

# Victory School

## Math Learning, 2017 – 2018



**Mathematics is not about numbers, but about life. It is about the world in which we live. It is about ideas. And far from being dull and sterile as it is so often portrayed, it is full of creativity.” – Keith Devlin, 2001**





At Victory School we are committed to teaching mathematics as a way of learning about our world and the parts of our daily lives. Our focus is on conceptual understanding, procedural thinking, and developing problem solving skills. Our goal is for our students to learn to communicate and reason mathematically, and to use mathematics confidently, accurately, and efficiently to solve problems. We want our students to appreciate and value mathematics, make connections between mathematical knowledge and skills and their applications, and commit themselves to lifelong learning. We want our students to become mathematically literate citizens, using mathematics to contribute to society and to think critically about the world. As you continue you will find excerpts from classroom at Victory that will provide evidence of how we accomplish these larger goals.



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A number line is a useful tool that students can use to help them solve equations in any grade. With this number line, students are learning that the benchmark 5 is halfway between zero and ten.

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In Kindergarten, we begin to learn about the stable-order principle; in other words, they learn that to be able to count also means knowing that the list of words used must be in a repeatable order 1,2,3,4,5,6 and 6,5,4,3,2,1.

While interacting in the 'Lining up the Threes' game, students also learn how to manipulate and play with numbers, problem solve, strategize the next step, and cooperative turn taking.

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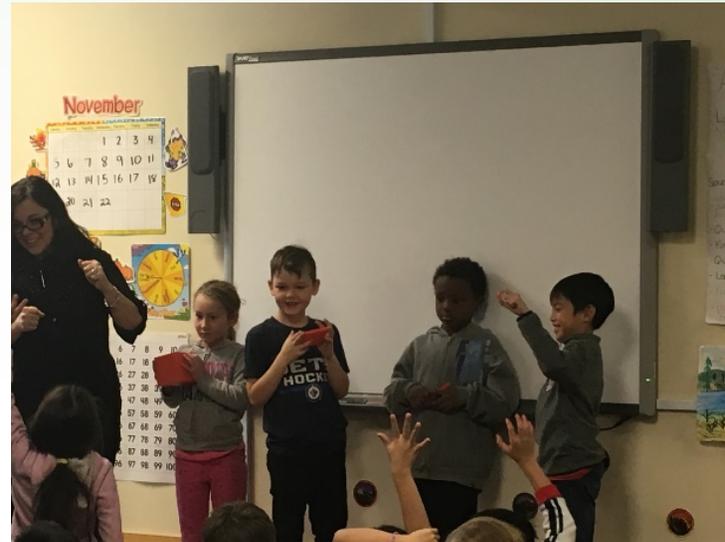
In Grade 1 students are playing a memory game with subitizing cards. When students learn different dot patterns (such as the ones you find on dice) it helps them to recognize numbers quickly. Also dot patterns help students with adding numbers together when learning different math facts. Being able to subitize numbers in early the years helps build children's number literacy. In older grades we could use the same game, but with dominoes and to subitize fractions, percentages, and decimals.



In many of our classrooms, teachers and students engage in morning meeting. This is a time when students connect mathematics to their everyday world. In Grade 1 they use the calendar for several mathematical activities including counting in a variety of ways (forward, backward, skip counting by 2s, 5s, and 10s), counting using tally marks, and incorporating graphing. Using the number of the day, the students enjoy getting active by exercising as they count.



As children get older they continue to build their understanding of digits and how numbers fit together. Ms Telenko and her students are having fun and engaging in a place value activity, using base ten blocks to organize their thinking. Base ten blocks help build concepts such as measurement and money. Understanding that the digit four in 456 is actually 400 not 4 is a very important concept that will help build number literacy.



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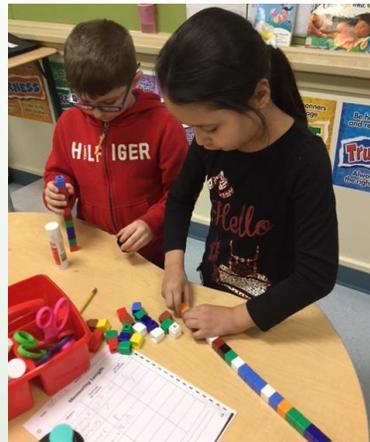
Hands on mathematics helps students build and solidify their conceptual development, their understanding, and their confidence. With the unit on Shape and Space, Ms Simard used engaging videos, modelling, and lots of practice with hands on manipulative materials, as well as, some paper pencil tasks.



When learning how to measure there were many steps that were imperative to the students' success. For example, students needed to learn the difference between a standard and a non-standard measure, where and how to begin to measure an object, and what to do when the final measurement was not a whole. Here students are learning to measure length and height using non-standard measurement units such as popsicle sticks, and their own handprints. Unifix cubes are also a popular manipulative material used for a variety of teaching and learning purposes. While measuring, students are applying their skip counting skills that they practice during morning meeting.

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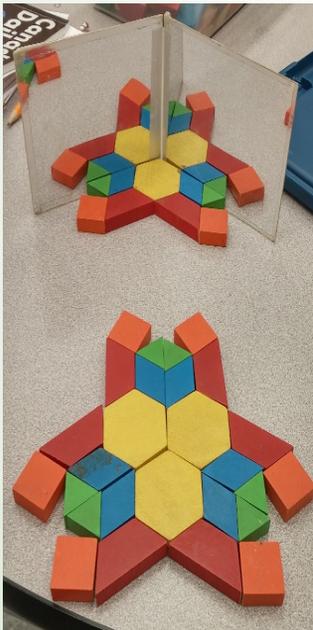


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## PATTERNS! PATTERNS! PATTERNS!

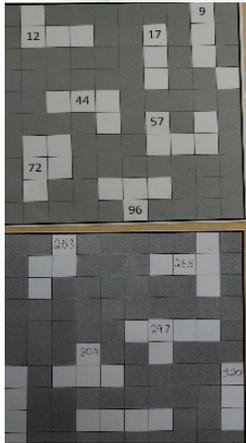
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Patterns are a key to problem solving in mathematics. They help us learn about sequence, spatial reasoning, as well as, temporal and linguistic reasoning. Patterns are part of our everyday world and throughout the year students engage in patterns, not only in mathematics, but in all study areas. Here you can see that Mrs. McQueen has connected patterns to text and textiles. Students spend time creating, replicating, and solving patterns in math class from Kindergarten to Grade 12.





Students begin each round by drawing three cards from their deck. They then have to make the largest numeral they can with those 'digits' and compare it to the other students at the table. The person with the highest numeral wins that round, adding one point to their score. First to 10 wins.



Coin Counting

Number	Nickels	Dimes	Quarters	Loonies
100				
10				
30				
25				
60				
75				
20				
55				
85				
35				
65				
40				
45				

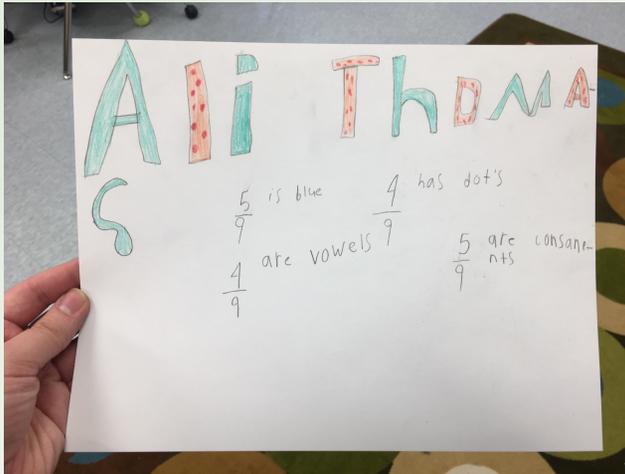


Children need to experience math through symbolic, visual, tactile, and auditory means. In order to best fulfill these needs, children are given opportunities to represent math concepts using as many different methods, mediums, and activities as possible. Using each learning tool at our disposal, and in proper moderation, will give children the greatest chance for success.



Classrooms are diverse and children enter with varied mathematical understandings. Thus, a one size fits all problem is not going to meet the needs of all learners. Open ended questions are one way to plan for different developmental levels. Here you see Ms Vandelaar's class answering the question from a menu *How Much Is Your Lunch?* which allows for many possible answers and encourages students to talk about their learning and use of different addition and/or subtraction strategies. For students who view mathematics as difficult, they are able to choose numbers with which they are comfortable and that may not require regrouping. While students who feel more confident, the problem can increase in complexity by changing the question to 'How much change will you receive if you pay with \$ 5.00?' Throughout the learning process students are working together talking about their thought process, and eventually sharing as a whole class to learn from each other. Adults supporting the room listen, support, encourage, and prompt students in their thinking and reasoning.

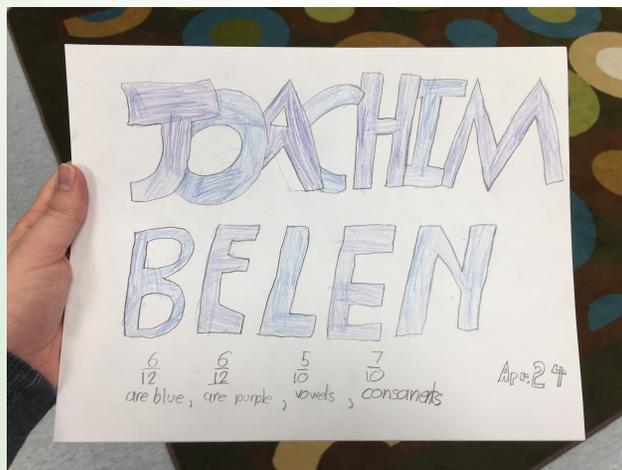




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In room 19, as a visual representation of fractions, we wrote out our names and coloured them. Then we used fractions to describe the colours or letters used in our name.

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Here, Mrs. Wakula's students are learning the concept of division with a remainder using manipulative materials. Students will work in pairs or groups to discuss and work through a problem.

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Showing 40 divided by 7. The boys have figured out that they can create 5 equal groups of 7, with 5 tiles left over.

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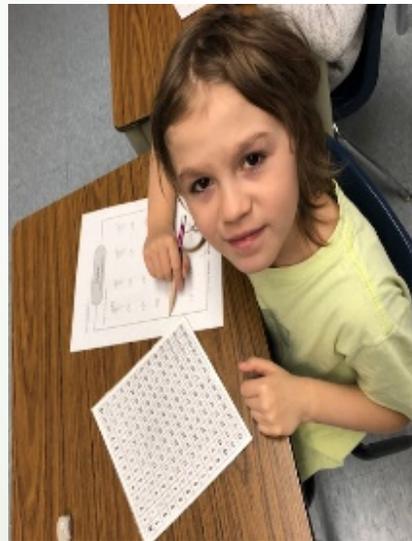
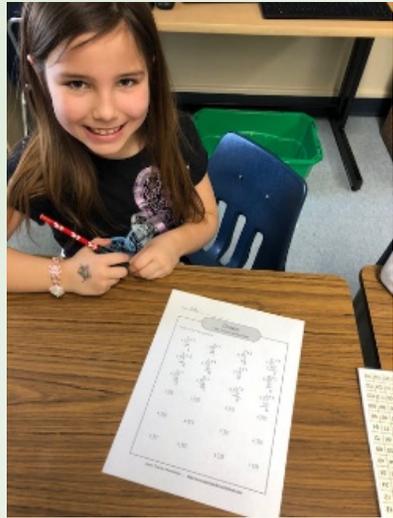


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New material is presented in a variety of ways: large group, small group, individual, using manipulative materials, using explorations, discussions, comparing and contrasting, and so much more...

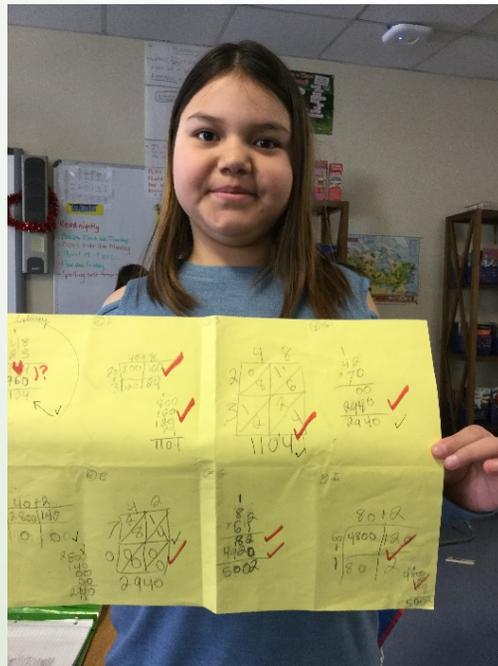
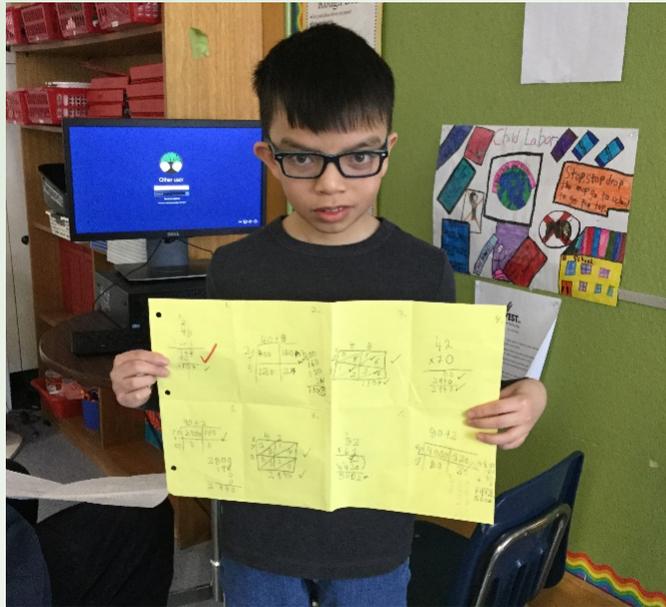
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Children are shown how to write the division algorithm. They practice together using a dry erase board. When they believe they have their work correct, they hold up their board for a quick check.

After working with a partner, students work on an individual assignment so show what they understand about the concept taught. This is an opportunity for the teacher to circulate around the classroom to help as needed and to check for understanding of the concept.



With every grade, students become more and more aware there are a number of strategies they can use to solve mathematical problems. For example, when teaching multiplication, we do not use just one algorithm to get to the correct answer.

Simply teaching the 'traditional method' does not work for all students.

This ensures that every student in class is given the opportunity to experience success. Students' knowledge is built on strategy. Once they know the strategies, the process of multi-digit multiplication becomes automatic.

Additional strategies include 'The Box Method' and the 'It Makes Sense Method.'



Working collaboratively on a Math concept gives students the opportunity

- to see different perspectives,
- to develop an ability to explain their thinking process,
- to expand their Math vocabulary,
- to share in each other's excitement while exploring new ideas.

Numeracy development is a rich experience when students are allowed to work together and bounce ideas off of each other.





*Children don't hate math. What they hate is being confused, intimidated, and embarrassed by math. With understanding comes passion, and with passion comes growth – a treasure is unlocked.*

*~ Larry Martinek*

