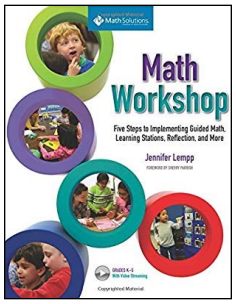
Math Workshop: Learning Stations and Guided Math Gr. 3 - 7

Presented by Jen Barker

DEC 2020 - October 9th, 2018
Surrey, B.C. 3:30 p.m. - 5:00 p.m.



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Guided Math and Learning Stations:
This structure is best used in two scenarios:

- when a whole-class focus lesson has already been done on the mathematical topic
- when you have gathered formative assessment (observations, talking points, pre-assessment) and know that your learners have different needs; therefore, in speaking to the whole-class you would impact a small portion of students. Instead, students can practice the concept at the learning stations, and the teacher can work with small guided groups, providing "just-right" instruction.

Three Math Workshop Structures: An Overview

TASK AND SHARE		FOCUS LESSON, GUIDED MATH, AND LEARNING STATIONS			GUIDED MATH AND LEARNING STATIONS		
5–10 minutes	NUMBER SENSE ROUTINE An engaging, accessible, purposeful routine to begin your math class that promotes a community of positive mathematics discussion and thinking.	10 minutes	NUMBER SENSE ROUTINE An engaging, accessible, purposeful routine to begin your math class that promotes community of positive mathematics ssion and thinking.		5–10 minutes	R SENSE ROUTINE An e ssible, purposeful routine to beg class that promotes a comm itive mathematics discus ng.	
30 minutes	MATH TASK A problem-solving task that students work on in small groups. The teacher circulates and probes student thinking through questions. The task typically has multiple entry points, allowing for all students to have access to the problem.	15 minutes	F SSO A wel hole-group lesson focused on the g target and accessible to all lev		45 minutes	GUIDED MATH Small-group instruction that allows the teacher to support and learn more about students' understandings and misconceptions. In this structure, the focus lesson is addressed in guided math groups and is differentiated for each group.	LEARNING STATIONS Activities in which students engage in meaningful mathematics and are provided with purposeful choices.
		30 minutes	GUIDED MATH Small-group instruction that allows the teacher to support and learn more about students' understandings and misconceptions.	LEARNING STATIONS Activities in which students engage in meaningful mathematics and are provided with purposeful choices.			
20–25 minutes	TASK SHARE WITH STUDENT REFLECTION A math share in which students come together as a whole class and discuss the various strategies they used to solve the problem. Students ask questions, clarify their thinking, modify their work, and add to their collection of strategies.	5–10 minutes	STUDENT REFLECTION A deliberate and meaningful time for students to consider new learning.		5–10 minutes	STUDENT REFLECTION A deliberate and meaningful time for students to consider new learning.	

Questions to consider:

- **Where do students go?**
  - Do students need to stay where the station is located?
    Or can they take the materials to another place in the room?
  - Where and how do they get the materials they need? How do they clean up?

- **Who can students works with?**

Working with a partner

- Option One: They choose partners or work by themselves
- Option Two: Teacher selects their learning partner but make changes from day to day, or weekly

Working with a small group

- Option One: Teacher determines the groups
- Option Two: groups are determined by individual student station selection

NOTE: Do NOT ability group! Guided Math small group names are NEVER posted anywhere visible in your room. Additionally the Guided Math groups should be FLEXIBLE.

- **What can students do?**
  - What are the options for Learning Stations? Can students choose their station?
  - What are the benefits of choice?
  - If needed, where do students record their work?
  - What system will you use? (Jen will send you Blackline Masters of these)

    - **Math Menu** - Most often used in Kindergarten. Teacher places images of the stations in the boxes with a short heading. Students colour each box as they complete the station. Students choose their stations and groups are determined by the student choices.
    - **Pocket Chart** - Place cards with images and/or titles of the stations on the left. Next make a card for each student. These could include names and student pictures. Consider placing students at the station you want them to do first. Then once they complete that station, they can choose their next station.
    - **Must Do/Can Do** - Allows teachers to determine what must be done. Must do's can be adjusted based on students' needs. Groups are determined by the choices students make.
    - **Math Menu** - With a partner students can make choices or they can make choices individually. Number sense activities could be the appetizers. Activities that correspond to the current unit of student could be the main entree and activities that allow the students to spiral back to previously taught concepts could be the dessert choices.

- **Tic-Tac-Toe** - This is beneficial to provide differentiation. Learning stations could differ by readiness, interest, and learner profiles. For example, all activities in the first row might address number sense and computations. Second row might have activities around the current unit of study. Third row might be on concepts you want to revisit. Then each column could be differentiated by level of rigour.

- **How long do I do it?**
  - Some learning stations may take less time than other… how will you plan for this?
  - What is a reasonable amount of time for one rotation? 15 minutes or ?
  - Timed Rotations or Open Choice - there are pros/cons to both. See PPT for chart.

- **What do I do if I have a question?**
  - When can you ask the teacher?
  - What do you do when the teacher is busy? (e.g., Three before me, sticky notes on desk)

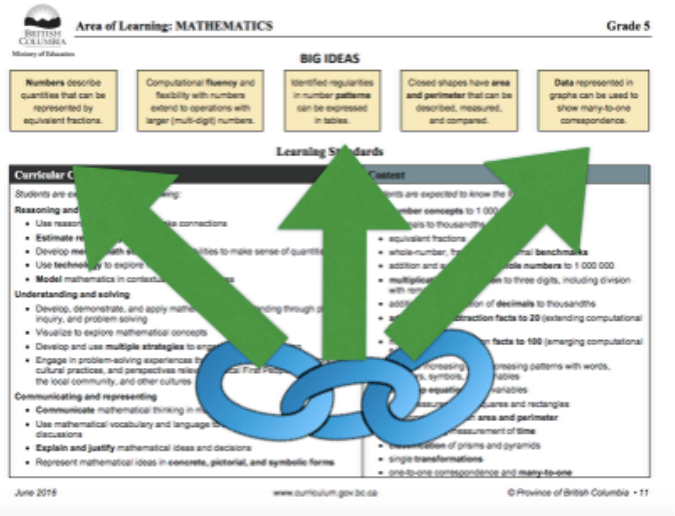
- **What do I do if I am finished?**
  - Are there extensions for each learning station?
  - How do you move to another station? How do students clean up?
  - What will transitions look and sound like?

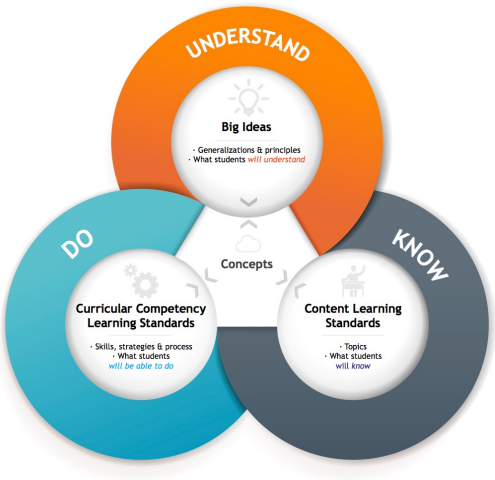
Learning Stations:

What are they?
Learning Stations often called Numeracy Centres, Math Stations, or Daily Math Investigations are mathematical activities designed for individuals, partners, and/or small groups of students. These activities are inviting, engaging and assist students in developing Mathematical understanding. Numeracy Centres are one component of balanced numeracy. It is a supplement to whole class instruction.

Why are they important?
- Students need daily opportunities to engage with mathematical ideas in purposeful and playful ways.
- They provide time for authentic, independent practice that connects to what they have learned through whole class quality instruction.
- Students need opportunities to develop the core and curricular competencies. Through the 'doing' of the mathematics, students will be building their confidence, seeing themselves as mathematicians, and seeing the connection of mathematics to their world.
- They give students choice, which increases motivation and fosters a positive disposition towards Mathematics.
- They give teachers an opportunity to meet with students one-on-one or in small groups to provide explicit instruction, engage in guided math, and/or have conferences.
- They allow students to revisit concepts. Learning takes patience and time.

How do I begin planning Learning Stations?

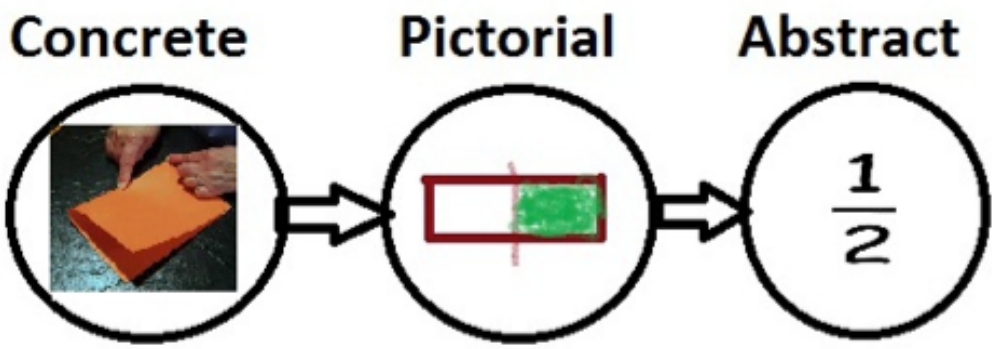




What are the critical learning phases in the DEVELOPMENTAL continuum of this concept?

- Graham Fletcher's Progression Videos https://gfletchy.com/progression-videos/
- How Children Learn Number Concepts by Kathy Richardson
- Teaching Student Centered Mathematics by John Van de Walle

How do we assist students in developing CONCEPTUAL understanding?



What to do?

Determine where your students are at mathematically.Think about what are the students' strengths, stretches, and what is needed to move their learning forward. Next create five or six centres to meet their needs. Think about incorporating centres based on the time of the year, student interests, and different mathematical concepts (e.g., not all patterning centres). Teach these centres (e.g., model how to use the materials, take turn, clean-up). Give them a try and make observations. Modify the centres if needed.

What to think about?

- Is the experience going to **ACTIVELY ENGAGE** your students?
- Are there entry points for **ALL** students?
- Can the experience be **DIFFERENTIATED** so each student can work to their fullest potential?
- Are there opportunities for the students to make **CHOICES?**
- Are they activities **PURPOSEFUL** as well as **PLAYFUL?**
- Are there opportunities for **COLLABORATION?**
- Have you woven in your students' **INTERESTS?**
- Are you providing opportunities for students to revisit/ **SPRIAL** concepts throughout the year?
- How will I be **RESPONSIVE** to misconception and gaps of understanding?
- How will I record **OBSERVATIONS?**
- What **QUESTIONS** will I ask to move the learning forward?
- How will I provide opportunities for **STUDENT REFLECTION AND CONNECTION?**
- How will I **COMMUNICATE STUDENT LEARNING?**

FOUR Types of Learning Stations

Current Concepts

- Concrete - Pictorial/Representative/Abstract
- Primary Daily Math Investigations https://startingwiththebeginning.wordpress.com/daily-math-investigations/
- Intermediate Daily Math Investigations created by Selina Millar http://bit.ly/intermediateinvestigations
- Janice Novakowski Reggio-Inspired Mathematics http://janicenovkam.typepad.com/reggioinspired_mathematic/
- Daily Math Investigations K - 2 created by Jen Barker, Jen Tammen, and Kristen Pennington http://www.meaningfulmathmoments.com/daily-math-investigations-numeracy-centres.html
- Patterning, Number Concepts, Fractions, Multiplication provocations can be found on my site under the "Instructional Ideas" http://www.meaningfulmathmoments.com/instructional-ideas.html Scroll down to the concept you are looking for.
- www.onetwoinfinity.ca/presentations/AMElemNov.pdf
- Marian Small's Open Questions http://www.rubiconpublishing.com/shop/?pa_focus=numeracy

Conceptual Fluency

- games, sorting strategies, sorting facts I know and facts I don't
- Box Cars and One-Eyed Jacks https://www.boxcarsandoneeyedjacks.com/product-category/math/
- Addition and Subtraction games created by Sandra Ball https://startingwiththebeginning.wordpress.com/building-a-foundation/
- Multiplication Games http://bit.ly/multiplicationfactgames
- Multiplication Subtizing Cards http://bit.ly/multiplicationsubitizing
- Ten Frame Multiplication visual cards http://bit.ly/tenframemultiplicationcards

Problem Solving

- Cognitively Guided Instruction is an inquiry based approach to teaching mathematics. Here is a link to the different problem types. http://www.uwosh.edu/coehs/cmagproject/ethnomath/legend/documents/teacher_guide.pdf

Consumable and Creative Digital Apps

- Consumable apps are engaging, provide instant feedback, and are similar to skill and drill. BE CAUTIOUS about any apps that focus on time and speed, and memorization (e.g., naked number problems). Is there a visual model/scaffold?
- Creative apps are multimodal, emphasize communication, collaboration, creativity, make student thinking visible - document understanding, shift the focus from the answer to the process, facilitate higher order thinking skills, allow students to uncover the big ideas and make connections, permit reflection, become powerful assessment for and of learning EXAMPLES: Skitch, ShowMe, Explain Everything, PicCollage

Concepts you intentionally want to SPRIAL back to

How can we share ideas?

Pinterest

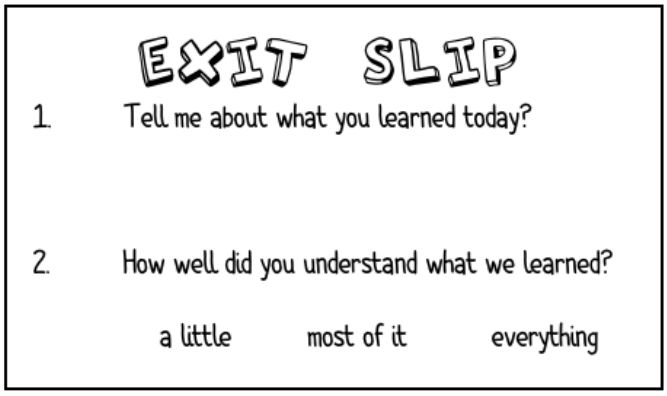
You will receive an invitation to join the Intermediate Learning Stations board. You will be able to save ideas to this board and are able to categorize them to sub-boards (e.g., specific concepts like geometry)

Guided Math:

"It is through small group instruction that differentiation can happen; as teacher we can gather a great deal of information on each student… When we work with students in small groups, providing the instruction they need when they need it, we are better able to address individual needs, keep students engaged, understand their strengths and struggles, and ultimately foster a growth mindset, building not only students' mathematics knowledge but also their confidence." - Lempp (2017), p.g., 184

Pre-Assessments

Survey
Talking Points
Checklist
Anecdotal Notes
Written Quiz
Exit Slips
Conferences
Self-Assessment
Running Records



Three Types of GUIDED GROUPS:

Readiness Groupings
- students who have a similar strength or need
- groups based on collected formative assessment

Heterogeneous Groupings
- combines strengths, struggles, learning styles, interests
- everyone benefits
- we are more likely to get a variety of strategies
- students learn from each other

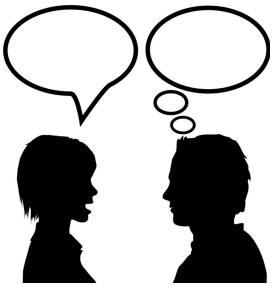
Random Groupings:
- call the table playing “Make Ten”
- great for data collection

What might you do during this time?
- reinforcing a new learning station
- engaging in problem solving
- teaching a game
- reviewing a concept
- providing enrichment/extension
- teaching a strategy
- teaching a mathematical model (e.g, open number line, open array)
- discussing common errors
- assessing students

3 Parts to the Guided Math

INTRO (Mini-lesson)	• set the focus/ explain the goals for the lesson • go over any tricky vocabulary • model the concept, strategy, or skill
DURING (Doing the math)	• observe the students “doing” the math • listen intently to the conversations • record students’ strategies • support, prompt, and question to make thinking visible
AFTER (Reflecting and Connecting)	• lead share • ask focus questions that will help students make connections • check-in with individual students about their learning

What to keep in mind for one-on-one conferences?



- done on an “as-needed” basis
- can take from one to ten minutes
- could be used to clarify questions about a student’s work
- maybe you want to gather assessment about what a student knows
- you notice a student is showing evidence of a misconception and you know that working with them for five minutes could help correct this

What are you recording?

- What strengths or struggles do I see?
- What strategies are being used?

Student Reflection:

Time to concretize the learning from the day/week, summarize the key points, and gather formative assessment as to where your students are at with their learning. Students are often not accustomed to sharing about their mathematical thinking so this is something that will need to be modelled and developed.

Shared Thinking: the teacher could share images or videos they took while circulating and ask student to share their thinking.

Interactive Class Journal: Teacher: So if we wanted to write about what we learned today at these Learning Stations, what would you say are some of the important take aways? How did _____ help you? What else would we like to add about what we are learning?

Journal Prompts / Focused Math Writing For:

Conceptual Understanding: “What does it mean to regroup?”

Strategies: How would you solve 233 + 659 =

Reasoning: Write a division story where four is the answer.

Math Disposition: How well do you understand equivalent fractions?

Turn and Talk - Using similar prompts as above but instead of writing, have the student turn and talk with a partner. Set a timer for each partner to have 3 minutes.

Exit Tickets