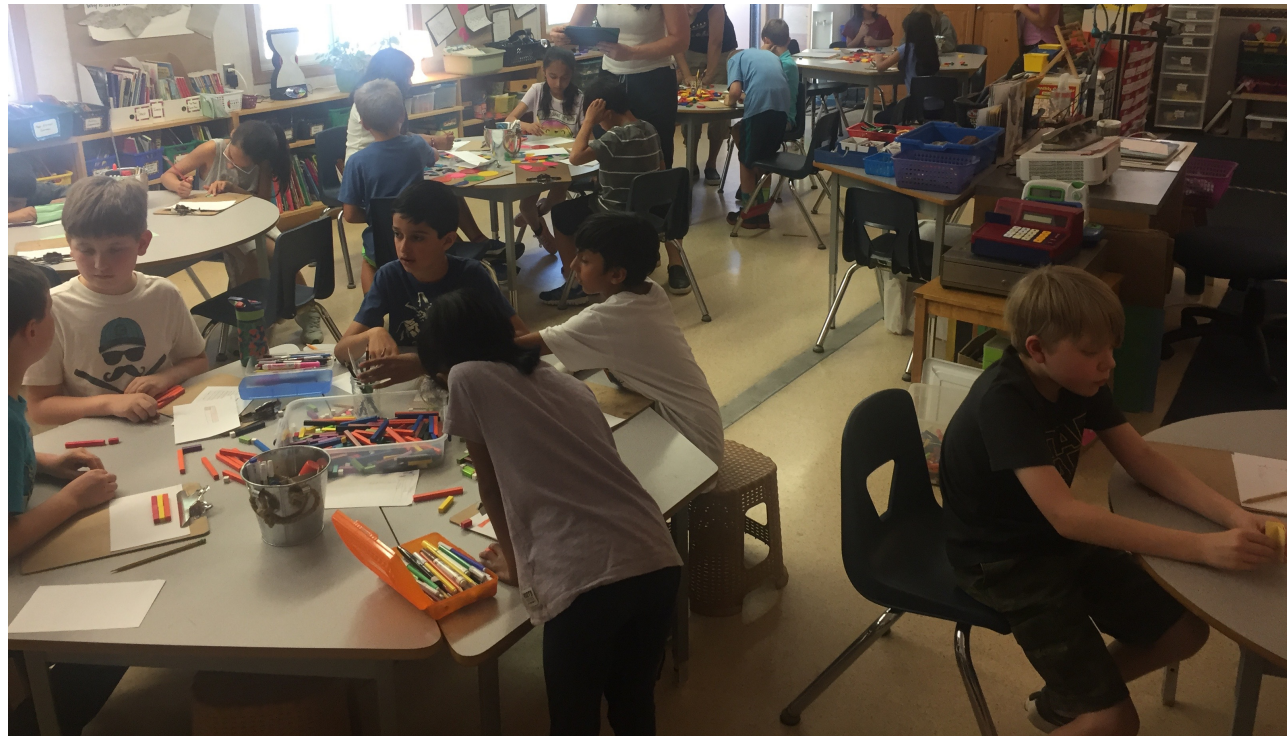


# Math Workshop - Learning Stations and Guided Math

## Gr. K - 2



October 15th, 2018

Jen Barker - Surrey Numeracy Helping Teacher

Website: [meaningfulmathmoments.com](http://meaningfulmathmoments.com)



@barkerjBarker



# Acknowledgement



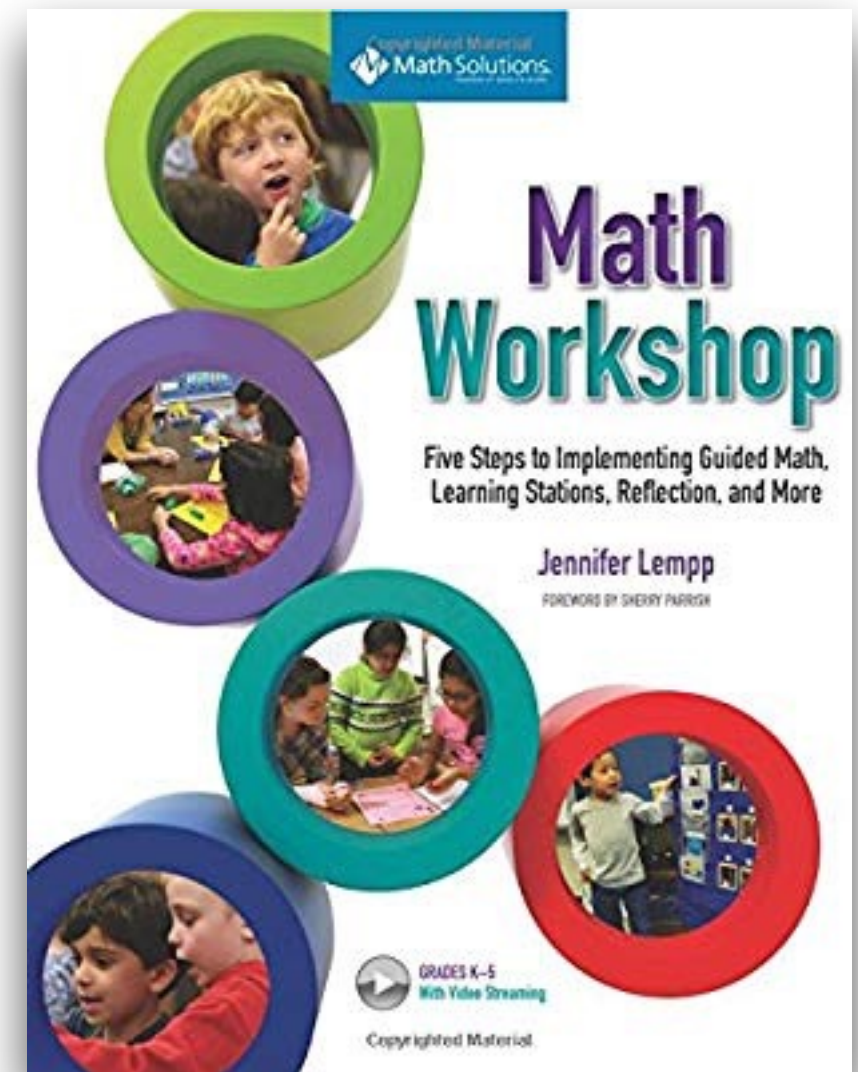
Before going any further, it is important that we recognize that we are here today on the unceded, shared territories of the Coast Salish people on which our schools are located. We are so grateful and honoured to be able to live, learn, and create on these beautiful lands.



# Learning Intentions

By the end of the session, I hope you will leave with answers to:

- Why would you want to use Learning Stations and Small Guided Math groups?
- What should I keep in mind when designing Learning Stations and Guided Math?
- What resources will support me?



LRS #179550



# Where can you find this PPT?

[www.meaningfulmathmoments.com](http://www.meaningfulmathmoments.com)

HOME MUSINGS RESOURCES INSTRUCTIONAL IDEAS PRESENTATIONS/PUBLICATIONS



Click the  
Presentations tab

## Meaningful Moments in MATHEMATICS



Welcome! Thanks for stopping by my site. I was inspired to write down my [Mathematical musings](#) by several other Math educators who have generously shared their stories with me either through workshops, blogs, Twitter, or through publications and have inspired my love of Mathematics and shaped my practice.

I have taught Kindergarten through Grade Five in both Richmond and the Surrey School District. This year I am in a new role. I have joined the Numeracy Helping teachers and will be working primarily with K - 7

Search



Tweets by [@Barkerjbarker](#)



**Jennifer Barker**  
[@Barkerjbarker](#)

Check out all the amazing K - 7 sessions!  
Titles and descriptions are online  
[#sd36learn](#)

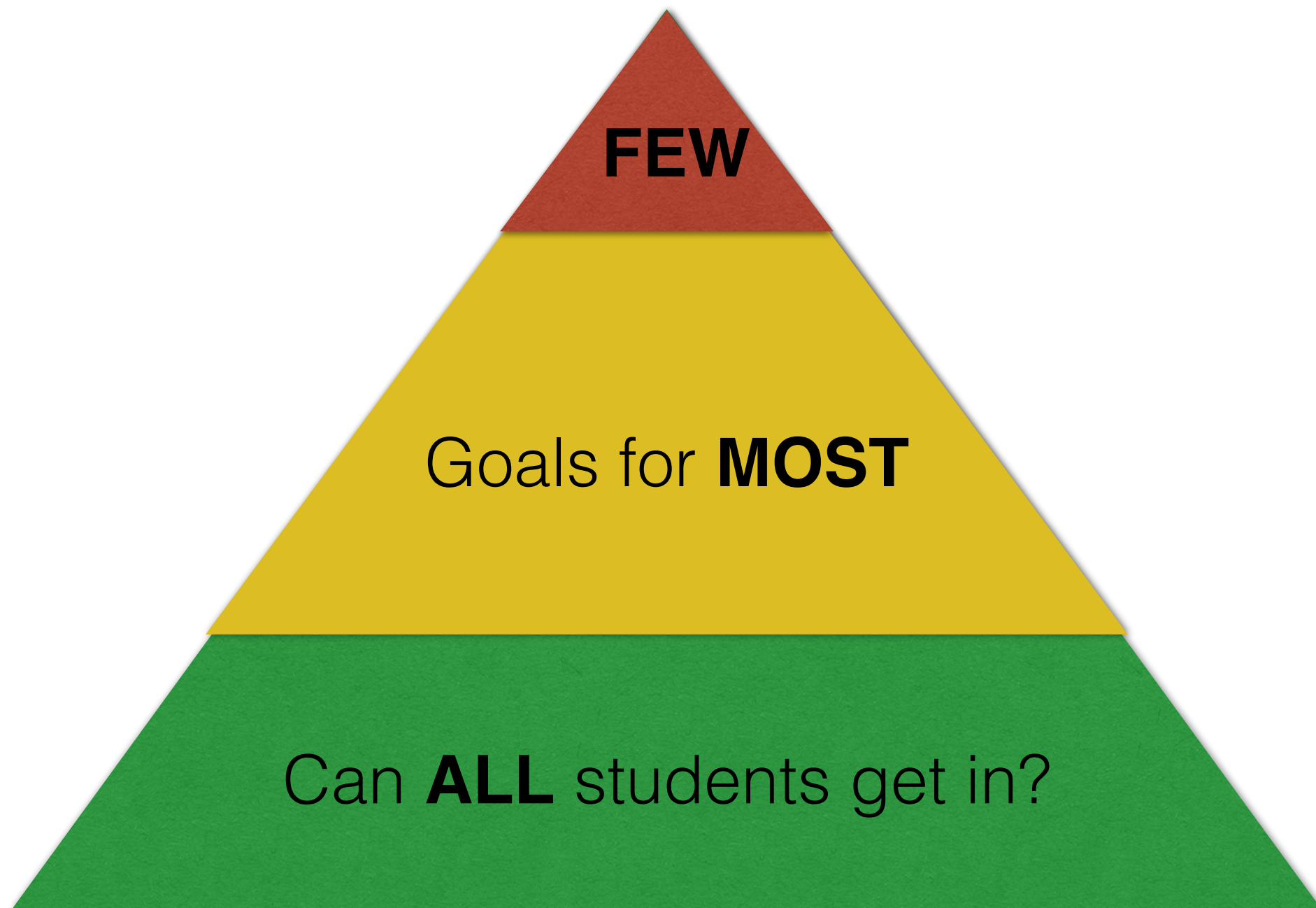
# Why use the Math Workshop approach?

An average teacher may be reaching 50 - 70% of their students. A great teacher may be reaching at any time 50 - 70% of their students, but a different 50 - 70% each time. They use a variety of strategies, instructional methods to differentiate.

– Eric Jenson (2003)



Math Workshop is about designing  
Learning for **ALL** our students!



# LEARNING STATIONS

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.		NUMBER SENSE ROUTINE An engaging, accessible, purposeful routine to begin your math class that promotes a community of positive mathematics discussion and thinking.		
15 minutes	FOCUS LESSON A planned, whole-group lesson focused on a learning target and accessible to all levels of learners.		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.			
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.	



In September we discussed how to set the foundation for Math Workshop



Classroom  
Arrangement



Mathematics  
Community



Routines &  
Procedures

# **ROUTINES & PROCEDURES**



---

**Have you selected a structure for “Learning Stations”? Did you develop the expectations for the “Learning Stations” with your students?**



# Routines and Procedures

## Where do students go?

- Do they need to stay where the station is located, or can they take the materials to another place in the room?
- Where can they get the materials they need
- How do they clean up?







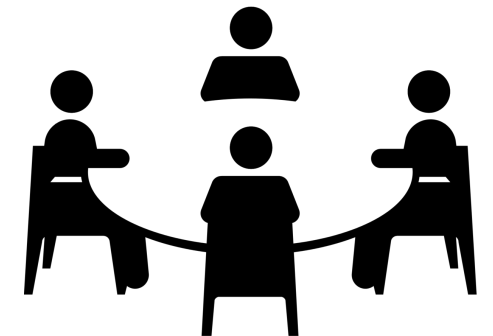
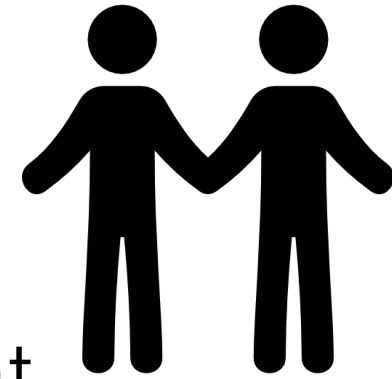




# Routines and Procedures

## Who can students work with?

Knowing your students and their needs, what options will work best? Partners or small groups and their choice or yours? Or both?



### 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



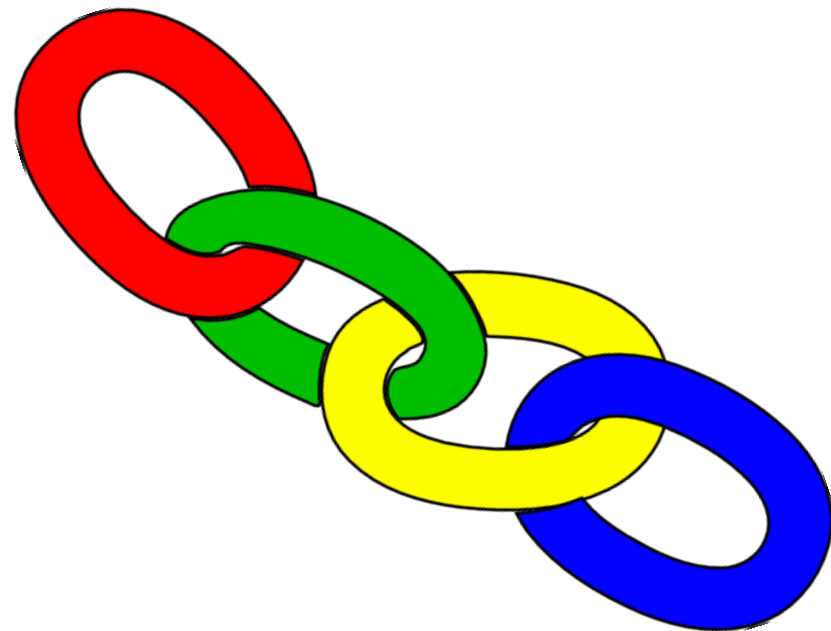


Learning Station groups are **NOT** ability based but heterogeneous!

# Routines and Procedures

## What can students do?

- What are the options for learning stations?
- Use a system (e.g., Menu)
- Can students choose their station?
- What are the benefits of choice?
- If needed, where do students record their work?



**Working independently**  
**Working with a partner**  
**Working with a small group**

# Math Menu: List It

**Math Menu: List It Template**

Name: \_\_\_\_\_

--	--	--	--	--

 My favorite learning station: \_\_\_\_\_

 My least favorite learning station: \_\_\_\_\_

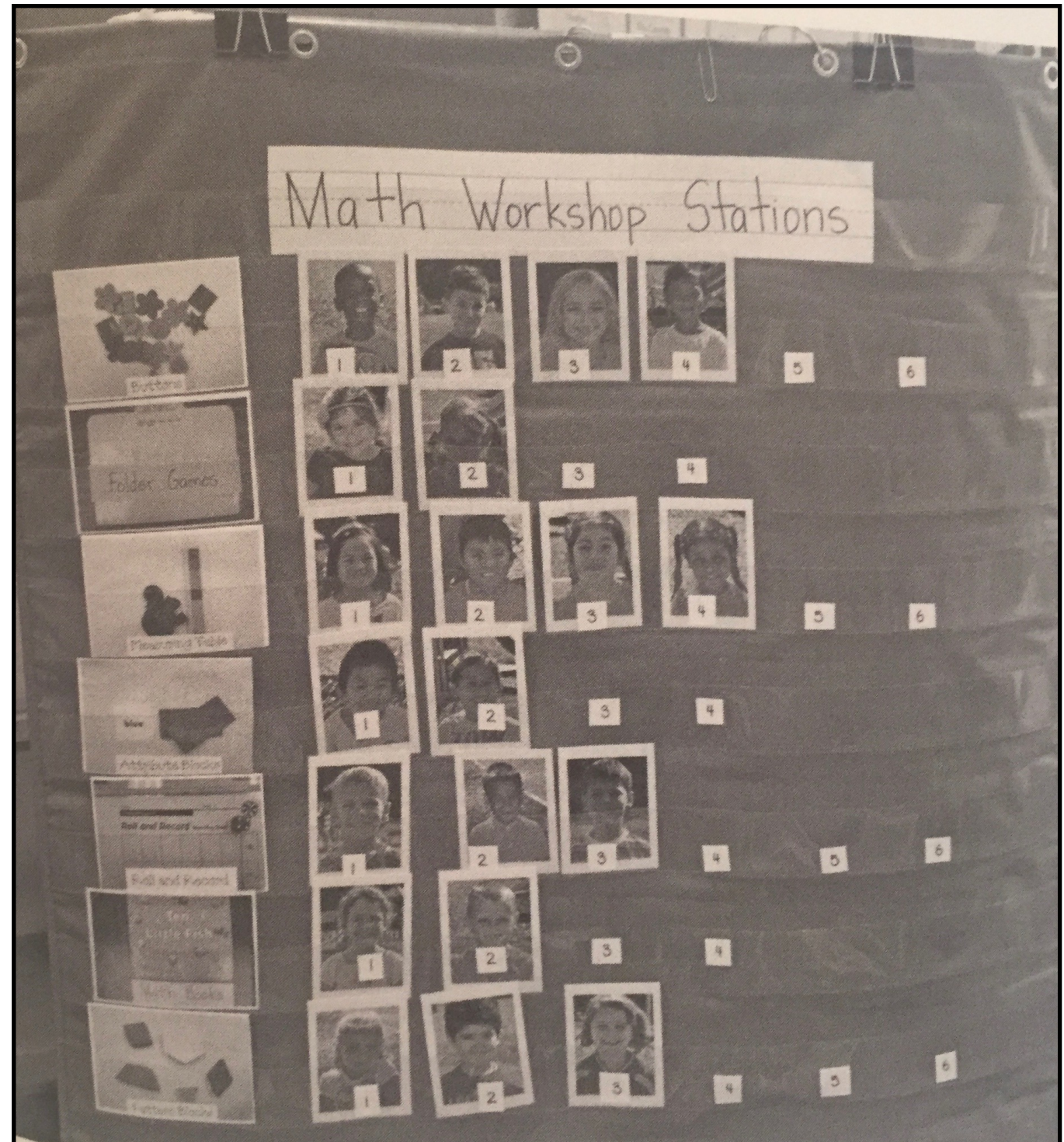
From *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp. Copyright © 2017 by Houghton Mifflin Harcourt Publishing Company. All rights reserved. [www.mathsolutions.com](http://www.mathsolutions.com). Downloadable from [mathsolutions.com/mathworkshopenreproducibles](http://mathsolutions.com/mathworkshopenreproducibles).

## Working with a small group

- Option Two: groups are determined by individual student station selection



# Math Menu: Pocket Chart



## Working with a small group

- Option One: Initially teacher determines the groups
- Option Two: Then groups are determined by individual student station selection.



# Math Menu: Must Do /Can Do

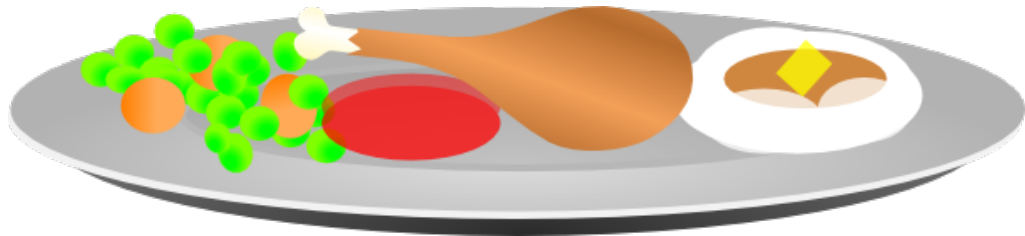
Math Menu: Must Do/Can Do Template	
Student Name: _____	
Due: _____	
<b>Must Do:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<b>Can Do:</b> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Something that I really enjoyed doing this week:	
Something that I struggled with this week:	
Something that made me think differently this week:	

From *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp. Copyright © 2017 by Houghton Mifflin Harcourt Publishing Company. All rights reserved. [www.mathsolutions.com](http://www.mathsolutions.com). Downloadable from [mathsolutions.com/mathworkshopreproducibles](http://mathsolutions.com/mathworkshopreproducibles).

## Working with a small group

- Option Two: groups are determined by individual student station selection

# Math Menu: Dining Out



## Math Menu: Dining Out Template

<p><b>Appetizers</b> (choose 2)</p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Write about it:</p>
<p><b>Entrée</b> (choose 1)</p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Write about it:</p>
<p><b>Side Dish</b> (choose 2)</p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Write about it:</p>
<p><b>Dessert</b> (choose 1)</p> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<p>Write about it:</p>

From *Math Workshop: Five Steps to Implementing Guided Math, Learning Stations, Reflection, and More* by Jennifer Lempp.  
Copyright © 2017 by Houghton Mifflin Harcourt Publishing Company. All rights reserved. [www.mathsolutions.com](http://www.mathsolutions.com).  
Downloadable from [mathsolutions.com/mathworkshopepreducibles](http://mathsolutions.com/mathworkshopepreducibles).

## Working with a partner

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



# Math Menu: Tic-Tac-Toe

## Math Menu: Think-Tac-Toe Template


My favorite activity this week was \_\_\_\_\_

because \_\_\_\_\_

The most challenging activity this week was \_\_\_\_\_

because \_\_\_\_\_



## Working with a small group

- Option Two: groups are determined by individual student station selection



Where will students keep their menu?

Where will they place any written work?



# Routines and Procedures

## How long do I do it?

- Some learning stations may take less time than others... how will you plan for this?
- What is a reasonable amount of time for one rotation? 15 minutes or ?

Timed Rotations



OR

Open Station Choice



# Routines and Procedures

## What do I do if I have a question?

- When can you ask the teacher?
- What do you do when the teacher is busy?



# Routines and Procedures

## What do I do when I am finished?

- Are there extensions for each activity?
- How can they clean up?
- How do you move to another station?
- What will transitions will look and sound like?





# Why are Learning Stations Important?

- Students need ***daily opportunities*** to engage with mathematical ideas in ***purposeful and playful ways***.
- They give students ***choice***, which increases ***motivation***
- 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 plan Learning Stations?

## BIG IDEAS

**Numbers** describe quantities that can be represented by equivalent fractions.

Computational **fluency** and flexibility with numbers extend to operations with larger (multi-digit) numbers.

Identified regularities in number **patterns** can be expressed in tables.

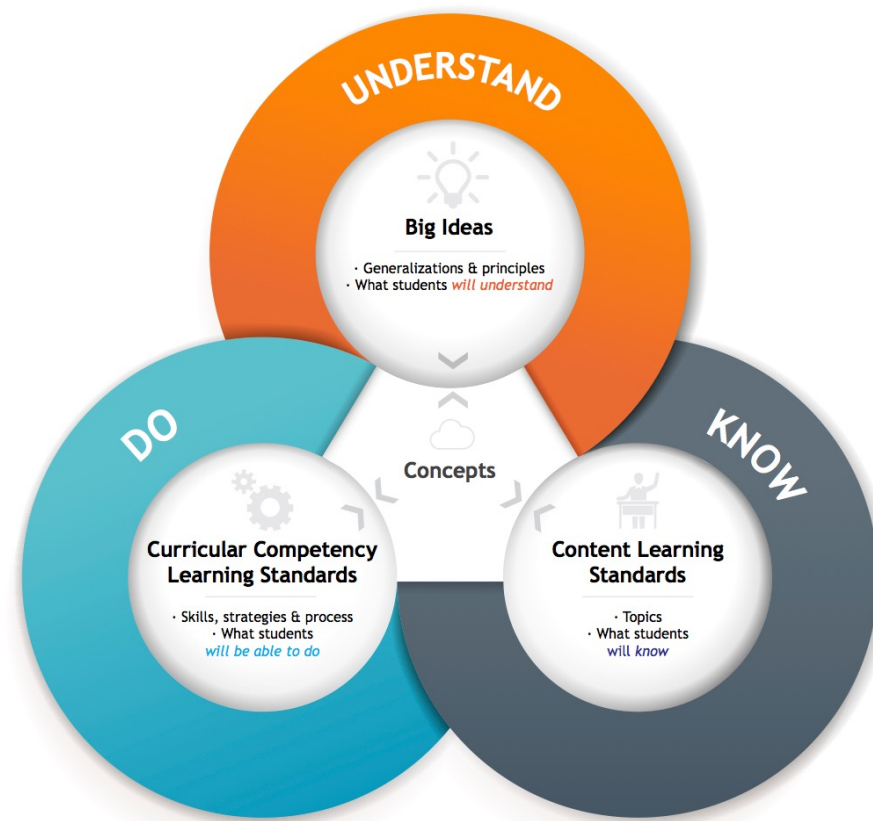
Closed shapes have **area and perimeter** that can be described, measured, and compared.

**Data** represented in graphs can be used to show many-to-one correspondence.

## Learning Standards

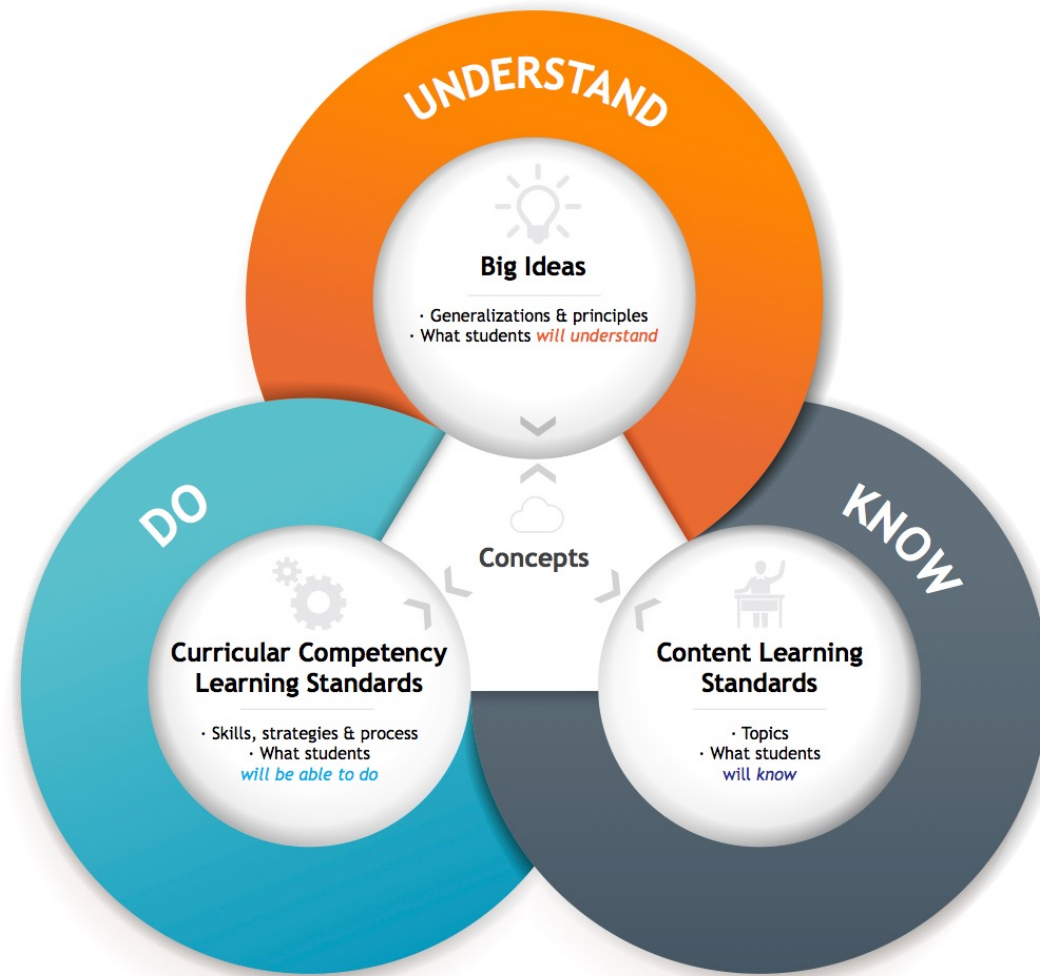
Curricular Outcome	Content
<p>Students are expected to be able to do the following:</p> <p><b>Reasoning and problem solving</b></p> <ul style="list-style-type: none"> <li>Use reasoning to make connections</li> <li><b>Estimate</b> results of operations</li> <li>Develop mental math strategies and abilities to make sense of quantities</li> <li>Use <b>technology</b> to explore mathematical concepts</li> <li><b>Model</b> mathematics in contextual situations</li> </ul> <p><b>Understanding and solving</b></p> <ul style="list-style-type: none"> <li>Develop, demonstrate, and apply mathematical understanding through problem solving, inquiry, and problem solving</li> <li>Visualize to explore mathematical concepts</li> <li>Develop and use <b>multiple strategies</b> to engage in problem solving</li> <li>Engage in problem-solving experiences that reflect cultural practices, and perspectives relevant to the local community, and other cultures</li> </ul> <p><b>Communicating and representing</b></p> <ul style="list-style-type: none"> <li><b>Communicate</b> mathematical thinking in multiple ways</li> <li>Use mathematical vocabulary and language to engage in discussions</li> <li><b>Explain and justify</b> mathematical ideas and decisions</li> <li>Represent mathematical ideas in <b>concrete, pictorial, and symbolic forms</b></li> </ul>	<p>Students are expected to know the following:</p> <p><b>Number concepts to 1 000 000</b></p> <ul style="list-style-type: none"> <li>equivalent fractions</li> <li>whole-number, fraction, and decimal <b>benchmarks</b></li> <li>addition and subtraction of <b>whole numbers to 1 000 000</b></li> <li><b>multiplication and division to three digits</b>, including division with remainders</li> <li>addition and subtraction of <b>decimals to thousandths</b></li> <li>addition and subtraction of <b>facts to 20</b> (extending computational fluency)</li> <li>addition and subtraction of <b>facts to 100</b> (emerging computational fluency)</li> <li>increasing and decreasing patterns with words, numbers, symbols, and variables</li> <li><b>simple equations</b> with variables</li> <li>measures of length, area, and perimeter</li> <li>measurement of <b>time</b></li> <li>classification of prisms and pyramids</li> <li>single <b>transformations</b></li> <li>one-to-one correspondence and <b>many-to-one</b></li> </ul>

# What does this mean for me?



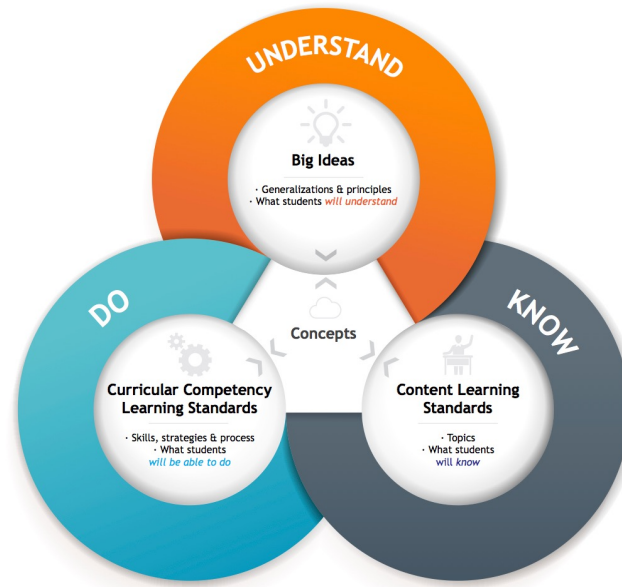
We must design learning experiences that foster both  
**DOING** and **KNOWING!**  
to develop **UNDERSTANDING!**





Learning standards must including the **DOING** and KNOWING!

\_\_\_\_\_ is able (is beginning to, needs support) to add and subtract to 1000



Learning standards must including the **DOING** and **KNOWING**!

~~\_\_\_\_\_ is able (is beginning to, needs support) to add and subtract to 1000~~

\_\_\_\_\_ **communicates** their understanding of **addition** and subtraction to **1000** in many ways

\_\_\_\_\_ **applies** their understanding of **addition** and subtraction to 1000 through play, inquiry, and problem solving

# Our Guiding Questions

## Skip Counting:

How can you count these items?

Can you count your items a different way?

If you could count these items a different way, how many will you have?

## Spatial Tasks – Creating:

What shapes can you create?

Can you identify your shape?

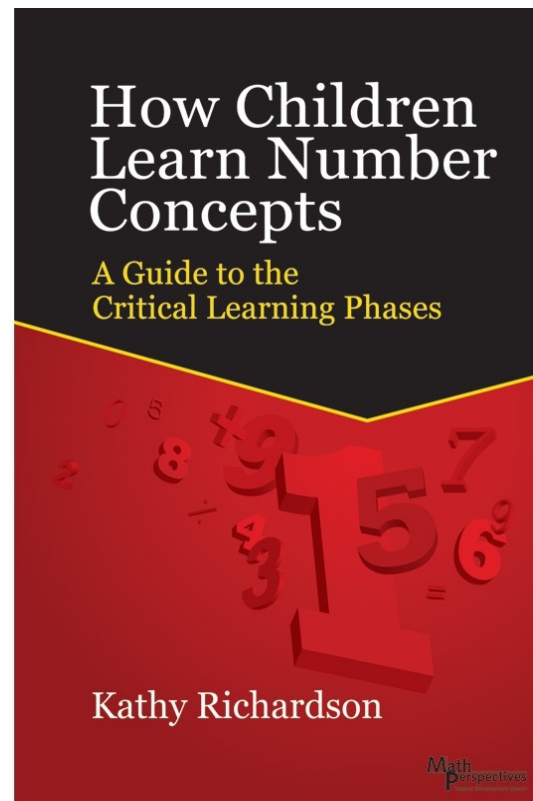
How are your shapes alike and different?

Can you sort your shapes?

We must know what we are looking for!  
Which curricular competencies are the students using?  
What is the Mathematical understanding?



# Learning is developmental...



As teachers we **MUST** know the critical learning phases that build upon on one and other and lead to conceptual understanding.

# Developmental progression of Counting pg. 3

## THE CRITICAL LEARNING PHASES

### Counting Objects

- Counts one item for each number (one-to one correspondence)
- Keeps track of an unorganized pile
- Notices when recounting a group results in a different number
- Is bothered when counting a group results in the same number after some have been added or taken away
- Spontaneously checks by recounting to see if the result is the same
- Knows “how many” after counting
- Counts out a particular quantity
- Reacts to estimate while counting
- Spontaneously adjusts estimate while counting and makes a closer estimate

### Knowing One More/One Less

- Knows one more in sequence without counting
- Knows one less in sequence without counting
- Notices if a counting pattern doesn't make sense  
(Ex: instead of saying “13, 12, 11,” says “13, 14, 15,” or instead of saying “21, 22, 23”, says “20, 30, 40”)

- Knows one more without counting when numbers are presented out of sequence
- Knows one less without counting when numbers are presented out of sequence

### Counting Objects by Groups

- Counts by groups by moving the appropriate group of counters
- Knows quantity stays the same when counted by different-sized groups

### Using Symbols

- Uses numerals to describe quantities

# Finding Out What Students Know

## Performance Based Task

### Counting Collections

- Present the students with a collection of 7 counters (12, 21, or 32)
- Ask:
  - How many do you think there might be?
  - Would you check and see?
  - How many did you count?
- Say: **Now make a pile of 5 objects (9, 18, or 28)**
- Begin with the collection the student just counted...
  - Add 4 counters (**one at a time**) each time asking '**How many now?**'
  - Take away 5 counters (**one at a time**) each time asking '**How many now?**'
- Ask:
  - What if we had 6 and we added one more? (17, 39, 68, 109)





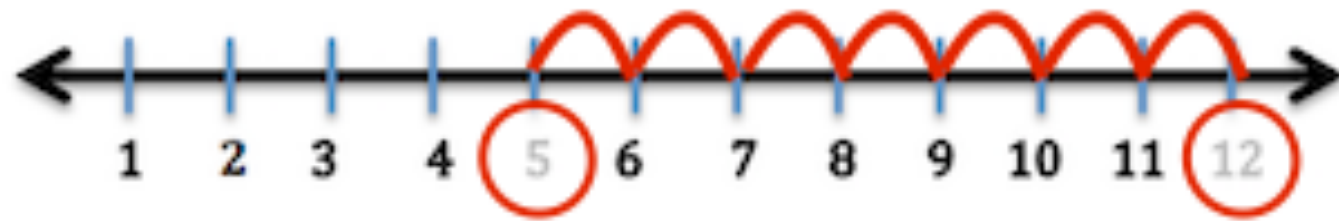
# Teaching Conceptually

## **Concretely:**

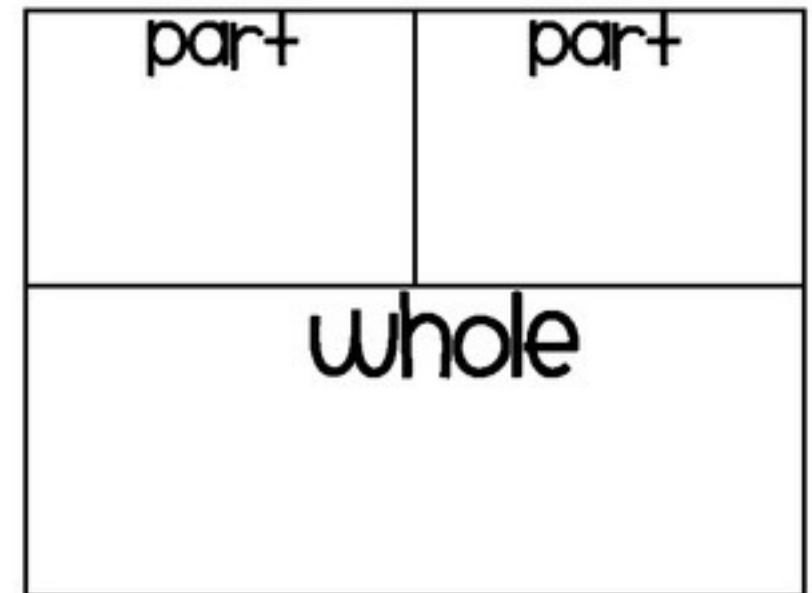
Developing an understanding of the operations through hands-on real materials (e.g., beans) or manipulatives (e.g. unifix cubes)



# Representations (Pictorial):



$$5 + 7 = 12$$



TEN FRAMES




# Abstract:

Develop understanding of representing addition and subtraction with numbers and symbols

$$4 + 8 = 12$$

Addend

Addend

Sum


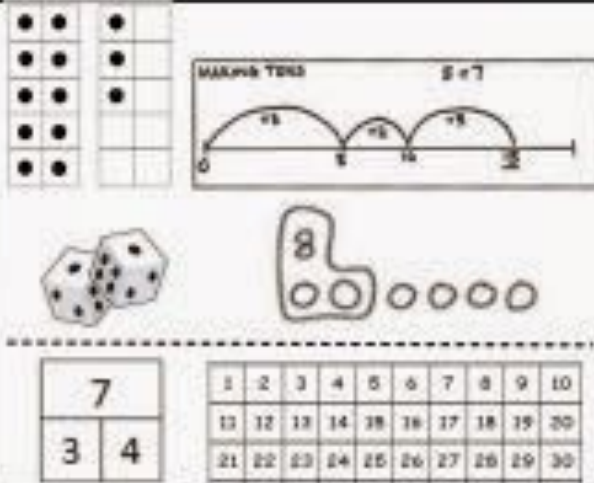

$$13 - 7 = 6$$

Minuend

Subtrahend

Difference

# We need to assist students in making connections between these!

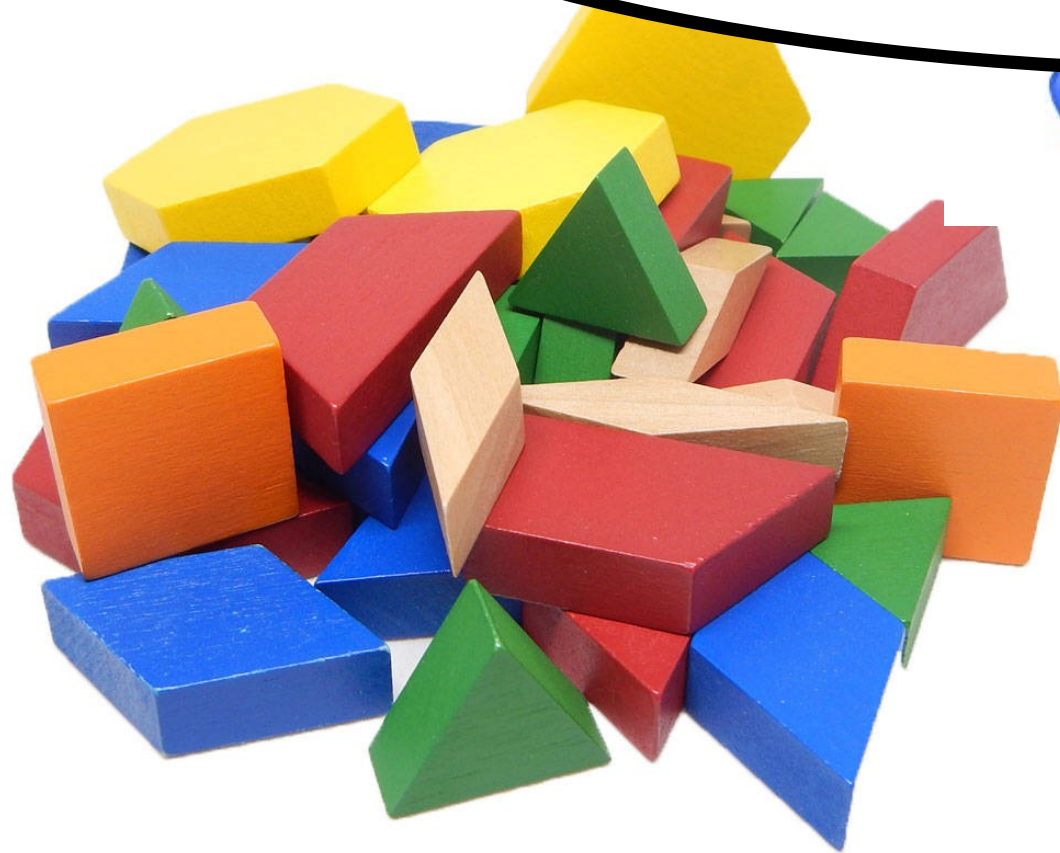
Concrete	Representational	Abstract
Students manipulate hands-on, concrete materials	Students draw and observe diagrams, or watch the teacher touching and moving hands-on materials	Numbers and mathematical symbols
		

# Exploring Stations

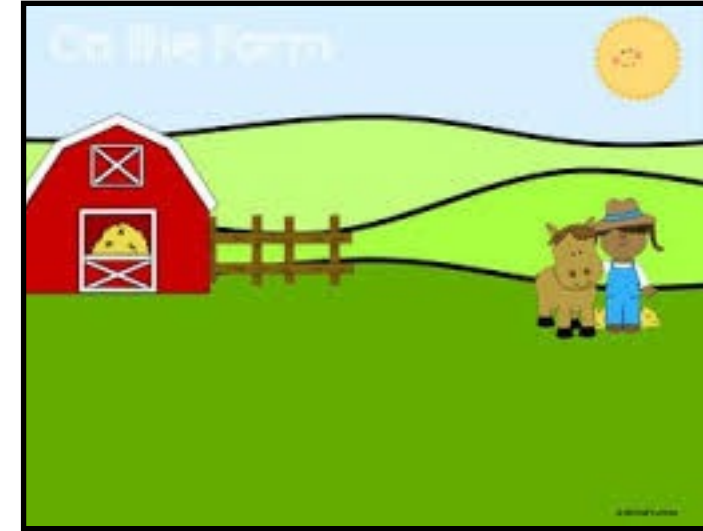




Watch carefully what they do with the materials. Ask students “What do you notice? What do you wonder?”



# Teach EVERY station through a Focused Lesson



Example:

“We have been learning how to tell number stories using story mats and cubes. Today we will start to use these during stations. You and your partner will choose a mat and make a story.”

Next, the teacher selects a student to help with the modelling. “Travis and I will be partners and will show you what this might look like.”

Ask the students for feedback “What did we do well?”

# Types of Learning Stations

- Exploring Stations
- Current concept being studied
- Computational Fluency
- Problem Solving
- Digital apps
- Concepts I intentionally want to spiral back to





You can find some of these ideas on

*Pinterest*



**CAUTION**

Look beyond the 'cute factor'  
Ask yourself "Where's the Math?"  
"Is this activity open-ended?"  
"Is it invitational?"



Jennifer  
Barker  
@Barkerjbarker



Barb  
Matson  
@B\_Matson36



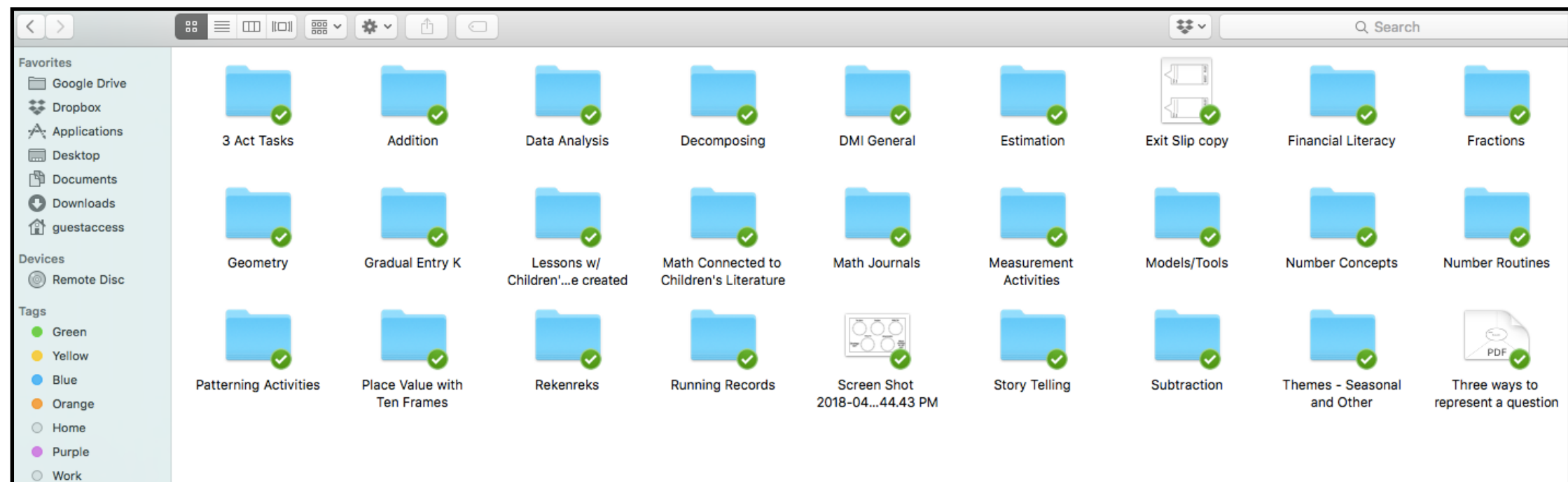
Kristen  
Pennington



Jennifer  
Tammen

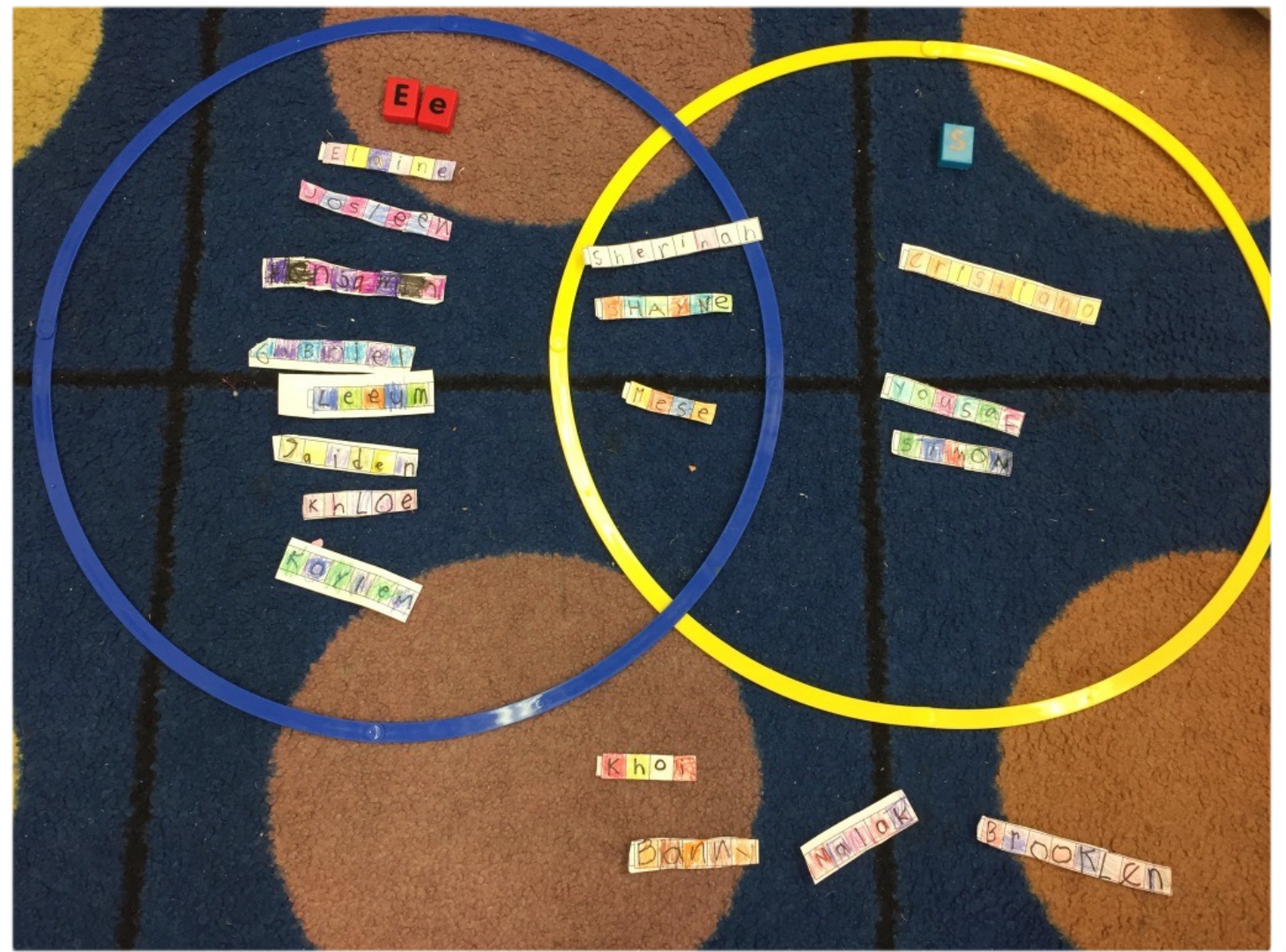


# Collaborative repository



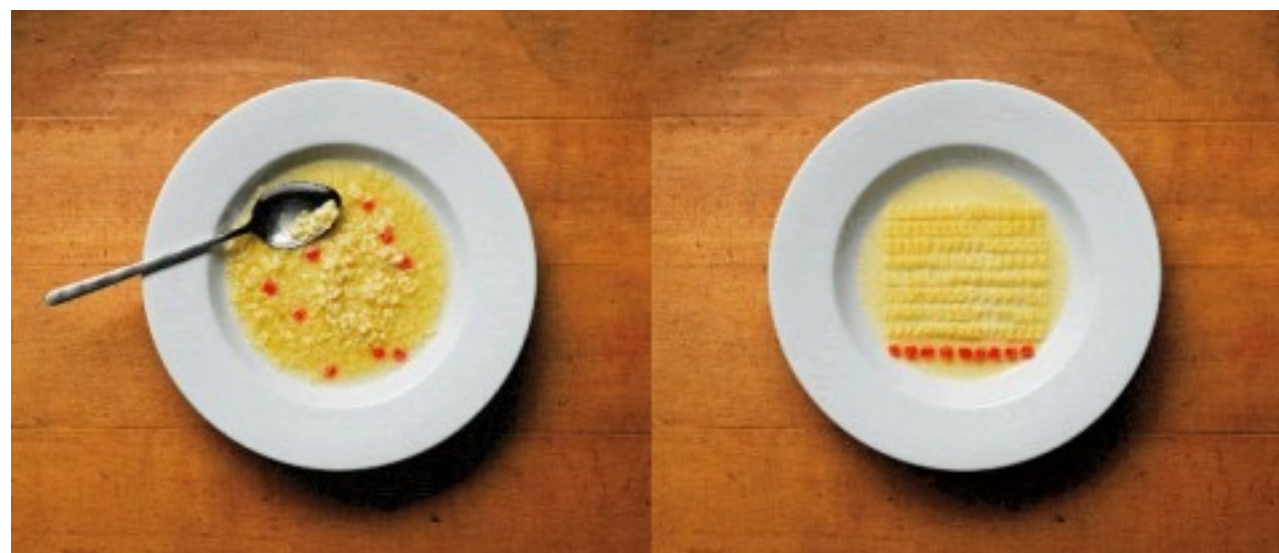


# PATTERNING: Sorting



“How did you sort your items?”  
“What is your sorting rule?”





Place pages in sleeves!

“How did the author sort these items?”

“How many ways could you sort this bin of items?”





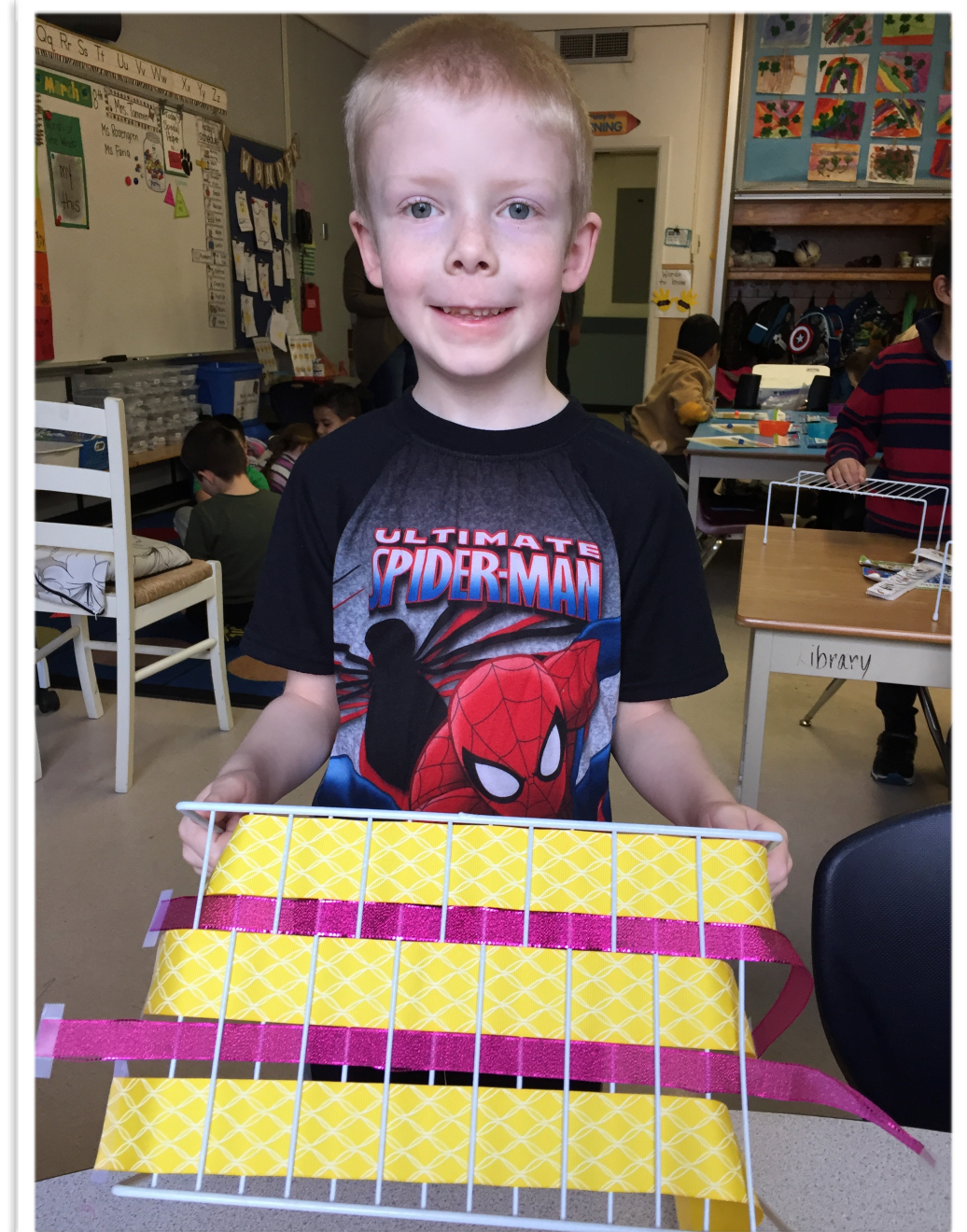
“Can you sort the same items a different way?”



# PATTERNING:



Real world objects build connections and can spark inspiration!



“Can you describe your pattern to me?”





“Can you label your pattern?”

Provide socks with various patterns.

“Which patterns are the same?”

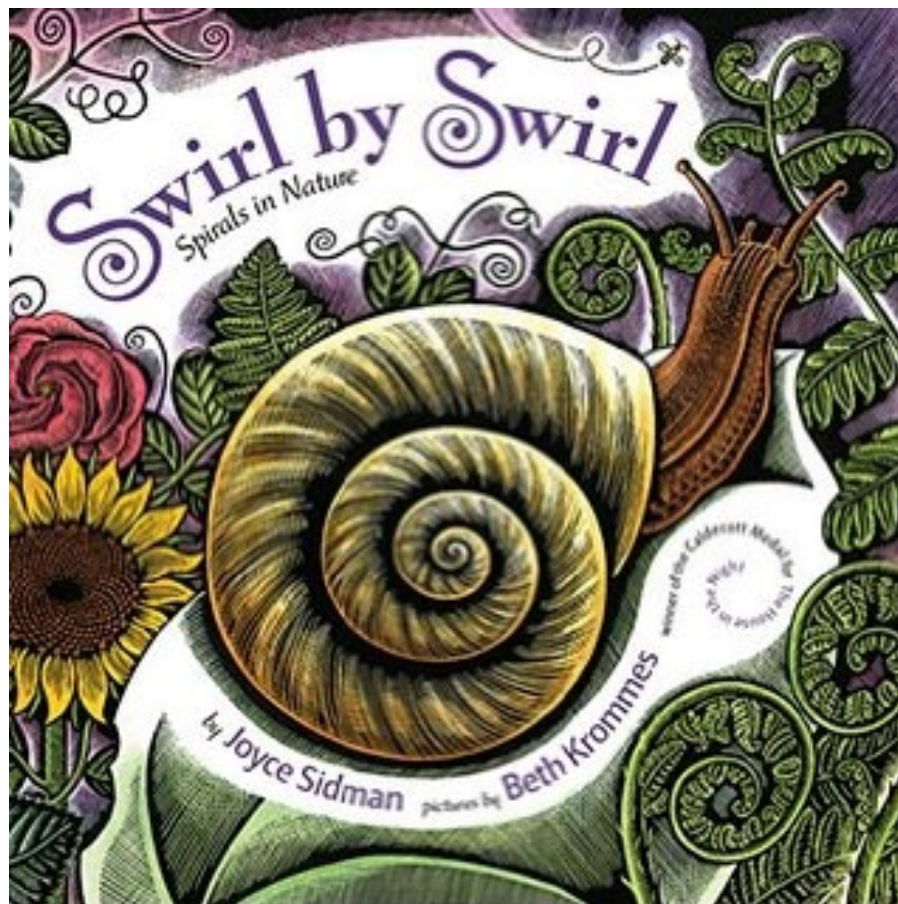
“Which patterns are similar but a bit different?”

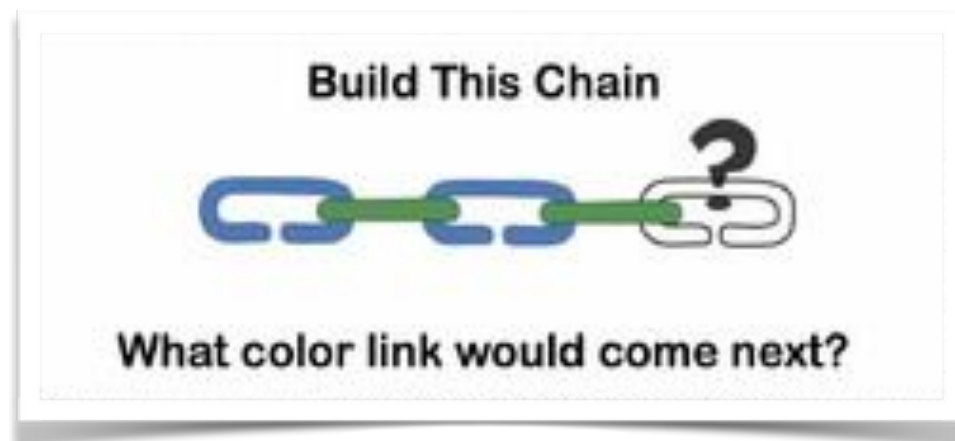




Children's books can also provide invitations to learning!

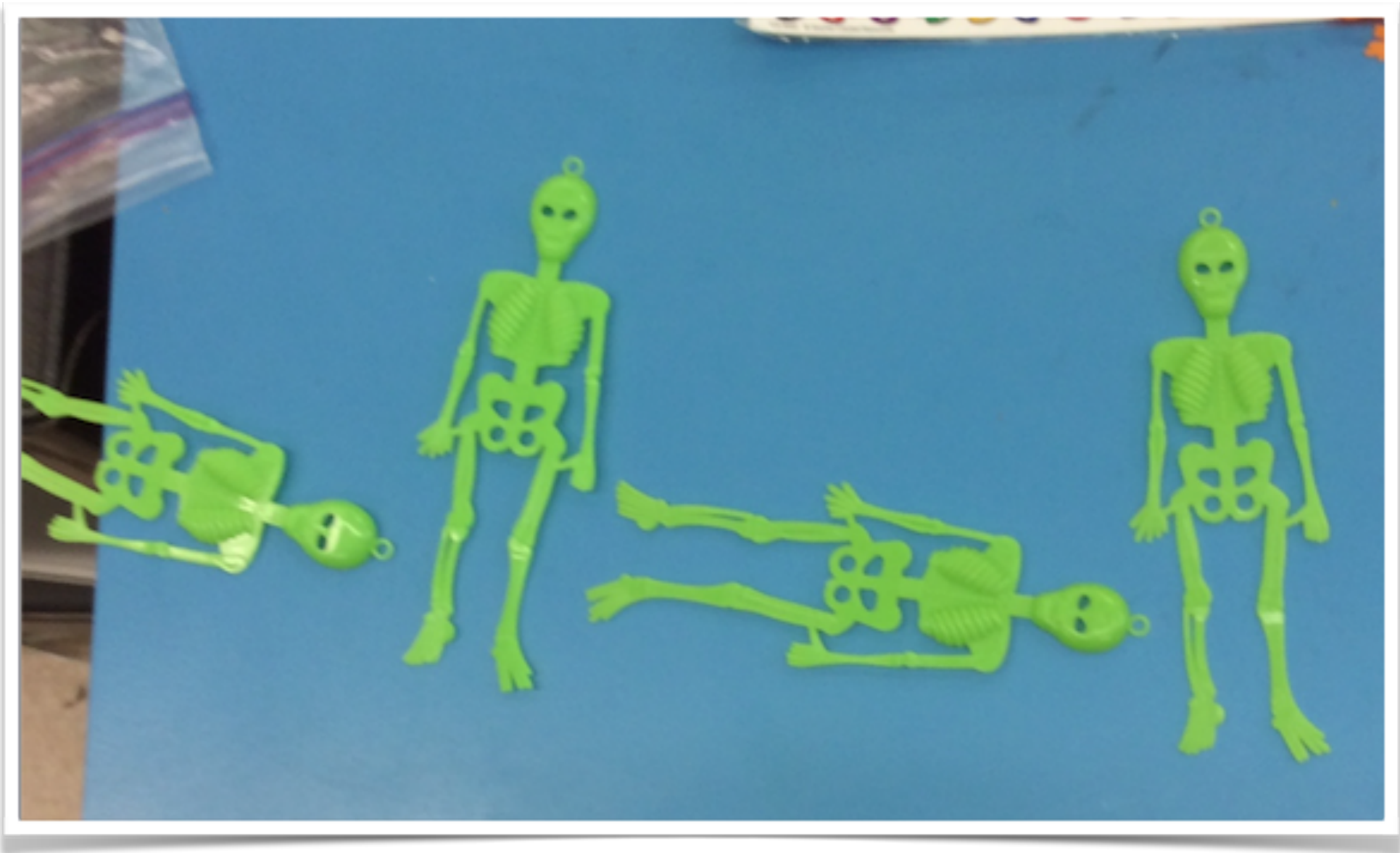
“Tell me about your pattern”  
“Is it similar to something you saw in the book(s)?”





“How would you extend this pattern?”  
“What goes here?” - pointing to both ends





“Can you make a pattern with only one item?”  
“Describe your pattern”



“Is this pattern correct?”

“Can you spot the mistake?”

“How would you fix-it?”

“Can you extend this pattern?”

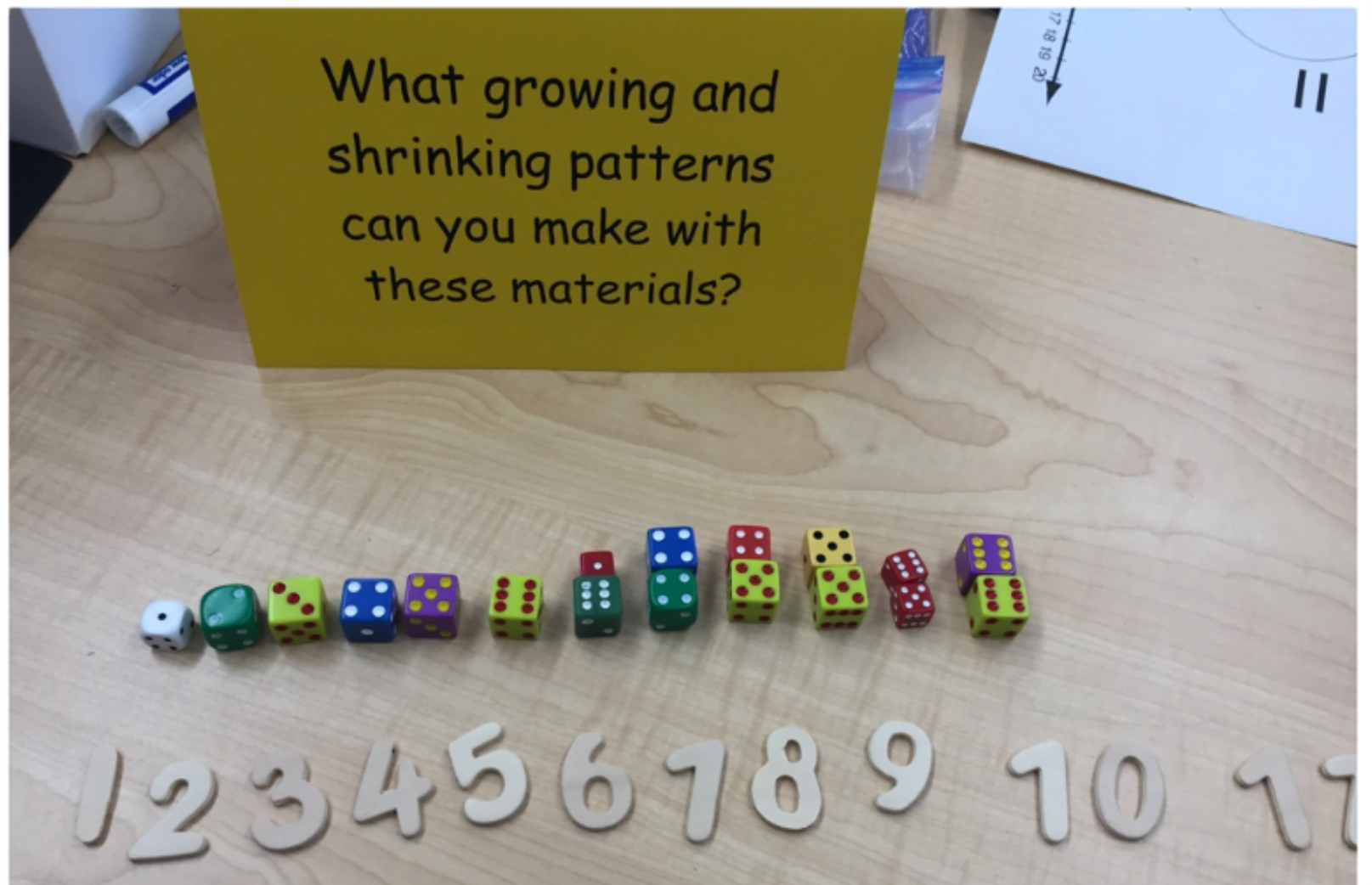
“Can you make the same pattern another way?”



What growing and shrinking patterns can you make with these materials?

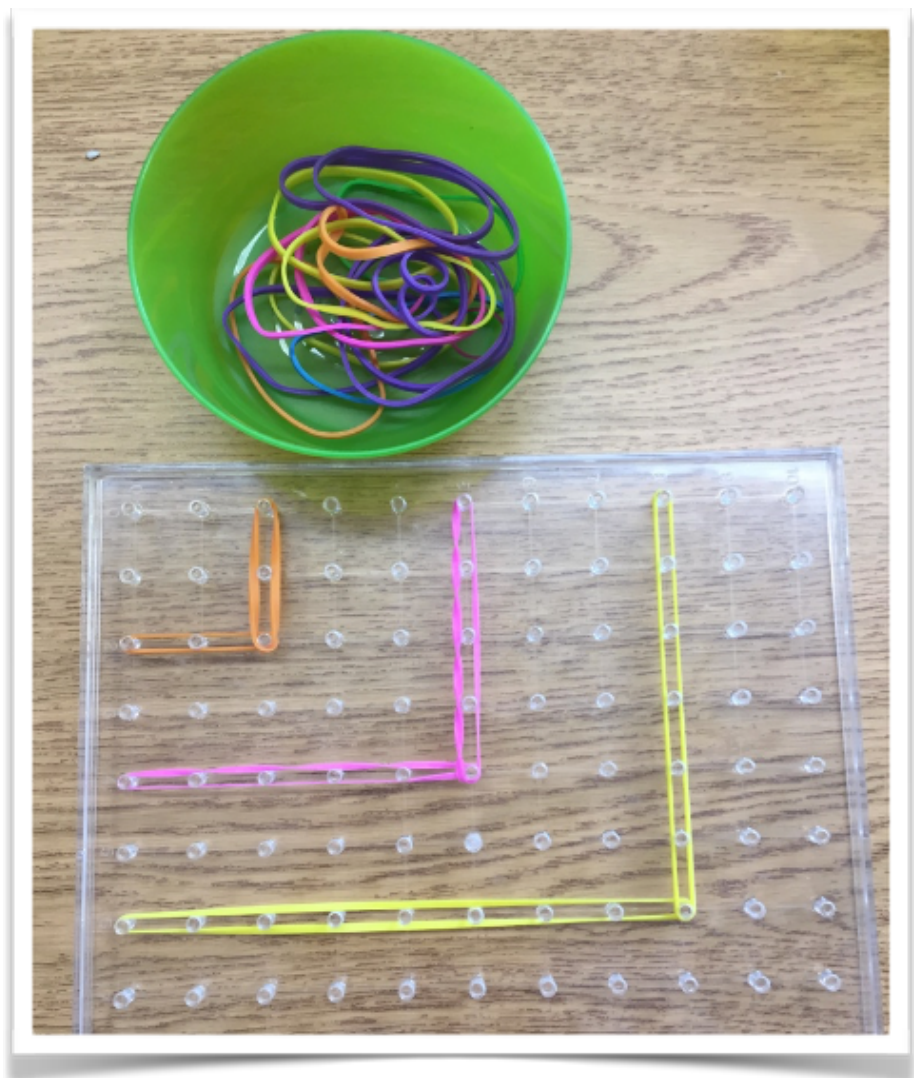


What growing and shrinking patterns can you make with these materials?



“What shrinking and growing patterns can you make with these materials?”  
“Can you describe your pattern?”  
What is your pattern rule?”





“Can you describe your pattern?”  
How are yours and your friend’s patterns  
alike and different?”

What patterns do  
you see?

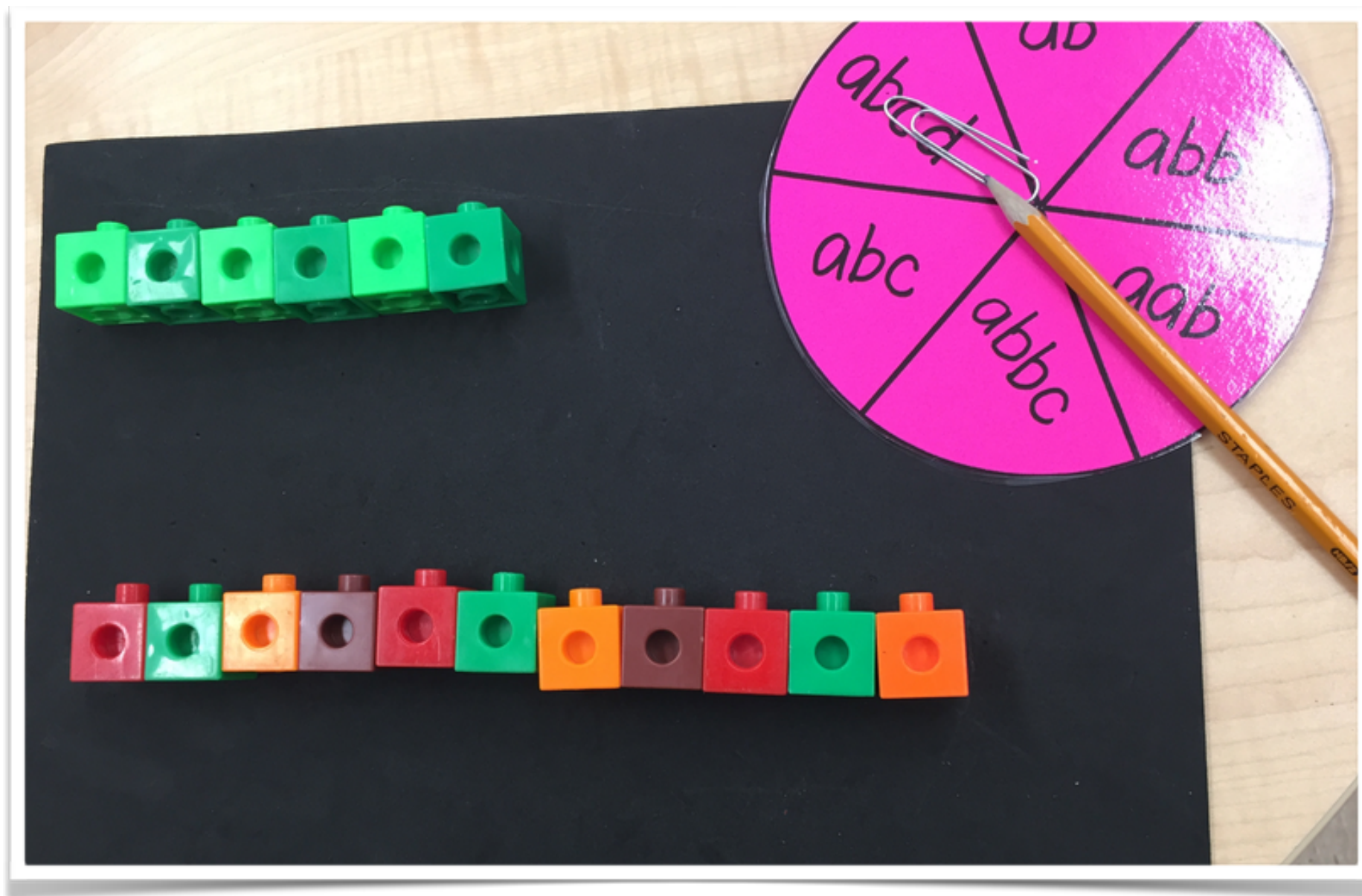
“What patterns  
do you see?”

What is your  
pattern rule?”

Hundred Chart

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100





“Can you make the same pattern another way?”

# Using images to inspire and invite!



The pegboard and idea came from Sandra Ball

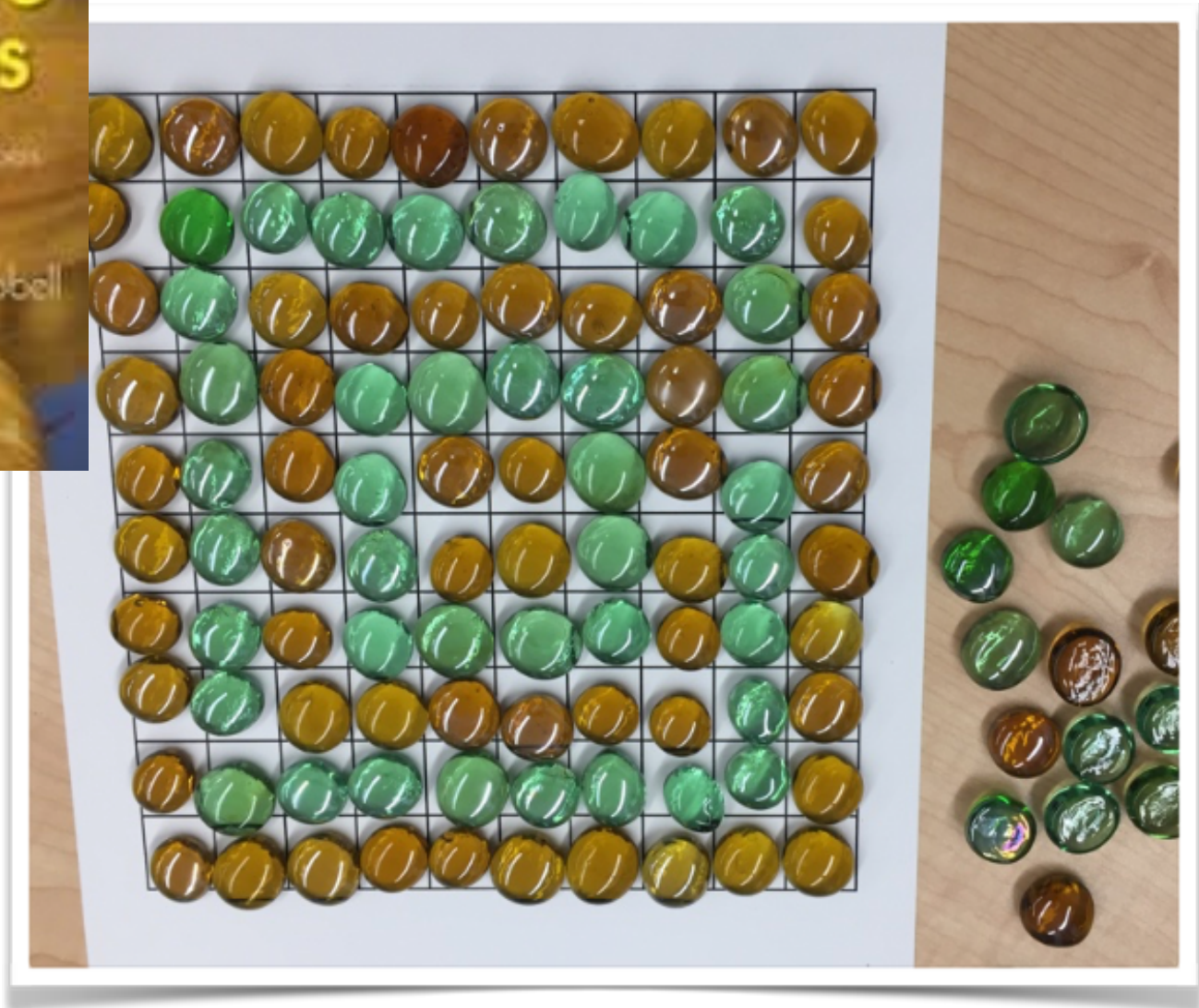
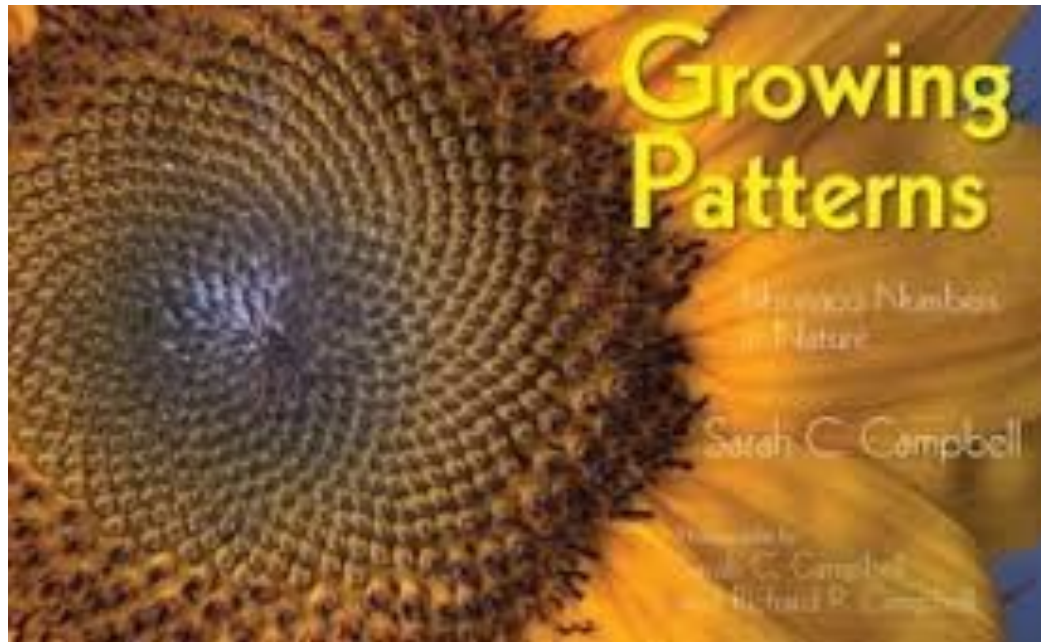


# More children's books!



“What patterns can you create?”

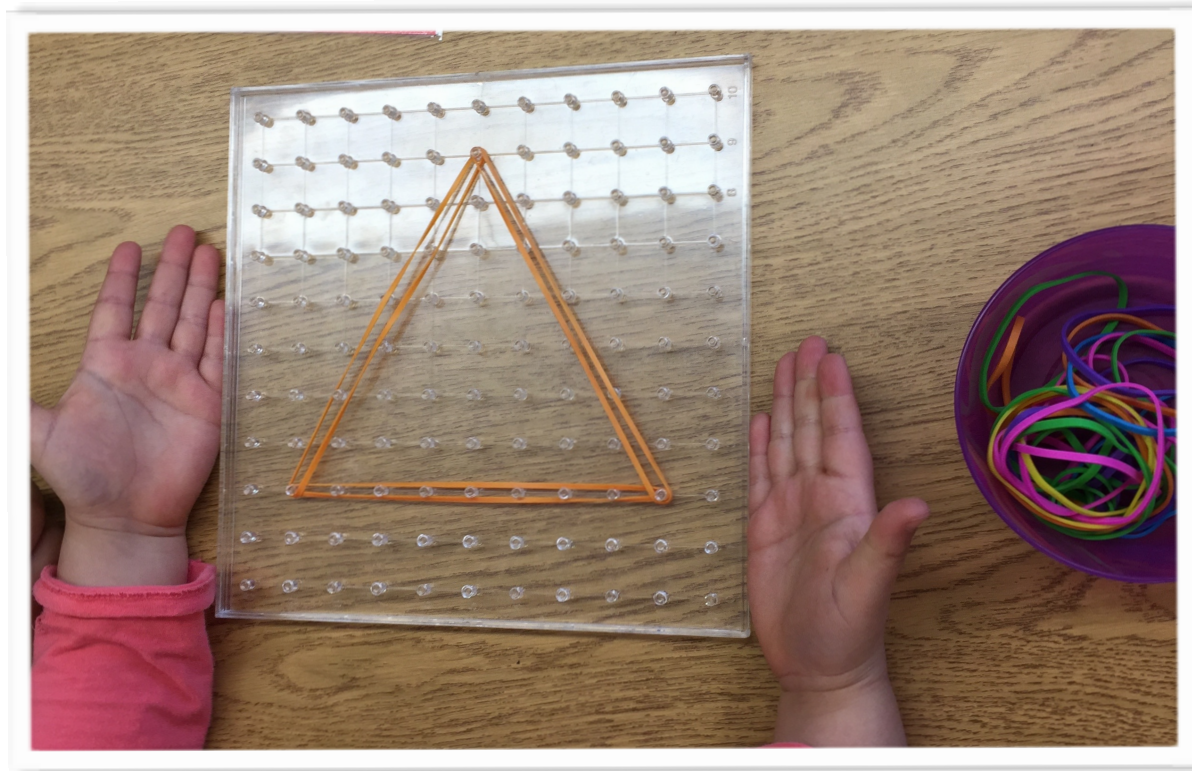




“What growing patterns can you create?”  
“Describe your pattern.”



# SPATIAL TASKS: 2D shapes and 3D objects:



“What shapes can you build?”  
“Can you build these shapes?”



Which shapes are  
similar?





“What shapes can you make with these materials?”

“Can you identify the shape you made?”

“Can you sort your shapes?”

“How are \_\_\_\_\_ and \_\_\_\_\_ alike and different?”

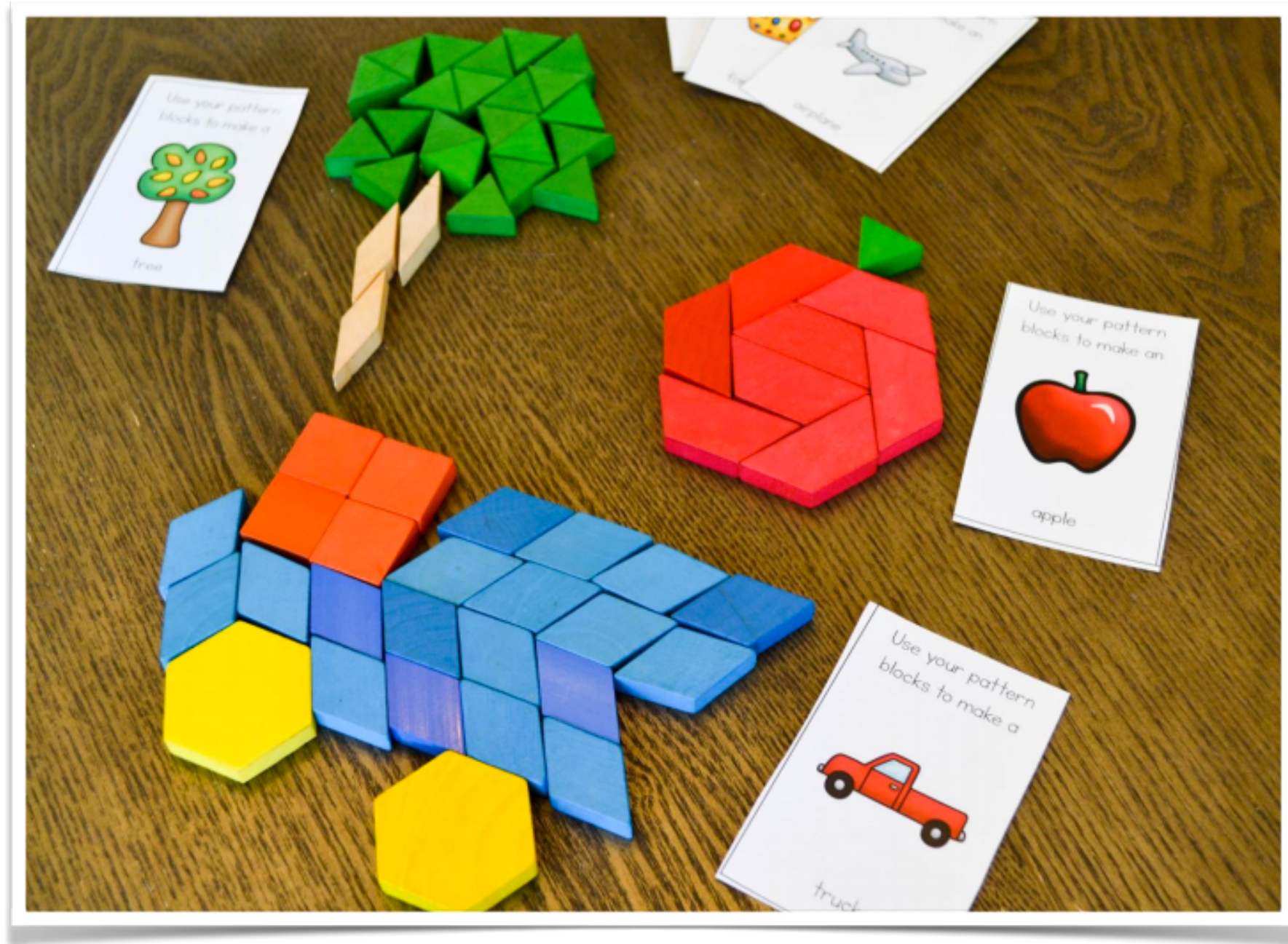




“What shapes do you see on this page?”

Have clipboards at this centre with a blank piece of paper and a question “What shapes do you see in your environment?”



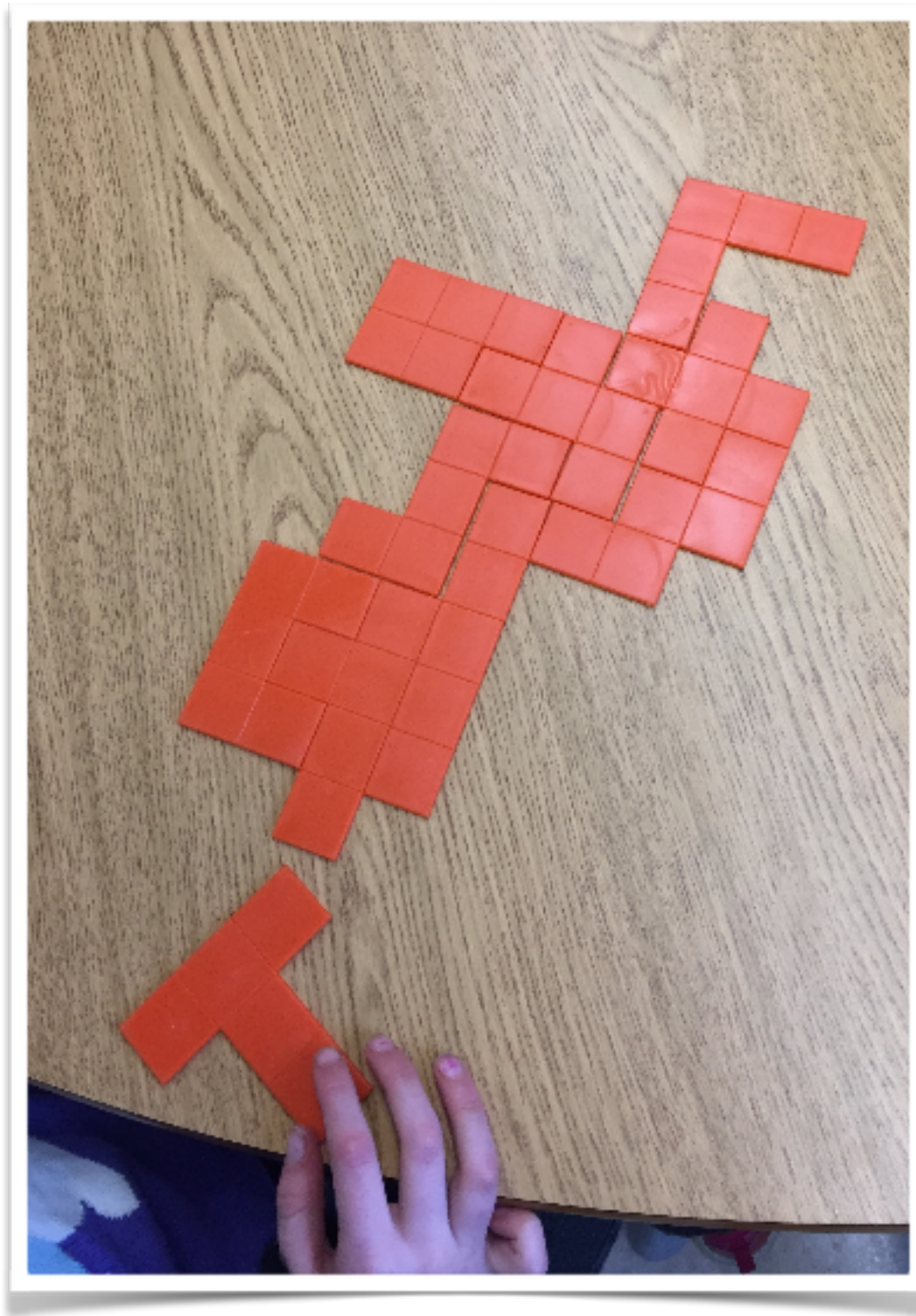


“Can you combine shapes to make an object?”

“Can you make the same object using different shapes than the ones you used?”

“How many shapes did you use to make your object?”





“What objects can you make with pentominoes?”  
“Can you make a square, a rectangle, or a triangle with your pentominoes?”

# SPATIAL TASKS: 3D shapes



“How many edges or vertices do you feel?”

“What faces do you feel?”

“What does this shape remind you of?”

“Can you identify this 3D shape?”

“Where do you see this shape in your environment?”





“Can you use the straws and connectors to help you determine how many vertices and edges this shape has?”

“What are the faces of this shape?”  
“How many faces does it have?”

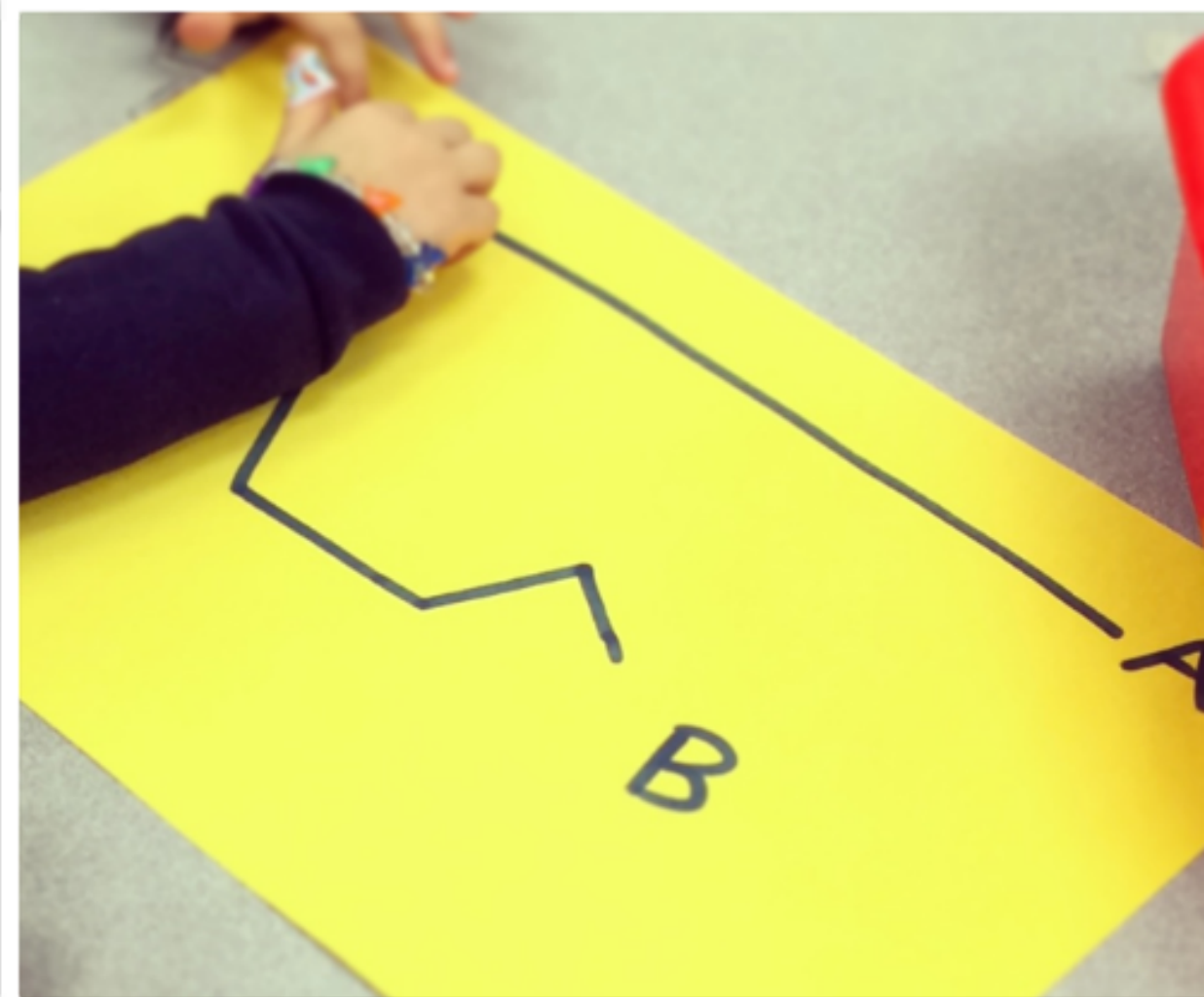


# Measurement: Non-standard



“Can we use cubes and paperclips at the same time to measure?”

“Which line do you think is longer?” Explain your thinking.  
“How might we find out?”







“Tell me about how you ordered these items?”

# How Many Conversation Hearts Will Fit on This Heart?

My Guess 5



Actual 19

“Was your guess reasonable? Why or why not?”  
“Can you draw a heart that might hold 50 hearts?”



More inspiration and invitation from children's books!

“How tall is the gorilla's hand?”  
“How much taller is the gorilla's hand than yours?”



“What wonders do you have?”  
“What would you like to explore?”

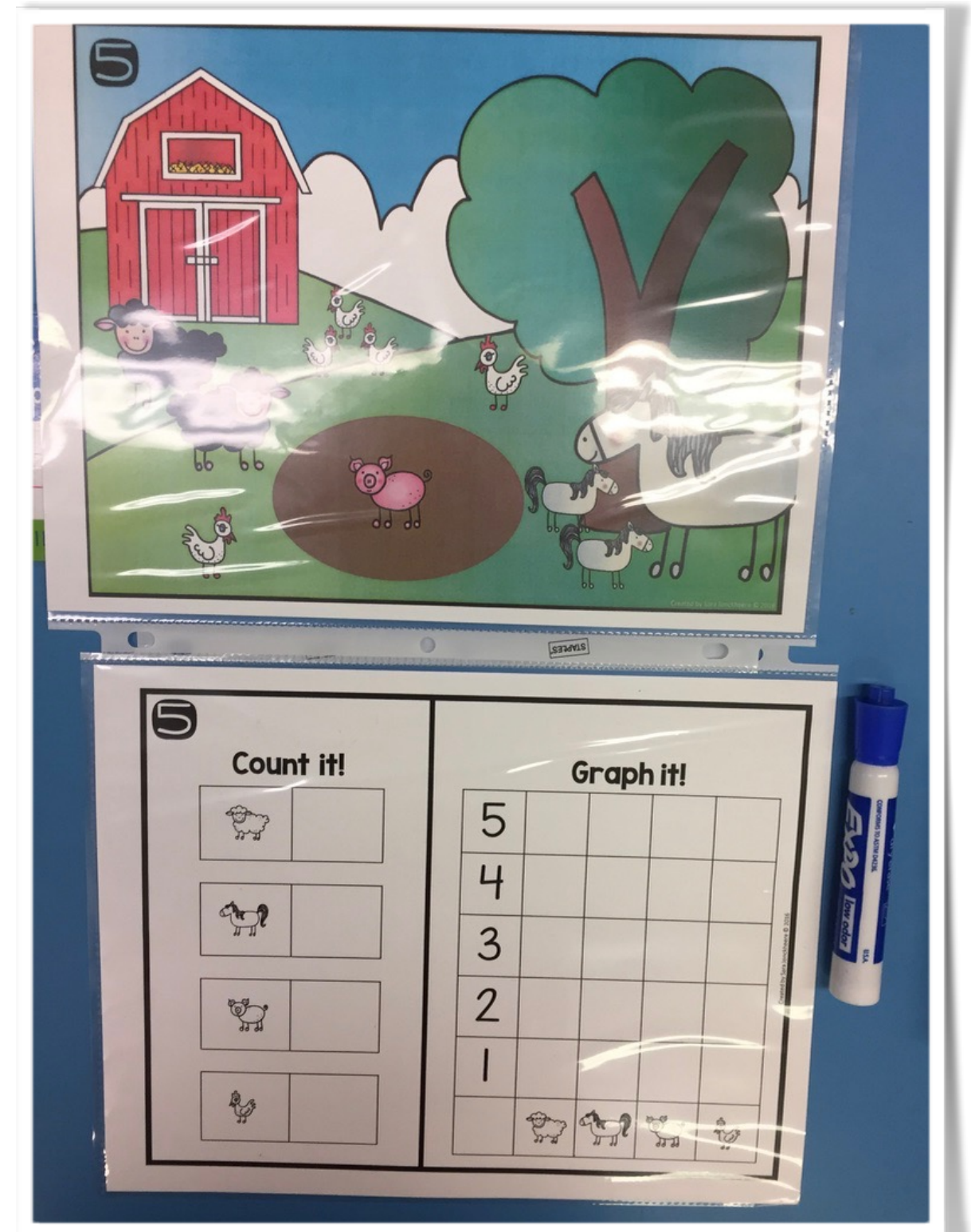
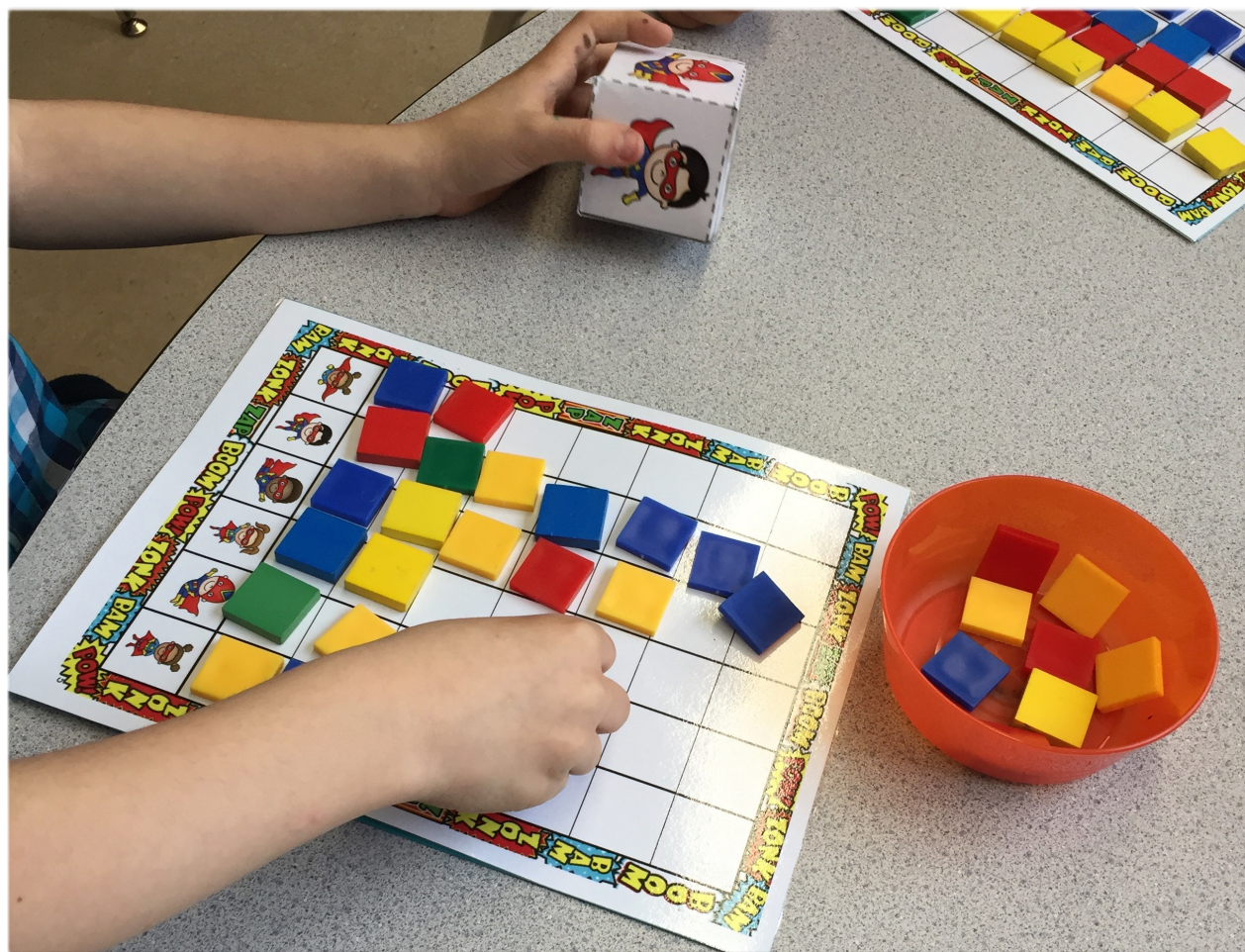




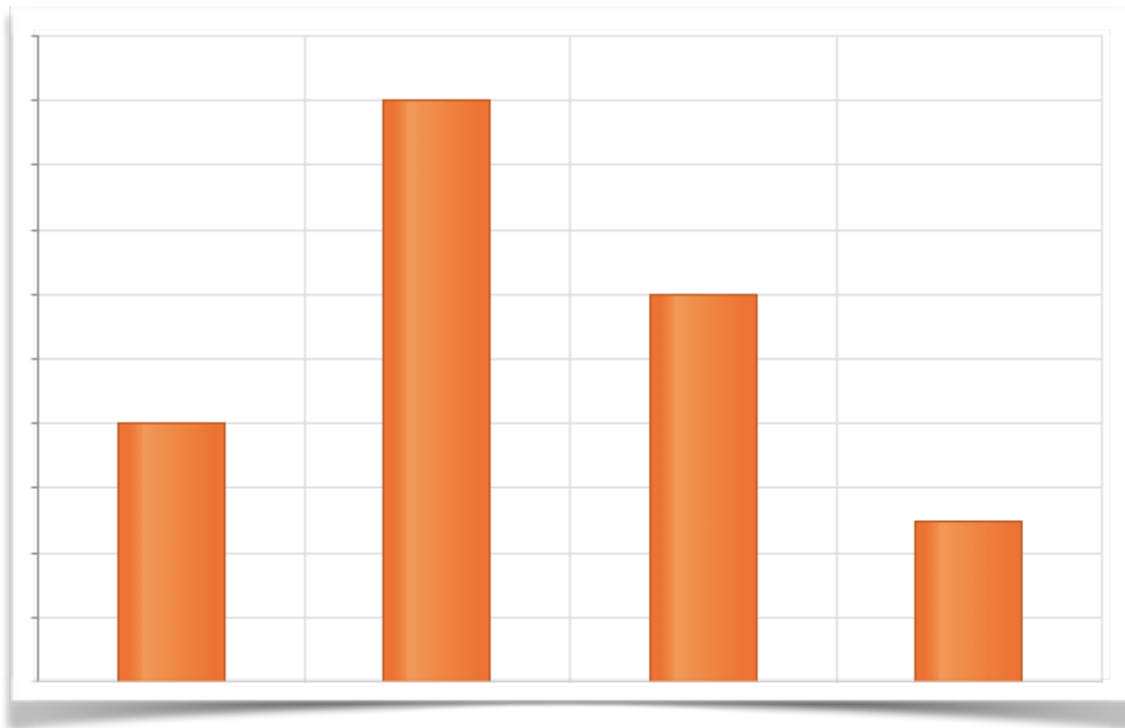
# Data Analysis:

“Which do you predict you will roll the most?”

“Tell me about your graph.”







Place a graph on chart paper.  
Ask “What story might this tell?”

Or what information can be learned  
from our Question of the Day?  
Leave chart paper out for students to  
record their ideas!

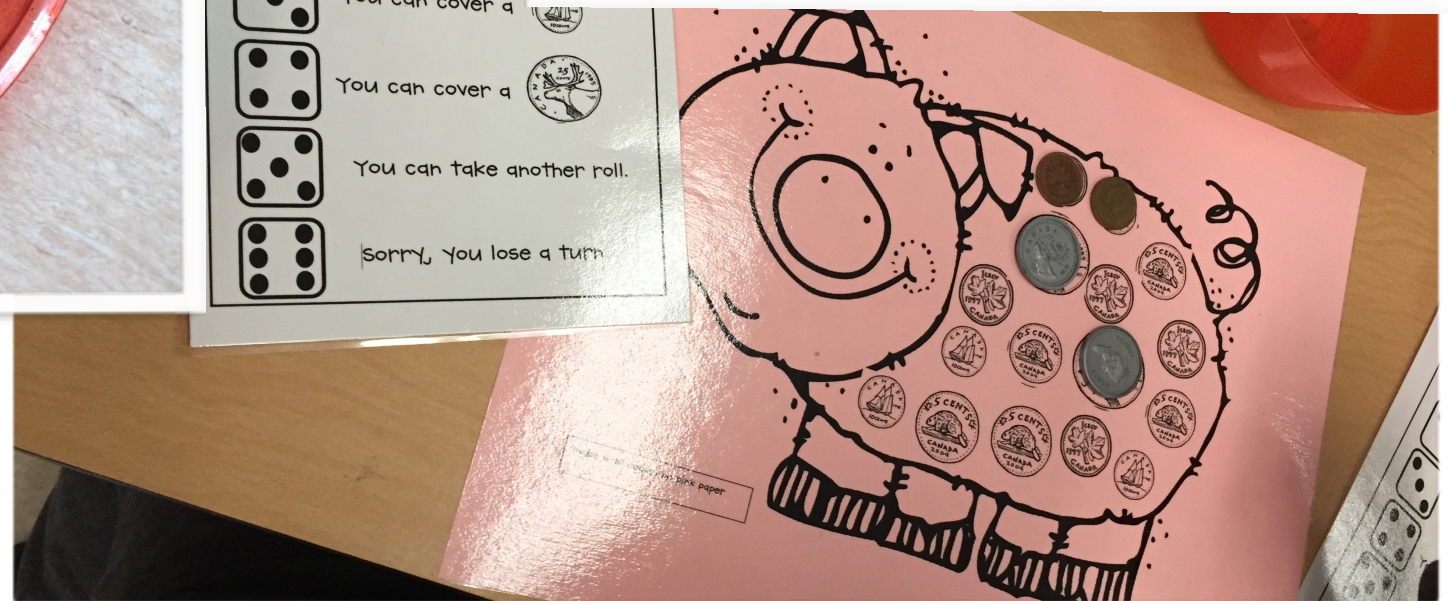
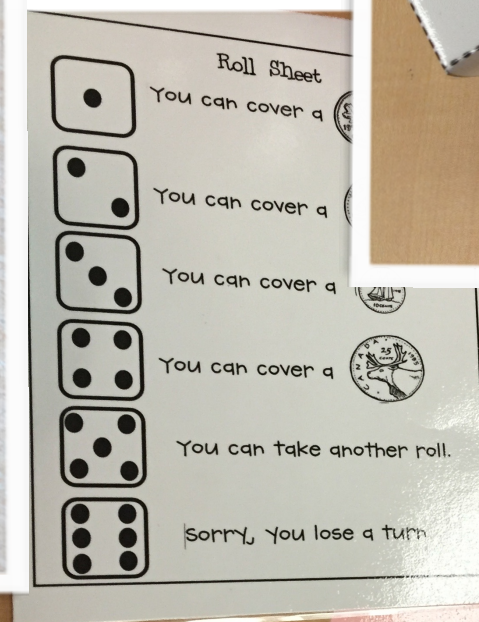
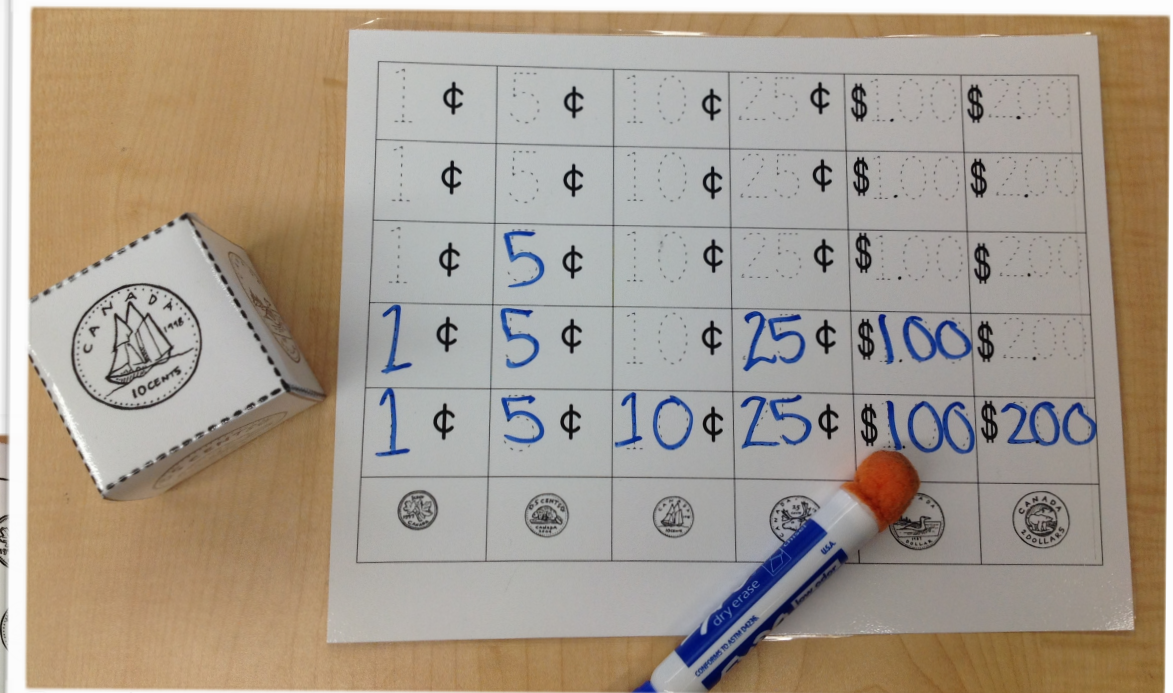




# Financial Literacy

“What do you notice about the coins?”

“How are they similar? How are they different?”

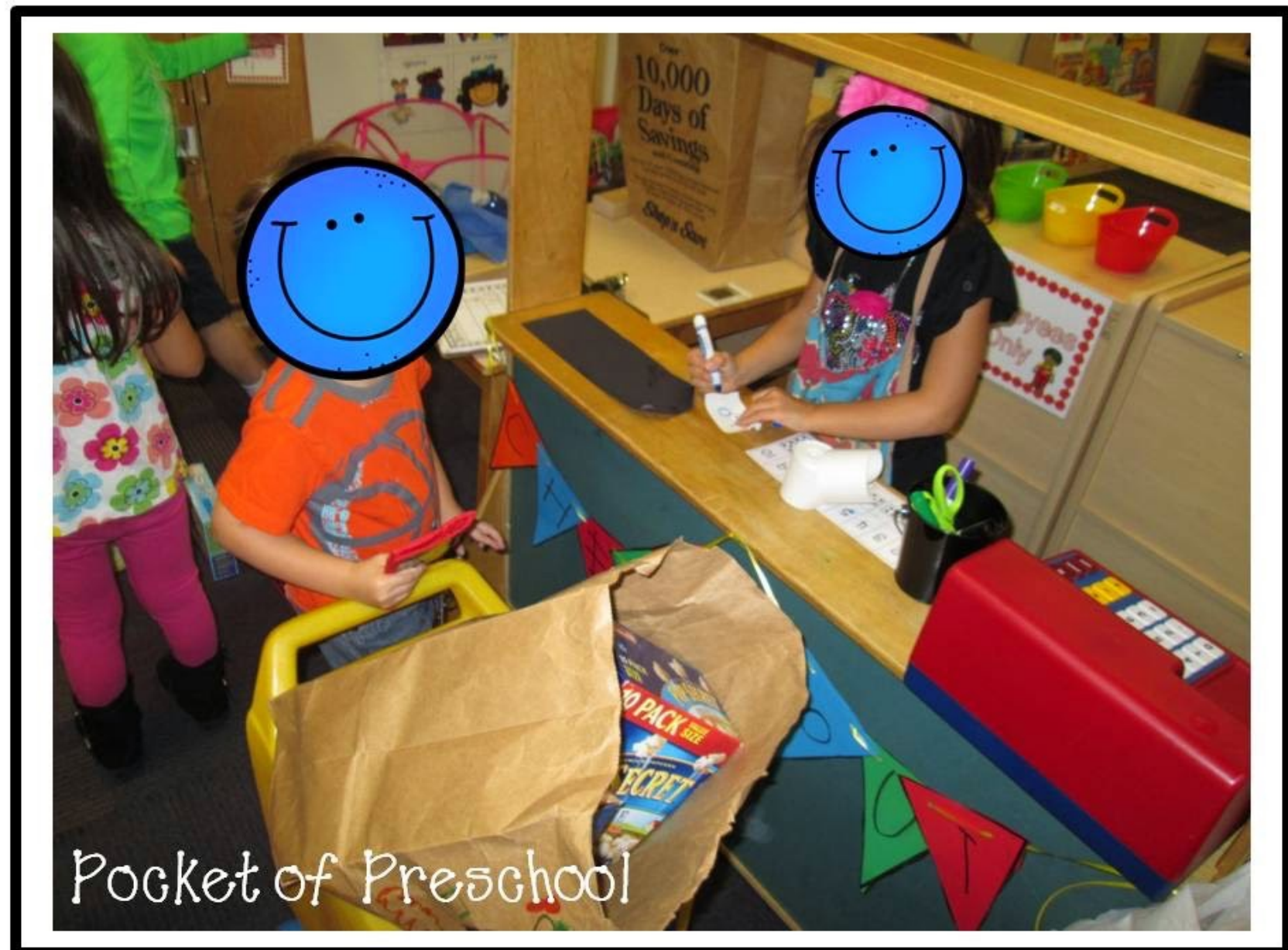




A store centre is a great way to have student engage in role-playing to explore money as a medium of exchange!



Provide blank shopping lists  
Pretend credit cards  
Coins and bills  
Flyers



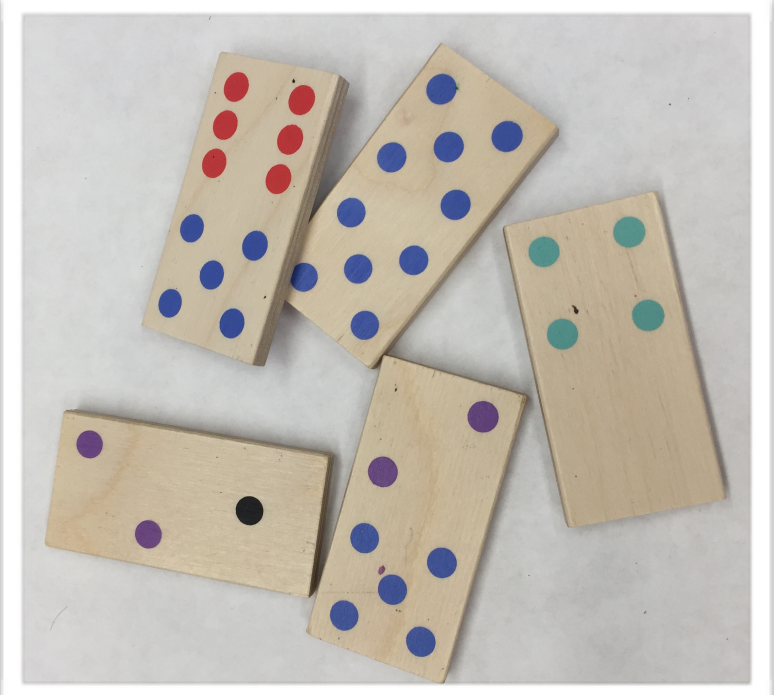




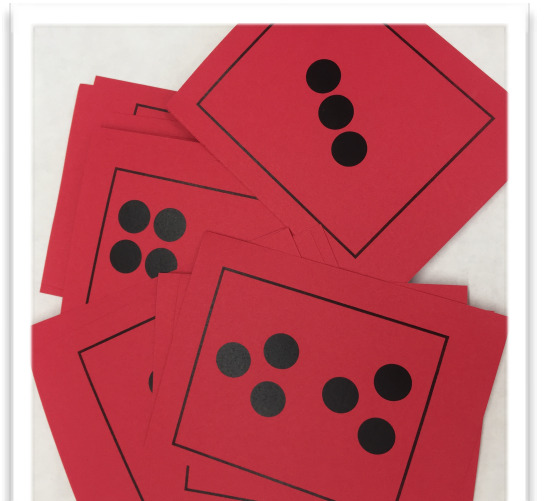
“How many different ways can you make \_\_\_\_\_ cents?”  
“How can you make \_\_\_\_\_ using the fewest coins? Most coins?”

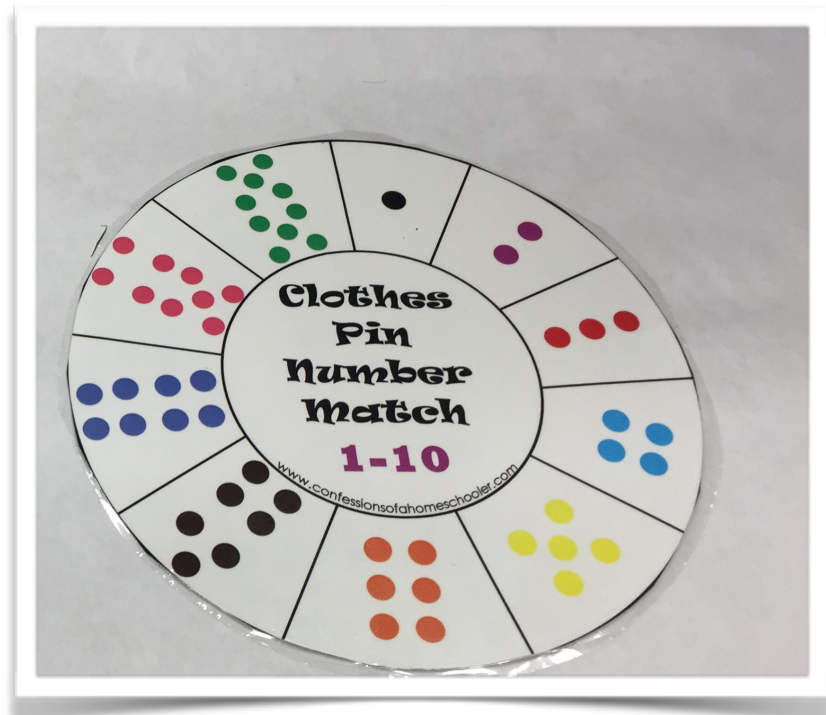


# NUMBER: Subitizing



“How many dots do you see?”  
“How do you see them?”





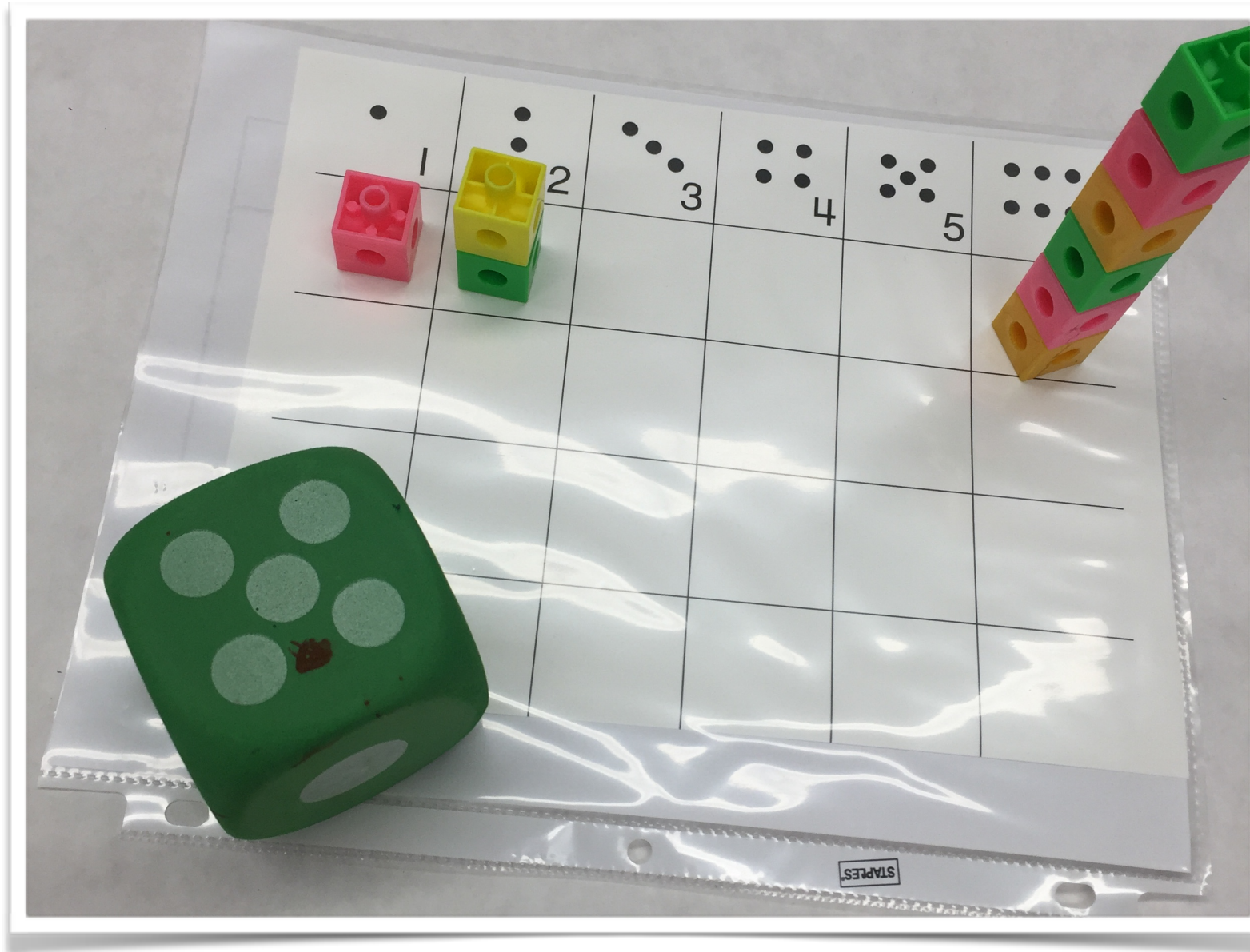
Draw with a  
q-tip

“How many dots do you see?”

“What number matches that quantity?”

“What does the corresponding numeral look like? Can you use a q-tip to write it?”



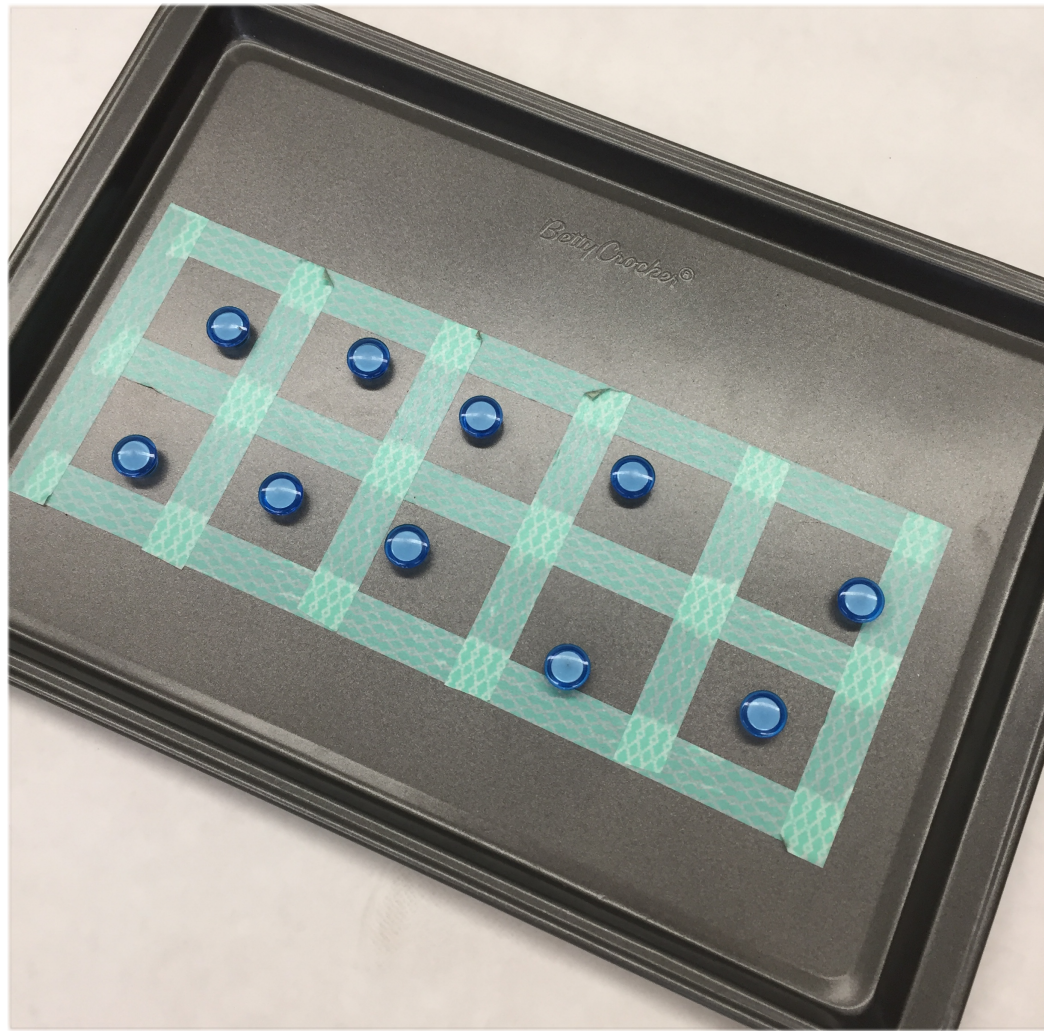


“How many dots do you see?”

“Can you build that quantity?”

“What number do you think you will roll the most? The least?”

Adapted from Carole Fullerton's Number Sense for K/1



“How many do you see?”

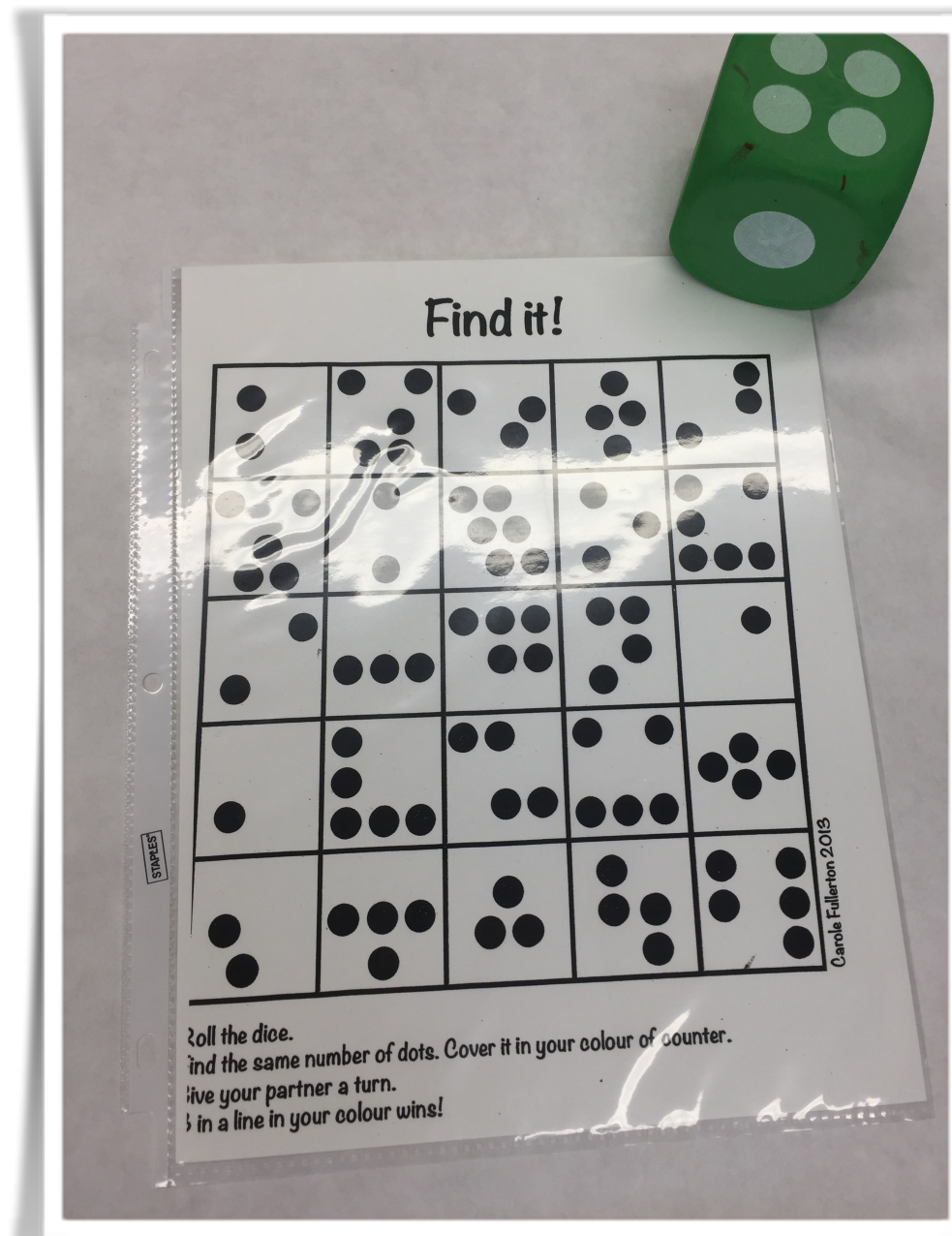
“Can you build the amount you see?”

“Can you show me on your fingers how many more are  
needed to get to 10?”

“How might you record this as a number sentence?”

“Can you see it a different way?”



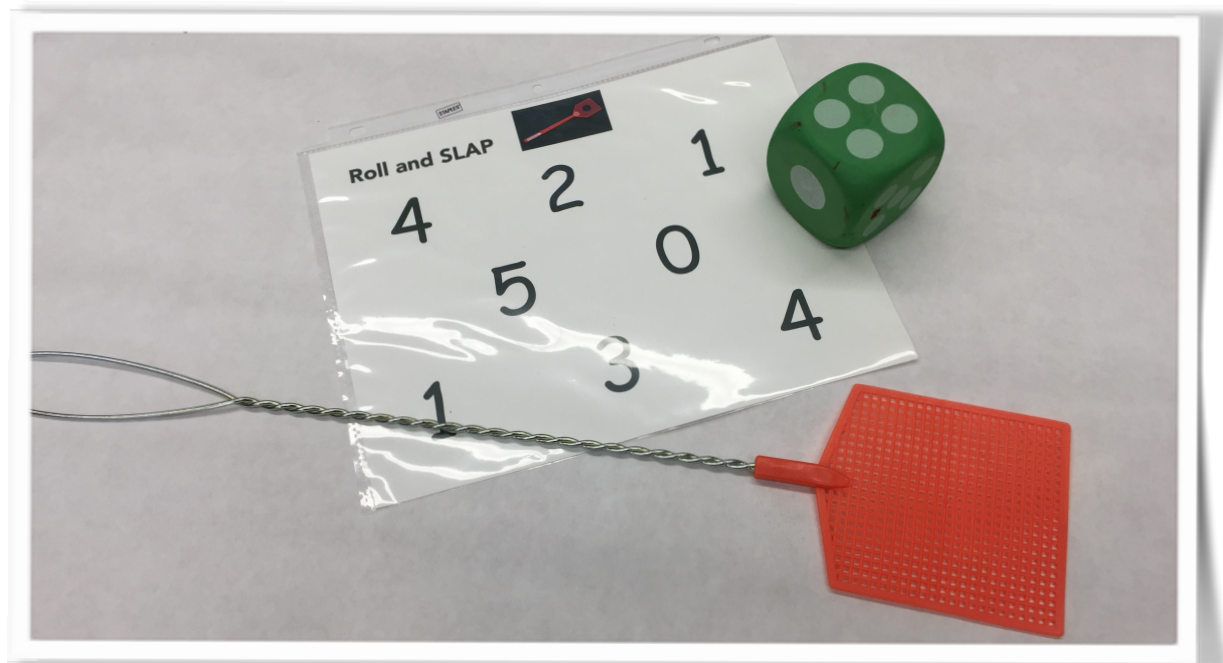


“How many dots do you see?”  
“Can you build that many?”

“What did you roll?”  
“Can you spot the same quantity?”  
Also, provide numeral dice.

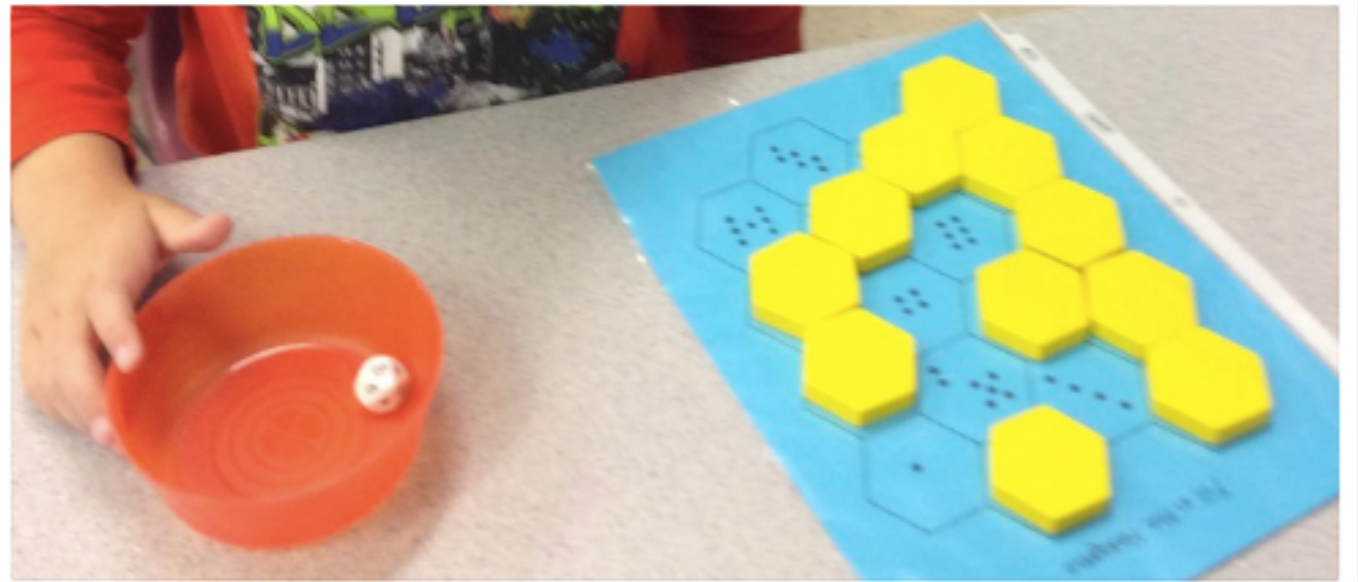






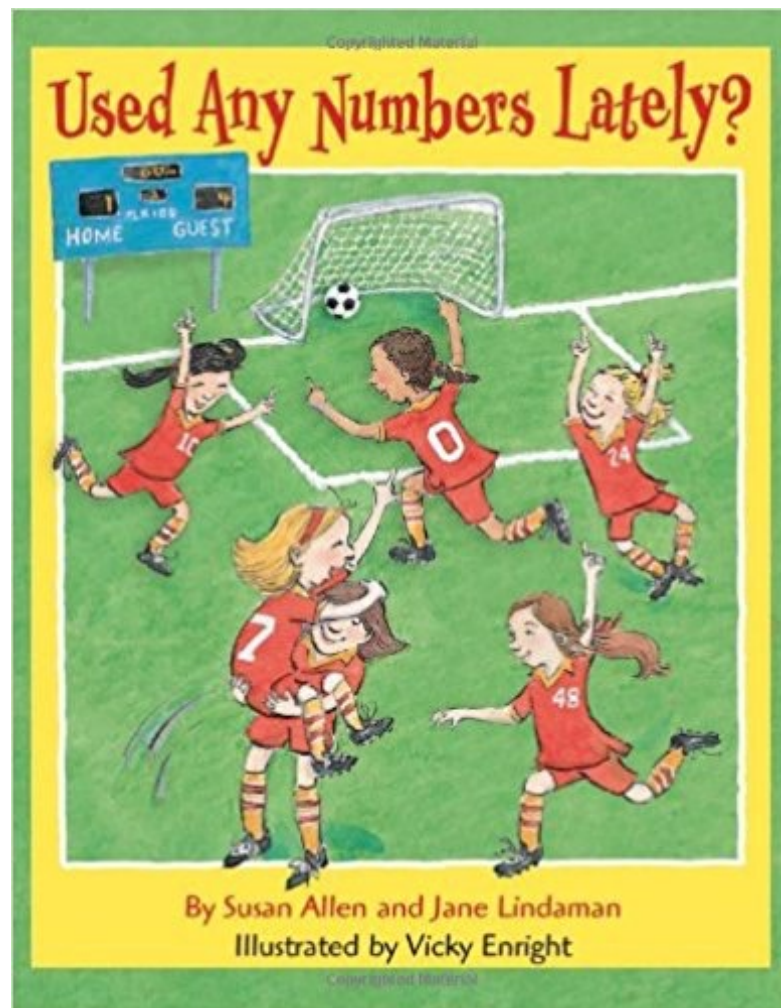
“Build a City” is from  
Building Number Sense K -2  
“Counting Activities” -  
Leaders Across Oregon  
Link on website





Hexagons activity from Sandra Ball  
[www.startingwiththebeginning.com](http://www.startingwiththebeginning.com)

# NUMBER: Awareness



“What numbers do you see in your world?”



# NUMBER: Counting

“Can you put your birds in order?”  
“Which number is the largest? Smallest?”



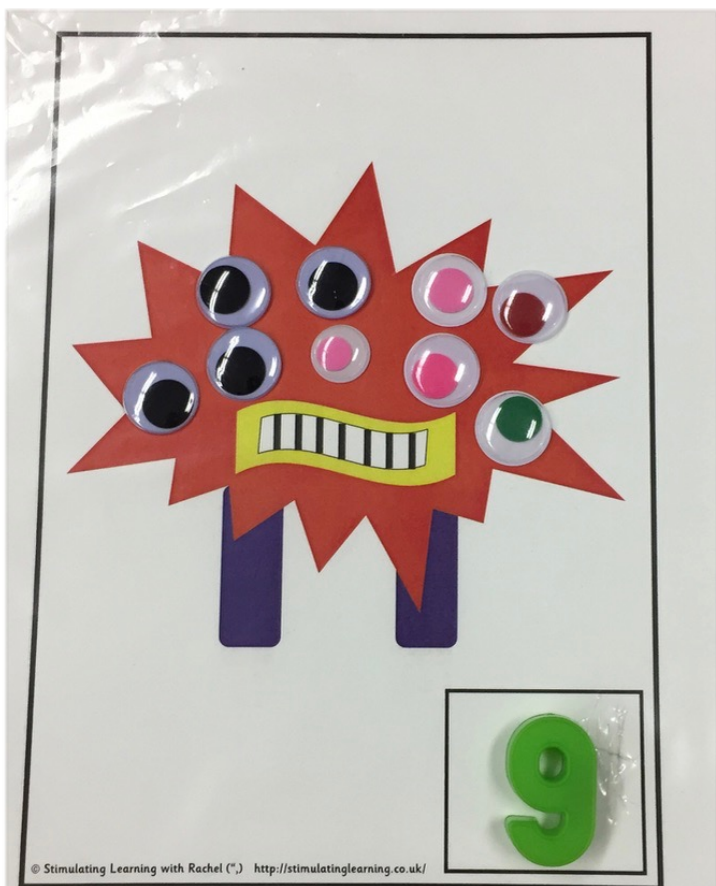
These can be found on many of the homeschooler blogs/websites.



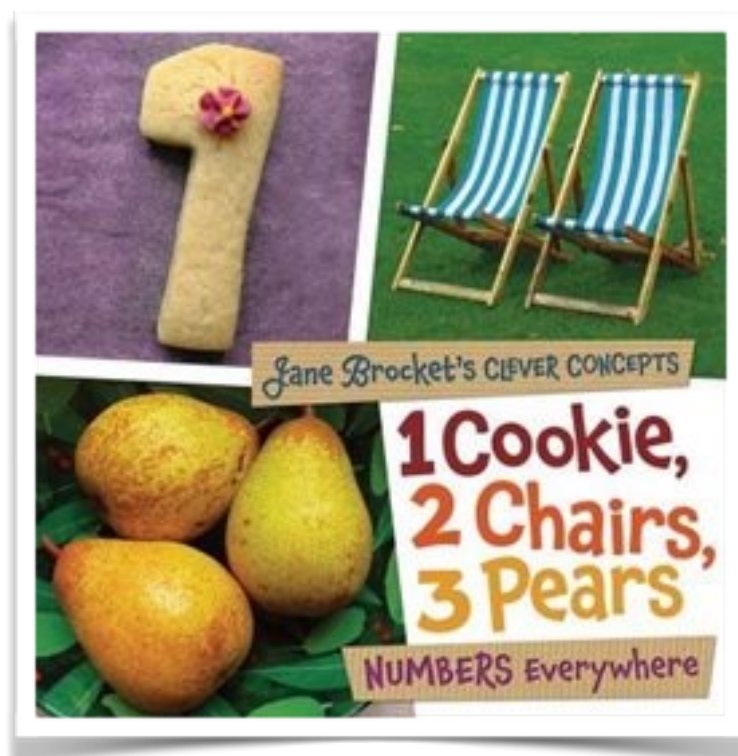
Note: Being able to count a quantity of items is easier than counting out a specific number, as students must hold that number in their heads as they count.



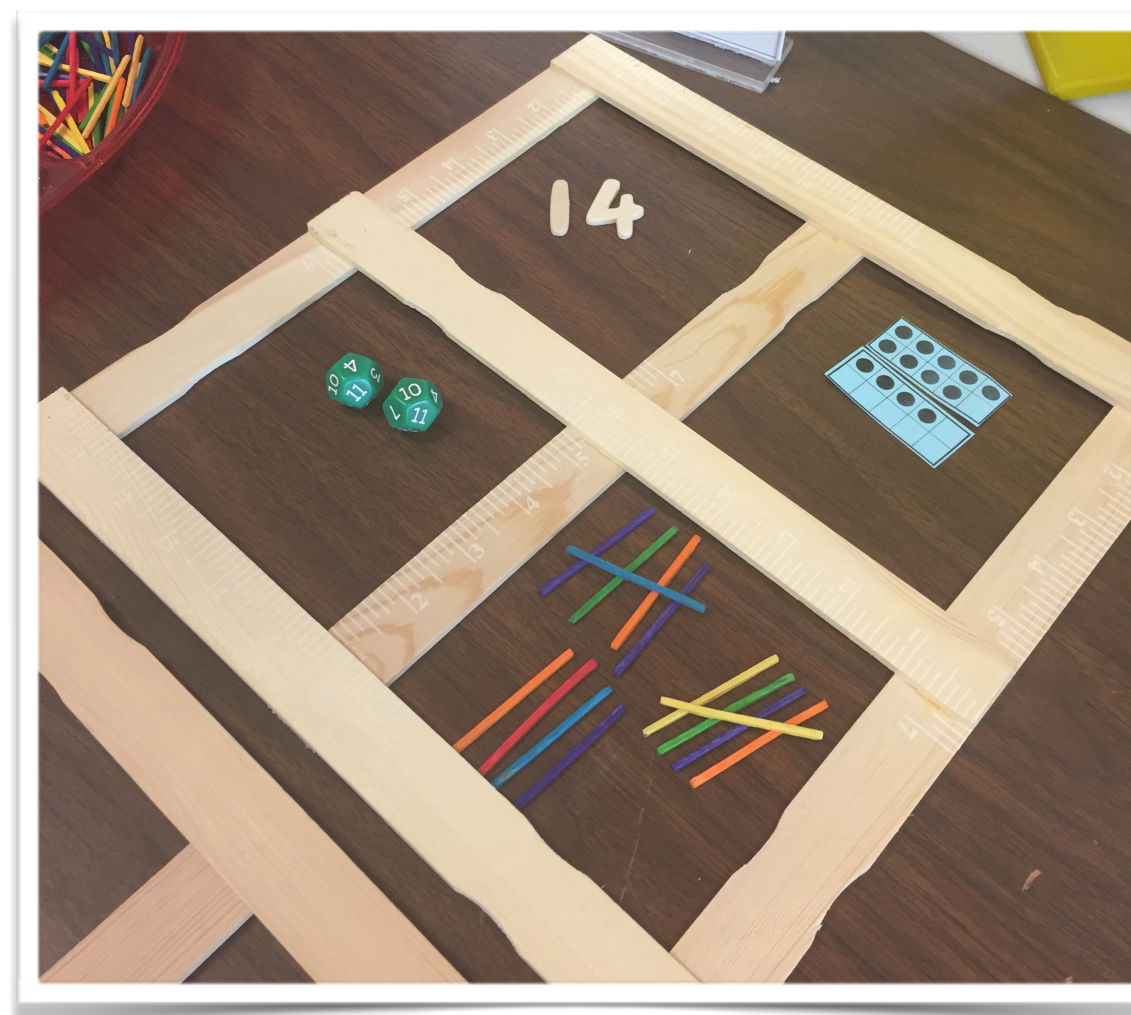








“How many different ways can you make \_\_\_\_\_?”



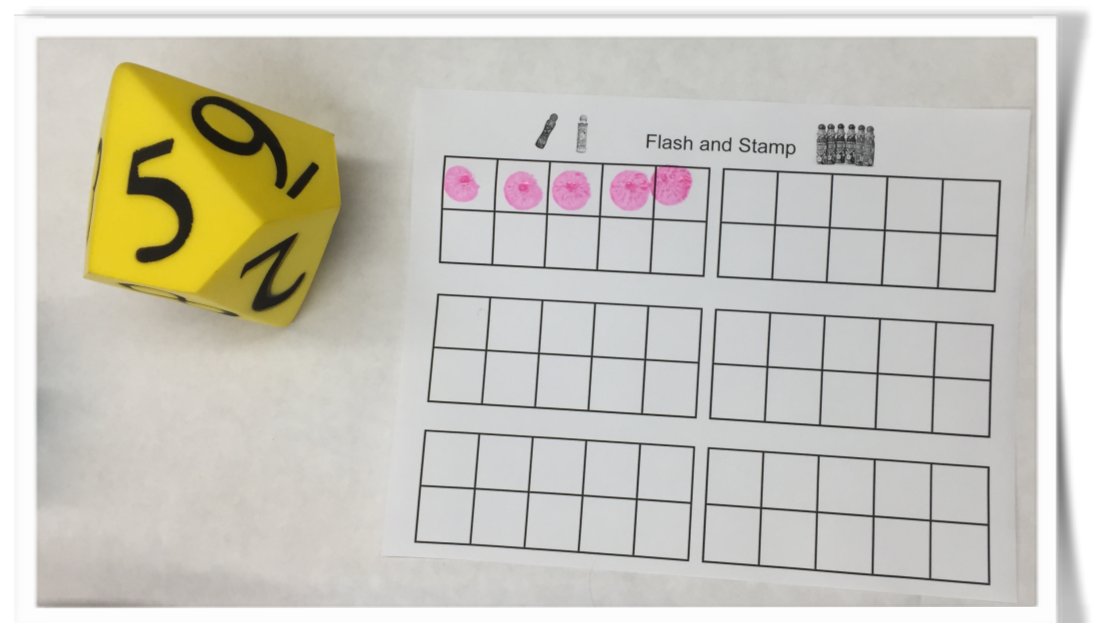




“How many more cubes do you think you will need to fill the cup?”

“How many more rolls do you think you will need to fill the cup?”

“How many more dots do you need to make 5 or 10?”







“Can you order your beaded rings? Or cupcake sprinkles?”

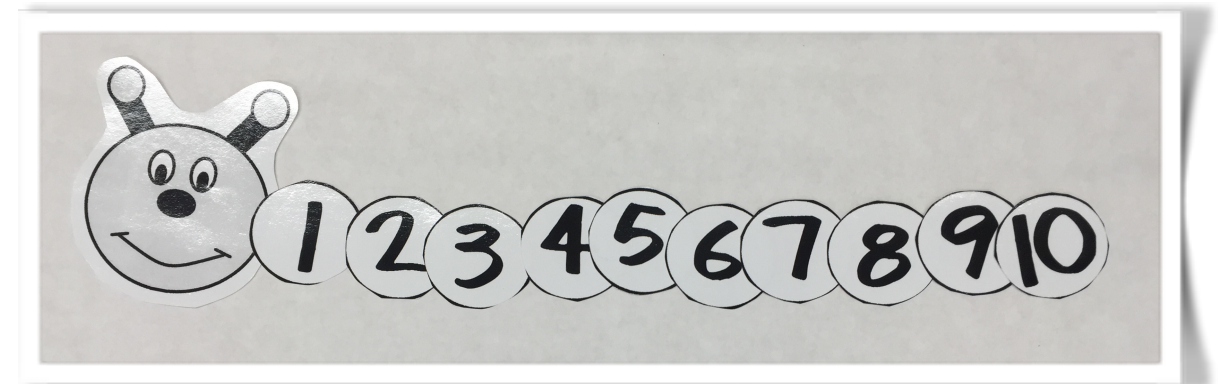




“Which is more 11 or 3?  
How much longer? How do  
you know?”



# NUMBER: Stable Order



“What numbers comes next?”

“What are the next three numbers?”



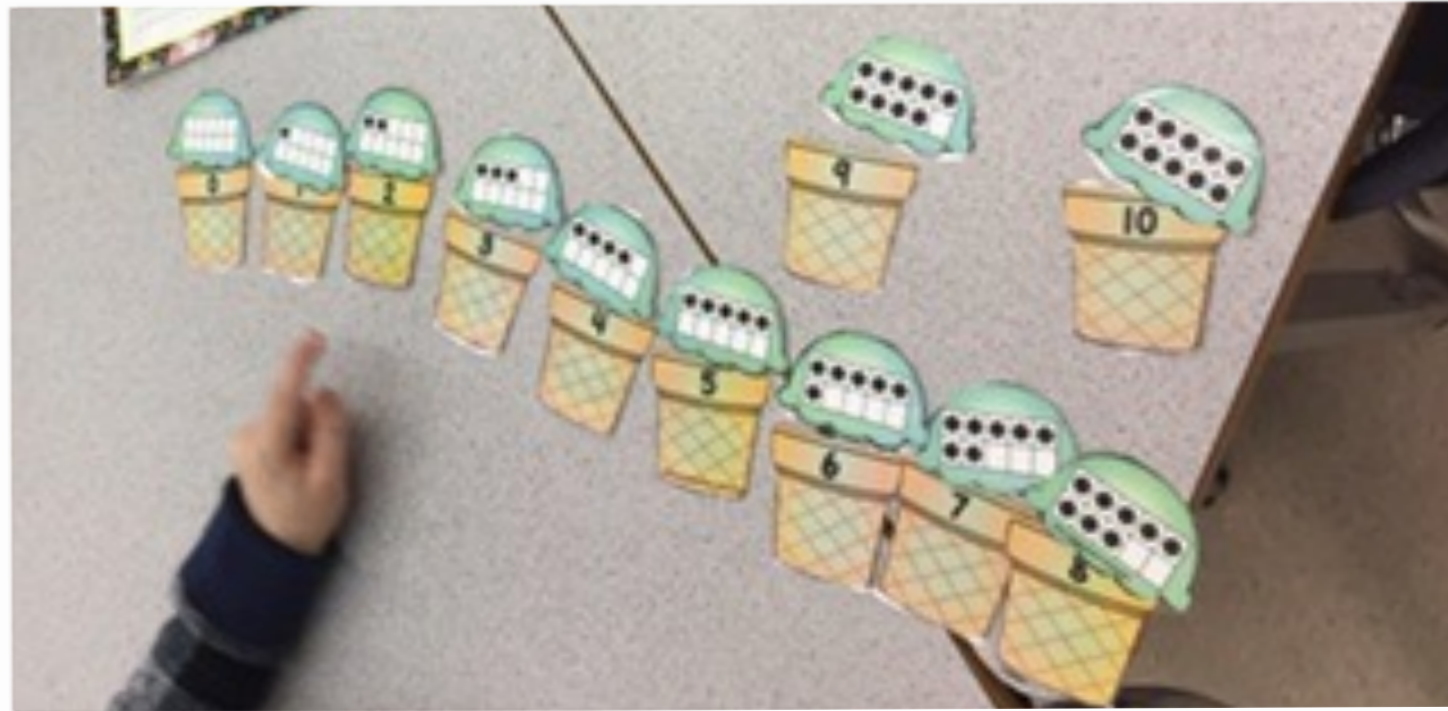
From Sandra Ball's website





“What did you roll?”  
“Can you find that number?”  
“What number comes next?”  
“And next?”





“How can you order these quantities?”

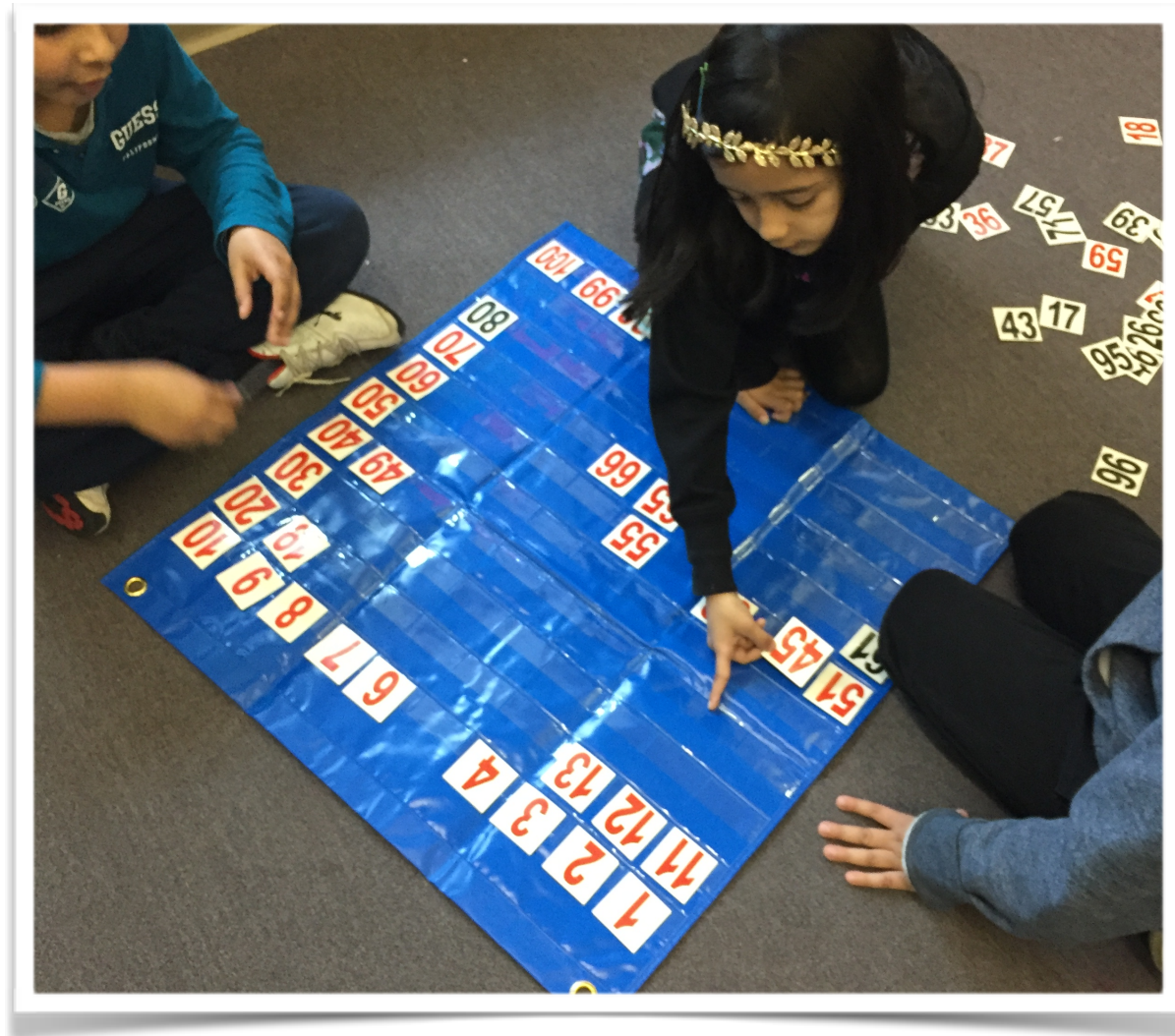




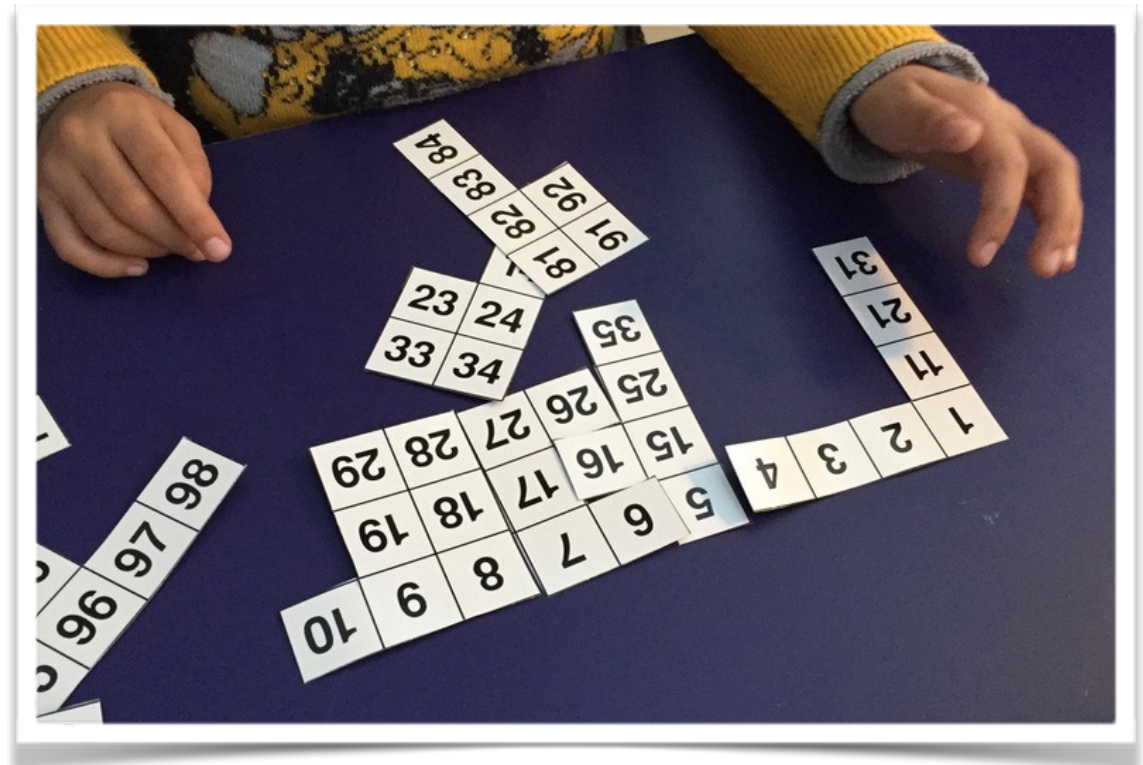
“What is the smallest number? The biggest? Where should those go? What number comes before this one? After? Do you notice any patterns?”



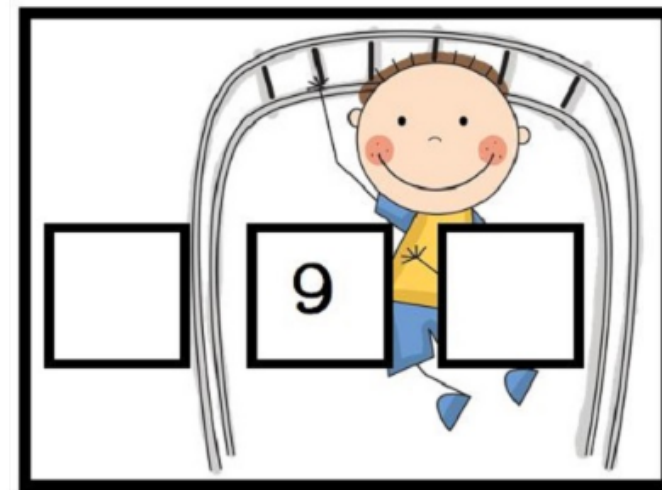
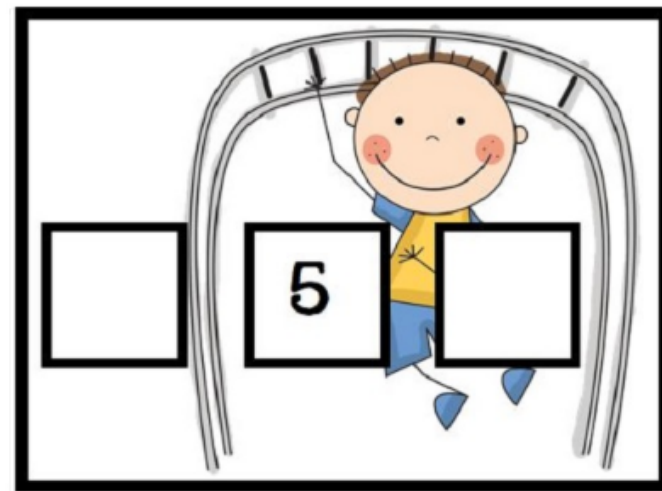
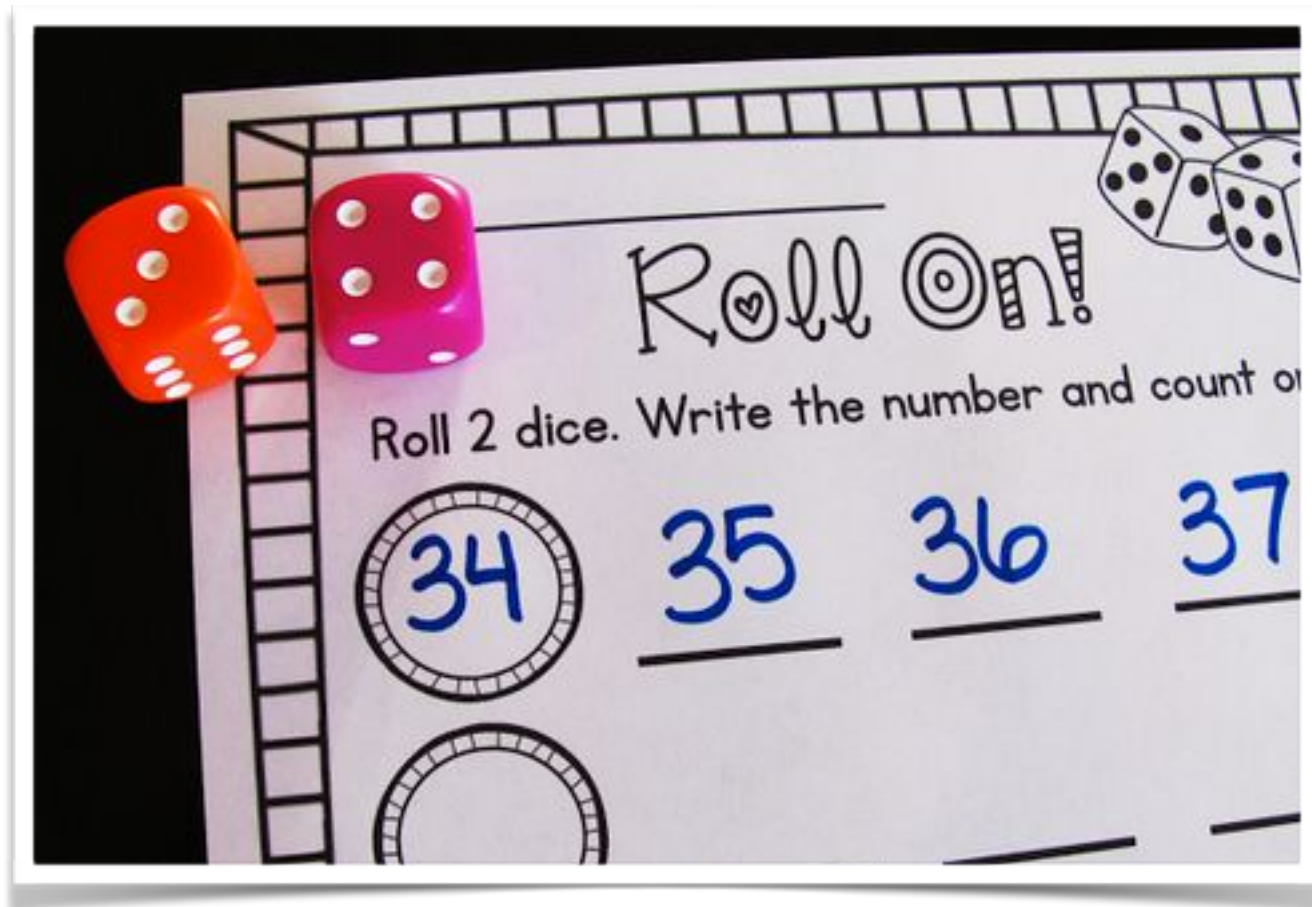
Working in a small group



Independently



“Why did you start with those numbers?”  
“Are there any patterns that you use to help  
you decide where the numbers go?”



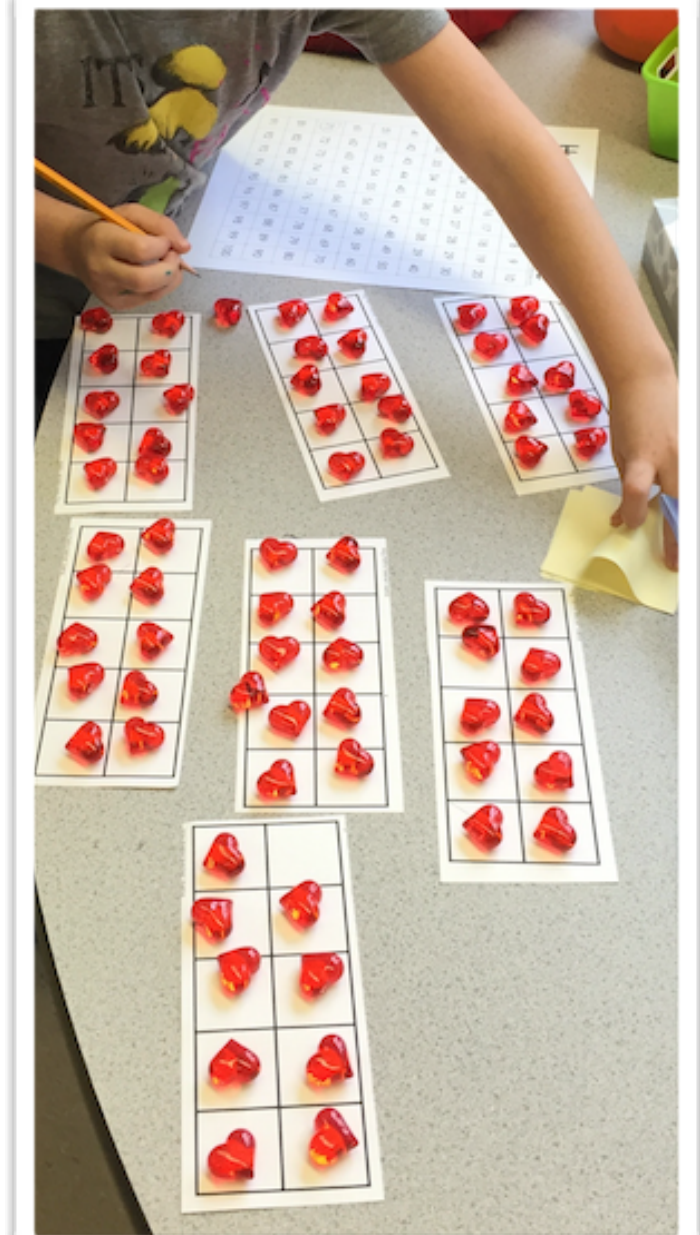
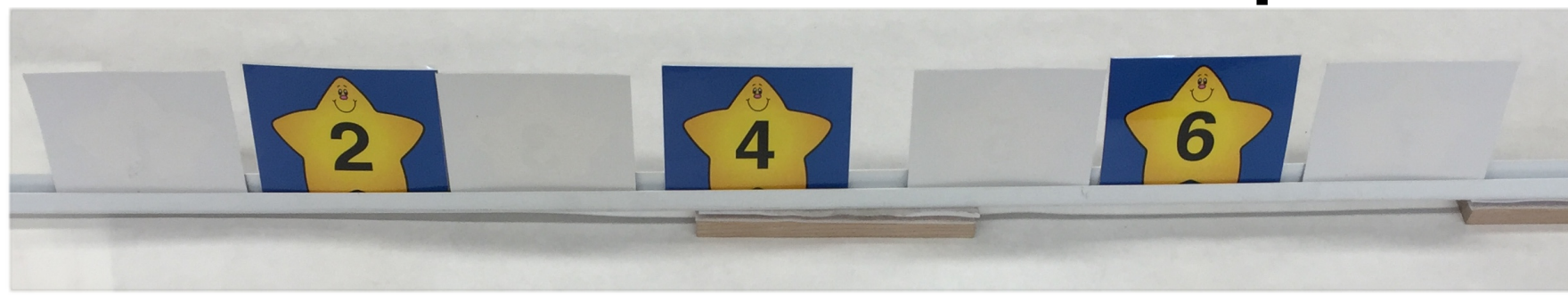
“What number comes before?”

“What number comes after?”

“What are the next two numbers?”



# NUMBER: Skip Counting

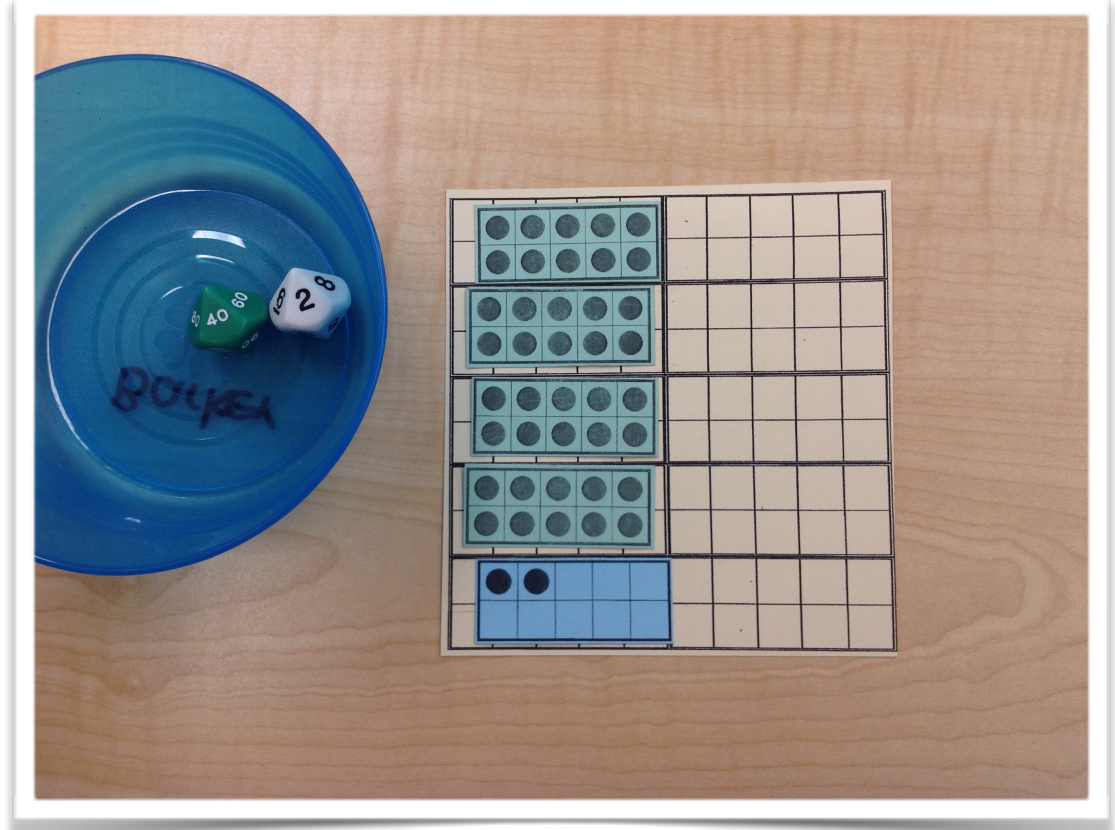


“How did you count?”

“If you count these items a different way,  
how many will you have?”



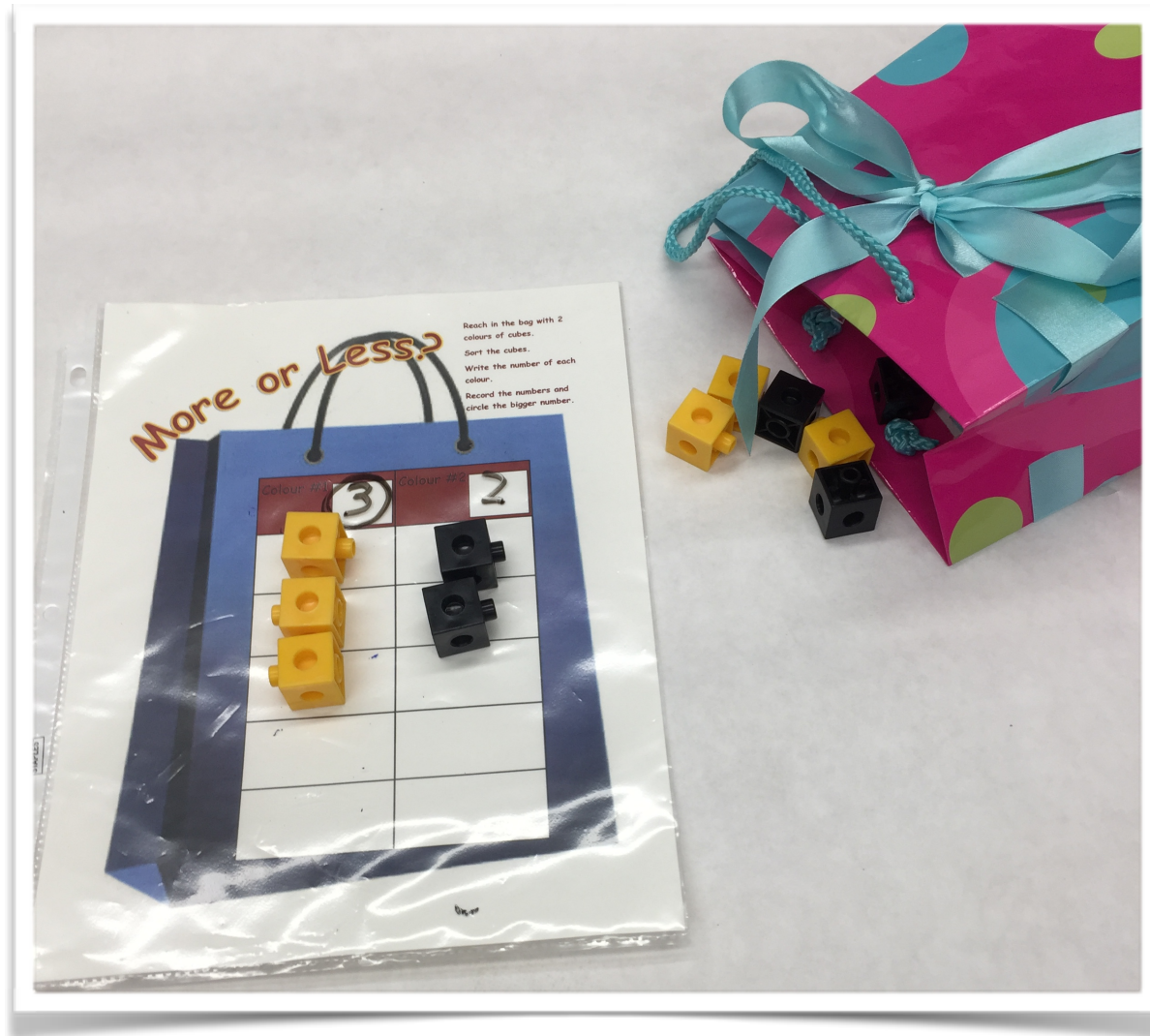
# NUMBER RELATIONSHIPS: Changing One Number to Another



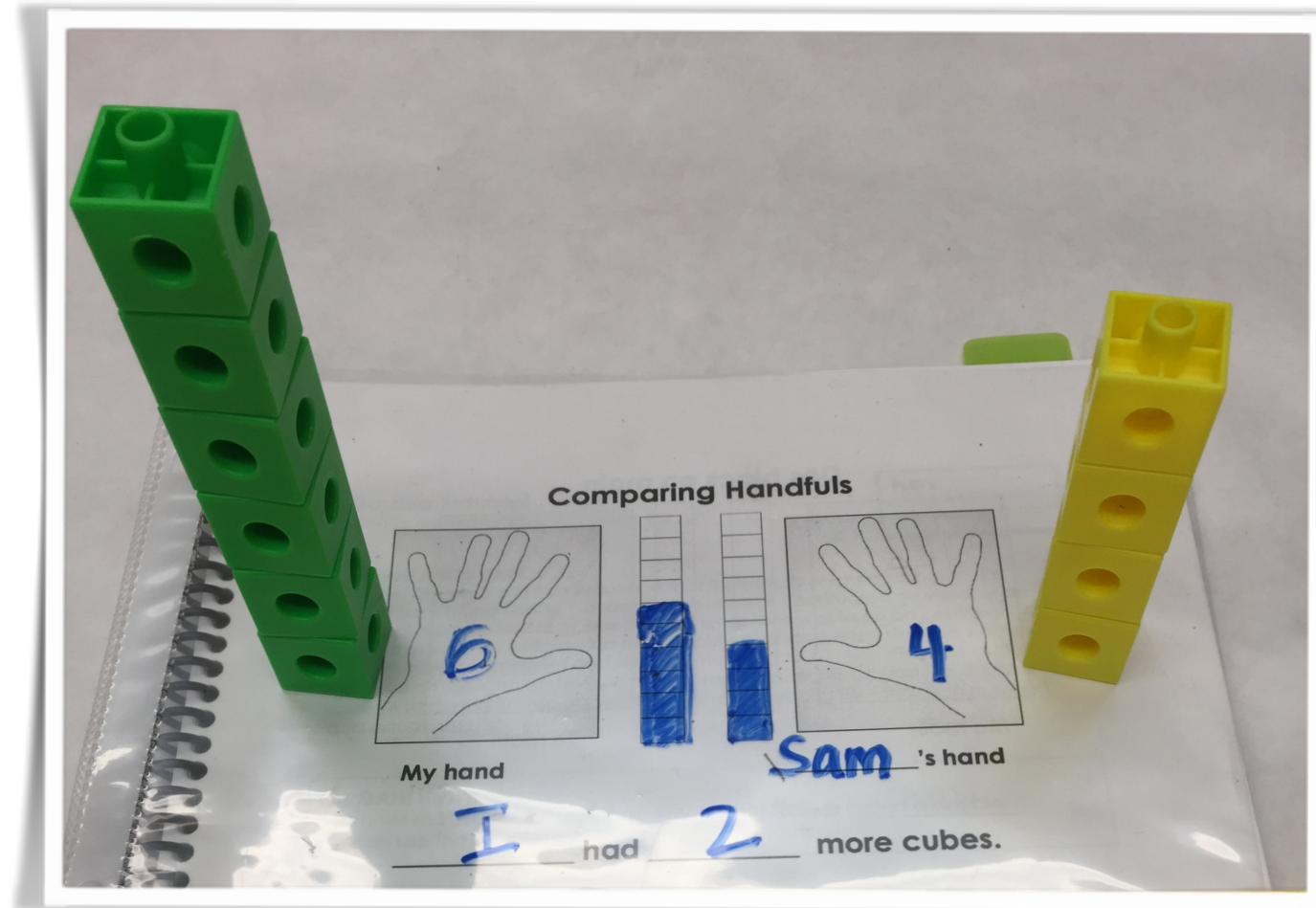
“We had 5 and now we rolled 10. Are we going to shrink or grow?” “How do you know?”  
“Do you need to clear off your ten frame?”



# NUMBER RELATIONSHIPS: More/Less



Sandra Ball's website  
[www.startingwiththebeginning](http://www.startingwiththebeginning)

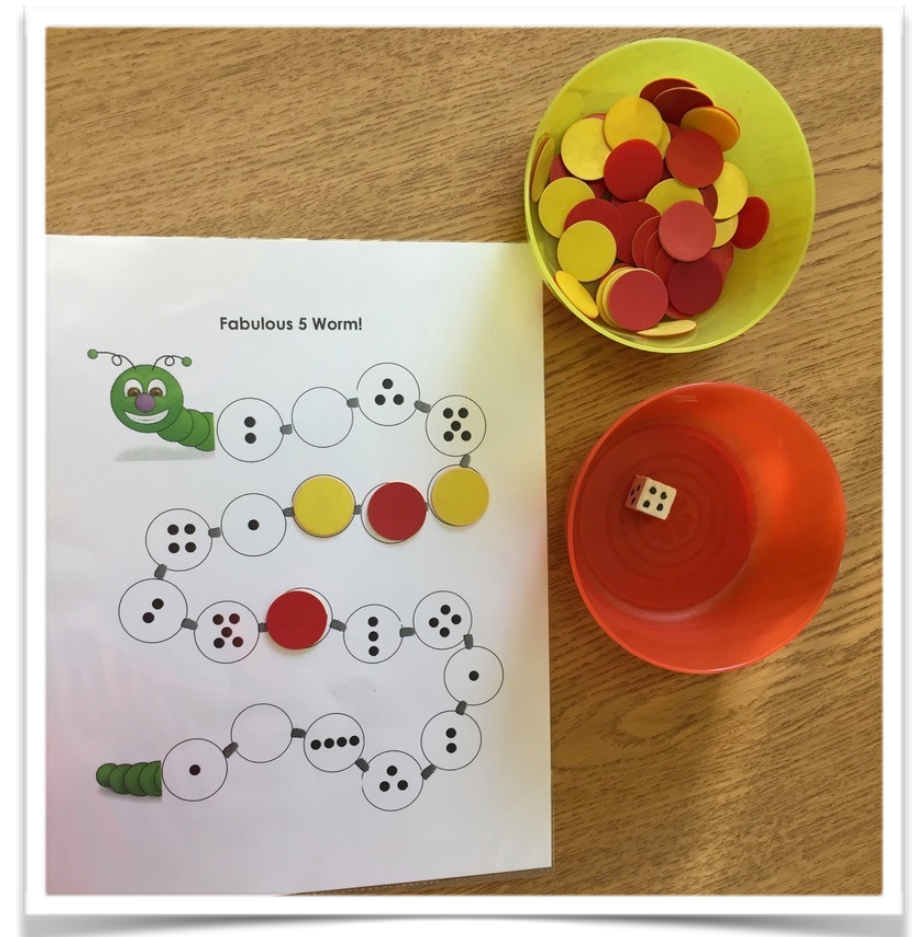
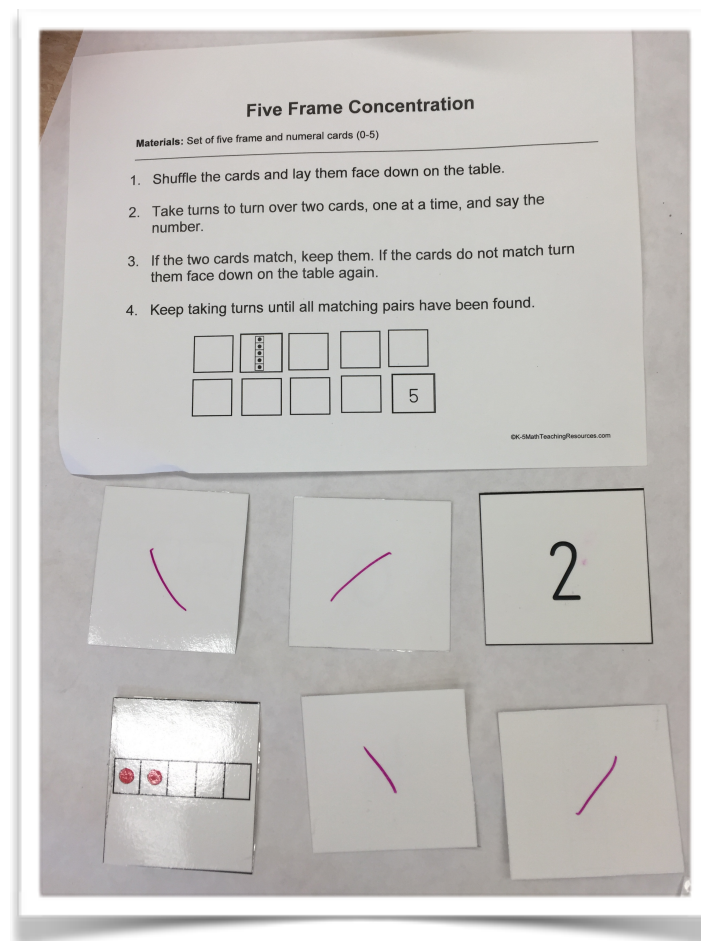
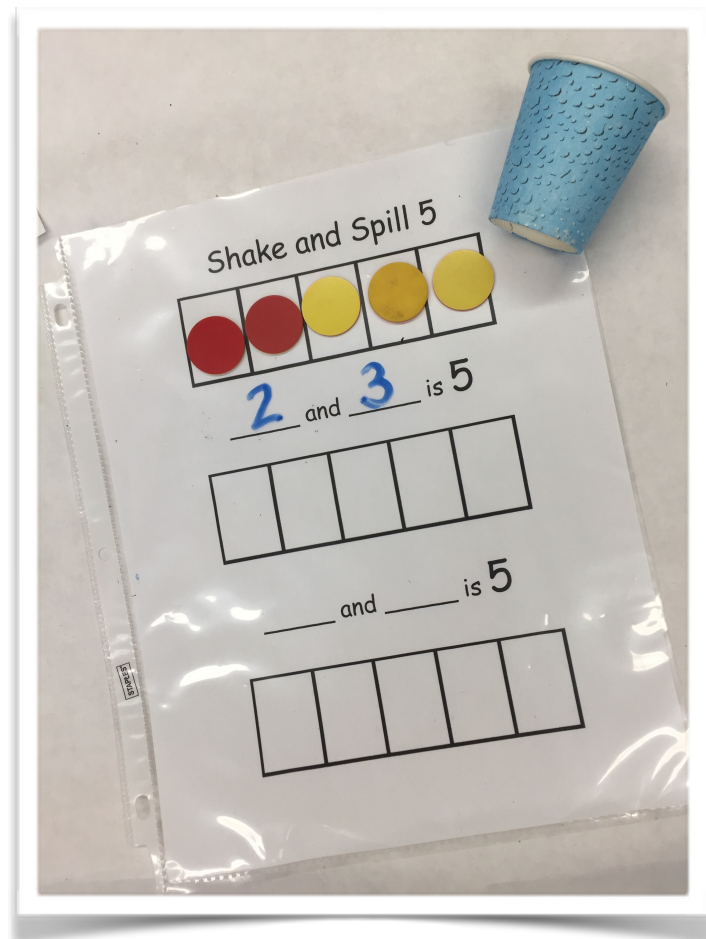


Carole Fullerton's Number  
Sense K/1

"How many more green do you have?"



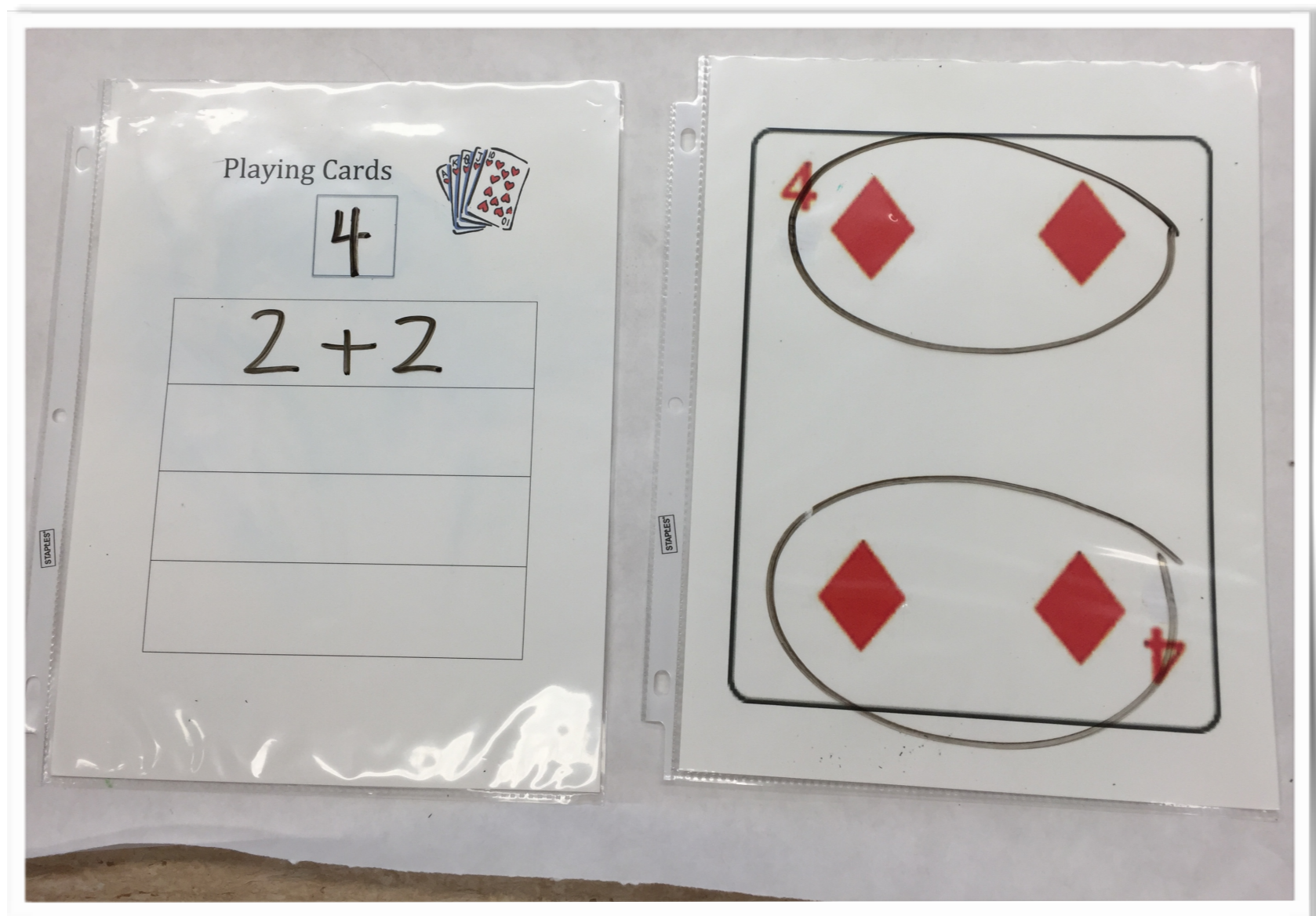
# NUMBER: Decomposing Five-Ness



“What are the partners for 5?”

From Carole Fullerton - on Sandra Ball's website





Idea adapted from Chris Confer's Teaching Number Sense K

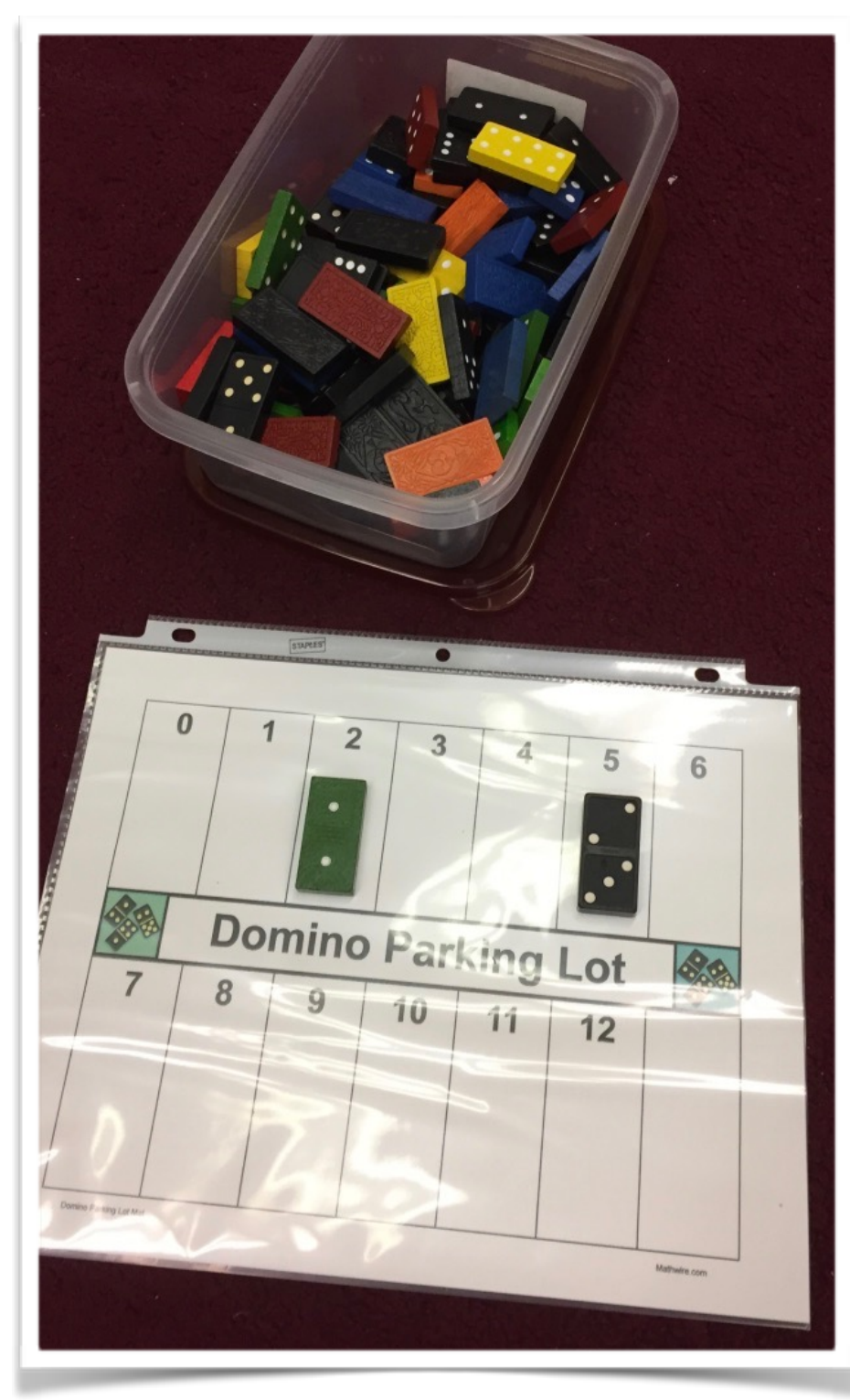
“How many do you see?”

“How do you see them?”

“Can you write an equation/number sentence for this?”

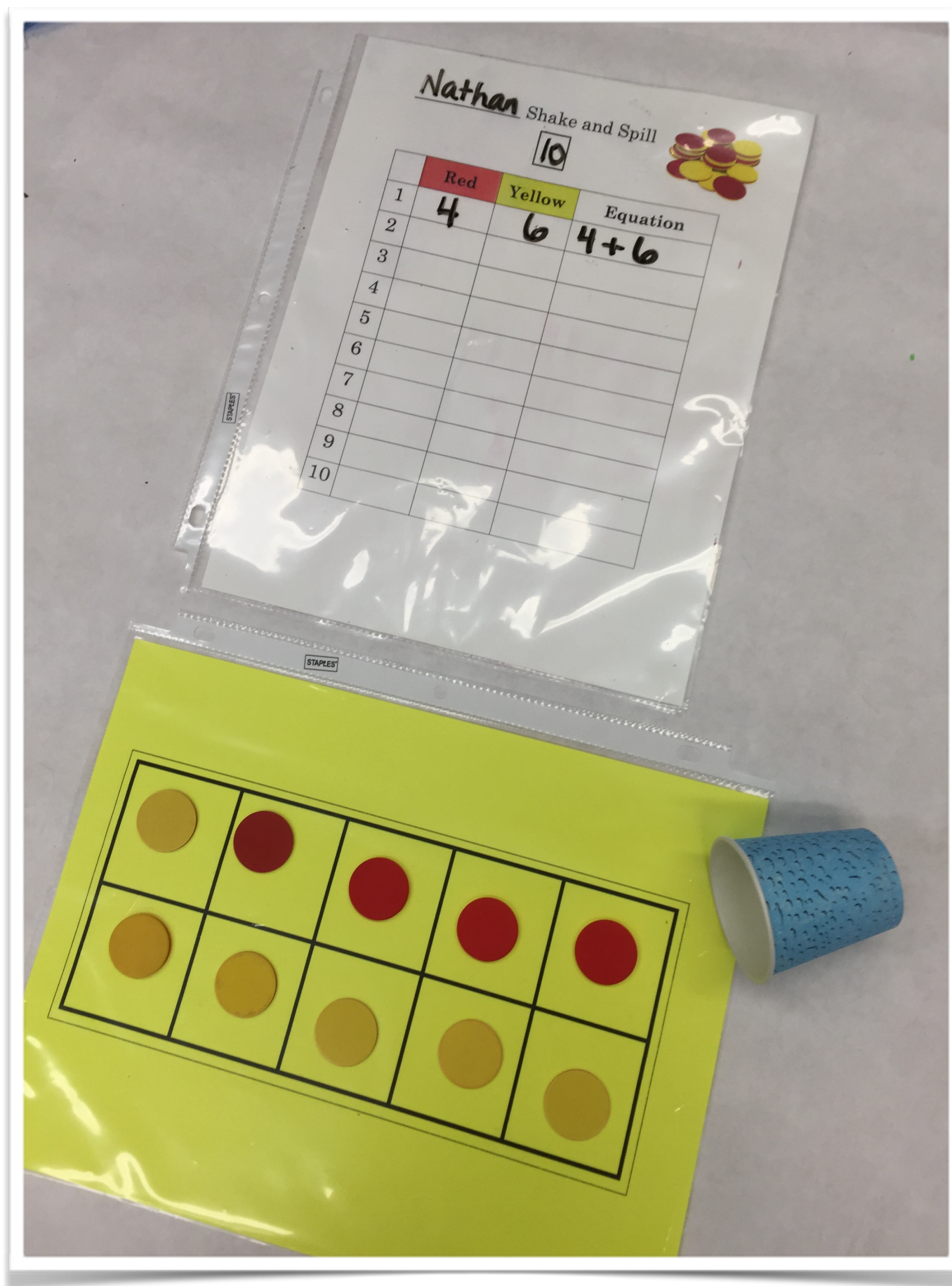
“Do you see it a different way?”





“How many ways do you think you can make \_\_\_\_\_?”





“How many red?”

“How many yellow”

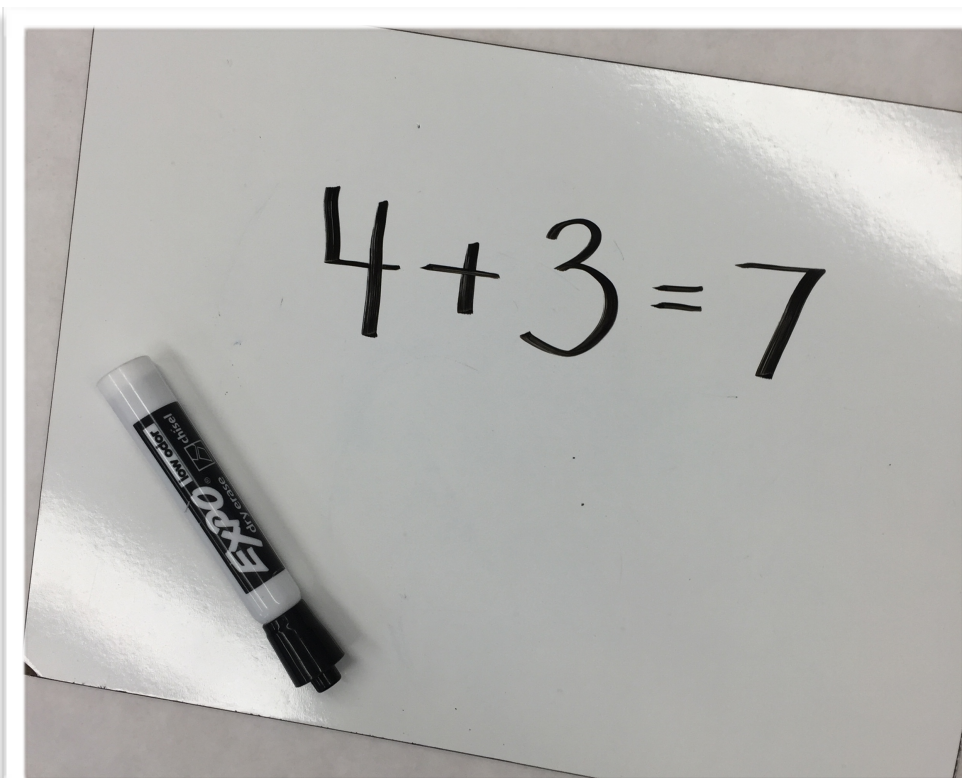
“How many altogether?”

“Can you record this as an equation/number sentence?”

“How many more yellow do you have than red?”

“How do you know?”





“What did you roll?” and “Can you build it?”

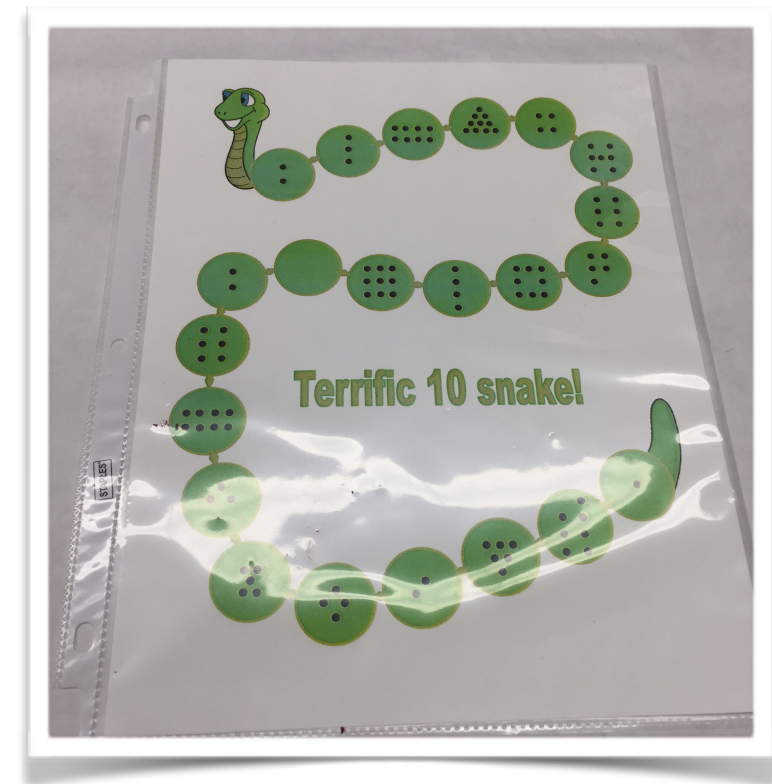
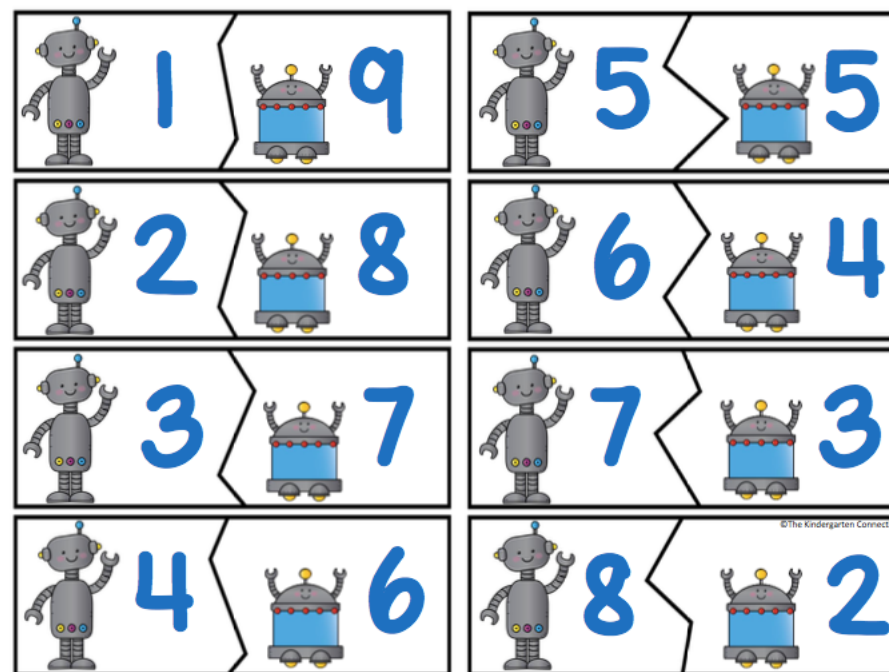
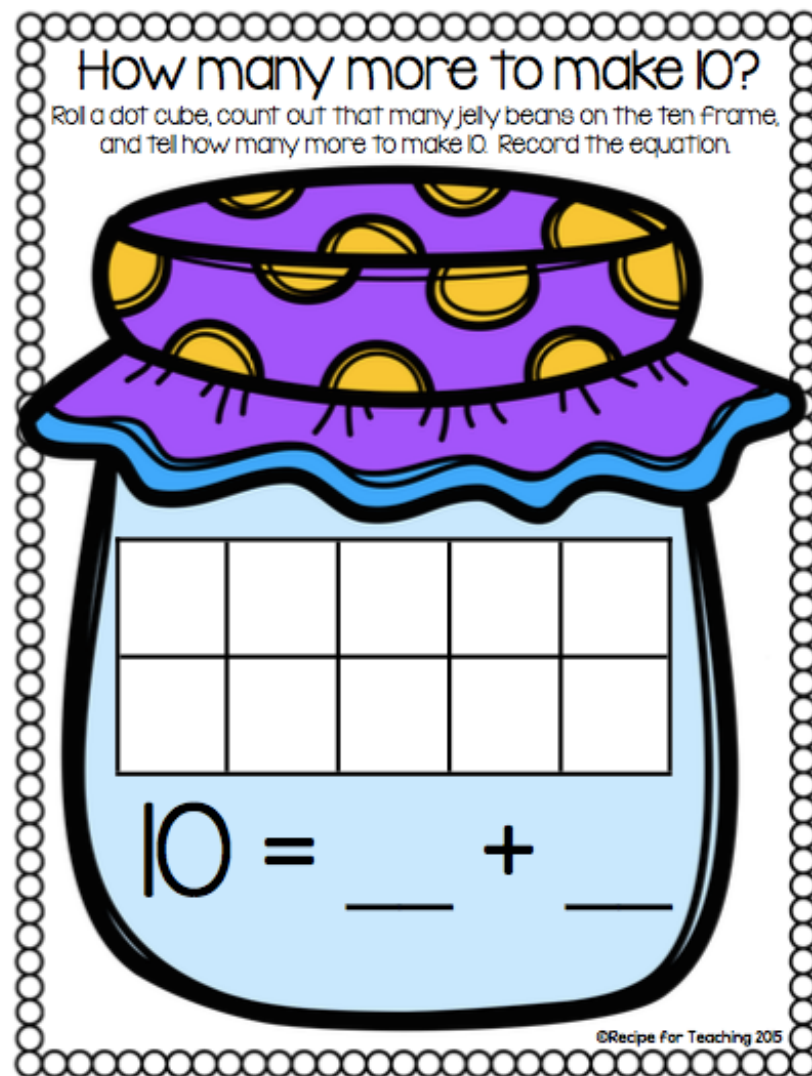
“How many do you have now?”

“Can you record this as an equation/number sentence?”



# NUMBER:

## Decomposing Ten-ness



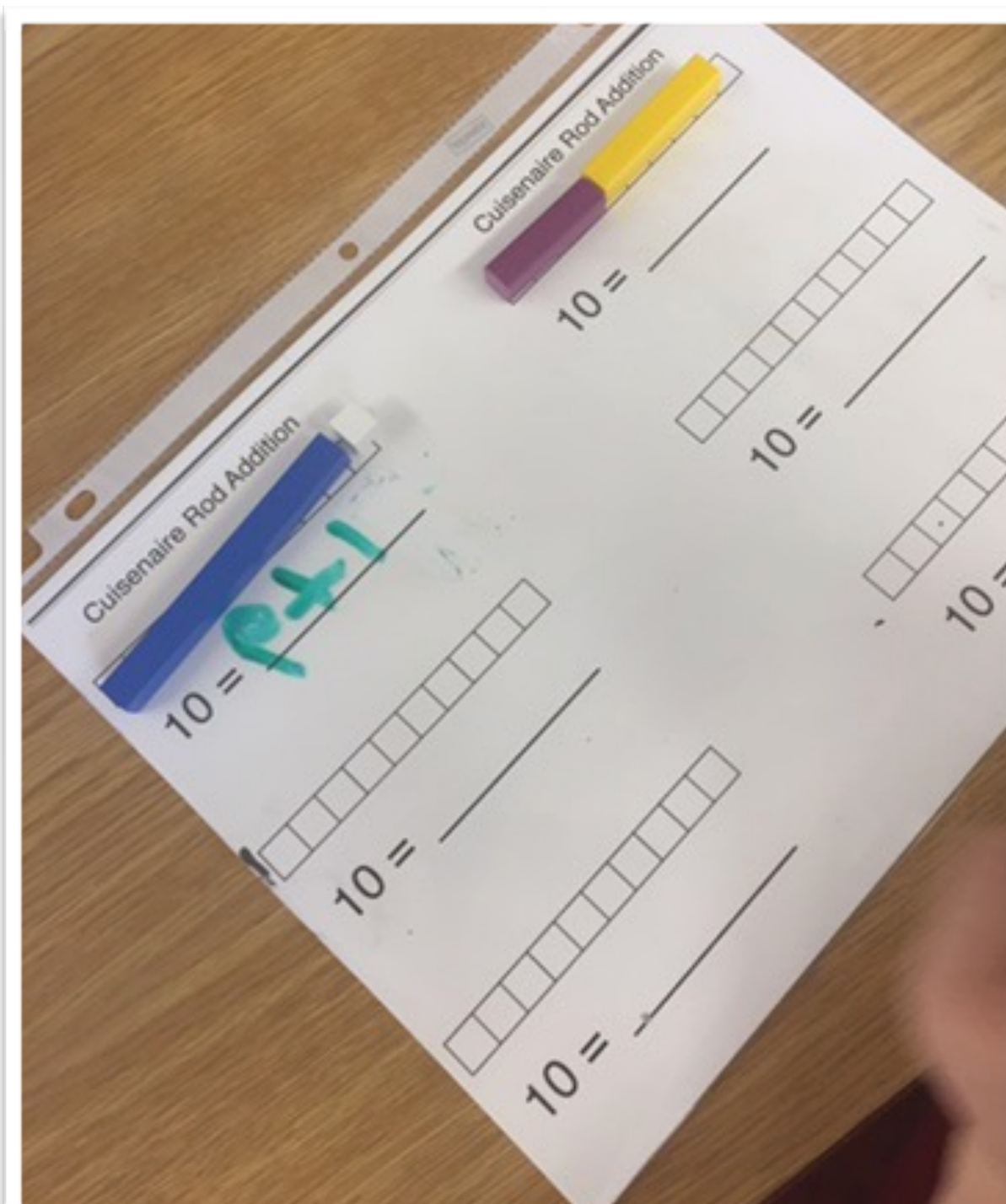
Carole Fullerton's idea

“What are the partners for 10?”



“Can you find all the partners for ten?”

“When you look at this card, how many more do you need to have 10?”

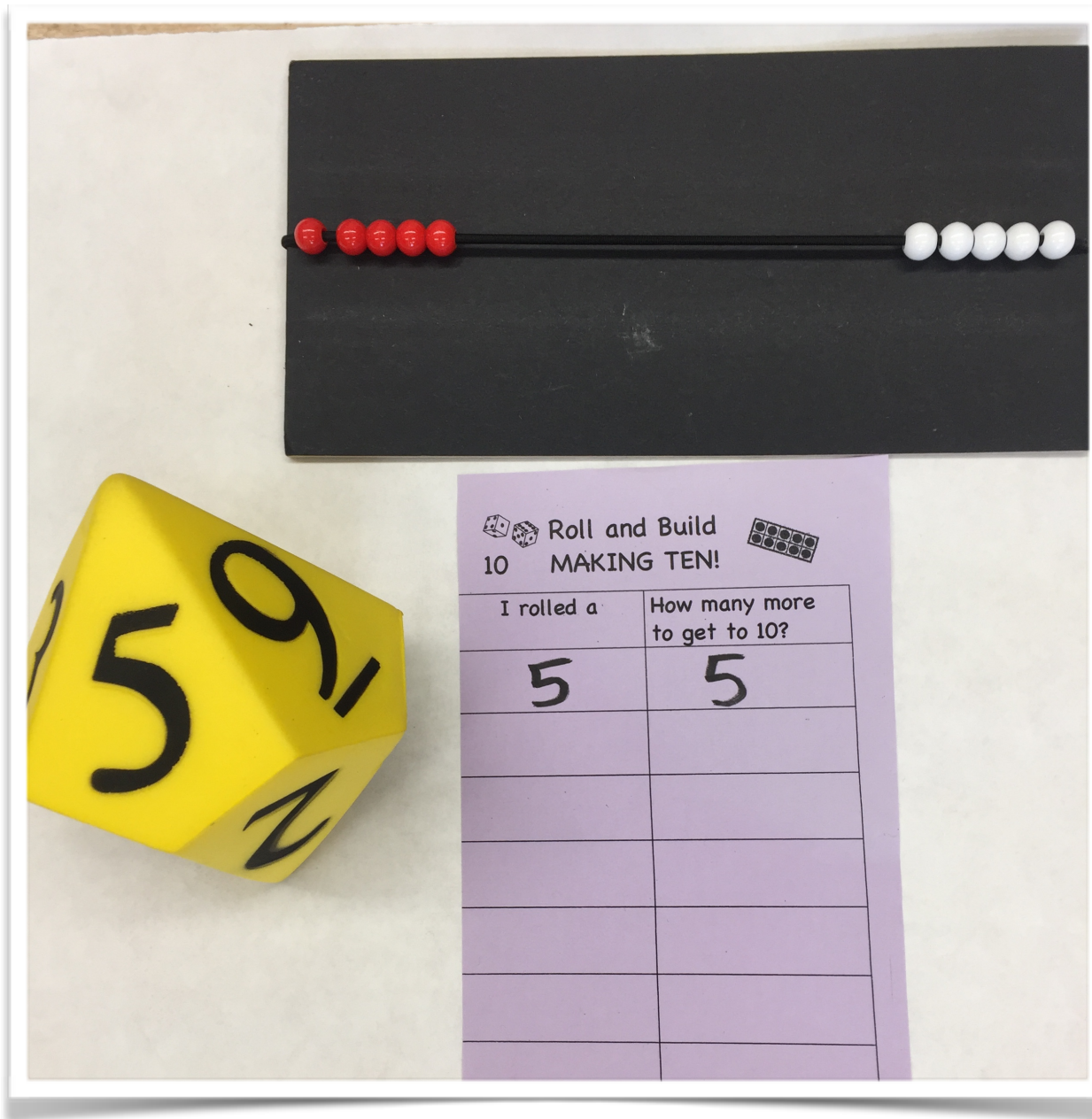


“Can you make 10 another way?”

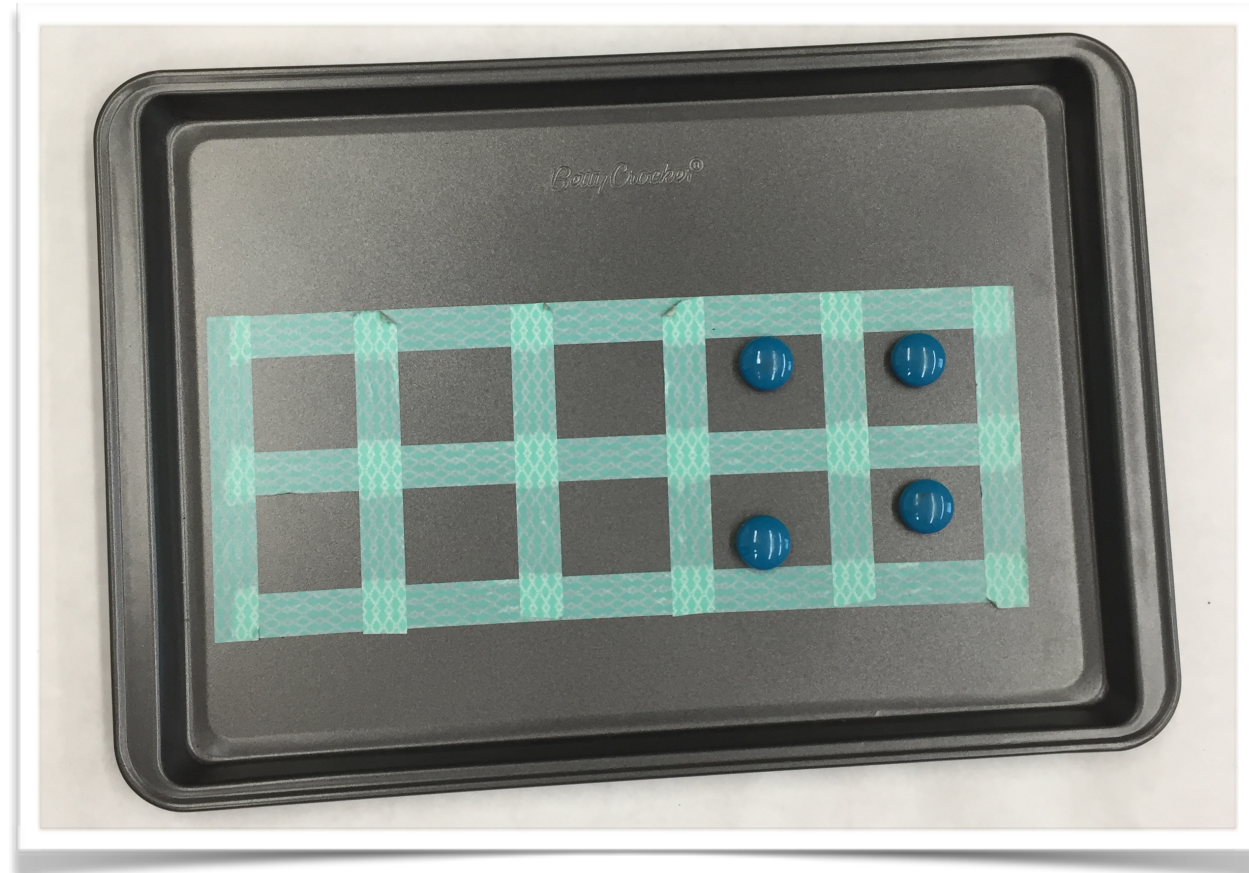
“How many ways do think there are to make 10?”

Carole Fullerton's Cuisenaire Rods





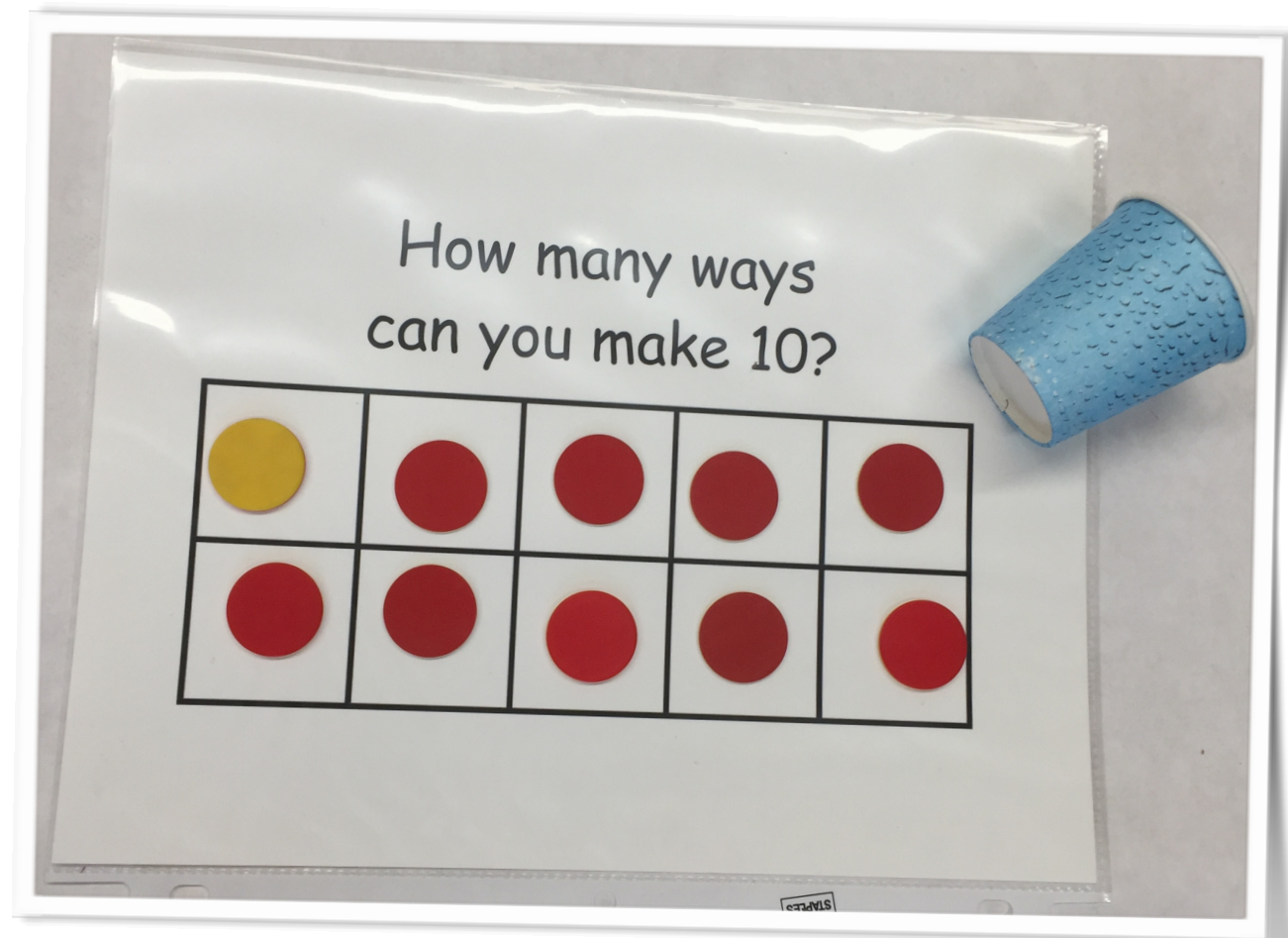
Note: Rekenreks come with 2 strands of 10 beads. To focus on 10, take one strand off.



“What did you roll?”  
 “Can you show it on the rekenrek?”  
 “How many more do you need to have 10?”

We began with 10 magnets!  
 “How many do you see?”  
 “How many are hiding?”





You could also use wooden ten frames, so the students could build all the different ways and look and compare them.

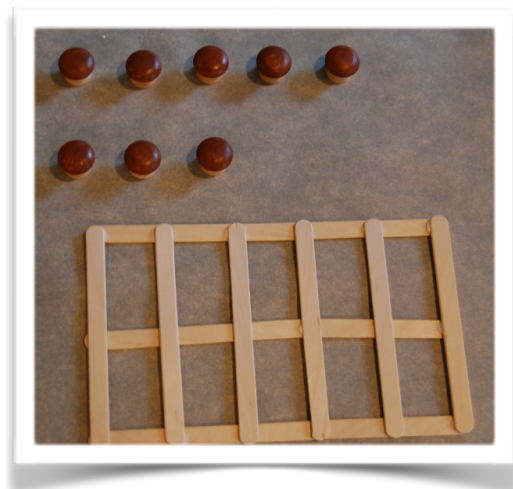


Image from  
Janice Novakowski



“What did you roll?”

“Can you build it?”

“How many more to have 10?”

“How might you record this?”



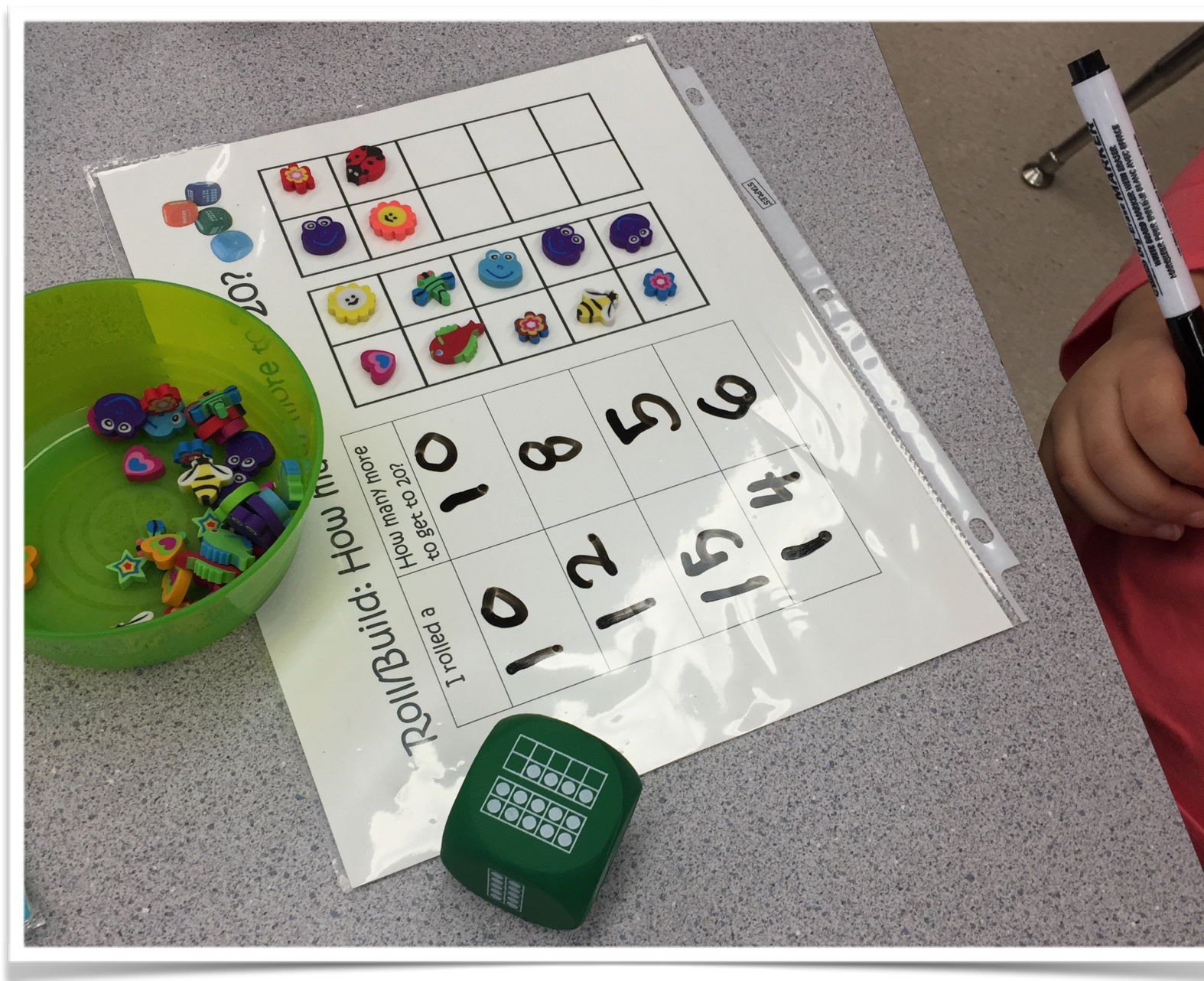
# Numbers to 20



“How can you show the numbers?”

“How does seeing the beads in groups of 5 and 10 help you to make a number?”



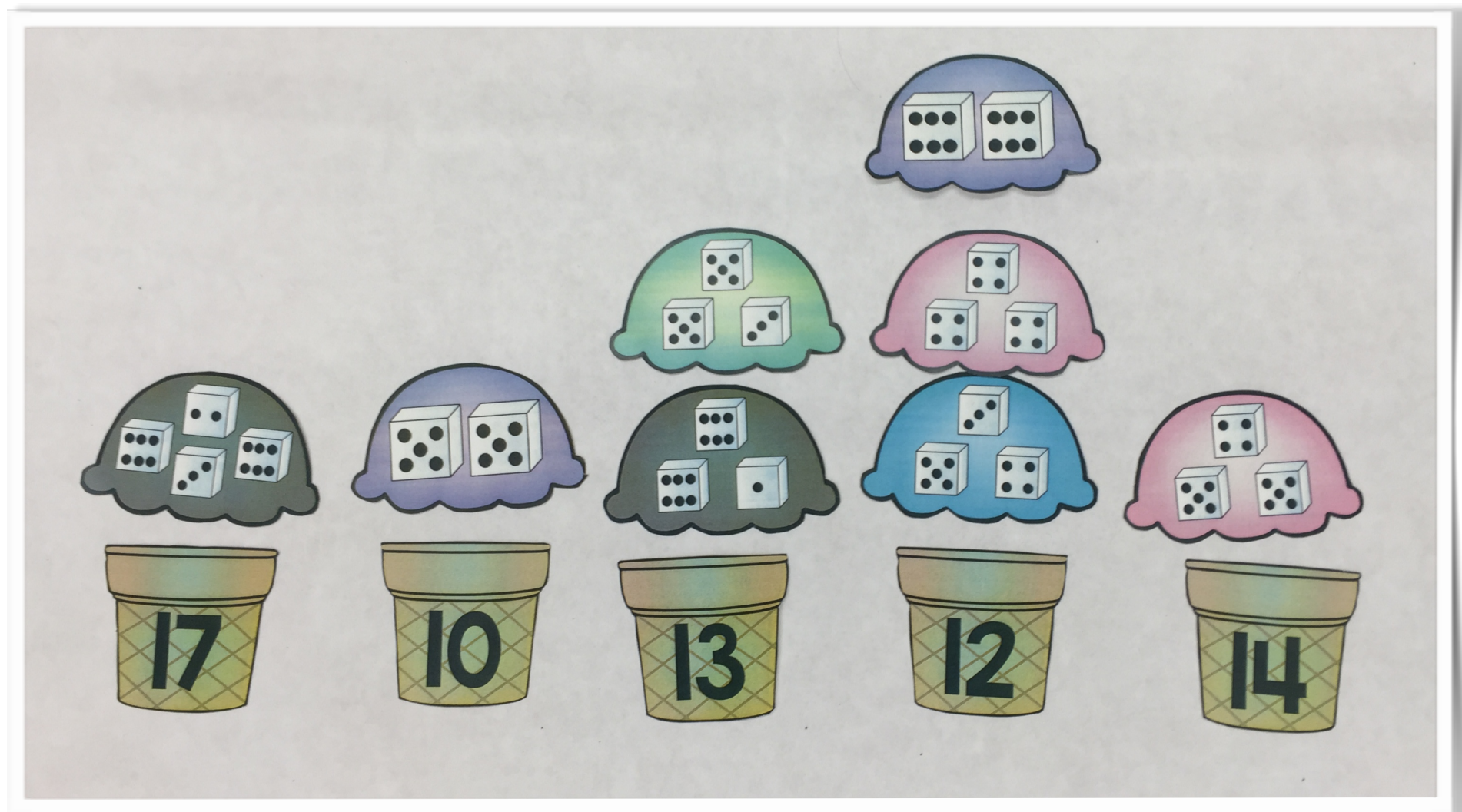


“What did you roll?”

“Can you build it?”

“How many more do you need to make 20?”

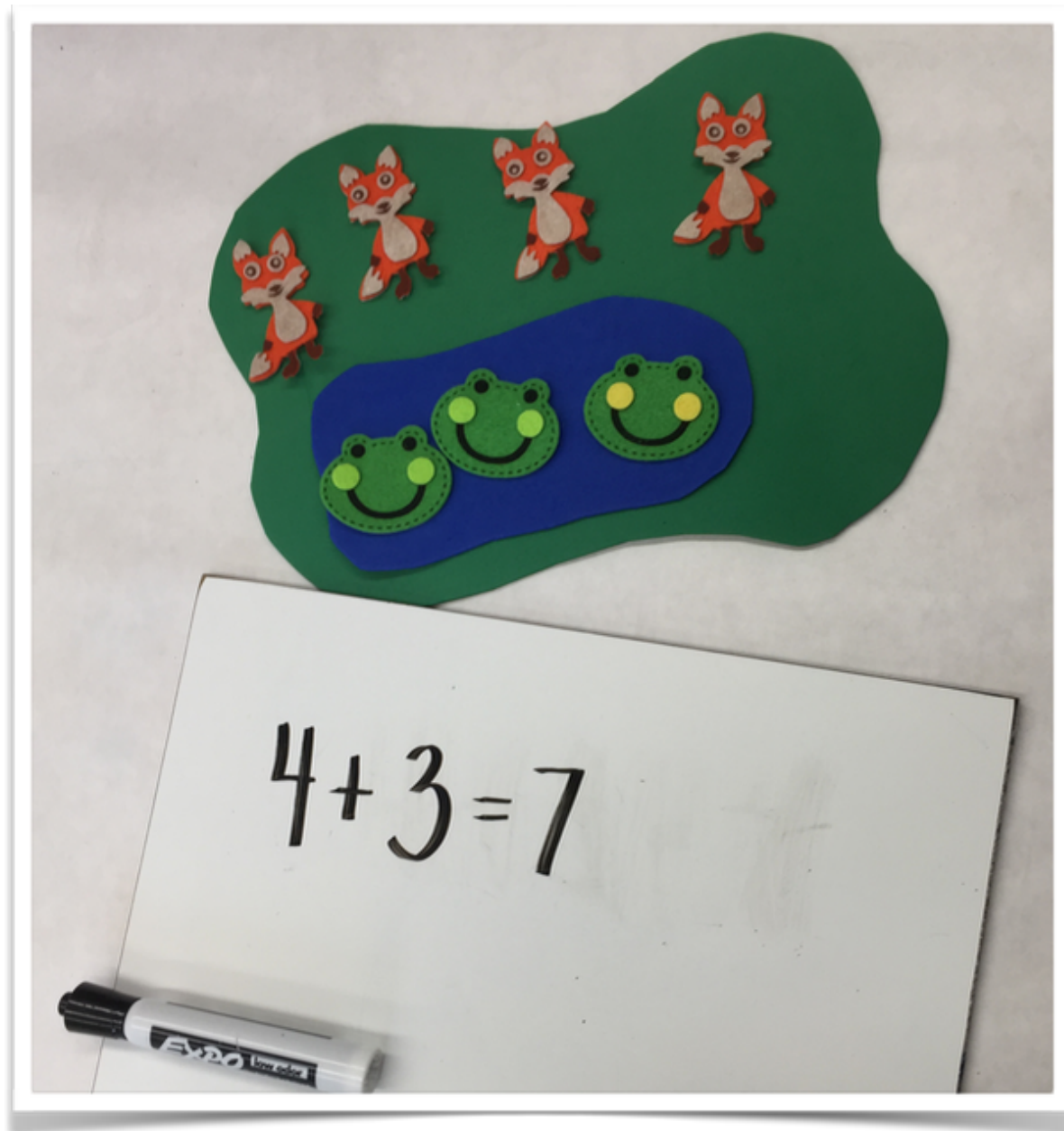




“Can you think of another way to make 13?”

“Can you record other ways to make these numbers on your white board?”

# NUMBER: Decomposing (Concept of Addition)

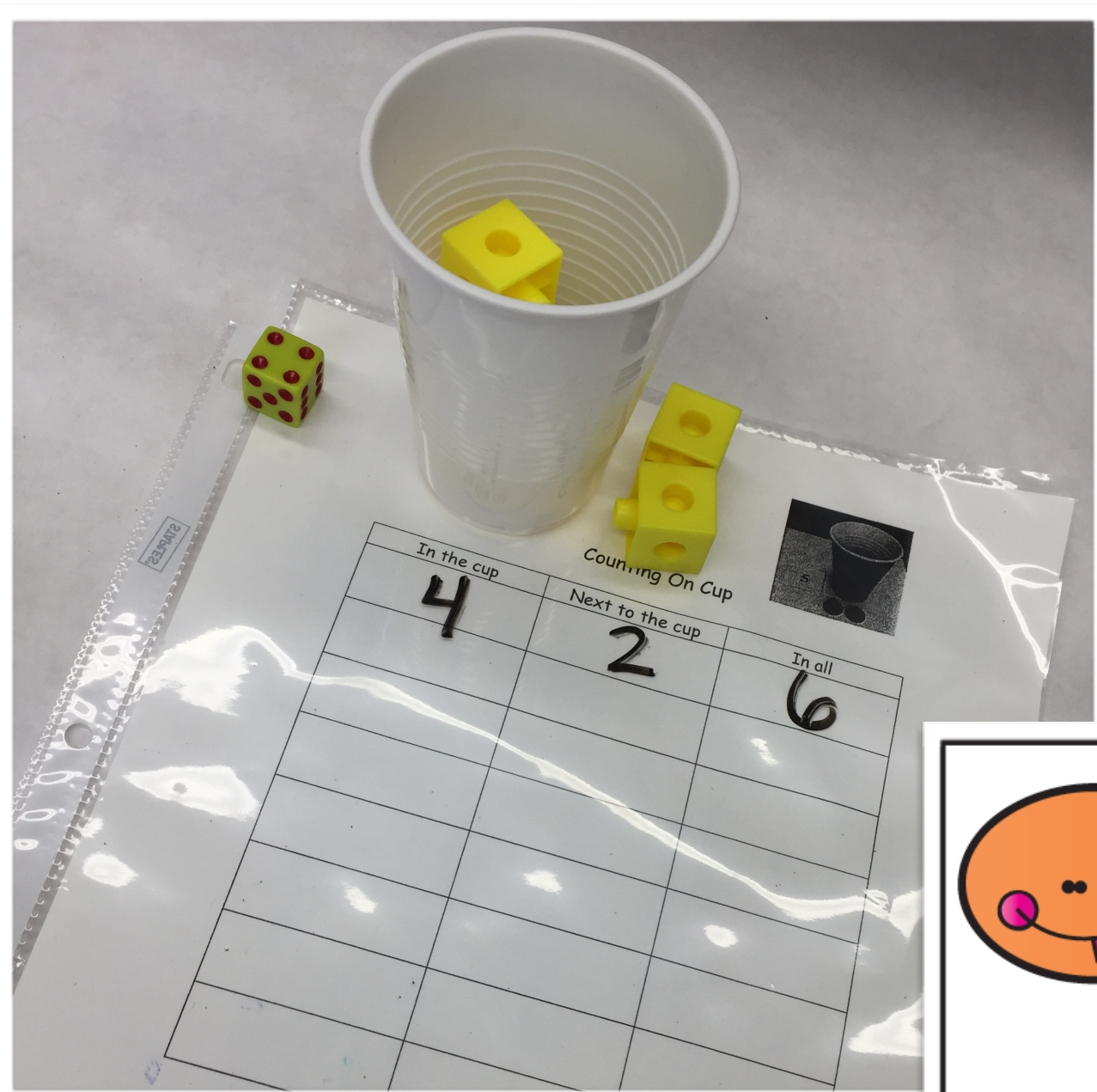


“Can you use the materials to make a ‘joining’ story?”

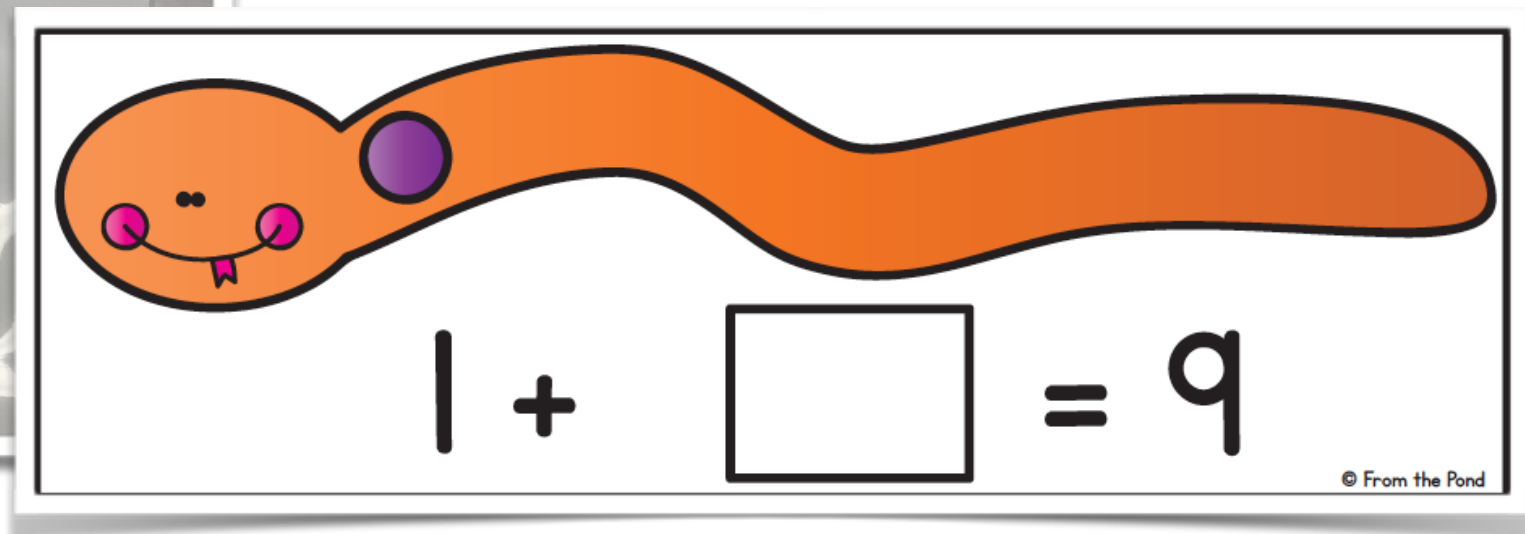
“How could you record this using numbers and symbols?”

“Is there another way to tell this story?”





“What strategy could you use other than counting all the cubes to find out how many?”



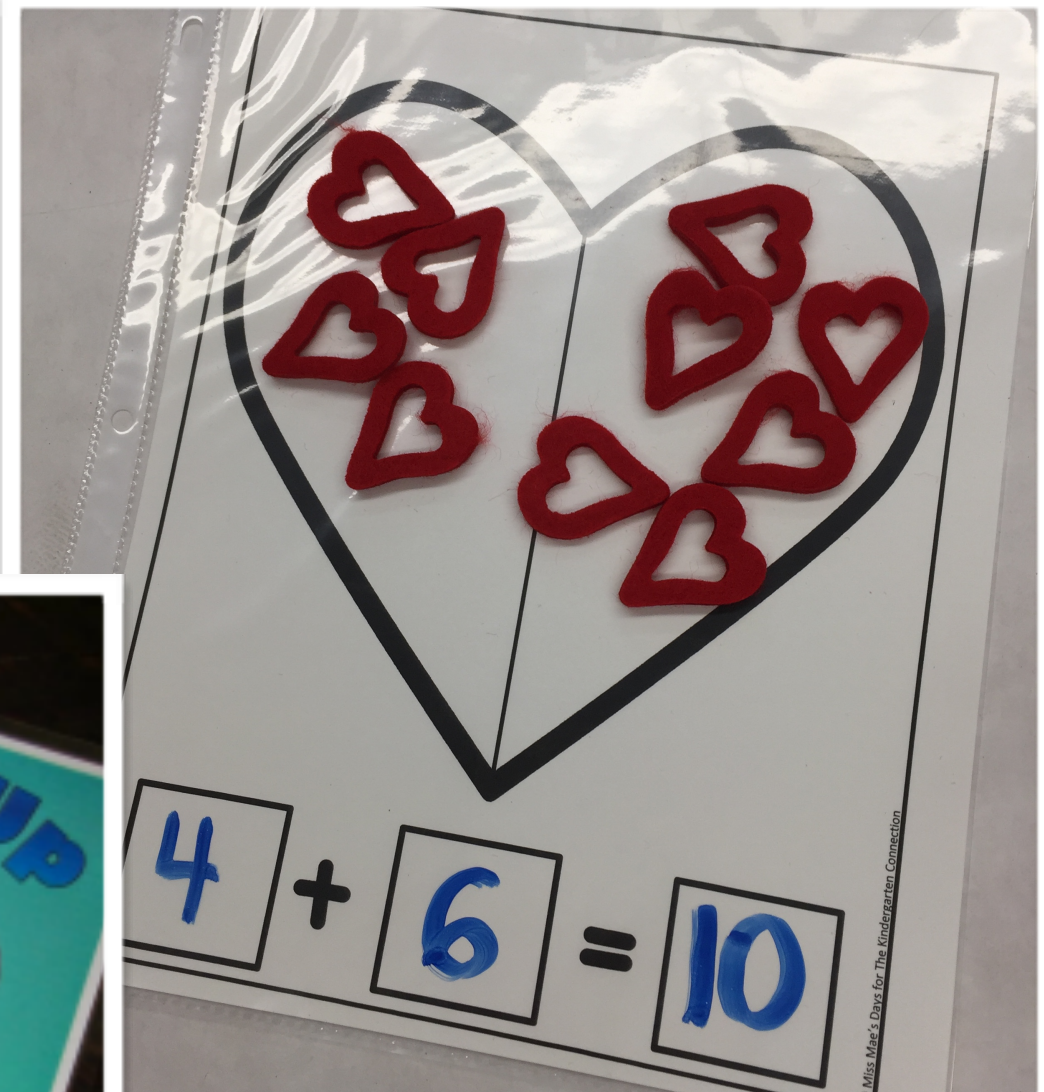
“Is it easier to count on from the smaller or bigger addend?  
Explain your thinking?”





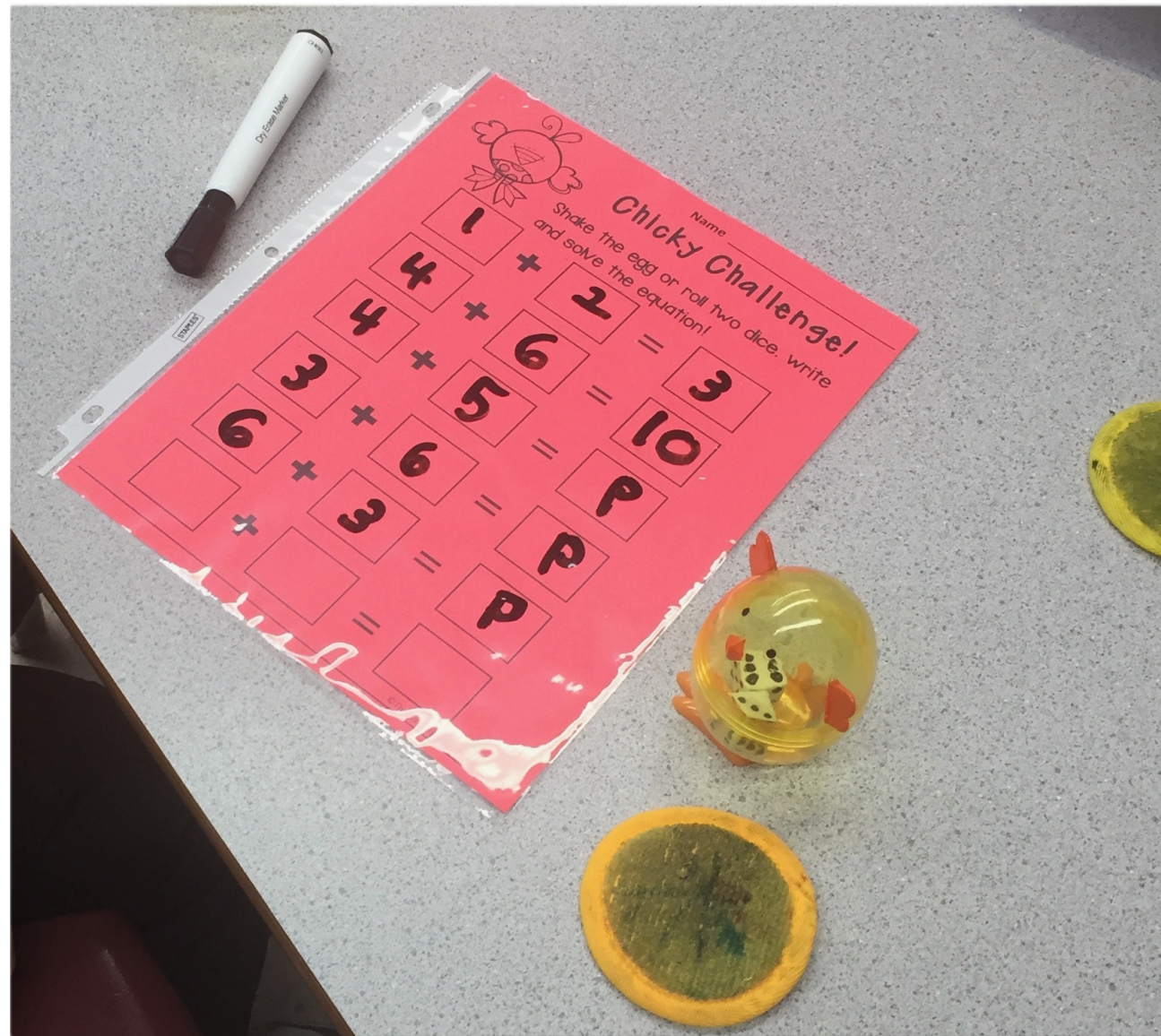
“Do you need to count all the buttons/cubes?”

“What strategies can you use to solve this question? (e.g., doubles plus one)”

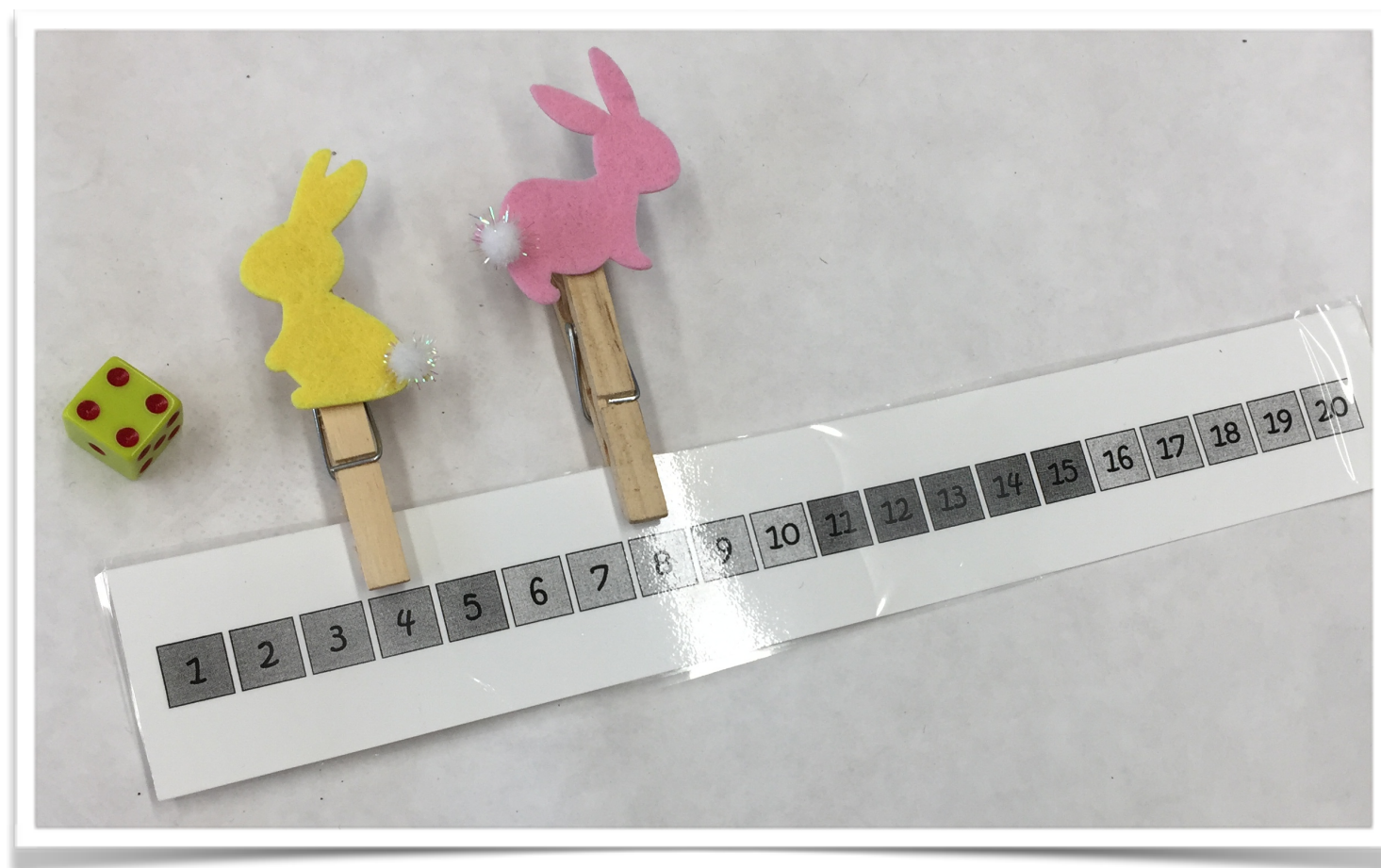


Change the shape with the season!





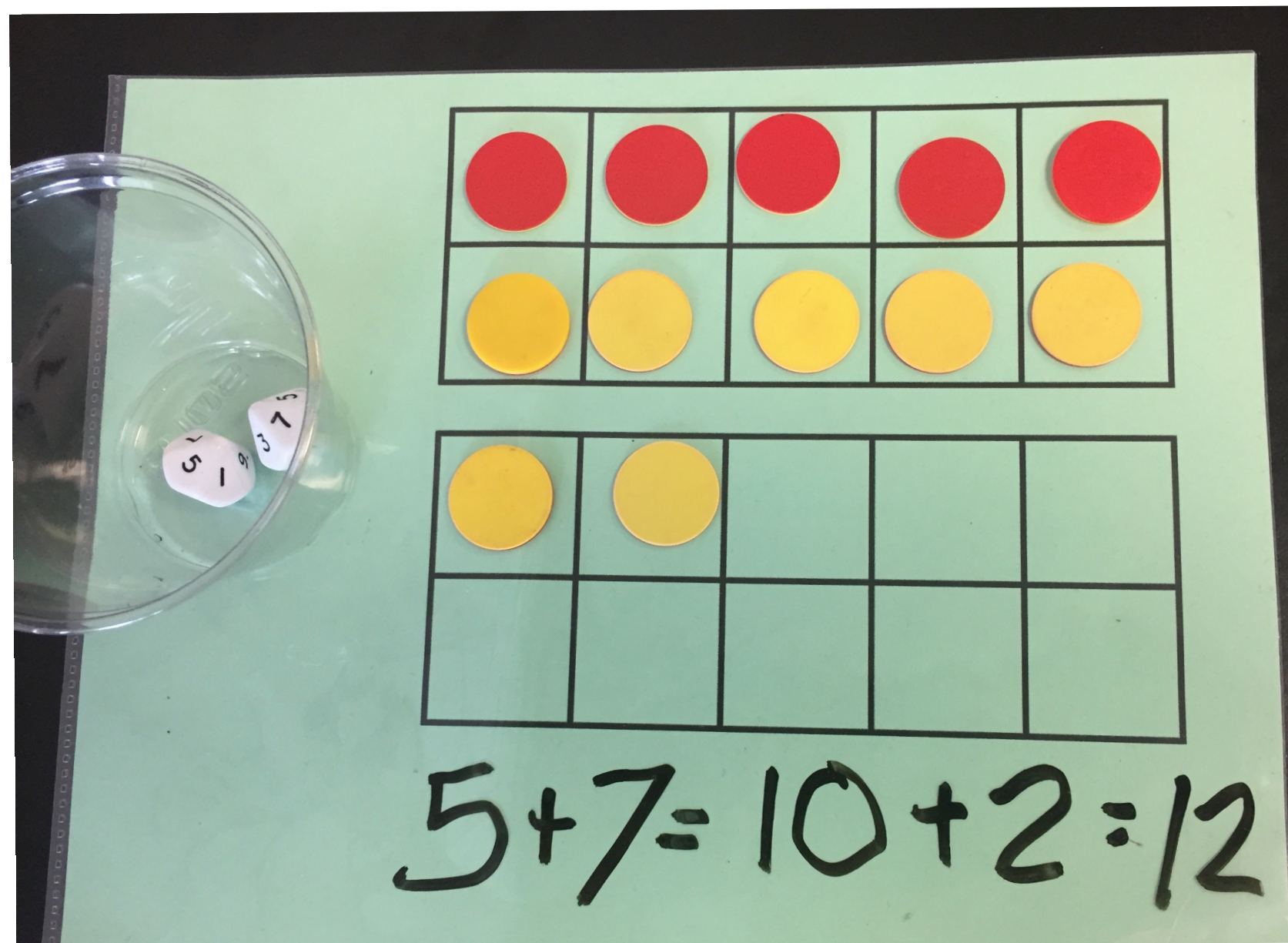




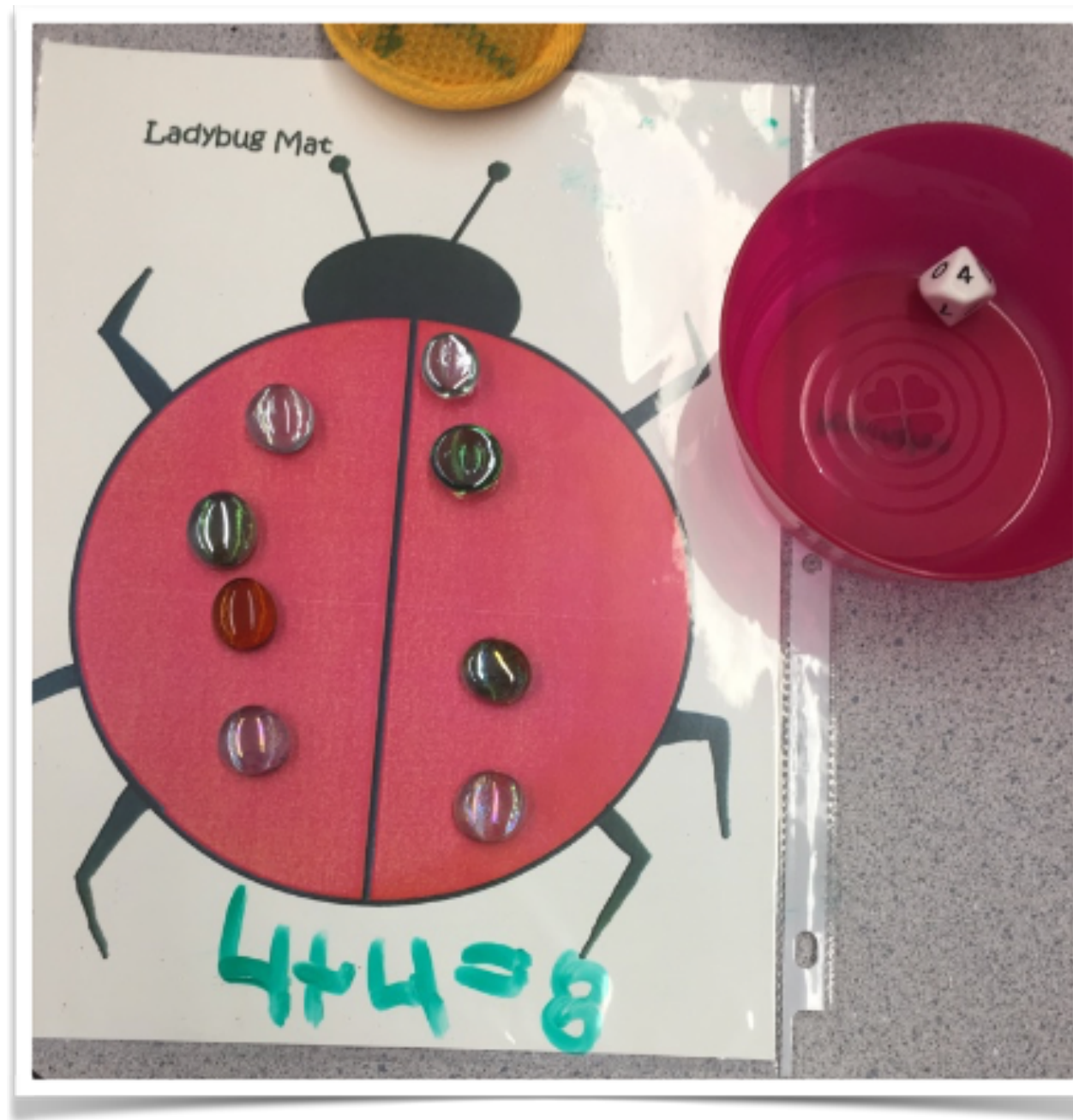
“How can you use a number line to help you add?”







“What strategies could you use to find out how many?”



“What did you roll?”

“Can you build it?”

“What is double that number?”



## COVER UP! Doubles!



12	6	10	12	4	8
14	18	8	16	8	6
6	10	14	12	10	14
12	4	8	18	16	10
14	16	18	14	4	14
2	8	4	10	16	18

Roll the die. Double the number.  
Find it on the grid and cover it in your counter.  
Give your partner a turn.  
First one to have 4 in a row wins!

## Chips Ahoy!



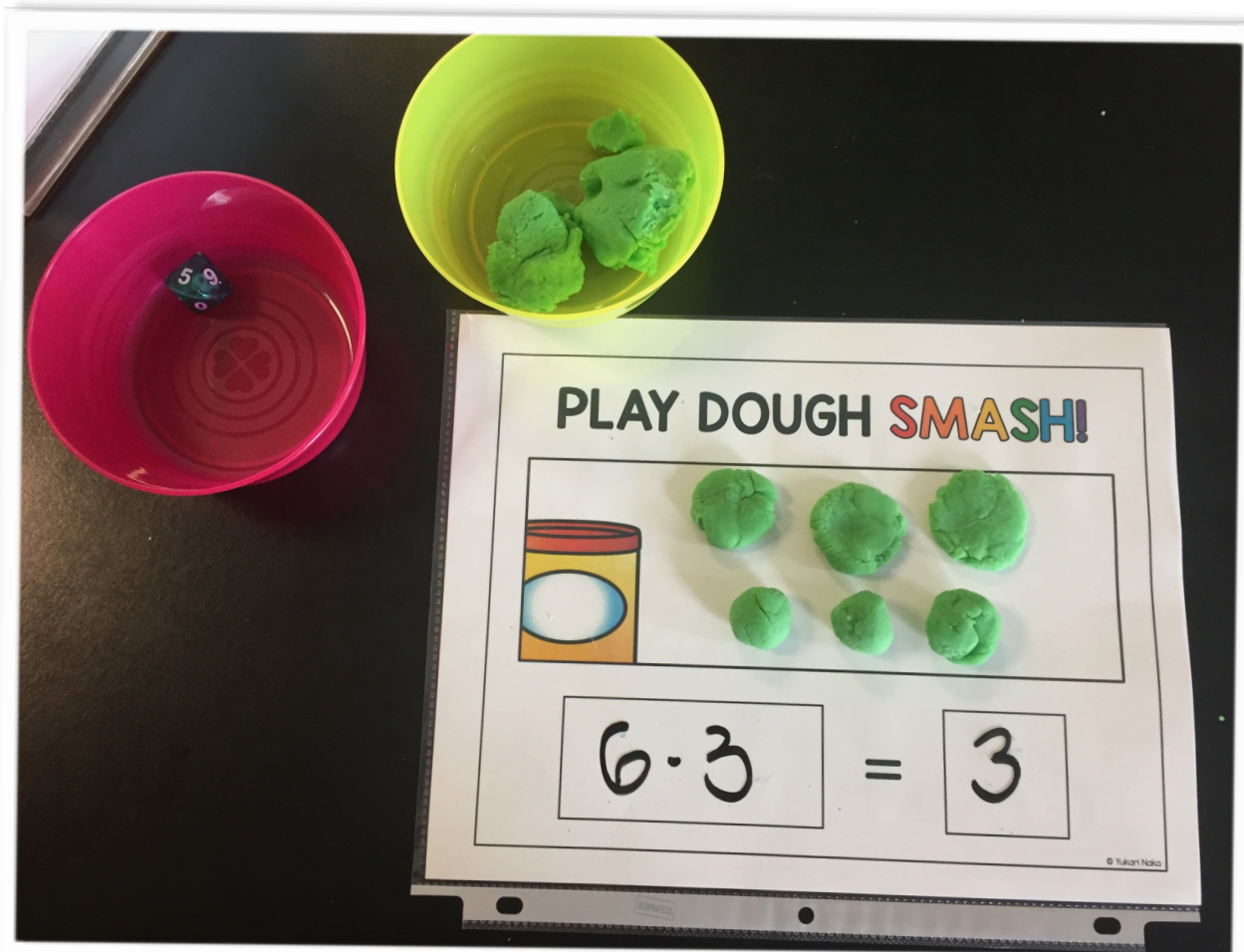
3	7	5
19	15	13
11	17	9

- ★ Place 15 chips on the game board. Chips can be placed anywhere, and doubles on a space are OK.
- ★ Roll a 10 sided die (0-9).
- ★ Double and add 1 to the number rolled, then remove a chip from the space that shows the sum.  
For example: Player A rolls a 2, say the near double fact ( $2 + 2 + 1$  is 5 or  $2 + 3 = 5$ ) and takes a chip off the 5 space.
- ★ Roll a zero and take a chip from any space!
- ★ Players take turns until one player has collected 8 chips. This person is the winner!

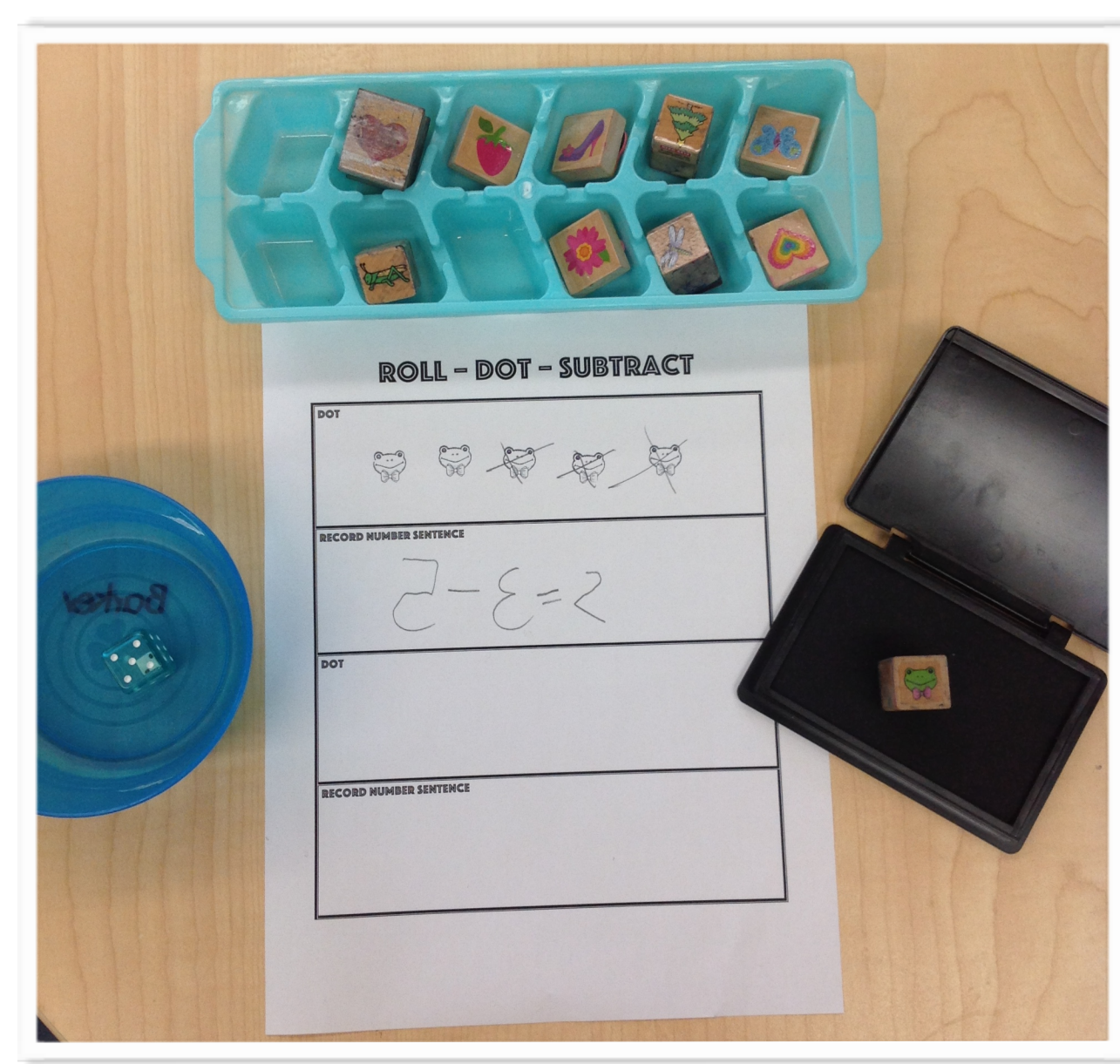
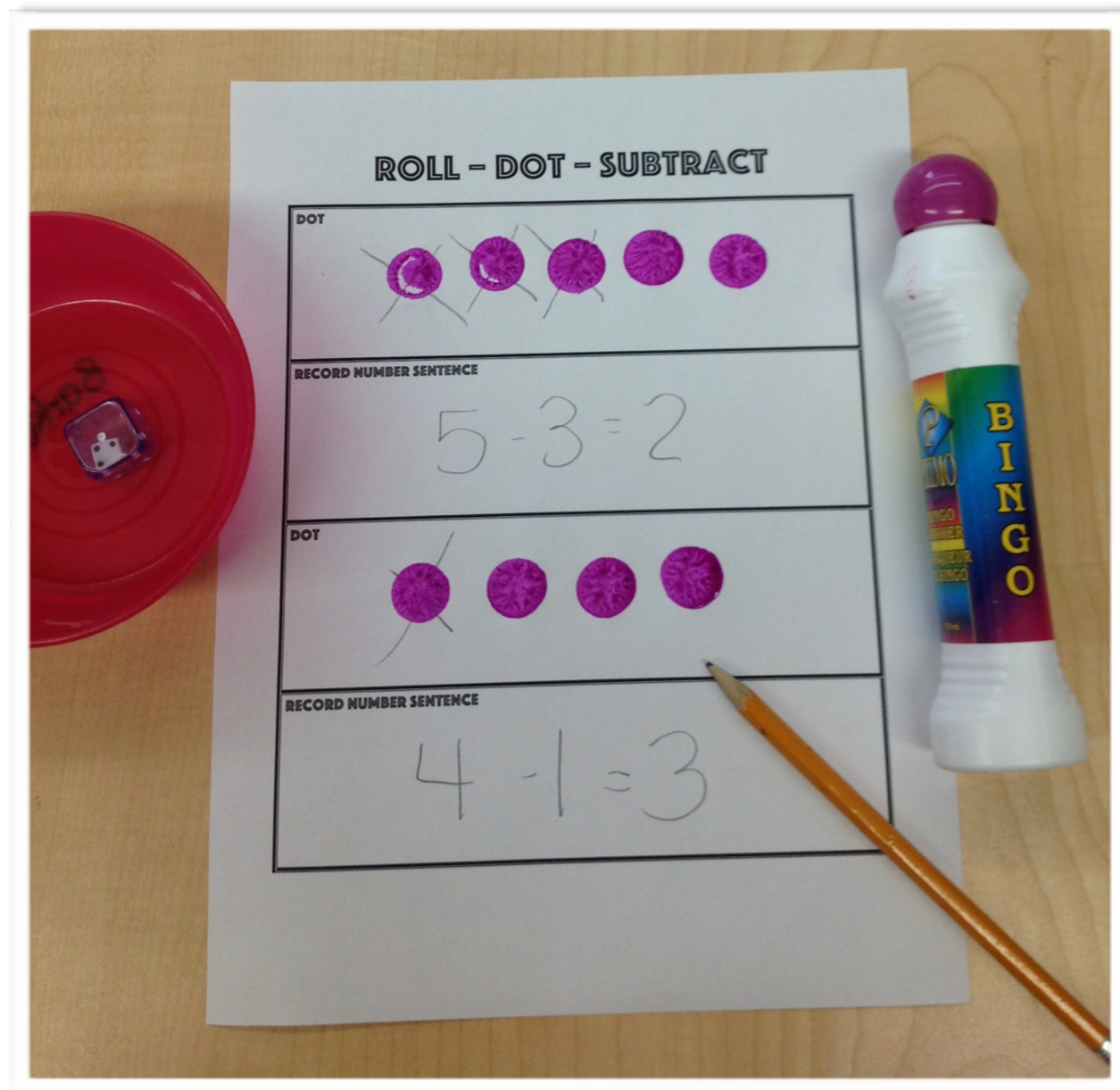
Available on Sandra Ball's website

“How can thinking about ‘doubles’  
help you solve  $6 + 7 =$  “

# NUMBER: Decomposing (Concept of Subtraction)







“When you look at your two numbers,  
which is larger or smaller?”

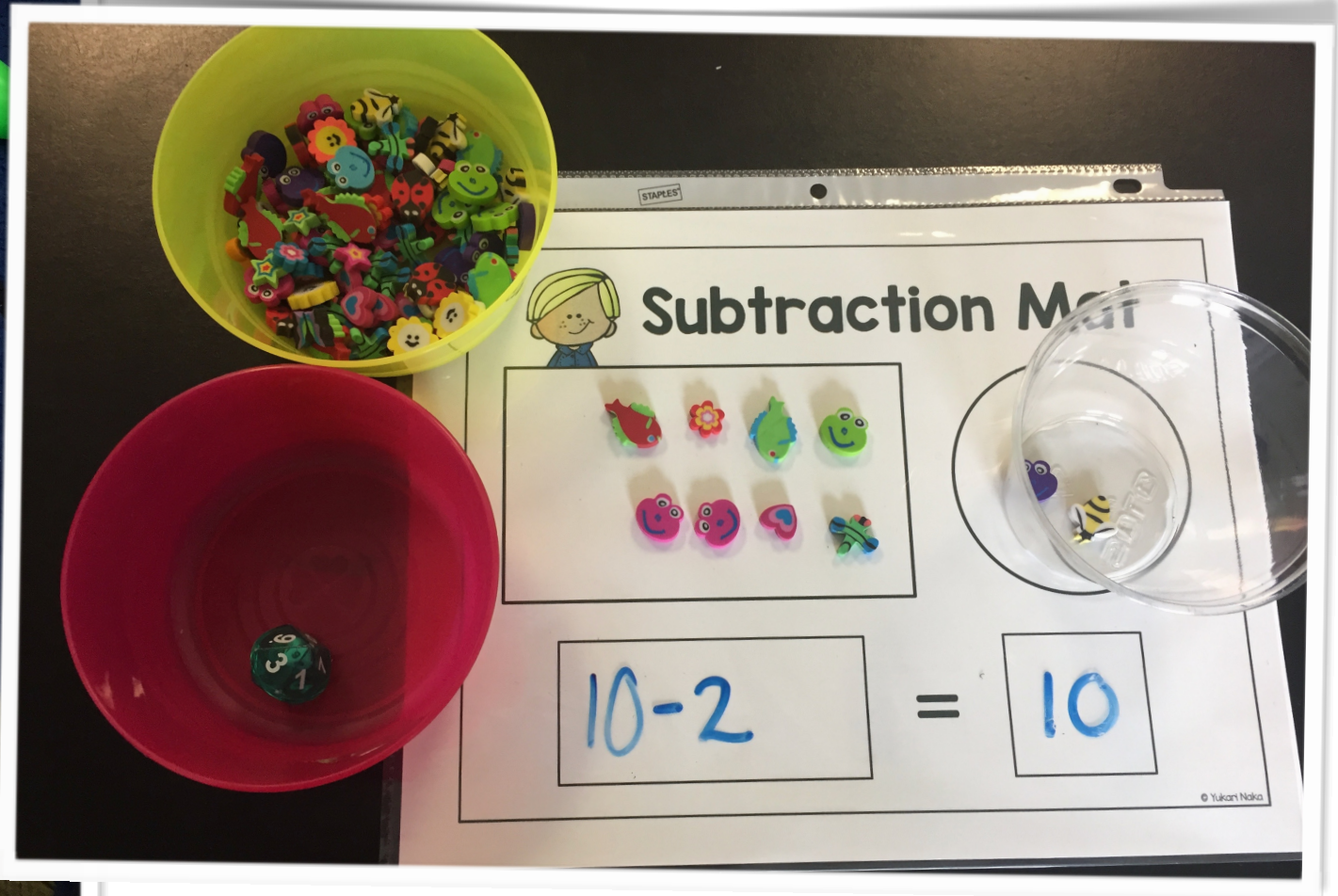
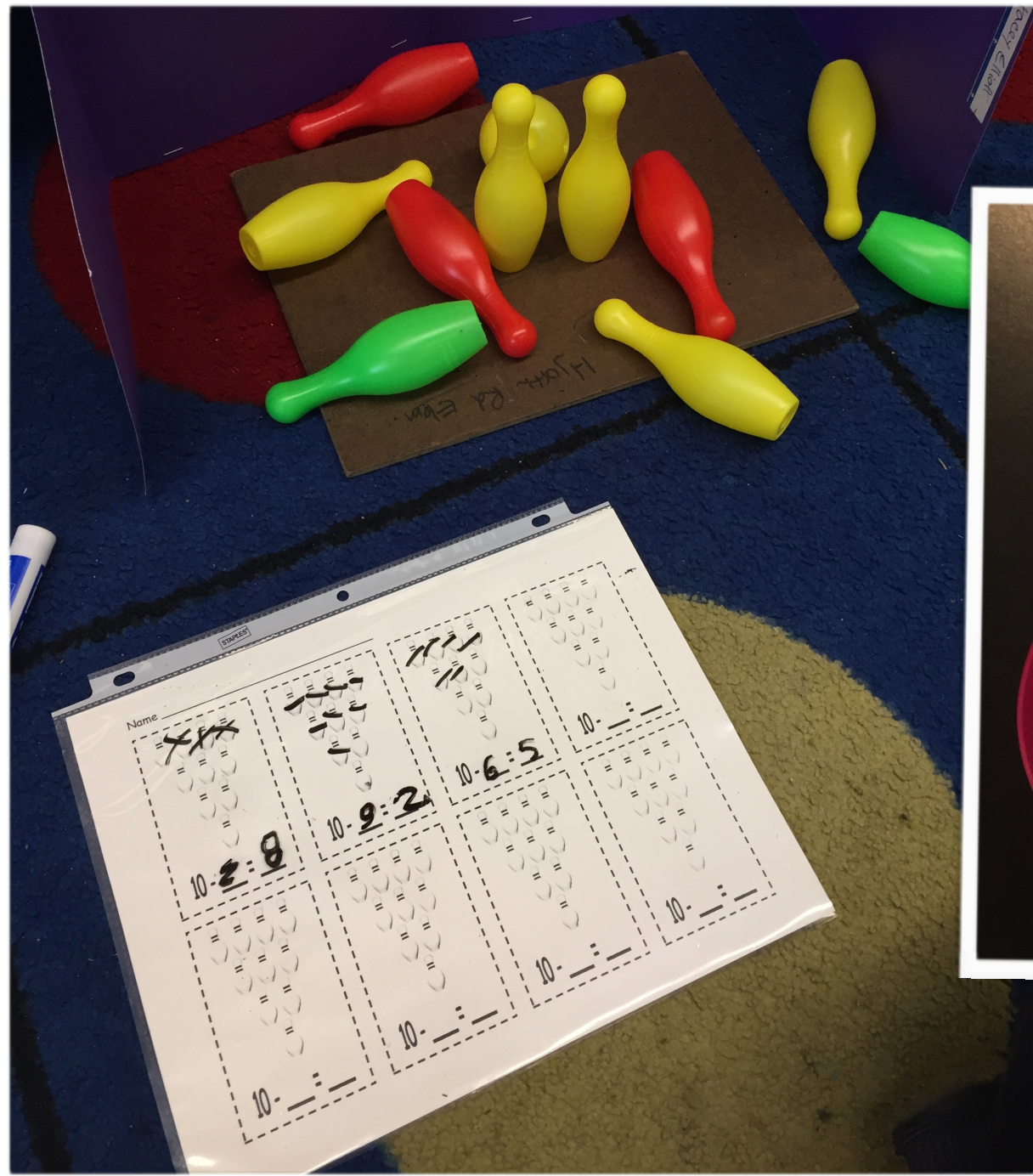
“Can you show that quantity?”

“What was the smaller number you rolled?”

“What strategy can you use to solve the question?”

“How could you record this?”





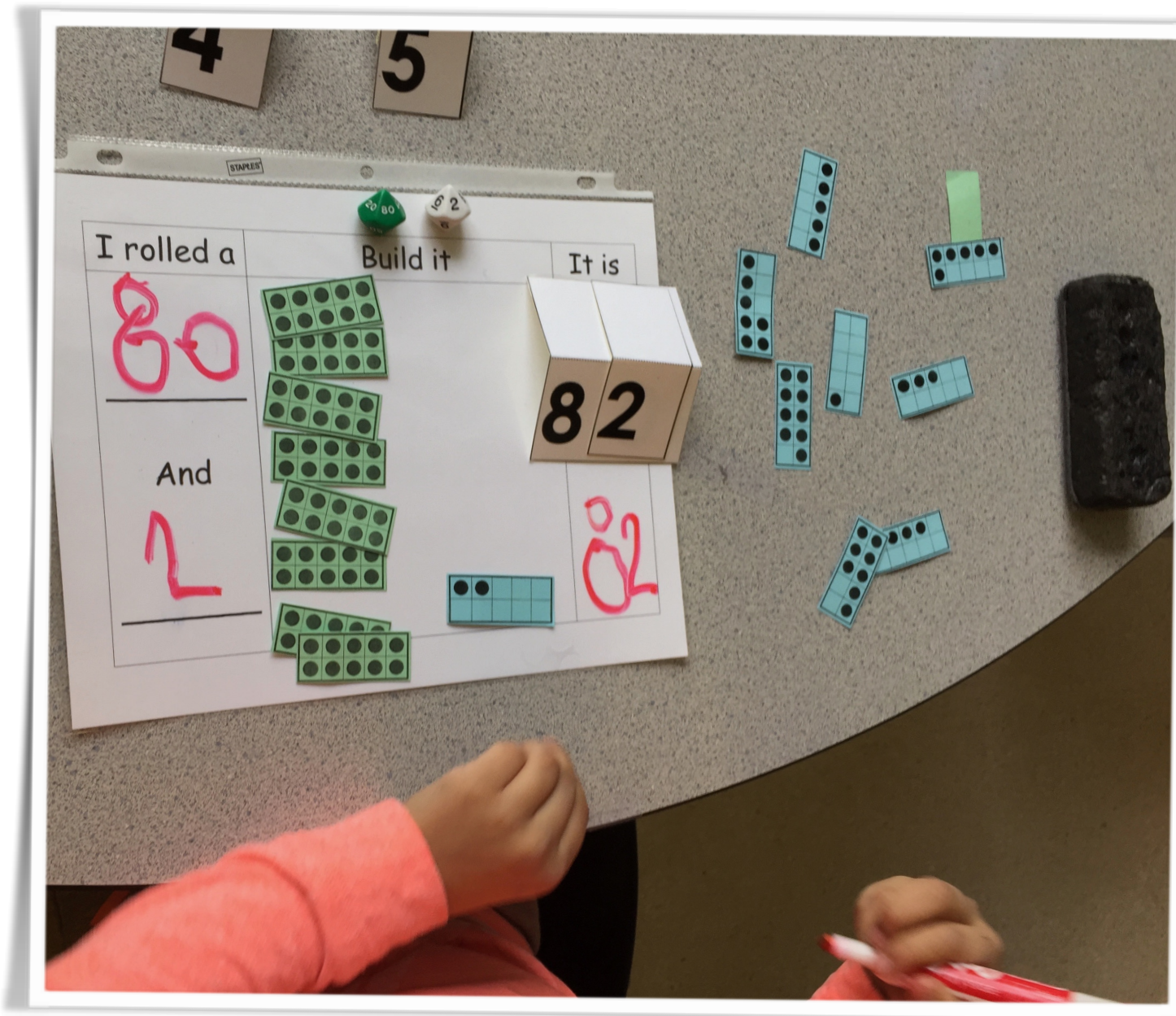


# NUMBER: Place Value



“How does organizing your items into groups of ten help you to count?”





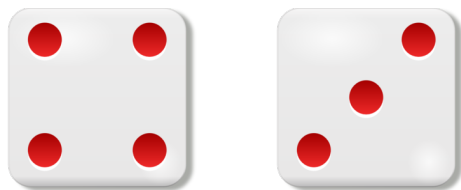
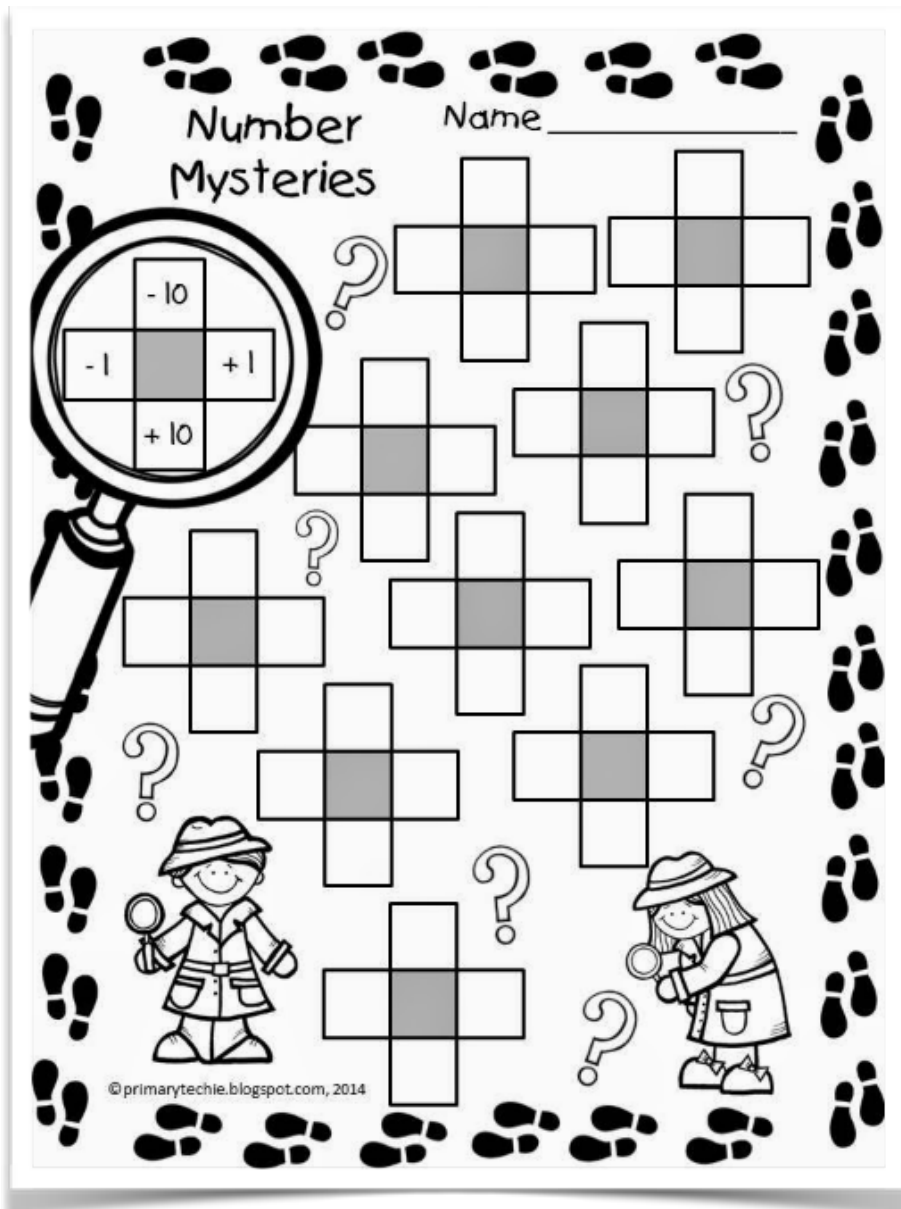
“What did you roll?”

“Can you build your number using ten frames?”

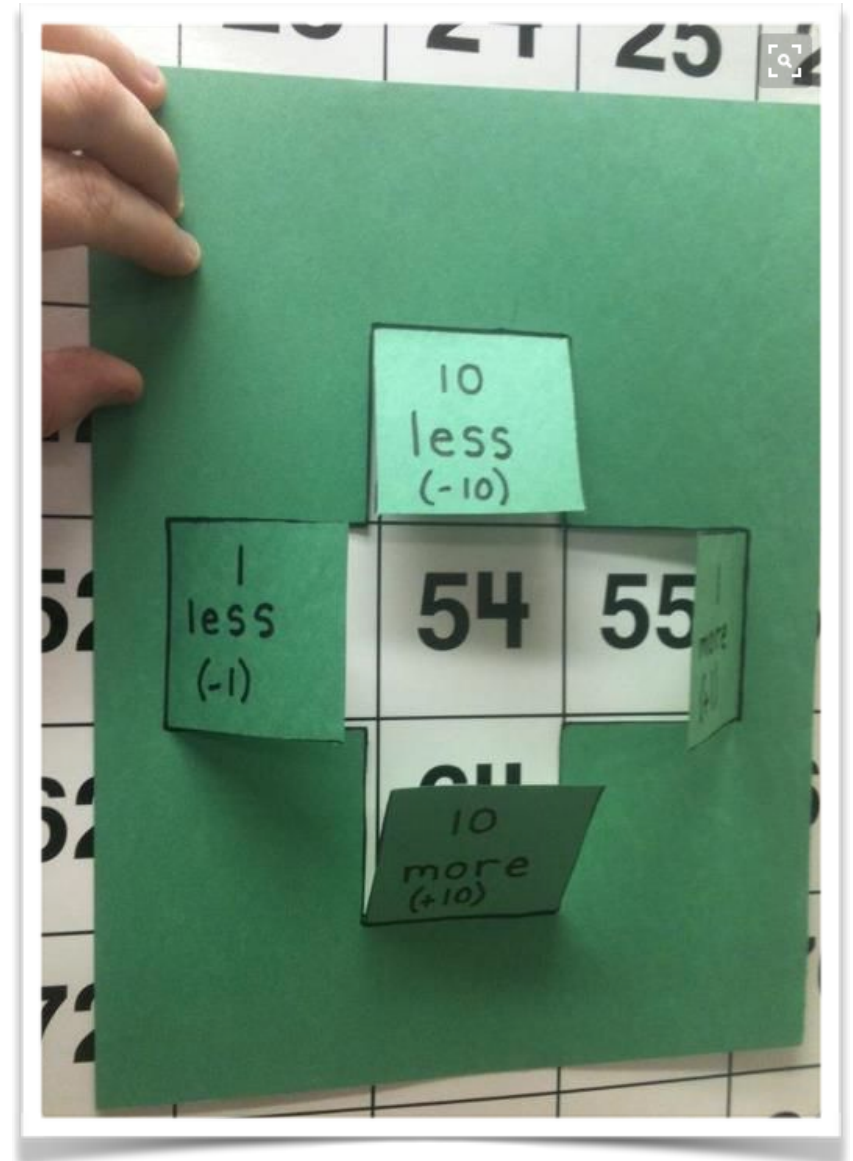
“How would you write your number?”

“If you added ten to your number, what number would you have?”





Roll 2 die to make  
a 2-digit number



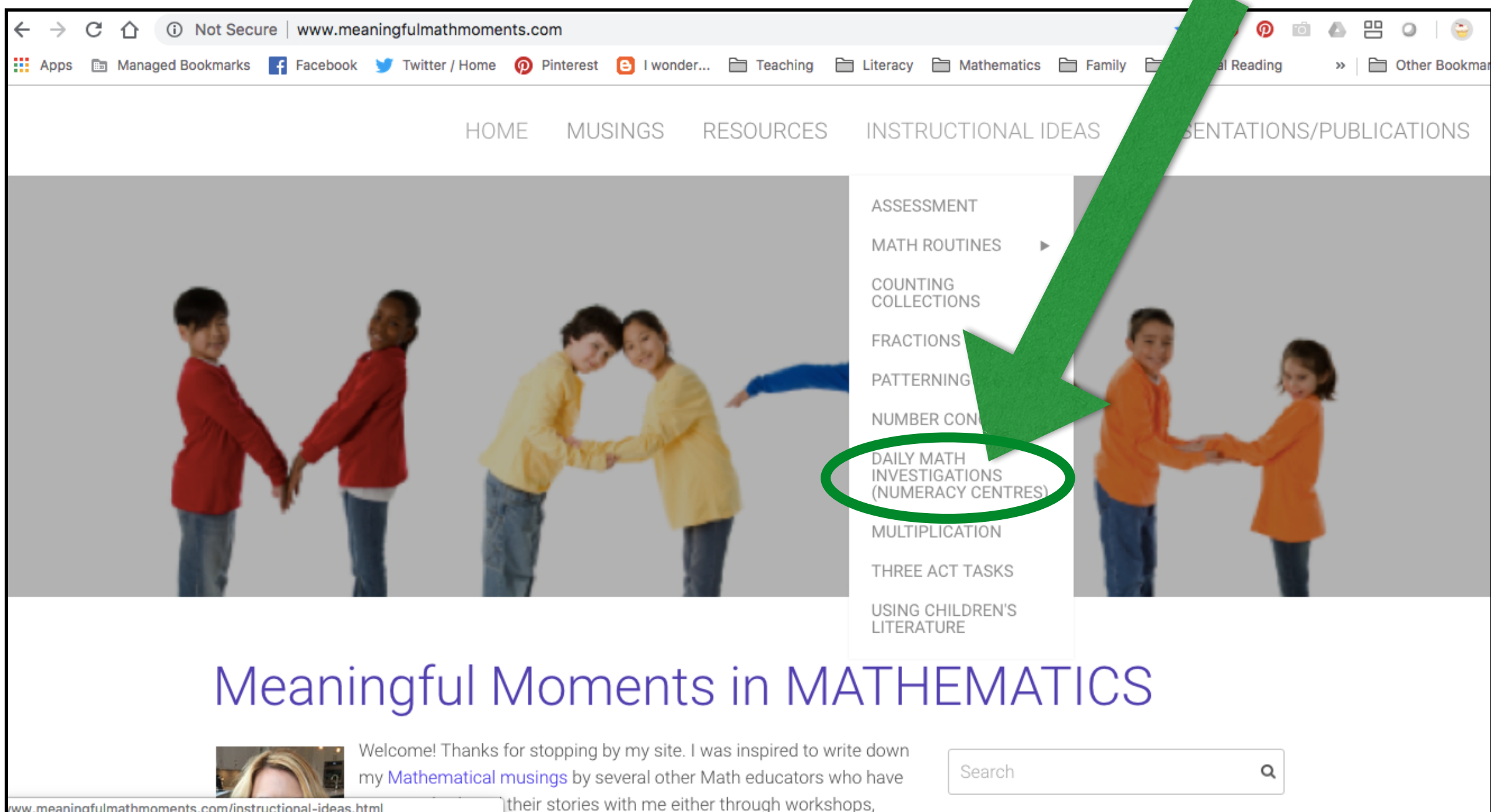
“What is your  
number?”

“What is ten more, ten  
less, one more, or one  
less than your  
number?”





Learning Station examples can be found on my site,  
under “Instructional Ideas” - Daily Math Investigations



The screenshot shows the website [www.meaningfulmathmoments.com](http://www.meaningfulmathmoments.com). The navigation bar includes links for HOME, MUSINGS, RESOURCES, INSTRUCTIONAL IDEAS, and PRESENTATIONS/PUBLICATIONS. The 'INSTRUCTIONAL IDEAS' dropdown menu is open, displaying a list of categories: ASSESSMENT, MATH ROUTINES, COUNTING COLLECTIONS, FRACTIONS, PATTERNING, NUMBER CONCEPTS, DAILY MATH INVESTIGATIONS (NUMERACY CENTRES), MULTIPLICATION, THREE ACT TASKS, and USING CHILDREN'S LITERATURE. A green arrow points to the 'DAILY MATH INVESTIGATIONS (NUMERACY CENTRES)' option, which is also circled in green. The background of the page features a large image of children holding hands in a circle. Below the navigation bar, the text 'Meaningful Moments in MATHEMATICS' is displayed in a large, purple font. At the bottom, there is a welcome message from the author, a search bar, and a social media link.

Not Secure | [www.meaningfulmathmoments.com](http://www.meaningfulmathmoments.com)

Apps Managed Bookmarks Facebook Twitter / Home Pinterest I wonder... Teaching Literacy Mathematics Family Personal Reading Other Bookmarks

HOME MUSINGS RESOURCES INSTRUCTIONAL IDEAS PRESENTATIONS/PUBLICATIONS

ASSESSMENT  
MATH ROUTINES  
COUNTING COLLECTIONS  
FRACTIONS  
PATTERNING  
NUMBER CONCEPTS  
**DAILY MATH INVESTIGATIONS (NUMERACY CENTRES)**  
MULTIPLICATION  
THREE ACT TASKS  
USING CHILDREN'S LITERATURE

Meaningful Moments in MATHEMATICS

Welcome! Thanks for stopping by my site. I was inspired to write down my [Mathematical musings](#) by several other Math educators who have shared their stories with me either through workshops, or by email.

Search

# Open Questions

What resources are available?



Each book spans several Grades (e.g., K - 3)  
Currently only the Number Strand is aligned to our BC Curriculum.  
There are other strands including Patterns and Relations/Statistics and Relations and Measurement.





**Janice Novakowski** @jnovakowskisd38 · Feb 10

How might Reggio-inspired practices enhance our math teaching and learning?

#BCAMTreggio #reggioplac #bced



← ↻ 21 ★ 47 ...

[View photo](#)



#iteachmath  
#BCAMTreggio  
@jnovakowski38

# What criteria guides the design of Learning Stations?

- Is this 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**?
- What **QUESTIONS** will I ask to move the learning forward



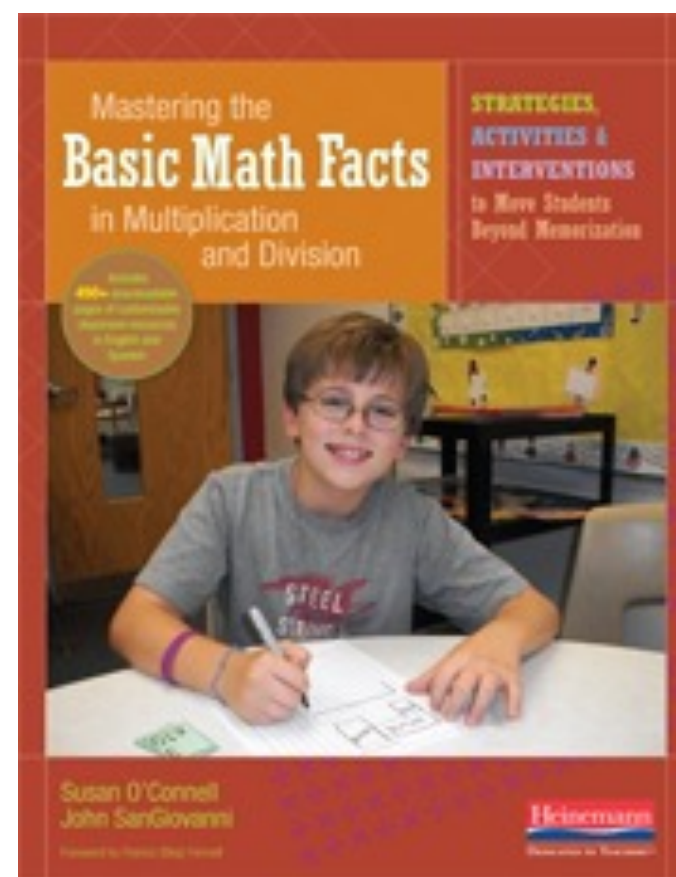
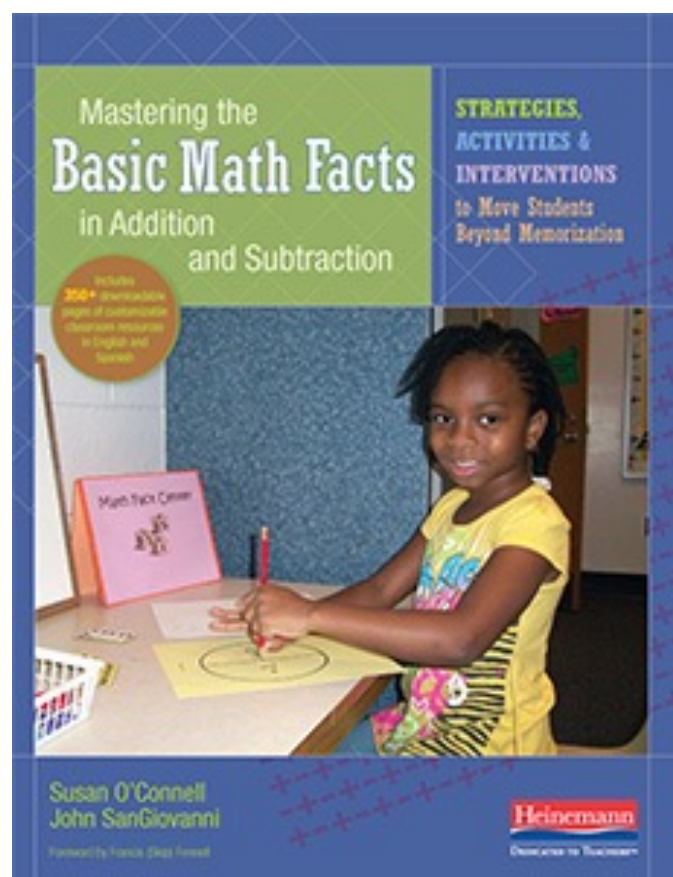
- Are there opportunities for **COLLABORATION**?
- Have you woven in your students' **INTERESTS**?
- Are you providing opportunities for students to revisit/  
**SPRIAL** concepts throughout the year
- How will I be **RESPONSIVE** to misconception  
and gaps of understanding?
- How will I **RECORD OBSERVATIONS**?
- How will I provide opportunities for  
**STUDENT REFLECTION**?
- How will I **COMMUNICATE**  
**STUDENT LEARNING**?



# Computational Fluency



# Consider joining the Developing Computational Fluency Series



Session One  
3:30 - 5:00 p.m.  
Tuesday, Nov. 20th

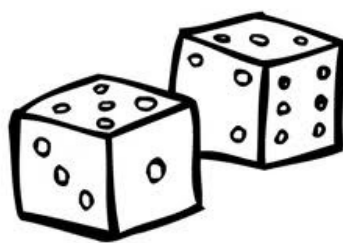
Session Two  
4:00 - 7:00 p.m.  
Tuesday, Jan. 15th

LRS #178984

LRS #178985

Session Three  
3:30 - 5:00 p.m.  
March 12th

box cars  
and  
one-eyed jacks®



# Primary Games can be found on Sandra Ball's Website

## Starting With The Beginning

Early Learning – Planting the Seeds

 Search



[Home](#)   **[About Me](#)**   [Alphabet Adventures](#)   [Back to the Basics](#)   [Big Books and Pocket Charts](#)

[Big Results in a Small Amount of Time](#)   [Building a Bridge](#)   [Building A Foundation – Numeracy](#)   [Cuisenaire Rod Quest](#)

[Daily Math Investigations](#)   [Foundational Keys to Success](#)   [Halloween Ideas](#)   [Linking Assessment and Curriculum](#)

[Literacy Centre Fun](#)   [Math in Nature](#)   [Northwest Math Conference 2012](#)   [Now I Know My ABCs](#)

[Number Sense – Building a Solid Foundation](#)   [Number Talks](#)   [Numeracy Centre Fun](#)   [Pattern Ideas](#)   [Read a Story, Explore the Math](#)

[Reggio-Inspired Math](#)   [Self-Assessment of Core Competencies](#)   [Sight Word Safari](#)   [The Power of Ten Frames](#)   [The Power of Two](#)



# Numeracy Centres



# What's Included?

## Penguin Package

### What's Inside?

#### 1. Domino Penguin Match - Matching Activity - 1 set

- students match quantities on a penguin with the numerals on a matching penguin



#### 2. Feed Me - Individual - BLMs

- reinforce partitioning of numbers into 2 parts.
- students use 2 sided counters and sort them into 2 parts



#### 3. Penguin Cover Up Five Frame - Individual

- roll the 1 - 6 sided die
- cover the rolled quantity on to the five frame
- students could record on a blank five frame the quantity (using bingo dabbers or felts)
- ask "How many more/less to get to 5?"



#### 4. Penguin Cover Up 0-10 - Individual

- player #1 needs to roll die (0 - 9 sided)
- build quantity on a ten frame and cover up the numeral
- students could record on a blank ten frame the quantity (using bingo dabbers or felts)
- ask "How many more/less to get to 10?"



#### 5. Penguin Cover Up 1-10 - Partner Game - BLM

- player #1 needs to roll 2 (1 - 10 sided) die
- build quantity on the ten frames and cover up the numeral
- players take turns rolling the die, building the quantity and covering the numeral
- first one to cover all the numerals wins

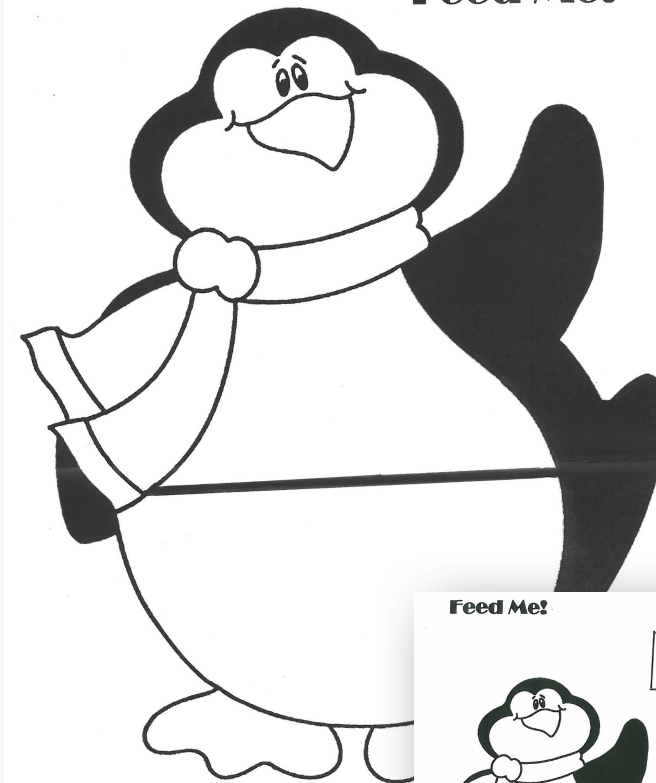


#### 6. Penguin Cover Up 2-12 - Partner Game - BLM

- player #1 needs to roll 2 (1 - 6 sided) dice and find the sum
- build the sum on the ten frames and cover up the numeral
- players take turns rolling the die, building the quantity and covering the numeral
- first one to cover all the numerals wins



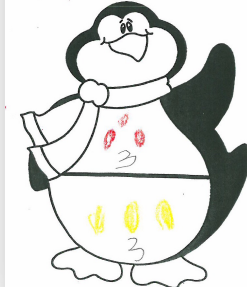
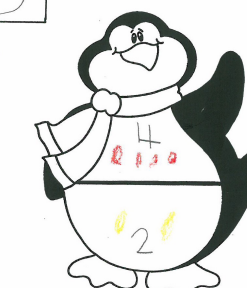
## Feed Me!



## Feed Me!

Bob 6/6

6





## COVER UP!

Doubles!



12	6	10	12	4	8
14	18	8	16	8	6
6	10	14	12	10	14
12	4	8	18	16	10
14	16	18	14	4	14
2	8	4	10	16	18

Roll the die. Double the number.  
Find it on the grid and cover it in your counter.  
Give your partner a turn.  
First one to have 4 in a row wins!

## Chips Ahoy!



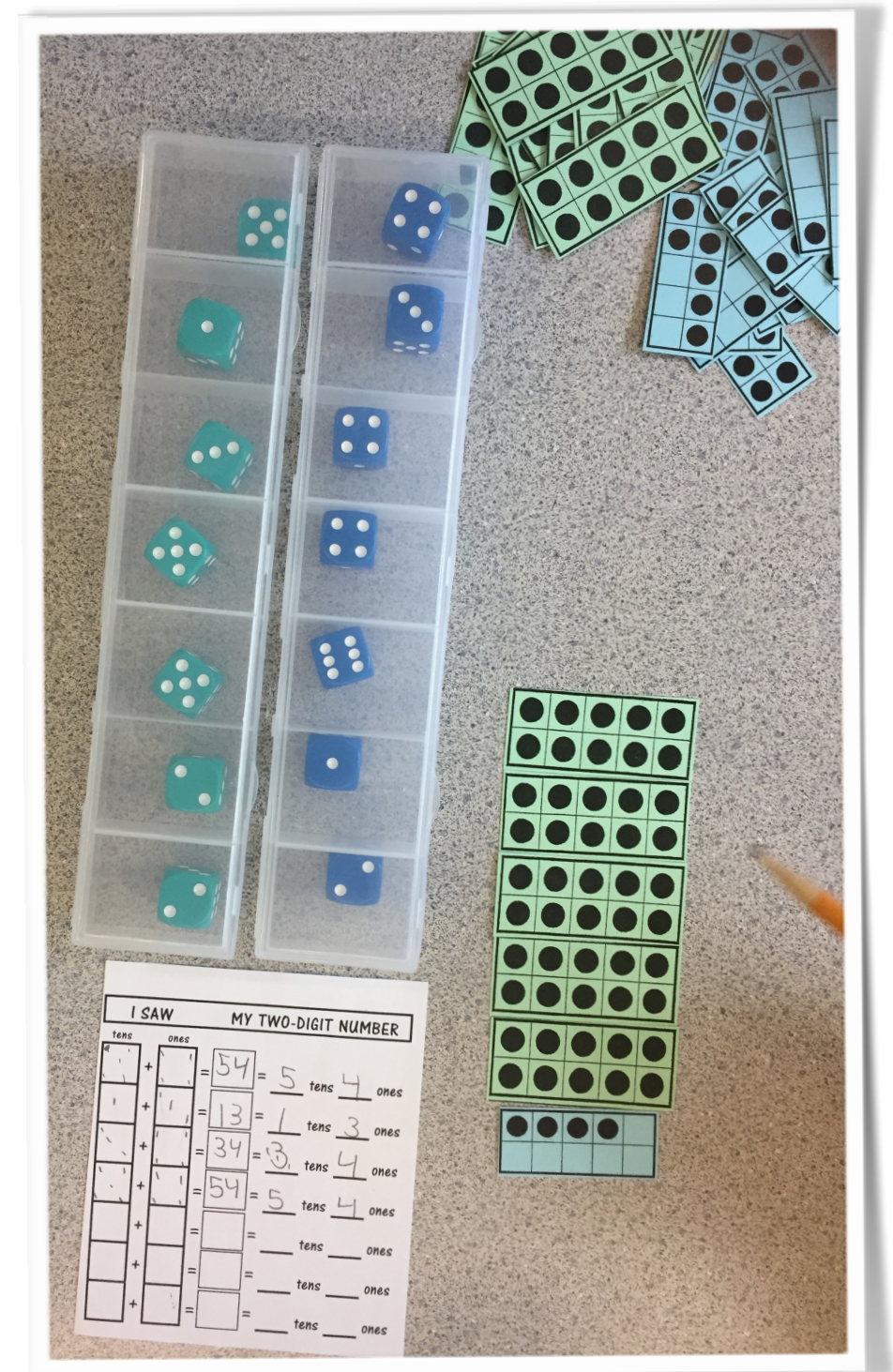
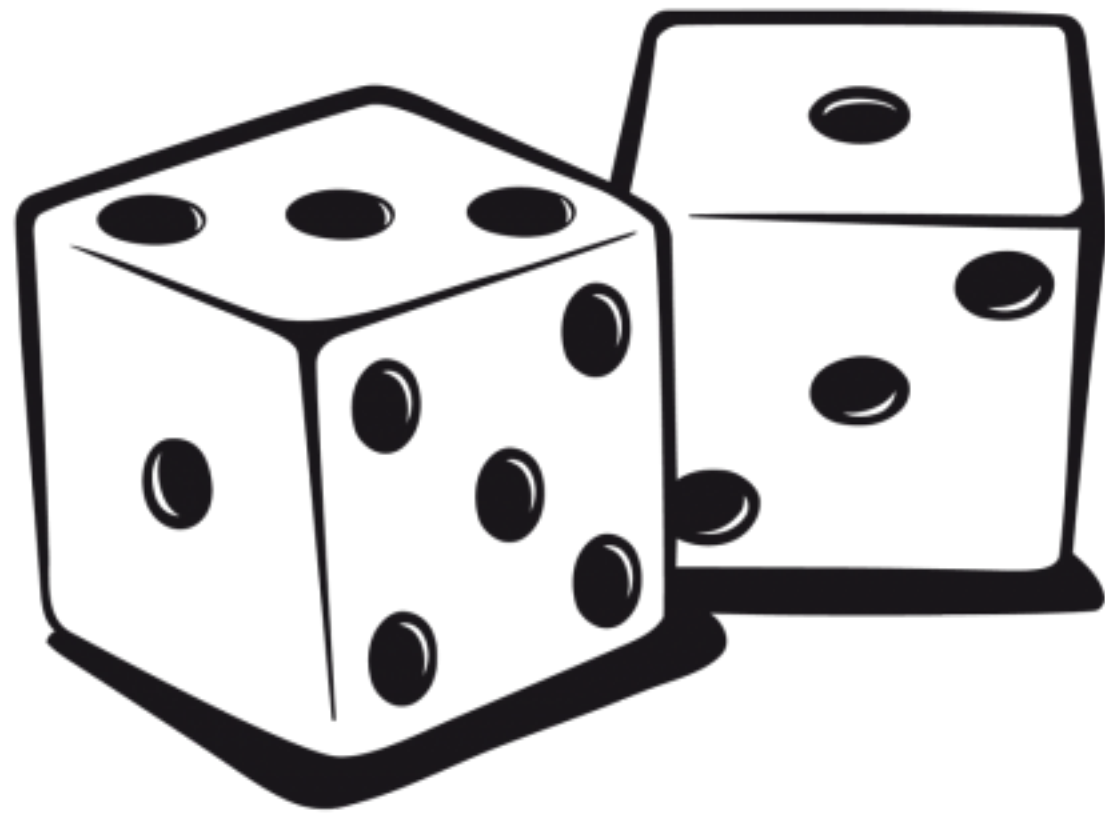
3	7	5
19	15	13
11	17	9

- ★ Place 15 chips on the game board. Chips can be placed anywhere, and doubles on a space are OK.
- ★ Roll a 10 sided die (0-9).
- ★ Double and add 1 to the number rolled, then remove a chip from the space that shows the sum.  
For example: Player A rolls a 2, say the near double fact ( $2 + 2 + 1$  is 5 or  $2 + 3 = 5$ ) and takes a chip off the 5 space.
- ★ Roll a zero and take a chip from any space!
- ★ Players take turns until one player has collected 8 chips. This person is the winner!

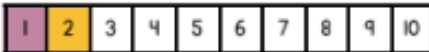
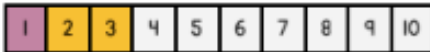
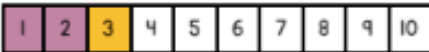
Available on Sandra Ball's website

“How can thinking about ‘doubles’  
help you solve  $6 + 7 =$  “

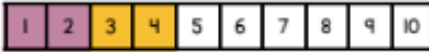
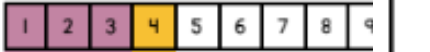


# Box Cars and One Eyed Jacks

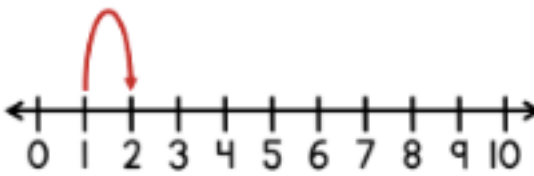

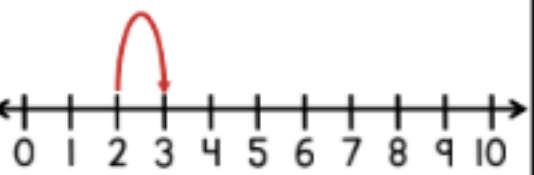
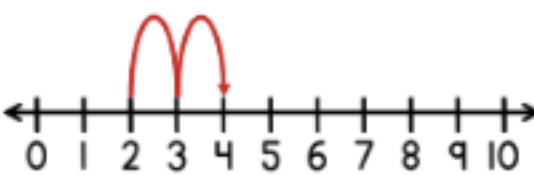
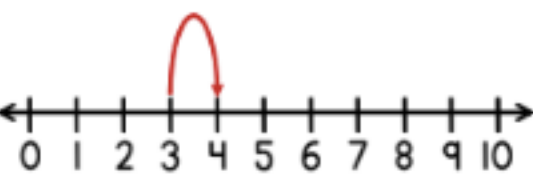
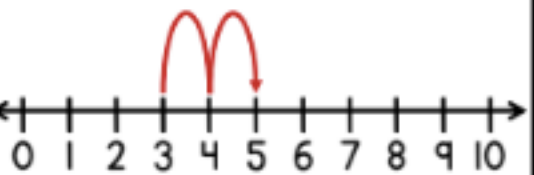
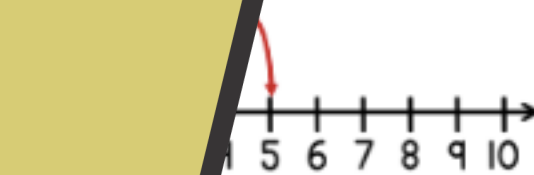
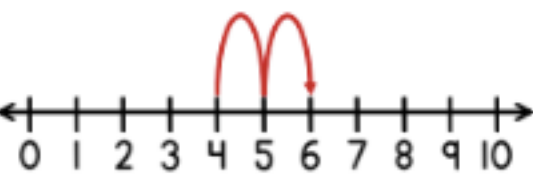
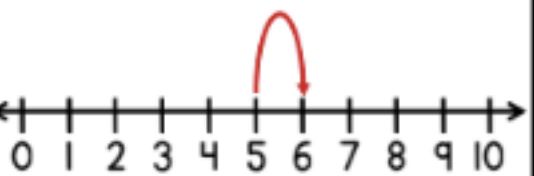


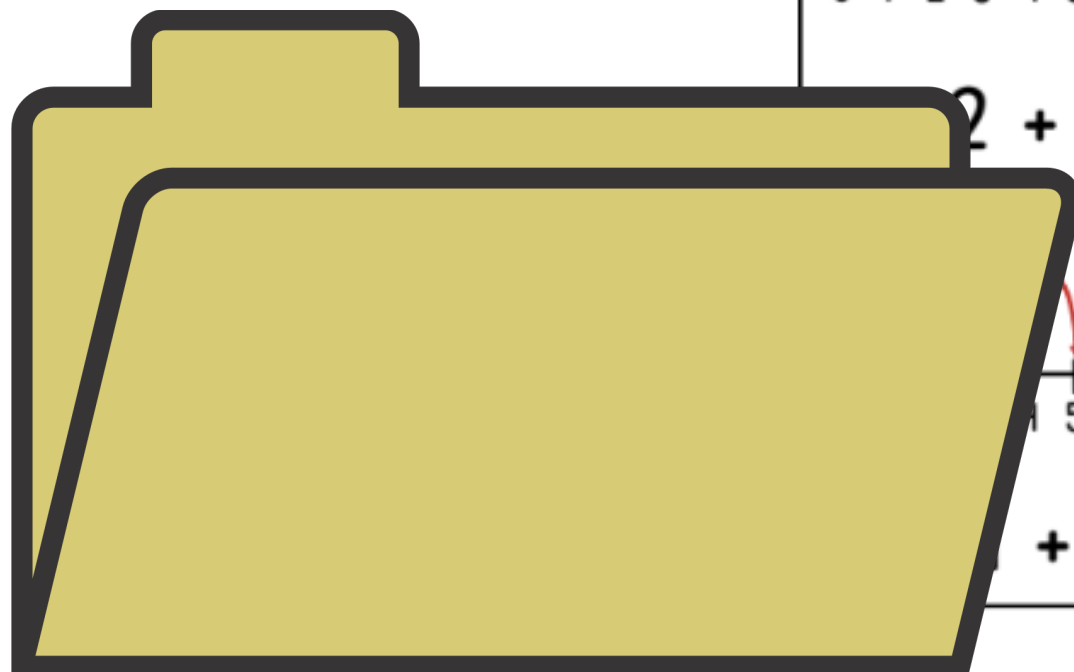


 $1 + 1 =$	 $1 + 2 =$	 $2 + 1 =$
---	--	---




Sort the cards by answers you know and those you don't.



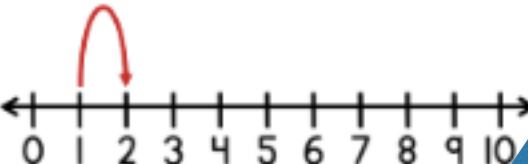
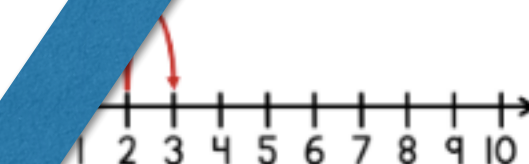
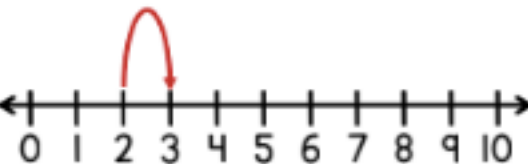
 $2 + 2 =$	 $3 + 1 =$
 $4 + 1 =$	 $4 + 2 =$


 $1 + 1 =$	 $1 + 2 =$	 $2 + 1 =$
 $2 + 2 =$	 $3 + 1 =$	 $3 + 2 =$
 $4 + 1 =$	 $4 + 2 =$	 $5 + 1 =$

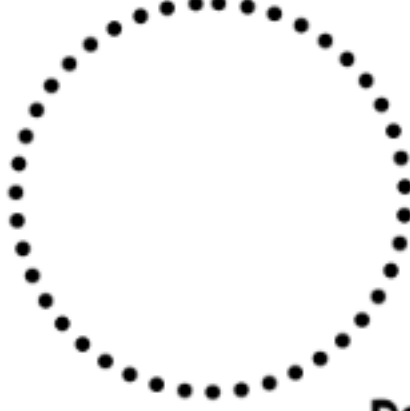


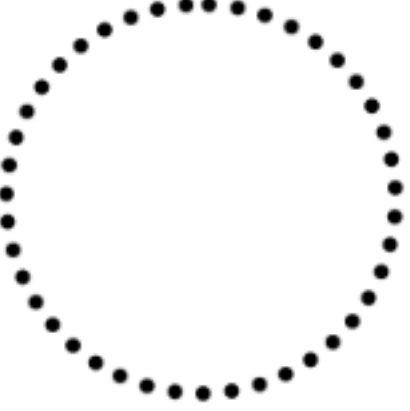
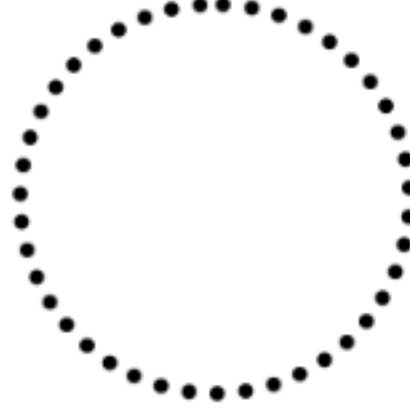


Sort the cards by the strategies you used.

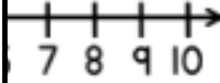
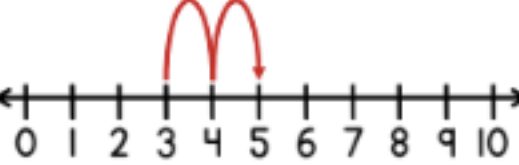
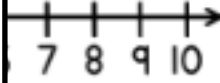
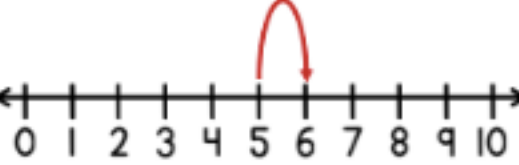
		
$4 + 6 =$	$5 + 5 =$	$4 + 6 =$

				
$4 + 6 =$	$5 + 5 =$	$1 + 1 =$	$1 + 2 =$	$2 + 1 =$



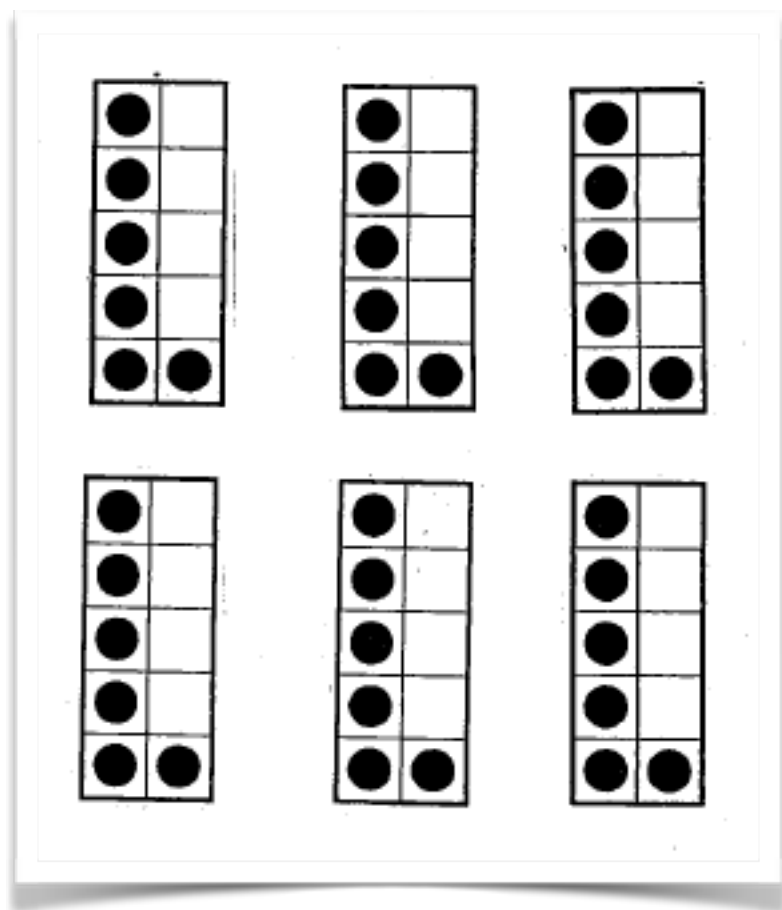
<b>Plus One, Plus Two</b> 	<b>Add Zero</b> 	<b>Ten More</b> 
<b>Doubles</b> 	<b>Make Ten</b> 	<b>Which strategy do you use?</b>

**Strategy Sort**

	
$=$	$3 + 2 =$
	
$=$	$5 + 1 =$



# Ten Frame Multiplication Cards



For  $6 \times 6$  I can think  
 $6 \times 5$  and add one more  
group. Example  $6 \times 5 = 30$   
plus  $6 = 36$

# Regrouping

$$8 + 9$$

$$6 + 5$$

# Not Regrouping

$$13 + 4$$



TRUE

FALSE

$$6 = 4 + 2$$

$$10 - 2 = 7$$

$$11 + 8 = 19$$

# Problem Solving

Students need to be able to read to engage in these problems; therefore, this type of learning stations makes the most sense for the end of Grade One or Grade Two. These problems can also be used with the whole class as a rich tasks and/or in Guided Math small groups.



## JOINING PROBLEMS

Join (Result Unknown) $6 + 3 = \underline{\quad}$	Join (Change Unknown) $4 + \underline{\quad} = 7$	Join (Start Unknown) $\underline{\quad} + 4 = 6$
Mr. Smith had 6 cookies. Suzy gave him 3 more cookies. How many cookies does Mr. Smith have now?	Mr. Smith had 4 cookies. Suzy gave him some more. Then, Mr. Smith had 7 cookies. How many cookies did Suzy give Mr. Smith?	Mr. Smith had some cookies. Suzy gave him 4 more cookies. Then, he had 6 cookies. How many cookies did Mr. Smith start with?

## SEPARATING PROBLEMS

Separate (Result Unknown) $7 - 4 = \underline{\quad}$	Separate (Change Unknown) $5 - \underline{\quad} = 1$	Separate (Start Unknown) $\underline{\quad} - 4 = 4$
Mr. Smith had 7 cookies. He gave 4 of them to Suzy. How many cookies did Mr. Smith have left?	Mr. Smith had 5 cookies. He gave some to Suzy. Then, he had 1 cookie left. How many cookies did Mr. Smith give to Suzy?	Mr. Smith had some cookies. He gave 4 to Suzy. Then, he had 4 cookies left. How many cookies did Mr. Smith have to start with?

## PART - PART - WHOLE PROBLEMS

Part - Part - Whole (Whole Unknown) $6 + 3 = \underline{\quad}$	Part - Part - Whole (Part Unknown) $7 - 4 = \underline{\quad}$ or $4 + \underline{\quad} = 7$
Mr. Smith had 6 white cookies and 3 pink cookies. How many cookies did Mr. Smith have altogether?	Mr. Smith had 7 cookies. 4 were pink and the rest were white. How many white cookies did Mr. Smith have?

## COMPARING PROBLEMS

Compare (Difference Unknown) $5 - 3 = \underline{\quad}$ or $3 + \underline{\quad} = 5$	Compare (Quantity Unknown) $3 + 2 = \underline{\quad}$	Compare (Referent Unknown) $8 - 5 = \underline{\quad}$
Mr. Smith had 5 cookies. Suzy had 3 cookies. How many more cookies did Mr. Smith have than Suzy?	Mr. Smith had 3 cookies. Suzy had 2 more cookies than Mr. Smith. How many cookies did Suzy have?	Mr. Smith had 8 cookies. He had 5 more than Suzy. How many cookies did Suzy have?

COMPARING PROBLEMS		
Compare (Difference Unknown) $5 - 3 = \underline{\quad}$ or $3 + \underline{\quad} = 5$	Compare (Quantity Unknown) $3 + 2 = \underline{\quad}$	Compare (Referent Unknown) $8 - 5 = \underline{\quad}$
Mr. Smith had 5 cookies. Suzy had 3 cookies. How many more cookies did Mr. Smith have than Suzy?	Mr. Smith had 3 cookies. Suzy had 2 more cookies than Mr. Smith. How many cookies did Suzy have?	Mr. Smith had 8 cookies. He had 5 more than Suzy. How many cookies did Suzy have?

MULTIPLYING AND DIVIDING PROBLEMS		
Multiplication $3 \times 3 = \underline{\quad}$	Measurement Division $9 \div 3 = \underline{\quad}$	Partitive Division $12 \div 3 = \underline{\quad}$
Mr. Smith had 3 piles of cookies. There were 3 cookies in each pile. How many cookies did Mr. Smith have?	Mr. Smith had 9 cookies. He put 3 cookies in each box. How many boxes did he need?	Mr. Smith had 12 cookies. He wanted to give them to 3 friends. How many cookies did each friend get?

What materials will be available for students?

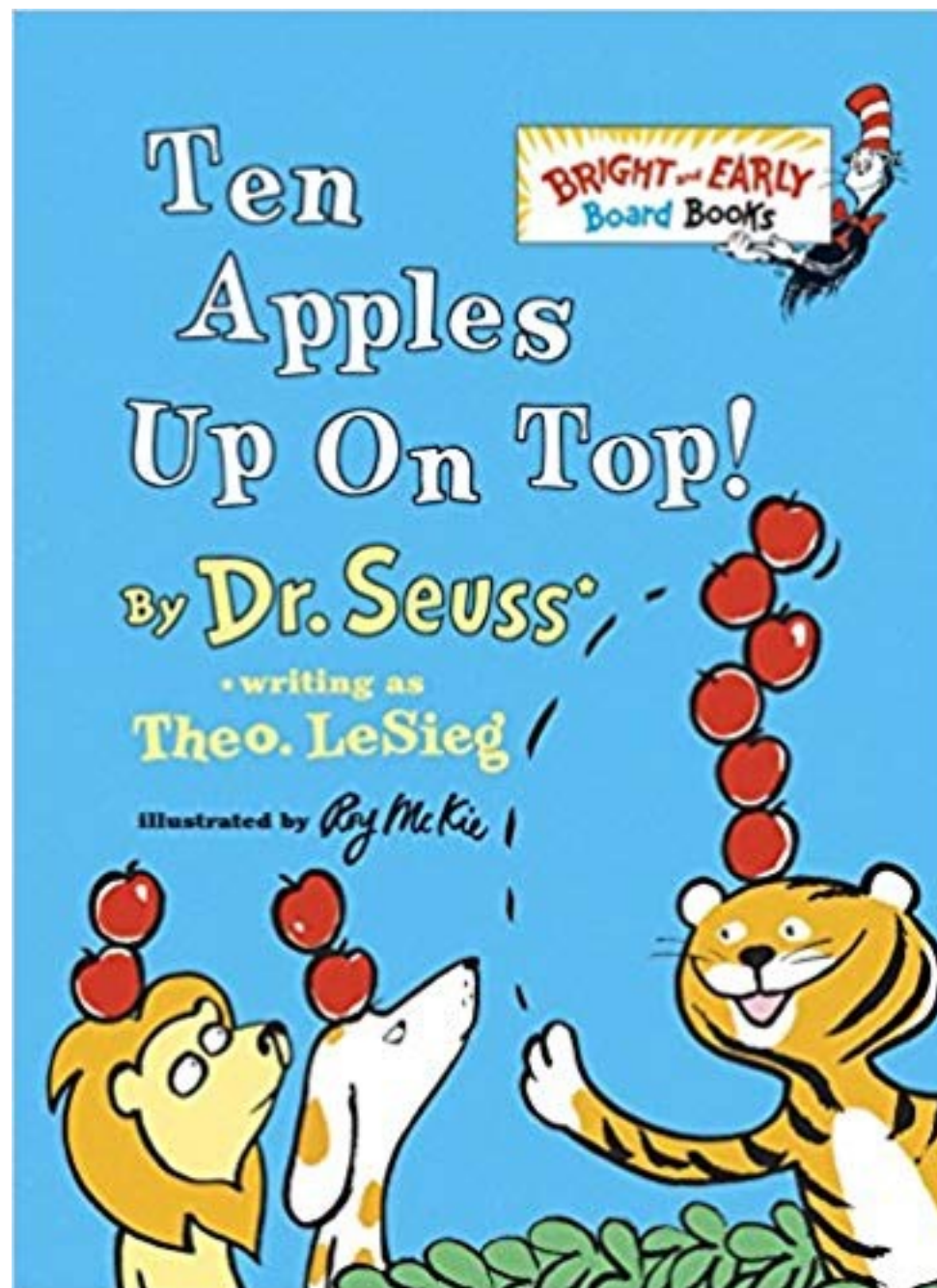
What models will help your students?

Where will students record their ideas?

Could students match solutions to problems?

Could students match representations/models to problems?





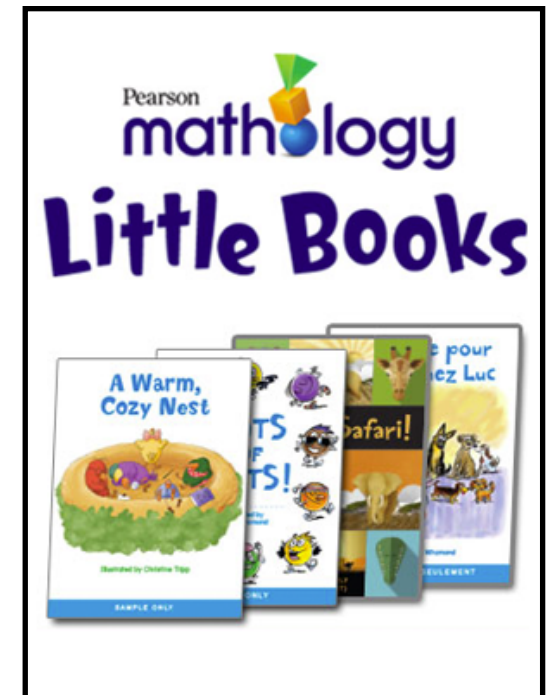
Look at a page  
from the story.  
What question  
could you ask the  
addition could  
help you solve?  
Try it out!

**Digital Apps**



# Consumable Apps

- Engaging
- Provide instant feedback
- Similar to Skill and Drill
- Focus on discrete concepts



# Be CAUTIOUS about...

- apps that focus on SPEED
- that focus on MEMORIZATION with no visual supports
- how apps handle mistakes





# CREATIVE APPS IN MATH:

- emphasize communication, collaboration, creativity
- make student thinking visible - document understanding
- shift the focus from the answer to the process
- allow students to uncover the big ideas and make connections
- permit reflection
- become powerful assessment *for* and *of* learning



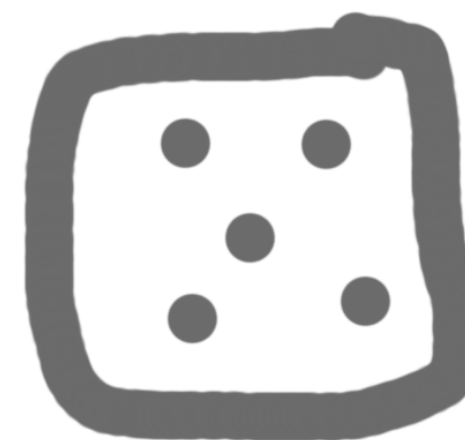
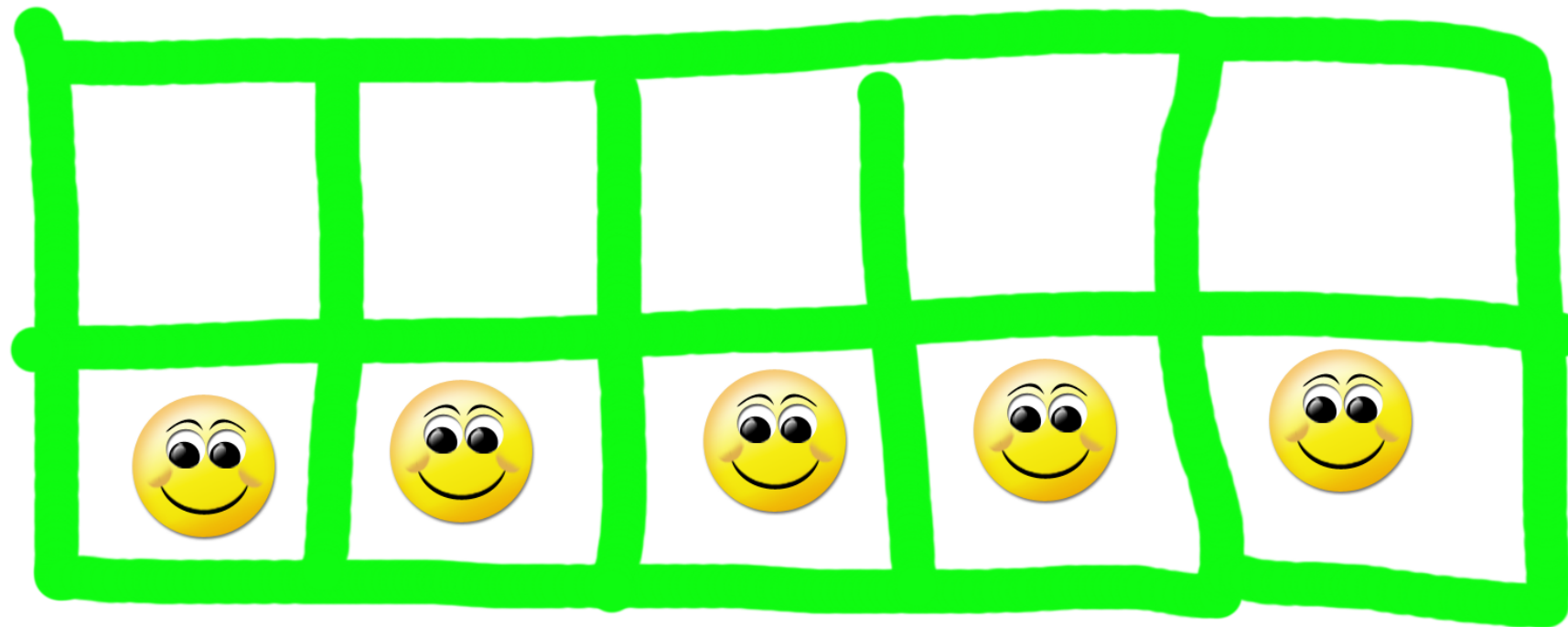
- Free app
- Users can draw, stamp, use backgrounds, and change colours
- Students can show what they know through pictures, words, and numbers
- Images can easily be shared



# MATHEMATICAL INQUIRY TASK:

*How many ways can you show me  
the number \_\_\_\_\_?*

- Use the stamps and markers
- Be creative!
- Don't forget that you can make a 10-frame if you want using the dot background paper.







- Free and easy to use
- Annotate images or PDFs
- Add arrows, tags, text, highlight, crop, or pixelate
- Users can easily share images

# MATHEMATICAL INQUIRY TASK:

*What patterns can you create?*

*Can you label and translate your pattern?*

- Design a pattern
- Take a photo
- Using Skitch label your pattern
- Trade iPads with a partner and translate each other's pattern



Winnie.Z

Queenie.L

A

B

C

A

B

C

A b c a b c





Jonathan



**AA BC AAB CA AB CA AB C**







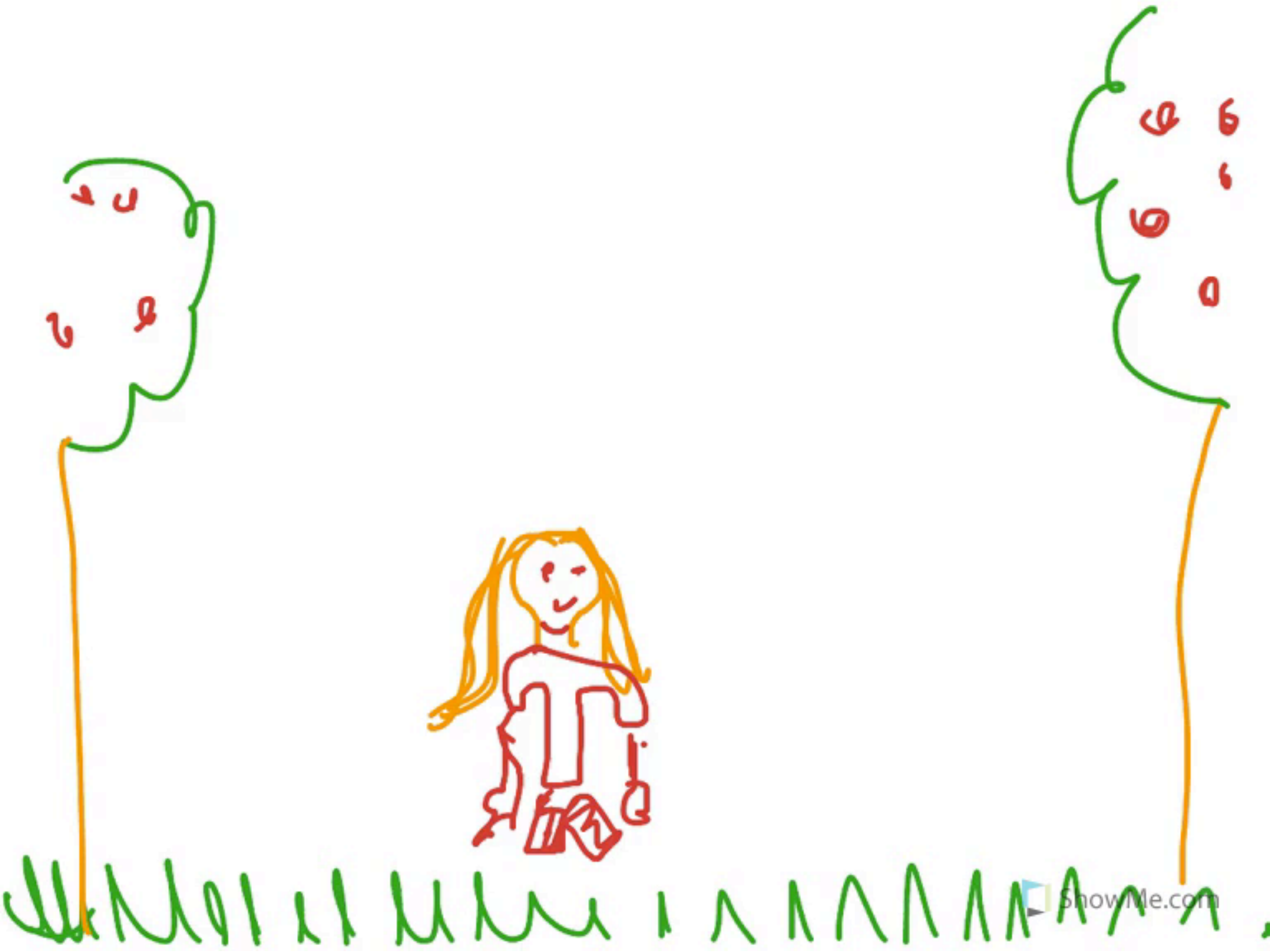
- Free and easy to use
- Interactive whiteboard
- Add images, animation, narration, and use laser pointer to create multiple slides
- Users can easily share presentations

# MATHEMATICAL INQUIRY TASK:

*What joining stories can you tell?*

- Draw a picture
- Hit the record button. Explain your thinking.





# MATHEMATICAL INQUIRY TASK:

*What patterns do you see in the  
hundreds chart?*

- Tap the +photo icon and select from web
- Type hundreds chart and select one
- Label and explain the patterns you find



## Hundreds Chart

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

specialied.about.com



# Hundred Chart

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
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



# MATHEMATICAL INQUIRY TASK:

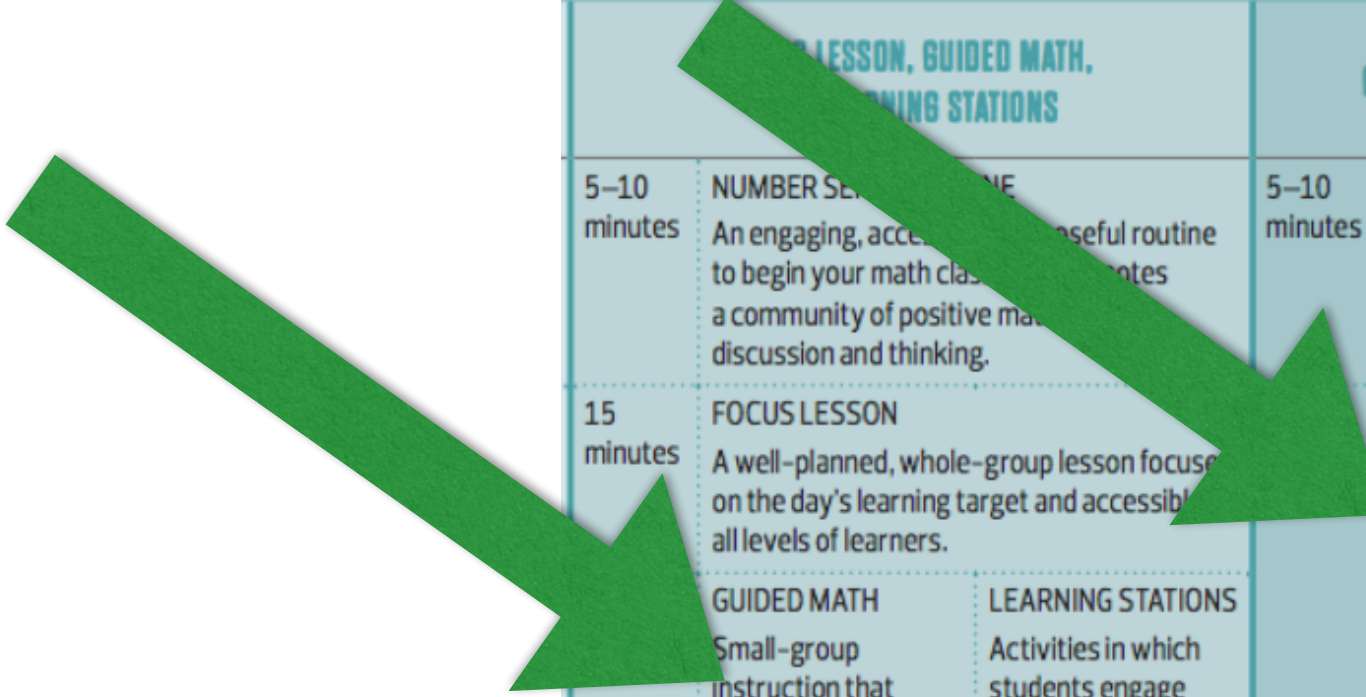
*What strategies can you use to solve this question?*

- Write out the question
- Show all the different strategies you know to solve the problem
- Record and explain your mathematical thinking





# GUIDED MATH



FOCUS LESSON, GUIDED MATH, 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.		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.
15 minutes	FOCUS LESSON A well-planned, whole-group lesson focused on the day's learning target and accessible to all levels of learners.		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.
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.

# **CLASSROOM ARRANGEMENT**

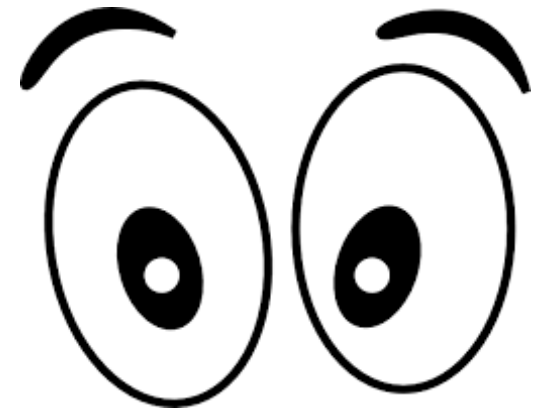


---

**Look around your room. Is your space  
arranged to be as conducive as possible to  
math workshop?**



# A Place for Guided Math



# **ROUTINES & PROCEDURES**



---

**Have you spent time practicing “Learning Stations” and transitions with students?**



# **MATHEMATICS COMMUNITY**

---



**Are you students talking with one another,  
explaining their thinking, working together,  
respecting each other's ideas, and exhibiting a  
growth mindset?**

# Guided Group Instruction

What could this look like?



- Groups are **FLEXIBLE** and composition changes according to the needs of the students.
- The number of groups you meet with vary, depending on needs.
- Sometimes teachers work one-on-one with students.
- The amount of time spent with each group varies but generally not ever more than 15 minutes. Fair does not meet equal!
- Names are **NEVER** posted.



# Why is Guided Math so important?

“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

# How do we form groups?

## **Pre-assessments**

It is important to find out “What do your students know?”

Checklist  
Anecdotal notes  
Conferences  
Self-Assessments





# Checklist

Student Names	Is able to create an increasing pattern.	Can explain the pattern.
Michael	Applying	With support
Jane	Extending	Extending
Sara	Developing	Not yet
Oliver	Applying	Applying

# Anecdotal Notes

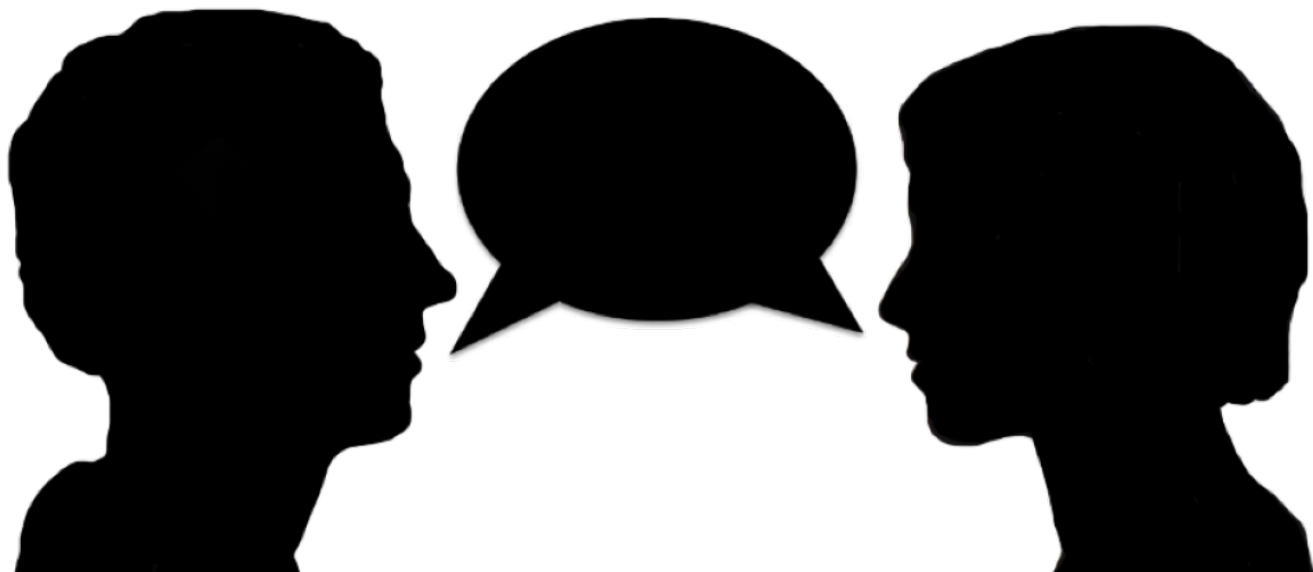
**Michelle**

**8/20 Learning Stations:**  
**Had difficulty stating the pattern rule when the pattern began at a number other than one.**

**8/25 Whole class discussion:**  
**Could orally describe the increase in the pattern but could not predict the tenth term without continuing the pattern.**



How do you find out what your students know? What new idea might you want to try?



# Types of Groupings

## **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.

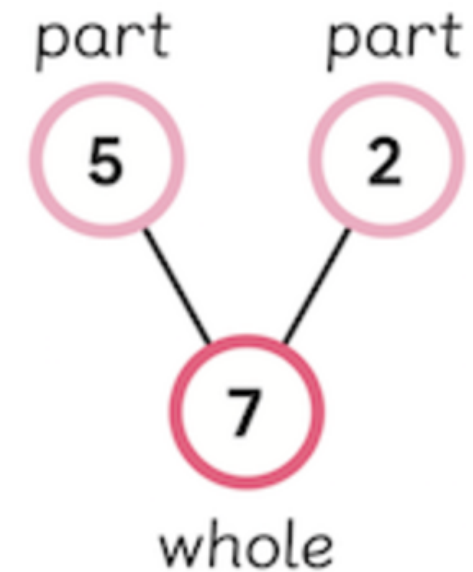




# Guided Group Instruction

What might you be doing in 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, number line, number bonds)
- discussing common errors
- assessing students

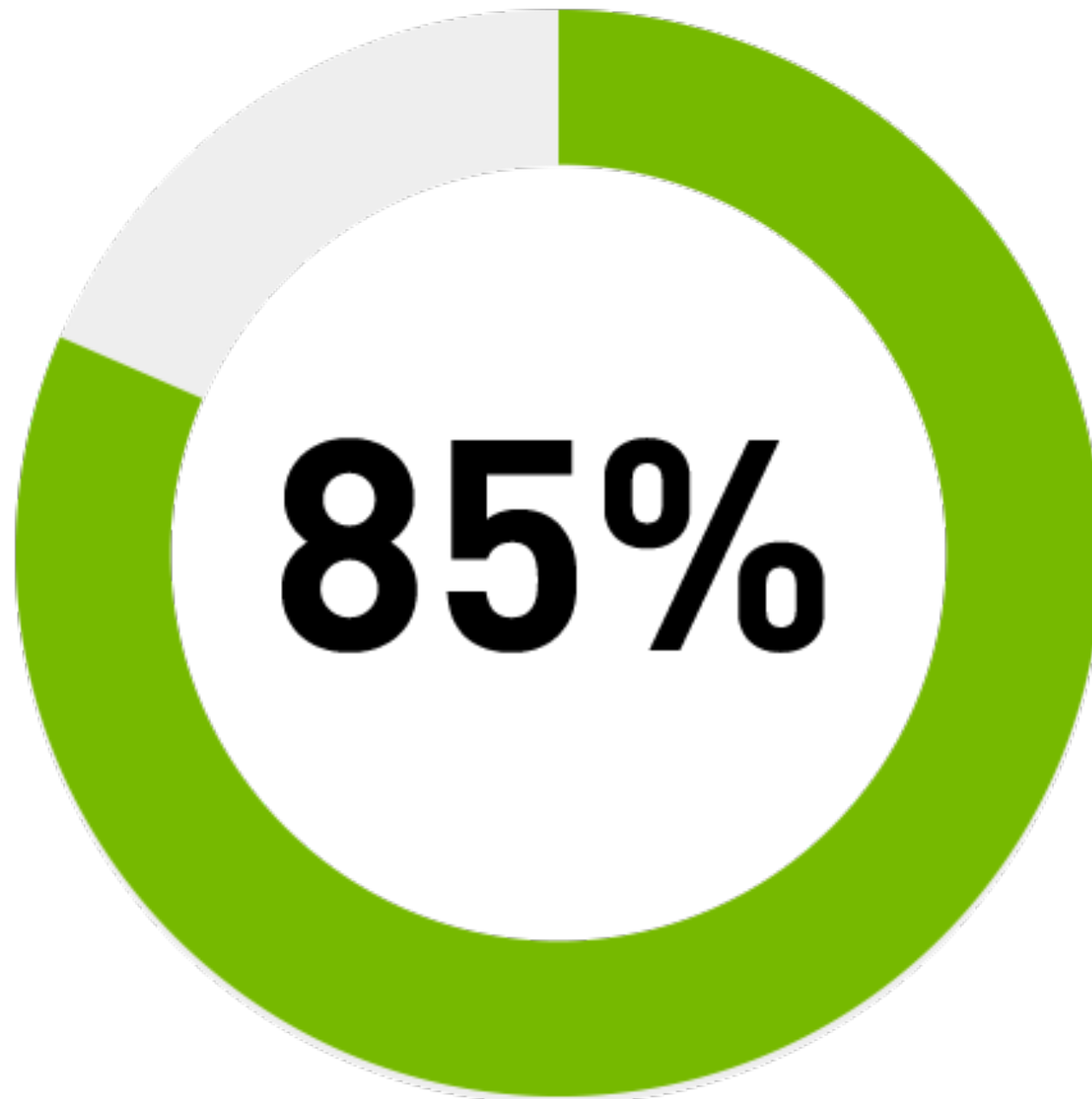


# 3 Parts to the Guided Math

<b>INTRO</b> <b>(Mini-lesson)</b>	<ul style="list-style-type: none"><li>• set the focus/ explain the goals for the lesson</li><li>• go over any tricky vocabulary</li><li>• model the concept, strategy, or skill</li></ul>
<b>DURING</b> <b>(Doing the math)</b>	<ul style="list-style-type: none"><li>• observe the students “doing” the math</li><li>• listen intently to the conversations</li><li>• record students’ strategies</li><li>• support, prompt, and question to make thinking visible</li></ul>
<b>AFTER</b> <b>(Reflecting and Connecting)</b>	<ul style="list-style-type: none"><li>• lead share</li><li>• ask focus questions that will help students make connections</li><li>• check-in with individual students about their learning</li></ul>



**Students should be DOING the math  
hands-on and minds-on**



# Primary Example

Video 5.1

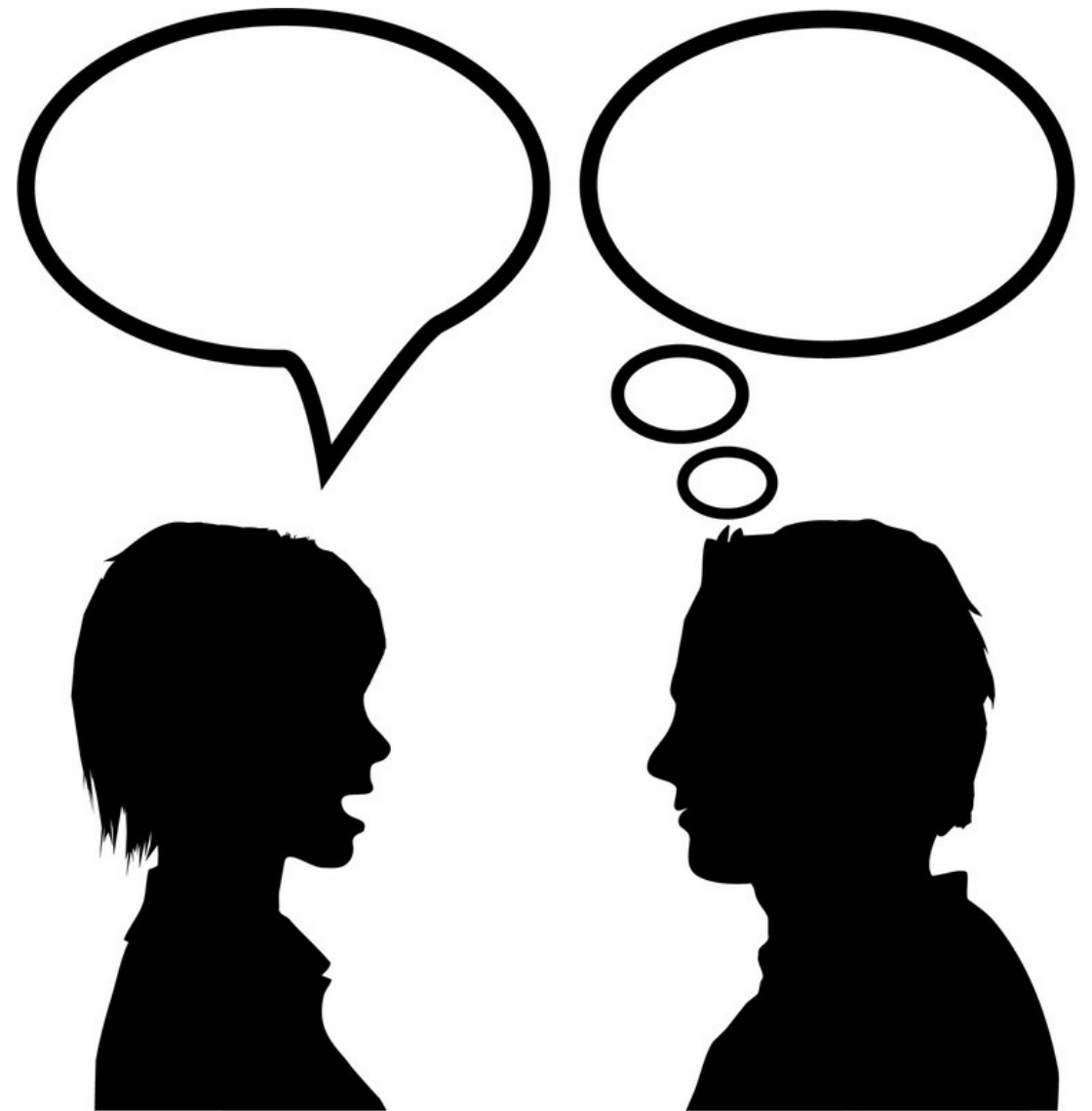
Starting at 9:10



# Guided Group Instruction

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



Let the guilt go!





# Guided Group Instruction

What are you recording?

What strengths or struggles do I see?

What strategies are being used?



These notes will help you make instructional decisions and it is likely that by the end of the day you will forget what you saw and heard, so take the time to record the data.

R+B

- good understanding  
- writing - needs to

in summer

action, capitals

Ariel

Jason

Queenie

Kelly

Phyllis

Corina

Jonathan

Andrew

Kaiflin

Leo

Sady

Eric

Malia

Vincent Z.

Gerge

Vincent C.

Leon

Gina

Suki

Lucy

Leila

Samantha

Camille

Kyle



## Anecdotal Records Template: Recording Student Strategies and Observations

Use this record page to jot down what you see students doing during math workshop. What strategy is being used? What is the student showing you about his or her understanding? What misconceptions might the student have? Use these notes later to group students, confer with students, communicate with parents, and plan for instruction.

MATH PROBLEM	STUDENT NAME AND STRATEGIES/OBSERVATIONS			

# STUDENT REFLECTION

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.		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.	
15 minutes	FOCUS LESSON A well-planned, whole-group lesson on the day's learning target and accessible to all levels of learners.		45 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.
15 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.			
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.	



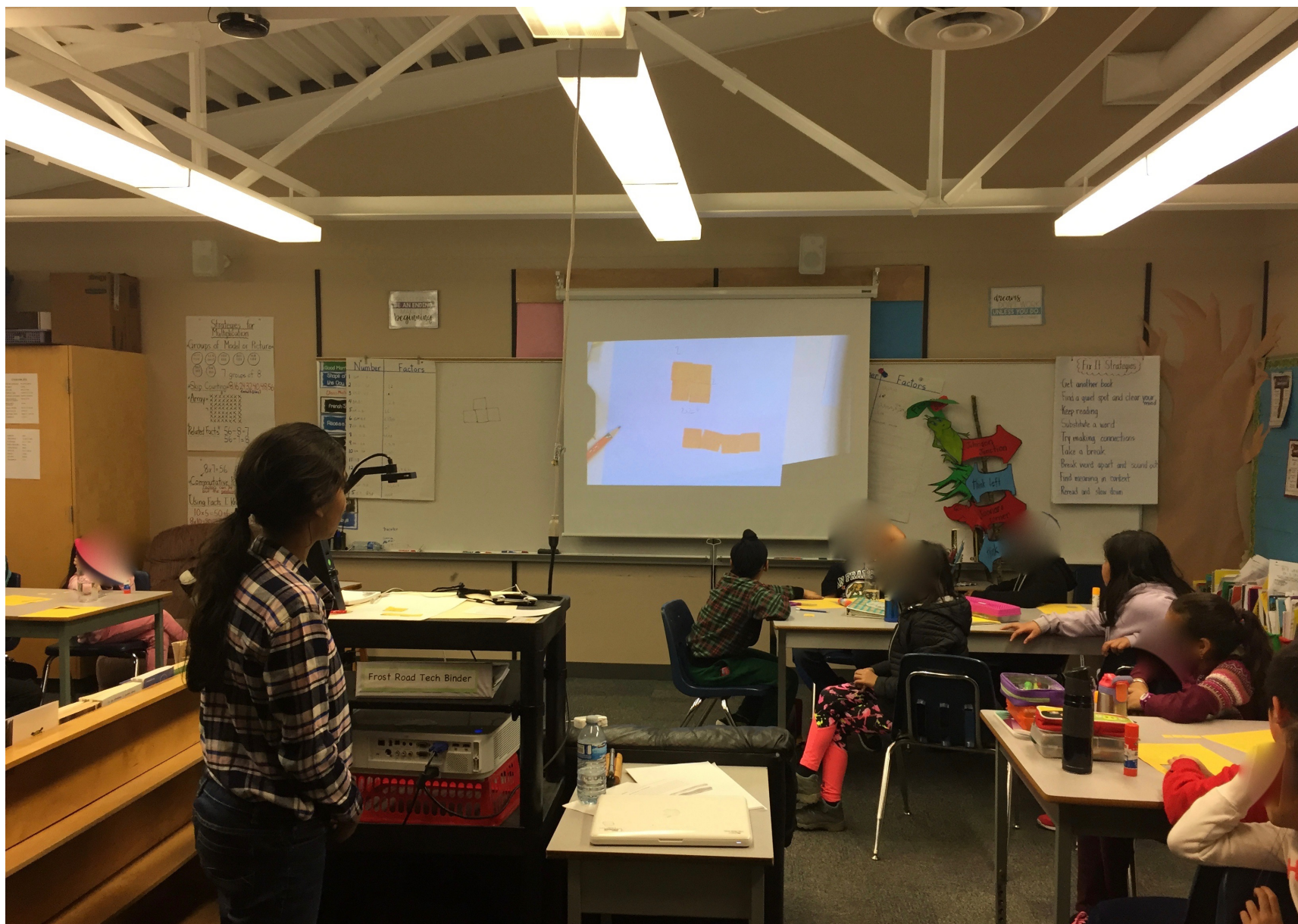


Because mathematics is so often conveyed in symbols, oral and written, communication about mathematical ideas is not always recognized as an important part of mathematics education. Students do not necessarily talk about mathematics naturally; teacher need to help them learn how to do so.

- National Council of Teachers of Mathematics, 2000

# Shared Thinking

Teacher takes photos while circulate and shares these via projector. Students are asked to share the mathematical thinking occurring in the image.





# Think - Pair - Share

Pick a question!

What did I do at Learning Stations today? What did I learn?

What didn't I like doing at Learning Stations today? Why?

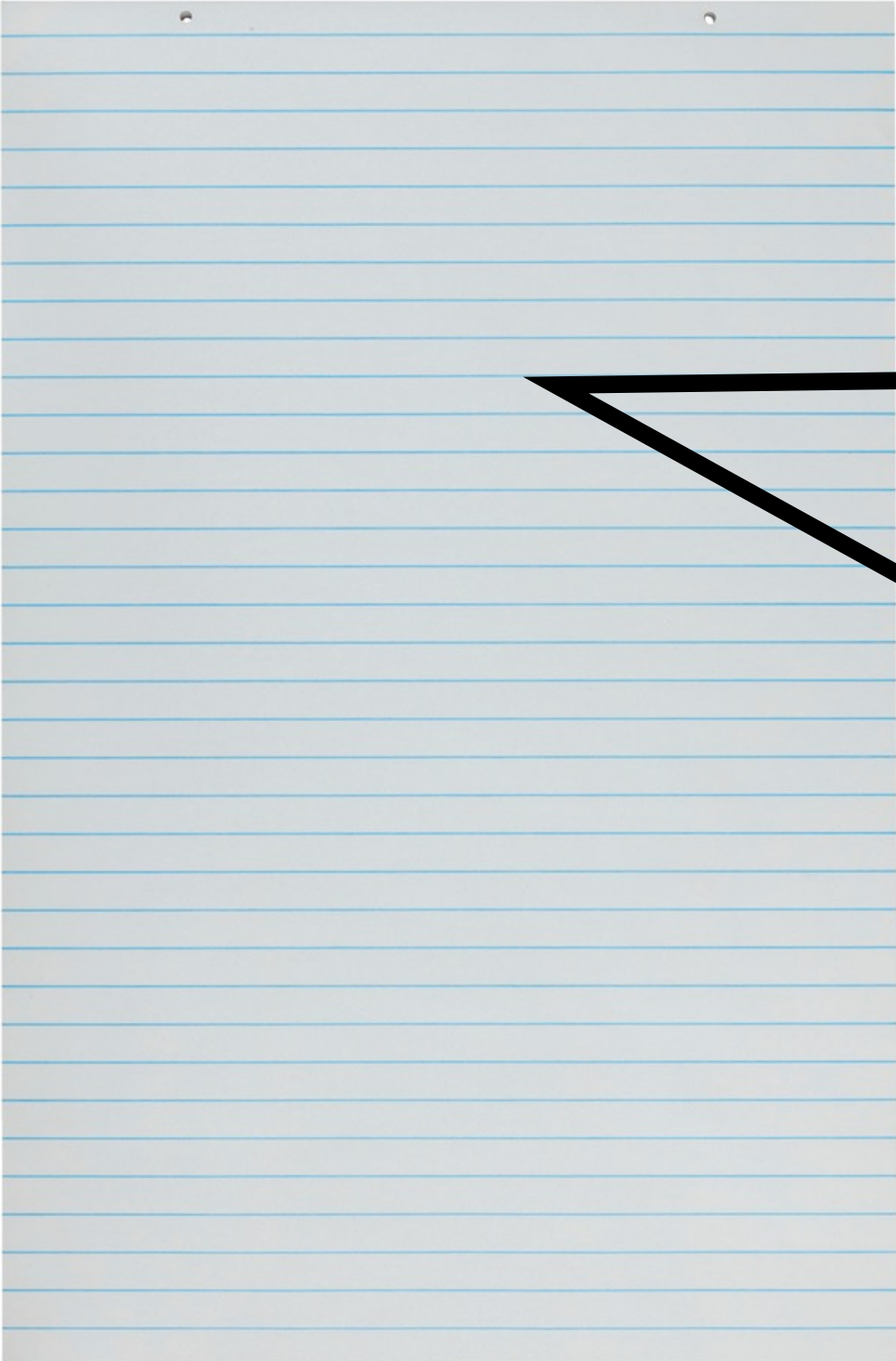
What did I enjoy doing at Learning Stations today? Why?

How did I represent my thinking today?

How did I solve a problem today?

What math connections did I make today?

# Interactive Class Journal



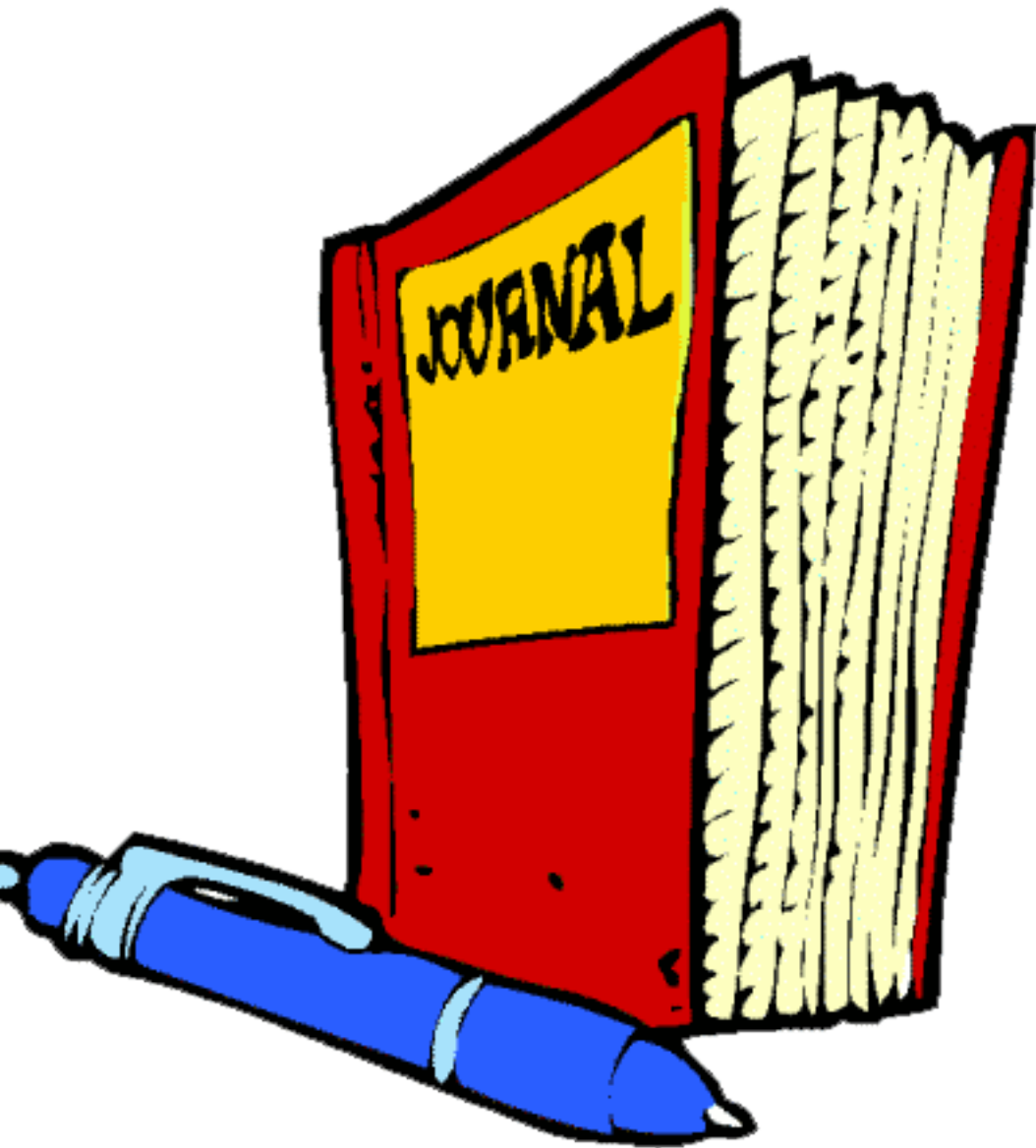
If we were to write about our learning today, what would you say are the important takeaways? How did \_\_\_\_\_ help you? Could we draw a picture to show our thinking?





- Monitoring one's own learning
- Self-assessing
- Setting personal goals

# Journal Prompts



## **Conceptual Understanding**

Tell me everything you know about addition.

What does skip counting mean?



# Journal Prompts

## Strategies

How would you solve  $8 + 3$   
Can you solve it a different way?



# Journal Prompts



## Reasoning

What would happen if\_\_\_\_\_?

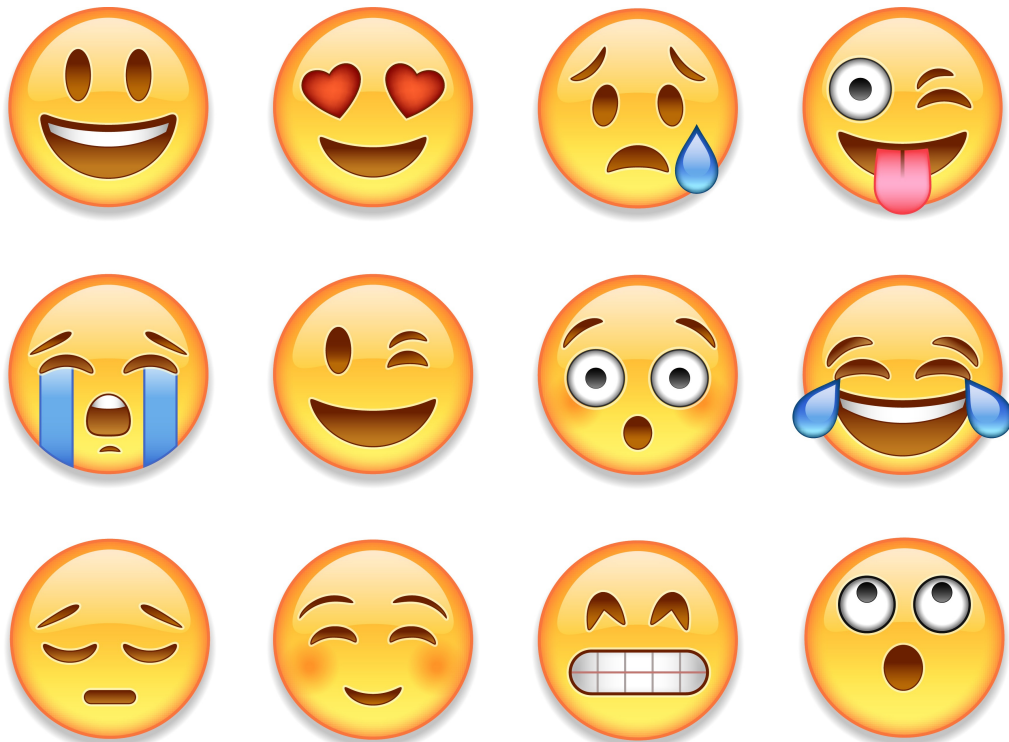
How is \_\_\_\_\_ like \_\_\_\_\_?

Can you tell me an addition story  
where the sum is 11?



# Journal Prompts

## Dispositions



How do you feel about \_\_\_\_\_?

A challenge I had was \_\_\_\_\_

Today, I felt \_\_\_\_\_

# EXIT SLIP

1. Tell me about what you learned today?

2. How well did you understand what we learned?

a little

most of it

everything





Thank You  
FOR Your Time