object in relation to another object, using comparative language. Describe the size of an object in relation to a purpose or need, using comparative language.
- Identify the pattern core, up to three elements, in a repeating pattern.
- Predict the next elements in a repeating pattern. Create a repeating pattern with a pattern core of up to three elements.

How would you model, exemplify or teach the following using money?

Grade 1

No quantity represented by 0
Know all coins and bills including 100
Know value of each coin and bill
Skip count to 100 by 5, 10; 20 by 2”s
Symbols for equal, not equal
Words greater than, less than, Compose quantities within 20 in various ways
Model transactions with money, limited to dollar values within 20
In a part-part-whole relationship, the sum represents the whole and the difference represents a missing part.
Sharing involves partitioning a quantity into a certain number of groups.
½, one- half of the whole quantity.(not using fraction)
Length may refer to the size of any one dimensional measurable attribute of an object, including: • height • width • depth • diameter
Compare the length, area, mass, or capacity of two objects directly, or indirectly using a third object.
Describe the size of an object in relation to another object, using comparative language.
Pattern core, up to four elements, in a cycle. Identify a missing element in a repeating pattern or cycle. Describe change and constancy in repeating patterns and cycles.
Create different representations of the same repeating pattern or cycle, limited to a pattern core of up to four elements.
Extend a sequence of elements in various ways to create repeating patterns

Grade 2

Decompose into groups of 100
Skip count by 20, 25, 50, (review skip counting by 1's, 2's, 5's,10's)
Determine the value of bills or coins of the same denomination by skip counting
<,>, =
sum composed in multiple ways
Model transactions with money, limited to dollar values within $100 or 100 cents
½ , ¼ and unit fractions with denominators or 10 or less
Common geometric attributes include. • sides • vertices • faces or surfaces
Length can be measured with nonstandard units or standard units (e.g., centimetres).
Identify referents for a centimetre. Estimate length by visualizing the iteration of a referent for a centimetre.
Change can be an increase or a decrease in the number and size of elements.
Create and express a repeating pattern with a pattern core of up to four elements that change by more than one attribute.

Grade 3

The dollar sign $ is placed to the left of the dollar value in English and to the right of the dollar value in French.
The cent sign is placed to the right of the cent value in English and in French.
How can work with money support the work for place value?
Count and represent the value of a collection of nickels, dimes, and quarters as cents.
Count and represent the value of a collection of loonies, toonies, and bills as dollars.
Compare French and English symbolic representations of monetary values.
Estimation can be used when an exact sum or difference is not needed and to check if an answer is reasonable.
Model regrouping by place value for addition and subtraction.
Relate multiplication to repeated addition. Relate multiplication to skip counting.
Model a quotient by partitioning a quantity into equal groups with or without remainders. Visualize and model products and quotients as arrays.
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. (10 x 10)
Fraction notation (a/b) relates the numerator ‘a’ as a number of equal parts, ‘b’ to the as the total number of equal parts in the whole. (leave until the end)

Green shows where money will LEAD the Fraction work

A whole quantity can be a whole set of objects or a whole object that can be partitioned. Each fraction is associated with a point on the number line.
A unit fraction is any one part of a whole divided into equal parts.
Fractions with common denominators are multiples of the same unit fraction
A unit fraction is any one part of a whole divided into equal parts.
Fractions with common denominators are multiples of the same unit fraction
Decompose a fraction into unit fractions.
Express a fraction as repeated addition of a unit fraction. Relate repeated addition of a unit fraction to multiplication of a natural number by a unit fraction.
Add and subtract fractions within one whole, limited to common denominators of 12 or less. Solve problems involving fractions, limited to common denominators of 12 or less.

***Unit Fractions will LEAD the work

Fractions can be compared by considering the number of parts or the size of parts.
Partition a whole into 12 or fewer equal parts.
Describe a whole as a fraction, limited to denominators of 12 or less.
Model fractions of a whole, limited to denominators of 12 or less. Express fractions symbolically. Relate a fraction less than one to its position on the number line, limited to denominators of 12 or less.
Compare fractions to benchmarks 0. ½. and 1.
Recognize the whole to which a fraction refers in various situations.
Compare the same fraction of different-sized wholes.
Compare different fractions with the same denominator.
Compare different fractions with the same numerator.
Write equations that represent equality between a number and an expression or between two different expressions of the same number.

Grade 4

Money could be used initially to teach the outcome

Lines in white are best approached outside of money

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.

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.

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.

Round numbers to various places, including tenths.

Compare and order numbers, including decimal numbers.

Express the relationship between two numbers, including decimal numbers, using <, >, or =.

Express a monetary value in cents as a monetary value in dollars using decimal notation.

Grade 4

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.

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.

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.

Determine the factors of a number 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.

Recall of multiplication and division number facts facilitates multiplication and division strategies.

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.

Grade 4

- Determine the factors of a number 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.
- Recall of multiplication and division number facts facilitates multiplication and division strategies.
- 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.
- Equivalent fractions are associated with the same point on the number line
- Equivalent fractions can be created by partitioning each equal part of a fraction in the same way.
- Partitioning a fraction can be interpreted as multiplying the numerator and denominator of a fraction by the same number.
- A fraction can be simplified to an equivalent form by dividing the numerator and denominator by a common factor.

Grade 4

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.

Model equivalent fractions by partitioning a whole in multiple ways.

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.

Grade 4

- Determine fractions equivalent to a given fraction.
- Relate the position of equivalent fractions on the number line.
- Identify fractions in which the numerator and denominator have a common factor.
- Simplify a given fraction by dividing the numerator and denominator by a common factor.
- Compare and order fractions.

- Express a fraction in simplest form.

- Fractions and decimal numbers can represent the same number.
- Decimals can be expressed as fractions with a denominator that is equivalent to the place value of the last non-zero digit of the decimal number.
- Percentage is represented symbolically with %.
- Decimals can be expressed as percentages by multiplying by 100.
- Percentages can be expressed as decimals by dividing by 100.
- One percent represents one hundredth of a whole.

Grade 4

Investigate percentage in familiar situations.

Compare percentages within 100%.

Express the fraction, decimal, and percentage representations of the same part-whole relationship.

There are infinitely many expressions that represent the same number.

The order in which operations are performed can affect the value of an expression.

An equation is solved by determining an unknown value that makes the left and right sides of the equation equal.

Geometric properties are measurable.

Geometric properties define a hierarchy for classifying shapes.

A shape resembling a polygon that does not share the defining geometric properties of the polygon is a close approximation.

Grade 5

- A number expressed with more decimal places is more precise.
- Relate the names of place values that are the same number of places to the left and right of the ones place.
- 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.
- 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.
- A number is divisible by another number if it can be divided with a remainder of 0.
- Multiply up to 3-digit by 2-digit natural numbers using standard algorithms.
- Divide 3-digit by 1-digit natural numbers using standard algorithms.
- Express a quotient with or without a remainder according to context.
-

Grade 5

- Fractions allow counting and measuring between whole quantities.
- Improper fractions and mixed numbers that represent the same number are associated with the same point on the number line.
- Count beyond 1 using fractions with the same denominator.
- Model fractions, including improper fractions and mixed numbers, using quantities, lengths, and areas.
- Compare fractions, including improper fractions and mixed numbers, to benchmarks of 0, ½ and 1.
- Fractions with common denominators are multiples of the same unit fraction.
- Properties for addition and subtraction of natural numbers apply to fractions.
- Investigate the composition and decomposition of a quantity within 1 using unit fractions.
- Express the composition or decomposition of fractions with common denominators as a sum
- or difference.
- Compare strategies for adding or subtracting improper fractions to strategies for adding or subtracting mixed numbers.

Grade 5

- Add and subtract fractions with common denominators within 100, including improper fractions and mixed numbers.
- Solve problems requiring addition and subtraction of fractions with common denominators, including improper fractions and mixed numbers.
- A ratio is a comparison of two quantities in a specific situation.
- Fractions, decimals, ratios, and percentages can represent the same part-whole relationship.
- Evaluate numerical expressions involving addition or subtraction in parentheses according to the order of operations.
- Solve problems using equations, limited to equations with one or two operations.
- Solve problems involving an arithmetic sequence.

Grade 6

- Symmetry of the number line extends infinitely to the left and right of zero or above and below zero.
- 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.
- Compare and order positive and negative numbers.
- Express the relationship between two numbers, including positive and negative numbers, using <, >,or =.
- 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.
- Contexts for problems involving addition and subtraction include money and metric measurement.
- The order in which three or more numbers are multiplied does not affect the product (associative property).
- Multiply and divide up to 3-digit natural or decimal numbers by 2-digit natural numbers, using standard algorithms.
- Assess the reasonableness of a product or quotient using estimation.
-

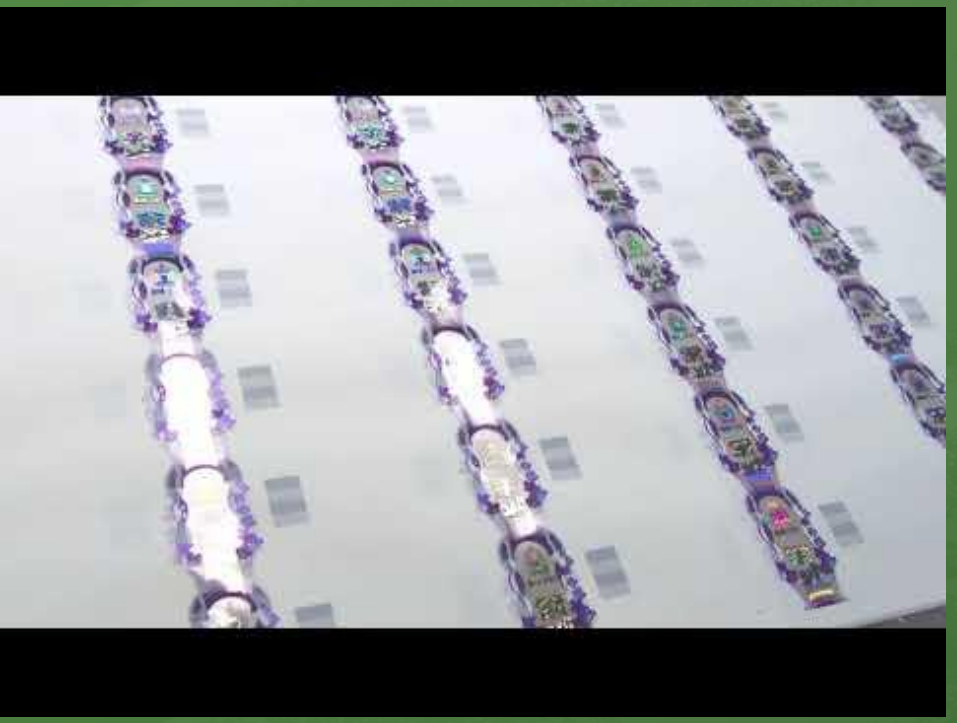
Grade 6

- Model an equal-sharing situation in more than one way.
- Describe an equal-sharing situation using a fraction.
- Express a fraction as a division statement and vice versa.
- Convert a quotient from fraction to decimal form using division.
- The product of the denominators of two fractions provides a common denominator.
- Recognize two fractions with related denominators.
- Determine the factor that relates one denominator to another.
- Express two fractions with common denominators.
- Add and subtract fractions.
- Solve problems involving addition and subtraction of fractions.
- Relate multiplication of a natural number by a fraction to repeated addition of the fraction.
- Multiply a natural number by a fraction.
- Relate multiplication by a unit fraction to division.
- Multiply a natural number by a unit fraction.

Grade 6

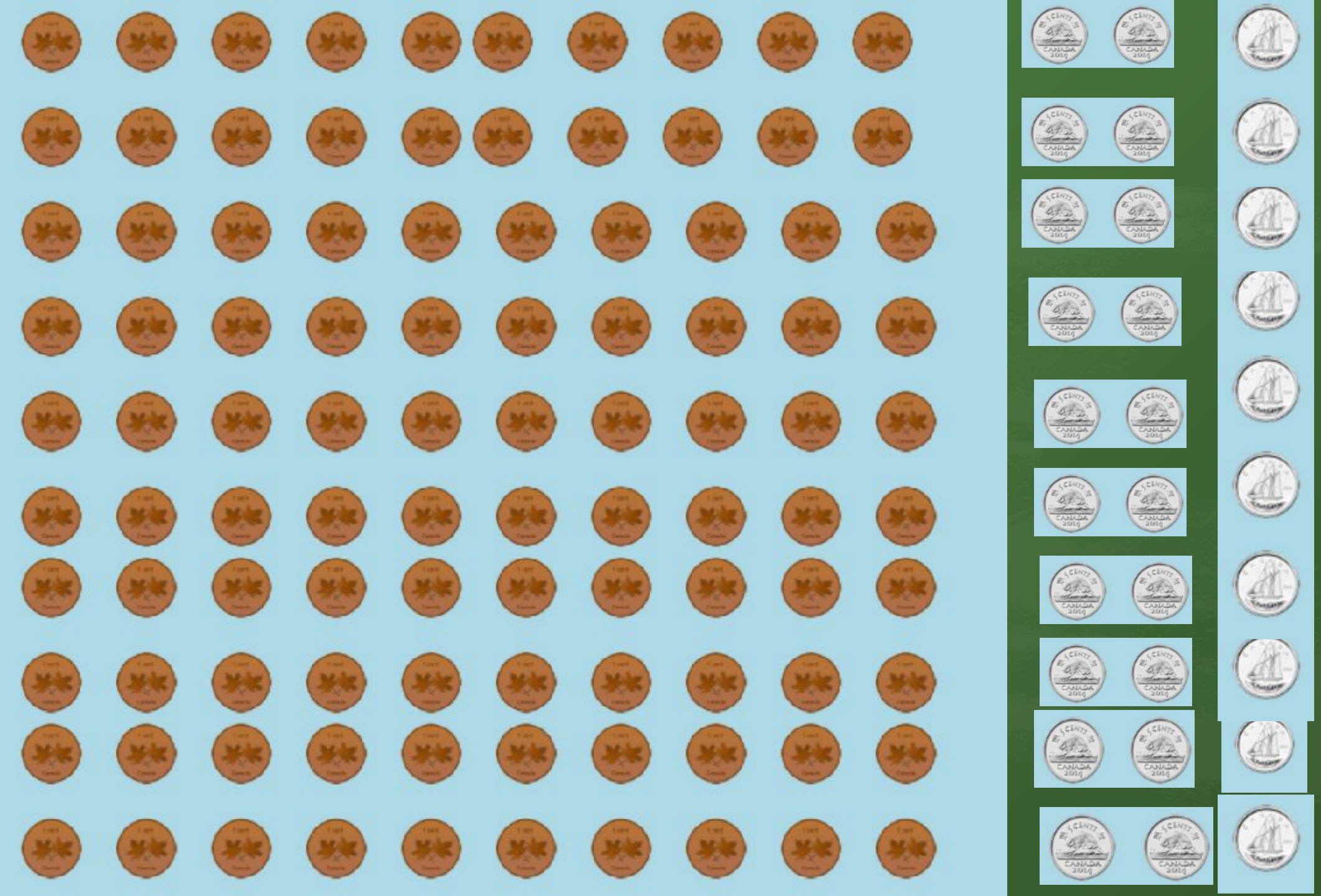
- Model a fraction of a natural number.
- Multiply a fraction by a natural number.
- Solve problems using multiplication of a fraction and a natural number.
- All equivalent ratios express the same proportional relationship.
- A rate can be used to extend a given proportional relationship to different quantities.
- Investigate like terms by modeling an algebraic expression.
- Simplify algebraic expressions by combining like terms.
- Express the terms of an algebraic expression in a different order in accordance with algebraic properties.
- Solve problems using equations, limited to equations with one or two operations.
- Solve problems involving a function.

The Making of a Bank Note

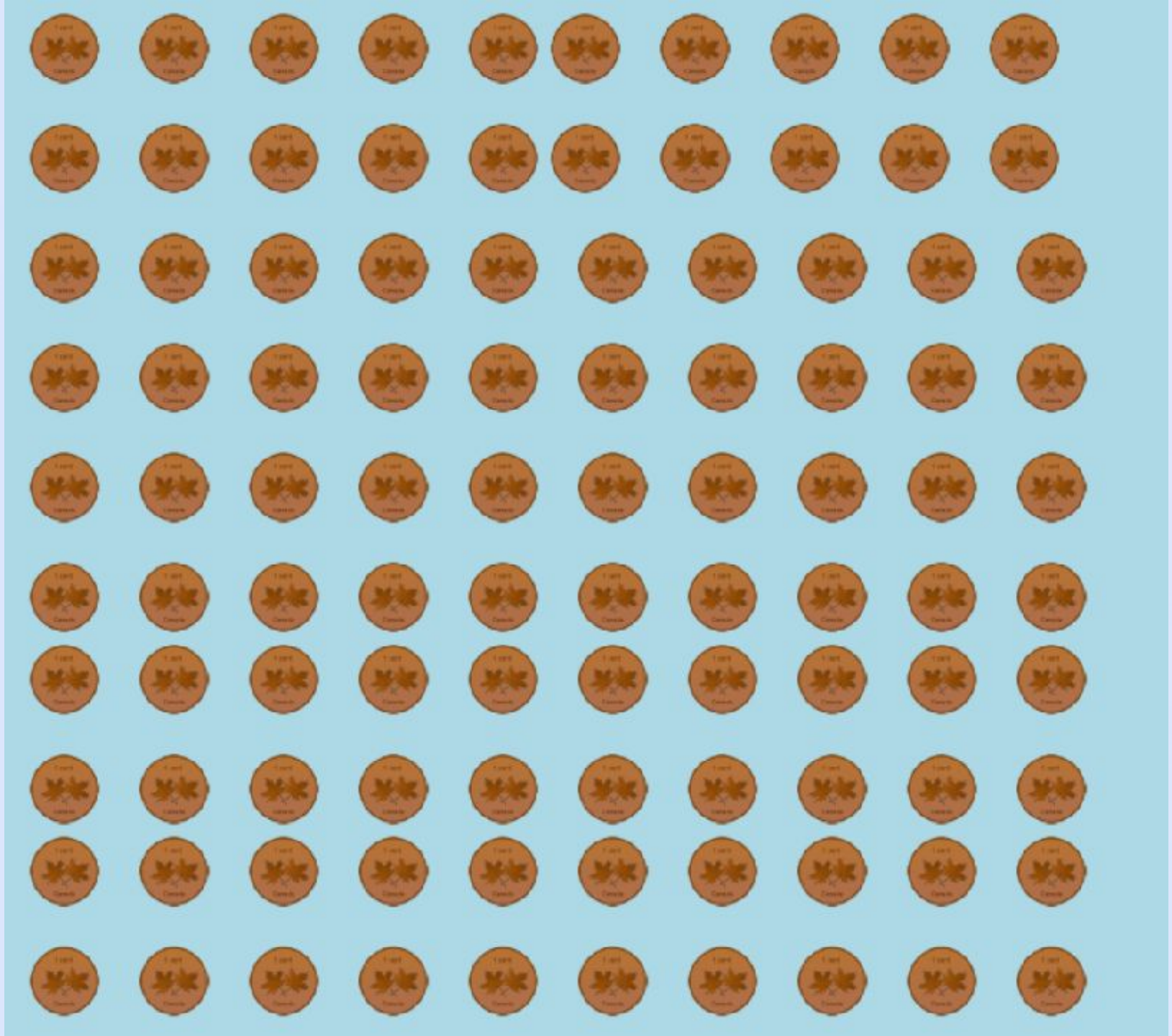


Canada's New Banknotes

The Secrets of the Canadian Dollar



Arrays galore!!!



Build your math facts here.
All they need is a copy of any money you are studying, use pencil crayons or markers to identify all possible arrays. Write them out.

Create the Unit Fractions Visually - no fraction terminology

Close to 100

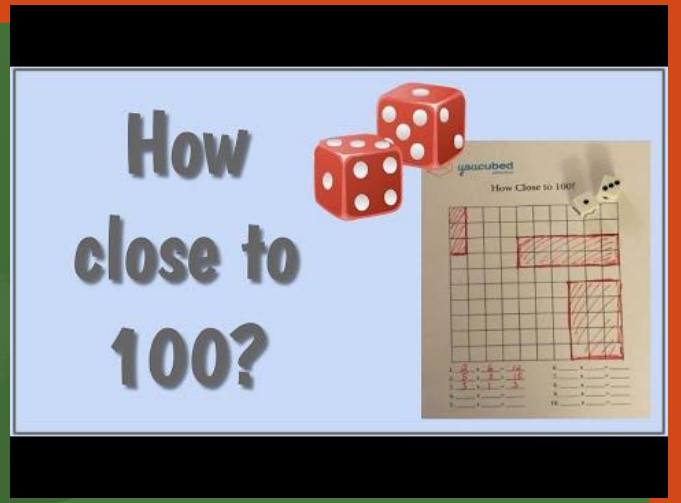
Tens	Ones

Each player rules up a column for “tens” and a column for “ones”. The aim of the game is to get a total as close to 100 as possible. The student tosses a dice and decides whether the number will be put in the ones or the tens place. For example, if a four is thrown, it could either be 40 or four. The dice is rolled a total of seven times. All seven numbers must be used. The total of all the columned numbers may exceed 100, but the students will need to decide which player has got closer to 100.

Extension Activity

Use larger numbers and decimals for the target numbers. Vary the number of throws and what the thrown number can represent, such as:
Closest to 1 000: 10 throws of hundreds, tens, or ones.
Closest to 10: 10 throws of ones, tenths, or hundredths.
Closest to 1: 10 throws of tenths, hundredths, or thousandths

Don’t wait until I have learned my facts to play, let me learn them while I play!



Close to 100 Using grids and Multiplication Facts

Greatest total area covered wins!

Thank You

Do not hesitate to reach out for anything you might need.