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

October 9th, 2018

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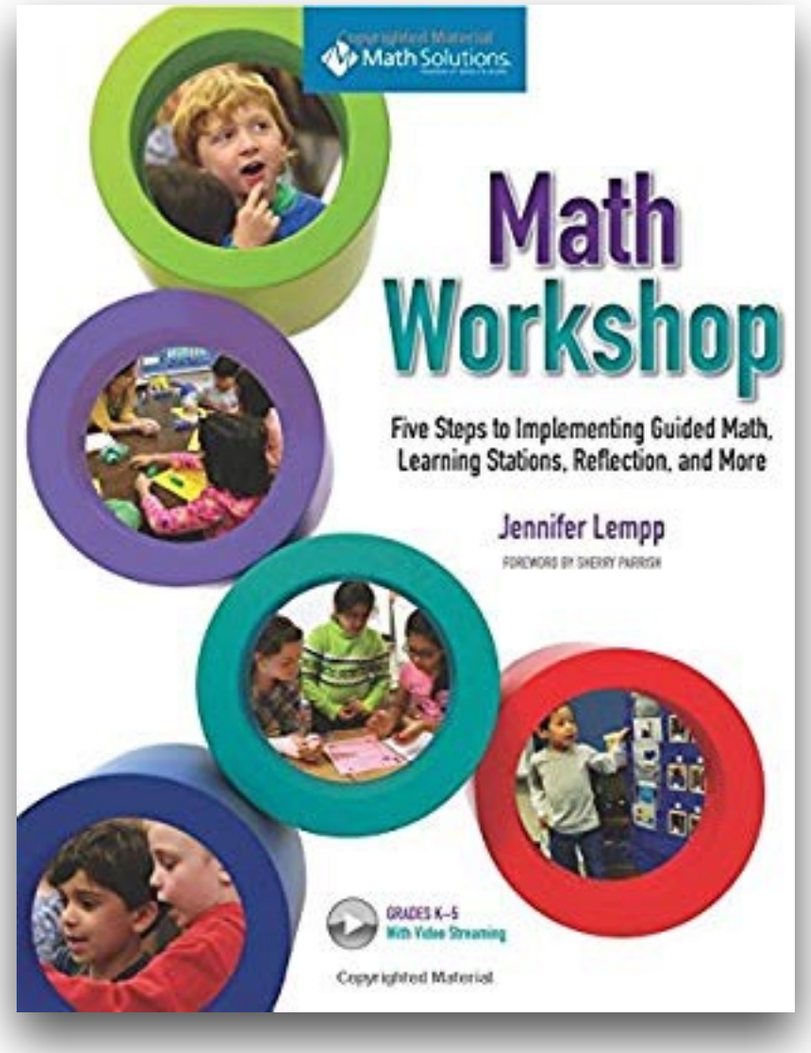
Acknowledgement

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:

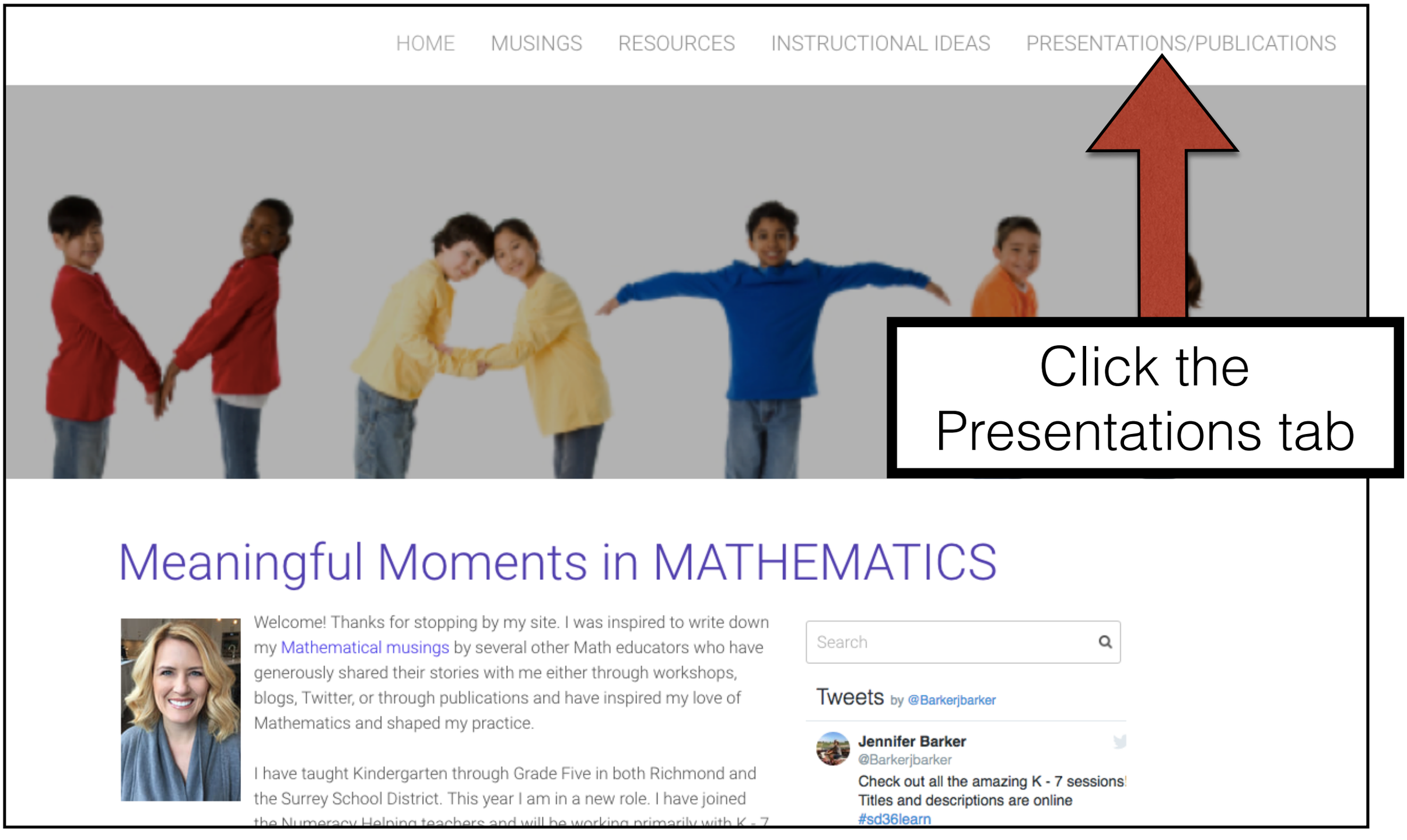
- Why would you want to use Learning Stations and Small Guided Math groups?
- What should I keep in mind when designing Learning Stations and Guided Math?
- What resources will support me?



LRS #179550

Where can you find this PPT?

www.meaningfulmathmoments.com

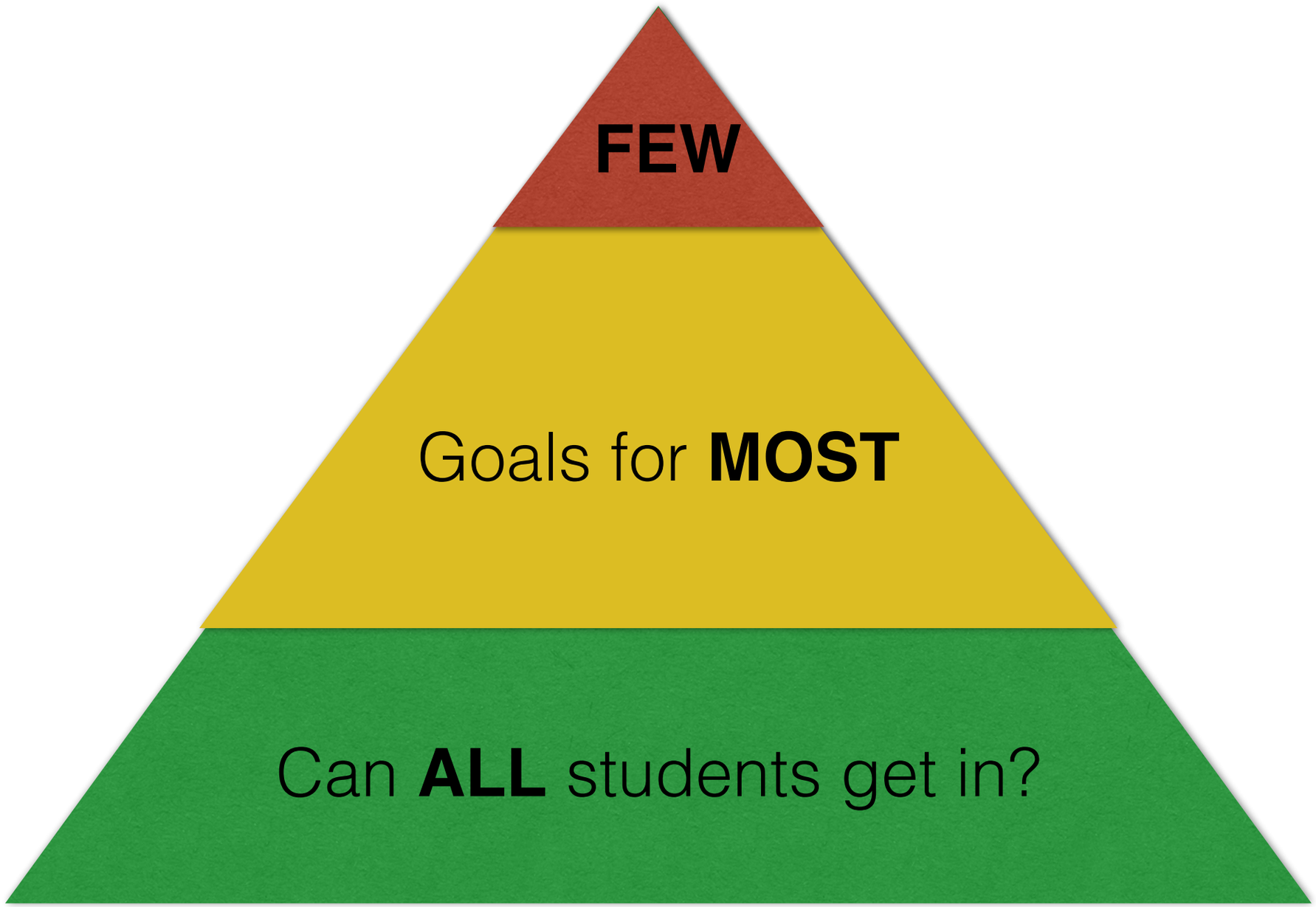


Why use the Math Workshop approach?

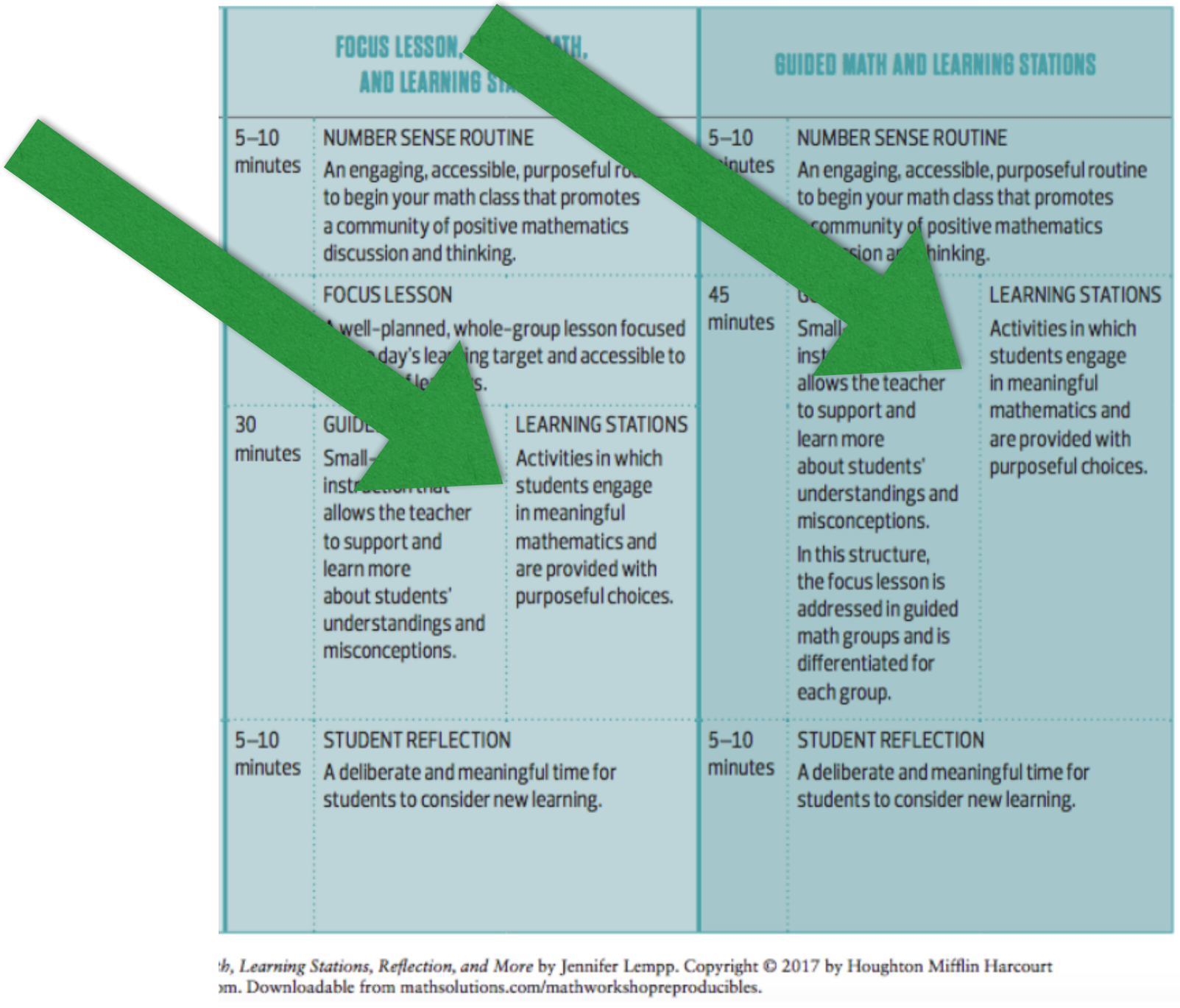
An average teacher may be reaching 50 - 70% of their students. A great teacher may be reaching at any time 50 - 70% of their students, but a different 50 - 70% each time. They use a variety of strategies, instructional methods to differentiate.

– Eric Jenson (2003)

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



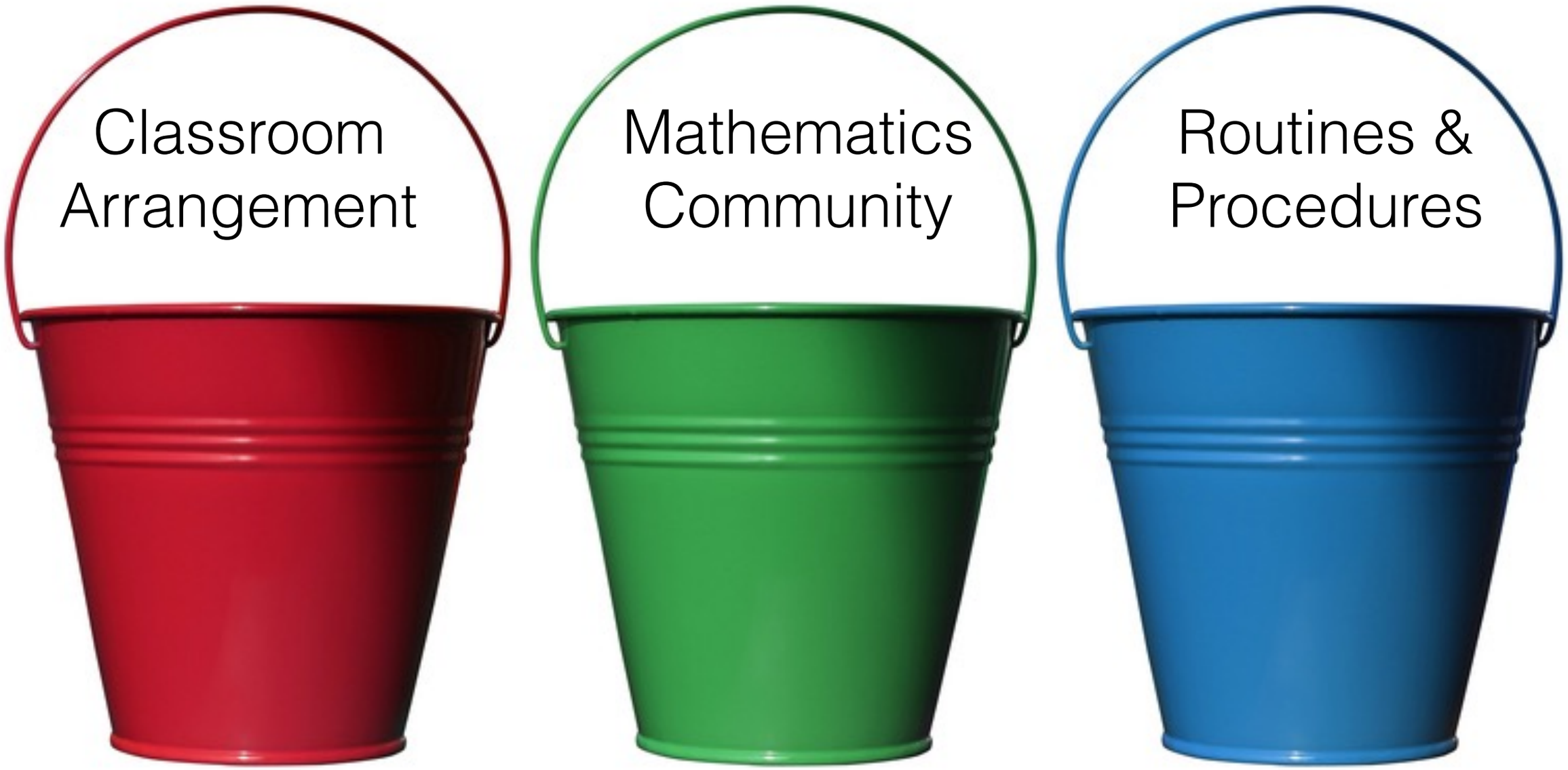
LEARNING STATIONS



FOCUS LESSON, [illegible] AND LEARNING STA[illegible]			GUIDED MATH AND LEARNING STATIONS		
5–10 minutes	NUMBER SENSE ROUTINE An engaging, accessible, purposeful ro[illegible] to begin your math class that promotes a community of positive mathematics discussion and thinking.		5–10 [illegible]inutes	NUMBER SENSE ROUTINE An engaging, accessible, purposeful routine to begin your math class that promotes [illegible]community of positive mathematics [illegible]sion a[illegible]hinking.	
30 minutes	FOCUS LESSON [illegible] well-planned, whole-group lesson focused [illegible]day's lea[illegible]ing target and accessible to [illegible]f le[illegible]s.		45 minutes	G[illegible] Small[illegible] inst[illegible] 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.
	GUIDE[illegible] Small-[illegible] inst[illegible]ction 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.	

[illegible]h, Learning Stations, Reflection, and More by Jennifer Lempp. Copyright © 2017 by Houghton Mifflin Harcourt
[illegible]m. Downloadable from mathsolutions.com/mathworkshopreproducibles.

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



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?

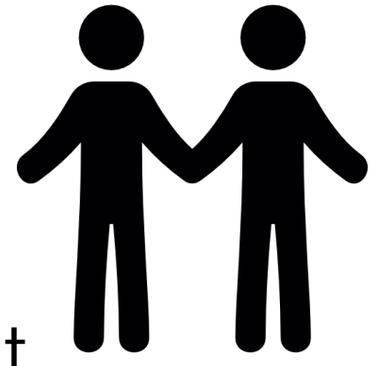
1
2
3
4
5
6
7
8
9
10
11
12

white boards
clipboards

MATH
CENTERS
1
2
3
4
5
6

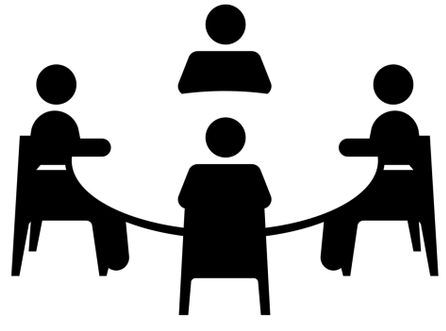
1
4
7
2
5
8
3
6
9

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

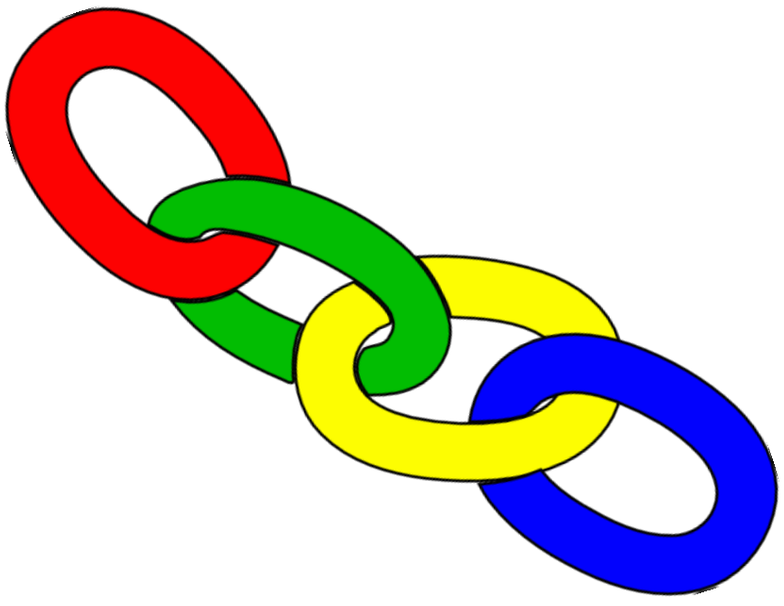
- Option One: Teacher determines the groups
- Option Two: groups are determined by individual student station selection

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: _____

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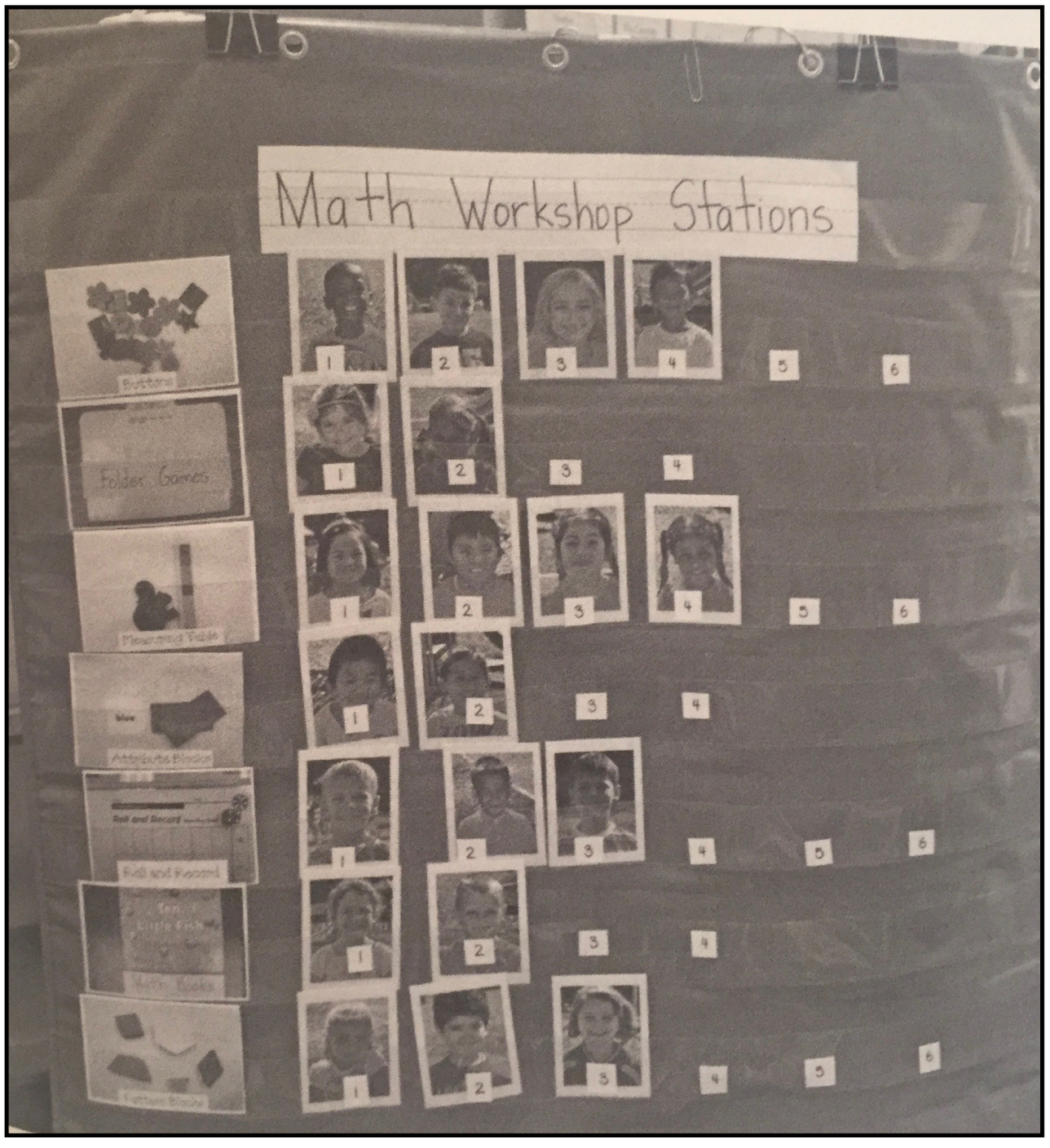
Working with a small group

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

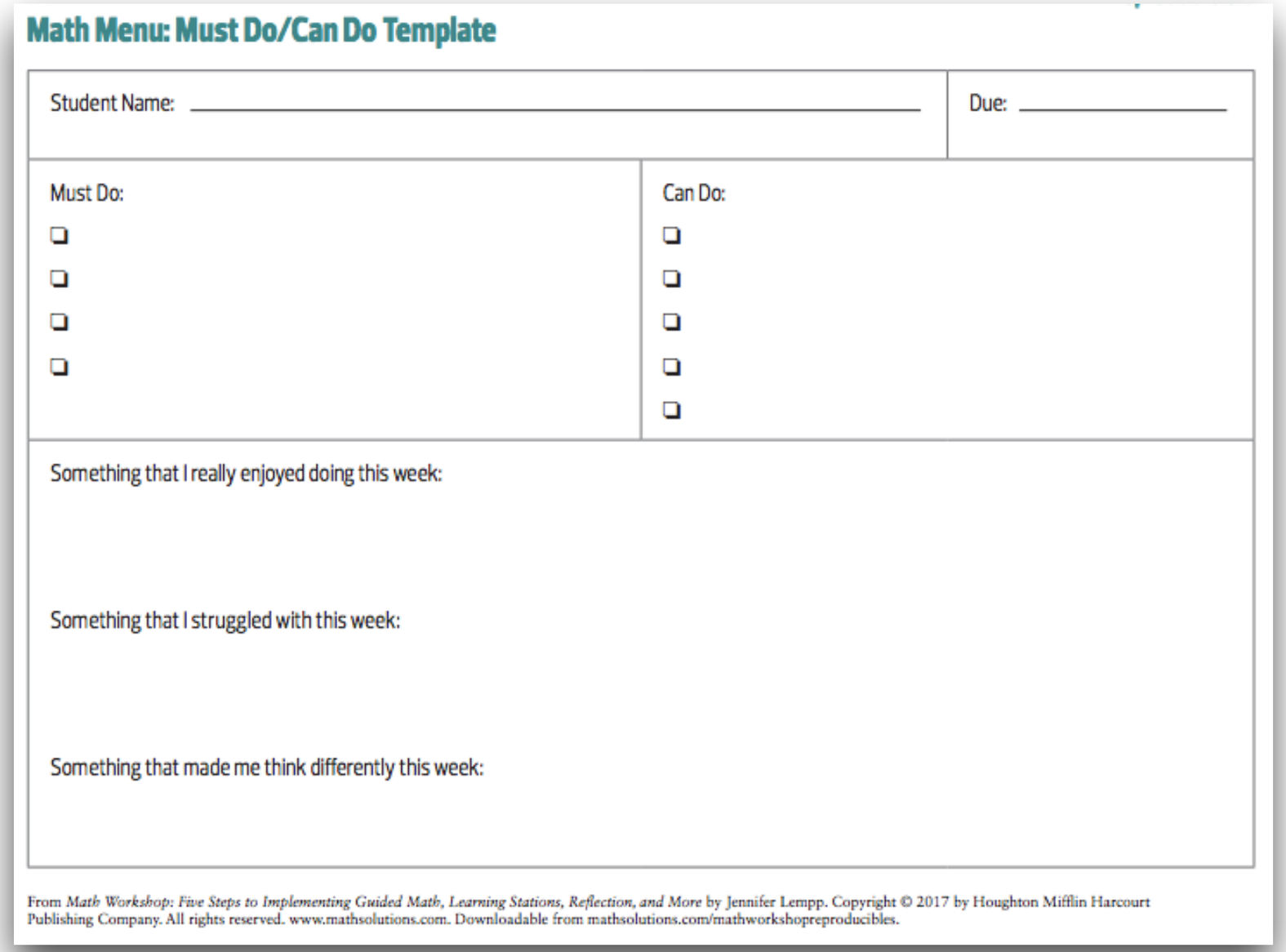
Math Menu: Pocket Chart



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: _____

Must Do:
- ❑
- ❑
- ❑
- ❑

Can Do:
- ❑
- ❑
- ❑
- ❑
- ❑

Something that I really enjoyed doing this week:

Something that I struggled with this week:

Something that made me think differently this week:

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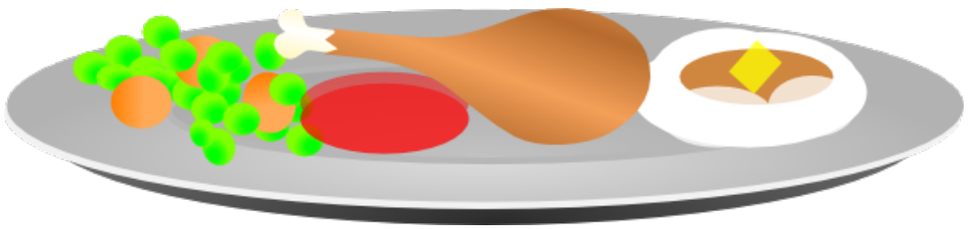
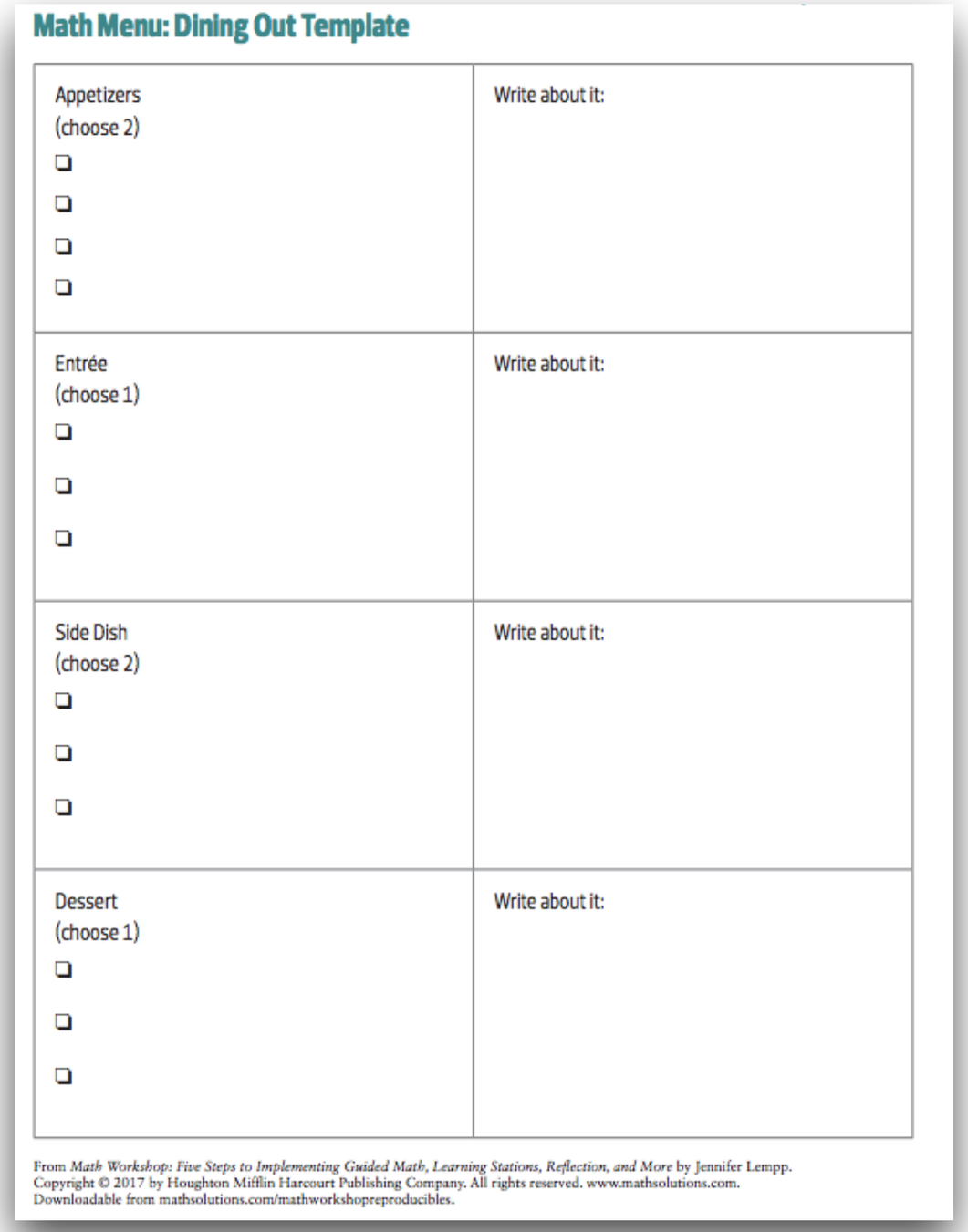
Working with a small group

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

Math Menu: Dining Out





Math Menu: Dining Out Template

Appetizers (choose 2) ❑ ❑ ❑ ❑	Write about it:
Entrée (choose 1) ❑ ❑ ❑	Write about it:
Side Dish (choose 2) ❑ ❑ ❑ ❑	Write about it:
Dessert (choose 1) ❑ ❑ ❑	Write about it:

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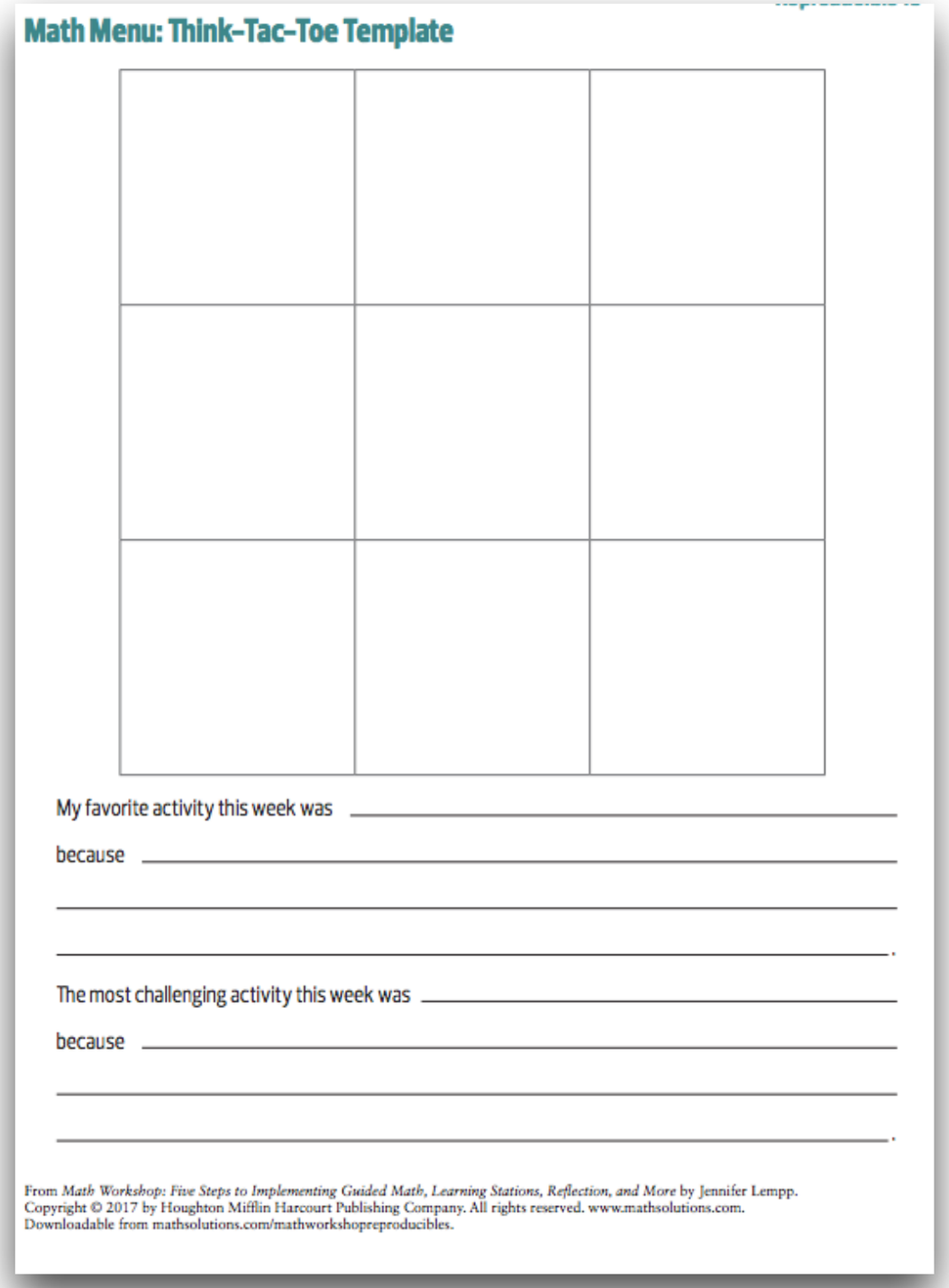
Working with a partner

- 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 _____

_____

_____.

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Working with a small group

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

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

	Timed Rotations	Open Station Choice
PROS	• You are in control of the movement of the classroom; if you see a student moving around before the timer goes off, you know they are not on task • Students are exposed to all the learning stations • Ideal for when you have a number of activities that all take a short (and equal) amount of time to complete. • You can chose who works with who	• Students work on the learning station activity for as long as they need (which provides differentiation) • Students don't feel any pressure of time • Students can work any of their classmates • choice can be a motivator
CONS	• For timed rotations to succeed, learning stations need to be about the same amount of time which takes a lot of planning and work.	• Students may choose to stay for the entire time at a learning station they enjoy and miss out on experiencing other stations. • Movement could be happening, which could be disruptive to other students

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

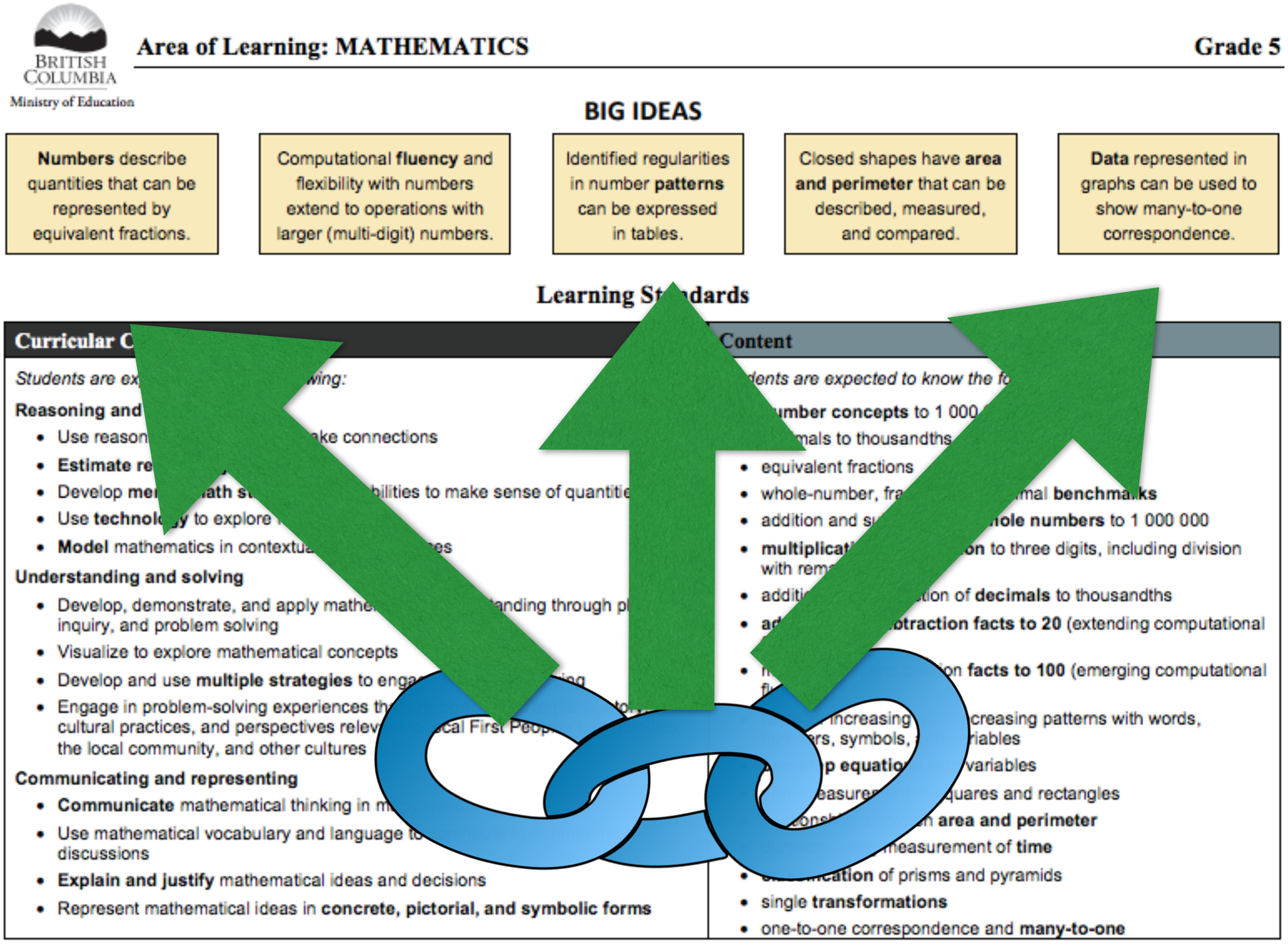
What do I do when I am finished?

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

How do I plan Learning Stations?



BRITISH COLUMBIA
Ministry of Education

Area of Learning: MATHEMATICS — **Grade 5**

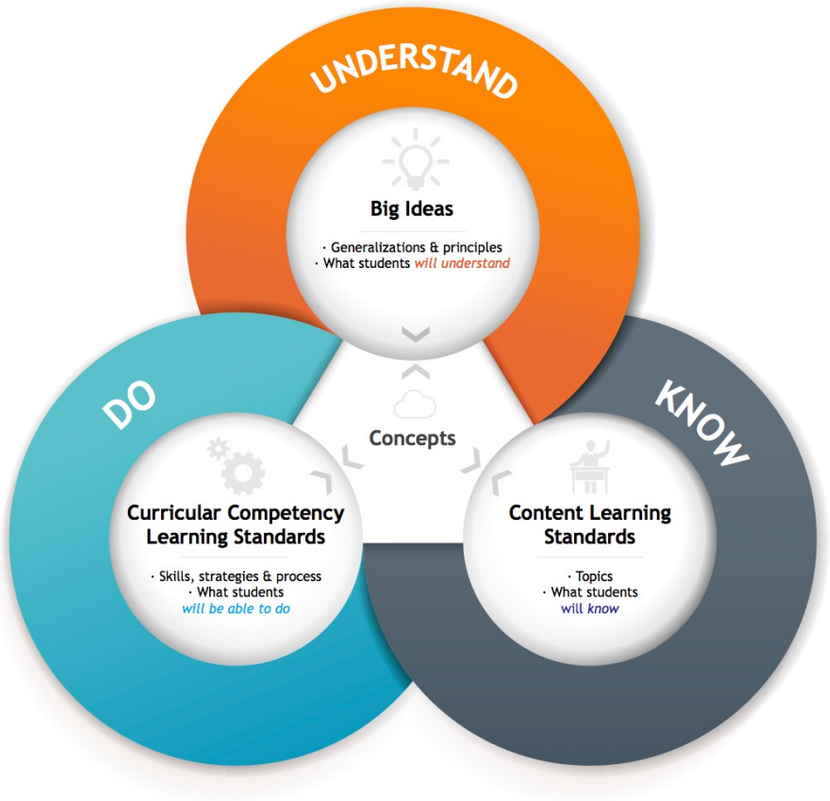
BIG IDEAS

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 St[illegible]ndards

Curricular C[illegible]	Content
Students are ex[illegible]wing:	*[illegible]dents are expected to know the fo*
Reasoning and [illegible]	**[illegible]umber concepts** to 1 000
• Use reason[illegible]ake connections	• [illegible]mals to thousandths
• **Estimate re[illegible]**	• equivalent fractions
• Develop **me[illegible]ath st[illegible]**bilities to make sense of quantiti[illegible]	• whole-number, fra[illegible]mal **benchmarks**
• Use **technolo[illegible]gy** to explore [illegible]	• addition and su[illegible]**hole numbers** to 1 000 000
• **Model** mathematics in contextua[illegible]es	• **multiplicat[illegible]on** to three digits, including division with rem[illegible]
Understanding and solving	• additi[illegible]tion of **decimals** to thousandths
• Develop, demonstrate, and apply mathe[illegible]anding through pl[illegible] inquiry, and problem solving	• **ad[illegible]otraction facts to 20** (extending computational [illegible]
• Visualize to explore mathematical concepts	• [illegible]n **facts to 100** (emerging computational fl[illegible]
• Develop and use **multiple strategies** to enga[illegible]ing	• [illegible] increasing [illegible]creasing patterns with words, [illegible]rs, symbols, [illegible]riables
• Engage in problem-solving experiences th[illegible]to [illegible] cultural practices, and perspectives relev[illegible]cal First Peop[illegible] the local community, and other cultures	• **[illegible]p equatio[illegible]** variables
Communicating and representing	• **[illegible]easurem[illegible]** quares and rectangles
• **Communicate** mathematical thinking in m[illegible]	• [illegible]n **area and perimeter**
• Use mathematical vocabulary and language to [illegible] discussions	• [illegible] measurement of **time**
• **Explain and justify** mathematical ideas and decisions	• **[illegible]ification** of prisms and pyramids
• Represent mathematical ideas in **concrete, pictorial, and symbolic forms**	• single **transformations**
	• one-to-one correspondence and **many-to-one**

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

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

Counts 1 hundred as a single unit

Instantly knows total when the number of hundreds, tens, and ones is known

Mentally adds and subtracts 10 and 100 to/ from any three-digit number

Knows the number of hundreds that can be made from any group of tens, and then number of tens leftover

Determines total value of groups of hundreds, tens and ones by organizing them into all the possible hundreds, tens, and leftover ones

Records the number of hundreds, tens, and ones, using appropriate symbolization

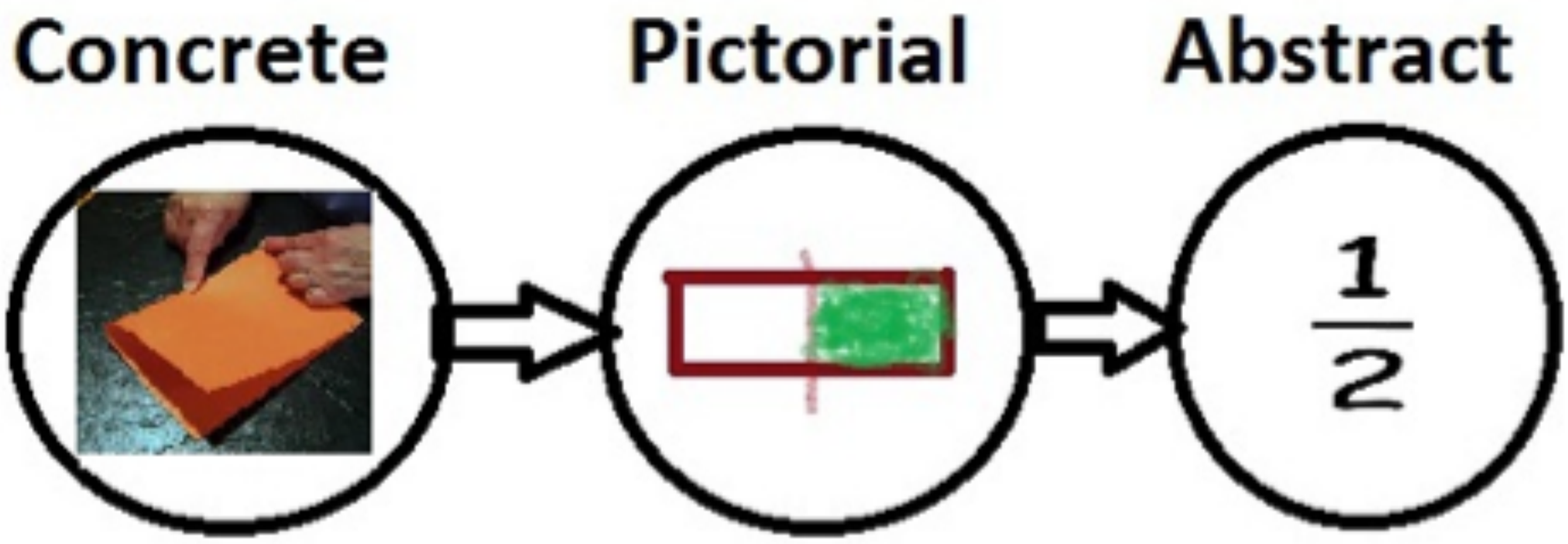
Making Sense Series

the progression of division
and
the standard traditional algorithm (aka: long division)

created by Graham Fletcher
@gfletchy
www.gfletchy.com

https://gfletchy.com/progression-videos/

How do we build conceptual understanding?



Types of Learning Stations

- Current concept being studied
- Computational Fluency
- Problem Solving
- Creative digital apps
- Concepts I intentionally want to spiral back to

Current Concepts

Choose a 2 or 3 digit number. What numbers can you make? Compare and order the numbers.

Each person at the table is to roll 3, 4, or 5 dice or draw five cards. Make the largest number possible. Compare and order the numbers at your table. Or sort the numbers. How many different ways can you sort the numbers?

Fractions:

If a hexagon represents a whole, what fraction do the other pieces represent?

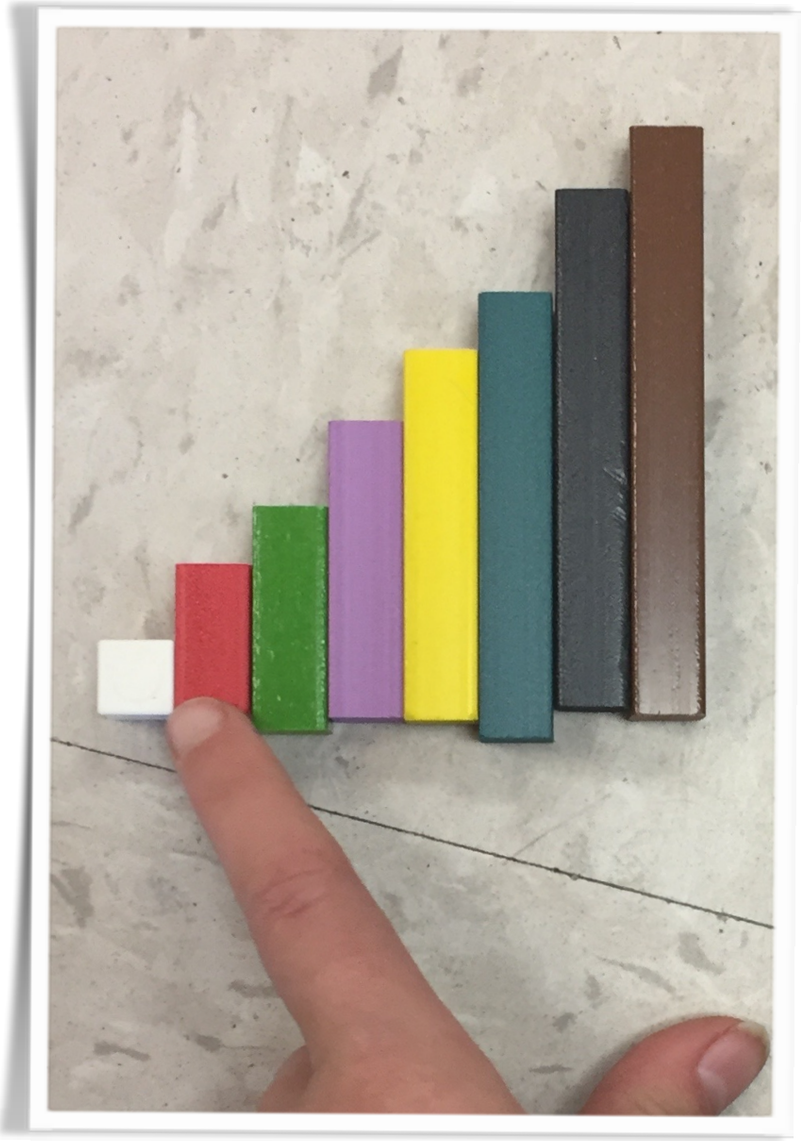
△ = $\frac{1}{6}$

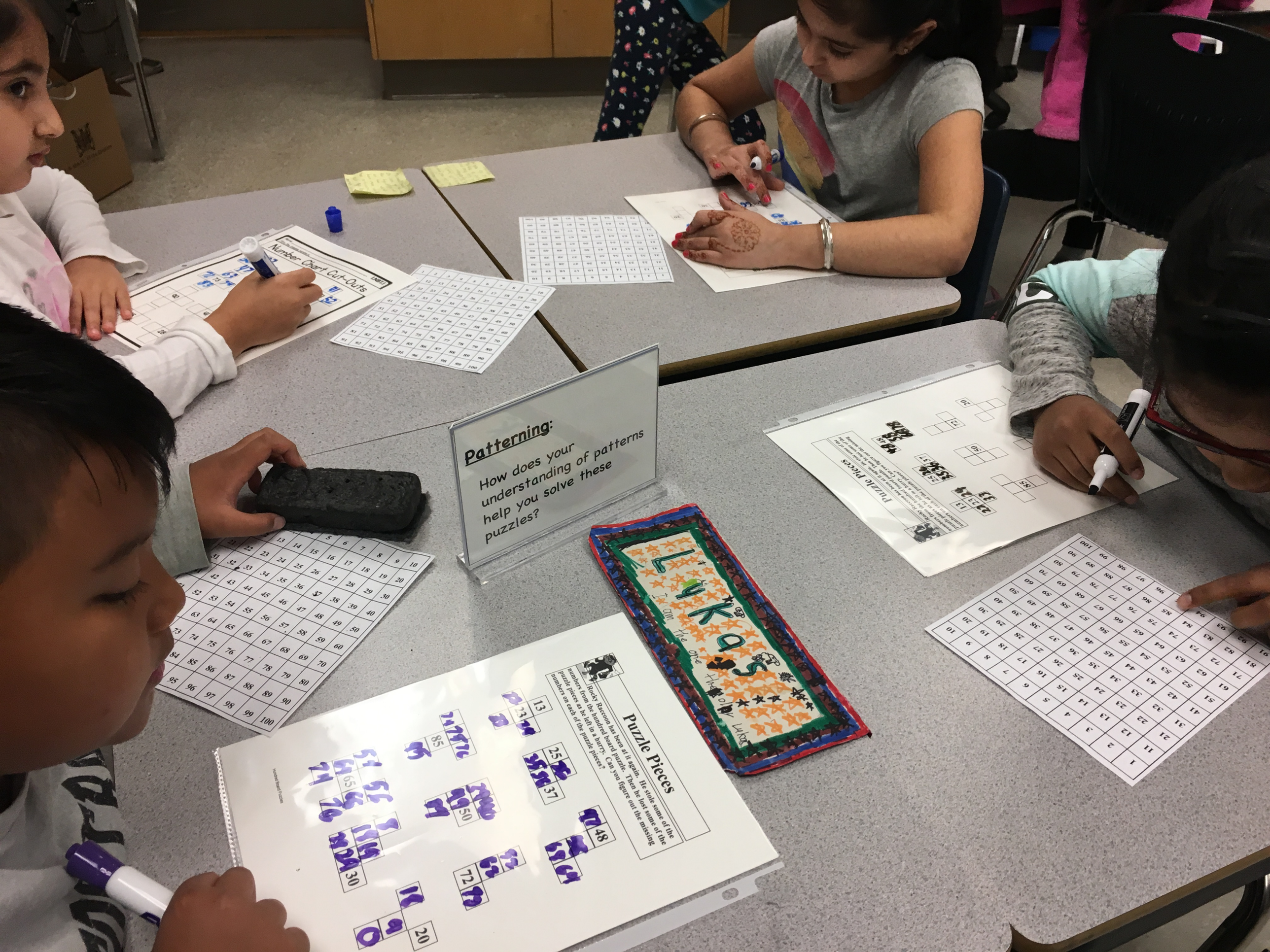
= $\frac{1}{2}$

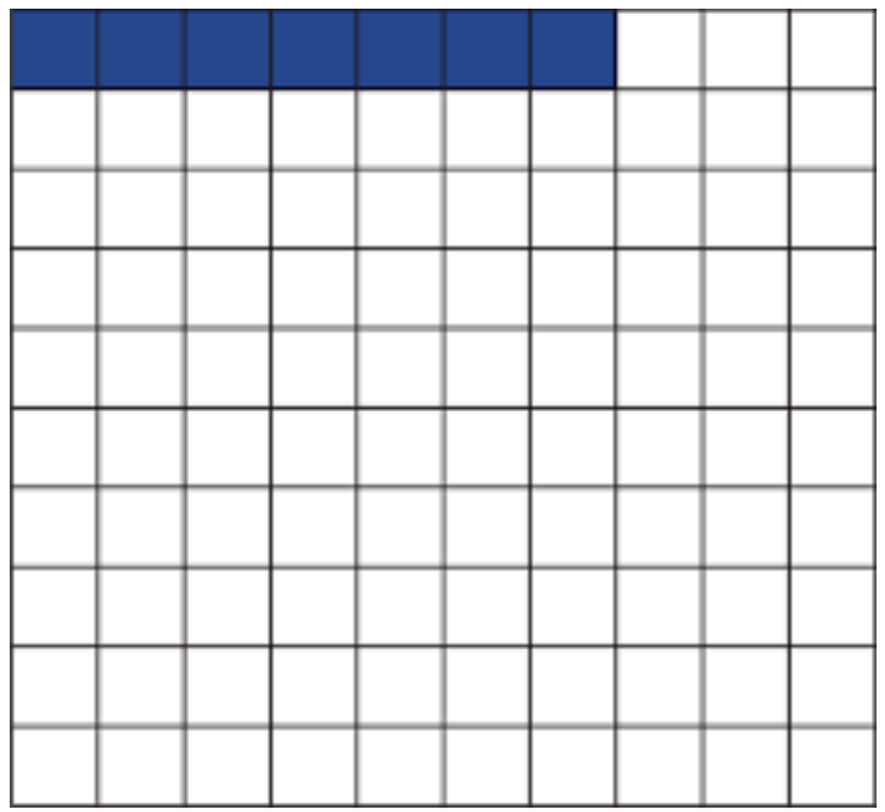
Fractions:
If 2 hexagons represent a whole, what do the other pieces represent?
= 1/2
= 1/6

What growing/shrinking patterns can you create?

How are these patterns alike and different?



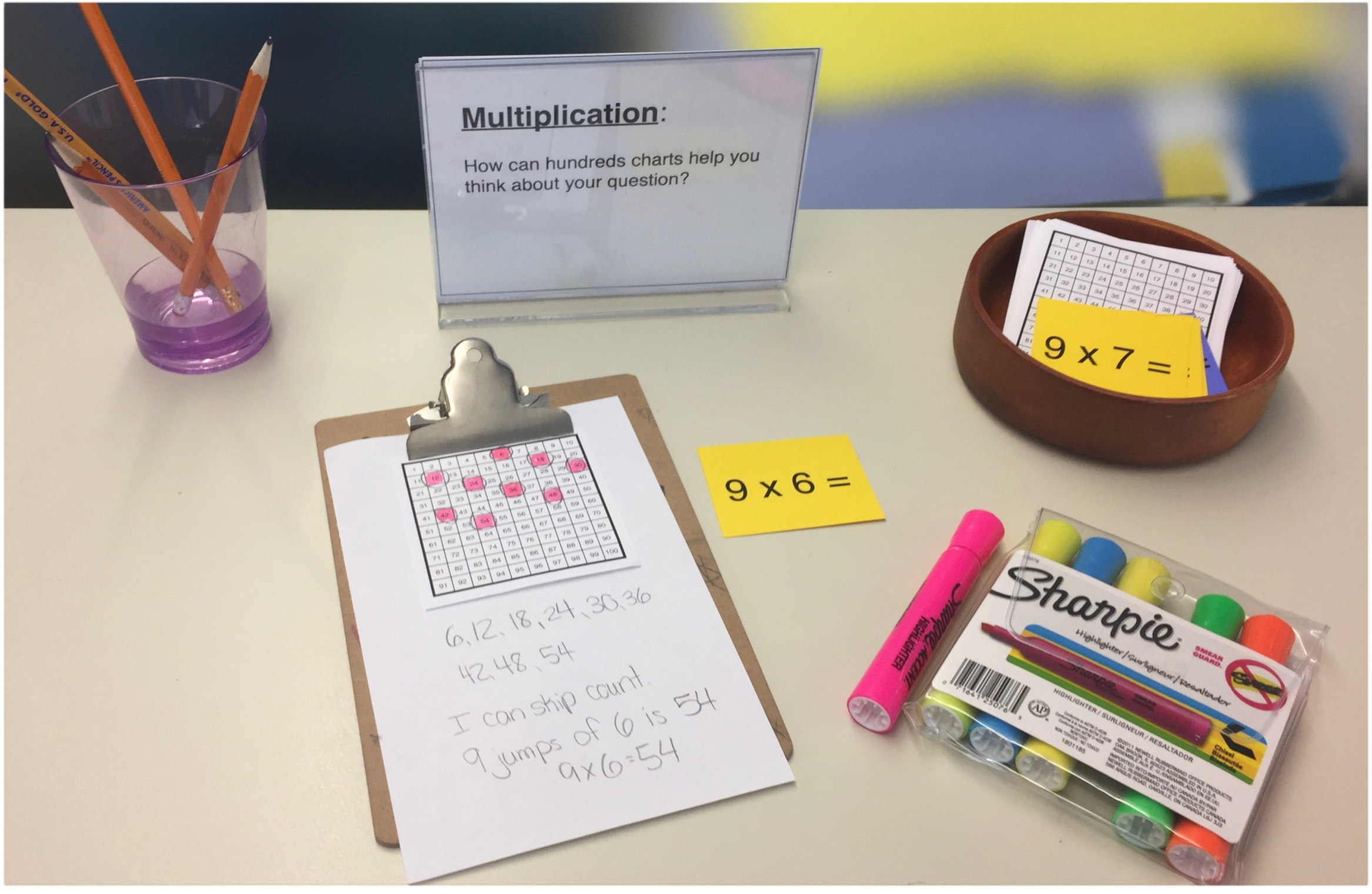

Patterning:
How does your understanding of patterns help you solve these puzzles?
Number Chart Cut-Outs
Puzzle Pieces
Rocky Raccoon has been at it again. He stole some of the numbers from the hundred board puzzle. Then he lost some of the puzzle pieces as he left in a hurry. Can you figure out the missing numbers on each of the puzzle pieces?
Lykas
I am the one the only Lykas

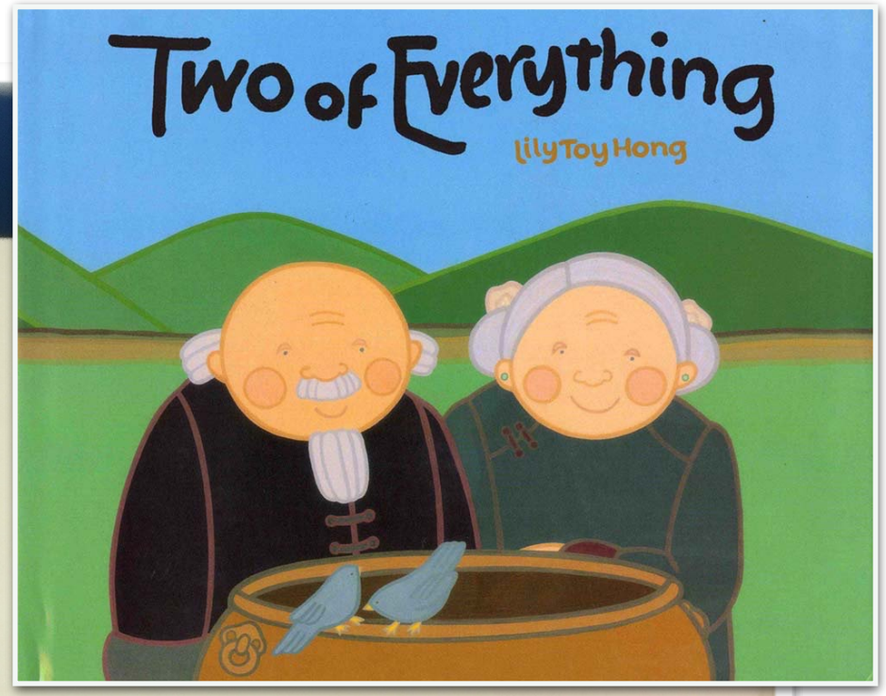


.06

Roll a decimal OR spin the spinner
Represent it on the grid.

Multiplication:
Using square tiles represent a multiplication question that has the same factors (e.g., 7 x 7) in an array.
What do you notice? What do you wonder?


Multiplication:
How can hundreds charts help you think about your question?
9 x 6 =
9 x 7 =
6, 12, 18, 24, 30, 36
42, 48, 54
I can skip count.
9 jumps of 6 is 54
9x6=54
Sharpie
Highlighter/Surligneur/Resaltador
HIGHLIGHTER / SURLIGNEUR / RESALTADOR

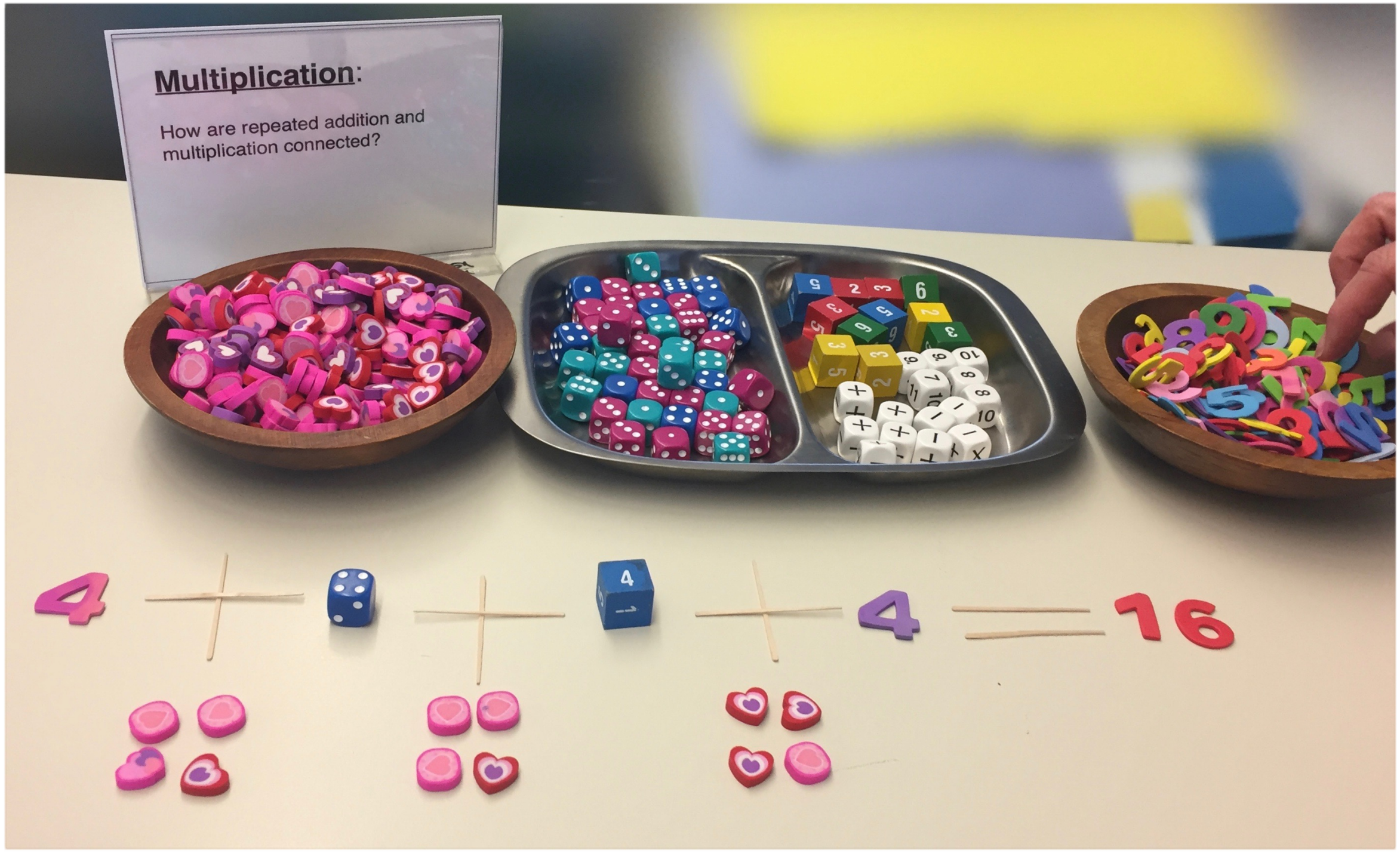


Multiplication:

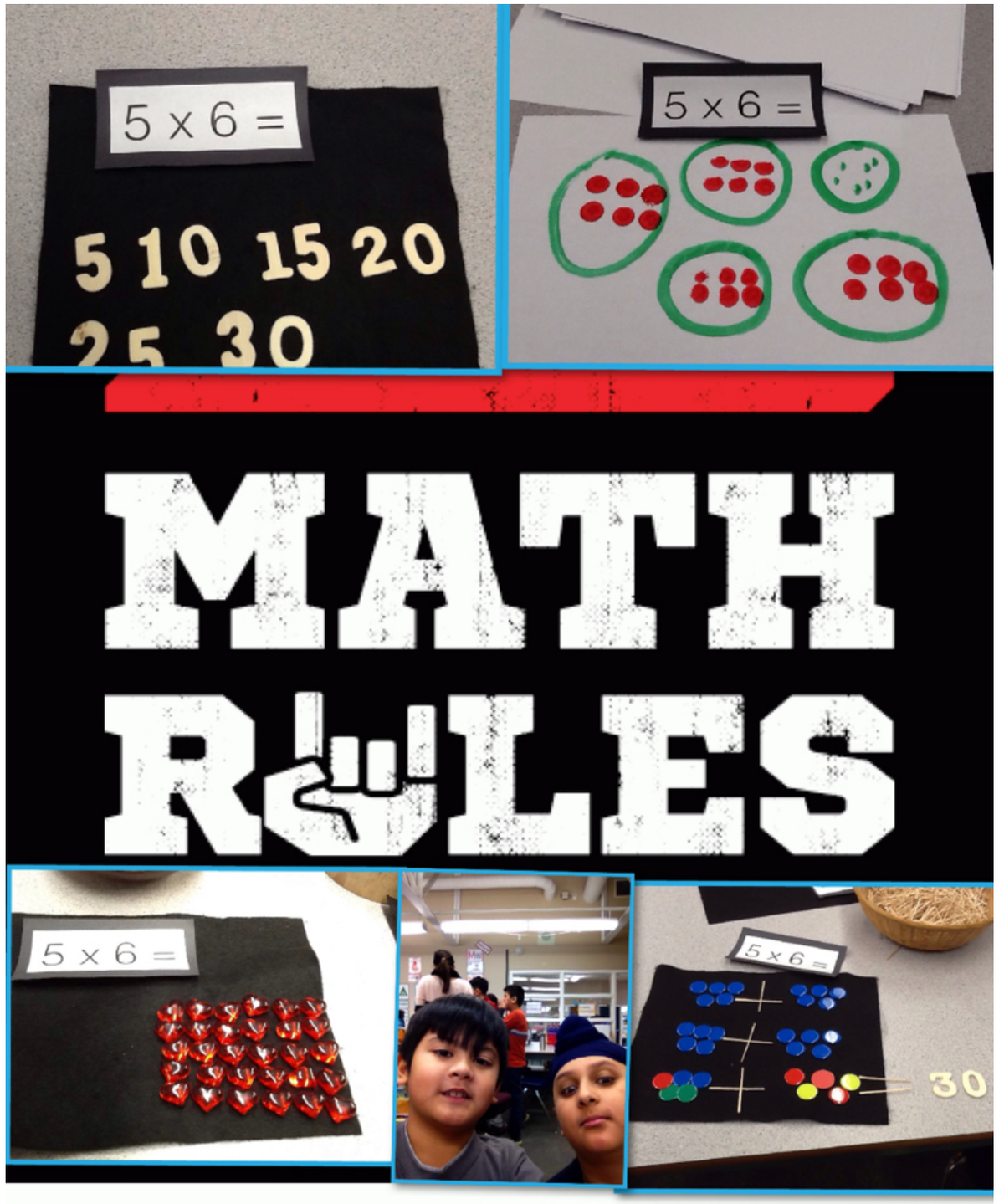
How do T charts help us to count groups of items?

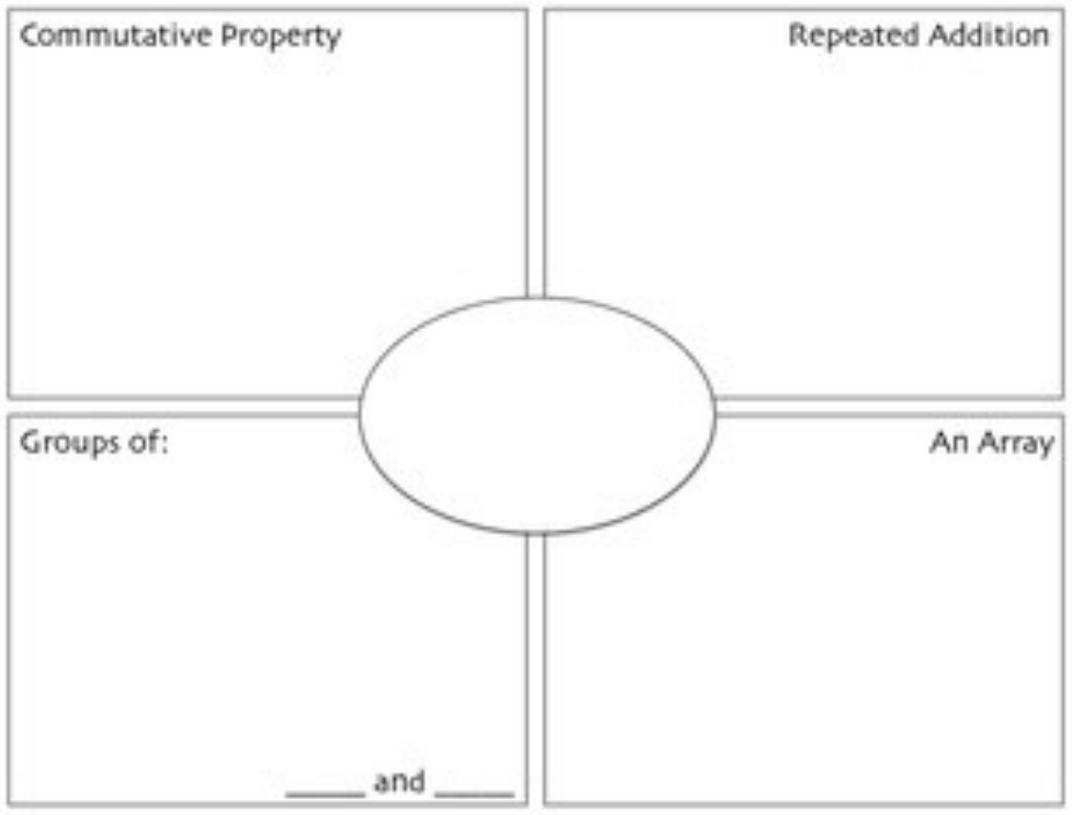
4 x 9 =

n	9
1	9
2	18
3	27
4	36

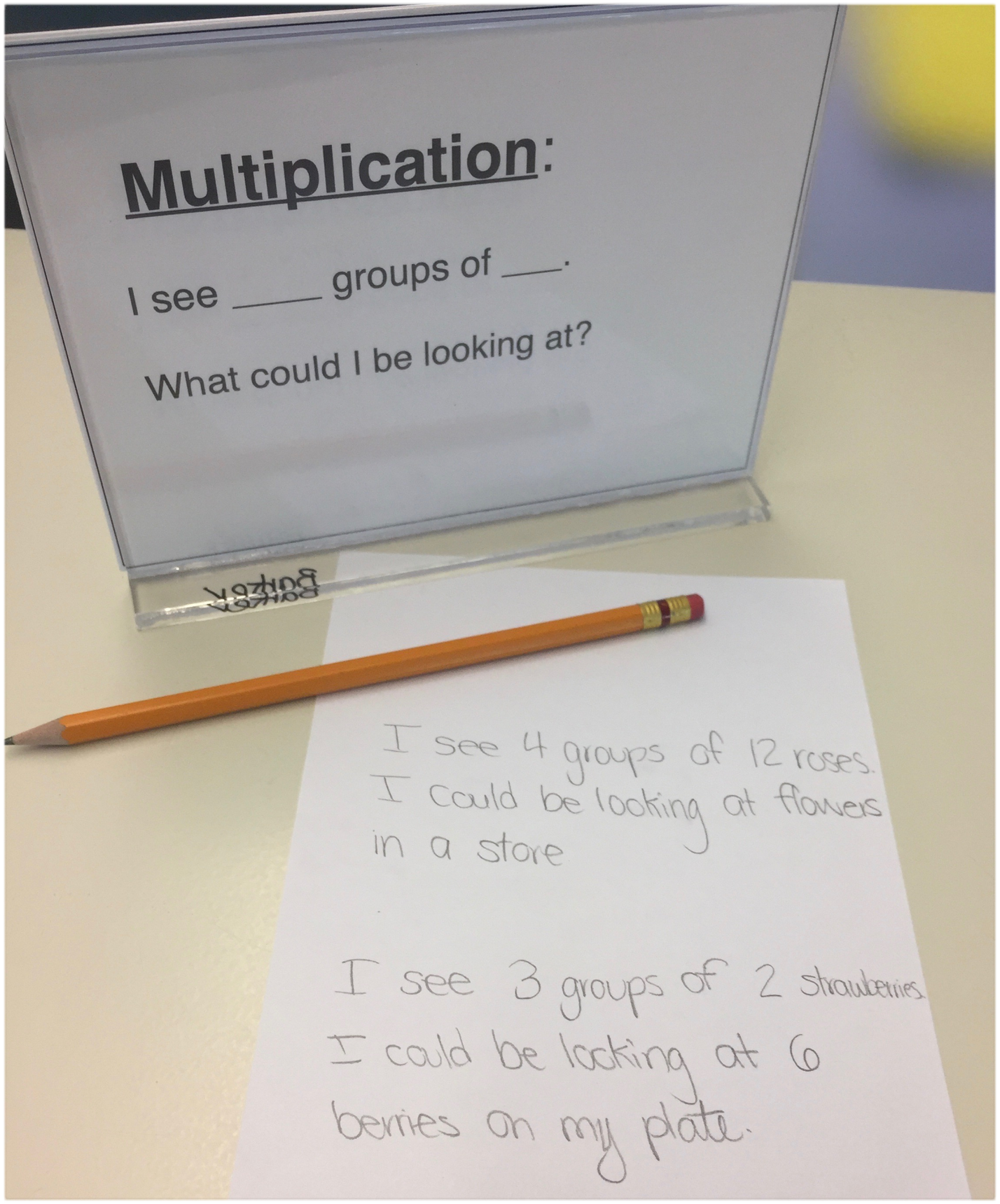

Multiplication:
How are repeated addition and multiplication connected?
4 + + + 4 = 16

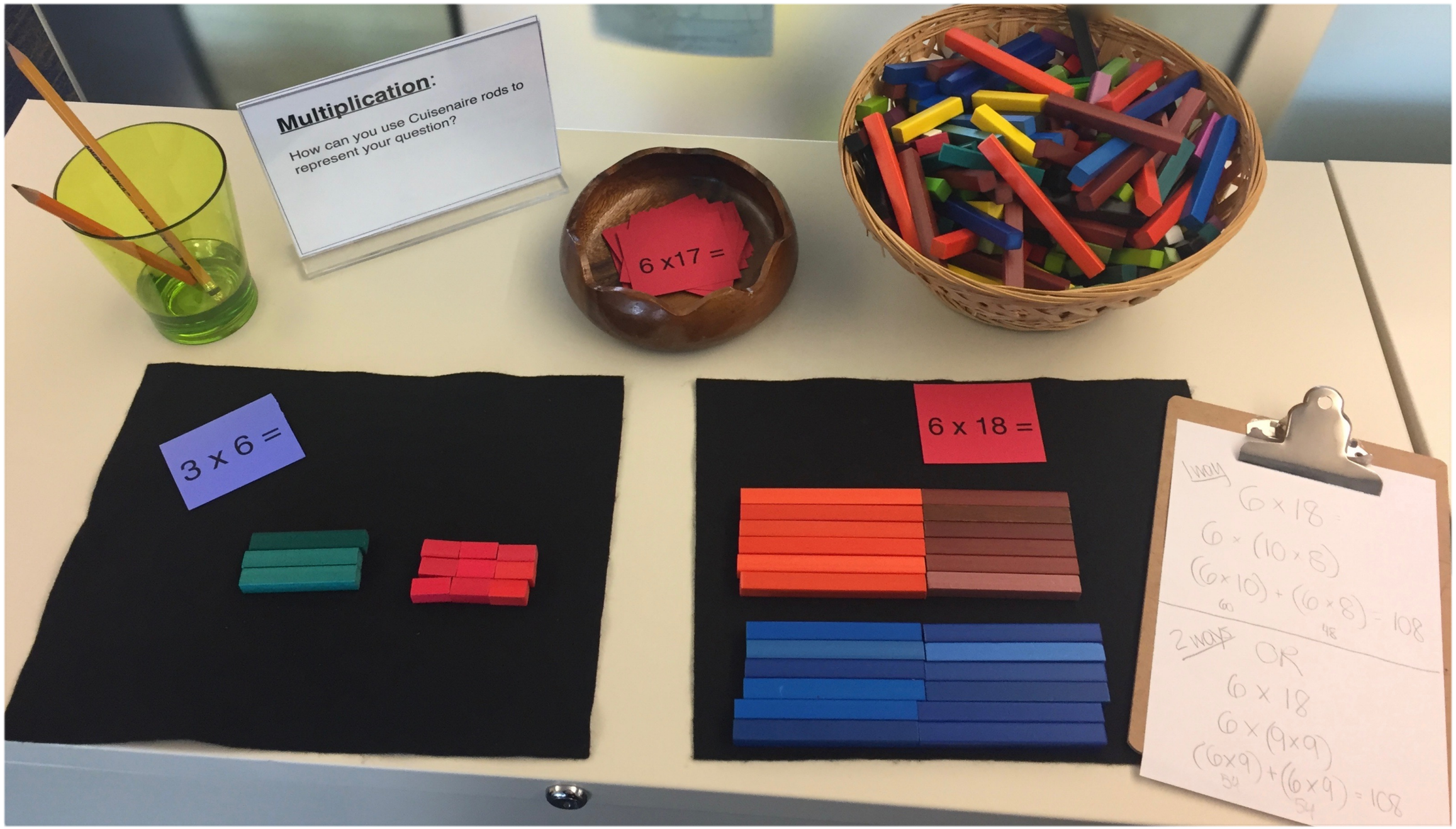
4 square model - CRA

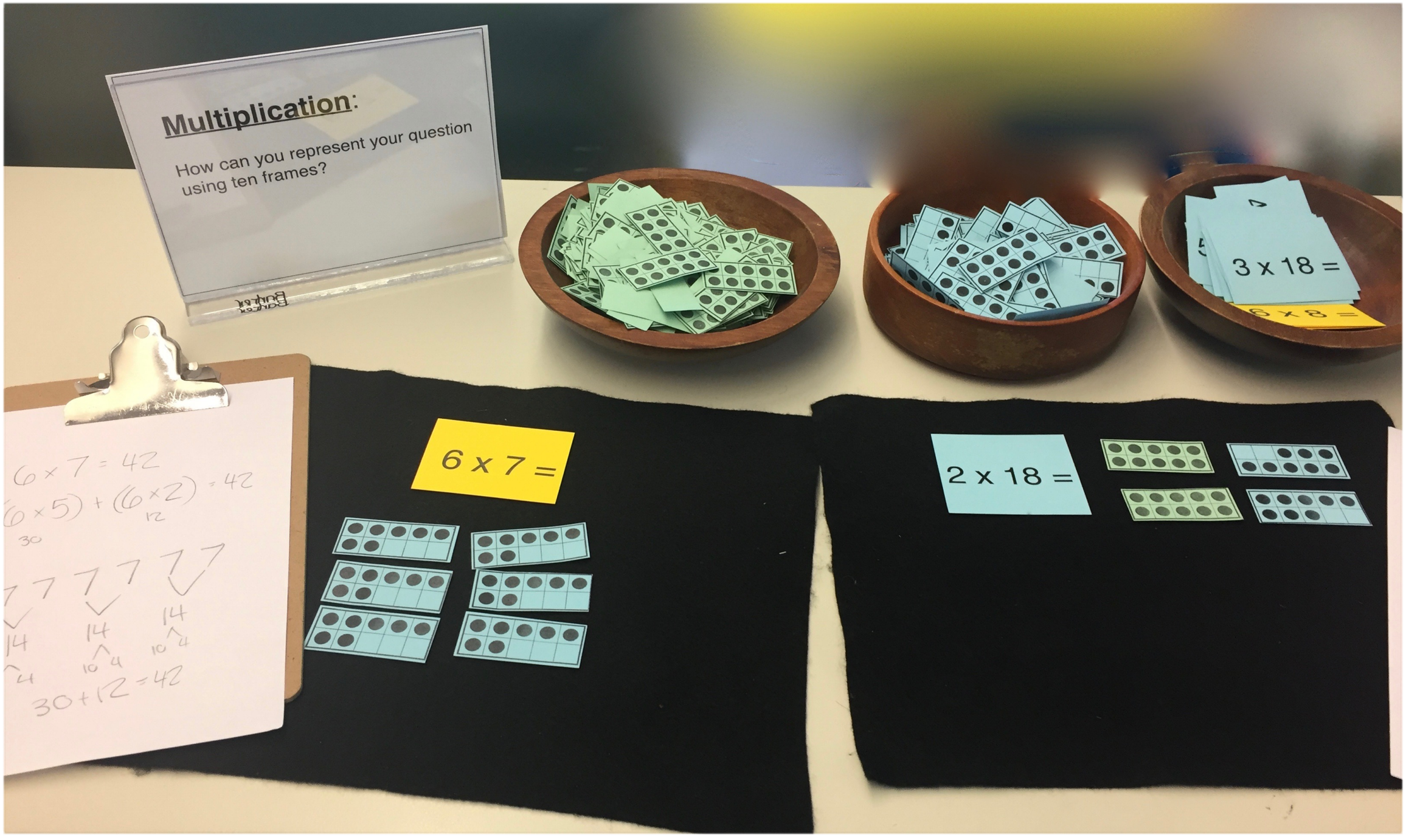




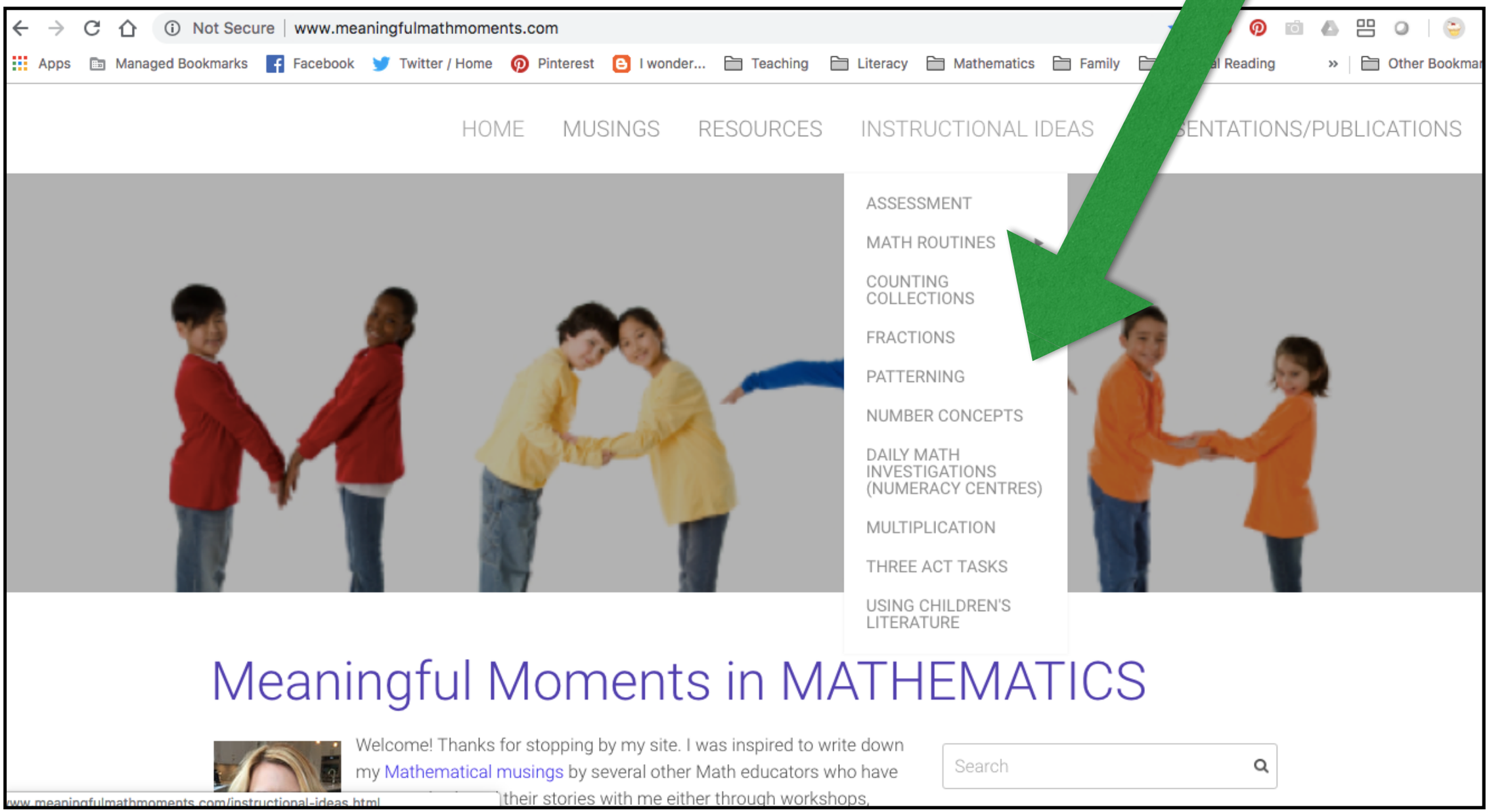
Frayer Model


Multiplication:
I see ____ groups of ___.
What could I be looking at?
I see 4 groups of 12 roses.
I could be looking at flowers
in a store
I see 3 groups of 2 strawberries.
I could be looking at 6
berries on my plate.


Multiplication:
How can you use Cuisenaire rods to represent your question?
6 x17 =
3 x 6 =
6 x 18 =
1 WAY
6 x 18 =
6 x (10 x 8)
(6x10) + (6x8) = 108
60
48
2 WAYS
OR
6 x 18
6 x (9x9)
(6x9) + (6x9) = 108
54
54

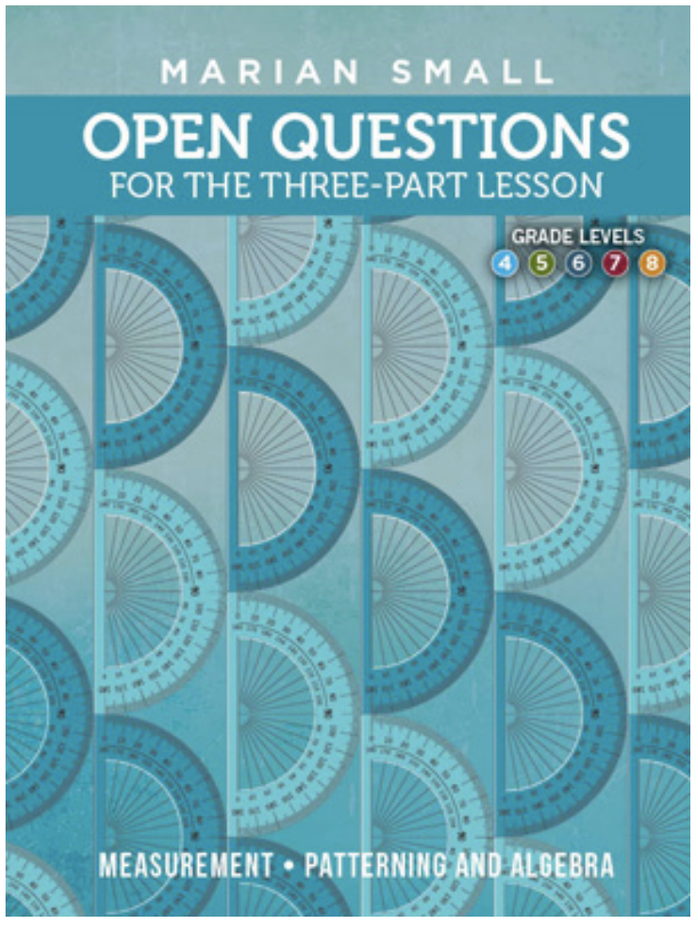

Multiplication:
How can you represent your question using ten frames?
3 x 18 =
6 x 7 =
2 x 18 =
6 x 7 = 42
(6 x 5) + (6 x 2) = 42
30 12
14 14 14
14 10 4 10 4
4
30 + 12 = 42

Example provocations can be found on my site

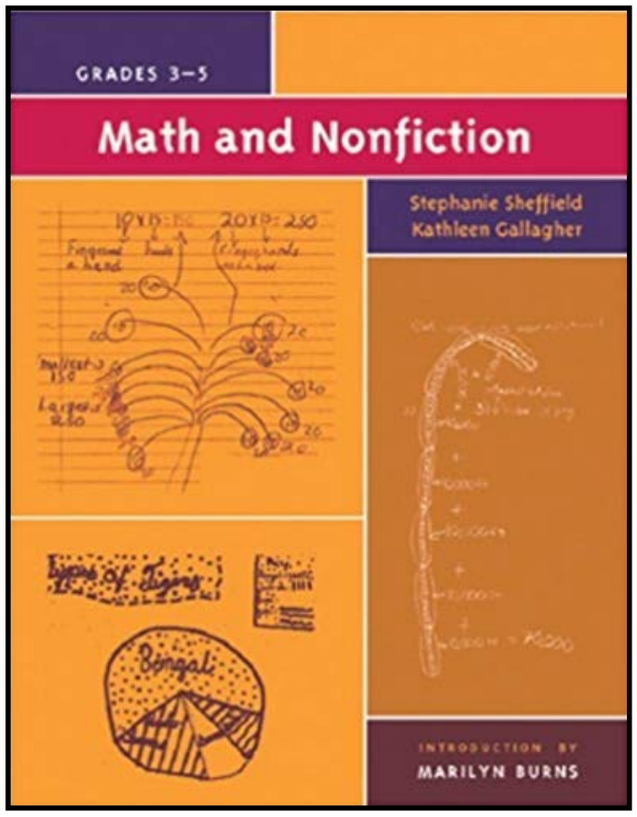


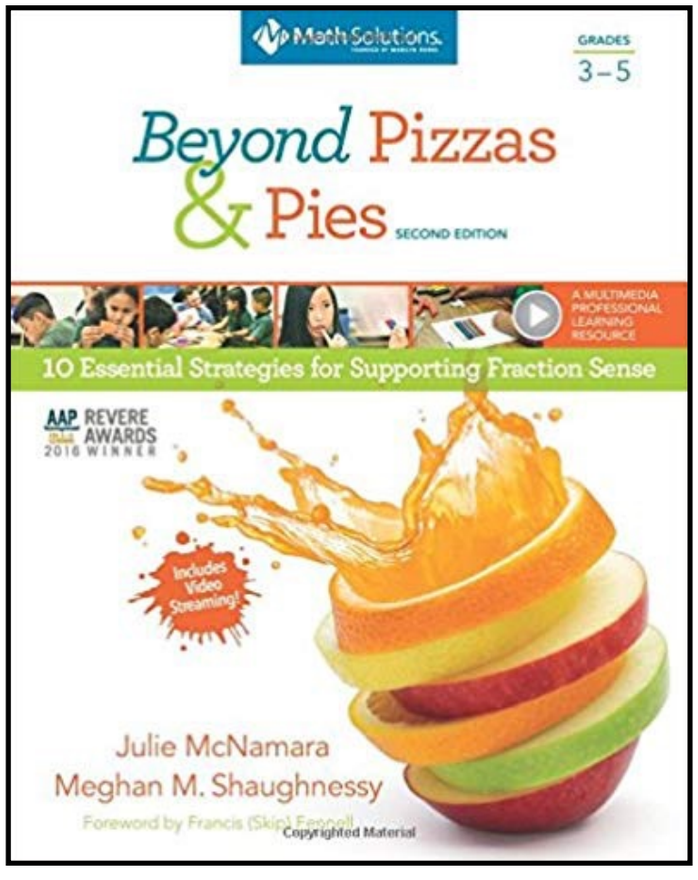
Open Questions

What resources are available?



Each book spans several Grades (e.g., K - 3, 4 - 6, and 7 - 9.)
Currently only the Number Strand is aligned to our BC Curriculum.
The other strands are coming in Spring 2018.



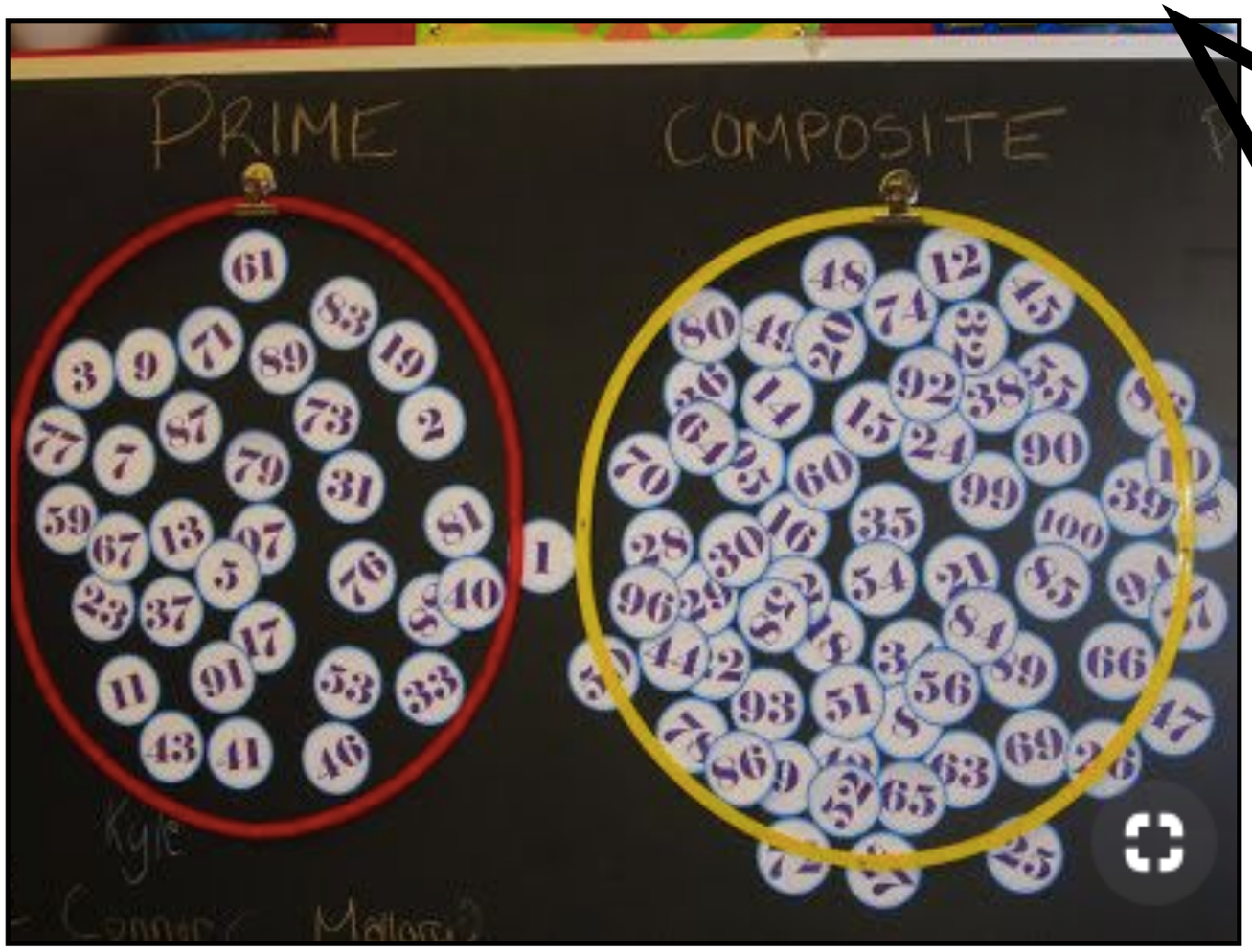


twitter

#iteachmath
#BCAMTreggio
@jnovakowski38

Intermediate Learning Stations

https://www.pinterest.ca/



Look at page 5 in the handout. How could you tweak this idea to make it ENGAGING, ACCESSIBLE, and DEVELOPMENTAL?

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

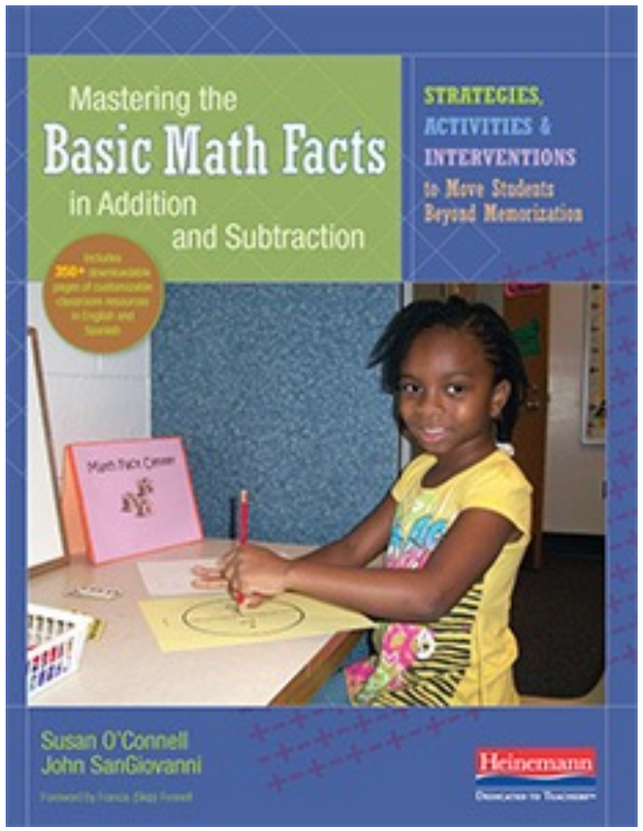
Independent Practice Time

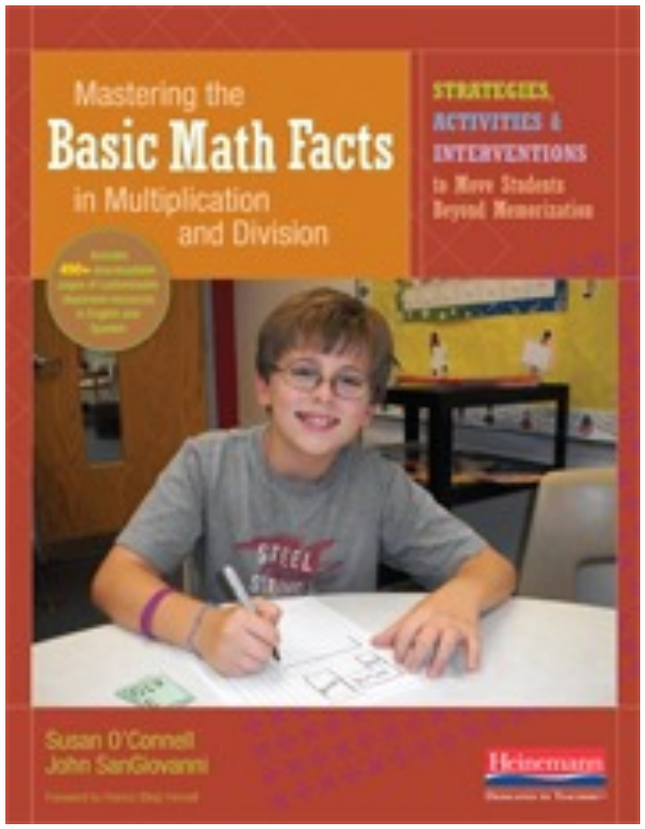
Pick a “just right” game

Self-monitoring promotes automaticity with the basic facts. Self-monitoring requires that students focus their attention on some specific aspect of their learning. As students monitor themselves, they think about what they know and what they still need to learn.

- p.g. 77 Math Running Records

Consider joining the Developing Computational Fluency Series

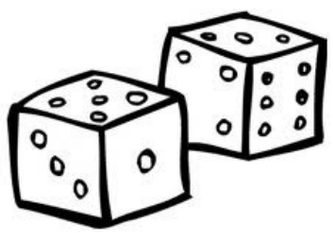




LRS #178984

LRS #178985

box cars and one-eyed jacks®



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

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

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

Multiplication Games

Cover Up! A Doubles Game

You need
~ 10 sided dice
~ Counters (2 different colors)

How to Play
Roll a 10-sided die. Multiply your number by 2.
Find it on the grid and cover it in your color.
Partner 2 gets a turn.
The first one to have 4 in a line wins!
Roll a 0 and lose a turn!

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

Double or Double-Double

Pick a factor from the **Factor Box**.
Double it (multiply by 2) or double-double it (multiply by 4).
Find the product below and cover it in your colour.
Four in a row wins!

Factor Box

1	2	3	4	5	6
7	8	9	10	12	14

24	8	6	20	12	4
16	28	14	32	18	24
10	2	6	36	28	40
12	14	18	4	16	20
10	8	24	32	36	2
40	28	18	16	4	6

Multiplication – What's Inside?

1. Cover Up! – Partner Game

- doubling strategy (x2)
- place 4 markers in a row
- differentiated instruction—strategic game

2. Double or Double-Double – Individual Activity

- based on doubling strategy (x4)
- place 4 markers in a row
- differentiated instruction—strategic game

3. Doubles and Halves – Partner Game

- relating multiplication and division (x/÷2)
- create longest row of markers
- differentiated instruction—strategic game

4. Doubles in a Row – Partner Game

- doubling strategy (x2)
- limited counters, place 3 in a row
- differentiated instruction—strategic game

5. Stack 'em up for 4 – Partner Game

- based on doubling strategy (x4)
- collect most counters
- differentiated instruction—strategic game

6. Stack 'em up for 8 – Partner Game

- based on doubling strategy (x8)
- collect most counters
- differentiated instruction—strategic game

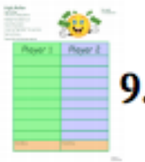
3	6	9
12	15	18
21	24	27

7. Stack 'em up for 3 – Partner Game

- based on doubling +1 more set (x3)
- collect most blocks
- differentiated instruction—strategic game

8. Thinking About Tens – Partner Game

- multiples of 10 (x10)
- place 4 markers in a row
- differentiated instruction—strategic game



9. High Roller – Partner Game

- multiples of 5 (x5)
- highest sum of multiples of 5

10. Multiply by 9 Bingo Card – Partner/small group/whole class

- multiples of 9 (x9)

Instructions

- students record multiples of 9 up to 81 on card
- repetition of multiples is permitted
- using x9 fact cards, call out multiplication facts, others find the product and cover
- line wins the game

11. Square Number Capture – Partner Game

- square numbers
- laminate or slip into page cover
- can relate to area
- variations: capture the greatest area, square spaces need to be connected to one's own continuous space

12. Four in a Line – Partner Game

- doubling/double-double strategy
- larger numbers
- strategic reasoning

13. The Ugly Ones – Partner Game

- multiplication facts not addressed by previous strategies
- encourages students to find efficient strategies based on what they know

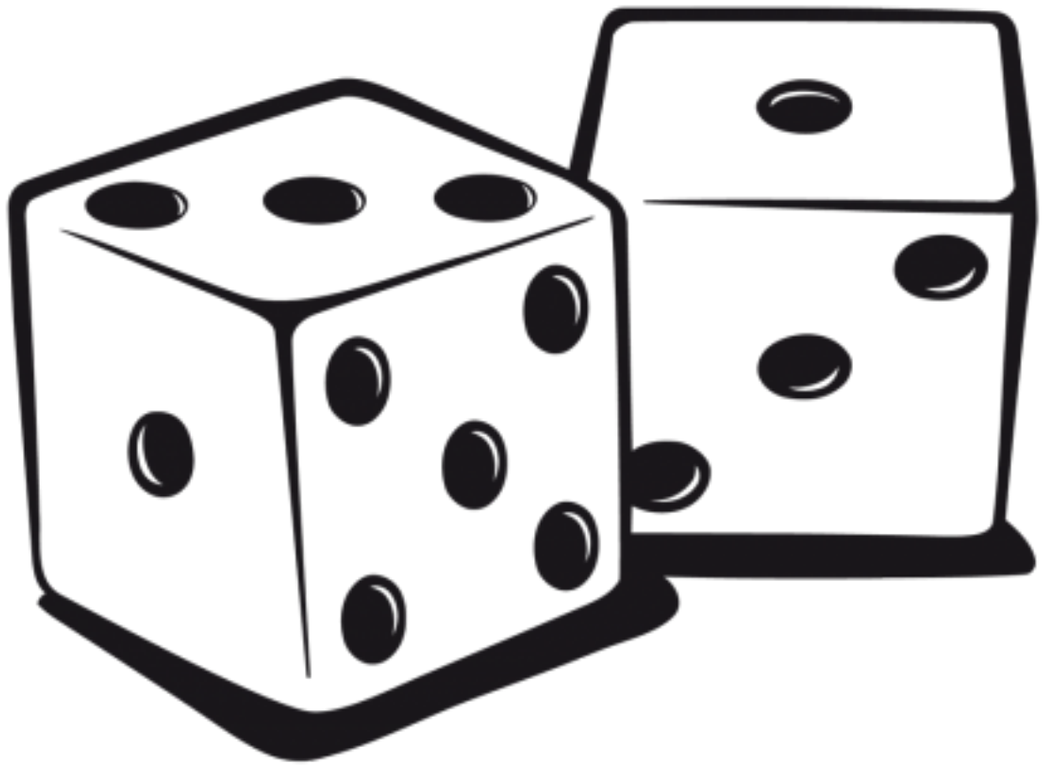
14. Wipe Out – Individual Activity/Partner Game

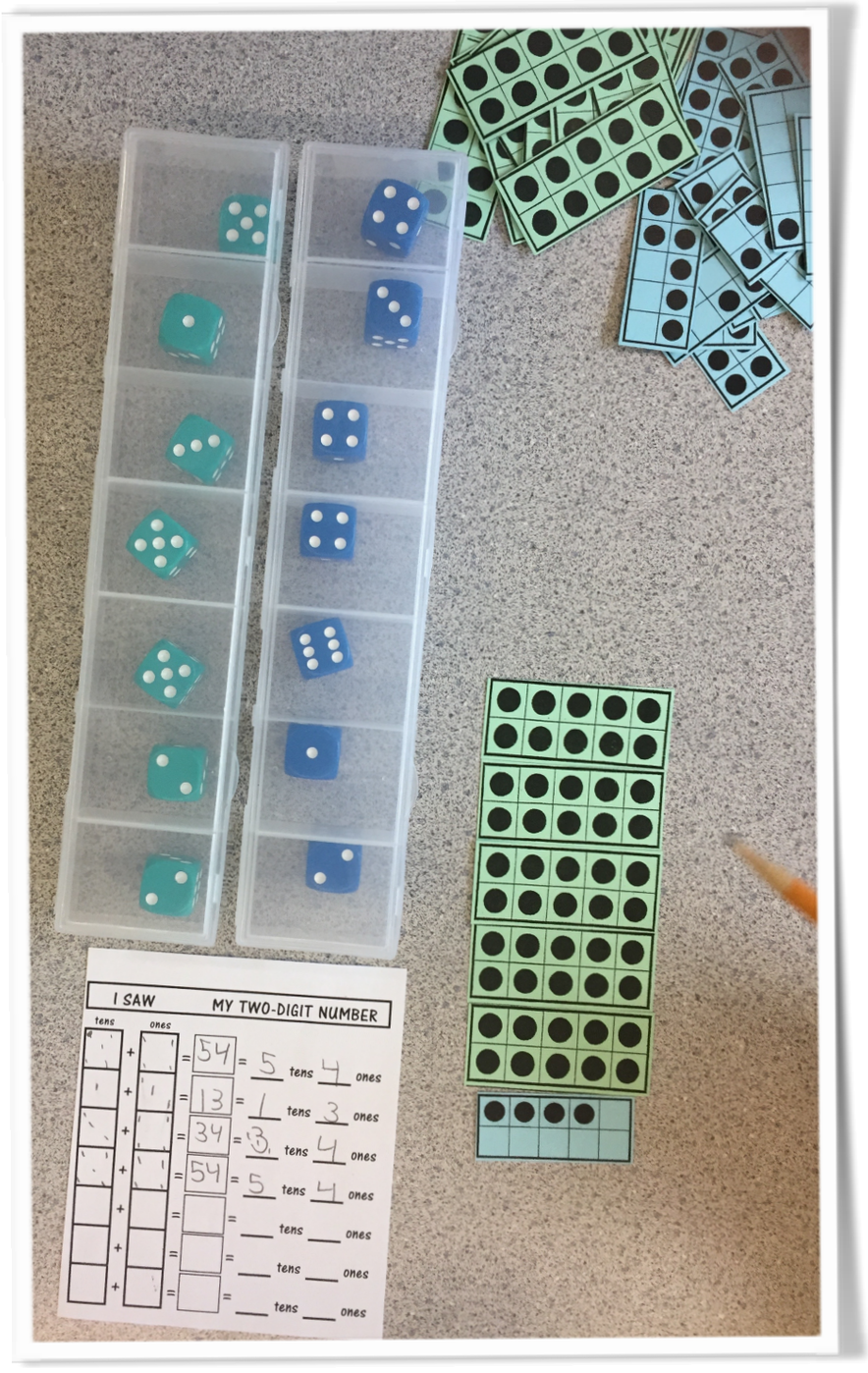
- multi-leveled students can play as partners

Instructions

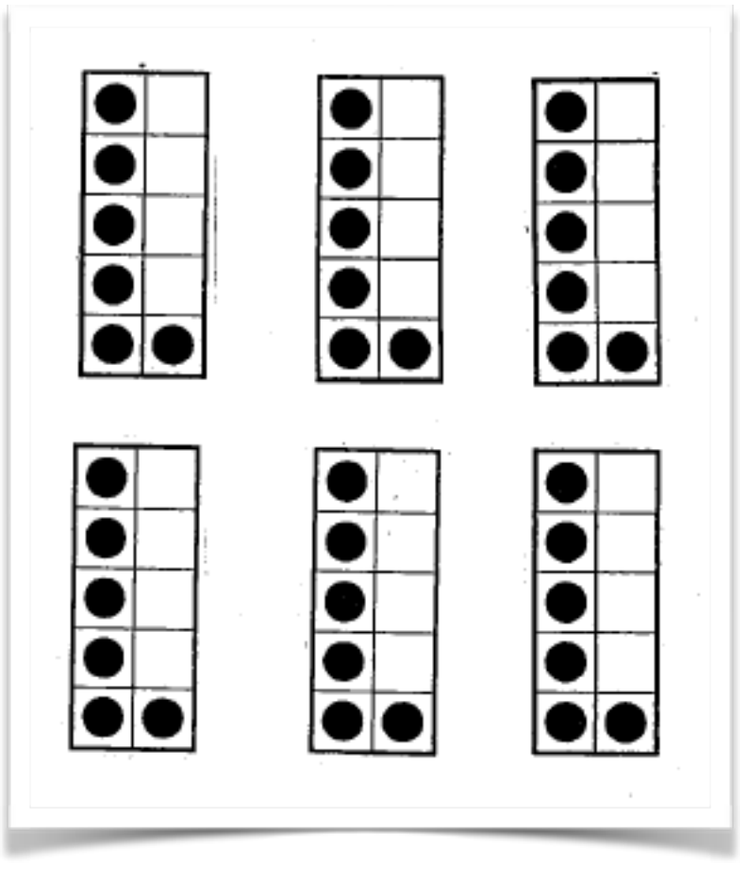
- before starting, students need to identify a single factor for self
- follow instructions as written on the board

Box Cars and One Eyed Jacks





Ten Frame Multiplication Cards



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

Regrouping	Not Regrouping
227 + 49	201 + 16
38 + 584	

TRUE	FALSE
587 - 10 = 577	275 - 238 = 43
299 - 89 = 210	

Problem Solving

Joining Problems

Join (Result Unknown) 6 + 3 = __	Join (Change Unknown) 4 + __ = 7	Join (Start Unknown) __ + 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 = __	Separate (Change Unknown) 5 - __ = 1	Separate (Start Unknown) __ - 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 = __	Part - Part - Whole (Part Unknown) 7 - 4 = __ or 4 + __ = 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 = __ or 3 + __ = 5	Compare (Quantity Unknown) 3 + 2 = __	Compare (Referent Unknown) 8 - 5 = __
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?

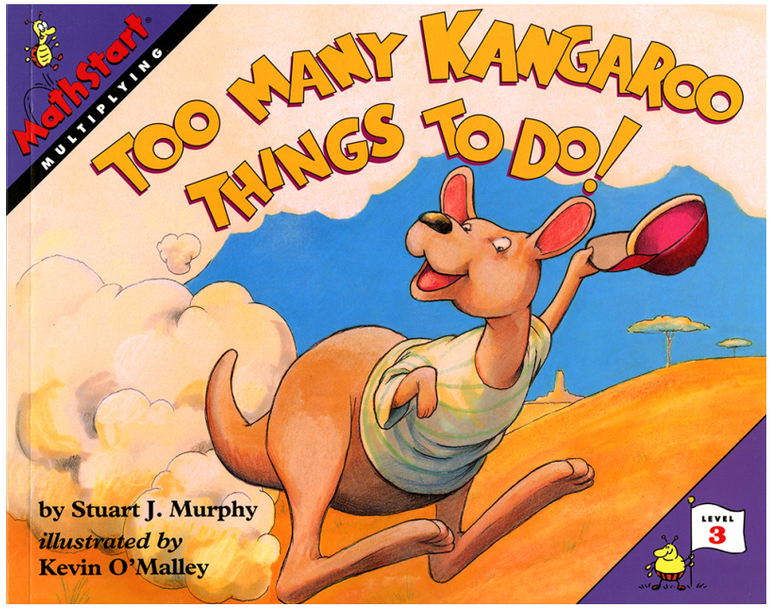
Comparing Problems

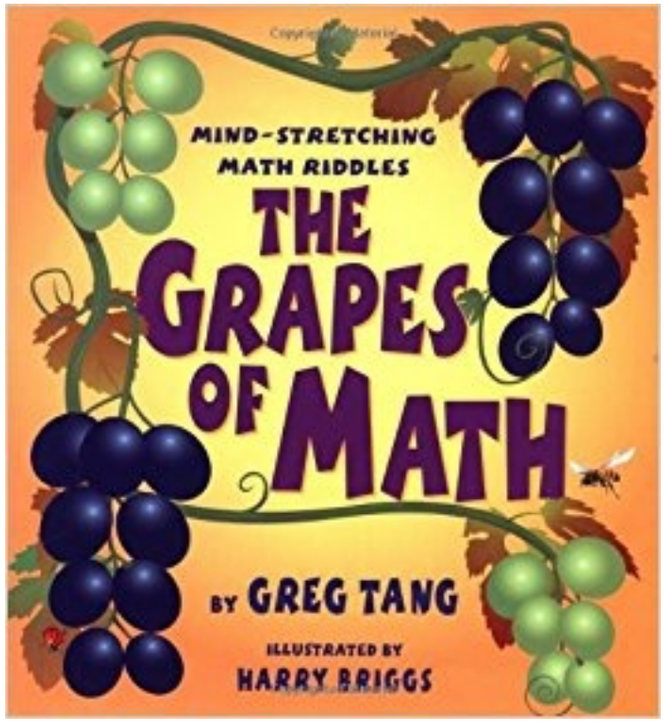
Compare (Difference Unknown) 5 - 3 = __ or 3 + __ = 5	Compare (Quantity Unknown) 3 + 2 = __	Compare (Referent Unknown) 8 - 5 = __
Mr. Smith had 5 cookies. Suzy had 3 cookies. How many more cookies did Mr. Smith have than Suzy?	Mr. Smith had 3 cookies. Suzy had 2 more cookies than Mr. Smith. How many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

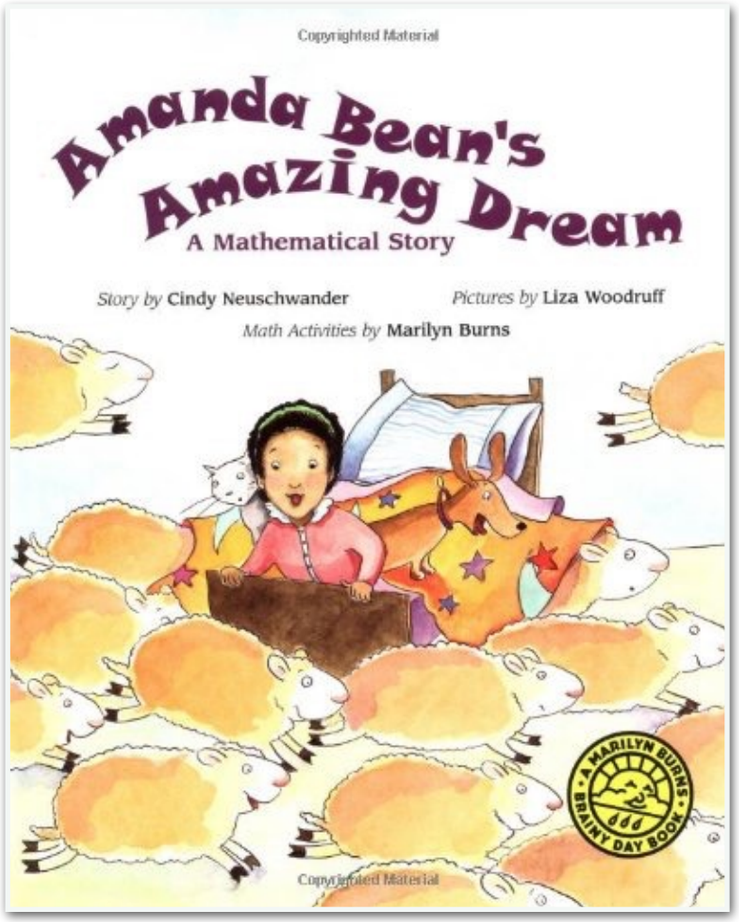
Multiplying and Dividing Problems

Multiplication 3 x 3 = __	Measurement Division 9 ÷ 3 = __	Partitive Division 12 ÷ 3 = __
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?

How will you assist your students in
selecting a 'just right' problem?
What materials will be available for students?
Where will students record their ideas?
Could students sort the problems by the different types?
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
multiplication 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:

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

- 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:

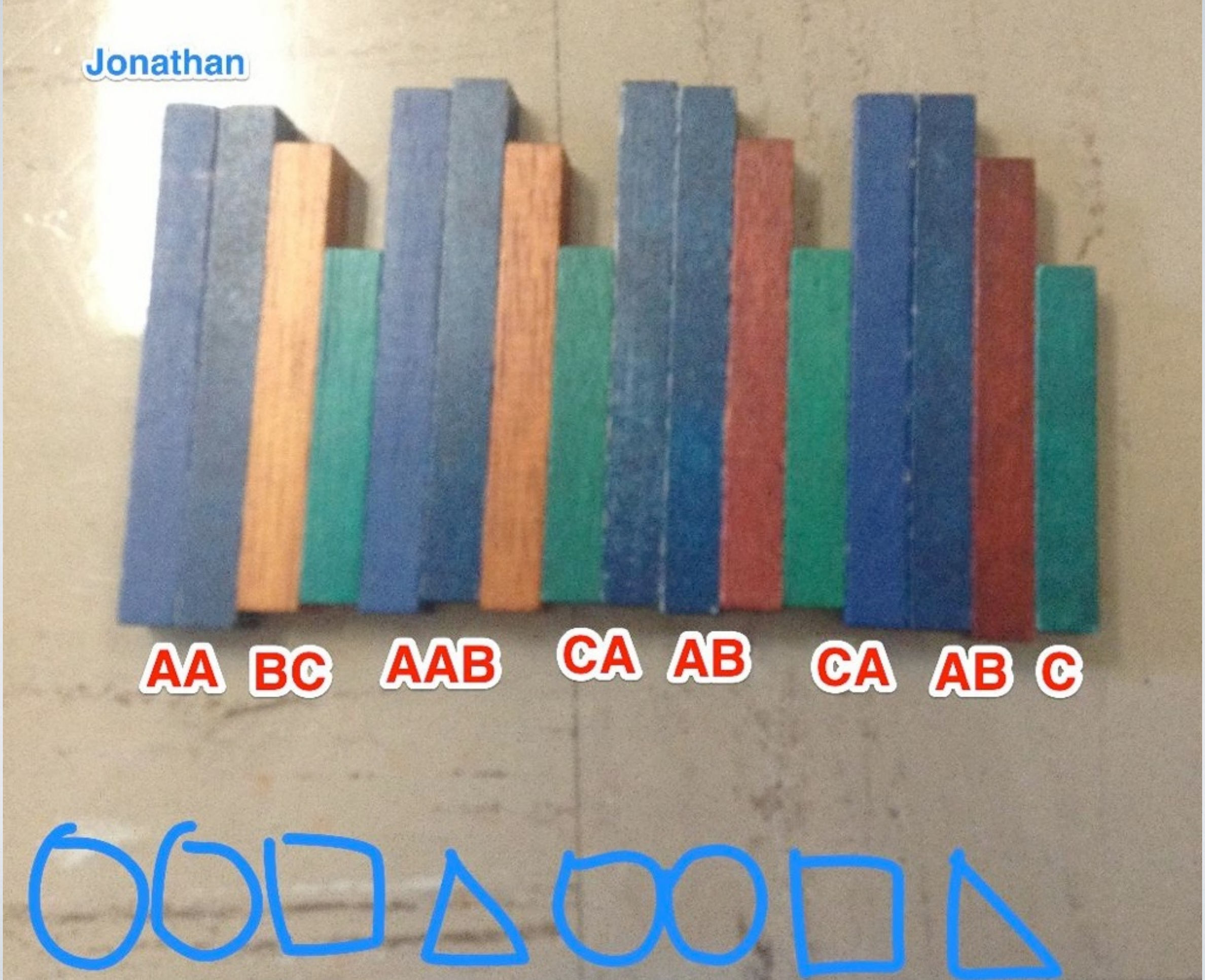
What patterns can you create?
Can you label and translate your pattern?

- 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

ABC A B C

Abcabc


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:

Can you represent this expression?

- Represent the expression using any materials you'd like
- Take a photo
- Record and explain your mathematical thinking

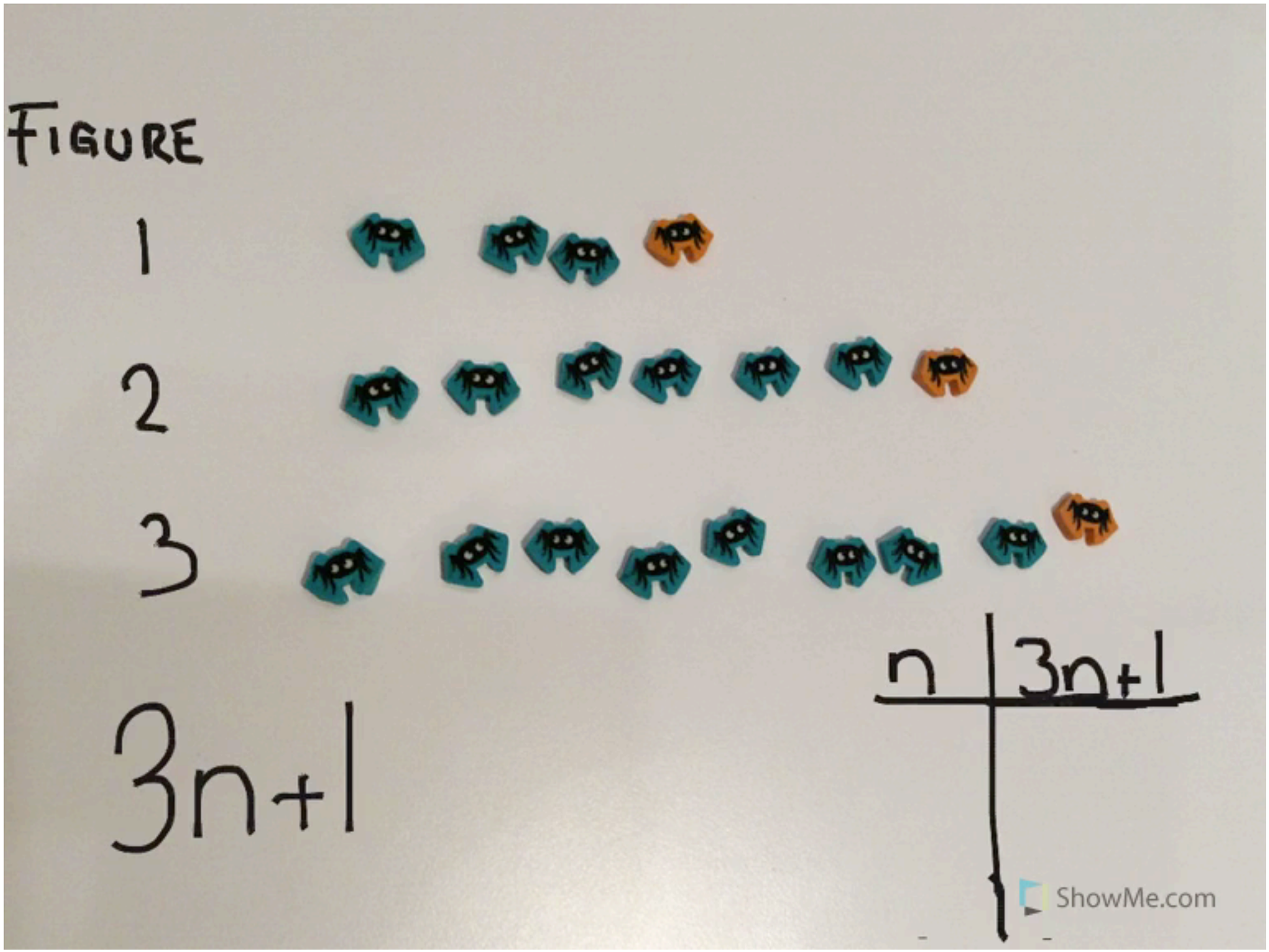


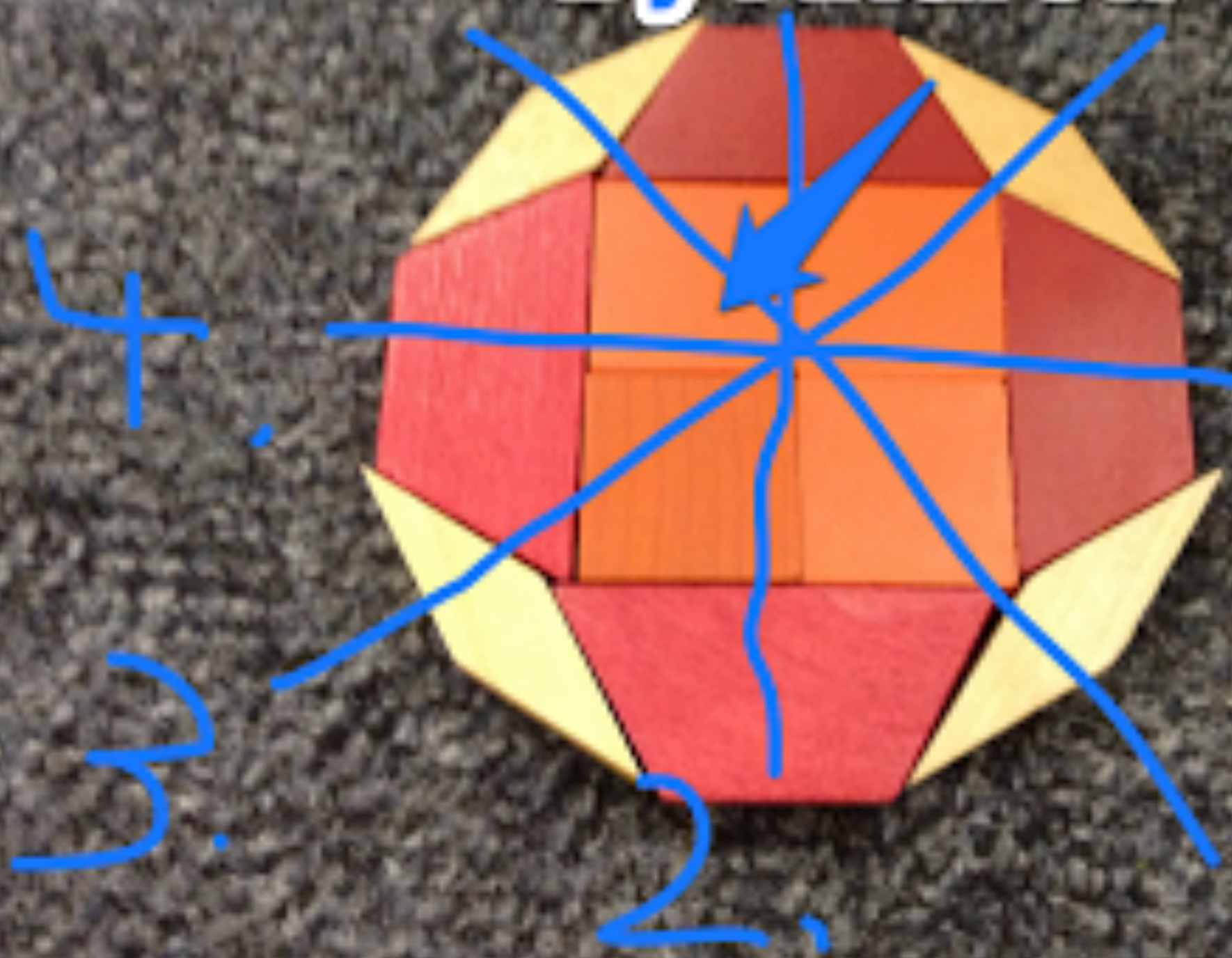
FIGURE
1
2
3
3n+1
n
3n+1
ShowMe.com

MATHEMATICAL INQUIRY TASK:

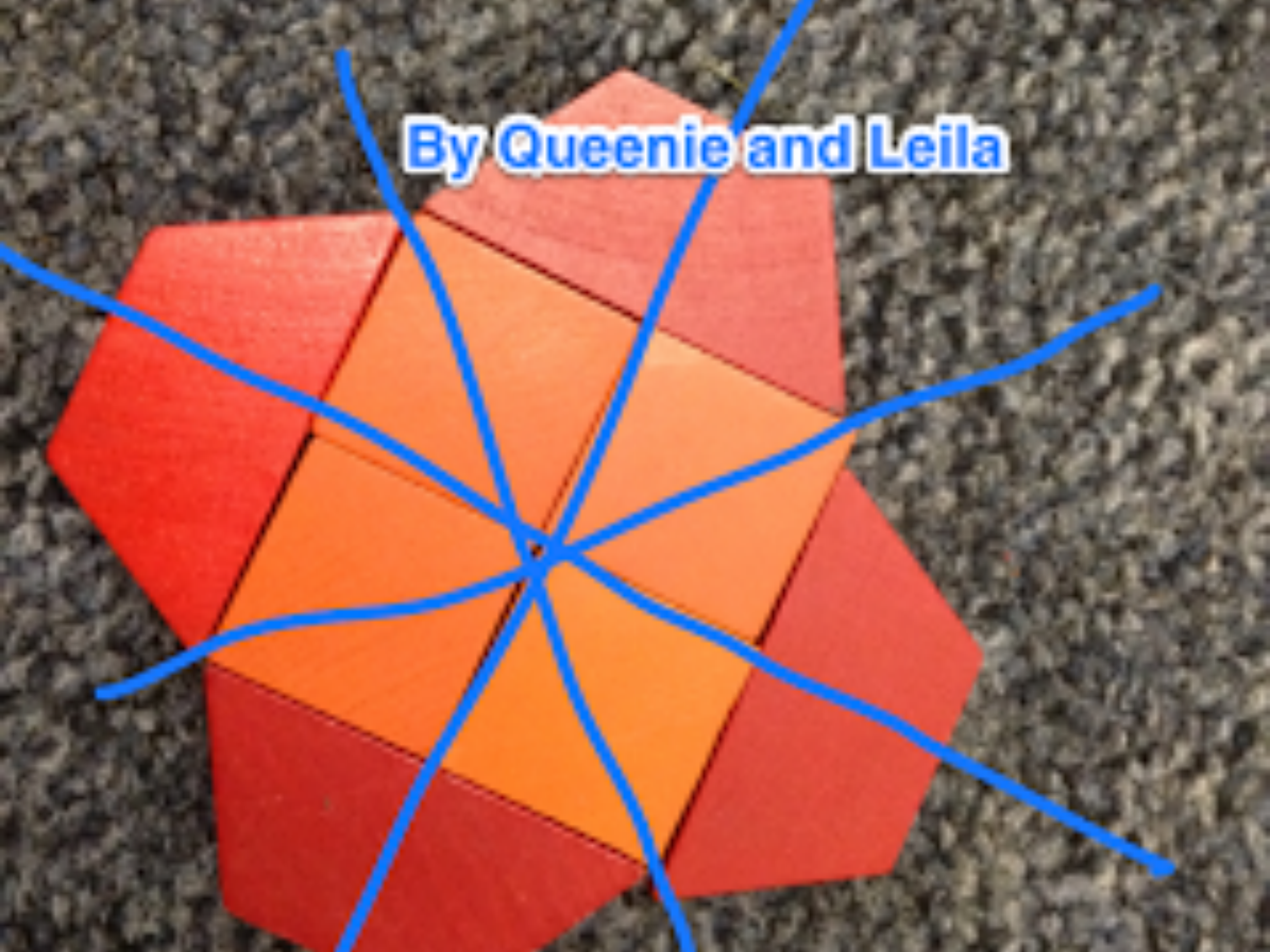
How many lines of symmetry are possible in a design?

- Create a design
- Take a photo
- Using Skitch find all the lines of symmetry

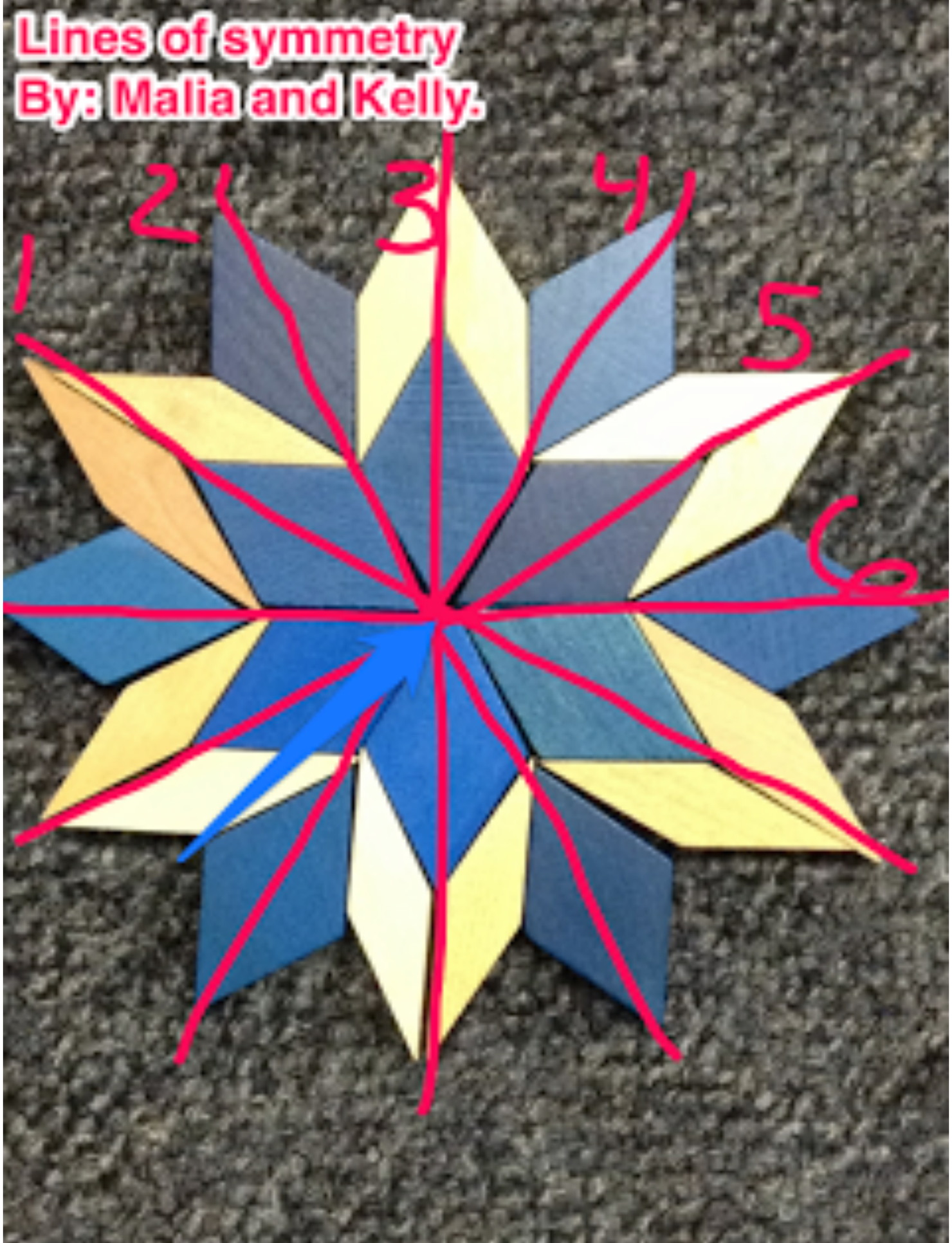
Symmetry lines
By Andrew



By Queenie and Leila



Here is six symmetry shape
BY:Vincent.zeng


Lines of symmetry
By: Malia and Kelly.
1
2
3
4
5
6

MATHEMATICAL INQUIRY TASK:

What fractions do you see in our school?

- Take photos
- Use arrows to highlight
- State the fraction using text

Half of the letters are vowels

3/18 are yellowish paints

Or 1/6

1/3 is wearing a dress
ADULTS
WASHROOM

- Paid app - similar to Showme with more features
- Interactive whiteboard
- Add images, animation, narration, and use laser pointer to create multiple slides
- Users can easily share presentations

By Andrew and Erik

Grade three

What happens when you multiply an even number times an even number? Explain how you know.

GUIDED MATH

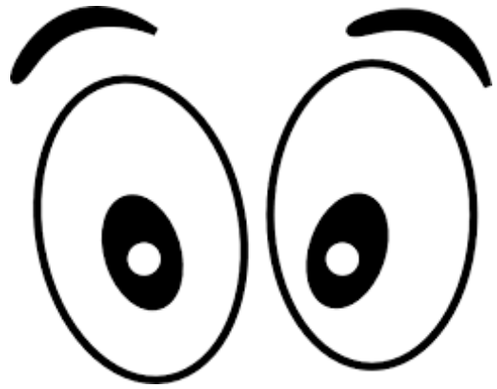
	LESSON, GUIDED MATH, NING STATIONS		GUIDED MATH AND LEARNING STATIONS		
5–10 minutes	NUMBER SE NE An engaging, acce seful routine to begin your math cla otes a community of positive ma discussion and thinking.		5–10 minutes	NUMBER SENSE ROUTINE An engaging, accessible, purposeful routine to begin your math class that promotes a community of positive mathematics discussion and thinking.	
15 minutes	FOCUS LESSON A well-planned, whole-group lesson focuse on the day's learning target and accessibl 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.
	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.	

h, Learning Stations, Reflection, and More by Jennifer Lempp. Copyright © 2017 by Houghton Mifflin Harcourt
m. Downloadable from mathsolutions.com/mathworkshopreproducibles.

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.

“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

Forming Groupings

Pre-assessments

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

Survey

Talking Points

Checklist

Anecdotal notes

Written quiz

Exit slips

Conferences

Self-Assessment

Running Record

Name_____

Date _____

A Survey

1. When I hear the word division, I think…

2. When it comes to division, I know

   a lot a little not much

3. Here is a sample division problem:

4. Write a division problem. Then solve it one way and check it another way.

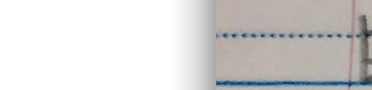
5. What is a remainder? Can you give an example?

Talking Points

Name _____ Date Tuesday, sept, 26

Talking Points	Rounds Agree/Disagree/Unsure 1	2	3
Patterns are predictable.	A	A	
Patterns can increase (grow) but cannot decrease (shrink).	U	D	
Patterns can be made out of one item that is all the same colour (brown toothpicks).	D	A	
Numbers can be used to describe patterns.	U	U	
Patterns can help us to solve problems.	A	A	

1. witch talking point are you sure you were right with your awnser?

I am pretty sure I'm right about patterns are predictable because if you Draw two shapes you could just copy it so it is predictable Example=  ← triegal and a sqaure if you keep on adding to it, you will get the hang o so it will be predictable.

2. witch talking point are you insure about?

I am most unsure about "Numbers can be use to discribe putterns" because I don't re learning that last year.

2. Patterns can increase but cannot decrease. I do know that Patterns can increase but before I never knew that Patterns can decrease.

1. I was sure about that Patterns can be made out of Items that are all the same colour because you can make diffrent design that can be used in diffrent ways.

September 26 2017

1. The talking point I am sure I am right with my answer is Patterns are predictable because you can always predict what comes next when you do 3 or 2 shapes.

2. The talking point I am unsure about is Numbers can be used to describe patterns because I really don't get it and I don't know if it is a disagree or a Agree so I just wrote unsure/U.

Checklist

Student Names	Is able to create an increasing pattern.	Can explain the
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: Coud orally describe the increase in the pattern but could not predict the tenth term without continuing the pattern.

Exit Slip

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

Self Assessment

Name_____

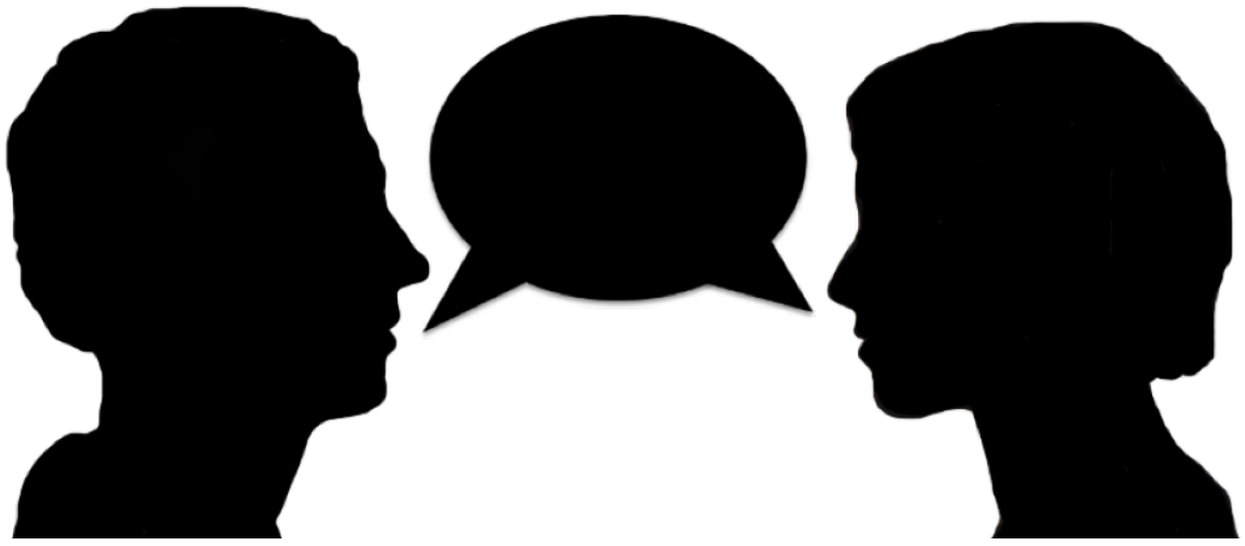
Date _____

1. What did I do well on the quiz?

2. What do I still need to practice?

3. What it my action plan for doing it?

What types of pre-assessments do you use? 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

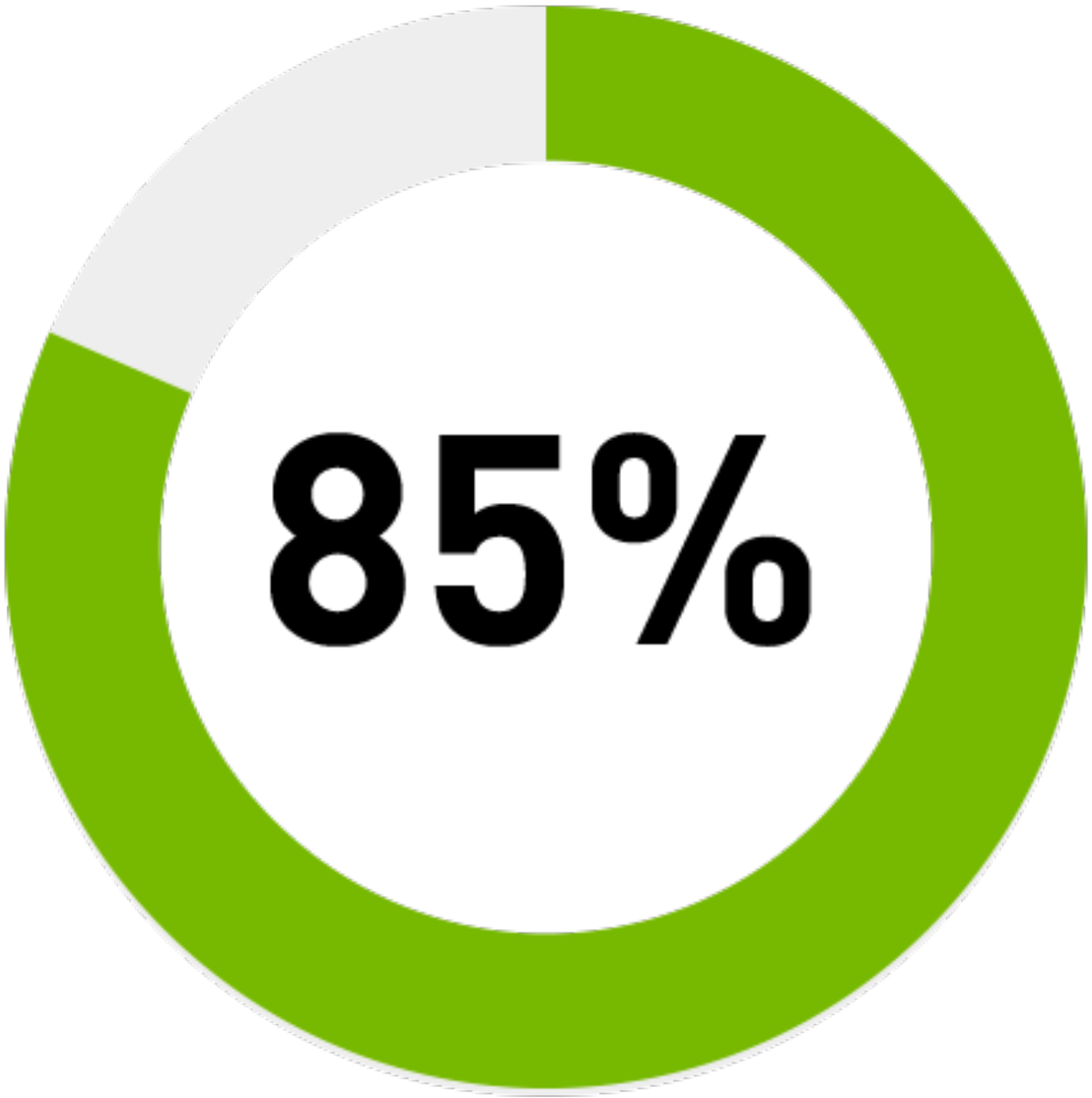
What might you be doing in this time?

- 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, open number line, open array)
- discussing common errors
- assessing students

3 Parts to the Guided Math

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

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



Grade Four Example

Video 4.1

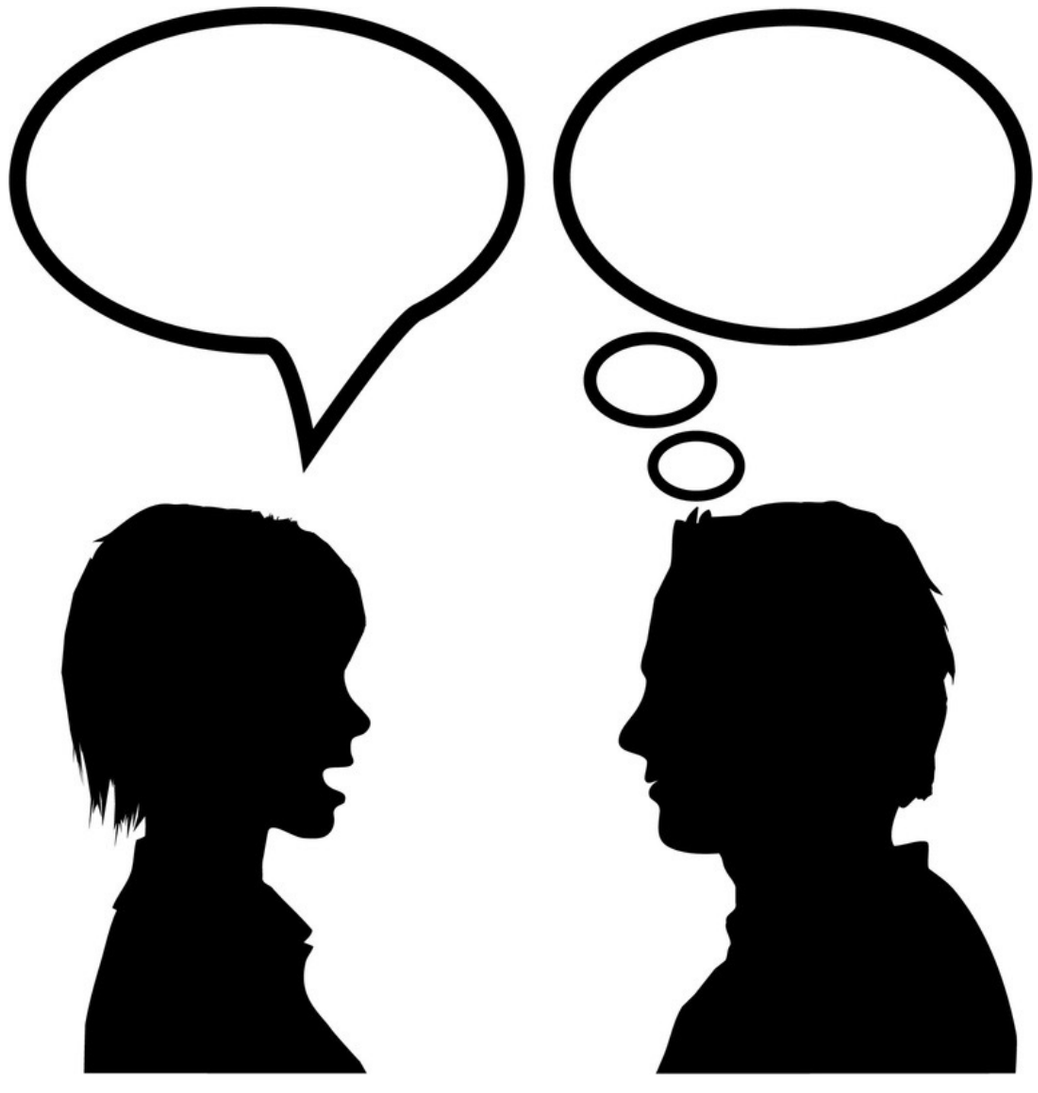
Starting at 11:30

Ending at 13:50

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!

The Role of the Teacher

1. Teacher as *Facilitator*
   - talking less and asking more
   - asking effective questions to make thinking visible

2. Teacher as *Clarifier and Connector*
   - providing appropriate vocabulary
   - anticipate and sequence student solutions to foster connections
   - assisting students in making connections between concrete, pictorial, and symbolic representations
   - ask thoughtful questions

3. Teacher as *Monitor*
   - *observe and note who is engaged/passive*
   - *use active participation strategies to hear more voices*

4. Teacher as *Data Collector*
   - *work to find out our students' strengths, challenges and interests*
   - *record anecdotal notes and use these to inform instruction*
   - *collect and share photos, videos, and other documentation*

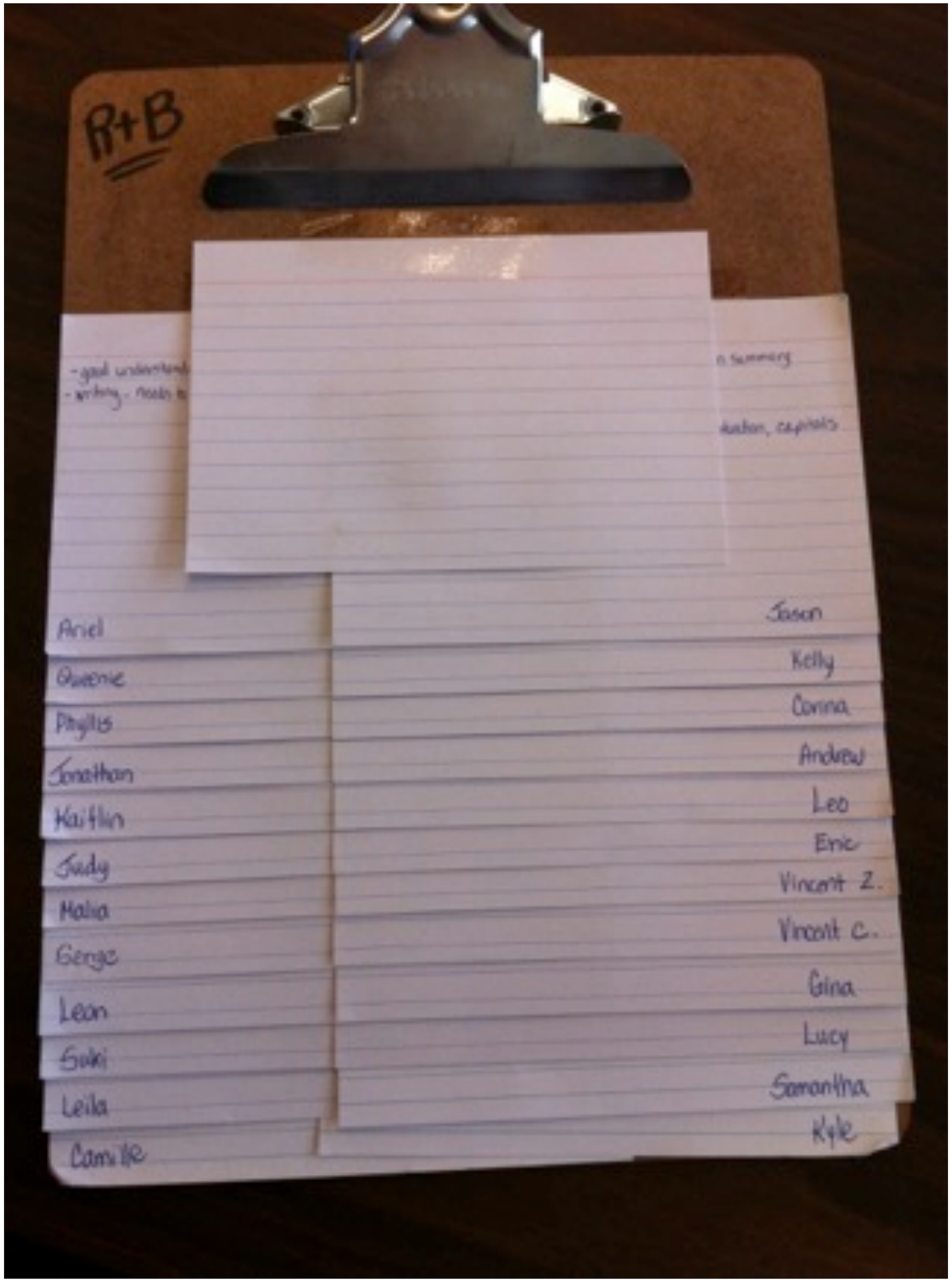
Guided Group Instruction

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
Ariel
Queenie
Phyllis
Jonathan
Kaitlin
Judy
Malia
George
Leon
Suki
Leila
Camille
Jason
Kelly
Corina
Andrew
Leo
Eric
Vincent Z.
Vincent C.
Gina
Lucy
Samantha
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			

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. Downloadable from mathsolutions.com/mathworkshopreproducibles.

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 [illegible] on the day's learning target and accessible [illegible] 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. [illegible] this structure, [illegible] focus lesson is [illegible] guided [illegible] and is [illegible] for [illegible].	LEARNING STATIONS Activities in which students engage in meaningful mathematics and are provided with purposeful choices.
[illegible]	GUIDED MATH Small-group instruction that allows the teacher [illegible] support and [illegible] more [illegible] students' [illegible] and [illegible]	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.	

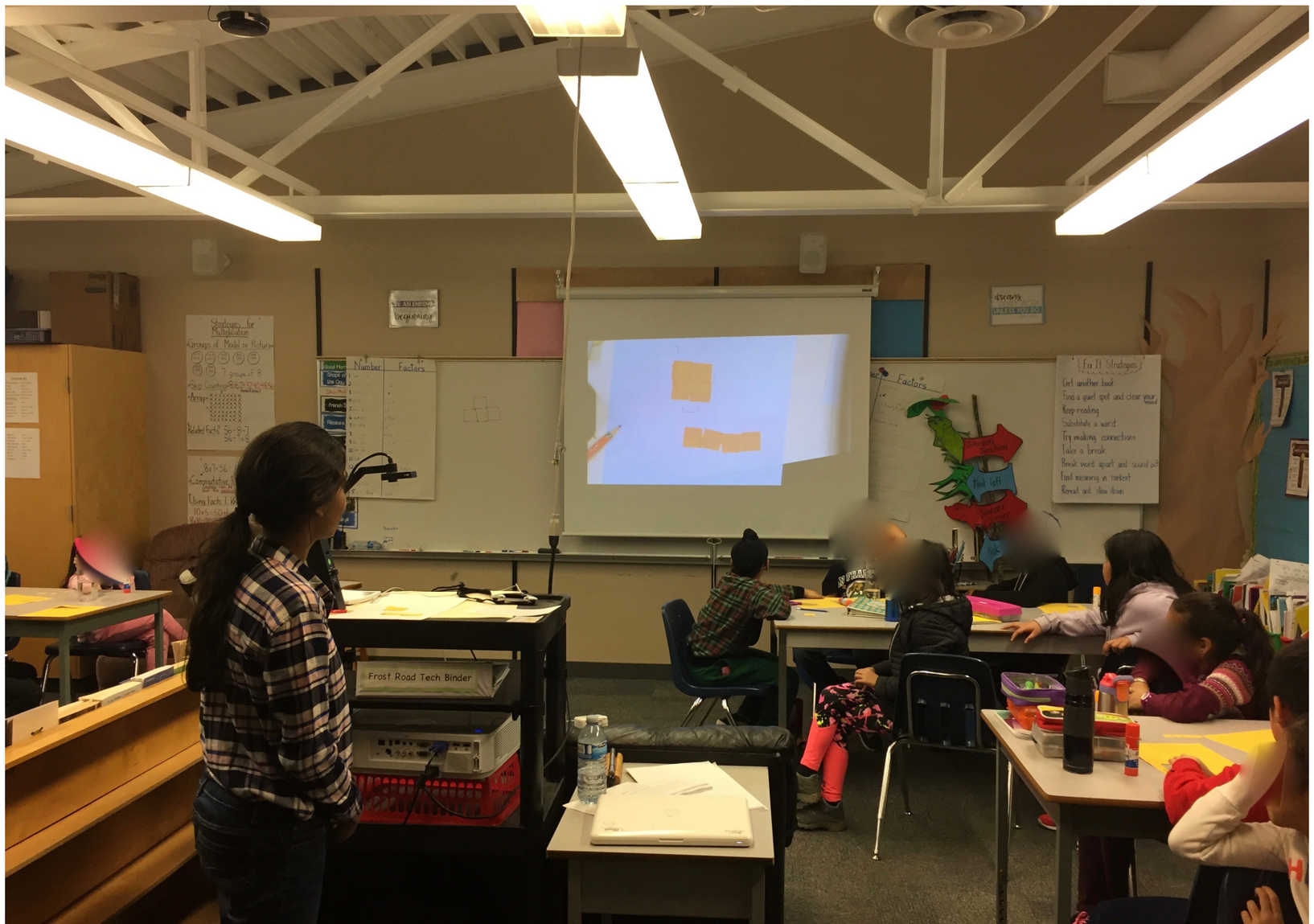
[illegible]h, Learning Stations, Reflection, and More by Jennifer Lempp. Copyright © 2017 by Houghton Mifflin Harcourt
[illegible]m. Downloadable from mathsolutions.com/mathworkshopreproducibles.

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.

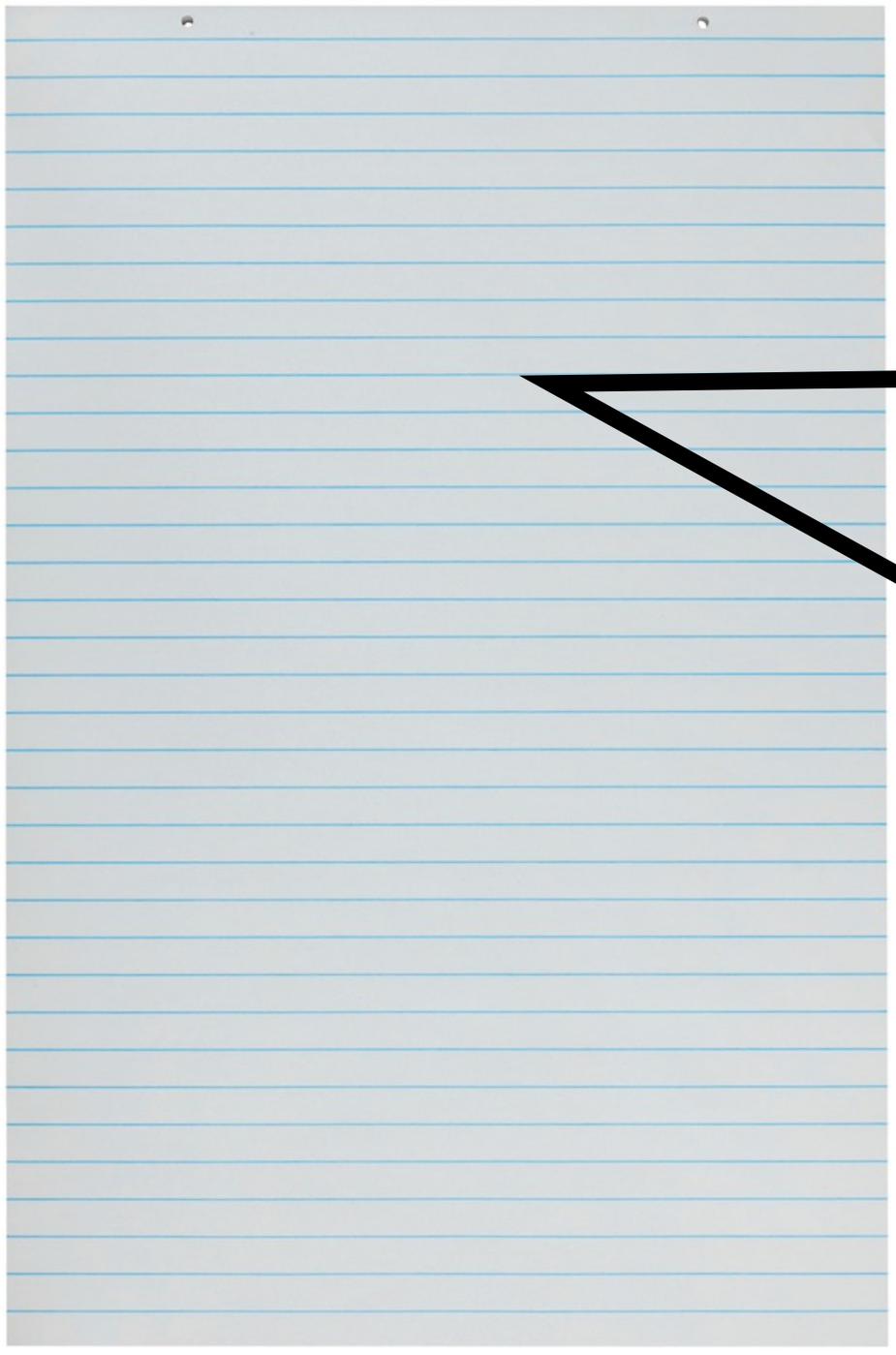
- National Council of Teachers of Mathematics, 2000

Shared Thinking

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



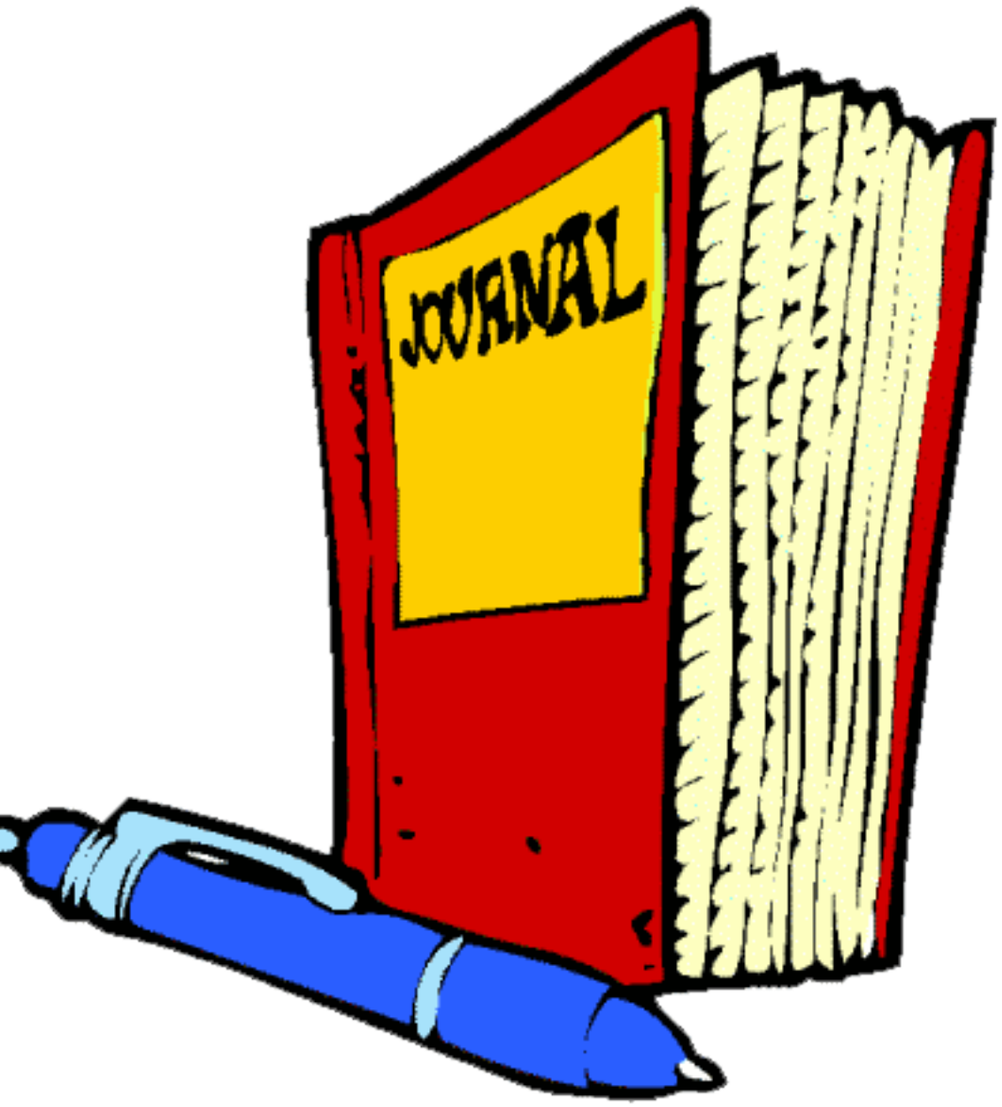
Interactive Class Journal



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

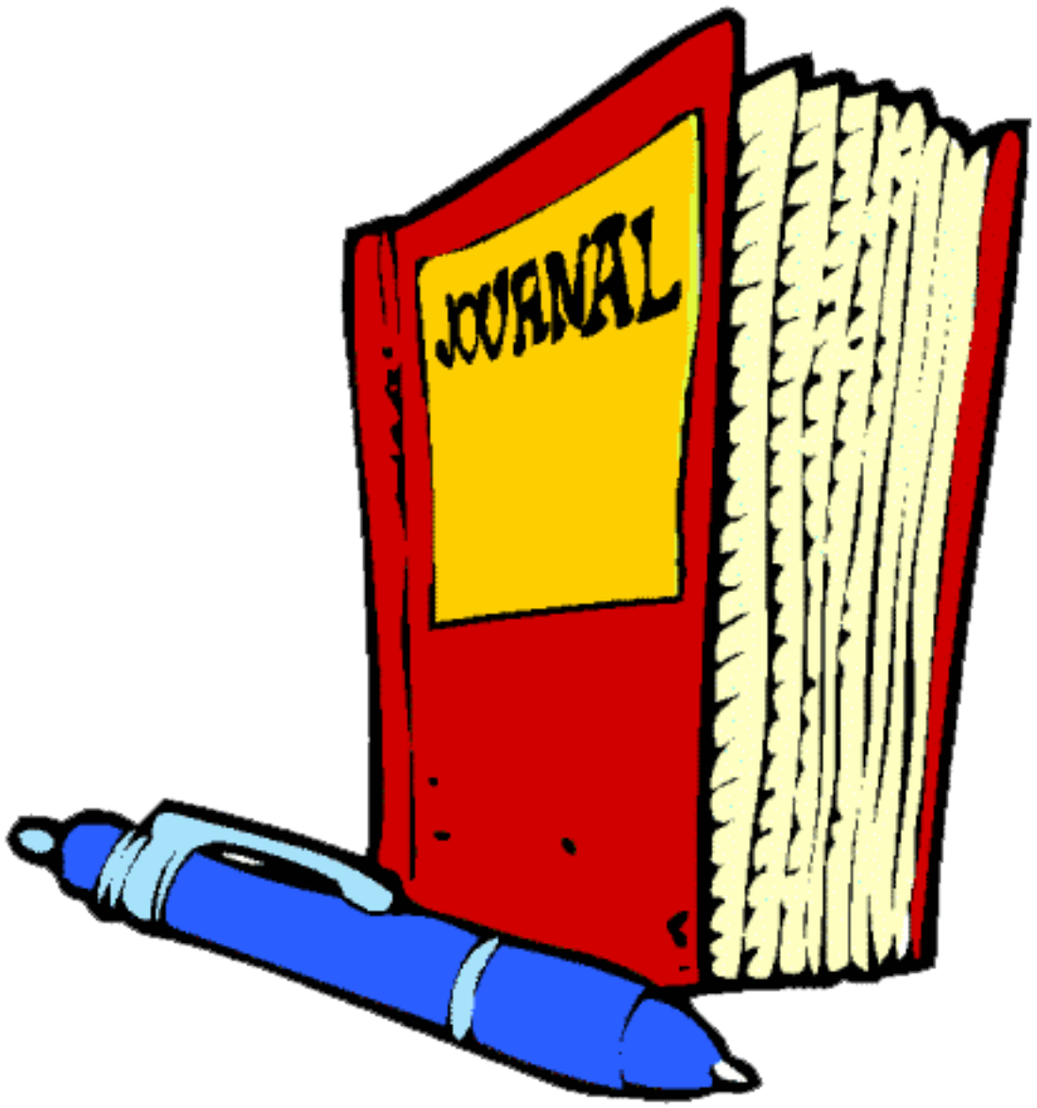


Conceptual Understanding

Tell me everything you know about fractions.

What does elapsed time mean?

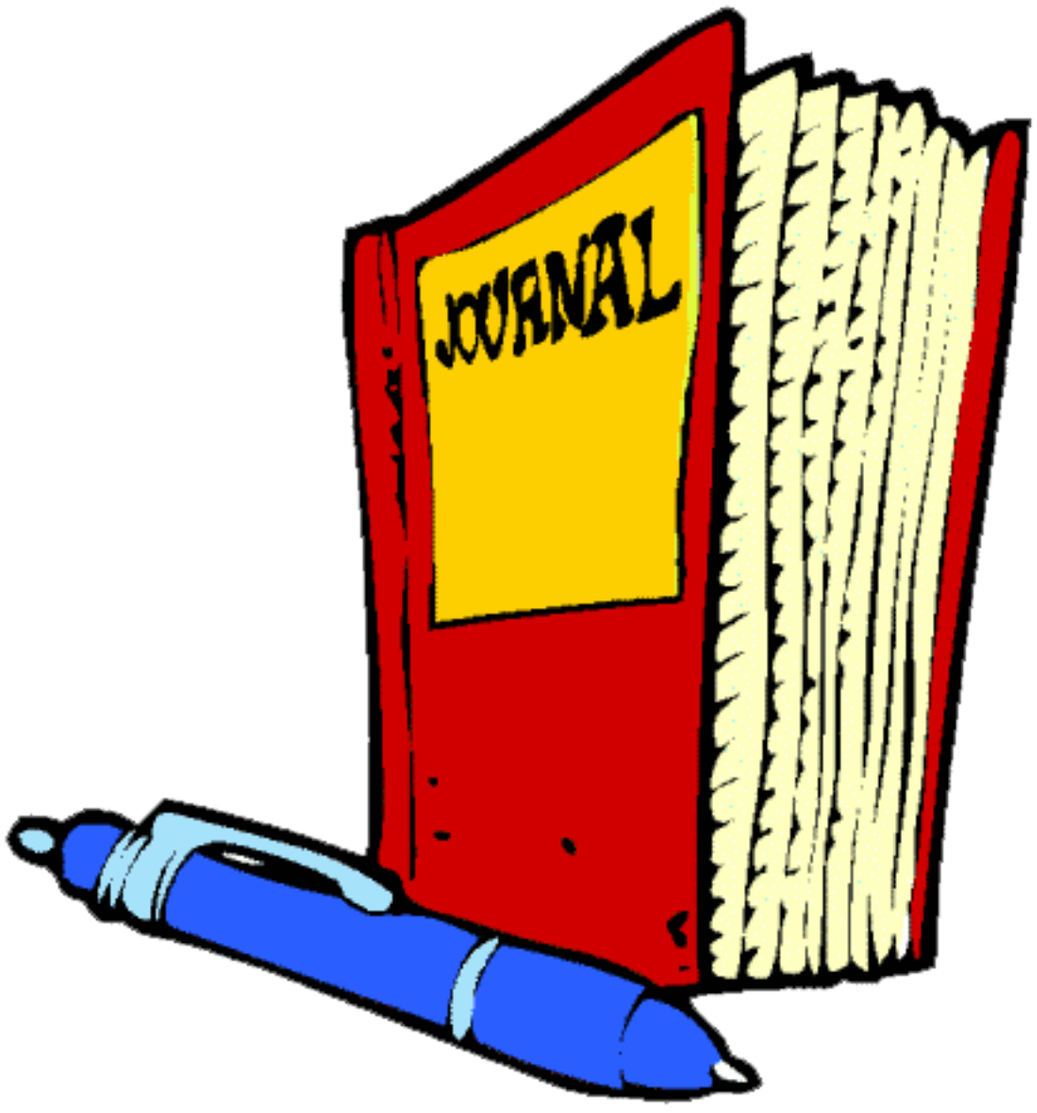
Journal Prompts



Strategies

How would you solve 35 x 13
Can you solve it a different way?

Journal Prompts



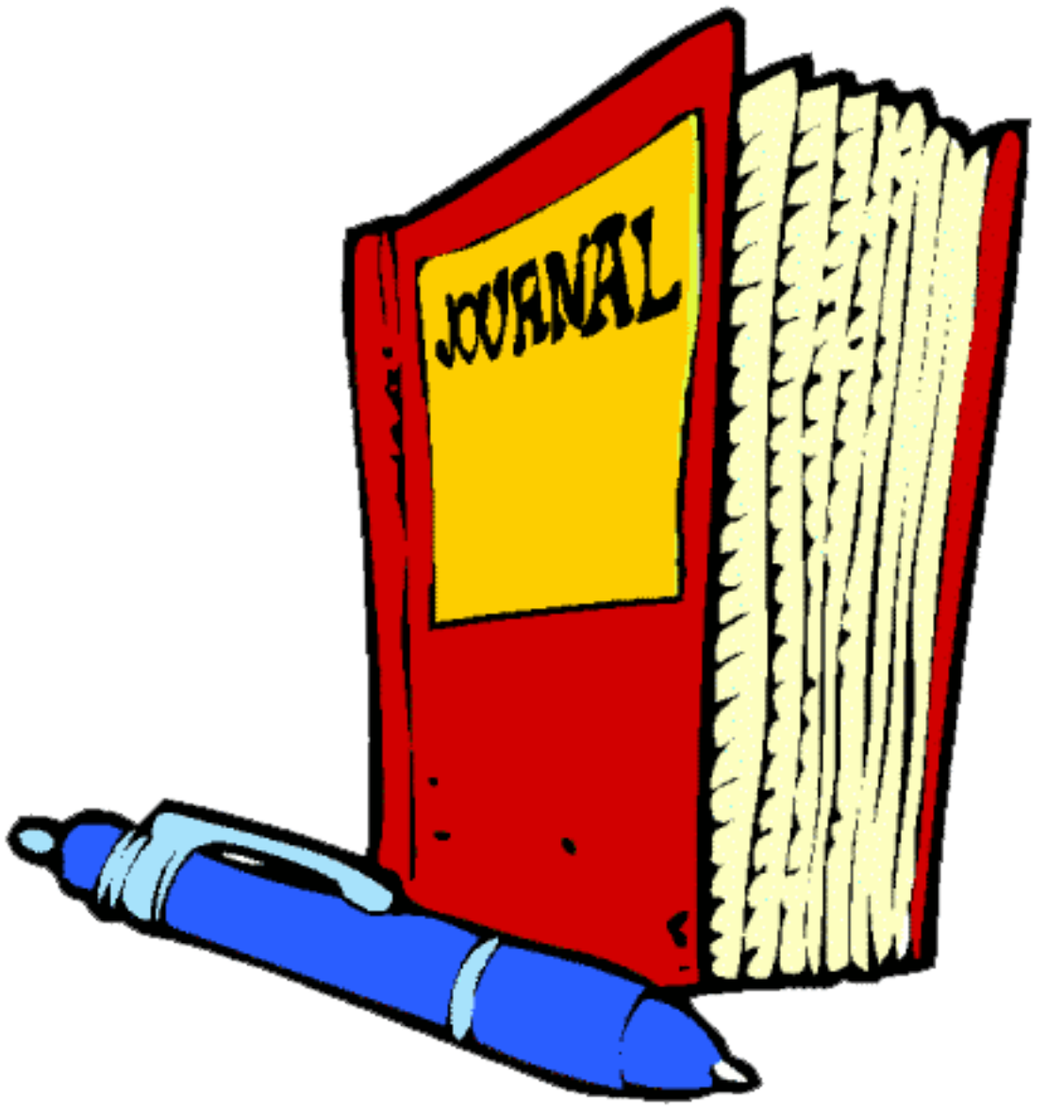
Reasoning

What would happen if_____?

How is this like _____?

Can you tell me an addition story where the sum is 345?

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