Grade 6&7 Numeracy Session 2

November 2018

Agenda

- Recap of new curriculum and growth mindset
- Scope and Sequence
- Games
- Math through an Indigenous Lens
- Lesson sequence:

Session Goals

- To continue to deepen our understanding of the new math curriculum
- To explore worldviews and teaching practices that can more inclusive for all learners

Share...

Something that you tried in your classes from last session, or something that has been working well in your classes

An Analogy

The Curricular competencies are the vehicle

The Curricular content are the passengers

The Big Ideas are the destination
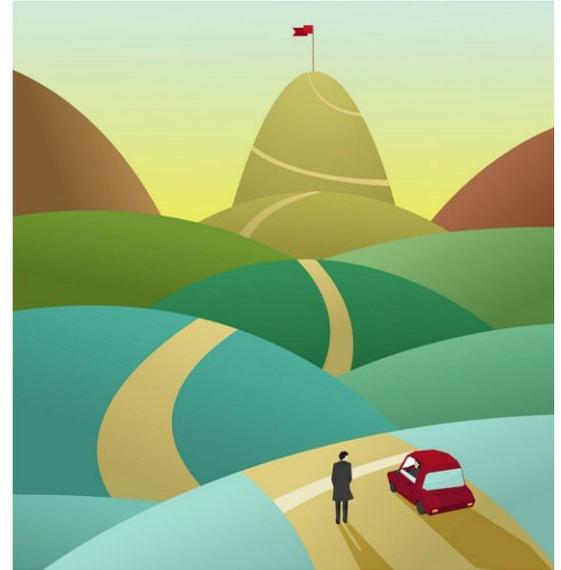
Growth Mindset
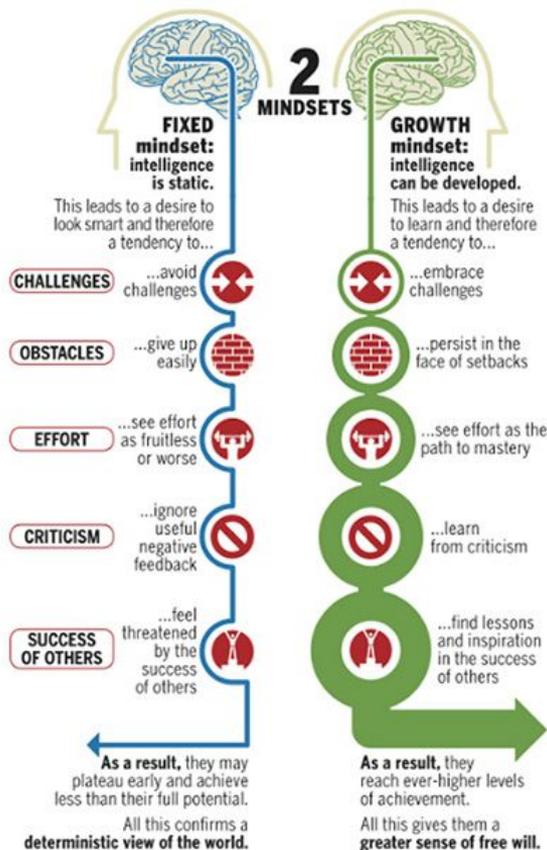
Growth Mindset Videos

https://www.youtube.com/watch?v=75GFzikmRY0

https://www.youtube.com/watch?v=cgLYkV689s4

https://www.youtube.com/watch?v=ElVUqv0v1EE

https://www.youtube.com/watch?v=-_oqghnxBmY

For teachers:

https://www.youtube.com/watch?v=NWv1VdDeoRY
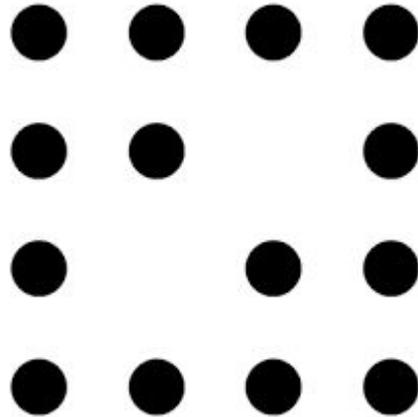
Number Talk

Number String

$$24 \div 2 =$$

$$24 \div 4 =$$

$$24 \div 8 =$$

$$120 \div 8 =$$

Numeracy Routines Similar to Number Talks

Splat: https://www.stevewyborney.com/?p=893

Estimation Clipboard: https://www.stevewyborney.com/?p=1483

Which One Doesn't Belong: http://wodb.ca/

Would you Rather: http://www.wouldyourathermath.com/

Estimation 180: www.estimation180.com

Sequence

Order:

- Many good ways to order - consider prior knowledge (what do they need to know before I teach this concept)
- Connecting ideas and revisiting past concepts when introducing new concepts is most important

Combine:

- Look for applications and concepts that combine well (ex: financial literacy with decimals)

Scope

- The goal is for students to understand the big ideas so use those as your goal posts.
- Students will be on a spectrum of mastery but if you can revisit concepts throughout the year, it allows more opportunity to move along the mastery continuum.
- Use a variety of depth of knowledge questions to differentiate - some students might be working on DOK1&2, while others, on the same concept are working on DOK 3 or 4 (if they are doing a larger project)

Games

High/Low:

1) Use a deck of cards (J=11,Q=12,K=13) and each player gets half the deck
2) Flip two cards each and add them together - each player has to share their strategy (can also use for multiply, subtract, divide)
3) Roll the die, if it is even the person with the HIGH score wins and if it's odd, the person with the LOW score wins a point.
4) Play until a player reaches 10 points (or 15, 20 etc.)
5) If there is a TIE, players flip over 2 more cards each and the winner of this round gets TWO points

*Ensure there are visuals to support the use of STRATEGIES

High/Low Alternate Versions

1) When focusing on a specific fact family, for example 4's, leave one 4 out of the deck and then each player just flips one card and multiplies by 4.This is great for practising a certain strategy, like double-double for 4's
2) Students can be working on mentally adding double digit numbers (or multiplying) using the same game, just flip more cards.
3) You can also use multi-sided dice instead of cards for larger numbers (20 sided or 30 sided dice)

How Close to 100? (or 400)

Beginner: Use a the game board found here:
https://www.youcubed.org/tasks/how-close-to-100/

Students roll two dice and represent their product using arrays (area models). The winner is the last person who can fit their product on the game

Can use larger game board and cards to expand to numbers up to 12 or 13

(game board for 400 in Hub)

Lesson Sequence: Fractions, Decimals, Percentages

Goals: To understand how fractions, decimals and percentages are related including how to convert forms and compare sizes

Start with a pre-assessment (see version on Hub for example) so that you know how to differentiate for your class

Accessing Prior Knowledge

What is larger $\dfrac{1}{2}$ or 0.75? How do you know?

Explain, in your own words the relationship between fractions, decimals and percentages.

Which of the three do you find easiest to convert and which are more difficult? Explain.

Processing

What do you notice? What do you wonder?

Source: Statistics Canada, National Household Survey, 2011.
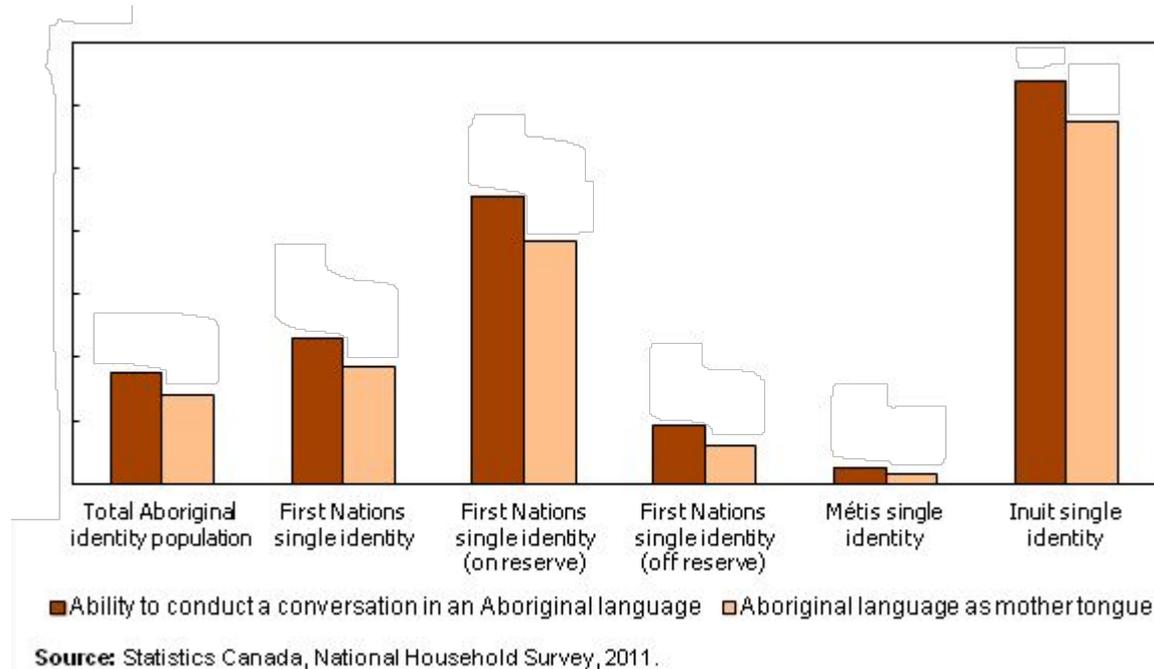
What Are Your Questions?

- In Canada, $\frac{9}{20}$ of First Nations people living on a reserve and $\frac{16}{25}$ of Inuit reported the ability to conduct a conversation in an Aboriginal language.
- 9% of off-reserve First Nations people and 0.02 of Métis reported the ability to conduct a conversation in an Aboriginal language.
- The Aboriginal languages most commonly spoken by First Nations people were Cree languages, Ojibway, and Oji-Cree. Métis spoke mostly Cree languages, Dene, and Michif. Inuktitut, Inuinnaqtun and Inuvialuktun were the Aboriginal languages most commonly spoken by Inuit.

Processing

How do 'on-reserve' and 'off-reserve' aboriginal language acquisitions differ?

Who speaks more aboriginal languages? By how much?

Use your base 10 blocks to model each of the numbers given in the example:

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- 9% of off-reserve First Nations people and 0.02 of Métis reported the ability to conduct a conversation in an Aboriginal language.

Processing

- Based on results of the Aboriginal Peoples Survey, $\frac{3}{5}$ of off-reserve First Nations people, 37% of Métis and 0.84 of Inuit aged 6 and older reported that speaking and understanding an Aboriginal language was important to them.

- Compare these to the amount of people who can speak an aboriginal language by using your base 10 blocks to model. What do you notice? What does this information tell us? What can be done with this information?

Processing

Now that you've explored these values, label the graph with the numbers that you've been given:
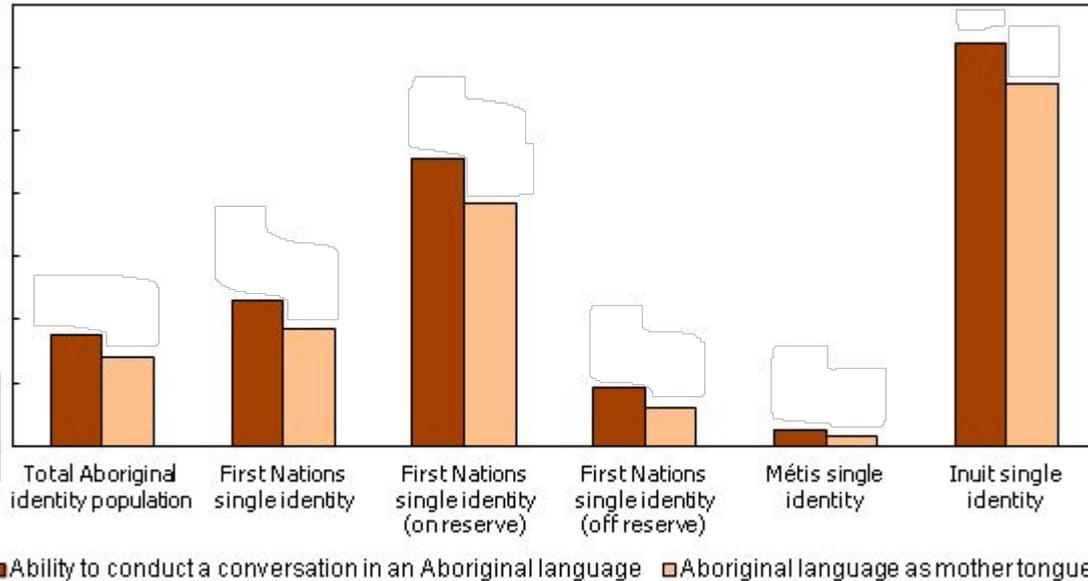
Total Aboriginal identity population | First Nations single identity | First Nations single identity (on reserve) | First Nations single identity (off reserve) | Métis single identity | Inuit single identity

■ Ability to conduct a conversation in an Aboriginal language   □ Aboriginal language as mother tongue

Source: Statistics Canada, National Household Survey, 2011.

Processing
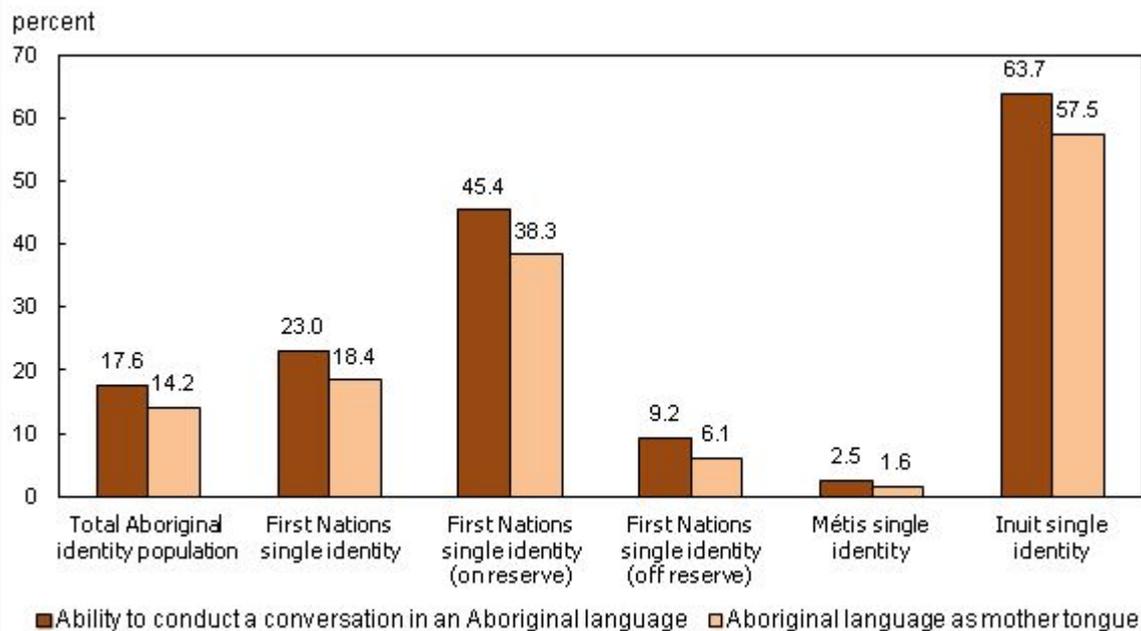
percent

Source: Statistics Canada, National Household Survey, 2011.

Processing

Use your base 10 blocks to find the decimal and percents that are equal to each of the following fractions. Estimate first!

$$\frac{4}{5}$$

$$\frac{1}{12}$$

$$\frac{1}{3}$$

Sometimes, Always, Never...why?

Equivalent decimals and percents have the same digits

Equivalent fractions and decimals have the same digits

There are some fractions that can't be turned into decimals and percents

It's easiest to compare numbers if they are all in the same format (ie: all fractions, all decimals, all percents)

Transforming

Students solve a variety of problems requiring them to order and compare numbers written in the three forms.

*Move towards doing this on a number line!

See Educating Now for lessons

9. Identify the number that has been placed incorrectly.
Explain how you know.

a)

$1\frac{1}{2}$ $\frac{15}{8}$ 2 $2\frac{1}{8}$ $\frac{11}{4}$ $2\frac{1}{2}$

b)

3 $3\frac{2}{5}$ $3\frac{1}{2}$ $3\frac{3}{5}$ $\frac{15}{4}$ 4
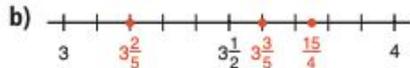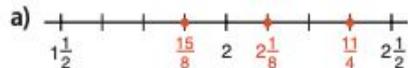
10. In each set, identify the number that is not in the correct order.
Show where it should go. Explain your work.

a) $\frac{29}{5}, 6\frac{2}{10}, 6.25, 6\frac{2}{20}$ b) $1\frac{7}{16}, 1\frac{3}{8}, \frac{3}{2}, 1.2, \frac{3}{4}$

From Math Makes Sense 7

11. **Assessment Focus** Amrita, Paul, and Corey
baked pizzas for the fund-raising sale.
The students cut their pizzas into different sized slices.

Amrita   Paul   Corey

Amrita sold $\frac{11}{6}$ pizzas. Paul sold 1.875 pizzas. Corey sold $\frac{9}{4}$ pizzas.
a) Use a number line to order the numbers of pizzas sold
from least to greatest.
b) Who sold the most pizzas? The fewest pizzas?
c) Use a different method. Verify your answers in part b.
d) Alison sold $2\frac{1}{5}$ pizzas. Where does this fraction fit in part a?

Reflect

Describe 3 ways to compare and order fractions and decimals.
Give an example of when you would use each method.
Which way do you prefer? Why?

5. **Assessment Focus** You will need a sheet of paper
and coloured pencils.

Divide the paper into these 4 sections.

- 1 blue section that is $\frac{1}{2}$ of the page
- 1 red section that is 10% of the page
- 1 yellow section that is 25% of the page
- 1 green section to fill the remaining space.

Explain how you did this.

What percent of the page is the green section?

How do you know?

From Math Makes Sense 7

6. **Take It Further** Suppose each pattern is continued on a hundred chart.
The numbers in each pattern are coloured red.
For each pattern, what percent of the numbers on the chart are red?
Explain your strategy for each pattern.

a) 4, 8, 12, 16, 20, …   b) 1, 3, 5, 7, …   c) 2, 4, 8, 16, …   d) 1, 3, 7, 13, …

Reflection

How did using the base 10 blocks affect your understanding of relating decimals to fractions and percents?

What are you finding challenging about converting and comparing?

What do you find easiest aboutconverting and comparing?

Explain a mistake that occured today that helped you to better understand this concept.

Assessment/Journal

Explain how to turn a fraction into a decimal and percent. Use examples, pictures, words and numbers in your explanation.

Routines/Strategies

Formative Assessment = Minute by Minute - What do they 'get' and 'not get'

- Accountability sticks
- Questioning the answers 'basketball' technique
- Individual white boards/pouches
- Thumbs up/side/down
- Think-Pair-Share
- Daily Reflections on learning - last 5-7 minutes (or homework)
- Journals - formative feedback only about 2 times a week
- Ticket out the door - into piles of "got it", "kind of", "not yet"

Depth of Knowledge 2-3 Resources

Use Robert Kaplinsky's custom search engine:

http://robertkaplinsky.com/prbl-search-engine/

Open Middle Tasks:

http://www.openmiddle.com/

http://iweb.jackson.k12.ga.us/Exemplars/Math2/html/main_grade3.html

Making Your Own DOK 2/3

In resources like Math Makes Sense, DOK 2&3 are often the last questions in the section. Any contextualized problems can also be made into DOK 2 or 3 by making small changes such as:

- Take out some details, or information so that there are more than one right answer or a range of answers
- Require students to estimate, model, write to explain their process of solving
- Give students the answer and ask them for the question(s)

Begin at the Beginning

I HIGHLY recommend this course:

http://pdce.educ.ubc.ca/Reconciliation/

Next registration is January and could be done as a PLC or individually.

Self Location

What is your personal and family history that brought you to this land?

Are you aware of the history of the land you live and work on?

Were your family or ancestors impacted by colonization, oppression, structural violence, or war?

What is your understanding of the impacts of colonial violence against Indigenous communities?

What does reconciliation mean to you?

https://www.bcasw.org/wp-content/uploads/2016/07/Reconcilliation-Toolkit-June-16-Edit.pdf

Traditional Western Worldview

5 consistent characteristics (no ONE Western Worldview):

- "Knowledge is linear, singular and static in nature, resulting in the valuing of one correct answer to any problem or question and one correct way to achieve these answers
- Valuing of hierarchies within knowledge → specialization
- Absolute belief in scientific method (observation that is done in total isolation of all other variables and is based on measurable data). This leads to truth being linked to measurability
- Valuing of compartmentalisation and categorisation of knowledge into small components in order to facilitate complete understanding → knowledge that is valued is abstract, void of context, and dissected for meaning
- Valuing of knowledge that is captured in written form, with more abstract forms, like mathematical symbolism, being highly prized"

Russell, G.L., Chernoff, E.J. The marginalisation of Indigenous students within school mathematics and the math wars: seeking resolutions within ethical spaces. Mathematics Research Group of Australia, 2012

Discuss

New learning

How these relate to how you teach and how your students learn

Which worldview is aligned with our curriculum?

Indigenous Worldviews

Indigenous Worldviews are reflected in the First Peoples Principles of Learning. Start with ONE and think about it, try it out in different ways.

Some things to consider:

How can we build respectful relationships with our students and their families?

How many visuals versus symbolic representations are used/explored?

How can storytelling be incorporated into math classes?

How can we learn on and from the land more?

How can we find the strengths in each student?

Reflection and Action Plan

"If you don't use it, you lose it"

Action Plan:

- What are you going to implement this week?

Feedback sheets for reflections please...