Number Sense in Early Elementary Math

NCTM Conference
Thursday, November 19, 2015

Do First

What is 1 rule some elementary school teachers teach their students to help with the current grade level content, but “expires”?

13 RULES *That Expire*

Overgeneralizing commonly accepted strategies, using imprecise vocabulary, and relying on tips and tricks that do not promote conceptual mathematical understanding can lead to misunderstanding later in students' math careers.

By Karen S. Karp, Sarah B. Bush, and Barbara J. Dougherty

Rules that Expire: Examples

- Addition and multiplication make “bigger” numbers
- When you multiply by 10, just put a 0 on the end of the number
- The longer the number, the larger the number
- KEY Words!
- Always put the bigger number on top when you subtract

Let’s Get Moving!

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

Objectives

- ❑ TWBAT describe what number sense in early elementary looks like and why it is important to develop
- ❑ TWBAT explain how to supplement current match practices and routines to increase student's number sense
- ❑ TWBAT choose 1 – 2 strategies to try in their classrooms next week

Agenda

- Introductions
- New Math
- What is numeracy?
- Strategies to Try!
- Planning Time
- Top 4 Tips & Resources

About Me

- Started as a 7th grade Pre Algebra teacher in Memphis City Schools
- Founded 2nd & 3rd Grade at KIPP LA Schools
- Moved to KIPP Austin

Founded Kindergarten
Assistant Principal
Elementary Math Coordinator for the district

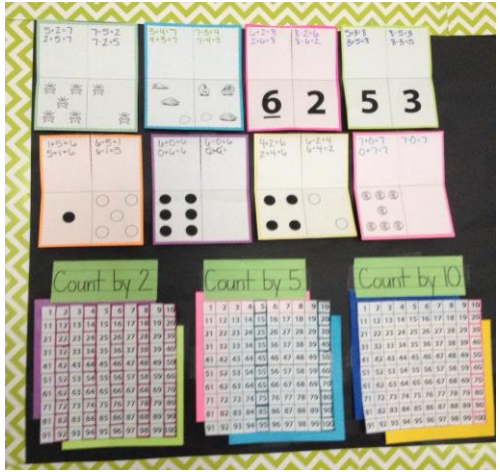
What We Believe

- Great teaching closes the achievement gap
- Growth mindset for kids and adults
- Kids must do the heavy lifting in math class
- All of our kids can and will be college ready
- Our students need to conceptually understand, we do not teach a process or procedure

What We Believe

Our Programs & Resources

- Blended learning with ST Math
- Bridges (The Math Learning Center) in English
- Number Corner (MLC) in Spanish
- CGI Story Problems in Spanish



Who is in the room today: Stand up if…

*You teach Pre K or Kinder
*You teach 1st or 2nd Grade
*You teach 3rd grade or up
*You are an administrator or coach
*You are an Interventionist
*You have been in education for more than 10 years
*Math is your favorite subject to teach!

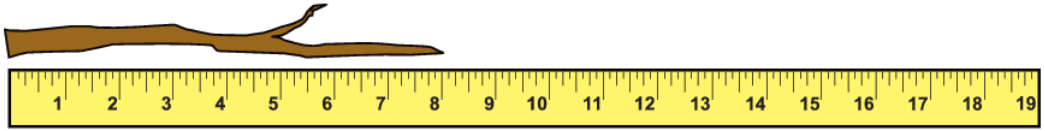
New Math

Independent Reflection

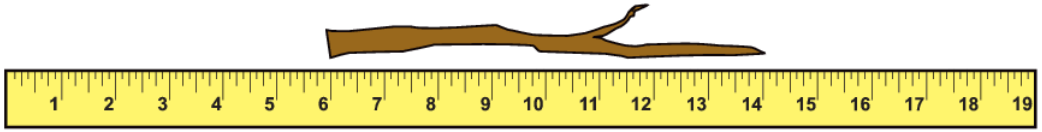
★Think about the measurement example below. Why are the results so different?

★What does this has to do with number sense?

Talk about it with a partner!



As we might hope and expect, most 4th grade U.S. students correctly answer this problem. When the diagram is altered, however, the number of correct scores plummets. Only about a quarter of U.S. 4th grade students typically answer the following question correctly, while their peers in many other countries continue to show proficiency that matches the results of the first problem shown above.



What is Number Sense?

What does it mean for a student to have number sense? Brainstorm as a group, with 1 person prepared to share!

Number Sense According to Marilyn Burns

“understanding the relationships between and among numbers”,
“having the ability to think flexibly about numbers and to break numbers apart and put them back together”,
“being familiar with the properties of single digit numbers and using this information to calculate efficiently using larger numbers”,
“having the ability to manipulate numbers in their head”, and
“having effective ways to estimate”.

Developing Number Sense, Grades K-6

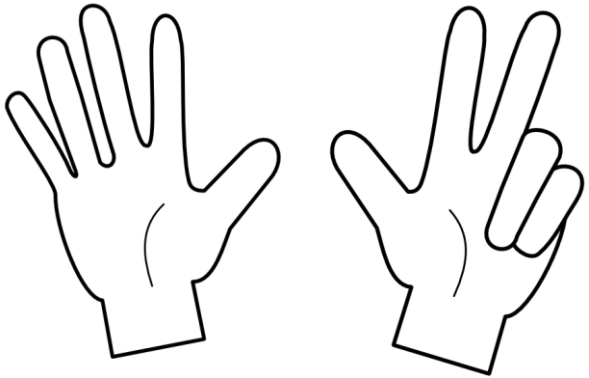
How does Number Sense Develop?

It develops gradually as a result of exploring numbers, visualizing them in a variety of contexts, and relating them in ways that are not limited by traditional algorithms. (Howden, 1989)

Provides the foundation for strategies that help students with basic facts

Brain Break: Let's Move!

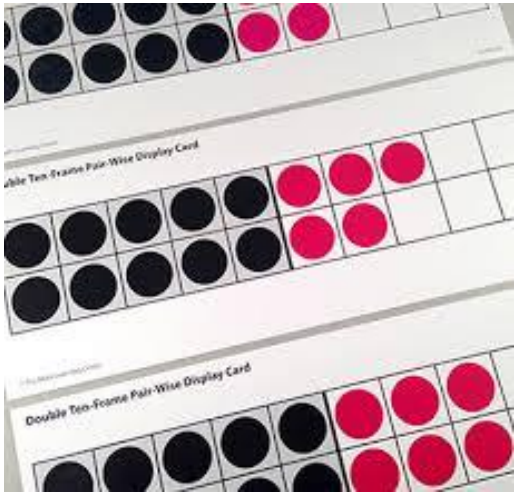
- Walk around while the music plays
- When it stops, find a partner
- Goal is to make the target number in as many ways as possible
- Example for Target 10: I hold up 5 fingers and say "5". My partner holds up 5 fingers and says "5 and 5 is 10."

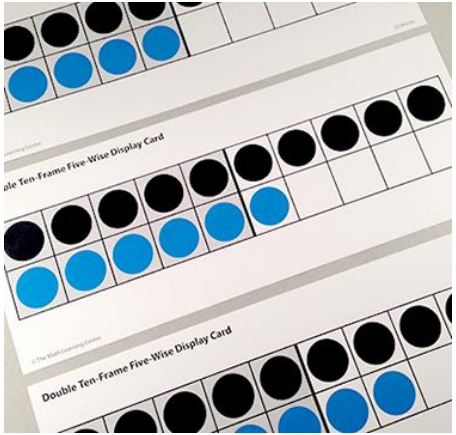


Strategies to Try

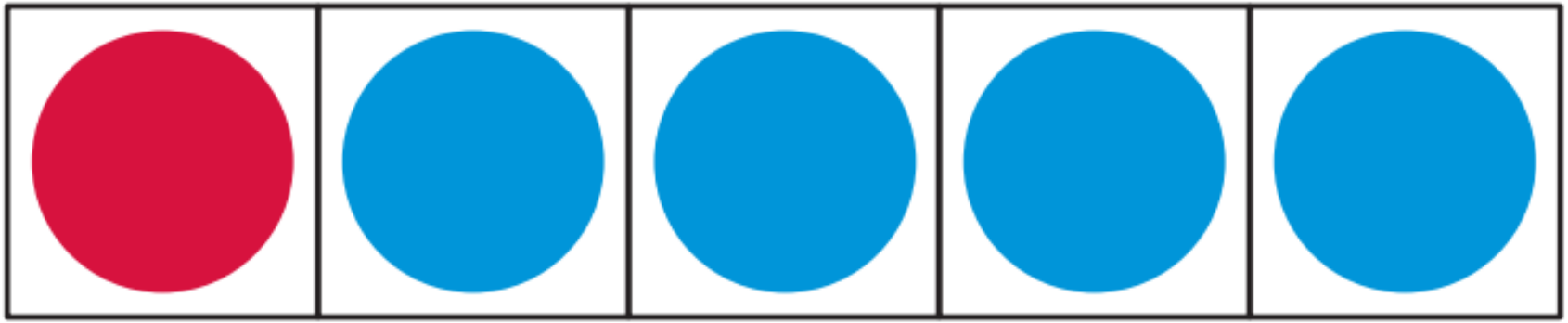
10 Frames Activities

- Flash Attack with fingers
- Flash Attack with Cubes
- 5 wise vs pair wise





Flash Attack (with Fingers)



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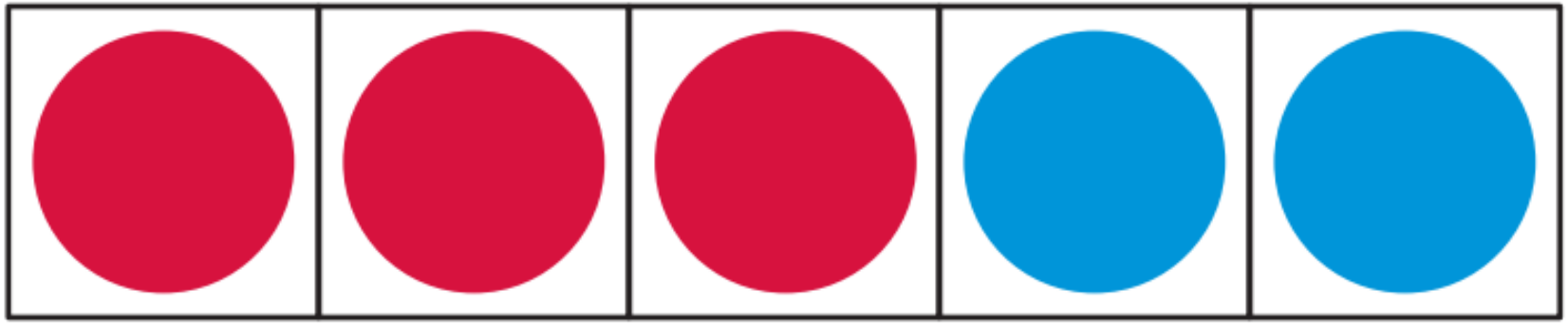

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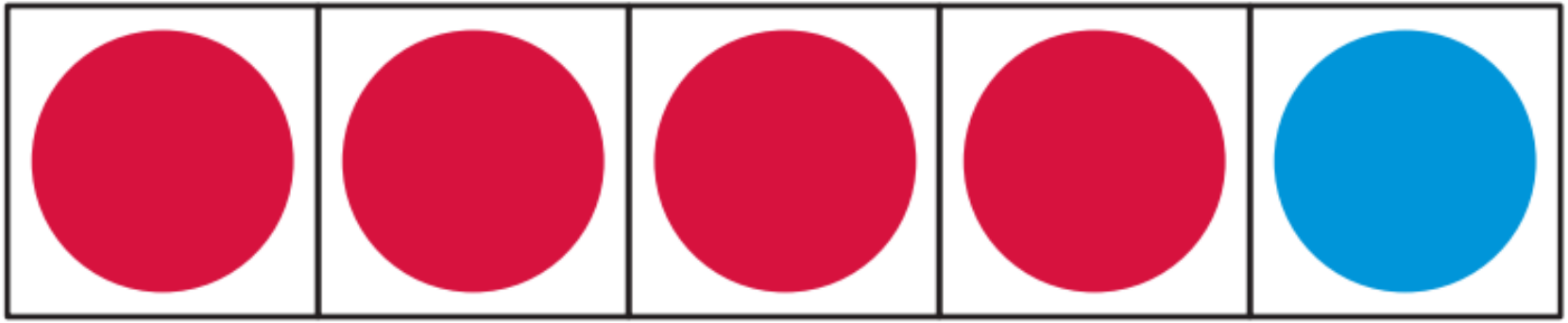
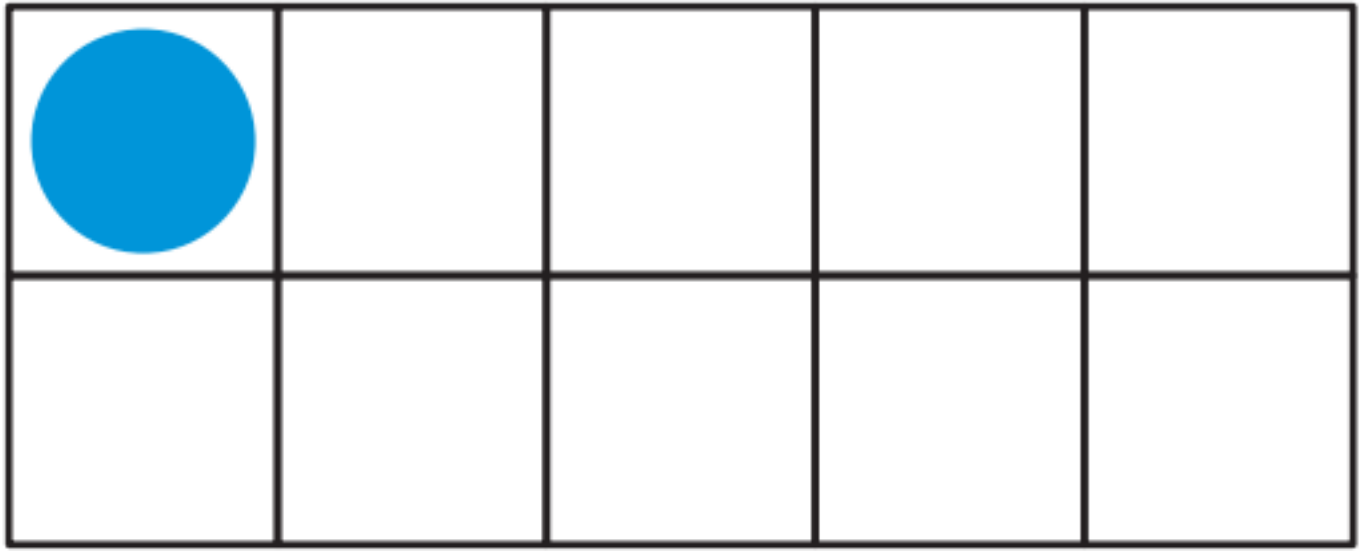


Flash Attach (with cubes)



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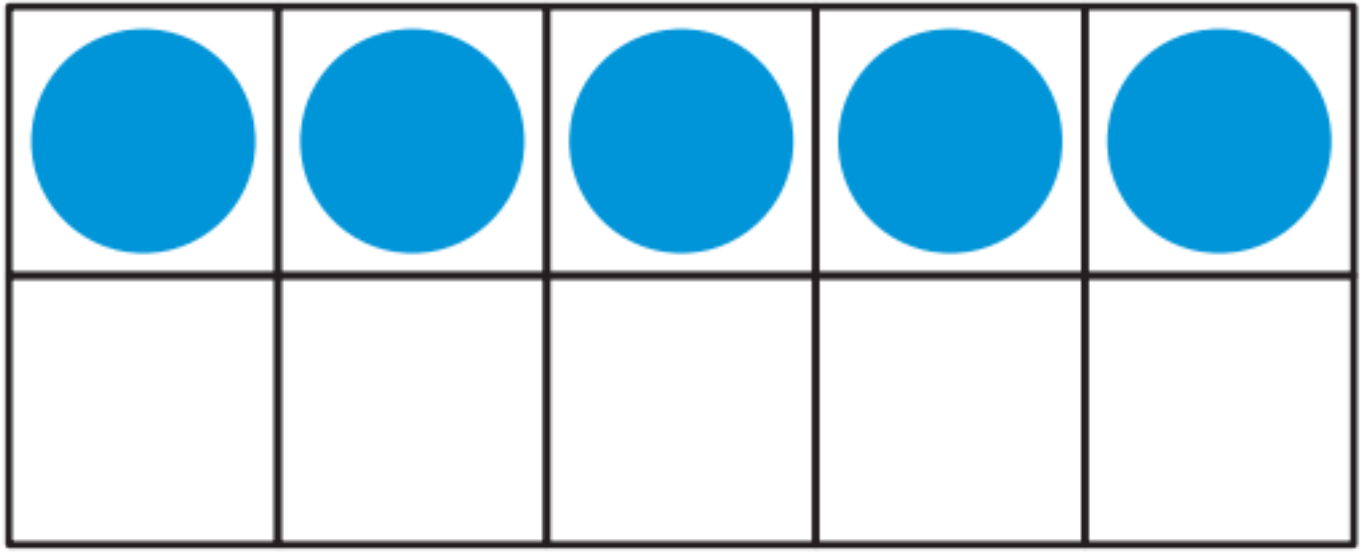

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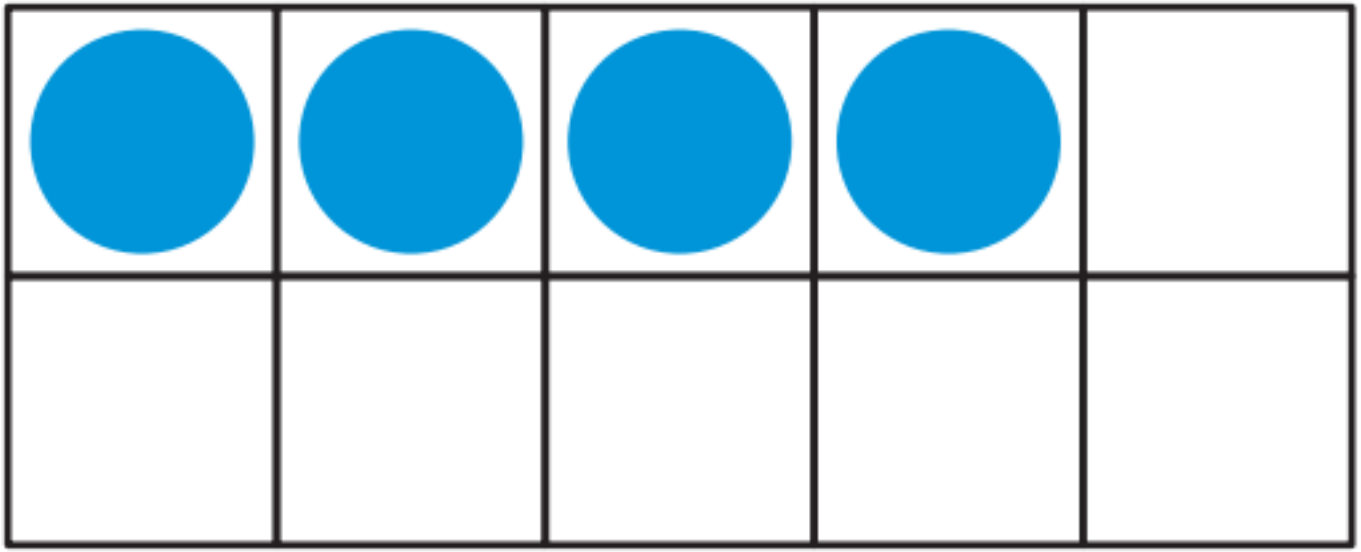

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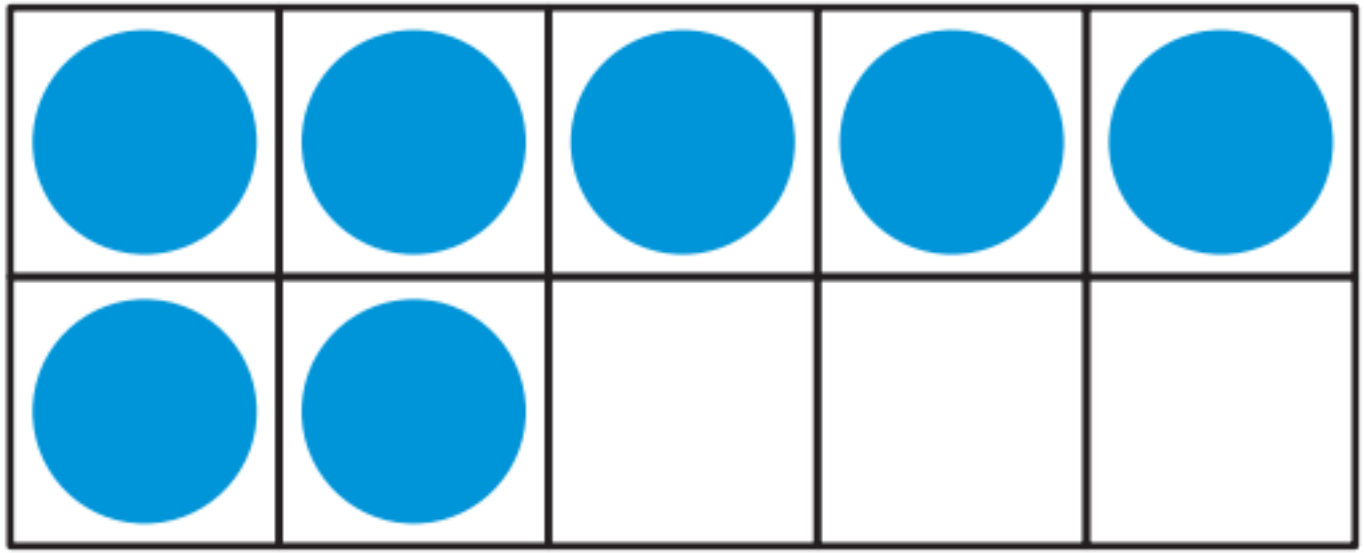
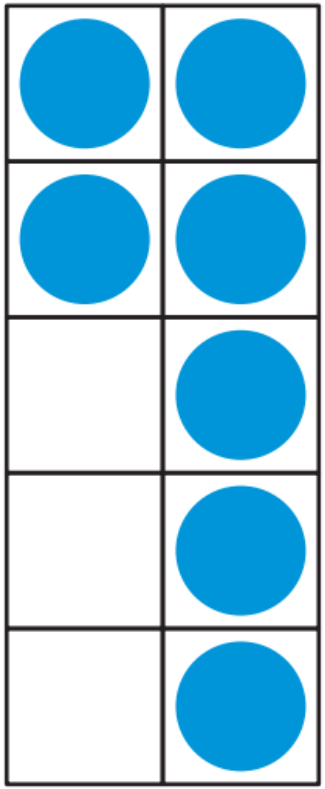
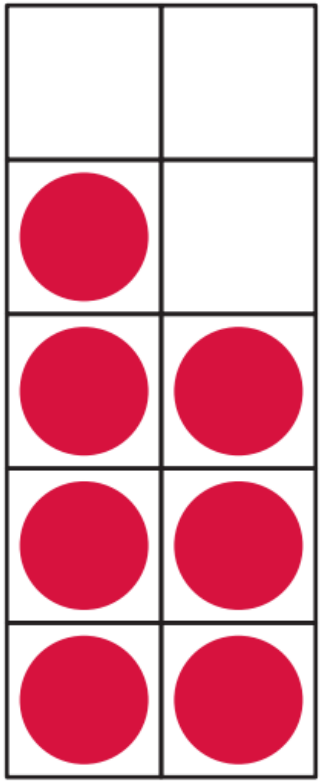


Five Wise & Pair Wise





Strategies to Try

Guess My Number

1	2	3	4	5	6	7	8	9	10
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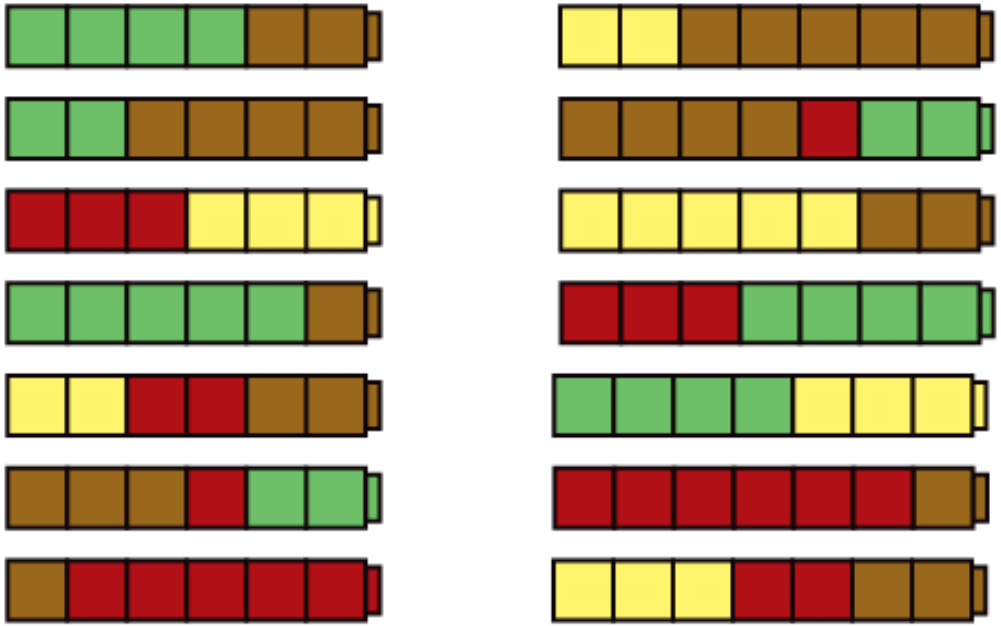
Strategies to Try

Exploring Equivalence with Trains



Strategies to Try

Building a Number Line: Where does it go?

Planinng Time

When can you incorporate these numeracy rich activities?

- Brain breaks
- Warms ups
- Arrival
- Dismissal
- Waiting in Line
- Waiting for anything!!

Review the activities in the packet

Share with a partner what you will do and are taking away from the session.

4 Tips

It's ok for kids to talk and move during math!
Kids need to DO it and TALK about it

Spending time digging deep is worth it
1 problem can be more valuable than 20

Routines are essential
Kids need to see it and practice many times

There is always extra time somewhere that could be used for learning.

Keep Learning!

- ✓ The Math Learning Center: www.mathlearningcenter.org/bridges
- ✓ Nimble with Numbers
- ✓ 13 Rules that Expire (NCTM article)
- ✓ Why Americans Stink at Math (NY Times article)
- ✓ Children's Math: Cognitively Guided Instruction
- ✓ www.mathwire.com
- ✓ www.teachingchannel.org

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