Helping Teachers Focus on What Matters

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What matters first?

- The classroom environment.
- But today my focus will be, assuming we get this right, instruction and assessment.

What matters?

- MOST FUNDAMENTAL-
- Knowing why you are teaching what you are teaching.
- That means MORE DEEPLY understanding the purpose of expectations

For example…

- Grade 1:
- Estimate, measure and record lengths, heights and distances
- What are the most important markers for you that the student has been successful on this expectation?

For me…

- How reasonable are their estimates? (i.e. can they relate two measurements to each other)
- Do they use unit size as a factor?
- Do they recognize bad measuring vs good measuring?

For me…

- Do they have a good sense of which attributes matter and which don’t when they measure?
- Do they realize units need to be the same size and why?
- Do they choose appropriate units?

For me…

- Do they know what to do if they don’t have enough units?
- Do they know what to do if the fit is not perfect?

What ideas

- You need to know what ESSENTIAL UNDERSTANDINGS/BIG IDEAS to pull out of a lesson, not just what problem to do and to get kids to share.

So..

- You might create your own, or use mine or use someone else's, but you need to do this to teach with confidence and to be able to respond effectively to students.

Clustering of expectations

- By more deeply understanding expectations, you can cluster them.
- This might be a collaborative effort.
- Clustering might facilitate planning, particularly in ensuring you keep returning to important ideas.

Longer term planning

- Consider what you think are the big ideas in math.
- Make sure you keep returning to them over the course of the semester/year.

For example – Gr 3

- **Number**
- **composing/decomposing**
- Place value as a specific type of decomposing/money as well
- **Sense of size of whole numbers**
- Serious intro to fractions

For example – Gr 3

- Operations: **adding and subtracting in pieces**
- **Intro of what multiplication and division are**

For example – Gr 3

- **Measurement**
- **Length** through kilometres including perimeter
- Meaning of area
- Sense of mass (kg), capacity (L)
- Relationship of unit size to measures

For example – Gr 3

- **Geometry**
- Sorting polygons, prisms and pyramids
- 2-D parts of 3-D figures
- Right angles
- **Decomposing shapes into others**
- Congruence
- Movement on grids and symmetry

For example – Gr 3

- **Pattern and algebra**
- Repeating patterns/2 attributes
- **Growing/shrinking with models**
- **Pattern rules**
- **Relationship between + and –**
- **Unknowns in + and – equations**

For example – Gr 3

- **Data and Probability**
- Two attribute sorting
- Data collection and graphs with scales
- **Interpreting data**
- Predicting frequency
- Determining fairness

So you might…

- Go back and forth between strands, e.g.

Compose/decompose—concrete- adding and subtracting

Include relationship between + and –

Sense of size of number

Growing and shrinking patterns

Length including relating unit size to measure

Two attribute sorting

Compose/decompose- place value

Adding and subtraction including + and – equations and properties

Sense of size of number

Decomposing shapes

Angles

Repeating patterns and pattern rules

Area including relating unit size to measure

Movement on grids

Data collection and graphs and interpreting data

Fractions

Compose/decompose- money

Sorting 2-D and 3-D

Intro mult and division; continued adding and subtracting
Including properties

Mass/capacity including relating unit size to measure

Frequency and fairness

Sense of size of number

You might also…

- Ensure that every couple of weeks, you do at least some small activity in pattern, or data and some in geometry or measurement.
- You might use some of the open questions minds-on activities for these, e.g.

Q

Why can you use different measurements to describe how big a pumpkin is?

Q Use square tiles to create a growing pattern. Represent the same pattern again, but use an action this time.

Revisiting concepts

- Or you might use one topic as a context for another, e.g. measurement for a number activity or fractions for a geometry activity

Revisiting concepts

- Some ideas are important enough to revisit, changing the task, of course, each time.
- In Grade 2, this might include composing/decomposing numbers, addition and subtraction.

Revisiting concepts

- You need to decide which are the biggies for your grade.

For an individual lesson…

Learning goals

- Learning goals should be about ideas, and not just performances, so that a teacher can stay focused on the IDEAS s/he is trying to get at.

For example…

- Instead of a learning goal being about adding 3-digit numbers, it might be about the notion that adding big numbers always involves breaking up the addition into manageable pieces.
- The lesson focuses on variations on what those manageable pieces might be.

The main teaching task…

- Is not what you start with, but is in service to getting to the IDEA learning goal you have set.

Consolidation

- What consolidation is relates to sharing, but is NOT JUST SHARING.
- You need to know what critical questions need to be asked at the end of the lesson to ensure that students really knew what math you were trying to get across

Question asking

- I believe the most important thing a teacher can learn to do is ask better questions to:
- Pose as tasks
- Scaffold
- Extend
- Probe
- Build connections

Manipulatives/visuals

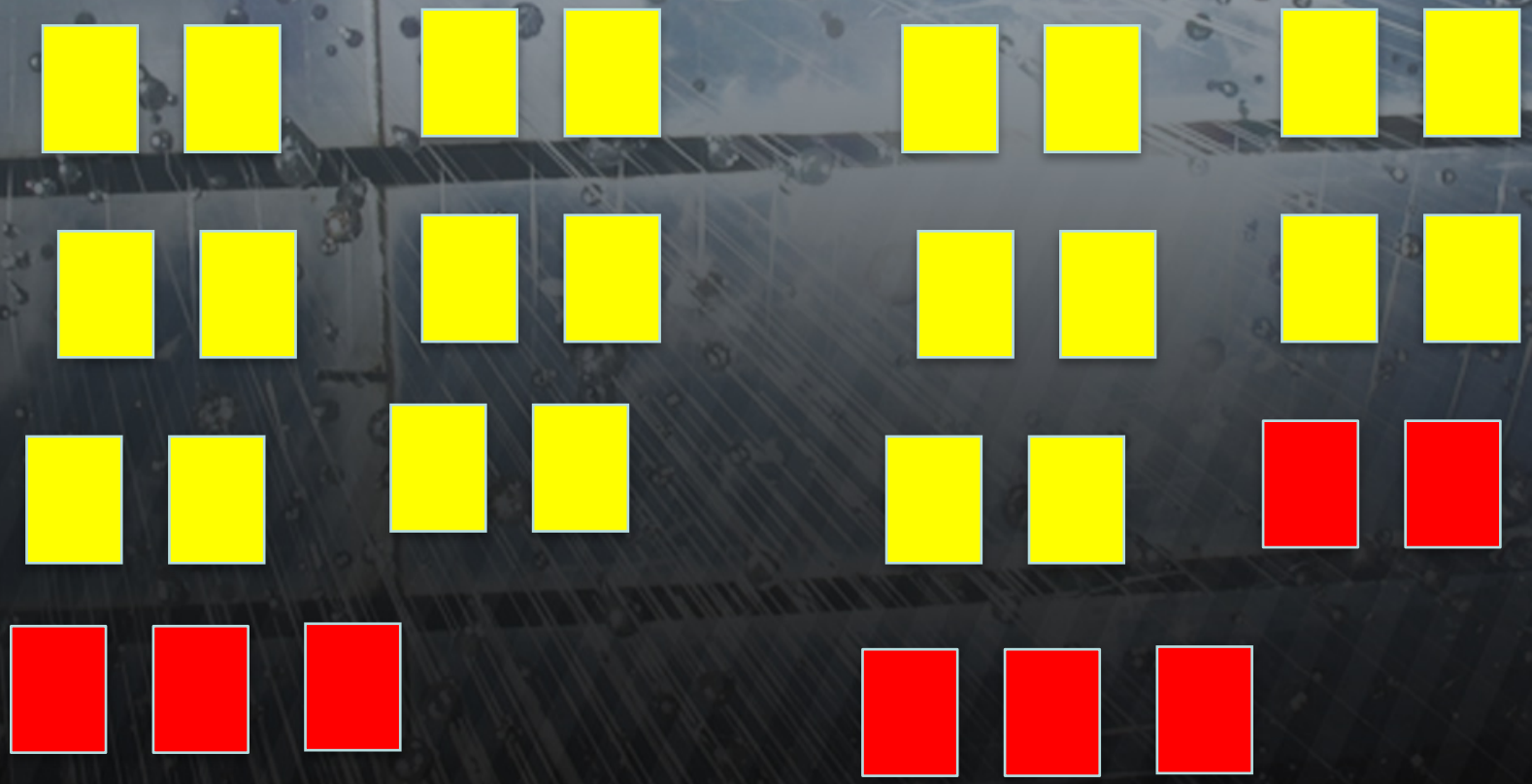
- There is a lot of use of manipulatives and visuals not in procedural ways but in service of “seeing” ideas.

Estimation/mental math

- There needs to be significant attention to mental math and estimation, whether through number talks or in other ways.

For example…

- To help students see why 12 + 3 = 10 + 5



Assessment for learning information

- You need to gather some diagnostic information at the beginning of a teaching piece to know what kind of differentiation you will need to do.
- That could be a single task or it could be a series of focused questions.

For example

- If you were teaching about adding and subtracting 3 digit numbers, you might want information about:
- Similar work with 2 digit numbers
- A recognition of what kinds of problems these operations apply to

Assessment for learning information

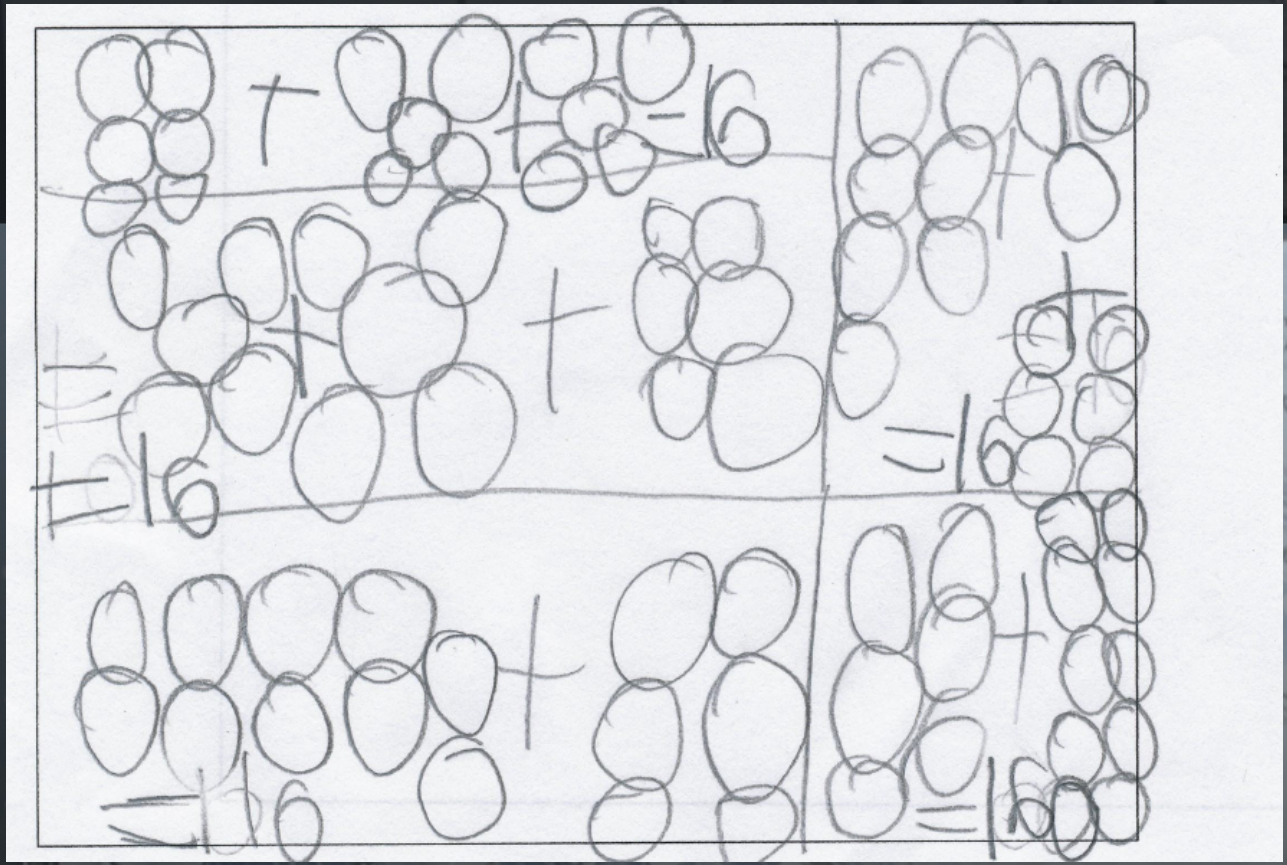
- You need to be gathering assessment for learning information all the time, but particularly at the end of the lesson--- you need an appropriate “exit slip” to find out if the lesson took.
- This could be observational or written or oral.

Specific rather than generic feedback

- Even though there are generic questions that can be posed,….
- It is valuable if feedback is very particular.

For example

- What would you say to this work?



5+5+6=16 10+6=16 6+10=16

6+5+5=6

Success criteria

- Success criteria need to focus not only on how many strategies to use but the quality of what is done and the ideas that the students show an understanding of.
- So, for example,…

Task

- What numbers can you show with exactly 12 base ten blocks?

Consolidate

- What was the smallest number you could create? Why?
- What was the greatest number you could create? Why?
- Could you have used 10 ones? How? What number would you create?
- Could you have used 9 flats? How? What number could you create?

Consolidate

- What do all of the numbers we created have in common?

Maybe

- 12
- 120
- 102
- 111
- 201
- 66
- 75
- 444
- 192
- 552

Success criteria

1. You created a lot of numbers that used 12 base ten blocks.
2. You could name each of the numbers you represented.
3. You could use one answer to get to another one.

Success criteria

4. You could come up with numbers when you were given part of the number.

5. You noticed what the numbers had in common.

Success criteria

- Some criteria should be discussed before the task is begun, but some should be discussed after consolidation.

Triangulating assessment

- Much of your assessment of learning observation needs to be observation and conversation, but you need to think carefully about what you are observing.

Triangulating assessment

- Assessment needs to focus as much (or more) on understanding and thinking questions as application and knowledge questions.

What does it look like?

- Suppose the topic were addition and subtraction of 2-digit numbers.

Skills include

- Adding numbers like 22 + 35 as well as 28 + 39 as well as 35 + 45
- But even more conceptual questions including some multiple choice for EQAO practice, e.g.

Concepts include

- You add two 2-digit numbers. When is the answer 3-digits?
- You add two numbers that are pretty close together and the answer is 87. What could the numbers be?

Concepts include

- How would you add 38 + 49 using mental math?
- What's another adding question you would do a similar way? Why similar?
- What's another one you would do a different way? Why different?

Concepts include

- Without adding, how do you know that the answer to 48 + 57 is more than the answer to 45 + 55.

Concepts include

- Which question has a different answer than 42 + 58?
- A: 52 + 48
- B: 40 + 60
- C: 40 + 56
- D: 58 + 42

Creating a report card

- What you show parents should reflect the balance of instruction.
- If it’s mostly concepts, you should be showing mostly concepts.
- If it’s project based, you should be showing projects?

Kinds of tasks you use

- You need a good blend of “3-part lessons”, game days, etc.
- You need a good blend of very focused tasks to reveal very particular math ideas and bigger, thinking tasks that apply what has already been learned.
- You need engagement.

For example

- Focused task:
- **1.** On the centimetre gird, draw two separate “creatures” that are different in size..
-
- They can look like animals, or monesters, or aliens.
- They should each be made up of full squares .

For example

- Focused task:
- 2. Estimate the area each crearure. Explain your estimate.
-
- 3.Then measure the area of each creature.

For example

- Application task: About how many people do you see in a day?

Cross-strand work

- You need a combination of tasks that are strand-focused to get at important ideas that are to be learned on which you want to focus as well as cross-strand tasks.

Differentiation

- There needs ot be significant use of open questions to allow for differentiation as well as parallel tasks.
- This is true in both the tasks assigned as well as assessment.

Continua focused on the big stuff

- You need to be aware of what comes before and after in the curriculum, but also what comes before and after in the development of ideas.

And the point is

- If you use resources that you get from somewhere else, you need to have a sense of why those authors did what they did.
- Otherwise you are not empowered to generalize from what you are using or appropriately adapt it.

Models

- You can see models of other teachers working and that is helpful, but you still need to make your own decisions about what to value.

Problems should be houghtful, not complicated

- Compare the two:

Complicated

- I bought 3 shirts that each cost $12.45.
- I bought 4 sweaters that each cost $39.95.
- I bought 5 pairs of pants that cost $9.95, $12.95, $22.95, $17.95 and $18.95.
- How much of the $500 I had budgeted for clothes do I have left?

Thoughtful

- I bought 7 items that cost under $20 and bought 5 items that cost more than $20. I spent almost $300.

- What are possible prices for the 12 items? Explain your thinking.

What other conditions?

- Misinterpretation is allowed.
- Mistakes are normal.
- Tasks are engaging.

What it might look like in P

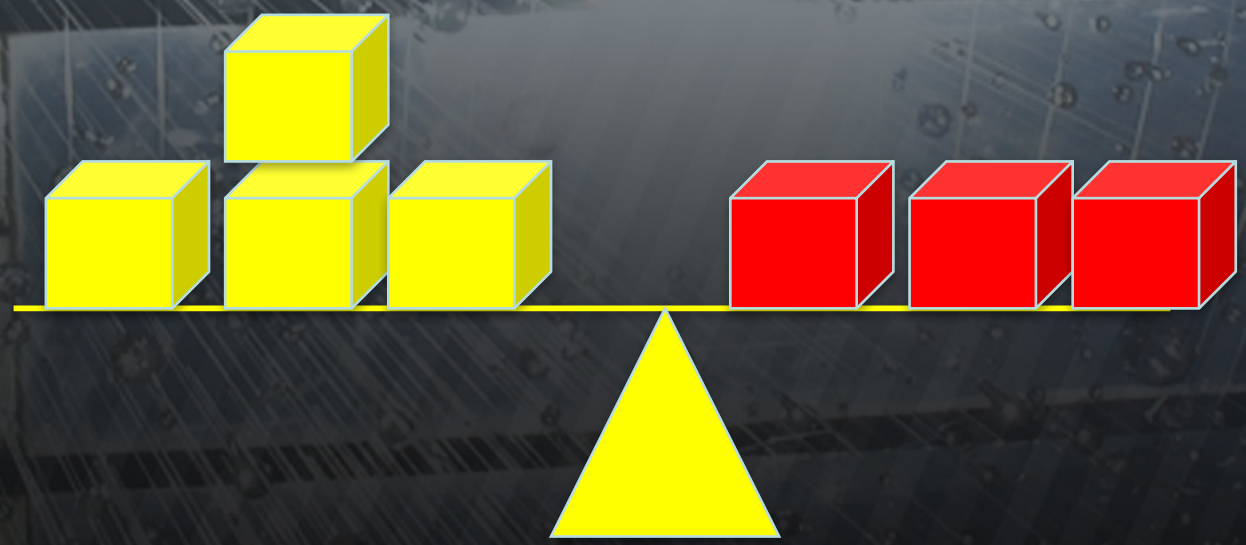
- You are on the number 5 on this path:

1	2	3	4	5	6	7	8	9

- You move SOME steps forward.
- Then you move SOME steps back.
- You repeat both moves
- You land at 9.
- How many steps each way?

What it might look like in P

- How many might be in each yellow box? How many in each red?



What it might look like in P

- I had more than 20 counters.
- I split them up into 2 small piles and 2 large piles.
- The large piles had twice as many counters as the small ones.
- How many might have been in each pile?

What it might look like in P

- I represented an amount of money with 8 coins.
- I represented the same amount with 22 coins.
- What coins might I have had each time?

You might think

- Every time I trade 1 quarter for 5 nickels, I would get 4 extra coins.
- Every time I trade 1 toonie for 2 loonies (or 1 dime for 2 nickels), I would get 1 extra coin.
- 14 extra coins is 4 + 4 + 4 + 1 + 1 extra.

You might think

- So I could have started with
- 3 quarters,
- 2 dimes and
- 3 nickels and traded for
- 15 nickels,
- 4 nickels and
- 3 nickels = 22 nickels

What it might look like in P

- I choose a two-digit number.
- I reverse the order of the digits.
- I subtract.
- The answer is 36.
- What could the number be?

By the way

- It could be 51 since

  51 – 15 = 36.

- It could be 84 since

  84 – 48 = 36.

By the way

- It could have been 51 or 62 or 73 or 84 or 95 or 40.
- What do these numbers have in common?

Admin support/School culture

- Confidence is more likely if you are working collaboratively with your colleagues and your administration in the same direction.

Help with parents

- You need to consider what to say to parents to help them better understand what you are doing and support your instruction with their children.

Download

- www.onetwoinfinity.ca
- Recent Presentations
- OCDSBCentral