Grade 4&5 Numeracy Session 2

November 2018

Agenda

- Numeracy Routines
- 3-Act Task involving area models
- Summative Assessment practices - how do YOU know what your students have mastered and to what level?
- Larger number division strategies

Session Goals

- To continue to deepen our understanding of the new math curriculum
- To understand how assessment practices align with the new math curriculum and development of growth mindsets

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/

Clothesline Activity

When doing clothesline activities, have blank index cards ready because students can ask for any other number to be added to the line if it helps them make their decisions.

In your groups complete the following task at your clothesline:

1) Find the incorrect number(s) and explain what is wrong and why
2) Round 46 to the nearest ten WITHOUT using the rule (if it's 5 or greater…)
3) Given the current scale, what is the biggest number you think we can fit on the line? Explain your estimate
4) What are the benefits of using the clothesline (for you and your students)?

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/

Open Middle Example

WHOLE NUMBER DIVISION

Directions: Using the digits 1 to 9, at most one time each, make a true statement.

$$\boxed{} \div \boxed{} = \boxed{} \div \boxed{} = \boxed{}$$

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)

7. Zoé estimated the product 245 × 9.
   She wrote these statements about the product.
   - The product is less than 2500.
   - The product is greater than 1800.
   How do you think Zoé got each estimated product?
   Use words and numbers to explain.

8. The students want to sell about 2000 tickets to a fashion show.
   They hope to sell 425 tickets each day.
   The students sell tickets for 5 days.
   Do you think they will sell enough tickets?
   How do you know?

9. The estimated answer to a multiplication question is 4200.
   What might the question be?

10. Write a story problem for which an overestimate would be needed.
    Solve your problem.
    Show your work.

Multiplication Using Area Models

Goals: To understand how to use an array or area model to model and solve double-digit multiplication problems (and single digit by double-digit)

3 Act Task

https://tapintoteenminds.com/3act-math/donut-delight/

Act 1

Act 2

What do you notice?

What do you wonder?

Act 2

Predict how many

donuts in the box

Act 3

Act 3

Solve the problem in any way that works for you (but NOT the traditional algorithm). Look at the numbers and think of strategies your students might use

Solve the problem using base 10 blocks and the area model to find the exact number of donuts in the box

Take some time to explore how the area model is the same and different from the way you've always mutliplied

Educating now

Act 3

Reveal: https://tapintoteenminds.com/3act-math/donut-delight/

As we look at each strategy, discuss in your groups:

- Connections you just made (or can make to other math, other concepts or ideas)
- Understanding the concept of partial products
- What's challenging you and why

Try a Few More...

Estimate first and share how you estimated, then solve using the area model:

22 x 31

13 x 63

Relate the Blocks to the Area Model Sketch

Explicitly work on how to connect the base 10 block area model to a sketch:
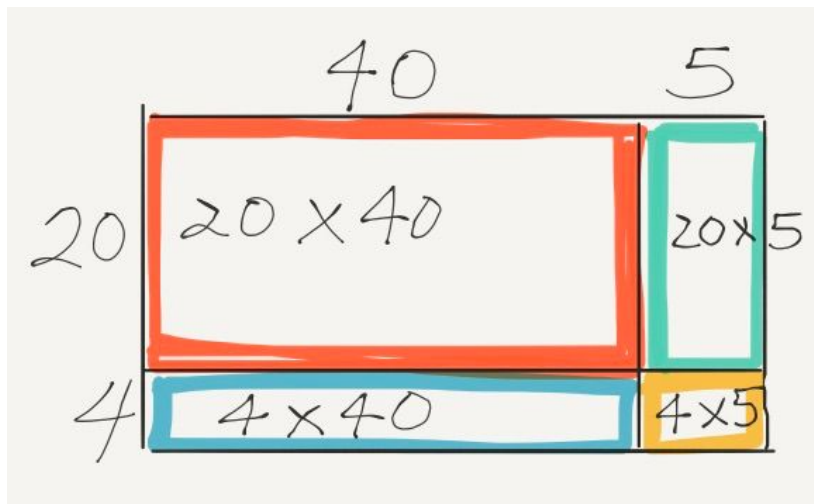
Challenge task

Jane made a mistake when writing down a multiplication, and she multiplied by 54 instead of 45. Her answer was 198 too big. What number did she multiply 54 by? (https://nrich.maths.org/12792)

Solving Problems Related to Place

Use this concept to solve problems like:

If we want to redo our classroom floor, how much flooring do we need to buy?

What about if we wanted to paint a wall with chalkboard paint...what's the area of the wall?

Extension: If 1 litre of paint covers about 10 square meters, how much paint will we need for the wall?

Find area of bedroom, kitchen at home

Math Talk and Reflection Stems

https://drive.google.com/file/d/1m9vIH_DTO2SjiPMsmP_NdwMalIx6H3Jf/view

Reflections

How did using the blocks affect your understanding of multiplying double digit numbers?

What part of the model do you find the most challenging?

How did you learn from others in today's class?

What did you do in today's clas that supported someone's learning?
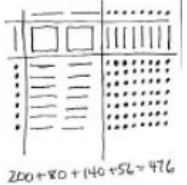
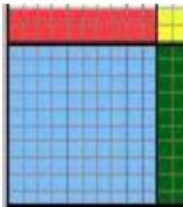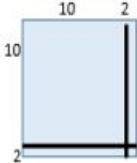What is this connected to? (other math problems concepts, home life, etc.)
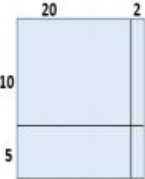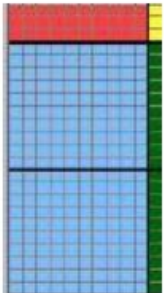
How could we use this idea to solve other problems?
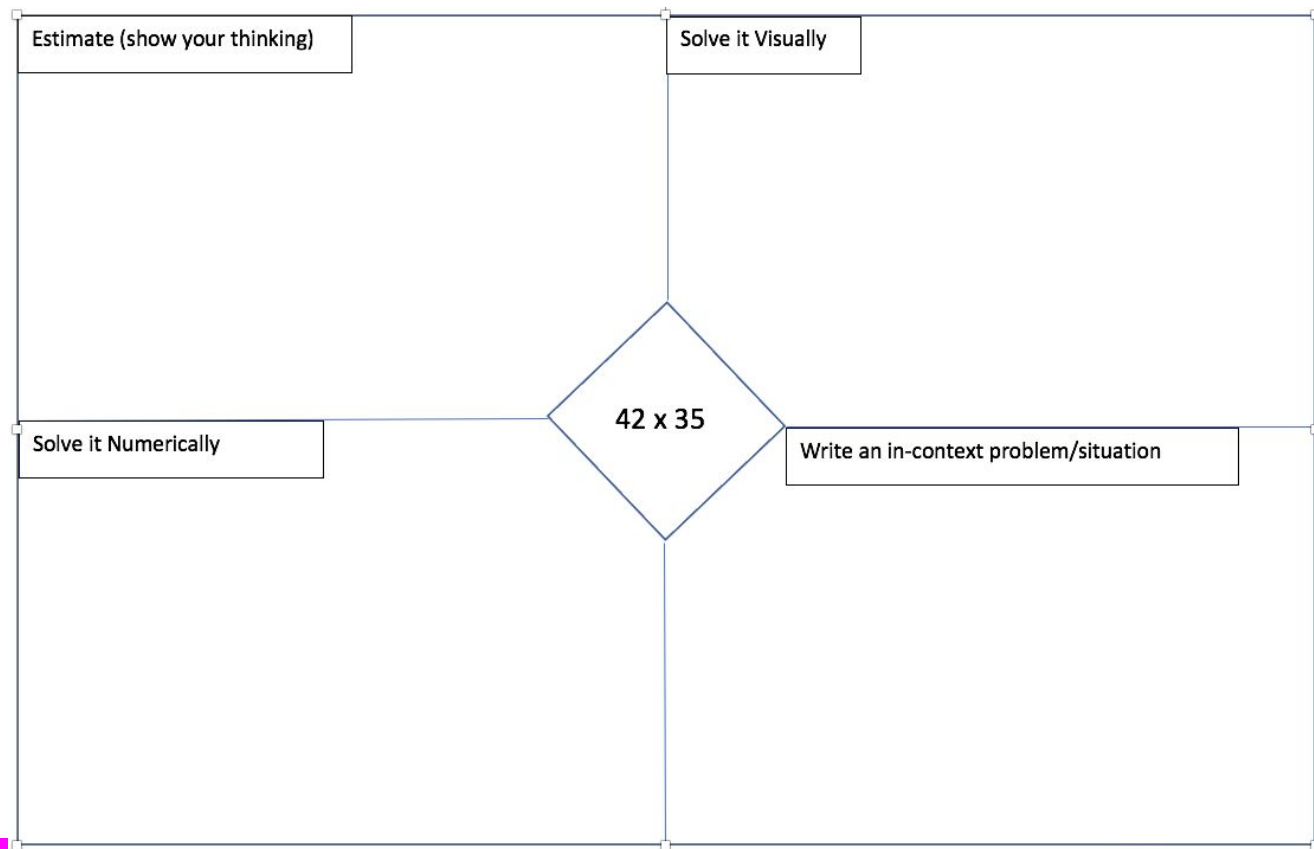
What is your learning goal for next lesson?

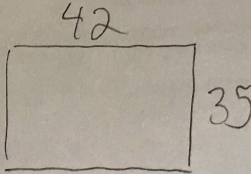Take a look at this assessment and see what you might change:

1.) Multiply 28 by 17 and show your work:

2.) Julie, Pete, Lisa, & Fred each multipled 28 by 17. Below each method indicate if the work is correct and then explain whether that method makes sense mathematically or not.

Julie	Pete	Lisa	Fred
$(20 + 8) \times (10 + 7)$ 20x10 +8 x10+20x7+8x7	$28 \times 10 = 280$ $28 \times 5 = 140$ $28 \times 2 = 56$ $280 + 140 + 56 = 476$	Lisa's area model: 20 / 8 across top 10: 200 / 80 7: 140 / 56 $200 + 80 + 140 + 56 = 476$	$200 + 80 + 140 + 56 = 476$
Check one: ___correct ___incorrect Explain why:	Check one: ___correct ___incorrect Explain why:	Check one: ___correct ___incorrect Explain why:	Check one: ___correct ___incorrect Explain why:

3.) Which method most closely matches how you solved the original problem? _____
Choose a *different* method than what you used in #1 to multiply 39 by 14.
Show your work below:

Problem Card Set A	Base Ten Card Set B	Area Model Card Set C	Distributive Property Card Set D	Partial Products Card Set E
Each pack of baseball cards has fifteen cards. How many cards are in twenty-two packs?		20 2 10 5	$(20 + 2) \times (10 + 5) =$ $20 \times 10 + 2 \times 10 + 20 \times 5 + 2 \times 5 =$	15 X 22 10 20 100 200
How many eggs are in twelve dozen?		10 2 10 2	$(10 + 2) \times (10 + 2) =$ $10 \times 10 + 2 \times 10 + 10 \times 2 + 2 \times 2 =$	12 X 12 4 20 20 100
The boy scouts traveled a distance of twenty-three feet in their boat. The girl scouts traveled eleven times farther than the boy scouts? How far did the girls travel?		10 1 20 3	$(20 + 3) \times (10 + 1) =$ $20 \times 10 + 3 \times 10 + 20 \times 1 + 3 \times 1 =$	11 X 23 3 30 20 200

Sample Assessment

Estimate (show your thinking)	Solve it Visually

42 x 35

Solve it Numerically	Write an in-context problem/situation

Use Joy's rubric to assess this.
What questions might you want to ask the student?

Ministry Assessment Resources

https://curriculum.gov.bc.ca/classroom-assessment-and-reporting

https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/assessment/classroom-assessment-resource-package-math.pdf

Take a good look through it. Joy Nugent's work is featured here:

https://curriculum.gov.bc.ca/sites/curriculum.gov.bc.ca/files/pdf/Teacher_Sample_SD61.pdf

Revisit the 3-Act Task...

The same 3-Act task actually has many more acts as the next part requires students to divide.

Allow them to do this in whatever way makes sense to them. Given the context, the traditional algorithm would likely not be used but see what they do and build from there.

Connect to Division
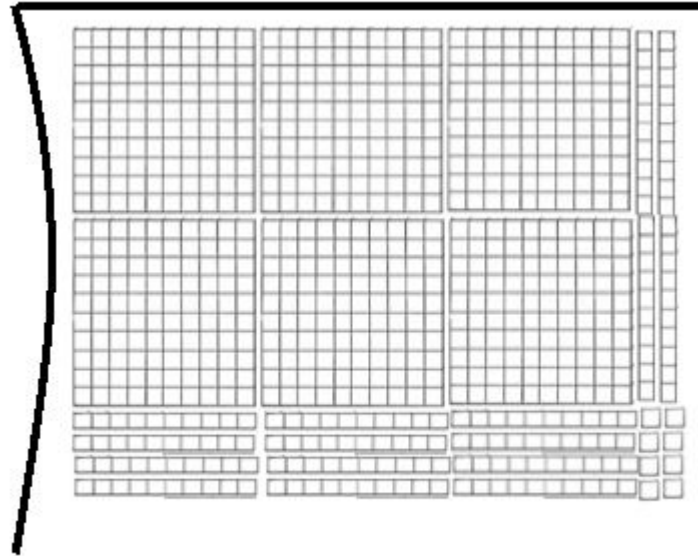
Different Ways to Divide

Traditional with NUMBERS (not digits): This procedure best matches what students usually do with the blocks. We can scaffold it further by using columns labelled with place value (you could even have pictures to really help them out)

Example:

Hund	tens	Ones

6 | 2   5   6
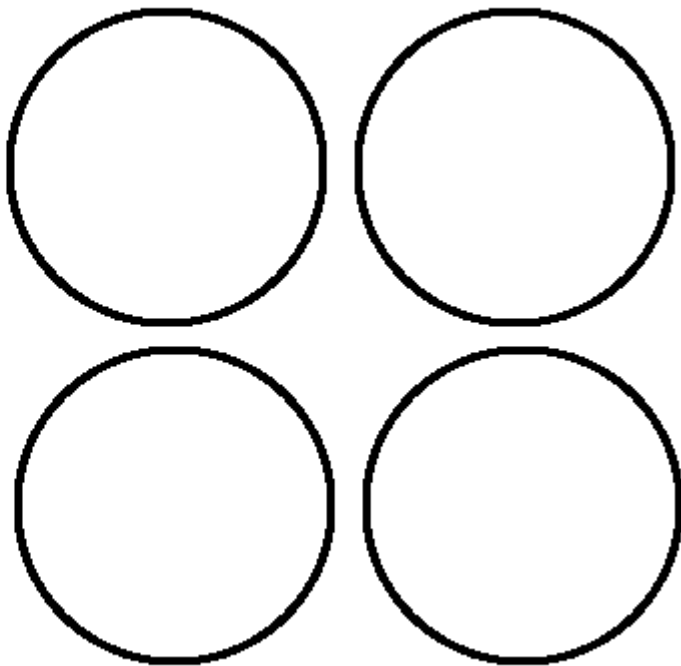
Partial Quotient Method

Benefits: uses knowledge they have and doesn't require knowing 'limits', proven to be more successful, and helps students to be GREAT estimators

This is connected to repeated subtraction or 'divvying out'

Scaffold by using 'bubbles' and by using manipulatives

Example:

$4 \overline{)175}$

Connecting Math to Place, Culture and Community

Using a meter stick (or rulers), have students estimate a meter (for shorter people it might be two steps and for longer-legged people it might be one large step).

Practice this a few times, then estimate distances (all students give a number), walk it out to see how close your first estimate was and then measure using measuring tapes, trundle wheel, etc.

Use this same process to estimate and find areas of the classroom, gym, school field, etc.

I found this on twitter!

Students find out about their culture, history and use the numbers to make generalizations!

Educating now

Nachbardiv8
@Nachbarclass

Follow

Where were you born? Where were your parents born? Where were your grandparents born? Maps, math and so much rich discussion! What does this data tell us about our families? What can you infer? As one student said, "who knew there was so much math in maps?!"

6:45 pm - 5 Nov 2018

Also from Twitter....I'm thinking could a class approach a local business and 'mathematize' it?

What a great project! Learn more:

https://www.public-math.org/news/
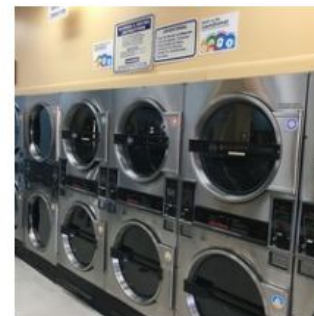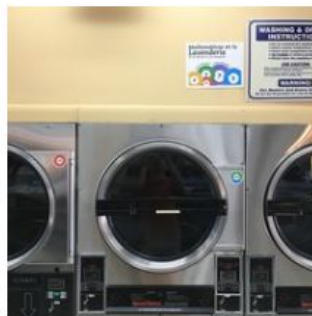
Reflection and Action Plan

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

Action Plan:

- What are you going to implement this week?
- What are you going to share with other teachers in the next month?

Feedback sheets for reflections please…

Additional Requested Resources

Picture books for math:

https://www.the-best-childrens-books.org/math-for-kids.html

https://artfulmath.com/resources/math-books-for-kids/