Math Newsletter

Kate Schmidt, March. 19

Headline News

During our math journey in this course, we explored a variety of Big Ideas to help guide us through our learning. Some of the big ideas that we covered within this course included looking at the First Peoples Principles along with the BC curriculum, appreciation of mathematics and its applicability and relevance in real world contexts, applying curricular competencies of Reasoning and Analyzing, Understanding and Solving, Communicating and Representing Connecting and Reflecting, to a variety of contexts and problems and choosing a representation to illustrate a mathematical point along with many others that we covered during the duration of this course. As a future educator, these Big Ideas are helping me to develop my mathematical knowledge for teaching and acted as a blueprint for us as we went through the course. Each one of these big ideas has been accompanied by in class activities as well as external resources. On our very first day in class, we were presented with a movie called "Donald in MathMagic Land". ([Donald Duck - Mathmagic Land - YouTube](#)).

 At first, I was a bit confused about why I was being shown a Disney movie within a mathematics course. After we started watching the movie during our first week, I realized its purpose in demonstrating that math is all around us. From daily mental math, to geometry and even pythagorean theorem. This Big Idea was later re-introduced to us during both of our Math Investigations. Investigation 1 looked at a traditional pit house and how we could apply both

pythagorean theory as well as estimation. In Investigation 2, we looked at how we can maximize spending money that was earned during a school fundraiser, and used some basic mathematical processes such as addition and problem solving.

Another Big Idea from this course that stood out to me was when we discussed mathematical processes, such as mental math as well as estimation. A common example that we explored was new headlines for tragedies or general surveys, where they need to estimate large numbers. Although this is a common example of estimation, it has never stood out to me how many places we instantly use it. For mental math, we looked at examples, such as the parking lot problem, which was a new type of problem that I had not experienced before.

Find the Missing Number

16   06   68   88   98
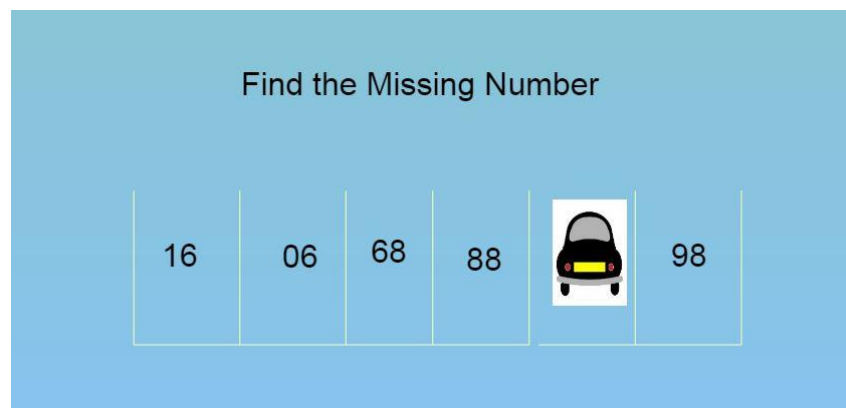
This problem allowed us to in small groups use a variety of problem solving strategies to try and find the answer. We were also given a list of mental math strategies that I have been referring to throughout the course. This list offered a wide range of strategies for adding, subtracting, multiplying and dividing. At first, I made a number line to approach the problem in a logical way. I used the counting on and skip counting strategies the first time I tried to find the missing number, Skip counting allowed me to try and look for a pattern. I was not able to find the answer before we re-connected as a class. After being told to look at the problem from a new perspective, and having it explained to me, it opened up a new way of thinking. Although it was not a conventional way to solve or approach a problem, looking at this problem in a more abstract way (turning the image upside down) was the solution we needed. This problem prepared me to have a more open mind when approaching math problems throughout the remainder of the course.

New Discoveries
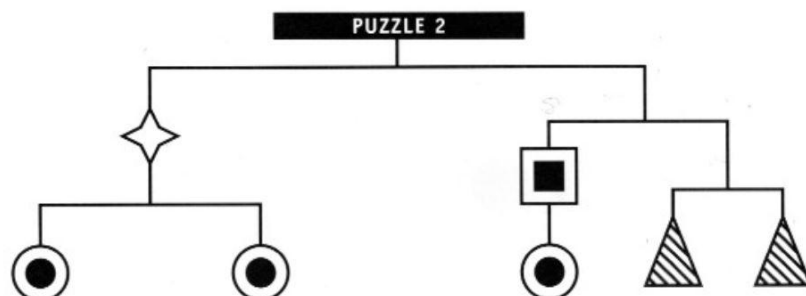
"Follow the Instructions" was an activity to help us see the importance of using a variety of ways to communicate mathematical thinking. We need to understand what certain vocabulary and words mean in order to demonstrate what we know and learn when solving a problem. It allows us to explore math in a variety of ways, which can be beneficial to many learners. Through this activity, I was able to learn how beneficial it is to incorporate a variety of methods of instruction as well as learning. Personally, I am a hands-on (kinesthetic) learner, and learn best when I am given a manipulative. For this activity, we were partnered up and 1 partner had to verbally describe what they saw. Partner 2 had to use the information that their partner described to help them solve the problem for the value of each shape. I was not able to complete this activity with just the audio communication, and ended up also needing visual assistance. However, when we switched roles my partner was able to complete the activity without seeing the visual first to aid her.

The most challenging part for me was trying to compute what I was hearing onto my paper. Yes, I was hearing their instructions but it was almost as if it went in 1 ear and out the other. It was hard for my brain to retain most of the information without it being repeated or broken down into some smaller steps. Some strategies that I used to help me overcome these challenges included asking my partner more direct questions, creating my own visual and

Visualization

Greg has made a pan of brownies that he wants to cut into 24 equal pieces. He wants to share them equally with 5 of his friends. Divide the pan of brownies and use colour coding to show how many Greg and his friends will get?

Draw a 6 x 4 grid, use 6 colours to show how these are shared

This brownie problem was introduced to us when we started to discuss forms of communication. The different types of communication that we discussed were oral, audio, physical and visual. Visualization is a tool that many learners use to help enhance their understanding. We talked about mathematician Maryam Mirzakhani who said that "... the process of drawing something helps you somehow to stay connected." (Maryam Mirzakhani - YouTube). With our in class brownie problem, we used a visual with a colour coding system. At first, I was just going to add numbers into the squares I created to solve this problem. After adding in colors, it made the problem seem simpler to me. By making a simple substitution from numbers to a visual (color), it allowed me to solve this problem in a simpler way.
A challenge about visualization for me is oftentimes not starting with the correct visual. We also explored visualization during Investigation 1, where I needed to draw a triangle. At first, I was drawing the wrong type of diagram, and putting the missing side on the wrong side of the triangle. In order to overcome this, I re--evaluated what the question was asking me. At first, I drew a simple version of my visual, then overtime I added into my image certain aspects that were useful to me when I needed to solve the problem.

Connections

The Orange Shirt Story
Author: Phyllis Webstad
Illustrations: Brock Nicol
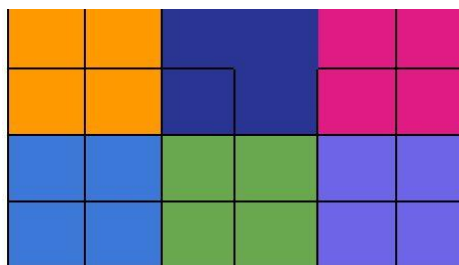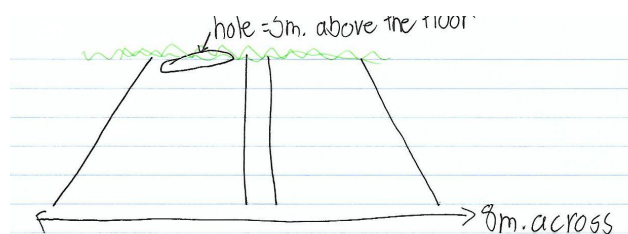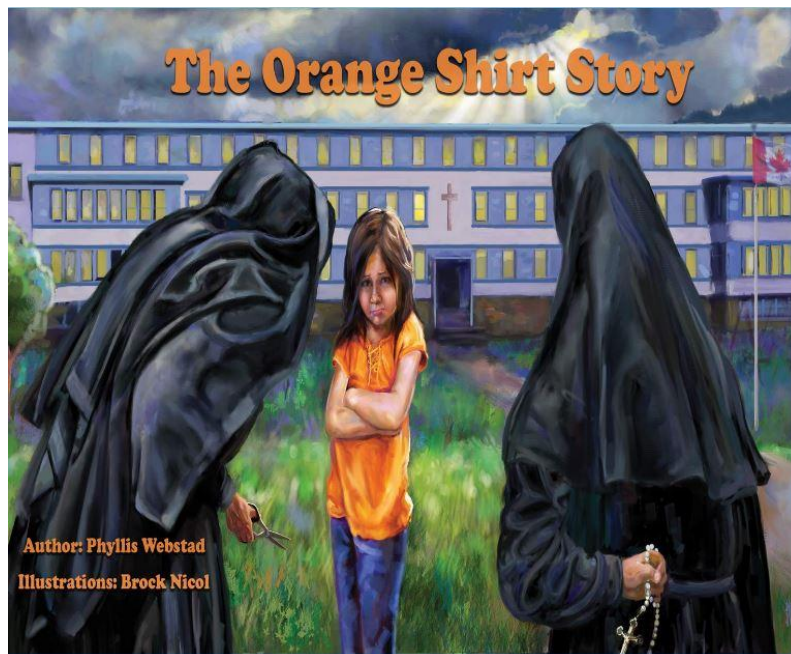
1 additional activity that helped me to learn a new math idea was when we discussed orange shirt day mathematics. As I am going through my education journey, I am always looking for engaging ways to incorporate the First Peoples Principles of Learning into other subject areas. When we read "The Orange Shirt Story"", it opened my eyes and reminded me of one of our big ideas from our courses, which is that math is all around us. In the book, some ways that they connected social studies to math through calculating distances walked (from her house to her school), applying basic mathematical processes (addition and subtraction problems) as well as working on students estimation skills. One example of a question that could be asked otherwise during or after reading the story, is " If School for Phyllis started on Orange Shirt Day, September 30th, what would the date be that Phyllis was allowed to go home(after 300 sleeps)?

Another way I have seen social studies connected to mathematics is when students were exploring patterns. During my Wednesday visits last semester, I was observing a grade 3 classroom at Prospect Lake Elementary. The class looked at traditional blankets that had repeating patterns woven into them. After looking at some examples from local Indigenous groups, the students had to create their own patterns which we then as a class turned into a wall-display to create our own class 'blanket'.

Being able to connect mathematics to the social studies curriculum is important because it is unfortunately an area that gets overlooked. Social studies, under the BC curriculum, offers a wide variety of areas that can be covered. Creating these connections are important because we can expose students to a variety of new areas of interest. Creating these cross curricular connections can also strengthen learning in both areas, if students are more attentive during the lesson.

Txamsm Brings Light to the World

Many thanks to the Ts'msyen Nation and School District #52 (Prince Rupert) for allowing us to reprint this story. An illustrated version of *Txamsm Brings Light to the World* was previously published with a Sm'algyax language translation.

After the flood, Txamsm started to travel around the world to see how many people were saved. At that time the world was in darkness. Txamsm was looking for the chief's house where light was kept.

He came to the house of the chief who had the moon. The moon was kept in a large box. Inside this box were ten smaller boxes. In the smallest box was the moon sewn up in a bag made of hide. The chief had a daughter, and she was always kept on a platform where no one could see her.

Txamsm flew outside and waited. When he saw the girl coming out of the house, he turned himself into a pine needle and fell into the water. She was drinking and she swallowed the pine needle.

Soon the woman became pregnant and gave birth to a boy. He grew very rapidly, and every day grandfather took the boy and stretched him until he was nearly full grown.

The child would cry. He pointed to the box where the moon was kept. After he had cried for a while the chief took down the box and untied it. He gave the boy the moon ball to play with. Every day he would go under the smoke hole of the house, but this was always closed when he was playing with the moon ball.

One day he was playing with the ball under the open smoke hole. Txamsm turned himself into a raven and, taking the moon ball, he went up through the smoke hole and flew away with it. He traveled for a long time until he came to where he heard the people were fishing for oolichans.

He called out, "Give me some oolichans, and I will give you light." The people who were fishing in the dark called out, "You are tricking us. You are a liar. You can't give us light." This made the raven mad. He had now turned himself into a human being. He took the moon ball and opened it a little.

Then the people saw for themselves and they gave him many oolichans. When they had done this the man opened the moon ball and gave them light. He broke off a piece of the moon. He broke it piece by piece into smaller pieces. He said, "These will be the stars," and threw them into the sky.

After this, the man turned himself back into a raven and then into an old woman. He saw a reflection of himself as an old woman. He became ashamed at his long nose. He cut off part of his nose and used it as a labret. This was how the labret originated.[1]

In my future practices, I hope to be able to find many new connections between mathematics, social studies and the First Peoples Principles of Learning (FPPL). After looking through both our class resources as well as other online resources, I have found that the First Peoples Mat resource is a great starting point. On page 122, there is an activity called "Inside the Box" which introduces the mathematical process of calculating the volume of sphere and other shapes. This activity connects the story "Raven Brings the Light" (described above) to ordinary mathematical processes. I am looking forward to being able to introduce the idea of calculating volume through Bentwood Boxes as it opens up a new cross curricular way for my students to learn. When I was going through the BC school system, I was rarely taught about Indigenous studies. I hope to introduce it in an engaging and cross curricular way to help students to gain interest in both mathematics and another subject area (social studie in this case).

Future

After going through this course, my outlook towards mathematics and my future practice has greatly changed. This course has introduced several big ideas to me such as appreciation of mathematics and its applicability and relevance in real world contexts, Develop and apply estimation strategies to a variety of contexts, choosing a representation to illustrate a mathematical point and many others. Collectively, these big ideas have helped to equip me with mathematical knowledge for teaching. Although I do not get to do a practicum this semester, it has left me with lots to think about in regards to my future practices as an elementary/ middle school educator. These big ideas that the course has introduced to me are useful in helping me to convey mathematics and find connections to things that are relative to my students. Math is truly all around us and can be incorporated into many different things. This big idea will help me to hopefully up student engagement. Another big idea that I have found quite beneficial to myself is reflection. Reflection is not typically a form of assessment or progress that I use for myself. In my first week of this course, my reflection was more of a summary and a routine for me. I started out by stating what I had learned during the week. As we have continued to go through this course, I have found that reflection is meant to be much more than a summary. Reflection is our opportunity to look at what you have learned and been through, and to think deeper about what you have learned and how you can apply it. Below, I have included an example of my week 2 reflection versus a more recent reflection I have written to demonstrate how this tool has helped me and will continue to aid my future learning.

"During our classes this week, I appreciated being given the opportunity to work through problems with my peers as well as on my own. The 'Camden Market' activity was a new challenge for me to approach, and I was excited to after class try and attempt the activity with 4 blocks on each side." (Week 2)

"Certain areas, such as patterns, geometry, measurement, probability and financial literacy are some ways that we can incorporate real world or 'practical' mathematics into our teaching. These connections that students form with math, as well as other subjects, helps them to have a positive mindset when approaching math and can greatly change their outlook on a course" (week 10)

As I continue to learn more about mathematical processes and teaching strategies, I still have some questions. Some questions that I still have include:

- Where else can I apply math to real world situations?
- Where else in the curriculum can I plan for cross-curricular lessons that involve mathematics?
- How can I make sure to address all types of learning styles while teaching mathematics to keep everyone engaged?