
Grade 4&5 Numeracy

Session 1

October 2018

Agenda

- Recap of new curriculum and growth mindset
- Formative Assessment practices - how do YOU know what your students know minute by minute?
- Summative Assessment practices - how do YOU know what your students have mastered and to what level?

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

New Math Curriculum

- Focus on skills and processes as much as content
- All areas of learning are based on a “Know-Do-Understand” model to support a **concept-based competency-driven** approach to learning.
- Three elements, the Content (Know), Curricular Competencies (Do), and Big Ideas (Understand) all work together to support deeper learning.

An Analogy

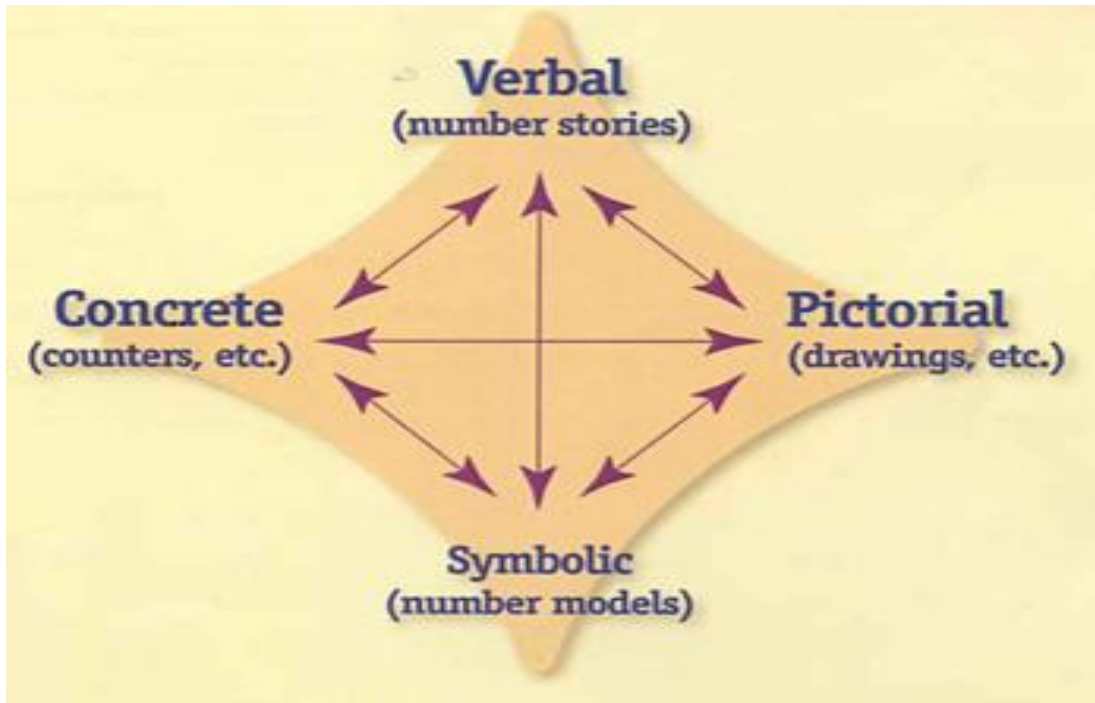
The Curricular competencies are the vehicle

The Curricular content are the passengers

The Big Ideas are the destination



Multi-Dimensional Mathematics



Math concepts are explored and understood in all of these ways to improve engagement, meaning and conceptual understanding

Growth Mindset

What Kind of Mindset Do You Have?

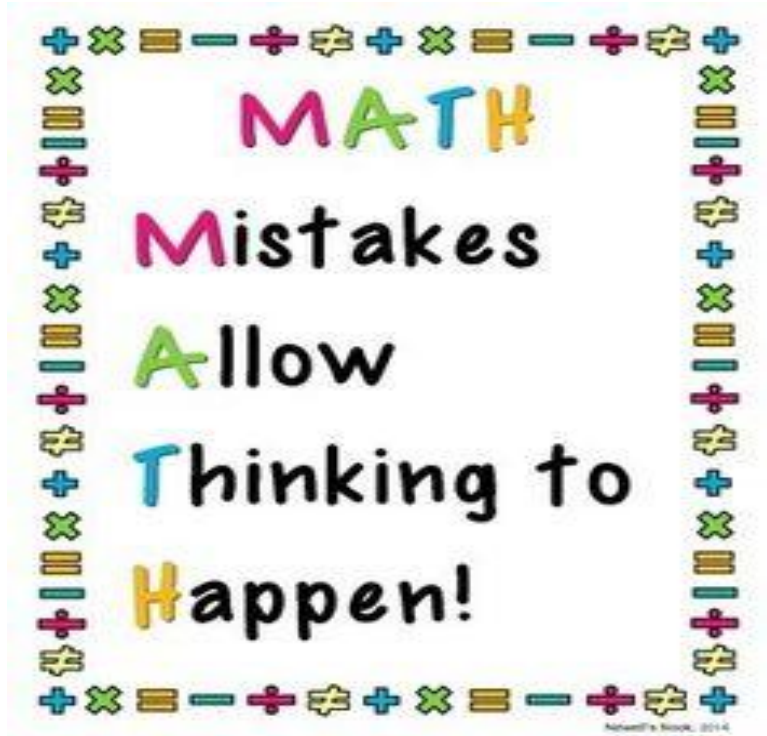


I can learn anything I want to.
When I'm frustrated, I persevere.
I want to challenge myself.
When I fail, I learn.
Tell me I try hard.
If you succeed, I'm inspired.
My effort and attitude determine everything.



I'm either good at it, or I'm not.
When I'm frustrated, I give up.
I don't like to be challenged.
When I fail, I'm no good.
Tell me I'm smart.
If you succeed, I feel threatened.
My abilities determine everything.

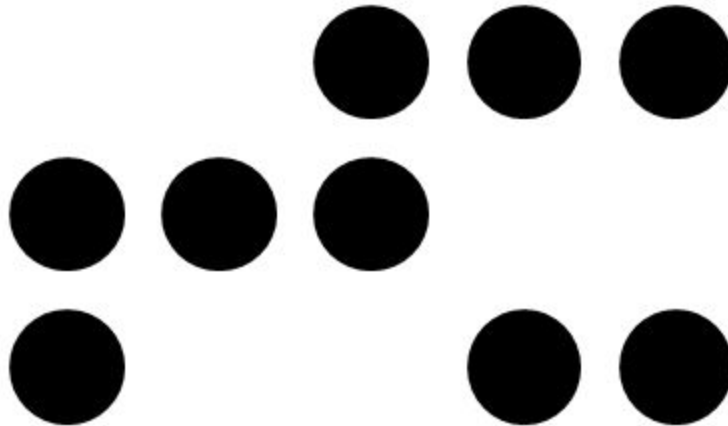
Shifting the Culture



Mistakes are an opportunity to learn

Productive struggle means that you are being challenged at the right level - if it doesn't challenge you, it doesn't change you!

Number Talk



Number Talk

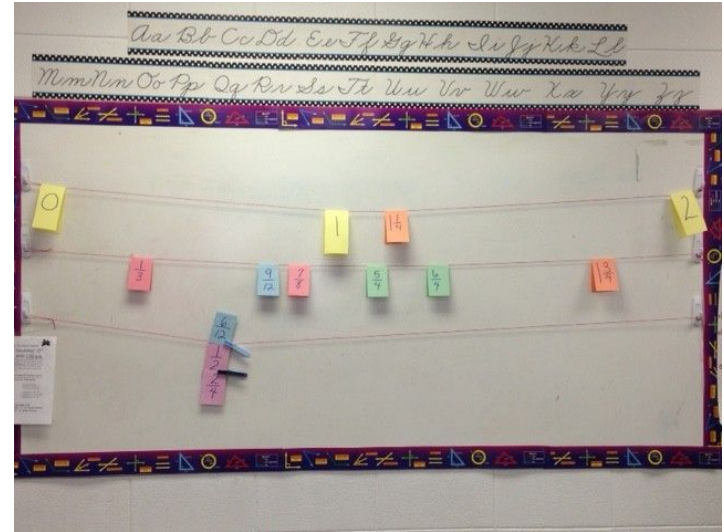
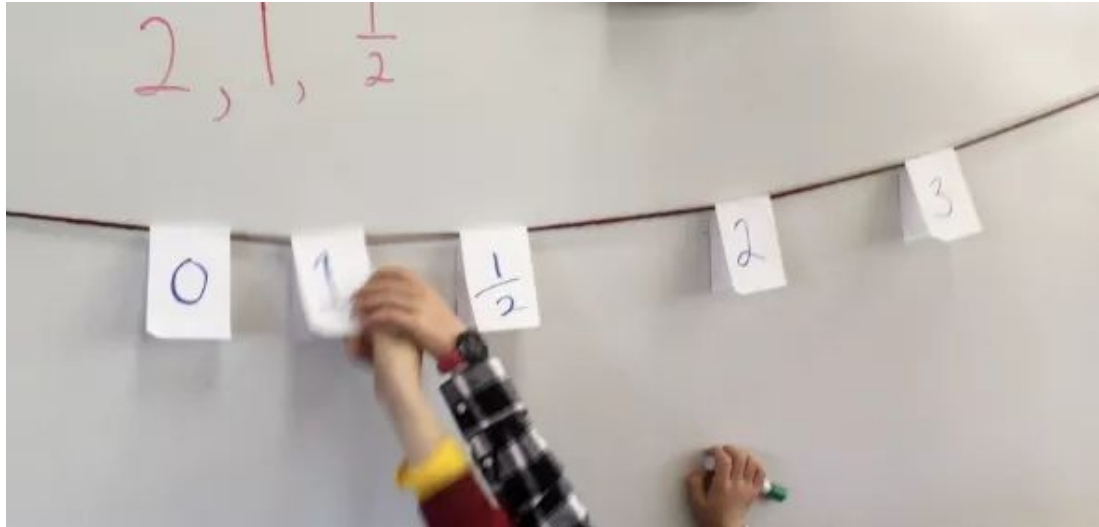
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Clothesline Activities

Have them up all year long

Start with whole numbers only

They are visual way to think about different strategies



Routines/Strategies

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

- Accountability sticks
- Mouthing technique
- Individual white boards/pouches
- Thumbs up/side/down
- Red/Yellow/Green
- 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"





Other References

Inside the Black Box:

<https://www.rdc.udel.edu/wp-content/uploads/2015/04/InsideBlackBox.pdf>

1 Hour Long Documentary (part 1) with Dylan Wiliam:

<https://www.youtube.com/watch?v=j25d9aC1GZA>

SNAP Assessments (Chilliwack):

<http://snap.sd33.bc.ca/node/58>

ANIE assessment (BC):

<https://savagebirdlearning.files.wordpress.com/2016/08/blank-anie-aug-6-bc-version.pdf>

Summative Assessments

Consider Depth of Knowledge: Level 1 is “Recall”

Example: 68×24

- This will show if they can execute the procedure accurately

Example: In preparing for the school fundraiser, Jackie fills up 68 bags with 24 candies in each bag. How many candies did she use?

- This will show if they know when to apply multiplication to solve problems, although when it's given on a 'multiplication test', they may just do it without really knowing why

Level 2: “Skill/Concept”

Example: Sandra is building planter boxes and wants the measurements to be 68cm by 24cm for the base and 18cm tall. Draw a sketch of the base of the box and solve for its area. Estimate first.

Level 3 “Strategic Thinking”

Example: Sandra is building planter boxes and wants the measurements to be 68cm by 24cm for the base and 18cm tall. Draw a sketch of the base of the box and solve for its area. How many box bases can she make with a 200cm by 200cm piece of plywood? Explain your solution with a diagram and words.

Estimate first and explain your estimate

Reflect

How many questions on the assessments you use are:

- Depth of knowledge 1
- Depth of knowledge 2
- Depth of knowledge 3
- Procedural only
- Conceptual only
- Procedural and conceptual
- Applied math
- Pictorial

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)

Accessing Prior Knowledge

Discuss with your partner:

What is an array or area model - show an example with your blocks.

Why might it be helpful to use an area model?

Use the small cube as 1 and show each of the following:

$$2 \times 3$$

$$2 \times 30$$

$$2 \times 300$$

Discuss what is the same and what is different about each representation

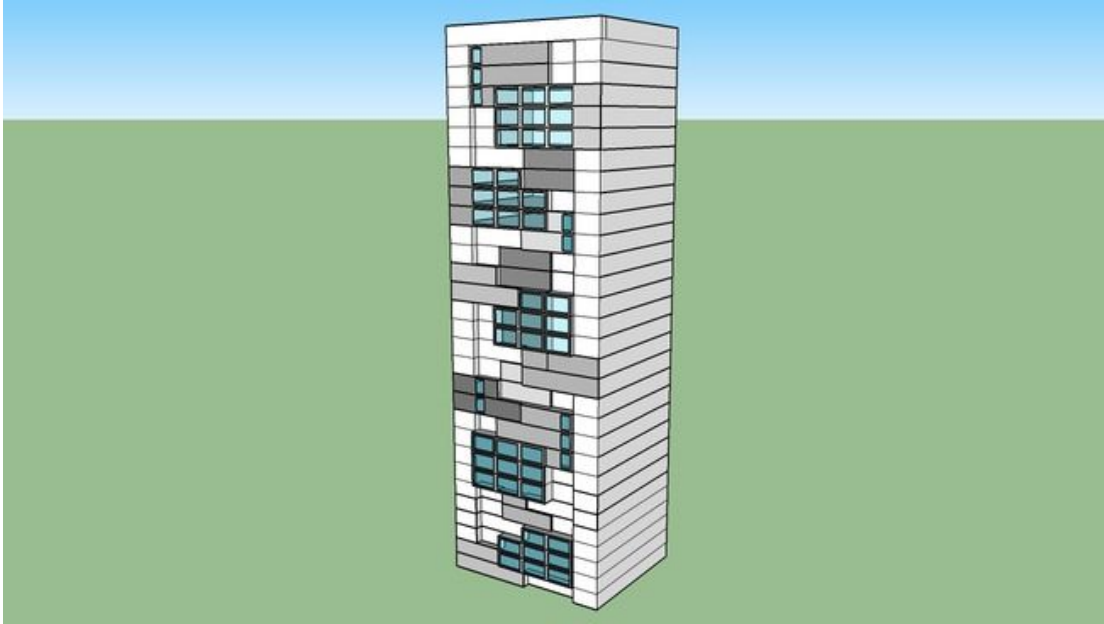
Accessing Prior Knowledge

Estimate 4×23 (4 rows of 23) and model and solve with the blocks

Estimate 10×23 (10 rows of 23) and model and solve with the blocks

Can you do this with fewer blocks (it can be built with 5 blocks)? Why does this work?

What Do You Notice?



What Do You Wonder?

Processing

An architect is designing a building that has a rectangular base that is 19×23

Estimate the area of the base

Model and solve with your base 10 blocks

How close was your estimate?

Is there another way you could solve this problem? Share with your group

Draw a sketch of the area model by breaking the side lengths into more 'friendly numbers' so you can calculate mentally

Processing

Sara has 24 students in her class and she wants to give each student 35 stickers, how many stickers is this?

Estimate first. Explain your estimate and if you think the exact solution is going to be larger or smaller and why.

Model and solve using your blocks

How close was your estimate? What might you do differently next time?

Check your solution by solving in another way

Transforming

The product of two double-digit numbers is between 510-565, what could the two numbers be?

Start with an estimate of what the numbers could be.

Model and solve using base 10 blocks

What context (story problem) could match this problem?

If this was the area of a table top (in square centimeters), what would be the best dimensions for the rectangle? Why?

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 class 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?

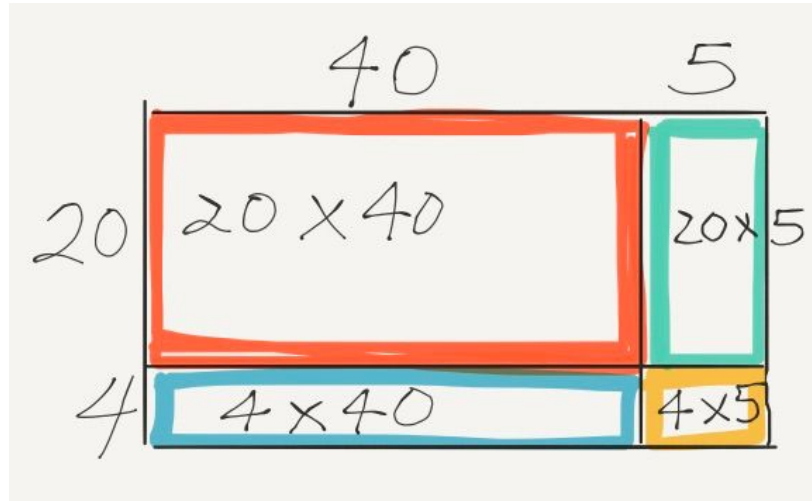
Competencies

Take a look at the curriculum grid and identify the competencies we engaged in while learning to understand how to multiply double-digit numbers using area models.

What Big Idea are we heading towards?

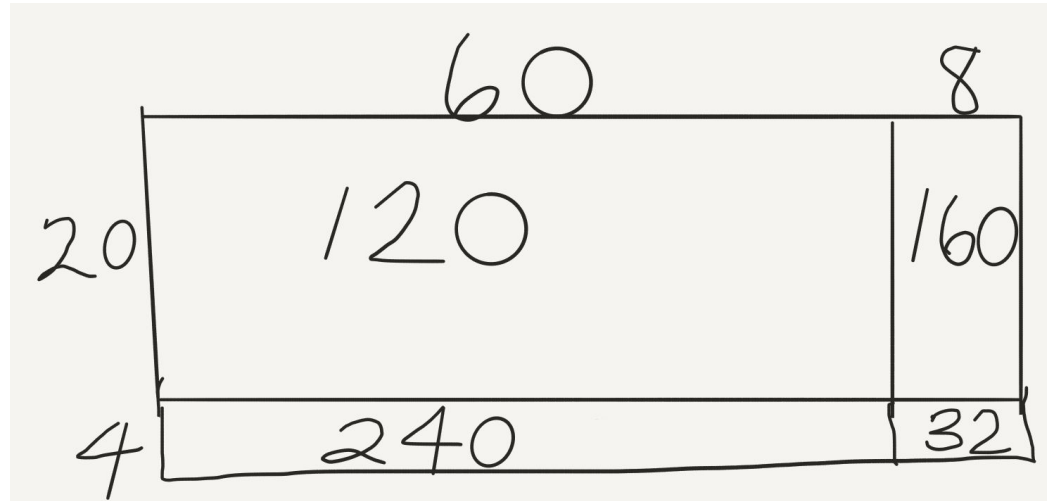
Next Steps...

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



Error Analysis

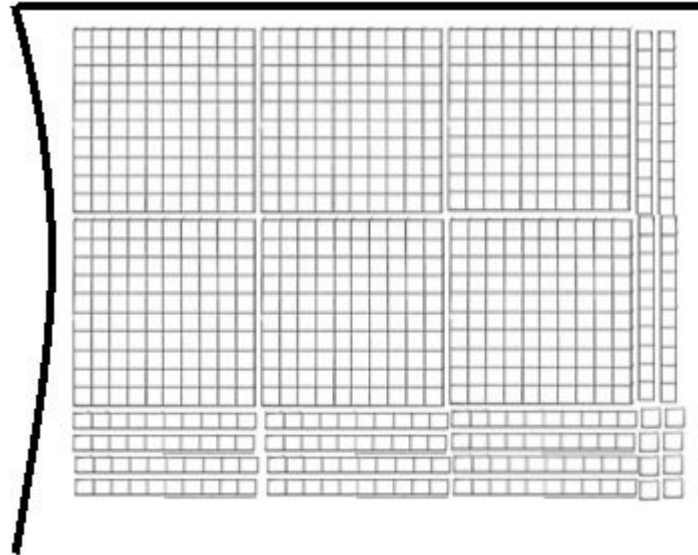
Help this student out... is their answer correct? Estimate first to see if they are even in the right ballpark. Then correct any mistakes you see:



A handwritten area model for the multiplication 24×68 . The model is a large rectangle divided into two parts by a vertical line. The left part is a rectangle with a height of 20 and a width of 60, containing the number 120. The right part is a rectangle with a height of 4 and a width of 8, containing the number 32. The total height of the large rectangle is 24, and the total width is 68. Below the area model, the equation $24 \times 68 = 552$ is written.

$$24 \times 68 = 552$$

Connect to Division



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

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...