Grade 2 & 3 Place Value in Primary



SD73 Balanced **Joyful** Numeracy Dec.2, 2024 Stacey Kaczur District Numeracy Resource Teacher







Secwepemcúľecw yi7élye ell

I respectfully honour and acknowledge that we are learning and unlearning in the territory and on the lands of the Secwepemc People. Specifically the territory of the Tk'emlups te Secwèpemc People.

Side Deck Links

- What is place value & why is it important? What are equivalent groupings?
- How can I start to <u>decolonize</u> my math classroom?
- How can I teach place value?
 - types of representations

tents, money, frames, online ten frames, online rekenreks Graphics Department: STEM Resources

- instructional routines
 - Number Mats (mysd73-numeracy-numeracy assessments) Late K/Gr. 1 Mat
 - Counting Collections
 - Clothesline Math
 - Today's Number Routine
- What Grade 2/3 resources are available? Electronic Version of Book List
- What are some assessment considerations?NSA and Curriculum Pathways
- What is the connection between operations and place value?

Learning Intentions

- What is place value & why is it important?
- How can I begin to decolonize my math classroom?
- How can I teach place value? types of representations instructional routines
- What resources are available?
- How might I assess place value understanding?
- What is the connection between operations and place value?





Google Classroom





Class Code: z5wgaag

CLASSWORK

Computational Fluency Utilities- The Foundation Year Plan Supports **Assessment Supports** Math Games Instructional Routines Models & Strategies Teaching Resources (Print/Online) **Newsletters Online Interactive Tools Professional Development** PD Slide Decks (like toady's!)

https://classroom.google.com/c /NjQ5MjM1OTk1NDAz



Number Sense is at the heart of it all. Place Value is part of number sense.

Part whole is the basis of place value.

Everything is connected.

02

Place Value is the foundation of computation.

03

"Without a firm foundation & understanding of place value, students may face chronic low levels of mathematics performance."

-Van de Walle, 2022



What is place value?

Place Value

Digit

Place Value

Base Ten



Number Sense

Learning *understands numbers, ways to represent GOALS numbers, and relationships among numbers. *makes reasonable estimates, computes fluently, and uses reasoning strategies

Number sense is complex with many layers and is rooted within all strands of math at all ages.

Place Value

- place

*combination of mathematical ideas and concepts related to the size of a number

*value of digits within a numeral based on their

NSA

*concepts of ones tens, hundreds, thousands * (de)composing numbers/equivalent groupings







ELEMENTARY COAST METRO MATH PROJECT

Knew/New Routine! "I KNEW THIS ... AND THIS IS NEW!"

Learning Stories & Overviews - Coast Metro Place Value Tasks:represent, describe, compare, order, estimate, measure, real world application

MBER CONCEPT ONE: PLACE VALUE GRADE TWO (C



Decolonizing My Math Class

FIRST PRINCIP OF LEARNING

Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).

Learning involves recognizing the conseque of one's actions.

Learning involves generational roles and responsibilities.

Learning recognizes the role of indigenous knowledge.

Learning is embedded in memory, history, and story.

Learning requires exploration of one's identity.

Learning involves recognizing that some knowledge is sacred and only shared with ermission and/or in certain situations.

0





Addition through place value based strategies oughout our curriculum instruction, we embed indigenous- informed Pedagogies. One way is rough the First People's Principles of Learning (FPPL - British Columbia). Below are considerations for r math collaborations on place value ailable in all schools WAYI WAHI, is an excellent resource for supporting educators i mbedding the FPPL into our learning environments. Learning ultimately supports the well-being of the self, the family, the land, the spirits and the ancestors

- Ensure there are multiple access points in learning to enable all learning from where they are. A learner's well-being is supported when they are provided with opportunities to learn from where they are, rather than be penalized because they are not beginning from where the teachers thinks they should
- Allow all learners to represent what they learn in a variety of ways ning is holistic, reflexive, reflective, experiential and relational (focused
- ness, on reciprocal relationships, and a sense of place).
- Help learners understand their own learning processes and how they build understanding on previous learning experiences
- Respectfully incorporate the use of circle for group discussions
- Create collaborative and cooperative learning opportunities that help learne further develop their abilities to learn from each other and value interdependence
- g involves recognizing the consequences of one's actions
- Provide learners with appropriate levels of choice in their learning. This might include some choices in what they learn, how they learn, and how they represent what they have learned

ning involves patience and time

Week 3

0

- Ensure that learning involves developing deep understandings of concepts and th pplication of knowledge, rather than only memorization of information
- Revisit concepts multiple times, providing learners with opportunities to deepen
- their knowledge by layering their learning · Help learners understand the need for patience in learning, and that patience is connected to perseverance
- Be patient with learners whose learning processes are different than y

ocal documents to guide your practice nol Education Enhancement Agreement 2023-2028 (EA)

s Cultural Safety. Humility and Competency Guide 202 Both are available on SD73's website under Aboriginal Education and both are relevant to ur math classrooms (ie. Foundational Skills p. 17 of the EA)

Professional Standard 9

How can I start to decolonize my math classroom?



How can I teach place value?

Materials



Collections Ten frames Base Ten **Snap/Unifix Cubes Hundred Charts** Number paths Money **Place Value Tents Cuisenaire Rods**

Representing Number *modeling hundreds, tens, ones with materials	Describing Number *pairs of ten *close to far from *open sentence (missing parts) *hundreds,tens, ones	Comparing & Orde *anchors of 5, 10, 10 *more than, less th *using number line
Using Referents to Estimate *5- ness *10 - ness *100- ness	Counting *skip counting 1s,5s, 10s, 100s *using tools (10 frames, base 10, Cuisenaire rods)	Measurement Conn *length *mass *area *capacity



ering Number 00 nan es	
ections	Real World Application





represent, describe, compare, order

e		Date			Today's Number is
aw It					Addition Equation
Form					
Chart	0.000	Place Value Chart	Ones		Subtraction Equation
ureus		lens	Olles		
	Show wh	ere the numbers belong	g on the number lir	ne.	
					1000 SD73



1 hundred + 13 tens + 5 ones

Equivalent Groupings





FAQ- Why does the Grade 3 (IVIAL C) Have a provide the chart with only tens and ones for the number 317? FAQ- Why does the Grade 3 (MAT C) have a place value

Background Backgroune Using expanded form is one way to decompose a number into hundreds, tens, and ones, but there are other ways too. Students need to represent three-digit numbers and represent numbers in multiple ways. It is essential that students Students need to represent three-digit numbers and represent numbers in multiple ways. It is essential that students recognize how and why hundreds are also tens. "Groupings with fewer than the maximum numbers of tens (or hundreds) are consistent to an environment of tens (or hundreds) and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional techniques for a constraint in addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint in addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional techniques for a constraint is addition and subtractional and subtractional and subtractional techniques for a constraint is additional techniques for a constraint in addition and subtractional techniques for a constraint in addition and subtractional techniques for a constraint is additional techniques for a constraint in addition and subtractional techniques for a constraint is additional techniques for a constraint in additional techniques for a constraint in additional techniques for a constraint is additional techniques for a constraint in additional techniques for a constraint in additional techniques for a constraint is additional techniques for a constraint in additional techniques for a constraint in additional techniques for a constraint is additional techniques for a constraint in additional techniques fore recognize now and why hundreds are also tens. Groupings with jewer than the maximum humders of tens (or hundreds (are referred to as equivalent groupings. Many computational techniques (e.g. regrouping in addition and subtraction) are based an equivalent concentrations of numbers "Walks 2022 = 2021 Walk more backgroupid. are referred to as equivalent groupings, many computational techniques (e.g. regrouping in automation unit a based on equivalent representations of numbers," (Van de Walle, 2022, p. 207) <u>Want more background?</u> MathUP Video (2:00 min video) Go to Grade 3 Number - Representing Whole Numbers- Topic Planning to find the video. Mathue video (2:00 min video) Go to Grade a Number - Representing Whole Numbers- Topic Planning to find the Here Marian Small discusses how different representations of a number reveal different things about that number Revealed a form attacked from white words and decompositions and that this is an attached understanding way of the second s rere marian amain discusses now different representations of a number reveal different things about that number (expanded form, standard form, written words and decomposition) and that this is an essential understanding we cover in *Counting Collections Counting Collections It's important for students to conduct actual counts of concrete materials to help them make sense of the magnitude of It's important for students to conduct actual counts of concrete materials to new time make sense of the magnitude of numbers greater than 100. - Small in MathUP. Have many collections available so that students can work simultaneously. tumbers greater than 200. - Smaw in Mathure. Have many collections available so that students can work simultaneously. Using many collections also allows for differentiation, since some students may benefit from working with situations that "Models (like base ten blocks) remind students of the relative sizes of hundreds versus tens versus ones. Models (like base ten blocks) remino students or the relative sizes of hundreds versus tens versus dnes. *Using money (Carole Fullerton has a free download with money to print) is a great way to explore different ways to Resources in the UISTICK 1.Math UP: Sample Tasks after instruction <u>To Rename or Not to Rename Game. Number Match</u> 2.Place Value in Intermediate (gr 3-5) by Carole Fullerton 2.Place Value in Intermediate (gr 3-5) by Carole Fullerton Place Value in Intermediate (gr 3-5) by Carole Fullerton Choral Counting and Counting Collections: Transforming the PreK-5 Math Classroom by Franke, Kazemi, & Turrou 5.Number Sense Routines Routines:Building Numerical Literacy Every Day in Grades K-3 6. Good Questions: A Year of Open-ended Math Problems for Grades 2-4 by Carole Fullerton Literature Connection - One Hundred Hungry Ants by Elinor J. Princzes youtube Students listen to the story One Hundred Hungry Ants by Elinor J. Princzes <u>volutube</u> number 100 in different ways. Good Questions Task: Proportional Reasoning: Get Rich! (ask one a day in the set) - Fullerton Would you rather have 10 quarters or 100 nickels? Would you rather have 100 nickels or 2 loonies? Would you rather have 100 dimes or 40 quarters? Place Value Riddles can be a fun, meaning-making task. Make your own or check these out. Place Value Modes can be a run, meaning-making task, make your own or creek triese i.e. What's My Number Cucumber - Fullerton i.e. <u>Place Value Riddles</u> Van de Walle Open Question: Find a three digit number that you can represent using 15 base ten blocks. The blocks can be all the same or different. Upon cuestion: Find a three digit number that you can represent using 15 base ten blocks. The blocks can be all the same or different. Show ar describe another way to represent the number using a different number of blocks. Repeat for several other numbers. Marian Small

12 tens + 6 ones

Equivalent Groupings

Students need to represent three-digit numbers and represent numbers in multiple ways. It is essential that students recognize how and why hundreds are also tens.

"Groupings with fewer than the maximum numbers of tens (or hundreds) are referred to as *equivalent groupings*.

Many computational techniques (e.g. regrouping in addition and subtraction) are based on equivalent representations of numbers." Van de Walle, 2022, p. 207

Decomposing Into Hundreds, Tens, and Ones

Using expanded form is one way to decompose a number into hundreds, tens, and ones, but there are other ways too.

For example, 517 can be written and modelled in many ways. A few are shown here.







The models are equivalent because each 100 is 10 tens, and each 10 is 10 ones.

5 hundreds + 1 ten + 7 ones

Hundreds	Tens	Ones		
	UNIVERSITY	0 0 0 0 0 0 0 0		

4 hundreds + 11 tens + 7 ones

Hundreds	Tens	Ones			
		ссс ссс с			

5 hundreds + 0 tens + 17 ones

Hundreds	Tens	Ones
		0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

MathUp sample



Transforming
the PreK-5Elham Kazemi, & Math Classroom Angela Chan Turrou

Choral Counting & Counting Collections



PLACE VALUE IN

Developing Number Sense In Kindergarten through Grade 2

Place Value in Primary





 $\mathbf{0}$











PRIMARY by Carole Fullerton







PLACE VALUE IN INTERMEDIATE

Building Number Sense Grades 3 to 5

by Carole Fullerton

Place Value in Intermediate



Part of being a numerate student is having a strong mathematical foundation

High Yield Routines

develop content and competencies Counting Collections

Clothesline

Today's Number







What is it?

This instructional strategy focuses on collections, or groups of objects, in which students draw on the counting principles in relation to one another as they figure out how many objects they have. As they cou-objects, their varied ways of grouping and sorting and recording enrich their understanding of counting. These objects can vary, such as buttons, beans, cubes, or other manipulatives. The goal is for students develop a deeper understanding of numbers, quantities, and mathematical relationships.

portunities where all can enter into tasks: a c



Watch the video from Janice Nova (SD38) to learn more about Cou Collections (20 min) 10 min mark for intermediate expl

A High Yield Routine:

Counting Collections





Students work in **partners** to count a collection of items in different ways. They may record their findings including quantity and how they counted. The focus is on "counting all."

The **goal** is for students to develop a deeper understanding of numbers, quantities, and mathematical relationships.

The Process



-





Part 2

Count, Organize, Record

* Conferring with students

Part 1

Mini-lesson

hape of the day	
Onnouncements/agendo 2,55,10s	lov. 17
PHF May game Mcs K	~~
snack by 55	
lath Guest punting Collections	5
Inch) (0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	egg co
$\partial = \partial + 1 + 2 + $ by 55 by 20 by 10 by 1	2222
$2+2+5+2+2+155$ (3) $4_{0}+4_{0}-8_{0}$ (4) (4)	by 25
$= 33 \qquad DID \qquad (545555555555555555555555555555555555$	20+20-
27.27 27.77	-
	-

Part 3

Debrief

The Routine

Counting Collections involves:

- Partners counting a collection of objects
- Choosing their own way of counting
- Recording the count how and how many
- Teacher circulating, listening in to hear strategies
- Teacher highlighting strategies noticed
- Scaffolding the learning leading to more sophisticated strategies
- Easily differentiated



The Collections

Collections vary in quantity and include interesting items for students to easily count and arrange.

shells, rocks, popsicle sticks, beads, gems, dried pasta, marker tops, buttons, cubes, small toys, pegs, pom • poms, corks, bottle tops, pattern blocks, tiles, unifix cubes, BINGO Chips, pennies, small toys





Individual Items

Packaged Items

Collections can also consist of packaged items like decks of cards, packs of markers and paper clips, when working with older students and their counts (i.e for multiplication).





Debrief

The Tools



Trays, cups, bowls, egg cartons, ice cube trays, muffin tins, place mats, 5, 10, double 10 frames, sheet of ten frames, 100s charts, large paper, coffee filters, number paths, cups that can be stacked

Recording the Coun _____

Counting Name: I counted: Picture	g Collections	Counting Collections Date:	Names: Date: Counting Collections We are counting Draw a picture that shows how you counted.	Names: Date: Counting Collections We are counting Estimation We think there are about (circle one): 25 50 75 100 125 150 Our Plan for Counting: We will count by Draw a picture that shows how you counted.
Numeral	Tally Marks		Our final count was	
			**Remember that your teacher needs to be able to check your count. Write a repeated addition sentence that shows how you counted.	Cur final count was **Remember that your teacher needs to be able to check y Write an equation that shows how you counted.

Early Primary

Primary

"Mart"

-		

. 175
our count.

Names:

Date:

Counting Collections Multiples

We are counting

Estimation

Draw or write to explain how you arrived at your estimate.

If you and your partner do not agree on an estimate, record both estimates and put your name beside your estimate.

Our final count was

**Remember that your teacher needs to be able to check your count Draw a picture that shows how you counted:

Write an equation that shows how you counted.

Names:

Date:

Counting Collections Fractions

We are counting

Estimation

Draw or write to explain how you arrived at your estimate

If you and your partner do not agree on an estimate, record both estimates and put your name beside your estimate.

Our final count was

**Remember that your teacher needs to be able to check your count. Show and explain all the ways you counted using fractions:

Grade 3+

Mindful Math



155, 150, 145, 140, 135 Math Guest Counting Collections by 5s Sticks cups, bowls lunch 0by 55 2+ 2+2+S+2+2+2+ 2+2+2+2+2+/ 155 5+5+5+5+5 = 33 5+5+5+5+5+5+5+5+5+5+

Dufferin Digs In!

Debrief



Your turn! Partner Work







1.Select a collection 2. Choose a method to organize your count 3.Decide how you will count 4.Record your count 5.Count it another way

Record your count on the Mindful Math Wall (by 's, pictorially, equation)

Do NOT clean up your count!





"Counting is fundamental to learning mathematics in elementary school.

It supports the development of a deep understanding of number providing:

- * the core foundation for understanding place value
- * how numbers are composed and decomposed
- * how they relate to one another

This deep understanding of numbers allows students to operate on them in powerful ways" (Franke, et. al, 2018, p. 1).

Counting involves pattern, structure, quantity, and number sense and can be extended to involve grouping, multiplicative reasoning, fractions and decimals.



Mindful Vath Moment











Clothesline Math K-12 Instructional Routine - SD73 Compiled by Stacey Kaczur (SD73 District Numeracy Resource Teacher Novem

What is it?

line Routine consists of a **length of string with moveable cards** with either numbers or representations of hem (e.g., ten frames, fingers, dots, money, images of fractions, decimals, etc...), Teachers could use one pipe lines that run parallet to each other. The clothesline or string is hung at a **level easily accessible** to s. bottom of a white board for primary) and partner work is recommended. Students place numbers along e justifying and explaining their placement.

meaning that the "benchmark" numbers may be adjusted when r alues that are placed on the line (Shore, 2023). There are many different ways the clothesline can be used. Check of ningful Math Moments for more information.

> The clothesline is the master number sense maker. - (Tim McCaffrey as cited by Chris Shore)

Clotheslines become interactive number lines that support the development of number sense from K - Grade 12 (whole numbers, fractional numbers, decimal numbers, exponents, irrational numbers, integers) with a focus on comparing and ordering.

Students are able to manipulate cards to strengthen concepts of ordinal n precision, equality be



Math - the proces

With your clothesline readily accessible and visible to students and your number tents built, you are ready to have your class explore the clothesline routine. Have students share what they notice and wonder about the line displayed. Students can work in pairs (less pressure) to determine where a number (or representation) should be placed and they have to share their reasoning. Before adjusting someone else's placement, students would have to explain why the adjustment is needed. Clothesline was initially built for middle and high school but has been adjusted to be used across the grades. See the following page for a variety of ways to implement the routine at the elementary school level.

A High Yield Routine:





Free Downloads Tents - start at page 22









The clothesline is the master number sense maker.

- (Tim McCaffrey as cited by Chris Shore)

number.



- Understanding & solving
- Connecting & Relfecting

The **goal** is for students to develop a deeper understanding of numbers, quantities, and mathematical relationships. Place Value Tasks: represent, describe, compare, order, estimate, measure, real world application

Students work in **partners** to place their

 Math reasoning and analyzing Communicating & representing Visualizing, sequencing, proportionality

The Process



Part 1

Select Clothesline Select Routine



Part 2

Partner plans Moving others



Part 3

Debrief

The Routine

Build the Line

What's Missing

Fix It!

Guess My Number!

Clothesline Math:

- Introduce the clothesline routine to your class.
- Have students share what they notice & wonder about the displayed line.
- Students work in pairs to decide where to place a number or representation and share "why".
- Require students to explain their reasoning before adjusting others' placements.
- Easily differentiated
- Vary benchmarks
- Add visual representations



Your turn! Partner Work



- Build the number for your collection 1.
- Discuss the benchmarks on the clothesline
- 3. Decide where you think you will place your number (be ready to share why)
- 4. Whole Class Placements (if you feel you need to adjust a group's be ready to justify your thinking)
- Place then space!
- 5. Debrief







Knowing our "why"

Clotheslines become interactive number lines that support the development of number sense from K - Grade 12 (whole numbers, fractional numbers, decimal numbers, exponents, irrational numbers, integers) with a focus on comparing and ordering.

Students are able to manipulate cards to strengthen concepts of ordinal numbers, show proportional reasoning, precision, equality between numbers, and magnitude (Acosta).

Connecting Representations



Ten Frames A "Must Have"

60	65









Today's Number Routine K - 3+ 🚰

What is it?

This instructional routine goes by many names (Today's Number, Ways to Make a Number, Number of the Day How Many Ways, Target Number). Students are asked to create a variety of representations of a carefully selected number. They might break it into parts, explore its place value, create equations and represent it with different models. 0

This could include concrete items (ten frames, base ten blocks, counters, rekenreks, collections, money), pictori representations (tallies, pictures, number lines) and symbolic representations (numerals, equations). The partner work involved supports rich conversation about <u>number</u>.

tart as a whole class number talk and move to small group or partner work over time. Non-permane the NSA Mats, concepts wheels, number webs, paper and math journals are examples of ways students can record their thinking. Taking photos is an effective way to capture learning in the moment.

The focus of the routine is thinking flexibly about numbers, how to compose/decompose them and appreciate th interconnectedness of math concepts.

Background

The <u>BC Curriculum</u> Big Ideas of Number and Computational Fluency are highlighted in this routine. The communicating and representing curricular competency is at the heart of it.

- Represent mathematical ideas in concrete, pictorial and symbolic forms Communicate mathematical thinking in many ways Use mathematical vocabulary and language to contribute to mathematical discussion Explain and justify mathematical ideas and decisions

"Number Sense is a daily thread that runs through all the mathematics work undertaken by students. Consistent use of this routine throughout the grades will continue to enhance number sense" (McCoy, et. al, 2013, p. 7).

Depending on the number chosen, students can be working on the following

- competencies and concepts embedded in number sense Detencies and concepts embedded in number see Demonstration of number sense, what numbers man Counting, skip counting Flasbibly and fluency with numbers Expanded fram and equivalent expressions Partipart whole Use of moduls Use of moduls Odd/even Screater thankes thankeus Montiless Anatyling menial math strategies

- woreness Applying mental math strategies Communicating mathematical ideas Number operations Number lines Connecting math concepts to each other and to the world



A High Yield Routine:







-



ne		Date			Today's Number is
aw It					Addition Equation
					na na haran a ang ang ang ang ang ang ang ang ang
Form					
				+	
Charf		Place Value Charf	Place Value Charf		Subtraction Equation
drads	Ones	Tons	Ones		
luieus	Ones	Teris	Offes		
(),e					
	Show wi	nere the numbers belong	on the number line	e.	

How might I assess place value?

SD73 NSAs Grade 1-3 Math In Mission Curriculum Pathways **Coast Metro Write Ups (below)**

Suggestions for Assessment By the end of grade 2, students will be able to think about two-digit numbers flexibly and fluently.

This would look like being able to represent and compose and decompose two-digit numbers in different ways using different forms (concrete, pictorial and symbolic) and order and compare two-digit numbers and explain their thinking and justify their choices.

Students will be able to use materials like Unifix cubes and base ten blocks as well as ten frames and counters to represent two-digit numbers concretely.

Routines such as choral counting, counting collections and clothesline help students to make connections between different representations of numbers, see patterns and practice symbolic notation of numbers and can be a rich source of observational assessment information – watch and listen as students engage in whole class or small group discussions using these routines.

Suggestions for Assessment By the end of grade 3, students will be able to think about three-digit numbers flexibly and fluently.

This would look like being able to represent and compose and decompose numbers in different ways using different forms (concrete, pictorial and symbolic) and order and compare three-digit numbers and explain their thinking and justify their choices.

By the end of grade 3, students will be able to apply their understanding of place value to strategies for adding and subtracting three-digit numbers. For example, they might decompose numbers by place value first and add like numbers and then recompose.

Turgery NO.	A OVERVIEW – GR	RADE 3: SNAP	SHOT			Name:
APSHOT OF ands	TASKS, LEARNING GOAL	LS, MATH STRANDS	AND PROFICIENC	CY SCAL	ES	Content: Number Concepts to 100 Content: Number Concepts to 100 Control of the Concepts Concepts Control of the Concepts Con
lumber Concep (NC)	Computational Fluency (CF)	Addition/Subtraction (AS)	Multiplication/Divisi (MD)	on \	Whole Class dministration	Represent machine mathematical concepts of make sense of quantities Represent machine in concrete, pictorial, and symbolic forms Stage 3 – With symbols
Plan Insight Insufficient Ev	Proficiency Scale Scoring idence 1→ Emerging 2→ Do	eveloping 3→ Proficien	t	Math	Ed Plan Insight	I can match a number to the corresponding numeral within 100 () know "eighty" is 80 eres within 100 () taken write numbers to 100 with ymbols and in work. I can write numbers to 100 with ymbols and in work. I can write numbers to an eight number that are eng/two/ten more/tes stan an number writes autoers that are eng/two/ten more/tes stan an number line and gives participants.
Tasks 1 SD73 NSA	Grade 3 Representing Numbers t	o 1000 With Picture	s, Symbols and	Strand NC	Proficiency Scale Score 0-3	1 can place a list of number (b 100) in increasing/decreasing order, of the second
Mat C	Build and print 317. Place Value: Decomposi	ng Three-Digit Numl	bers	NC	0-3	to 100 and place them on an open number line.
SD73 NSA Mat C	Representing 317 in variou	is ways.				I can represent and recognize numbers to 100 aluar What to be in the second sec
3 SD73 NSA Mat C	Comparing and Ordering Use an open number line to	Numbers o proportionally seque	ence 4 numbers.	NC	0-3	I can draw one, two, or ten more/less than a quantity within 100. I can draw one, two, or ten more/less than a quantity within 100. each) and say which we used so folgiests (with use the same more more more more more more more mo
4 SD73 NSA Mat C	Writing an Addition and S Create two equations with	Subtraction Equation an answer of 317.		AS	0-3	Move to Stage 3 where ital more and which has less. with little or no difficulty. Move to Stage 3 where ital more and which has less. with little or no difficulty. Mattery Date:
5 SD73 NSA Mat C	Fractions Can Be Repres Model 3/4 using an area, lin	sented in Three Way near (line) and set mo	/S del.	NC	0-3	Stage 1 – With materials Can represent quantities to 100 using and bases of the extension of the extensio
6	Fluency with Basic Facts "You have 7 marbles; you w have now?"	s – Addition within 20 win 8 more. How many) 7 marbles do you	CF	0-3	I can show on/two/ten more/less than a quantity within 100. Can compare two sets of objects (with up to 100 in each). Move to Stage 2 when student can and
7	Fluency with Basic Facts – Subtraction within 20 "You have 16 special cards in your collection. You gave 9 to your friend. How many do you have left?		CF	0-3	Ready to stare Area of the set of these tasks That is ten more or a view the amount Mastery Date: The current of the set of these tasks Anatery Date: The current of the set of the	
8	Skip Counting Forward a Counting forward by 3s an Counting backward by 10s	and Backward Fluent d 25s (various starting (various starting num	tly g numbers) hbers)	NC	0-3	 See reverse for explanations and Exploring to 100. Date
	Decomposing Numbers	to 1000		CF	0-3	Mission





School District No. 73 **Number Sense Assessment (NSA)** NSA OVERVIEW – GRADE 3: EMBEDDING THE NSA

EMBEDDING THE NSA IN GRADE THREE MATHEMATICS: SCOPE AND SEQUENCE

Recommended - three entry points Required - two entry points - looking for mastery in this year-long learning

coding	colour g:	number concepts computational fluency addition/ subtraction multiplication/ division # 14 tasks total Optional Entry Point (2 tasks) February 28 Score Entry (4 - 6 tasks)		whole class			
Strand	#			al Entry Point February 28 Score Entry 2 tasks) (4 – 6 tasks)		April 30 Score Entry (8 tasks)	
SD73 Ma nathem SD73 N	at C #1 atical co Mat C	- 5 Curricular Compe oncepts This can be a Num	etency: communicate ber <u>of the Day math r</u>	<i>mathematica</i> routine. Adjus	<i>l thinking in</i> t the numbe	many ways, vi r used based	isualize to explore on student needs.
NC	1	Representing Number (pictures/numerals)	ers Teach/	Assess	or Tead Extend to la	h/Assess	Extend to larger numbers
NC NC	1 2	Representing Number (pictures/numerals) Place Value Decomposing	Teach/	Assess Assess	or Tead Extend to la or Tea Extend to us	h/Assess arger numbers ch/Asses e of operations	Extend to larger numbers Extend to use of operations
NC NC NC	1 2 3	Representing Number (pictures/numerals) Place Value Decomposing Comparing and Order (open number line)	ers Teach/ Teach/ ering Teach with to s	Assess Assess number line 500	or Teac Extend to la or Tea Extend to us Teach	h/Assess arger numbers ch/Asses e of operations /Assess	Extend to larger numbers Extend to use of operations Use this knowledge for computational fluency
NC NC NC AS	1 2 3 4	Representing Number (pictures/numerals) Place Value Decomposing Comparing and Order (open number line) Representing Equation (symbols)	ers Teach/ Teach/ ering Teach with to 5 ons Review to 10	Assess Assess number line 500 00 and extend	or Teac Extend to la or Tea Extend to us Teach Teach	h/Assess arger numbers ch/Asses e of operations /Assess /Assess	Extend to larger numbers Extend to use of operations Use this knowledge for computational fluency Maintain

CF	6	Fluency with Basic Facts- Addition	Review Strategies	Teach/Assess for fluency	Apply to working with larger numbers
CF	7	Fluency with Basic Facts- Subtraction	Review Strategies	Teach/Assess for fluency	Apply to working with larger numbers
NC	8	Skip Counting Fluently	Review different counts and use different start points	Extend to skip counting with larger numbers. Apply to strategies with operations	Teach/Assess

#9 - 14 Curricular Competencies: communicate mathematical thinking in many ways, develop and use multiple strategies to engage in problem solving, connect math concepts to each other, estimate reasonably

CF	9	Decomposing Numbers (change unknown)	Review decomposing 10/ 100 & extend to larger numbers	Teach Decompose larger numbers	Teach/Assess
AS	10	Adding 3-Digit Numbers (result unknown)	Review 2-digit and extend	Teach 3-digit by 3-digit with strategies/models	Teach /Assess
AS	11	Subtracting 3-Digit Numbers (result unknown)	Review 2-digit and extend	Teach 3-digit by 3-digit with strategies/models	Teach /Assess
AS	12	Subtracting 3-Digit Numbers (change unknown)	Review 2-digit and extend	Teach 3-digit by 3-digit with strategies/models	Teach/Assess
MD	13	Multiplying Single Digits	Introduce	Teach	Teach/Assess
MD	14	Dividing with Single Digit Divisors (quotative)	Introduce	Teach	Teach/Assess



SNAPSHOT OF TASKS, LEARNING GOALS, MATH STRANDS AND PROFICIENCY SCALES

Strands

Number Concepts	Computational Fluency	Addition/Subtraction	Multiplication/Division	Whole Class
(NC)	(CF)	(AS)	(MD)	Administration

EdPlan Insight Proficiency Scale Scoring

0→ Insufficient Evidence 1→ Emerging 2→ Developing 3→ Proficient

Tasks	Grade 3 NSA Learning Goal	Math Strand	Ed Plan Insight Proficiency Scale Score
1 SD73 NSA Mat C	Representing Numbers to 1000 With Pictures, Symbols and Place Value Build and print 317.	NC	0-3
2 SD73 NSA Mat C	Place Value: Decomposing Three-Digit Numbers Representing 317 in various ways.	NC	0-3
3 SD73 NSA Mat C	Comparing and Ordering Numbers Use an open number line to proportionally sequence 4 numbers.	NC	0-3
4 SD73 NSA Mat C	Writing an Addition and Subtraction Equation Create two equations with an answer of 317.	AS	0-3
5 SD73 NSA Mat C	Fractions Can Be Represented in Three Ways Model 3/4 using an area, linear (line) and set model.	NC	0-3
6	Fluency with Basic Facts – Addition within 20 "You have 7 marbles; you win 8 more. How many marbles do you have now?"	CF	0-3
7	Fluency with Basic Facts – Subtraction within 20 "You have 16 special cards in your collection. You gave 9 to your friend. How many do you have left?	CF	0-3
8	Skip Counting Forward and Backward Fluently Counting forward by 3s and 25s (various starting numbers) Counting backward by 10s (various starting numbers)	NC	0-3
9	Decomposing Numbers to 1000 Determining an addend to get to 1000.	CF	0-3

Grade 2+

Name:

Curriculum Pathway: Place Value to 100

Content: Number Concepts to 100

Curricular Competencies:

- Develop mental math strategies and abilities to make sense of quantities
- Visualize to explore mathematical concepts
- Represent mathematical ideas in concrete, pictorial, and symbolic forms

**NOTE: Start at the bottom of the page and work your way up.			
Stage 3 – With symbols	What to look for		
I can match a number to the corresponding numeral within 100 (I know "eighty" is 80 for example). I can write numbers to 100 with symbols and in words. I can compare numbers within 100. I can name the numbers that are one/two/ten more/less than a number within 100. I can put a list of numbers (to 100) in increasing/decreasing order. I can place a list of numbers (to 100) on an open number line.	Students becoming more proficient with comparing/ordering/representing numbers to 100, especially using benchmarks. Students partitioning the number line and placing numbers correctly. Students developing fluency with 1/2/10 more/less than a given number within 100.		
Student is proficient on this pathway when they can represent numbers to 100 concretely, pictorially and symbolically in several ways and when they can compare and order numbers/quantities to 100 and place them on an open number line.	Mastery Date:		

Stage 2 – With pictures	What to look for
I can represent and recognize numbers to 100 pictorially (on ten-frames, with tally marks, by drawing base-10 blocks). I can draw one, two, or ten more/less than a quantity within 100. I can look at pictures of two sets of objects (with up to 100 in each) and say which set has more and which has less.	Students using a variety of ways to represent numbers. Students becoming more proficient with naming the number that is 1/2/10 more/less than a given number.
Move to Stage 3 when student can perform each of these tasks with little or no difficulty.	Mastery Date:

Stage 1 – With materials	What to look for
I can represent quantities to 100 using materials (counters, base-10 blocks). I can show one/two/ten more/less than a quantity within 100. I can compare two sets of objects (with up to 100 in each).	Unitizing – students grouping by tens to represent quantities. Students recognizing that adding/removing one ten-rod or ten-frame gives the amount that is ten more or ten less
Move to Stage 2 when student can perform each of these tasks with little or no difficulty.	Mastery Date:
A	

Ť

Ready to start	Date
I have completed the Curriculum Pathways: Counting and Subitizing to 20, Representing, Comparing &	
Ordering Numbers to 10, Counting and Skip-Counting to 100.	

*See reverse for explanations and resources



Rebekaah Stenner, June 2023 rebekaah.stenner@mpsd.ca

Grade 3+	
Ĩ	
5	

Content: Number Concepts to 1000 **Curricular Competencies:**

Stage 3 – With symbols

I can match a number to th (I know "seven hundred eig I can write numbers to 100 I can compare numbers with I can name the numbers th than a number within 1000 I can order a list of number I can place a list of number Student is proficient on th numbers to 1000 concrete several ways and when the numbers/quantities to 100 line.

Stage 2 – With pictures

I can represent numbers to quantity is shown pictorially number.

I can draw ten/one hundred

Move to Stage 3 when stud with little or no difficulty.

Stage 1 – With materials

I can build and name quant materials like base-ten blog manipulatives, I can say ho I can show ten/one hundre Move to Stage 2 when stud with little or no difficulty.

Ready to start

Date I have completed the Curriculum Pathways: Representing, Comparing & Ordering Numbers to 100 and Skip-Counting to 100.



Name:

Curriculum Pathway: Place Value to 1000

Develop mental math strategies and abilities to make sense of quantities

Visualize to explore mathematical concepts

Represent mathematical ideas in concrete, pictorial, and symbolic forms

	What to look for
ne corresponding numeral within 1000 ght" is 708 for example). 00 with symbols and in words. thin 1000. nat are ten/one hundred more/less 0. rs to 1000. rs to 1000) on an open number line.	Students becoming more proficient with comparing/ordering/representing numbers to 1000, especially using benchmarks. Students partitioning the number line and placing numbers correctly. Students developing fluency with 10/10 more/less than a given number within 1000.
is pathway when they can represent ly, pictorially and symbolically in ey can compare and order 00 and place them on an open number	Proficiency Date:

Ť	
	What to look for
9 1000 pictorially in different ways. If a ly, I can say how much and write the	Students using a variety of ways to represent numbers. Students becoming more proficient with naming the number that is 10/100 more (loss than a given
d more/less than a quantity to 1000.	number.
dent can perform each of these tasks	Mastery Date:

Ť	
	What to look for
tities to 1000 in different ways using cks. If a quantity is shown with ow much and write the number. ed more/less than a quantity to 1000.	Unitizing – students grouping by tens/hundreds to represent quantities. Students building quantities in a variety of ways.
dent can perform each of these tasks	Mastery Date:

Ť

Rebekaah Stenner, June 2023 rebekaah.stenner@mpsd.ca



SD73 Electronic List of Recommended









Primary Resources (Grades: K - 3)

Click on any of the images below, to access a more detailed description of the selected resource.



Grade 2 and 3 Considerations









Grade 2 - NUMERACY Resources

Recommendations for first steps (and shaded resources are second steps)

Number Concepts	Place Value in Primary K-2 by Carole Fullerton Choral Counting and Counting Collections by Megan Franke et al
Basic Fact Strategies Computational Fluency	 Mastering the Facts Addition and Mastering The Facts Subtraction by Carole Fullerton Minilessons for Early Addition and Subtraction by Catherine Twomey Fasnat (in all schools) What to Look For by Alex Lowson (in all schools) Math Fact Fluency By Jennifer Bay-Williams - free*
Addition and Subtraction Strategies	Sums and Differences 1 /2 by Carole Fullerton What to Look For by Alex Lawson
Geometry	Taking Shape by Joan Moss, Catherine Bruce et al.
Year-long Instructional Routines Number Sense	 Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3 by Jessica Shumway
All Strands	Good Questions Grade 2-4 by Carole Fullerton Coast Metro Math Project
Centres	Joyful Numeracy - Math in Mission has centres that cycle through learning year-long
Assessment Support	NSA throughout the year Curriculum Pathways (Math in Mission) Assessments embedded in the resources
Year Plan Support	Coast Metro Math Project Grade 2 Year Plan
Models	Multiple representations: ten frames, rekenreks, open number line, money, counting collections
Indigenous Informed Pedagogy	 WAHI WAY! By Jo Chrona - Chapter 5 of this book (in all schools) gives concrete examples of ways to embed First People Principles of learning into lesson planning.

Daily Math 60-70 min	м	т	w	R	F
Bell Work		Quiet review o	r consolidation time	of math learning	60
Daily Number Sense Routine 10-15 min Shumway book Examples of key one	Subitizing (Plates/Ten Frames/ <u>Rekenreks)</u>	Build it NSA Mat - partner	WODB/ Numberless Word Problems	Clothesline Moth	Choral Counting & Counting Collections Friday math learning
Resource 3 week rotations of content	rotations/layerings		ala a		
Centre rotations (option)					

SD73 Teacher feedback on Carole's Fullerton's resources: Clear and comprehensive. Explains the rationale for the learning, has a clear teacher script, are great for splits grades, align with the Coast Metro year plans (i.e. Place Value resource extends over the year), are based on BC Curriculum. They connect to one another (i.e The Place Value book also has computational strategies, and the basic facts taught in her Mastering the Facts book then extend to be used in her Sums and Differences books). - SD73 2024

Grade 3 - NUMERACY Resources

Re	commendations for first
N	umber Concepts
BC	usic Fact Strategies amputational Fluency
A	ádition and Subtraction rategies
м	ultiplication/Division
9	aometry
Fr	actions
Ye	ar-long instructional outines Number Sense
AI	l Strands
0	ontros
As	isessment Support
Ye	ar Plan Support
м	odels
in Pe	digenous informed adagogy
D	aily Math 60-70 min
B	ell Work
D 10 (4	aily Number Sense Routine -15 min: Shumway book xamples of key ones)
R	asource 3 week rotations of ontent
	entre rotations (option)

eps (and shaded resources are second steps) \$D73 2024

- Place Value in Intermediate Grade 3 -5 by Carole Fullerton
- Choral Counting and Counting Collections by Megan Franke et al
- Mastering the Facts Addition and Mastering The Facts Subtraction by Carole Fullerton (these need a review/reteach in grade 3)
- Minilessons for Early Addition and Subtraction by Catherine Twomey Fasnat (in all schools)
- What to Look For by Alex Lawson (in all schools)
- Math Fact Fluency By Jennifer Bay-Williams free*
- Sums and Differences 2/3 by Carole Fullerton
- Figuring Out Fluency Companion BookAddition & Subtraction of Whole Numbers
- What to Look For by Alex Lawson
- Multiplicative Thinking by Carole Fullerton
- Taking Shape by Joan Moss, Catherine Bruce et al. (It says K-2 but it appropriate for the BC Grade 3 curriculum)
- Rethinking Fractions by Catherine Bruce et al.
- Number Sense Routines: Building Numerical Literacy Every Day in Grades K-3 by Jessica Shumway
- Coast Metro Math Project
- Good Questions Grade 2-4 by Carole Fullerton
- Building Thinking Classrooms by Peter Uledhal and Maegan Biroux (green book)
- Joyful Numeracy Math in Mission has centres that cycle through learning year-long
- NSA throughout the year
- Curriculum Pathways (Math in Mission)
- Assessments embedded in the resources
- Sample Year Plan Draft

Multiple representations: ten frames, rekenreks, open number line, money, base 10

 WAHI WAYI By Jo Chrona - Chapter 5 of this book (in all schools) gives concrete examples of ways to embed First People Principles of learning into lesson planning.

м	т	w	R	F
	Quiet review of	or consolidation tim	e of math learning	
Visual Routine: i.e. Subilizing (Plates/Ten Frames/ Referensia)	Making Sense of Number Routine Build it NSA Mat - partner	WODE/ Numberleas Word Problems	Visual Routine Clothesine Math	Counting Routine Choral Counting & Counting Collections Friday math learning
rotations/layerings				
ga				

SD73 Printing & Graphics

P Search



S.T.E.M. Resources

DETAIL	S	
*Name	First & Last Name	

12

"Email Your Email @ad73.bc.ca

"Location - Please choose an option-

"Budget Code 1-222-33333-44-555

Fill in the text boxes below with the number of each item you require. Prices subject to change.

Addition / Subtraction strategy MATS [12x18] laminated - \$37.50 / aet of 25 Multiplication / Division strategy MATS [12x18] laminated - \$37.50 / set of 25 SINGLE Addition / Subtraction MAT [12x18] laminated ~ \$2.00 SINGLE Multiplication / Division MAT [12x18] laminated ~ \$2.00

18

NSA Mat A (Numeraoy Skills Assessment Gr.1) [11x17] +lam ~ \$30 / set of

NSA Mat B (Numeraoy Skills Assessment Gr.2) [11x17] +lam ~ \$30 / set of

NSA Mat C (Numeraoy Skills Assessment Gr.3) [11x17] +lam ~ \$30 / set of

Ten Frame Cards - Gr.1 (30 oards: x2 1-10, 11-20) [2.5 x 3.5] ~ \$18.00 / 16 decks

Ten Frame Cards - Gr.2 (30 oards: x2 1-10, x10 full-10-frames) [2.5 x 3.5] ~ \$18.00 / 16 decks

Ten Frame Card deok - Grade 1 (30 oards) [2.5 x 3.5] ~ \$3.00 Ten Frame Card deok - Grade 2 (30 oards) [2.5 x 3.5] ~ \$3.00

10 Frame TEACHER Cards (42/set; 20 tens) Colour [~7.2 x 3*] laminated ~ \$9.00

10 Frame TEACHER Cards (42/set; 20 tens) Grey [~7.2 x 3"] laminated ~ \$7.50

Graphics Department: S.T.E.M.







Gr 2 Curriculum

- decomposing numbers to 100
- estimating sums and differences to 100
- using strategies such as looking for multiples of 10, friendly numbers (e.g., 48 + 37, 37 = 35 + 2, 48 + 2 = 50, 50 + 35 = 85), decomposing into 10s and 1s and recomposing (e.g., 48 + 37, 40 + 30 = 70, 8 + 7 = 15, 70 + 15 = 85), and compensating (e.g., 48 + 37, 48 + 2 = 50, 37 - 2 = 35, 50 + 35 = 80)
- adding up to find the difference
- using an open number line, hundred chart, ten-frames
- using addition and subtraction in real-life contexts and problem-based situations
- whole-class number talks <u>COAST METRO EXPLAINS</u>

Place Value and Operations



"Place Value is like the ability to decode & operations are like the reading comprehension"



- Carole Fullerton April 22, 2024



Plan how to organize your count Decided how to count Record your count Count another way

Time to Shore

Count backwards to clean up the count



joyful

What is the connection?

decomposing/ recomposing

partial sums

splitting by place value

Left - right



44



Add the tens

Add the ones

Then add them together

Online ten frames









Ten frames and tents





-









- 2. At your table, choose two 2-digit numbers from your collections.
- 3. Represent the numbers with ten frames (there is a bag in your white basket).
- 4. By looking at the tens, can you make an estimate of the sum?
- 5. Add the tens together (move them as you do so)
- 6. Add the ones together (see how strategies for basic facts are important to get us moving away from counting on here)
- 7. Add the tens and ones together to get the SUM.



Number Sense is at the heart of it all. Place Value is part of number sense.

Part whole is the basis of place value.

Everything is connected.

02

Place Value is the foundation of computation.

03



Thank You!



Feedback Form



