



Engaging in Mathematics

Killarney School

learning | as unique | as every student

Agenda

- *Conceptions about Math*
- *Alberta Program of Studies (PoS) - Goals and Philosophy*
- *Resources*
- *Q & A*

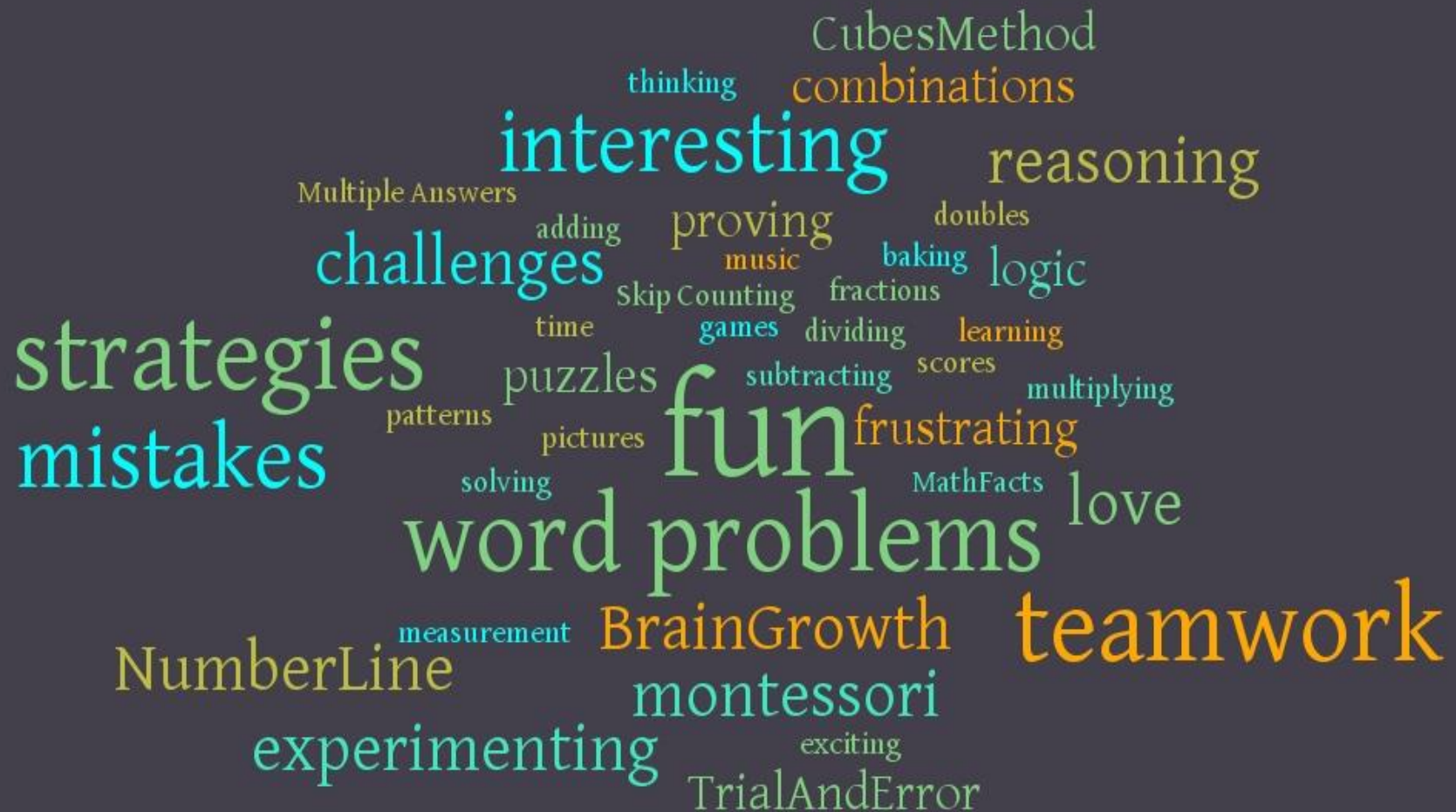
Math Conceptions: Ma and Pa Kettle



At Killarney, students think math is...

A word cloud of math-related terms. The words are arranged in a roughly circular shape, with some words being larger and more prominent than others. The colors of the words range from light blue to dark blue. The words include: equal, problems, checkerboard, fingers, poetry, counting, easy, music, numbers, odd, sports, machines, factories, whiteboard, brain, fact, Numberline, dividing, questions, solving, math, fun, sum, Montessori, equations, velocity, art, quotient, helping, money, tricky, helpful, division, times, CUBES, factors, time, difference, patterns, engineering, algebra, product, Hundredboard, families, mass, doubles, estimating, numerals, and writing.

Some more thoughts...



WordItOut

So, what does math mean to you?

Go to **www.menti.com** and use the code **24 27 93**



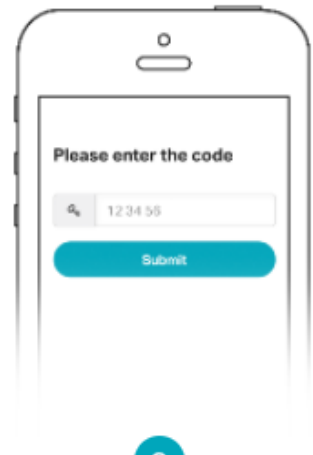
1

Grab your phone

www.menti.com|

2

Go to www.menti.com



3

Enter the code 24 27 93 and vote!



Alberta Program of Studies

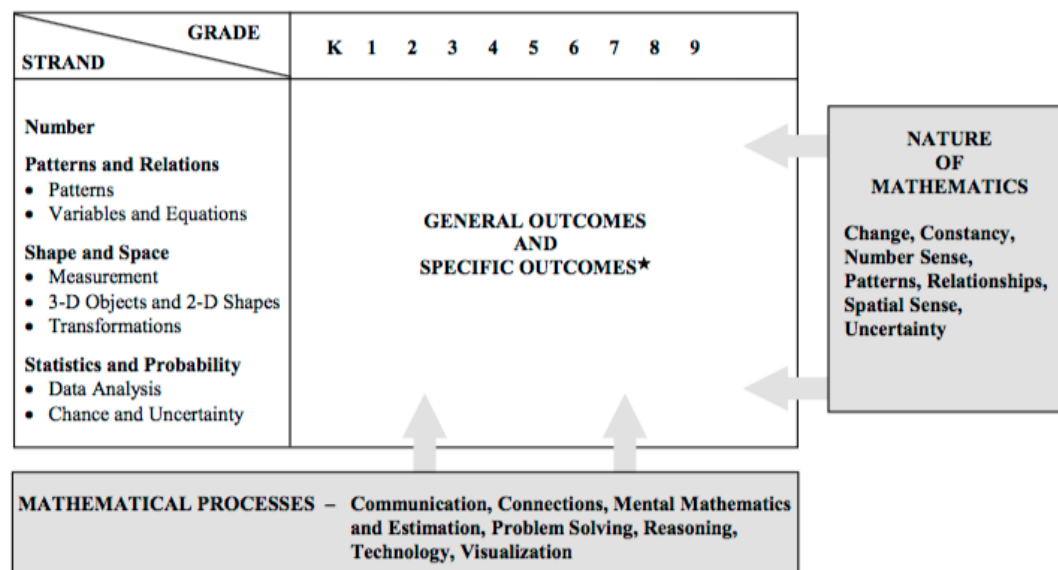
- *Released by Alberta Education in 2007, clarified in 2014 and 2016*
- *Focuses on:*
 - *Problem Solving*
 - *Deeper Understanding*
 - *Math Processes*
- *Goals:*
 - *use math confidently to solve problems, make connections, communicate and reason mathematically*

The Strands

- *Number*
- *Patterns and Relations*
- *Shape and Space*
- *Statistics and Probability*

CONCEPTUAL FRAMEWORK FOR K–9 MATHEMATICS

The chart below provides an overview of how mathematical processes and the nature of mathematics influence learning outcomes.



The

- *Communication [C]*
- *Connections [CN]*
- *Mental Math and Estimation [MF1]*
- *Problem Solving [PS]*
- *Reasoning [R]*
- *Technology [T]*
- *Visualization [V]*



Communication [C]

“Communication helps students make connections among concrete, pictorial, symbolic, oral, written and mental representations of mathematical ideas.

-Alberta Education POS pg. 5

Y/P/G

Mrs. Bahl is looking for an easy pet to take care of and decides to have pet fish. She decides to buy some clown fish which cost her \$12 each and some angel fish which cost her \$7 each. She spends exactly \$100 on the fish. How many of each fish did Mrs. Bahl buy? Use the checklist and show all your work.

1. Picture ✓
2. Equation ✓
3. Full sentence ✓
4. Strategy ✓
5. checked ✓

angel fish 28
clown fish 12

$7x + 12y = 100$

7 7 12 12

0 1 2 3 4 5 6 7 8 9 10

1 11 22 33 44 55 66 77 88 99 110

2 21 22 23 24 25 26 27 28 29 30

3 31 32 33 34 35 36 37 38 39 40

4 41 42 43 44 45 46 47 48 49 50

5 51 52 53 54 55 56 57 58 59 60

6 61 62 63 64 65 66 67 68 69 70

7 71 72 73 74 75 76 77 78 79 80

8 81 82 83 84 85 86 87 88 89 90

9 91 92 93 94 95 96 97 98 99 100

Mrs. bahl decides to buy two angle fish and eight clown fish, he

STRATEGY

I used a hundreds board - how I added hundreds board - first I - 90 I counted by 12

all the way to 100 but that didn't work so I tried 12's then 7's and 12 and that worked

adding numbers

$12 + 12 + 12 + 12 + 12 + 12 + 12 + 12 = 100$

28 12

Connections [CN]

“When mathematical ideas are connected to each other or to real-world phenomena, students begin to view mathematics as useful, relevant and integrated.”

-Alberta Education POS pg. 5

Word Problem grade 2, 3
There are 21 lunch kits in the lunch bins, how many lunch kits could belong to grade 1 students, grade 2 students and grade 3 students?

$0 + 0 + 21 = 21$
 $11 + 2 + 8 = 21$
 $10 + 10 + 1 = 21$
 $8 + 8 + 5 = 21$
 $13 + 4 + 4 = 21$
 $20 + 1 + 0 = 21$
 $13 + 5 + 3 = 21$
 $21 \times 1 \times 0 = 21$
 $11 + 9 + 1 = 21$
 $5 + 5 + 1 = 21$
 $5 + 6 + 0 = 21$
 $3 + 8 + 9 = 21$
 $7 + 9 + 5 = 21$
 $17 + 2 + 2 = 21$
 $7 + 7 + 7 = 21$
 $9 + 9 + 3 = 21$

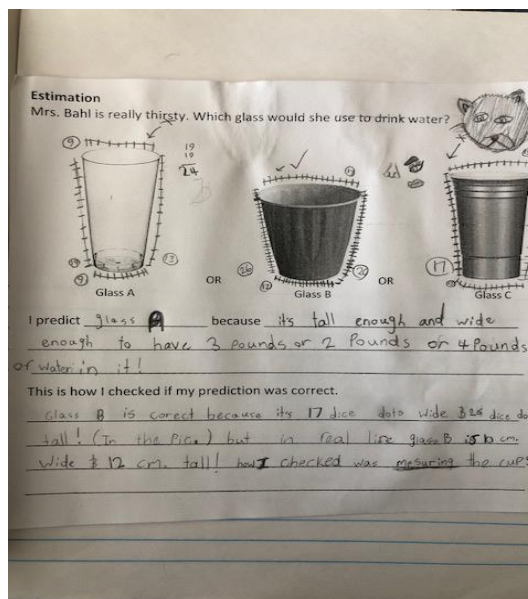
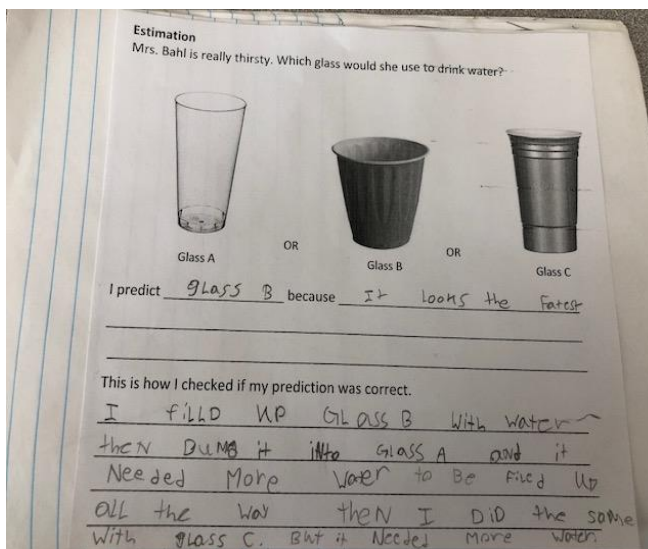
The strategy I used was...
the hundreds chart

Mental Mathematics and Estimation [ME]

“Mental math improves computational fluency by developing efficiency, accuracy, and flexibility.”

“Estimation assists individuals in making mathematical judgements and in developing useful, efficient strategies for dealing with situations in daily life.”

-Alberta Education POS pg. 5



Problem Solving [PS]

“A true problem requires students to use prior learnings in new ways and contexts. Problem solving requires and builds depth of conceptual understanding and student engagement.”

-Alberta Education POS pg. 6

Grade 3 Problem-Solving
A Hatchimal at Walmart costs \$4. If I have \$12 to spend on toys, how many Hatchimals can I buy? What if I have \$20, how many can I buy? How about \$32?
December 4, 2017

6 *

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

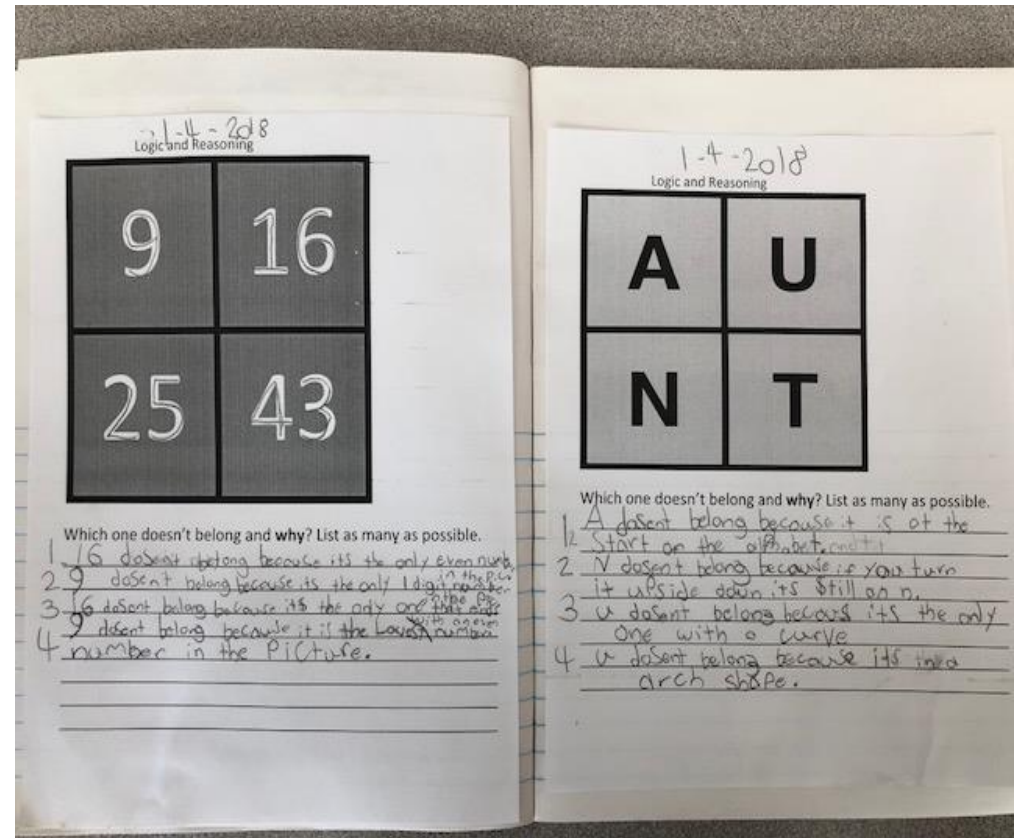
if I have \$12 I can buy 3. if I have \$20 I can buy 5. if I have \$32 I can buy 8.

The strategy I used to was...
100 chart.

Reasoning [R]

“High-order questions challenge students to think and develop a sense of wonder about mathematics. Reasoning skills allow students to use a logical process to analyze a problem, reach a conclusion and justify or defend that conclusion”

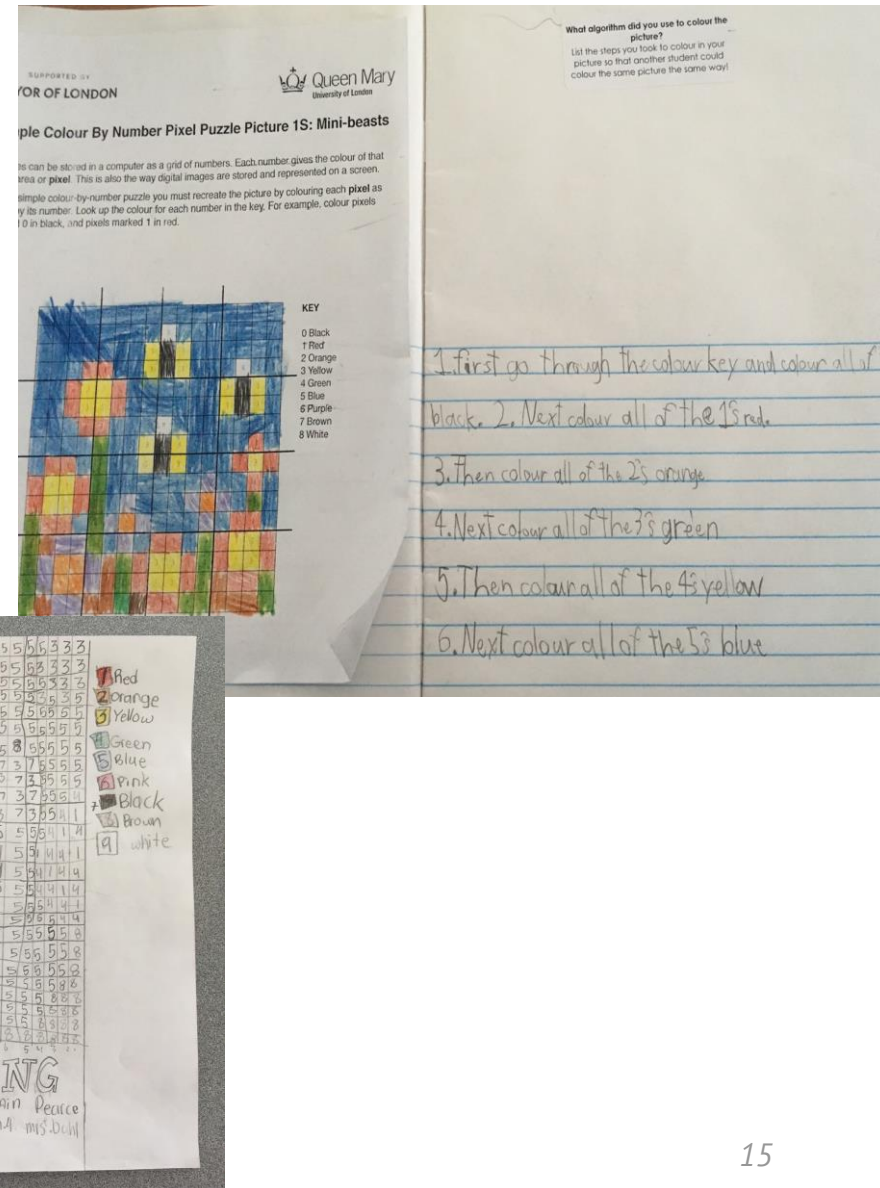
-Alberta Education POS pg. 6



Technology [T]

“Technology contributes to a learning environment in which the growing curiosity of students can lead to rich mathematical discoveries at all grade levels.”

-Alberta Education POS pg 6.



Visualization [V]

“Being able to create, interpret and describe a visual representation is part of spatial sense and spatial reasoning. It is fostered through the use of concrete materials, technology, and a variety of visual representations.”

*-Alberta Education POS
pg. 7*



Alberta Education

Literacy and Numeracy | Numeracy

- About Literacy and Numeracy
- Literacy
- Literacy in Subject Areas
- Numeracy**
- Numeracy Video (1)

What is numeracy?

Numeracy is critical for interpreting our data-driven world.

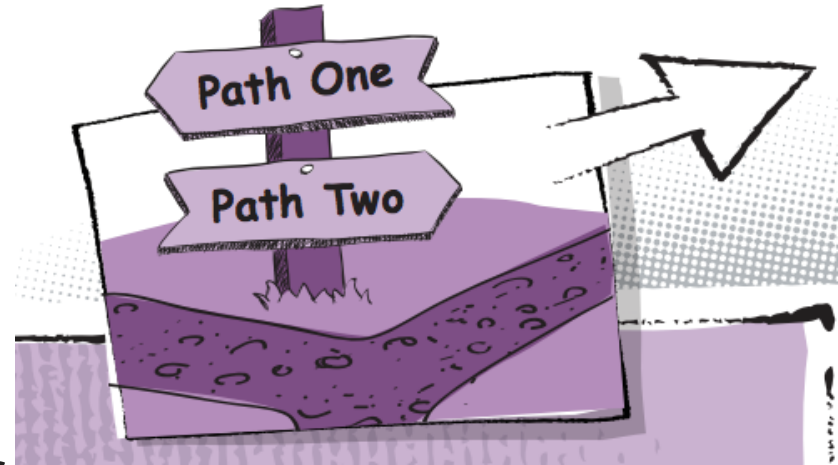


Alberta Education defines numeracy as the ability, confidence and willingness to engage with quantitative and spatial information to make informed decisions in all aspects of daily living.



Numeracy...

- *Is being able to understand and work with numbers flexibly,*
- *Confidently and effectively using mathematics to meet demands of everyday life, and*
- *Enables you to develop reasoning and logical thinking strategies*



Recall vs. Mastery

What is mastery of number facts?

The mathematics program of studies expects students to master their number facts. Mastery of number facts occurs when students understand and recall facts. This allows students to apply their knowledge to different and more complex computations and to be flexible in their thinking.

Example

If a child knows 3×8 is 24, then 3×16 becomes $3 \times 8 \times 2$ which is 48.

This example demonstrates flexibility of thinking in that students can extend their knowledge of a known fact and use it in an unfamiliar situation.

Recall of number facts is when students commit them to memory and retrieve them when needed. Students who simply recall facts without understanding have not achieved mastery. Similarly, students who understand the facts but are unable to recall them have not reached mastery.

...when students are able to apply their knowledge to different and more complex computations and to be flexible in their thinking.

Number Facts

What are the number facts that students are expected to know?

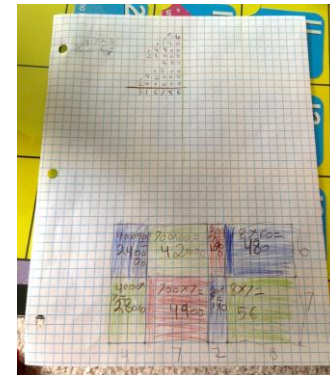
Grade 1
• Students begin to learn strategies for addition facts up to and including $9 + 9$ and related subtraction facts. • Students recall addition facts to a sum of 5 and related subtraction facts by the end of Grade 1.
Grade 2
• Students apply strategies for addition facts up to and including $9 + 9$ and related subtraction facts. • Students recall addition facts up to and including $5 + 5$ and related subtraction facts by the end of Grade 2.
Grade 3
• Students recall and apply addition facts up to and including $9 + 9$ and related subtraction facts. • Students recall multiplication facts up to and including 5×5 and related division facts by the end of Grade 3.
Grade 4
• Students apply strategies for multiplication facts up to and including 9×9 and related division facts. • Students recall multiplication facts up to and including 7×7 and related division facts by the end of Grade 4.
Grade 5
• Students recall and apply multiplication facts (multiplication tables) up to and including 9×9 and related division facts by the end of Grade 5.

Students investigate a variety of strategies for number operations, one of which must be the standard/traditional algorithm. Students are to use a strategy that they understand.

The Montessori Connection - from concrete to abstract



10,000	1000	100	10	1
10000 1000 100 10 1				
3	2	5	2	2



Curriculum Overviews

 Government

My Child's Learning: A Parent Resource

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K	1	2	3	4	5	6	7	8	9	HIGH SCHOOL	COMMON QUESTIONS	CUSTOMIZE YOUR PRINTOUT
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MY CHILD'S LEARNING: A PARENT RESOURCE



WELCOME TO MY CHILD'S LEARNING: A PARENT RESOURCE, YOUR DOORWAY INTO YOUR CHILD'S WORLD OF LEARNING.



Be informed. Be involved.

Alberta is committed to creating an inclusive education system that inspires and enables all students to achieve success and fulfillment.

We recognize that parents play an important role in shaping the way their children view learning. As a parent, you understand more than anyone else how your child learns and processes information. This

Supporting your child's learning

My Child's Learning: A Parent Resource

Math Is Everywhere!



Learning Math

- Mathematics learning for your child may look different from what you experienced:
 - Children will talk about how they solve problems.
 - Children will use different objects to help them learn math skills.
 - Children will work with others often to solve math problems.
- Problem solving is a big part of the math program, along with reasoning and making connections.
- Children still learn basic facts, including addition, subtraction, multiplication, and division. They also need to make sense of the answer rather than just memorize steps.
- In the past, students learned to solve math problems using a memorized, step-by-step procedure. Now

How You Can Help Your Child Learn Math

- Help your child use mathematical language at home to estimate, measure, and compare by using words like "how much," "how big," "how small," and "how many."
- Talk about how you use math when cooking, reading maps, playing or watching sports, and building things.
- Choose games or activities that involve counting, logical thinking, or finding patterns.
- Use a clock to help your child tell when it is time to go to school, time to eat, or time to go to bed.
- Show your child how to use calendars to plan events, holidays, and schoolwork.
- Ask your child to calculate how much things will cost and how much change will be given when at the store.
- Sort and count items such as toys, clothes, and shoes with your young child.

How do you feel about math now?

Go to **www.menti.com** and use the code **84 35 2**

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Now what does math mean to you?

 Mentimeter

Resources



learning | **as unique** | as every student



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Resources

- *Your child's teacher:
parent/teacher conferences, informal
conversations, blog posts*
- *Mathletics*
- *Take home items: Literature and
games*
- *Alberta Education Website*
<https://www.learnalberta.ca/content/mychildslearning/>

Q and A



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Questions?

- *Parking lot: Where you can record questions/wonders you may have*
- *Please add your name to our Email sign up list if you would like additional articles and resources*



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