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# Balanced Numeracy Gr 3 - 7

## Presented by Jen Barker

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Educational Spring Fling 10:30 a.m. - 12:00 p.m.

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### What is Balanced Numeracy:

Balanced Numeracy is a framework that incorporates a diverse range of organizational structures, assessments, and instructional practices that are intentional and responsive to students and curriculum. Balanced Numeracy provided opportunities for student to uncover, construct, and apply mathematical understandings.

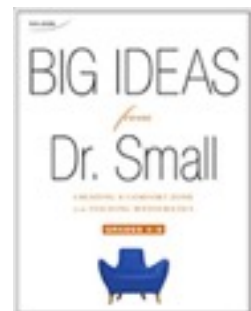
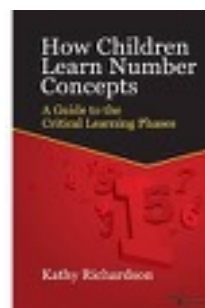
### Whole Class Lessons:

*\*See the Number Routines section of my website.*

### Finding Out What Students Know and Activate Prior Knowledge

In order to plan responsively to the needs of your students, it is important you have an understanding of the critical learning phases involved in whatever mathematical concept they are focussing on.

- Specific questions (e.g.  $8 \times 7$ )
- Pre-assessments
- Talking Points - <http://www.meaningfulmathmoments.com/musings/talking-points-patterning-pre-assessment>
- Know/Wonder



### Introducing New Concepts

- Use of math specific manipulatives to develop conceptual understanding - concrete/representational/abstract Teacher's help to guide students to make connections.
- [www.mathlearningcenter.org](http://www.mathlearningcenter.org) (Virtual Ten Frames)

<b>algebraic expression</b>	
$4x + 3$	$9 - 3y$
$y + 12$	

## Introduce Mathematical Vocabulary

- Math Word Wall - email me for your grade

## Open Questions

Questions that not only have different strategies but also could have different answers.

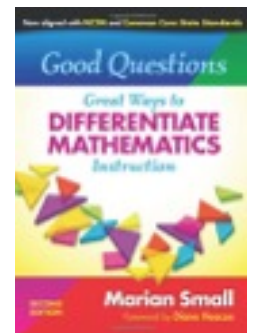
- [www.onetwainfinity.ca/presentations/AMElemNov.pdf](http://www.onetwainfinity.ca/presentations/AMElemNov.pdf)
- Marian Small's Open Questions [http://www.rubiconpublishing.com/shop/?pa\\_focus=numeracy](http://www.rubiconpublishing.com/shop/?pa_focus=numeracy)



The Open Questions for the Number Strand are correlated to the WCNP (BC Curriculum). The other strands are available but they are aligned to the Ontario curriculum, not BC. Number Strand K - 3 LRS #173627 and Grades 4 - 6 LRS #173628 and Grades 7 - 9 LRS #173629

## Parallel Tasks

Parallel tasks are a set of two or three tasks that are designed to meet the needs of students at different developmental levels, but that get at the same big idea and are close enough in context that they can be discussed simultaneously.



## Open Middle Problems

These questions have a 'closed' beginning and a 'closed' end. How children approach the question can vary in different ways - thus it has an "open" middle.

- Open Middle Blogpost Collection of Lessons <https://docs.google.com/document/d/1h-FX4tTm1GCz931MTDORKQIKU6btorKcDuNZ5RvrVXA/edit>
- Open Middle Website <http://www.openmiddle.com/>



## Rich Tasks

- Margie Pierce List of Rich Tasks <https://docs.google.com/>

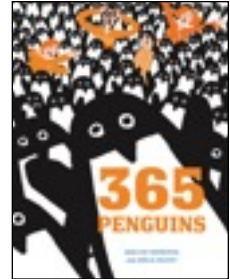
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[spreadsheets/d/1yGaZy9g8X0HHFuWMBQkF14pVStu\\_SIBnbZSkxo9nWPI/edit#gid=0](https://spreadsheets/d/1yGaZy9g8X0HHFuWMBQkF14pVStu_SIBnbZSkxo9nWPI/edit#gid=0)

- Rich Tasks list created by the BC Provincial Numeracy Project Team [https://www.dropbox.com/s/sc6h24ii69hacoz/Rich%20Tasks\\_Problems%20copy.docx?dl=0](https://www.dropbox.com/s/sc6h24ii69hacoz/Rich%20Tasks_Problems%20copy.docx?dl=0)

### Literature Based Lessons

Mathematizing a read-aloud provides students with opportunities to learn mathematical concepts in meaningful contexts. Using literature to connect concepts with students' experiences helps foster understanding and motivates students to learn.



- Intermediate: <https://portal.sd71.bc.ca/group/l7lwzs1/intermediatemath/Documents/Math%20Bibliography%20Intermediate%202017.pdf> from Campbell River/Comox
- <https://mathbookmagic.com/>

### Three Act Tasks

This activity is made up of three parts or “acts;” 1) The Question, 2) Gathering Information, and 3) The Reveal. The entire activity typically takes a full math period or the acts can be split up and worked on across multiple days. The goal of the activity is to engage children in asking mathematical questions, identifying information that will allow them to answer the question, developing a mathematical model of the situation, and revising their models to more closely reflect the real world.



- Graham Fletcher's Three Act Tasks <https://docs.google.com/spreadsheets/d/1hc1RelbdJZbEA3fO6DE457wu4AKOfi6BFxWLRBXO-bA/edit#gid=0>
- [tedd.org](http://tedd.org) NOTE - You need to register but it is FREE and a wealth of information.

### Playful Mathematical Inquiry

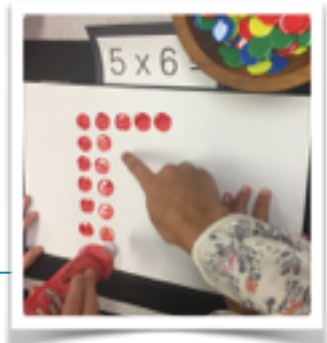
The following summary on the types of inquiry was written by Michelle Hikida, a Richmond Teacher.

#### Structured Inquiry

- The teacher determines the big idea and what the students will come to understand by the end.
- The teacher starts with a guiding question.
- The students will help create the plan and guide the inquiry with their questions, interests, ideas, analysis, reflections, and understandings.

#### Guided Inquiry

- The teacher comes up with the big idea or topic and students and/or the teachers come up with the questions.
- The students are responsible for designing and following their own



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procedures to test the question and then communicate their results and findings.

### Open Inquiry

- The students determine the purpose and formulate the questions.
- The students design the procedures, gather the materials and communicate their findings.
- The teacher facilitates, supports, asks questions and redirects the investigation.
  - Ontario Capacity Series – Inquiry Based Learning: [http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS\\_InquiryBased.pdf](http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_InquiryBased.pdf)
  - Janice Novakowski's websites - <http://blogs.sd38.bc.ca/sd38mathandscience/>
  - [http://janicenovkam.typepad.com/reggioinspired\\_mathematic/](http://janicenovkam.typepad.com/reggioinspired_mathematic/)
  - Look at specific concepts such as patterning, place value, and multiplication (coming soon) <http://www.meaningfulmathmoments.com/instructional-ideas.html>

## Independent Practice:

**Textbook Practice - Remember “One size does NOT fit all!”**

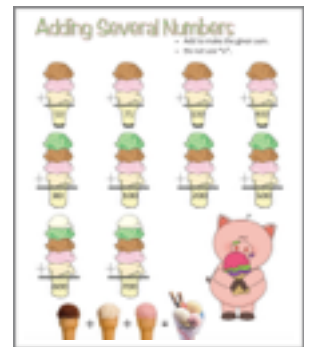


### Independent or Partner Games

- Box Cars and One-Eyed Jacks <https://www.boxcarsandoneeyedjacks.com/product-category/math/>
- Multiplication Games [http://www.meaningfulmathmoments.com/uploads/1/1/1/9/11190716/multiplication - mastering the facts.pdf](http://www.meaningfulmathmoments.com/uploads/1/1/1/9/11190716/multiplication_-_mastering_the_facts.pdf)

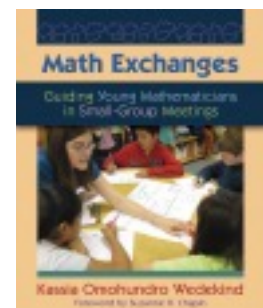
### Daily Math Investigations

- Daily Math Investigations created by Selina Millar <https://www.dropbox.com/sh/re2384i95esxuvq/AACIAng9H-C0EZUCJ2Op6Nkaa?dl=0>
- Multiplication Games [http://www.meaningfulmathmoments.com/uploads/1/1/1/9/11190716/multiplication - mastering the facts.pdf](http://www.meaningfulmathmoments.com/uploads/1/1/1/9/11190716/multiplication_-_mastering_the_facts.pdf)



## Guided Small Group Instruction:

Learning opportunities that support students' strengths and stretches and intentionally move them forward. Groups are **FLEXIBLE** and composition changes according to the needs of the students. It might include working with students on practice questions, teaching a new game, reviewing a concept taught to the class or working with students who are unsure how to start a problem.



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## Formative Assessment is on-going

While the students are working, circulate and ask questions that will facilitate your knowledge of their mathematical thinking and understanding. Tracy Zager's book called *Becoming the Math Teacher You Wish You'd Had* has some great prompts/questions to use when circulating.

What's going on here?

What do you wonder?

Tell me something about this problem.

Did you have a plan or were you just trying things out?

Where did you get the idea to try that?

How did your thinking about \_\_\_\_ help you here?

Keep going... What else?

Who has another strategy?

Turn and talk with your partner about what you are thinking.

Say more about that.

What are you noticing?

Forget about the question for a second.

What's going on in the situation?

What do you estimate the answer might be?

How did you decide to do that next?

Keep talking. I think you are onto something here.

This is what I thought I heard you say. Do I have it right?

What might be another way of thinking about this?

I'm not sure everybody knows this. Would you be willing to share your thinking with the class?

Teachers can also document student's responses on speech or thought bubbles and create a bulletin board that puts their thinking on display. Another great resource with suggestions on questions teachers can ask, is the Ontario Capacity Series article called "Asking Effective Questions". Here is the link [http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS\\_AskingEffectiveQuestions.pdf](http://www.edu.gov.on.ca/eng/literacynumeracy/inspire/research/CBS_AskingEffectiveQuestions.pdf)

## NOTES: