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ELEMENTARY
MATH

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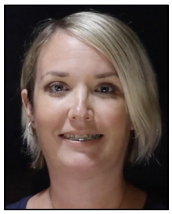
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STARTING THE SCHOOL YEAR OFF ON THE RIGHT FOOT

Welcome back, elementary school mathematics teachers, to an exciting new school year! In this special “Back to School” issue of the *Abacus*, we focus on new beginnings and setting the stage for a successful year ahead. This edition is dedicated to two key themes that are essential for a thriving classroom environment.

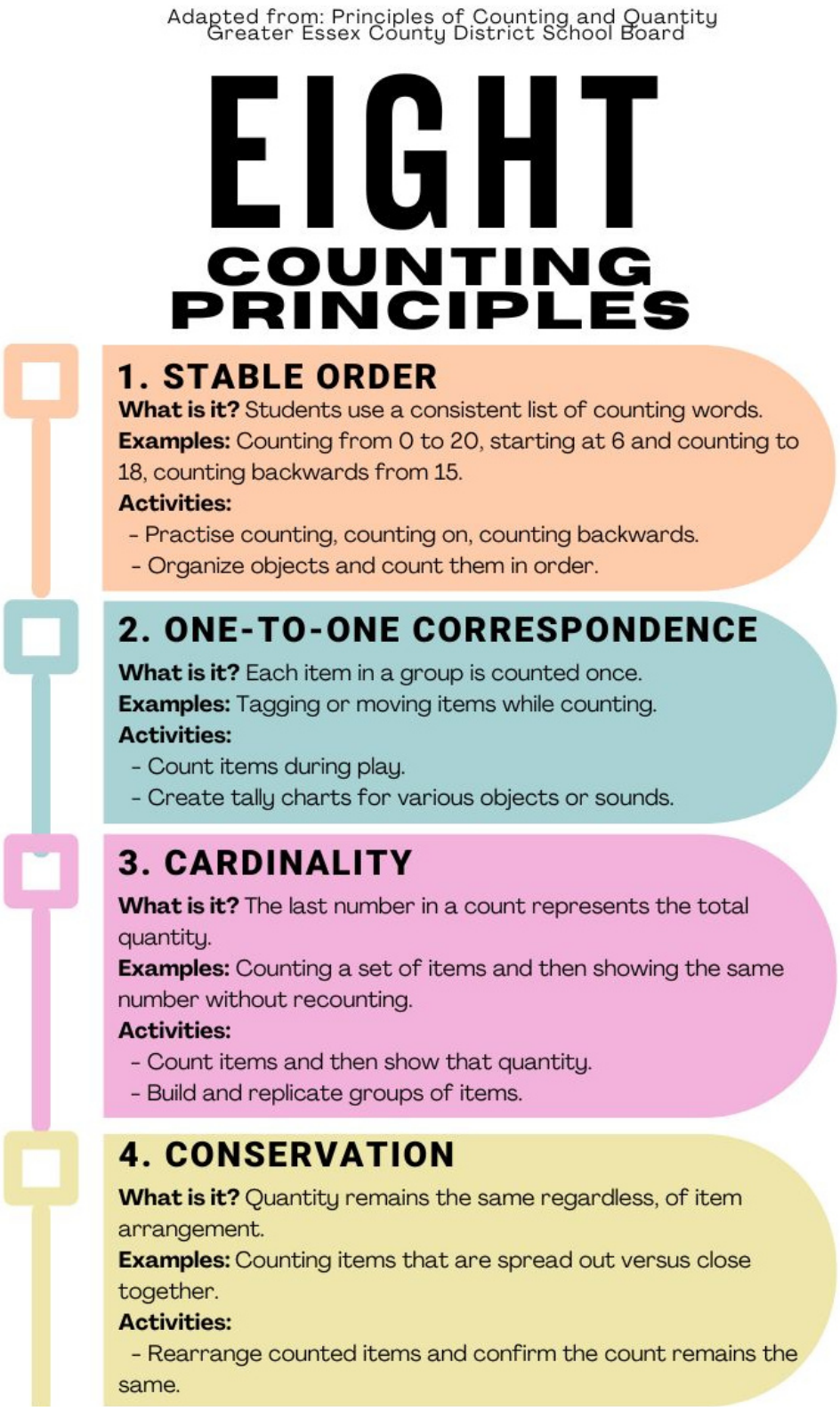
First, we delve into the question, “What does an effective classroom look like, sound like, and feel like?” To provide valuable insights into setting up a productive math classroom at the beginning of the year, we have invited Sheila Delaney, a veteran elementary educator with over 30 years of experience and a Practicum Facilitator at York University. Having visited hundreds of classrooms in her role, Sheila shares her expertise, offering practical tips and suggestions on how to create a classroom atmosphere that fosters student success and engagement.

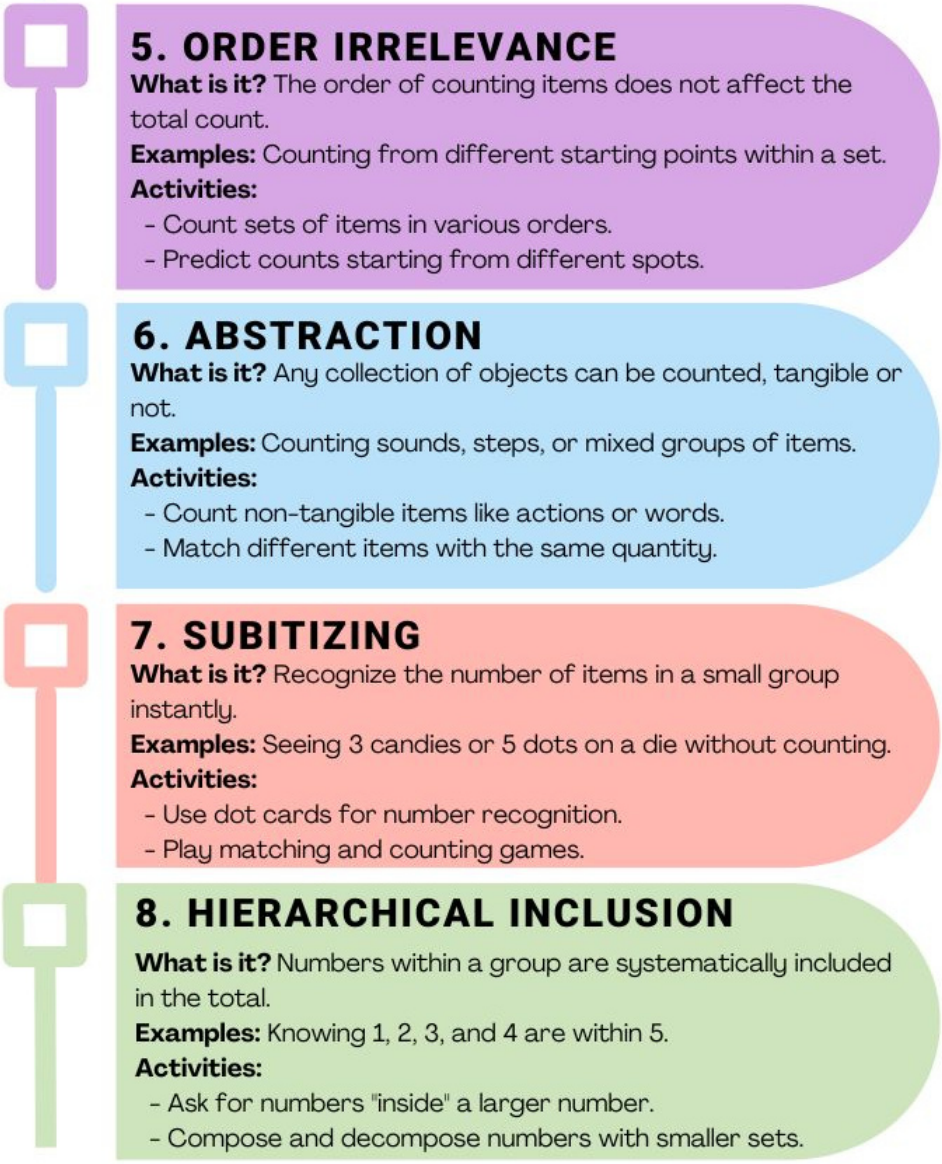
Our second focus is on beginning to teach counting. Responding to numerous teacher requests, this section of the issue unpacks counting principles, emphasizes the importance of movement in counting, and discusses teaching and subitizing. We’ll explore strategies and activities to help you start the year off right, ensuring your students build strong numerical foundations from the very beginning.

STARTING COUNTING: WHAT TO KNOW, WHAT TO DO.

Readers have asked many questions about how to support young learners in starting to count. Counting seems easy, but there's nothing simple about it, and teaching has to be thoughtful. When thinking about teaching, we think it is important to consider counting principles. We have relied heavily on counting principles in our own teaching and the teaching of future teachers.

As mathematics educators working with pre-service elementary teachers, we have found that most of them have never heard of counting principles, let alone know what they are. While they may explore these principles in teacher education classes and understand them theoretically, it remains





a significant challenge to identify and apply them in practice. Beginning teachers often struggle to see these principles in action within a classroom setting, adding an extra layer of difficulty to their teaching journey.

Our own teaching has left us focusing on the crucial element of movement, subitizing, and one-to-one correspondence. All the principles are important. We have explained them and suggested examples in the infographic for ease of the reader. One thing we have noticed and is in the literature is movement (Zhang et al., 2024). This means for counting, there should be lots of objects to count (and move around into different spatial arrangements). We have had great success in having students count small circular objects. These could be beads and are typically the size of the tip of a child's pointer fingertip.

When starting to count, the one-to-one relationship is really important, and students can demonstrate it while counting a set of objects by touching the objects as they "match it" with a number. Or a student might move objects from the group away from that same group as they count each one and assign it a number.

One very successful strategy that we recommend and have used ourselves is that as students move each item and assign it a number, we move the item a little further into a spatial arrangement that involves 5's, as you would see on a die. This combines a few counting principles and has led us to very confident counting students.

LESSON IDEA: THE HIDING GAME

Connections to the Curriculum Expectations in Ontario

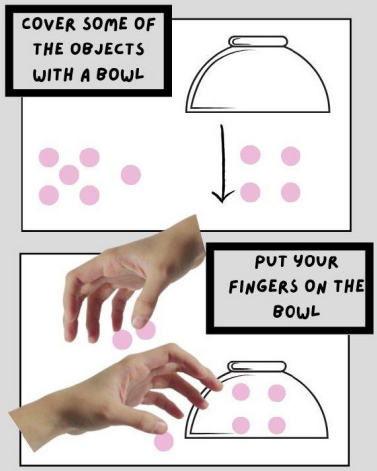
Kindergarten	Grade 1
15.3 make use of one-to-one correspondence in counting objects and matching groups of objects **15.4** demonstrate an understanding of the counting concepts of stable order (i.e., the concept that the counting sequence is always the same – 1 is followed by 2, 2 by 3, and so on) and of order irrelevance (i.e., the concept that the number of objects in a set will be the same, regardless of which object is used to begin the counting) **15.5** subitize quantities to 5 without having to count, using a variety of materials (e.g., dominoes, dot plates, dice, number of fingers) and strategies (e.g., composing or decomposing numbers) **15.6** use information to estimate the number in a small set (e.g., apply knowledge of quantity; use a common reference such as a five-frame; subitize)	count to 50 by 1's, 2's, 5's, and 10's, using a variety of tools and strategies

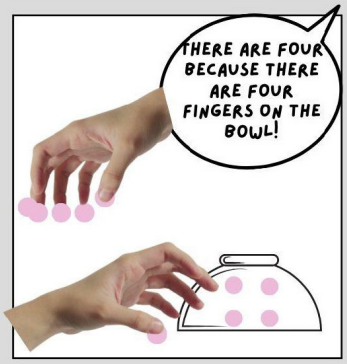


Check out an example of the hiding game on YouTube:
www.youtu.be/zHaps7H_DhY?si=oo82_2L7Me2cxoBG

STEPS TO PLAY THE HIDING GAME

1. Count ten small circular objects (preferably the same colour).
2. Both players agree there are ten objects.
3. One player closes their eyes (no peeking!).
4. The other player hides several objects under the bowl.
5. The player with their eyes closed can now open their eyes and guess how many were hidden.





TIPS:

- **Take turns:** The adult (or experienced other) can demonstrate their strategies!
- **Use small circular objects:** Think the size of pocket candies, Skittles®, M&M's®.
- **Colour:** Use all the same colours, or make five the same colour and the other five another colour.

- **Start with ten or five.** Play for a long time before you try other amounts.

Helpful Strategy:
- Cover the ones I see with fingers. The fingers I put on the bowl are the number under the bowl! (See image above)

HOW ALL TEACHERS CAN START THE YEAR OFF RIGHT

By Sheila Delaney

Over the past five years, my work as a Practicum Facilitator at York University, supervising pre-service teacher candidates in dozens of classrooms from K–12 across Toronto, has permitted me glimpses into the challenges of today's classroom. It has also offered me the opportunity to provide both insight and concrete strategies to the student teachers in my care. Here are some of the tips I've shared with my teachers in establishing some solid learning environments from the start:

1. Build a climate of trust. Easy, right? Every teacher wants their students to feel comfortable taking risks in their learning and to feel valued for their contributions to maximize outcomes. But like all worthwhile endeavours, this one takes daily patience, practice, and dedication. Good habits and healthy mindsets develop over time.

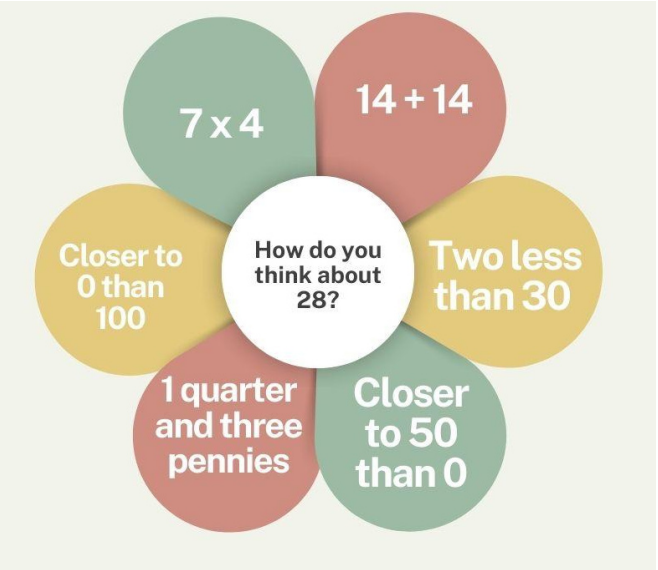


2. Literacy skills span across the curriculum. Building communication skills in Math, for example, is no different from with the Reading and Writing curriculum. Knowing how to navigate a variety of texts, both traditional and graphic, helps students communicate effectively in all subject areas. It also helps expand their thinking, when not restricted to certain forms of expression, whether it is working on students' receptive skills (reading and viewing) or expressive skills (writing and talking).

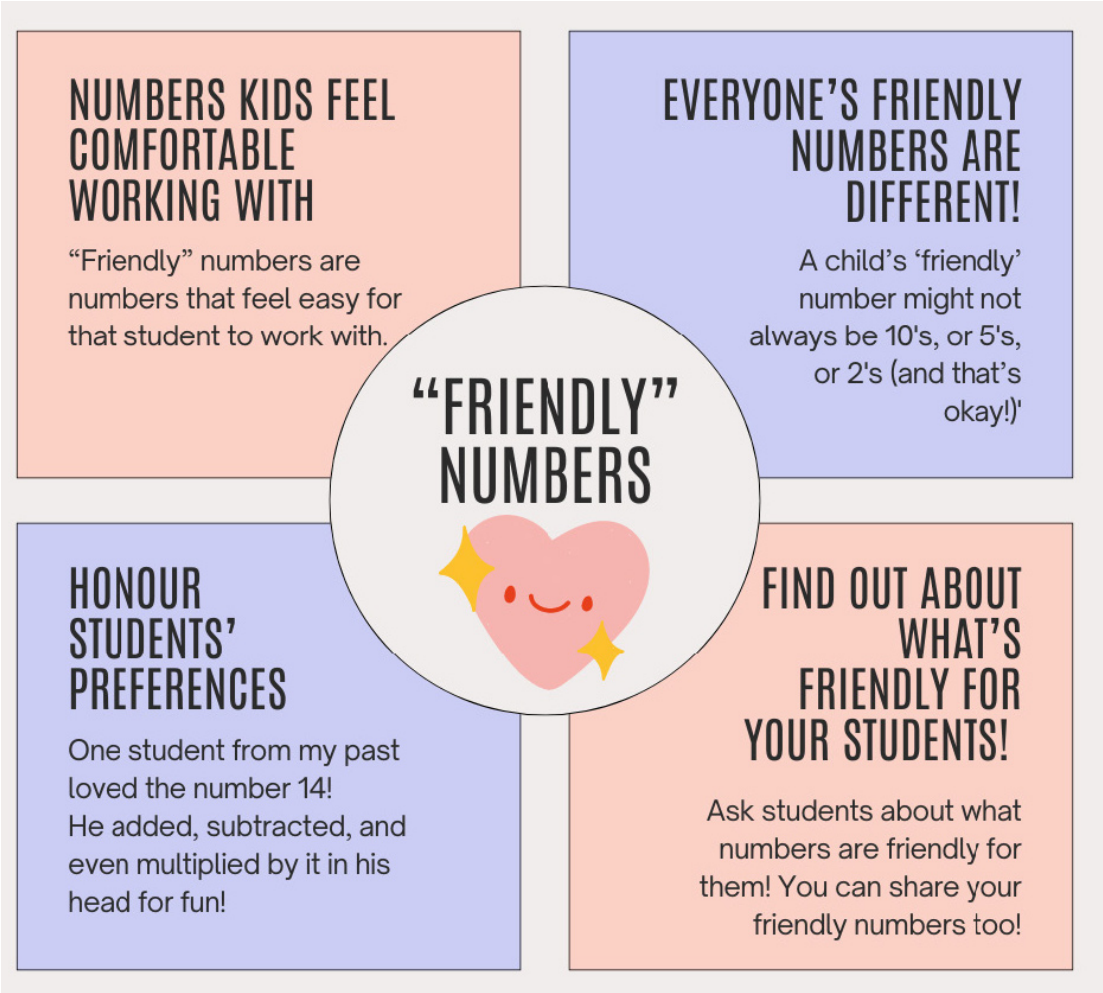
3. Integrate subject areas wherever possible, and maximize instructional/learning time. Make "Math talk," for instance, a part of the whole day in the classroom. Questions such as, "How many students are away today?" for Primary classes, or "What fraction of the class is away today?" for Junior students is a great way to begin the morning entry time and allow for task talk to be integrated with social talk. You can differentiate according to the grade level. When lining up for recess, try: "How long do you think Mr. Parker's scarf is?" or "What is the best unit to use to estimate the length/area of Mr. Parker's scarf?" By taking what would otherwise be "empty" spots in the day and making these minutes more fruitful, you will maximize learning opportunities throughout the instructional day. And we all know there are already enough disruptions and unforeseen circumstances that can impact our teaching time!

✕ INSTEAD OF	✓ TRY...
A math **notebook** with lined or graph paper	A math **journal** with blank pages
Students are **limited** to notebooks, worksheets 	Students have the **option** to write on walls, whiteboards, charts, easels, placemats, floor mats... 
Students **hand in** finished work to the teacher	Students go on **graffiti** or **museum walls** around the classroom to give peer feedback
Student raise their hands to answer questions **directly to the teacher**	Students are posed questions in a **think-pair-share model** 
Teacher records student thinking on board	**Student annotate** ideas on the board during class discussions

4. Be playful with numbers in Math, just as you would with letters, words, and sounds in your Literacy program. Students should see that there are no bad ideas, that there are multiple ways to approach a problem, and that there are multiple ways to represent their ideas. Create anchor charts at the beginning of the year that represent the diversity of student thinking, student background knowledge, and the respect for a variety of responses. Either you, or the students, may want to keep adding onto some charts throughout a unit of study for knowledge purposes, or throughout the entire year for skill or mindset purposes.

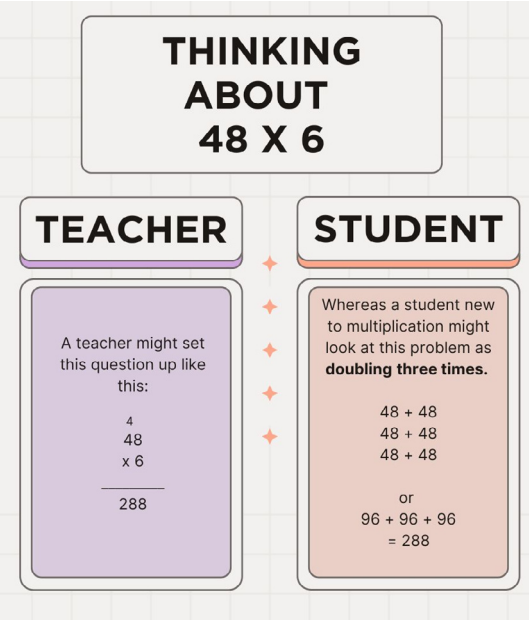


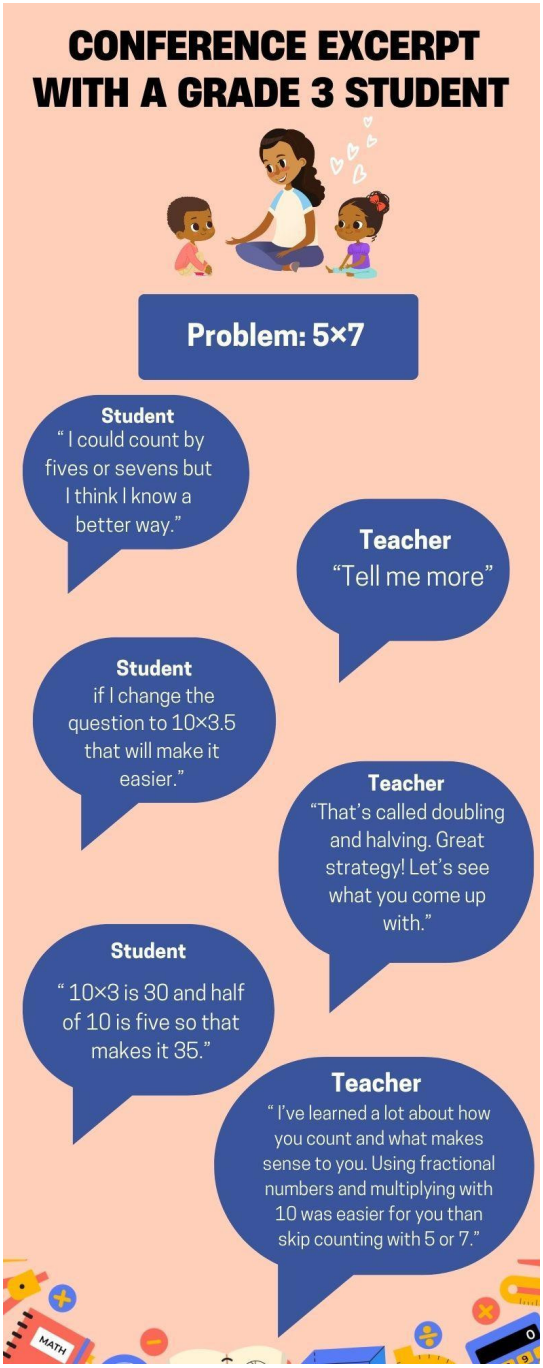
5. Work one-on-one with ALL students, not just the ones at risk. Ask yourself what can be gained by dialoguing with students across the spectrum of understanding and achievement. Get to know the profiles of all your learners right from your beginning days in September. Have conversations with each of them individually throughout the day and the week. The insights gained through talk and conferencing can never be replaced by a worksheet, nor can the level of confidence and trust your students will grow to have in both you and in themselves. See graphic for conferencing with a gifted Grade 3 student.



6. Don't assume all children fit into a certain category or mindset simply because they are in the same grade or class. Individualize your approach with students, and keep questioning open. Students will ALWAYS surprise you. See graphic for "friendly numbers."

7. Similarly, don't assume that you, as the teacher, know the best or most efficient way to solve a problem. The best way for you isn't always intuitive or fruitful to a child's way of thinking. Let children explore their own ways of making sense of problems. See graphic for 48 × 6.





CONCLUDING THOUGHTS

In this issue, we have explored essential strategies and principles to help you create an effective and engaging classroom environment. From understanding what makes a classroom look, sound, and feel favourable to learning, to diving deep into the foundational skill of counting, our goal is to equip you with practical tools and insights. Sheila Delaney's expert advice on fostering student success, and our focus on counting principles, including movement and subitizing, endeavour to set the stage for a successful year. We hope this issue inspires and supports you in making this school year a fruitful and enjoyable journey for both you and your students.

REFERENCES AND FURTHER READINGS:

Clements, D.H., Sarama, J., & MacDonald, B.L. (2019). Subitizing: The neglected quantifier. In A. Norton & M.W. Alibali (Eds.), *Constructing number: Merging perspectives from psychology and mathematics education* (pp. 13–45). Springer Cham. doi.org/10.1007/978-3-030-00491-0_2

Zhang, Y., Ng, O.L., Liang, B., & Wong, G. (2024). Young learner's gestural rountine development in manipulative-based number discourse. Paper presented at ICMI 2024 conference. Sydney Australia.

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Send your teaching-strategy ideas, problems, and student solutions to the *Abacus* Co-Editors via email abacus@oame.on.ca.