

Welcome to Math (September 2020)

Kindergarten

When we return to school in September, it will be different from anything we have ever known. Kindergarten is an amazing year full of new adventures, discoveries and wonderment. Our students have been learning about the world around them since the day they were born. Every student is capable, creative and responsible for their own learning.

Kindergarten is the first experience for students into the world of 'school learning'. Teacher's play an essential role in helping students feel safe, confident and excited about learning by creating an environment of wonder and noticing. This September, think about how we as teachers can create new possibilities for joy, wonder and inspiration. Focus on taking it slow and allowing students to work and play together to build relationships. Teachers will strive to create learning spaces that help all students thrive and become confident humans.

B.C. Mathematics curriculum's goals, aspects, content and competencies align with 'playful inquiry'. Playful inquiry creates opportunities for deeper engagement with concepts and ideas and provide students with choice in ways to uncover the curriculum, make meaning and connections. Start by focusing on 'Prioritized Learning Standards', identifying and building on students' strengths, and supporting them from where they are in their mathematical thinking.



Three Main Suggestions for Starting in September:

1. **Getting to Know Your Students**
2. **Prioritized Learning Standards**
3. **Finding Out What Your Students Know** (strength based) – diagnostic and formative assessment
 - a. **Ways to Support Your Students** (Instructional Routines and Open tasks)
 - b. Opportunities for Outdoor Learning
 - c. Adaptations for At Home Learning
 - d. Adaptations for Virtual Learning

1. Getting to Know Your Students

- Build caring attachments and a sense of belonging. This may look different from what we are familiar with, however, we can Start slowly and share the message that they are prized and cared for, allowing students to see themselves as part of a community of learners. Students need to feel a sense of belonging, where they see themselves as an important member. Get to know your students' passions, interests, personalities, strengths and insecurities. Take the time to get to know the families and their needs too.
- Covid-19 has been scary and worrisome for many students We must follow the guidelines. We can use our eyes, tone of voice, mannerism and carefully chosen words to build relationships. Kindergarten students need to feel safe within the community of learners. Provide multiple opportunities for the students to engage in meaningful experiences (within safe distancing) with others. Play will take on an important role as we deal with this world crisis.



2. Prioritize the Learning Standards

All mathematics curricular content and competencies are important and connected, but when having to prioritize learning standards, such as during Covid-19 times, idea of what is essential, foundational or core has emerged. In this time of varied learning, as we begin the new school year we consider and become mindful of what mathematics learning is essential for students to continue their learning at the next grade level.

The following questions can be considered in prioritizing essential learning standards:

- What is the content and competencies in the curriculum?
- What curricular content is necessary to review, practice and enhance knowledge of, that is essential for next year's mathematics learning? Some curricular topics need ongoing review and practice, such as number concepts. Other content area knowledge can be enhanced by connecting or applying that mathematics in a project or connected to another area of math.
- What curricular competencies can be developed during this time of different and remote learning? Consider what curricular competencies students can authentically develop at-home, through Zoom meetings or portal posts, or on the phone.
- What curricular competencies are connected to your prioritized curricular content learning standards? Is it possible to include one curricular competency from each of the four curricular competency areas?
- What curricular competencies are connected to your core competencies area/s of focus? Many teachers have chosen one or two core competencies to focus on during this time of returning to maths instruction. What curricular competencies are aligned with that focus?

Kindergarten

Prioritized Curricular Content	Essential Curricular Competencies	Indicators of Proficiency	Instructional and Assessment Practices
<p>Number concepts to 10</p> <p>Counting</p> <ul style="list-style-type: none"> • one-to-one correspondence • conservation • cardinality • stable order counting • sequencing 1-10 • linking sets to numerals • subitizing <p>Ways to make 5</p> <ul style="list-style-type: none"> • perceptual subitizing (e.g., I see 5) • conceptual subitizing (e.g., I see 4 and 1) • comparing quantities, 1-10 • using concrete materials to show ways to make 5 <p>Decomposing numbers to 10</p> <ul style="list-style-type: none"> • decomposing and recomposing quantities to 10 • Numbers can be arranged and recognized. • benchmarks of 5 and 10 • making 10 • part-part-whole thinking • using concrete materials to show ways to make 10 	<p>Develop mental math strategies</p> <p>Problem solving</p> <p>Explain and justify mathematical ideas and decisions</p> <p>Represent mathematical ideas in concrete, pictorial and symbolic forms</p> <p>Connect mathematical ideas to each other, other areas and personal interests</p>	<p>Represent quantities to 10 with materials, pictures and numbers</p> <p>Match sets of materials or pictures to corresponding numerals</p> <p>Count to 10 in sequence with one-to-one correspondence</p> <p>Subitize to 5 with dot images</p> <p>Build 5 in many ways (e.g. 2 and 3, 4 and 1 or 2,2, and 1)</p> <p>Compose and decompose numbers to 10 in many ways using materials, pictures and numbers</p>	<p>Number Talks (dot images, rekenreks, ten frames)</p> <p>Contributions during number talks and discussions</p> <p>Counting Collections</p> <p>task-based interviews including observations while solving problems, engaging in tasks and working with materials</p> <p>Math Games</p> <p>conferring – listening and observing</p> <p>Open Questions</p> <p>products involving representing mathematical ideas with concrete, pictorial and symbolic forms</p>

3. Finding Out What Your Students Know (strength based)

Using Instructional Routines

An instructional routine is a familiar structure with an open-ended task where more time is spent on the learning of mathematics. A good routine provides all students opportunities to do mathematics and gives teachers insight into the student thinking. Assessment is built into the routine and allows you identify the students' strengths and level of proficiency. Instructional routines should be intentionally planned to move learning forward in response to where students are in their mathematical thinking.

Considerations:

- Decide on 'What to look for' before starting the routine and ways to record the information indicating strengths (e.g. post it notes, check lists)
- Create a community atmosphere about sharing thinking and respecting one another.
- Start with an open-ended prompting question.
- Provide for student time to think, share and reflect.

What to Look for in Kindergarten – Indicators of Proficiency

Kindergarten
Represent quantities to 10 with materials, pictures and numbers
Match sets of materials or pictures to corresponding numerals
Count to 10 in sequence with one-to-one correspondence
Subitize to 5 with dot images
Build 5 in many ways (e.g. 2 and 3, 4 and 1 or 2,2, and 1)
Compose and decompose numbers to 10 in many ways using materials, pictures and numbers

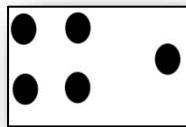
What to Look For... Considering the Proficiency Indicators

What level of proficiency are the students demonstrating?

Proficiency Scale				
	Emerging	Developing	Proficient	Extending
	The student demonstrates an initial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a partial understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a complete understanding of the concepts and competencies relevant to the expected learning.	The student demonstrates a sophisticated understanding of the concepts and competencies relevant to the expected learning.

Number Talk Images Instructional Routine

- Display an image and ask students to determine quantity of objects or pictures.
 - Dot card, five frame and ten frame images should be included (see Resources below for **Quick Images** details.)
- Students discuss different ways to decompose and compose a quantity displayed.
- Students share their reasoning, visualization, communicate and explain their thinking.



Guiding Questions

- What do you notice?
- What do you wonder?
- How many _____ ?
- How do you know?
- How do you see them?
- Can you see them another way?

What to Look for...



Kindergarten teachers know that there is a set of key math learnings for students in their first year of school. The capacity to see quantity at a glance without counting (subitizing), the ability to decompose a set into parts and the ability to pattern are all indicators of success in early primary numeracy.

What level of proficiency does the student demonstrate:

- Subitizing quantities
- Decomposition and composition of numbers
- Flexibility in thinking
- Reasoning to make sense of the math
- Sharing of strategies used to solve a problem
- Clear explanations of the relationship of numbers
- Ways to use multiple strategies
- Learning from others' ideas and adding on to ideas
- Confidence and perseverance

Resources:

Number Talk Images website curated by Pierre Tranchemange collections of dot images, photos and strings/sets as well as instructional ideas <http://ntimages.weebly.com>

Quick Image Resources:

Kindergarten Number Talks Based on Number Talks by Sherry Parrish, Math Solutions 2010
https://www.bps.solutions/MATH/Number_Talks_Kindergarten.pdf

Building Number Sense <https://buildingnumbersense.blogspot.com/p/number-talks.html> by Sherry Parrish

Dot Cards and Ten Frames Activities – excellent resource for how to use quick images.

<https://www.mathplc.com/sites/default/files/DotCardTenFrameActivities.pdf>

Counting Collections Instructional Routine

Counting Collections is an instructional routine during which a pair of students *choose a collection* of objects to count, *choose different ways* to count their collection and *record and share* their count. Seems straightforward but this routine has proven to be highly engaging and provides students with lots of time doing and talking about math. Teachers gain insight about their students' understanding of number. There are lots of

Depending on experience of the students, collections range from 5 objects to 30. Tools to support counting can be provided, such as ten frames, cups, bowls and small plates.

After counting their collection in multiple ways, students can record their count using wooden or plastic numbers, white boards or paper. Ensure that a number chart is available to support students if they need to find out what number comes next.



Guiding Questions

- How did you estimate how many?
- How did you count in the collection?
- How many do you have altogether?
- How might you count the collection another way?
- How will you record the count?
- How many more to make...10, 20, 30?

What to Look For

Depending on the student, the size of the appropriate collection, and curriculum focus, many concepts and competencies can be uncovered.

What level of proficiency does the student demonstrate:

- flexible counting strategies
- one-to-one correspondence - understanding that each object in a group can be counted once and only once.
- cardinality - is the ability to understand that the last number which was counted when counting a set of objects is a direct representation of the total in that group.
- stable order - involves the student using a list of words to count in a repeatable order.
- conservation - understanding that the **count** for a set group of objects stays the same no matter whether they are spread out or close together.
- subitizing – instantly recognizing at a glance
- connecting a count to a numeral
- estimating

Resources:

tedd.org: visit Content Areas, Mathematics and click on Counting Collections to find planning resources, tips and videos.

Richmond School District counting collections blog posts:

<https://blogs.sd38.bc.ca/sd38mathandscience/2016/10/18/introducing-counting-collectionsin-kindergarten/>

<https://blogs.sd38.bc.ca/sd38mathandscience/2015/11/03/counting-collections/>

<https://blogs.sd38.bc.ca/sd38mathandscience/2017/01/03/extending-counting-collections/>

Choral Counting and Counting Collections: Transforming the preK-5 Classroom by Megan L. Franke, Elham Kazemi, & Angela Chan Turrou

'Which One Doesn't Belong?' Instructional Routine

Which One Doesn't Belong? (WODB) is an instructional routine in which four related items are presented in a quadrant format. The items are connected, they belong together in some way. For example, they may all be candies or they may all be two-digit numbers. Students are asked to consider what is unique about each item, compared to the other items. The challenge is to choose one item that doesn't belong. *The great thing about this routine is that there are no wrong answers*, as long as the student's reasoning makes sense. The focus is not on the answer, but on the students being able to communicate their reasoning of their choice.



Guiding Questions:

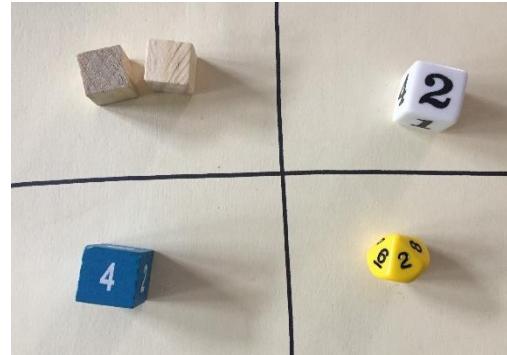
What do you notice?

What makes all the items alike?

What makes them different?

Which one doesn't belong?

How will you share your reasoning to justify your answer?



What to look for...

Students may demonstrate:

- attention to attributes (similarities and differences)
- ability to sort and classify
- connections to number relationships
- engagement problem solving
- use of mathematical language/vocabulary
- explain and justify ideas and decisions

Resources:

<http://wodb.ca/index.html> This website is curated by Mary Bourassa and is a collection of WODBs submitted by math educators from across the globe.

Twitter Hashtag: #wodb <https://twitter.com/search?q=%23wodb&src=typd>

Richmond School District WODB blog posts: <https://blogs.sd38.bc.ca/sd38mathandscience/2016/10/30/introducing-wodb-in-kindergarten/>

<https://blogs.sd38.bc.ca/sd38mathandscience/2016/10/16/introducing-wodbs-to-grades-45-atwestwind/>

Which One Doesn't Belong?: A Shapes Book by Christopher Danielson (picture book and teacher's guide)

Ways to Support the Learning

Open Questions based on Prioritized Learning Standards:

Open questions that allow you to see into the students' thinking and understanding and prepare for next steps for instruction to move the learning forward.

Sample questions are from the resource: '**Open Questions For Rich Math Lessons Number Strand K- 3'** by Marian Small, Rubicon Publishing 2016'. This is an amazing resource full of Open Questions that are ready to use in your classrooms.

- Find a number in the classroom. Tell what it means. (e.g. I see 7 on the calendar. It is the date.)
- Use stamps or drawings to show ways to make numbers from 2 – 5. What makes the numbers easy to recognize? (e.g. 2 is easy, it looks like two eyes).
- Look around the room and find as many examples as you can of pictures or objects showing 5 things. How are the 5 things arranged? (e.g. On my foot, 5 looks like five toes in a row.)
- Choose a number that is less than 10. Show the number in 3 ways. Which ways show the same thing about the number? Why? (e.g. a ten frame and my fingers can show 6 as 5 and one more).
- Use 8 two-sided counters. Shake and spill them onto a piece of paper. When you spill them, what combinations of red and yellow do you get? Try it 3 or 4 more times. Which combinations did you get the most? Are there other combinations?
- How could you arrange red and green cubes to tell which colour has more? Less?
- Take a handful of yellow pattern blocks. Then take a handful of red pattern blocks. Without counting them, figure out which you have less of. Explain how you figured it out.