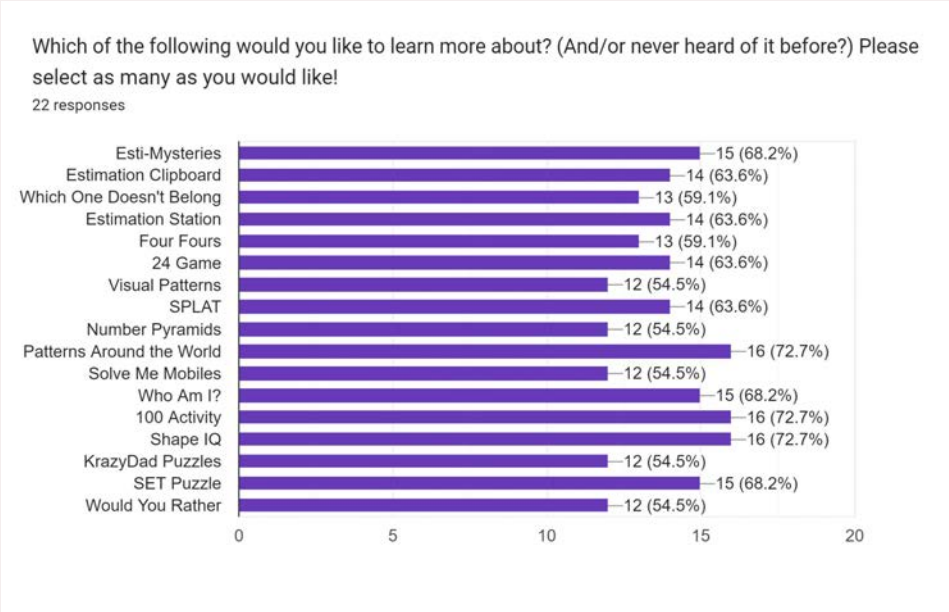
1. Esti-Mysteries
2. Estimation Clipboard
3. Which One Doesn’t Belong
4. Estimation Station
5. Four Fours
6. 24 Game
7. Visual Patterns
8. SPLAT
9. Number Pyramids
10. Patterns Around the World
11. Solve Me Mobiles
12. Who Am I?
13. 100 Activity
14. Shape IQ
15. KrazyDad Puzzles
16. SET Puzzle
17. Would You Rather



Welcome! While you wait...

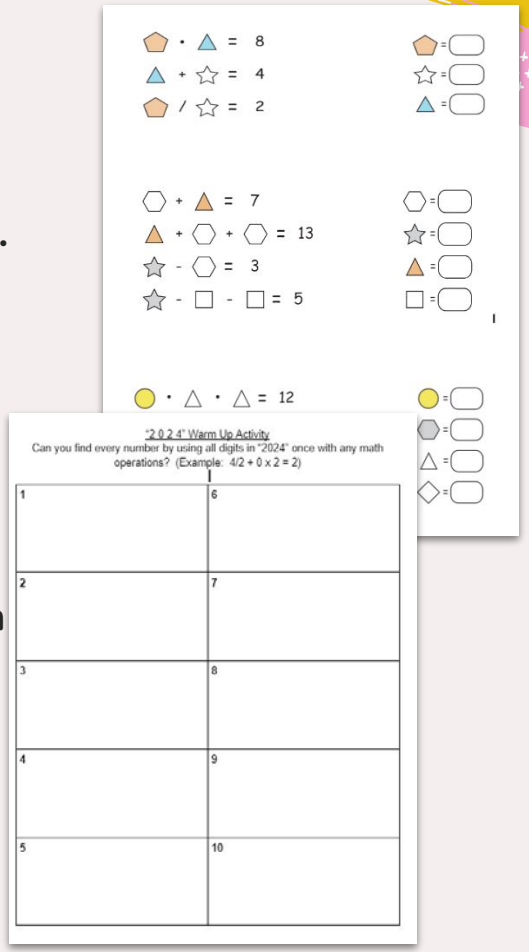
SCAN ME

Here are a couple of “bell ringers” for you..

FIRST...
Scan the QR code to answer the poll.
This poll will determine today’s presentation topics!

THEN...
- Can you solve the “Shape IQ” puzzles on your table?

- Can you complete the “2 0 2 4” activity on your table?



Mini-Activities to Get Students Talking about Math

Starting class off with mathematical discourse in any classroom

Meet the Presenters

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Presentation Overview

- This presentation will share several free math mini-activities that are great as bell-ringers or supplemental activities to encourage **math discourse**.
- These activities are designed as low floor, high ceiling, wide walls that are engaging for students in all levels.
- Furthermore, these activities can be modified to fit any age/grade level in any lesson topic or subject area.
- Many of these activities can be repeated and continued throughout the year.

Today's Objectives

Participants will have the confidence to:

01 Use a variety of mini activities that promote good math discourse in their classroom.

02 Adapt activities to meet the needs of their students' levels and the lesson topics.

Poll Results

Esti-Mysteries

Examples:

“Fruit Glass” (Grade 1-3)

“Sky Beads in Two Containers” (Grade 3-8)

“Shrink Ray and the Dice” (Grade 4-12)

Esti-Mysteries

- Great for building number sense, estimation, concept of volume, reading math phrases (less than, more than, etc.) and promotes good discourse about students' perspectives and opinions.

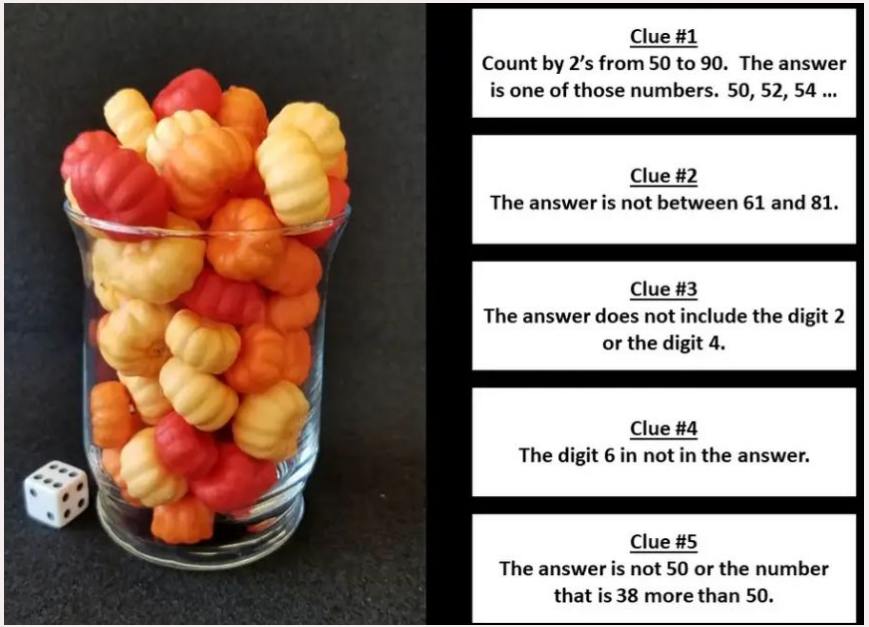
- Practice applying vocabulary and math concepts, such as digits, even/odd, multiples, divisible, skip counting, squares/cubes, etc.

- There are hundreds of free Esti-Mysteries available online to use. Grade levels vary from 1-4, 5-8, 3-12, etc. Different clues are used in the Esti-Mysteries that may apply different math concepts. All of them are editable!

Esti-Mysteries

Students may use a 100s chart to help them cross out numbers as the clues appear. Some Esti-Mysteries have the chart option on the slides.

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



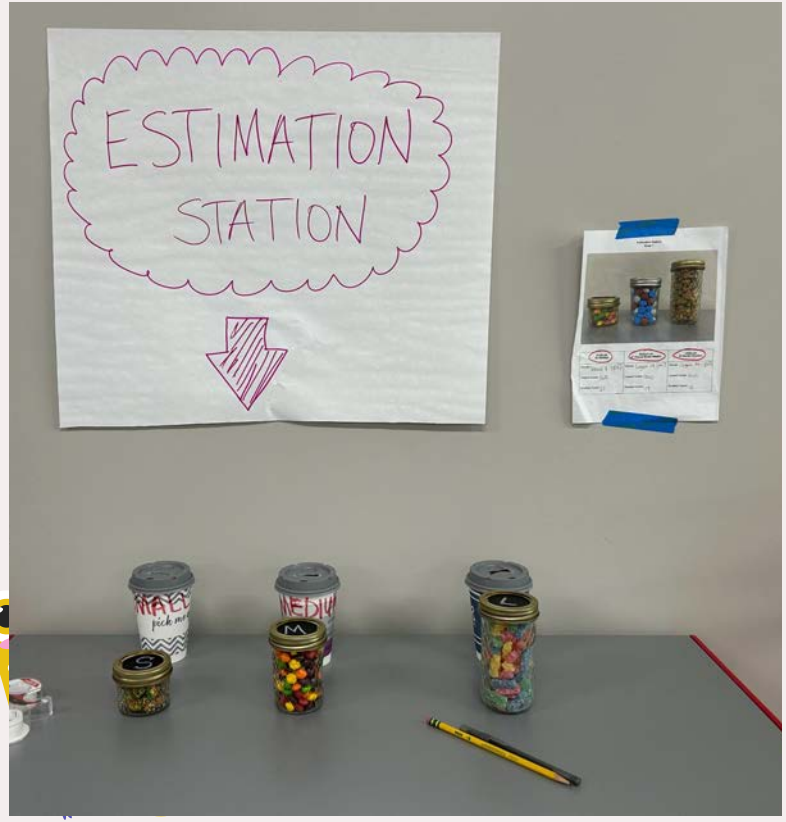
Estimation Clipboard

Similar to Esti-Mysteries, but good for comparing more/less, longer/shorter, etc. based on previously given information.

Examples:

“Tiny Baseballs in a Jar”

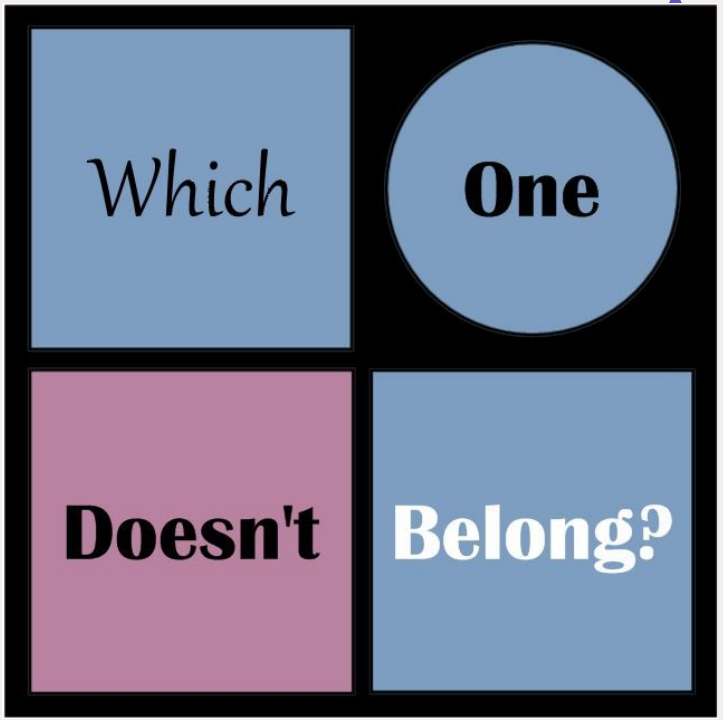
“Yarn Length”



Estimation Station

Which One Doesn't Belong (WODB)

- A fun activity that helps students identify the differences between things and JUSTIFYING their reasoning.
- All options have a reason to be right. This brings different perspectives. There is no one correct answer.
- Can be used for any topic in all grade levels and all subject areas.

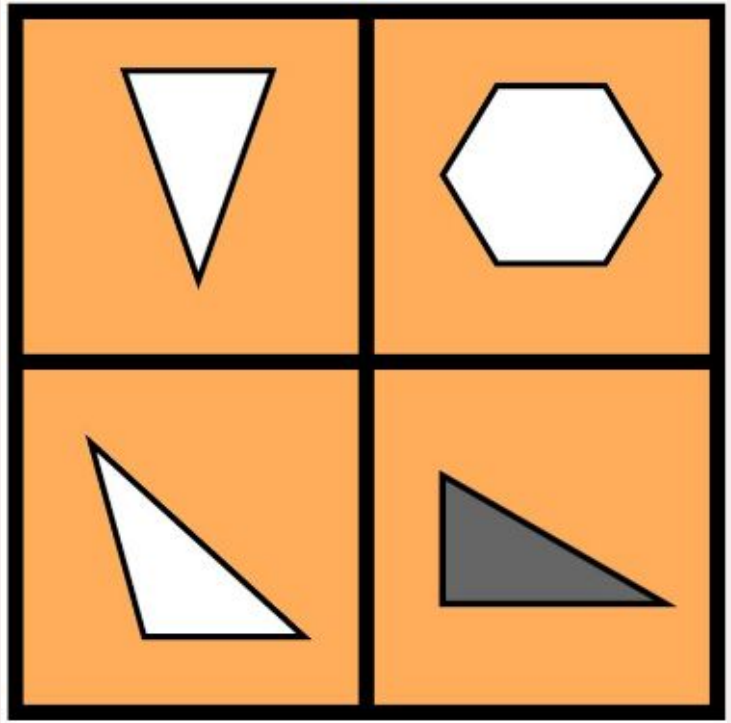


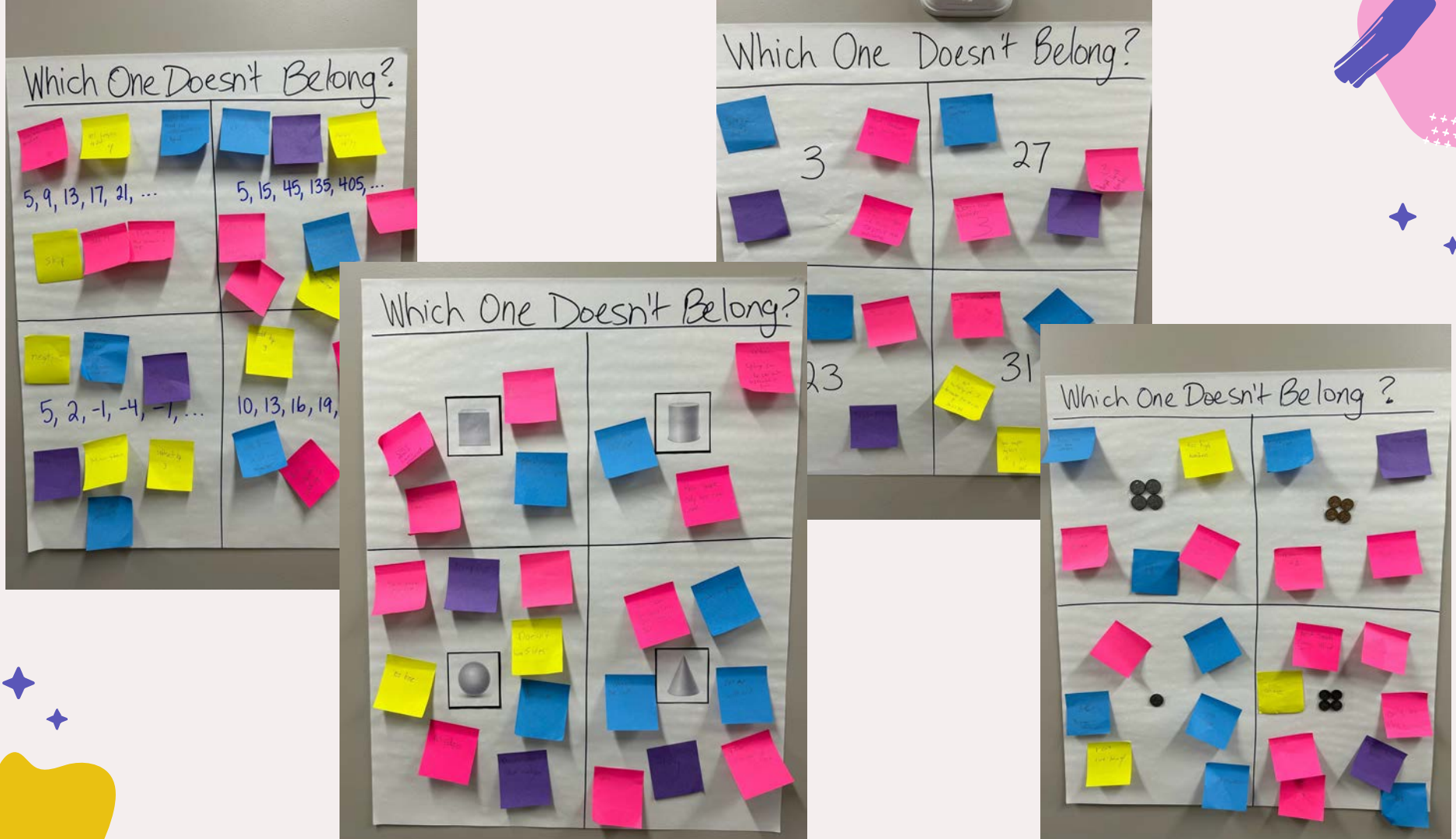
Which One Doesn’t Belong (WODB)

Look at the image on the right.

Which one doesn’t belong?

Discuss among your group.




Which One Doesn't Belong?
5, 9, 13, 17, 21, ...
5, 15, 45, 135, 405, ...
5, 2, -1, -4, -7, ...
10, 13, 16, 19,
Which One Doesn't Belong?
3
27
23
31
Which One Doesn't Belong?
Which One Doesn't Belong?

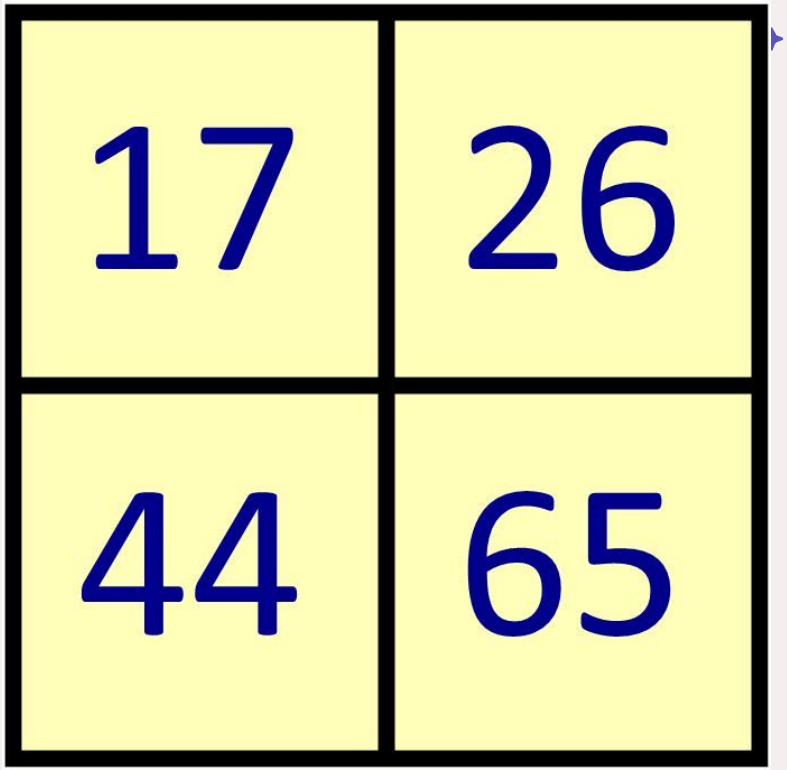
Example of a “WODB” Gallery Walk

Which One Doesn’t Belong (WODB)

Let’s do another one.

Which one doesn’t belong?

Discuss among your group.

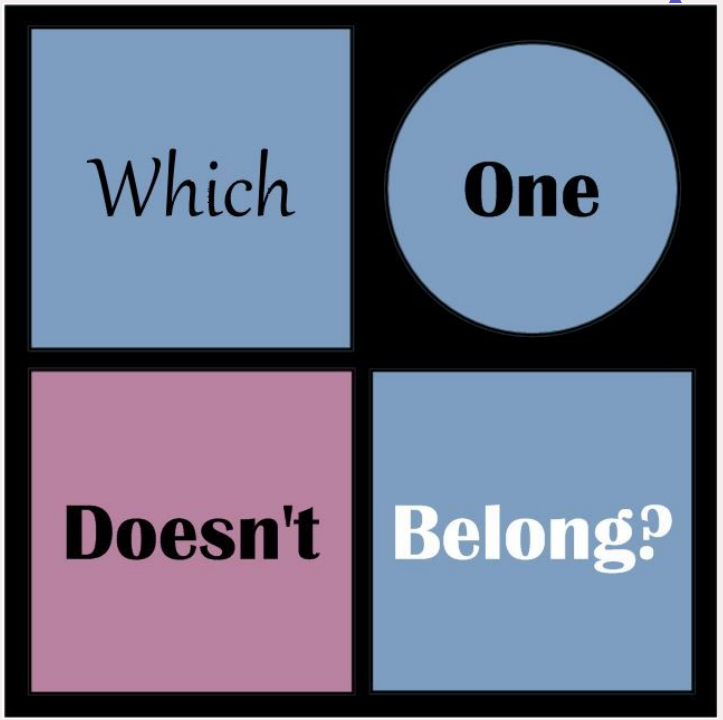


Which One Doesn't Belong (WODB)

Activity (5-10 minutes)

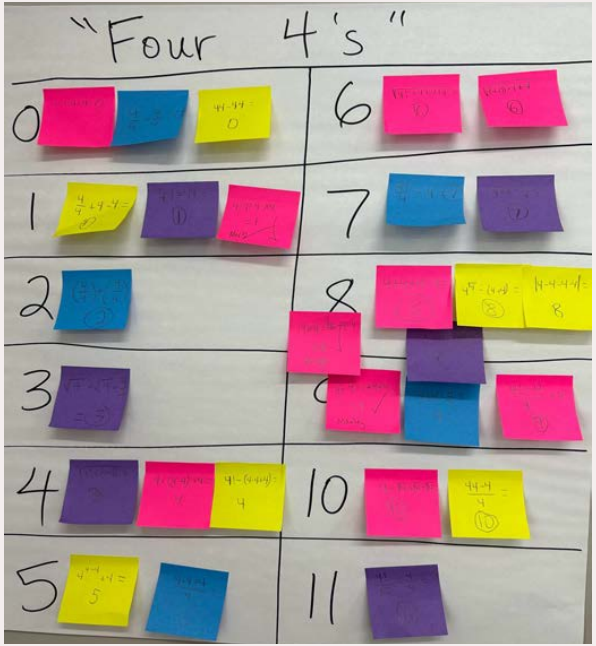
Think of a topic that you taught recently (or any topic if you are not a teacher).

In your group, on a sheet of paper, create your own "WODB" activity related to the recently taught topic.



“Four Fours”

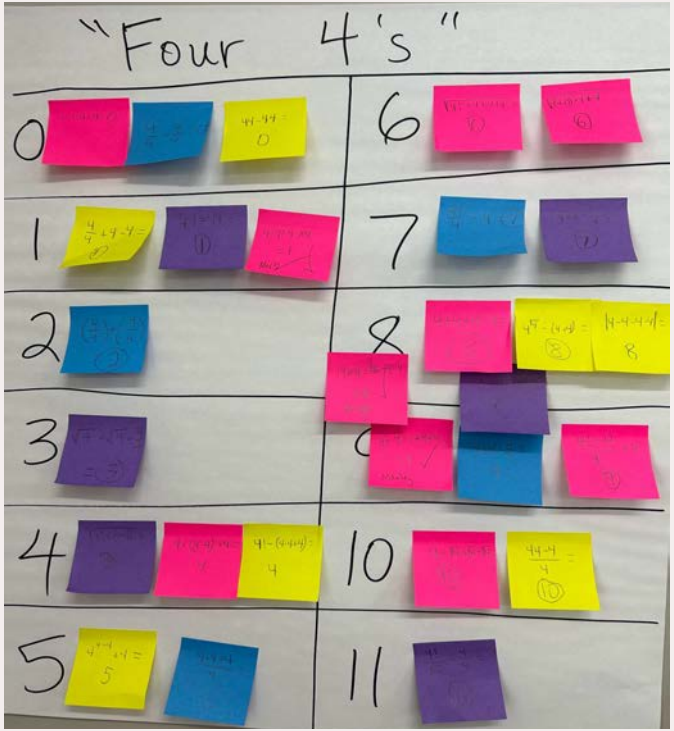
- Use four 4’s to find every number.
- Can be modified to 2024 (or any other year or any other digits such as “Three Threes” or 3141 for pi day, holidays, etc). Or pretty much any digits you desire.
- Can be differentiated by teaching students things such as factorials, exponents, etc. to make this good for any grade level.
- Some students are more comfortable staying with simple expressions, while other students may want to challenge themselves by creating more advanced equations.

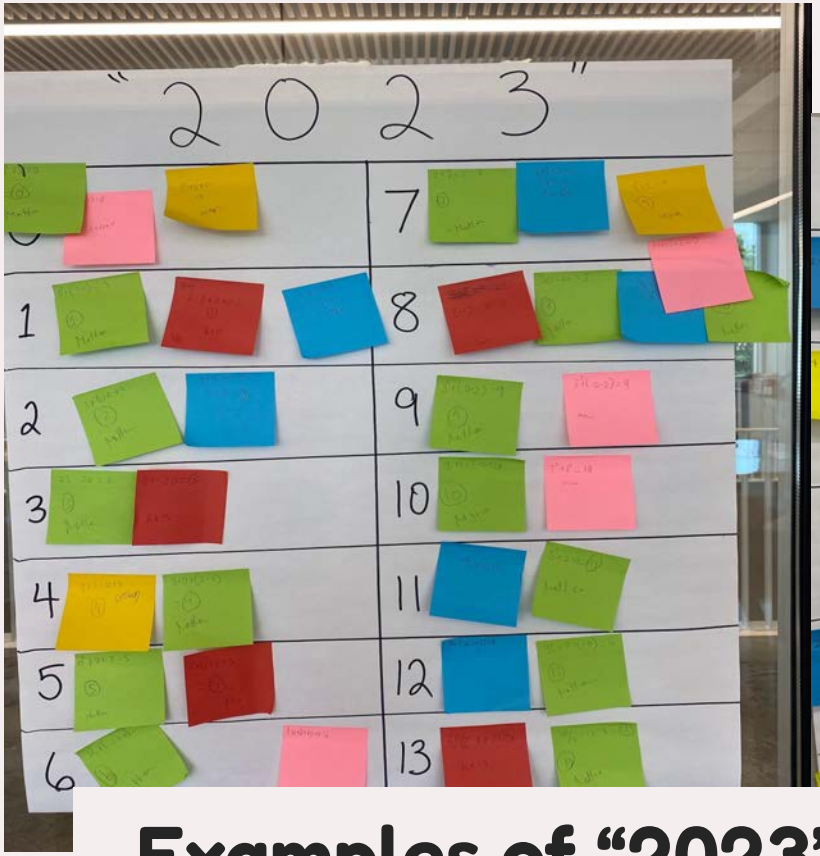


“Four Fours”

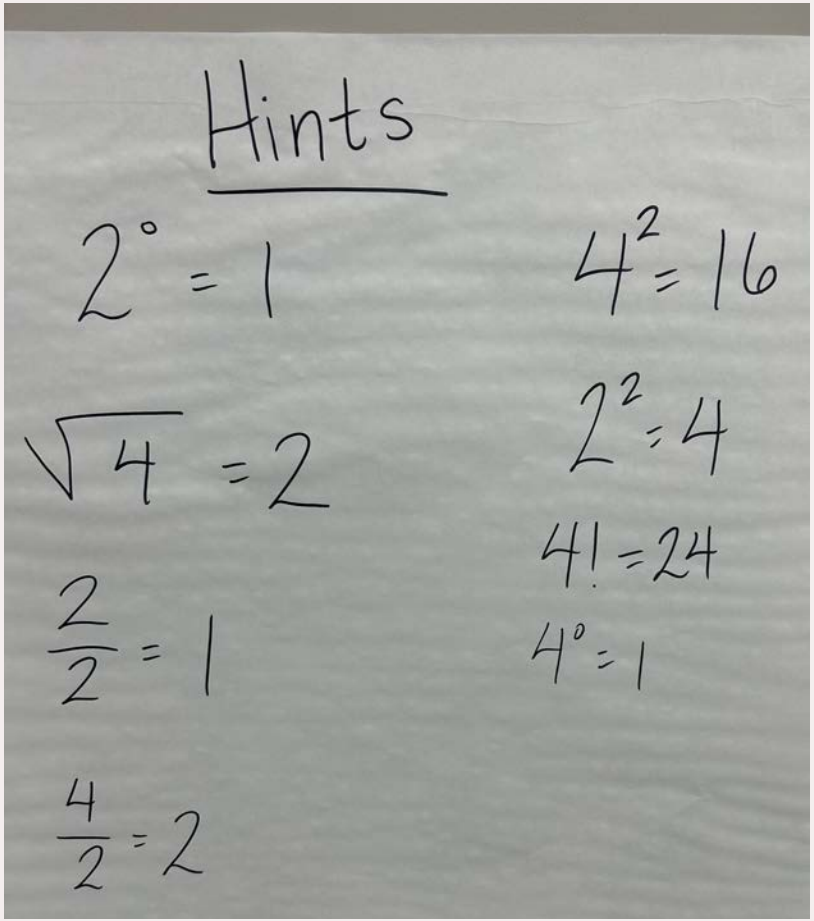
- This could be used as a mini activity regularly throughout the year, or at any time students need a break or have some down time.

- We started with 0-10 on the first day, then expanded it to 11-20 later, and so on. Sometimes we give points or some incentive when students find a new answer!





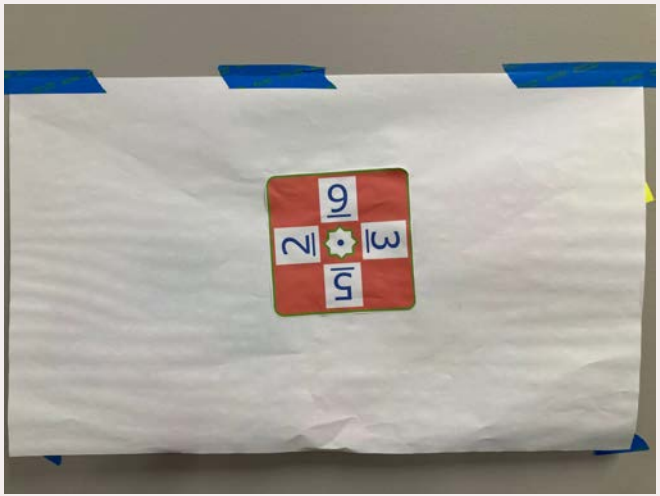
Examples of “2023” and 2024” activities

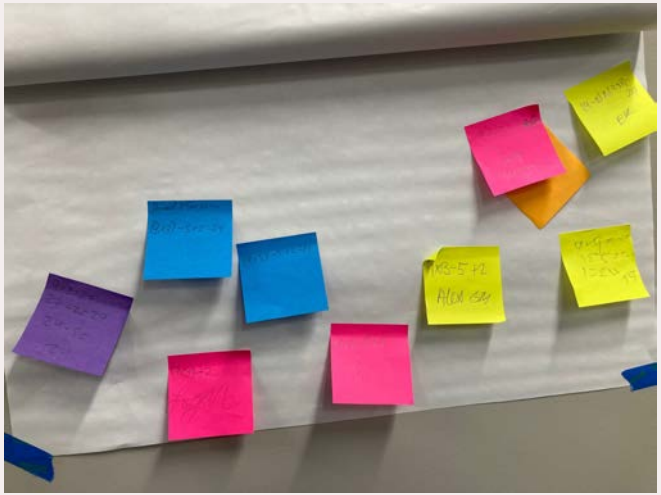


Hints added later to the “2024” activity

24 Game

In this activity, students are given a card, and must use those 4 numbers to get the answer 24. These are differentiated, and depending on the complexity level, would be good through high school to help with number fluency and creativity





24 Game

Try one! Discuss your answers with the people at your table.

24 Game

Variety of card game options with different operations, fractions/decimals, exponents/roots, integers can be purchased. Or you could search online to find some freebies.

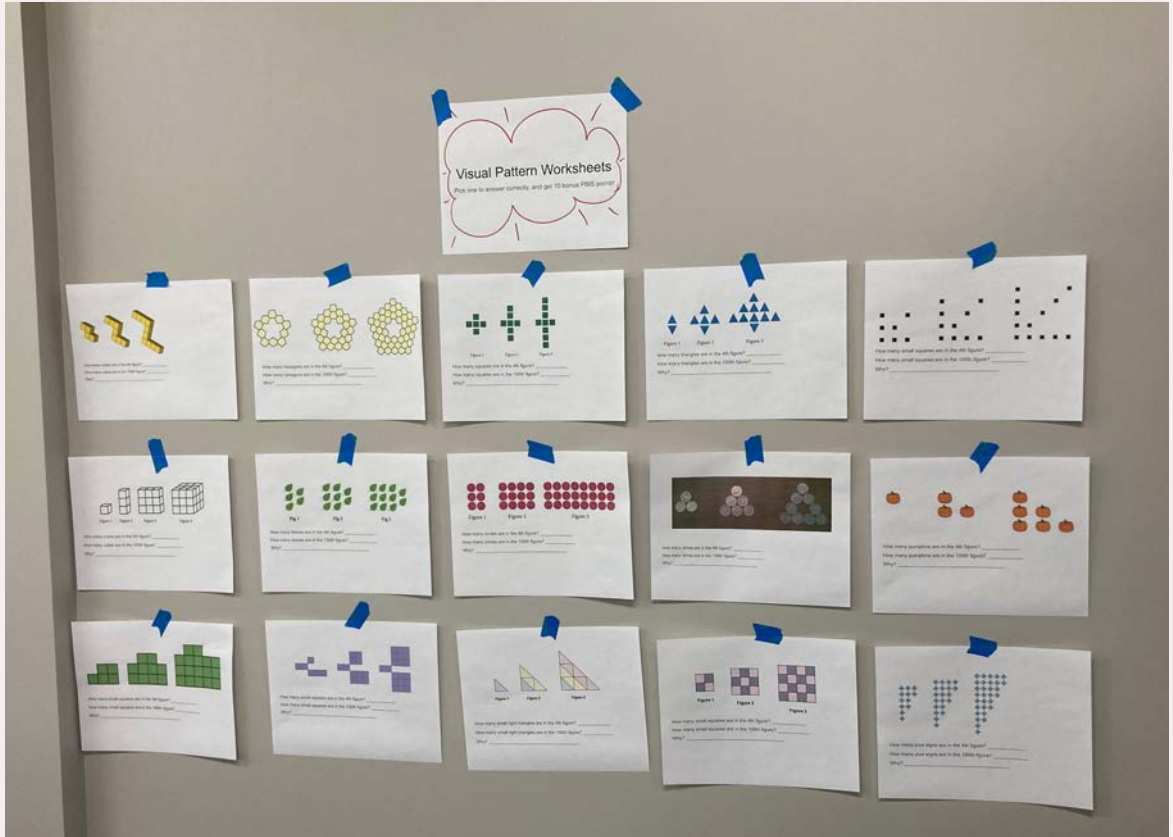
Visual Patterns

How many stars are in the next figure?
How many stars are in the 100th figure? Explain how you know.

Visual Patterns

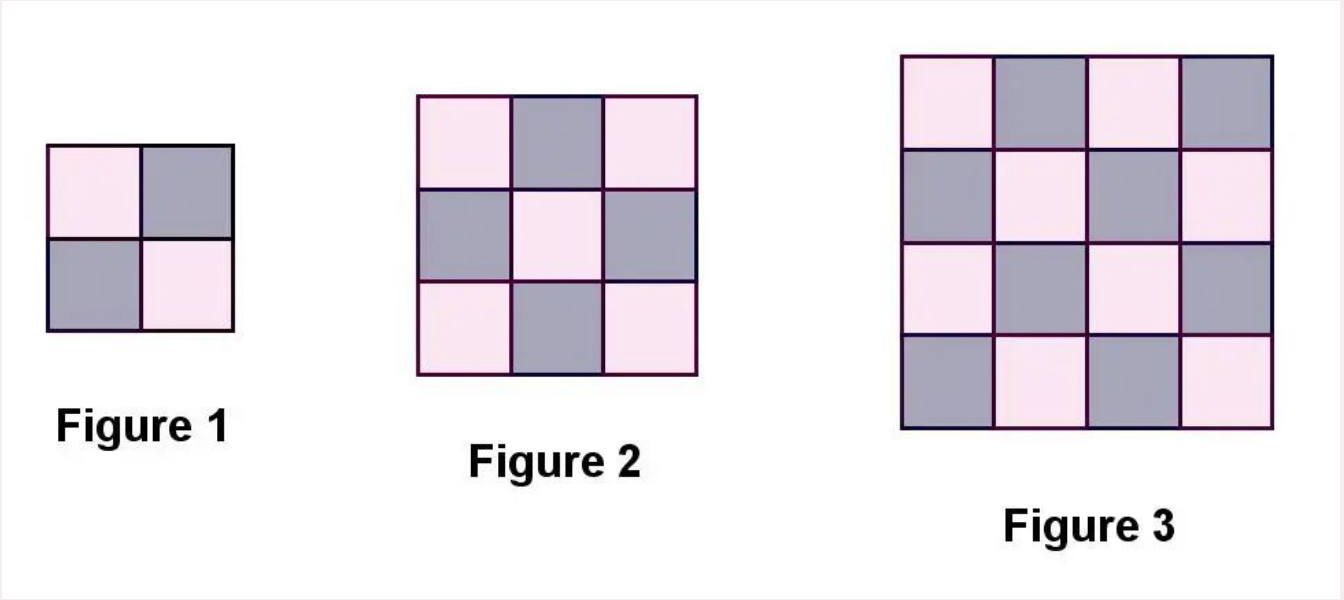
- These can be used kindergarten through high school
- Students are asked to look and predict how many shapes are in the next picture.
- Can be modified to ask students to create a formula so that they can figure out any step of the pattern, making this fantastic for Algebra topics in middle/high school
- Good for helping with skip counting and multiplication foundation for elementary school students

Visual Patterns



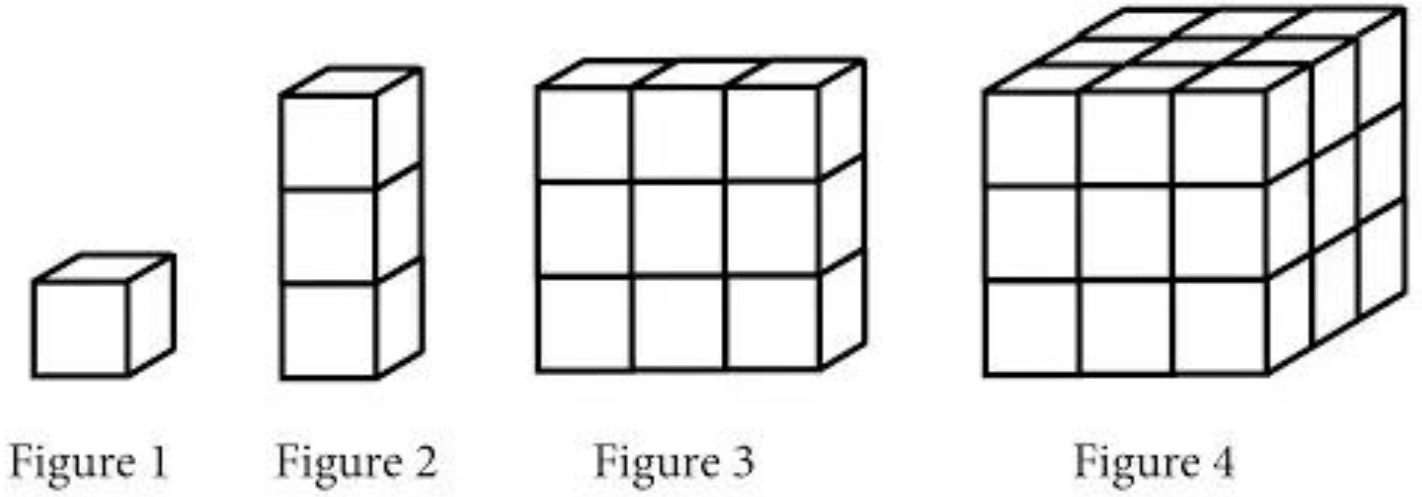
Visual Patterns

How many small squares are in the 4th figure in this pattern?
How many small squares are in the 25th figure in this pattern? Explain how you know.



Visual Patterns

How many cubes are in the 5th figure following this pattern?
How would you know how many cubes are in the 100th figure following this pattern?



SPLAT

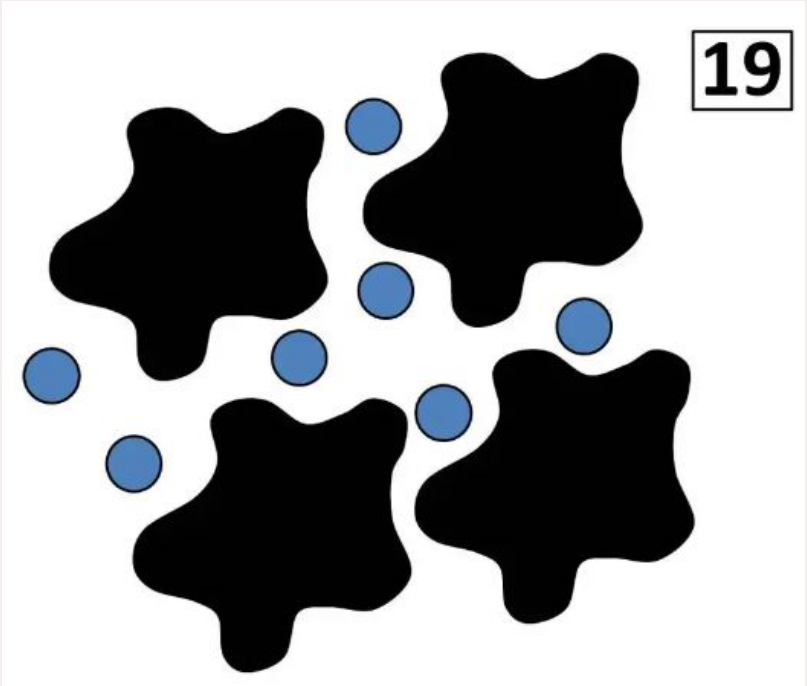
Examples

SPLAT 2.1 (basic splats)

SPLAT 3.1 (multiple splats)

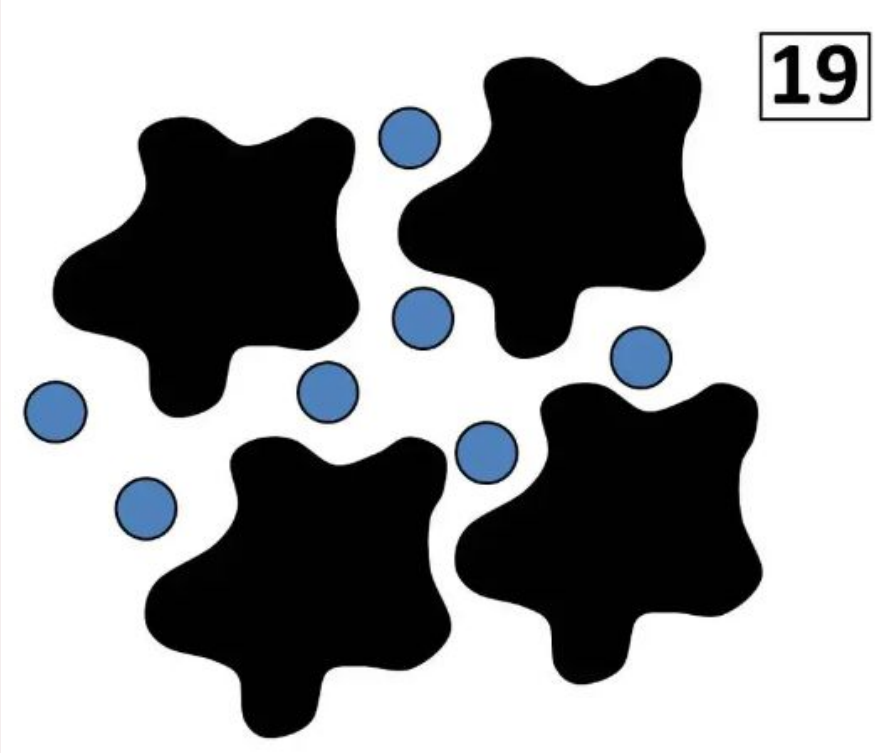
SPLAT 4.1 (instant multiple splats)

SPLAT 11.1 (fraction splats)



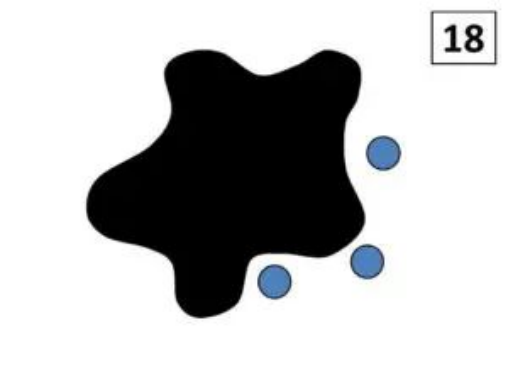
SPLAT

- Can help with “sight numbers” to help students be able to look and just see groups of numbers, without having to count 1, 2, 3, 4, etc.
- Helps visualize groups that apply addition/subtraction and multiplication/division concepts, especially number and algebra equations. Facilitates discussions about these topics.
- Leveled all the way from kindergarten through high school Algebra.



SPLAT

Algebraic Thinking

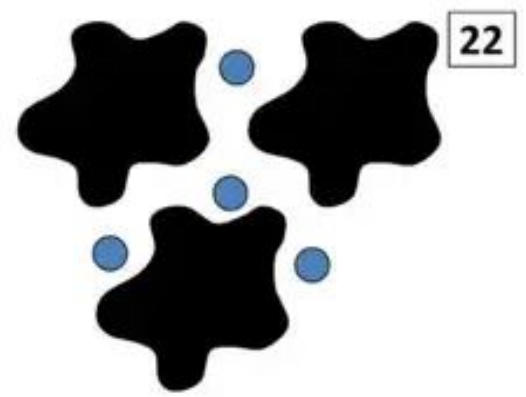


$3 + \underline{?} = 18$

$18 - 3 = \underline{?}$

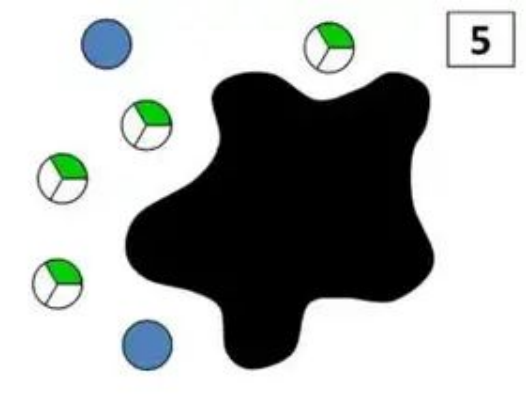
$x + 3 = 18$

$x = 18 - 3$



$4 + 3 \times \underline{?} = 22$

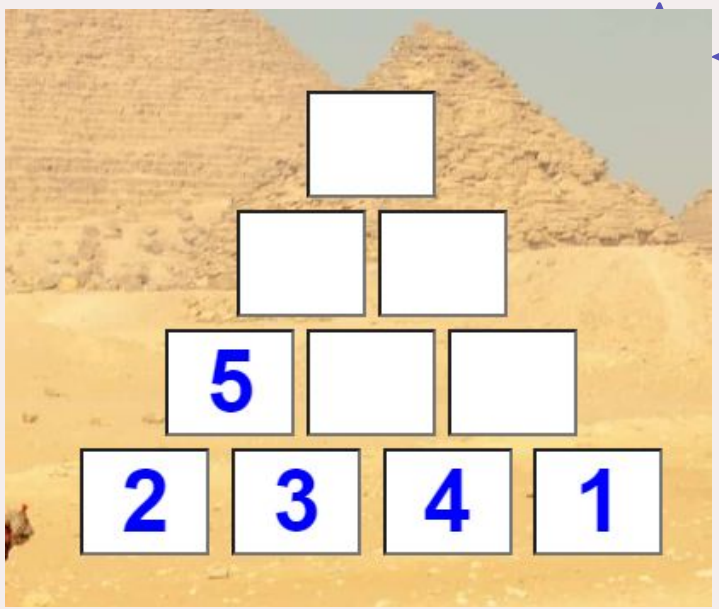
$4 + 3x = 22$



$3\ ⅓ + \underline{?} = 5$

Number Pyramids

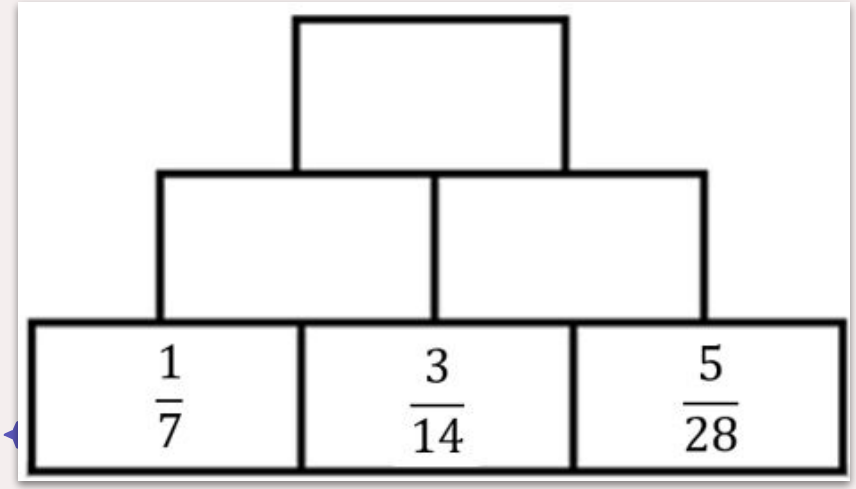
- Add the bottom numbers to get the next number up.
- You can customize the bottom row on a blank worksheet template to fit your lesson. Use fractions, decimals, polynomials, etc.
- Or leave some squares blank for students to “find the missing number” that may require subtraction



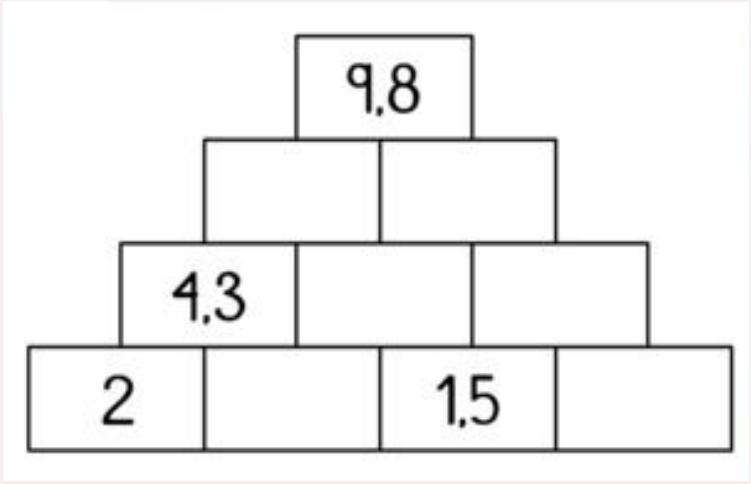
Number Pyramids

Other Examples

Adding fractions (unlike denominators)



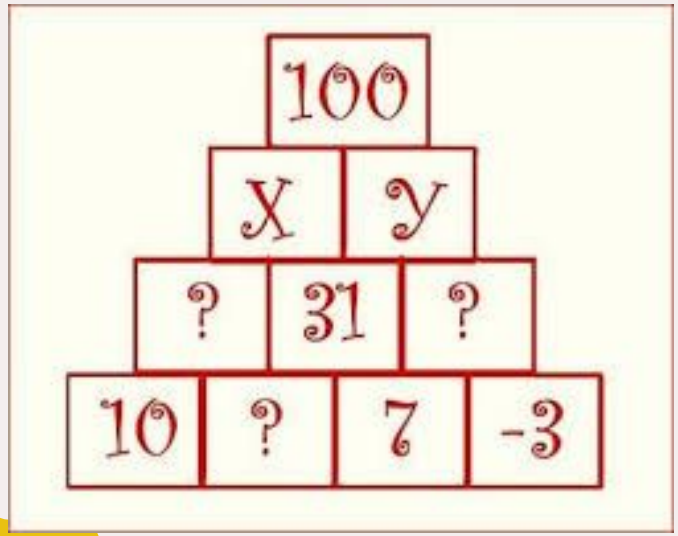
Decimals



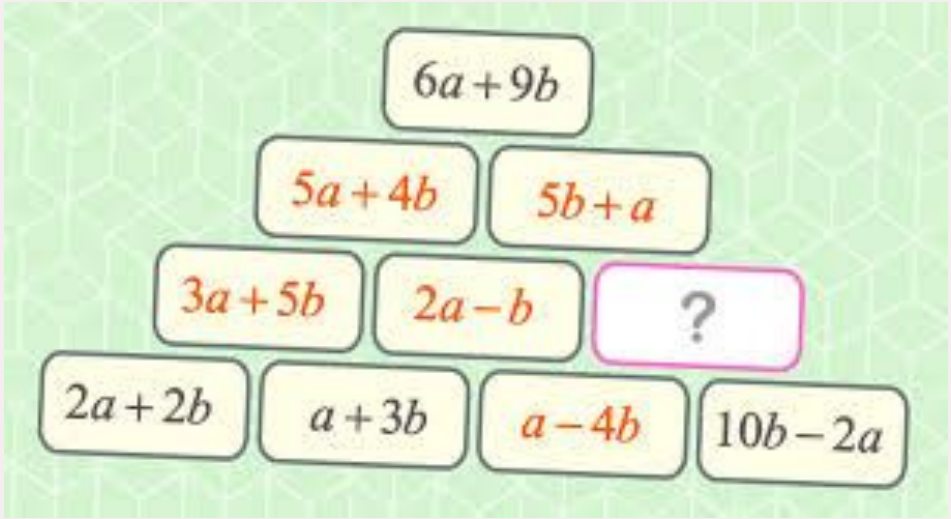
Number Pyramids

More Examples

Integers & missing numbers

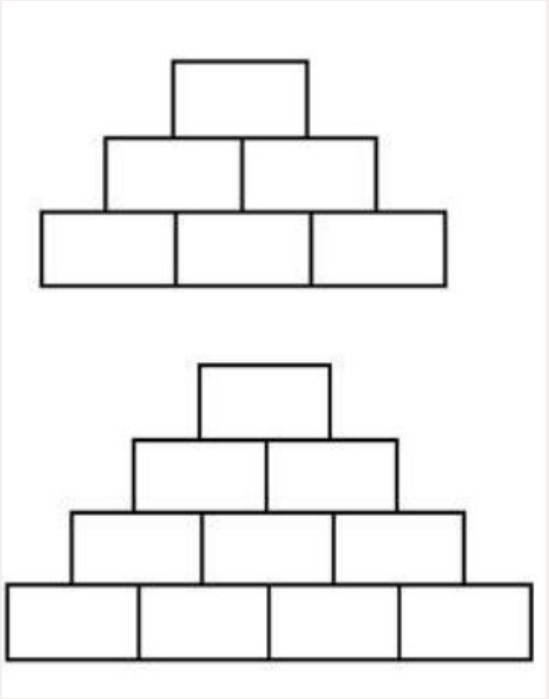


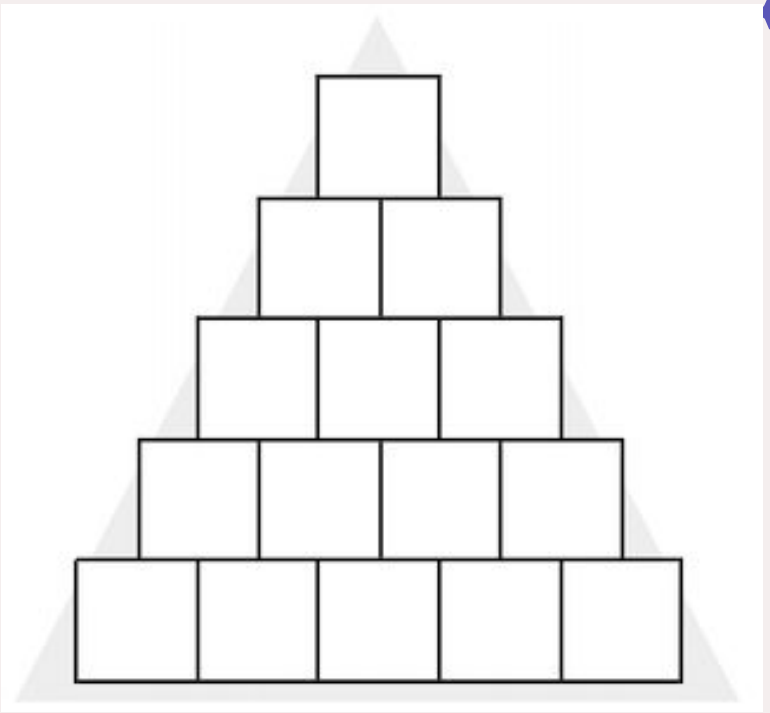
Polynomials



Number Pyramids

Blank Templates





Patterns Around the World

- Interactive activity where students stand in a circle and take turns answering the next item in a pattern or sequence.

- Good for identifying and following the rules of a pattern or sequence, especially when students have to pay attention to each other and be ready to answer their next number. Also reinforces mental math.

- Can be used to reinforce a variety of concepts such as skip counting, integers, fractions, decimals, number sense, arithmetic and geometric sequences, squares and roots. Harder patterns could apply to algebra (linear and quadratic functions)

- This can be a ping-pong activity in pairs.

Go around in your group

WORLD 2

56, 45, 34, ____, …

81, -27, 9, ____, …

$5\frac{1}{4}$, 6, $6\frac{3}{4}$, ____, …

$1.35, $1.60, $1.85, ____, …

Go around in your group

WORLD 3

Function: $4x + 1$; start with $x = 0$

Function: $(x - 8)^2$; start with $x = 0$

Patterns Around the World

Activity (5 minutes)

In your group, think of a topic that you taught recently (or any topic if you are not a teacher).

On a sheet of paper, create a new pattern that is related to your recent lesson or topic.

More examples from different topics

Triangle, square, pentagon, … (polygon vocab.)

$1^2 = 1,\ 2^2 = 4,\ 3^2 = 9,$ … (perfect squares)

$\sqrt{4} = 2,\ \sqrt{9} = 3,\ \sqrt{16} = 4,$ … (square roots)

1, 3, 5, 7, … (odd numbers)

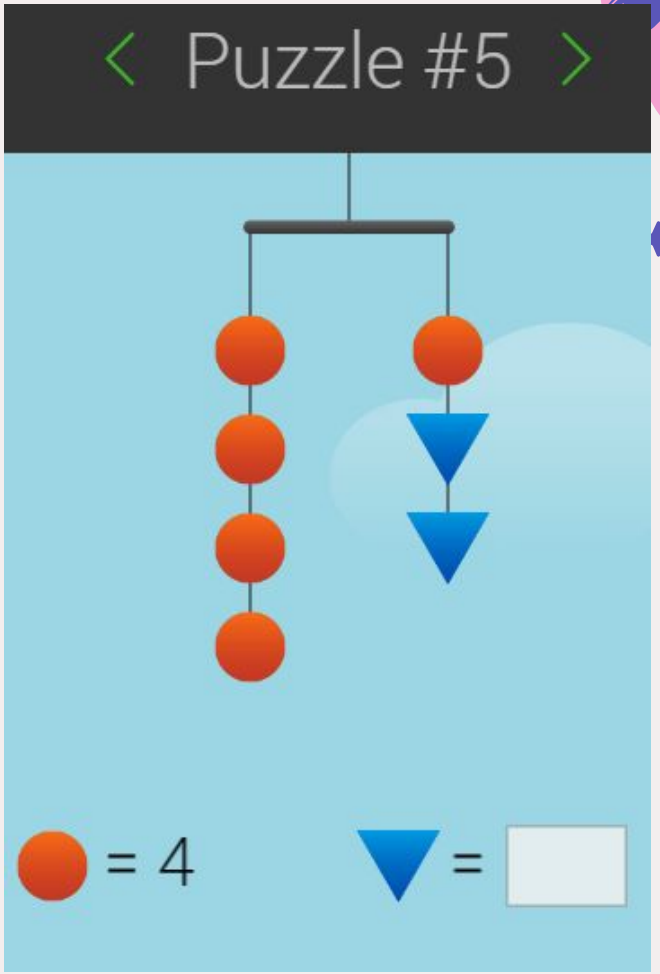
$2^0 = 1,\ 2^1 = 2,\ 2^2 = 4,$ … (binary)

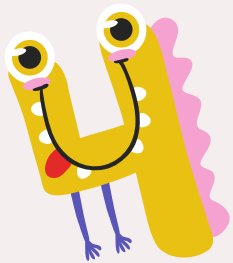
Solve Me Mobiles

- Good visual activity for helping students solve (and balance) equations.
- Good for elementary to figure out the “missing numbers”

- Good for high school with solving more complex equations, some with fractions

- There are many easy/medium/hard levels, and you can create your own or modify an existing problem.

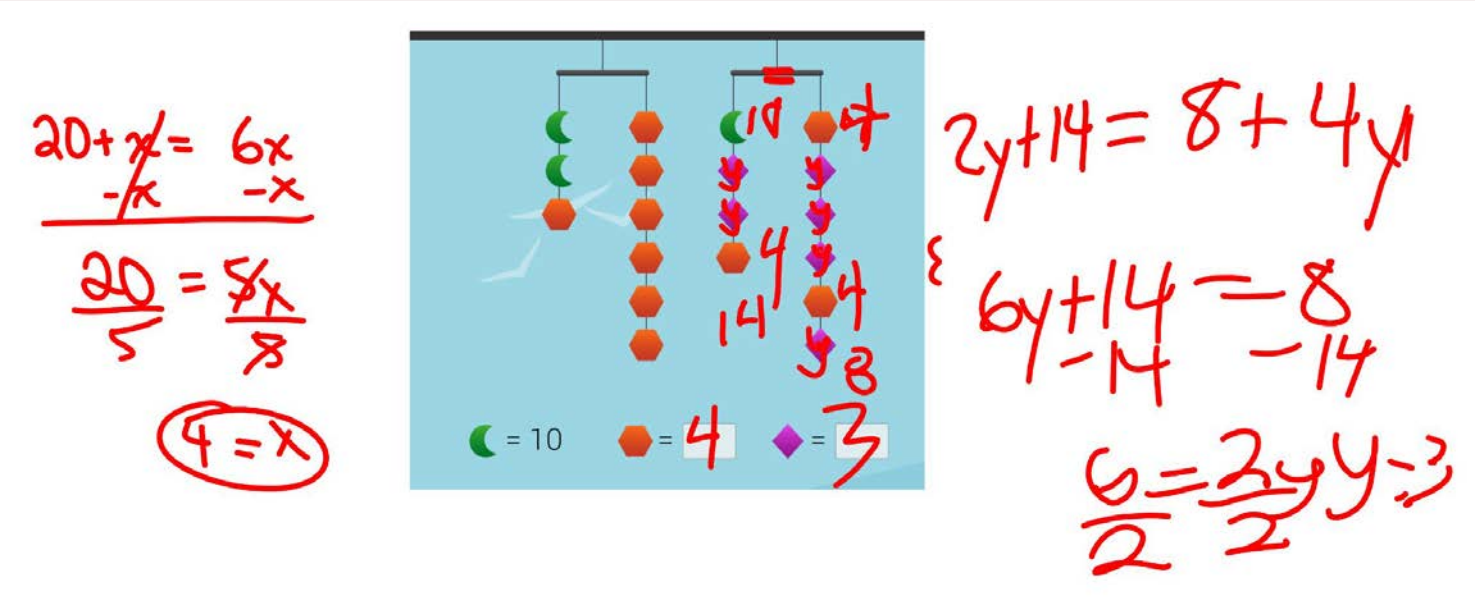




Students working on the Solve Me Mobiles!

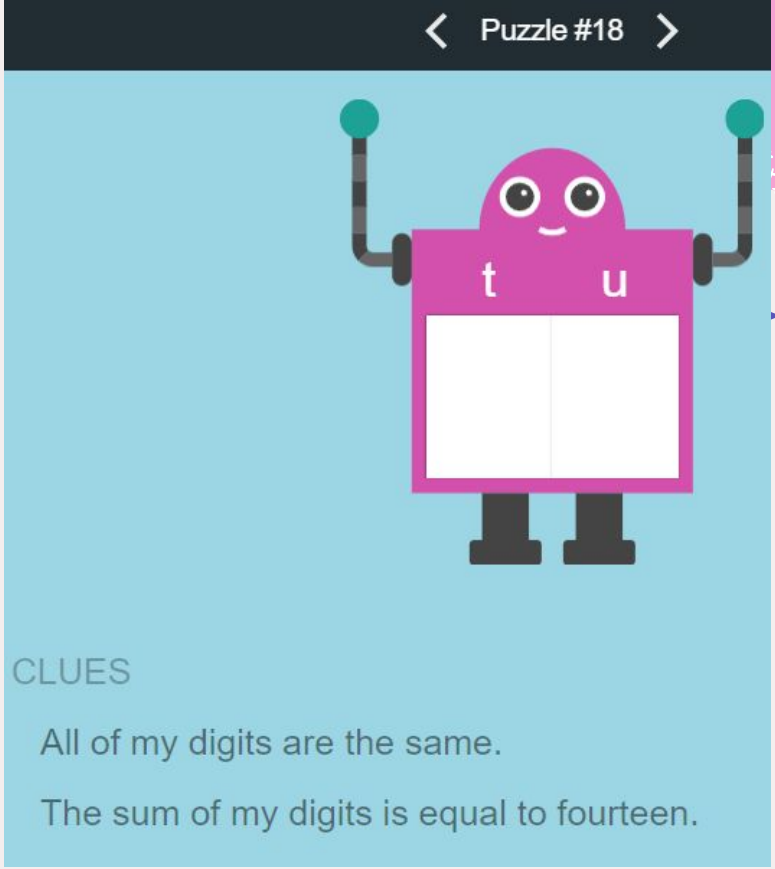
Solve Me Mobiles

Example of a harder problem with high school students working in partners. First they used trial/error, then tried some logic, then we helped them make the connection to algebra)



Who Am I?

- Good for reinforcing number sense and math vocabulary (sum, difference, greater/less than, etc.)
- Levels from elementary through high school
- Good for practice with place value and digits



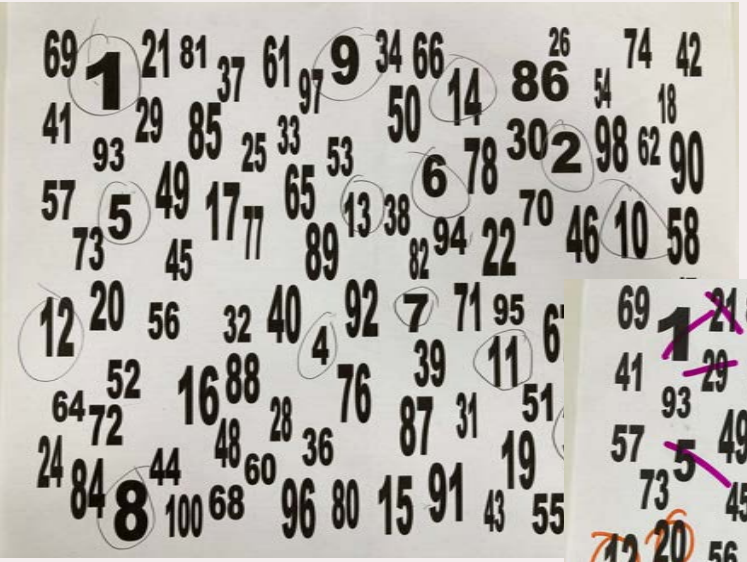
100 Activity

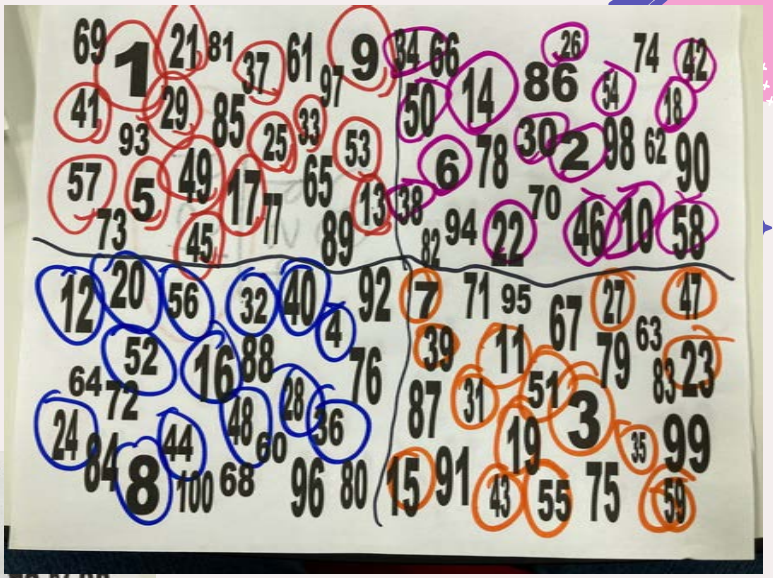
- Sounds simple, but students from k-12th grade have enjoyed this one!
- Teaches what it means to “help” a peer, not just doing it for them or telling them the answer
- Math is something they can figure out, especially when given the right tools (different colored pencils vs. grey pencil for example)
- Great for 1st week of school as a team-building activity

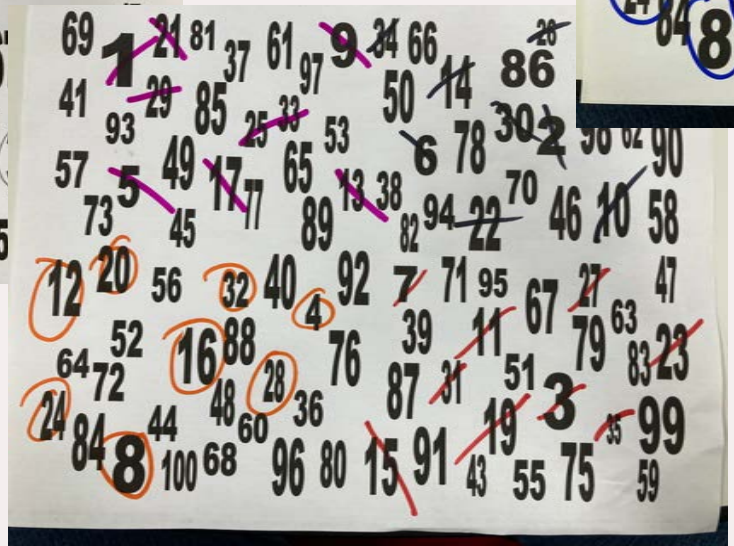
100 Activity

- Move so that there are 4 people per table.
- Each table gets one copy of this paper. Groups of 3 people Groups of 4 people
- Some tables will have colored markers, red, green, yellow, blue
- Some tables will use pencils (you'll see why when we are done!)
- You will have 2 minutes to find as many numbers as you can, in order, from 1-100, rotating around the table with each person looking for a number
- Remember: You can help your neighbor by ***pointing*** to the number, but they must be the one to mark it.
- After 2 minutes, we will see what happened!

100 Activity

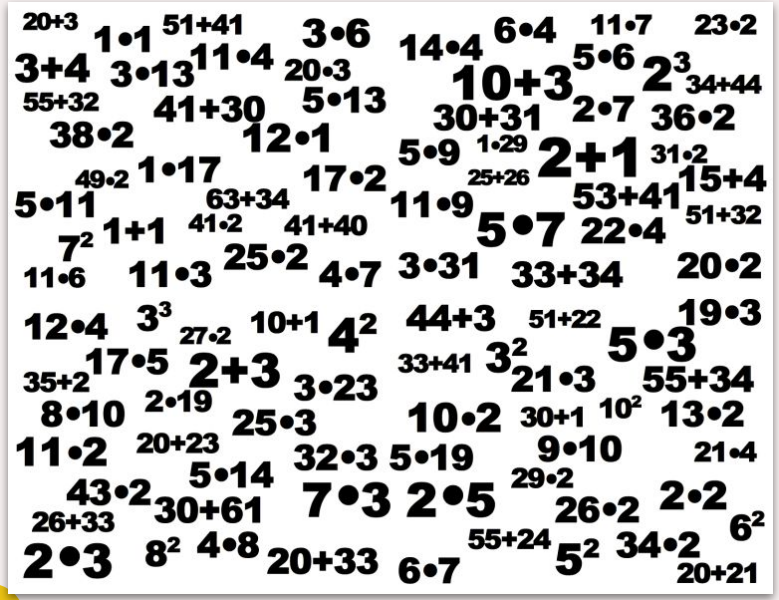


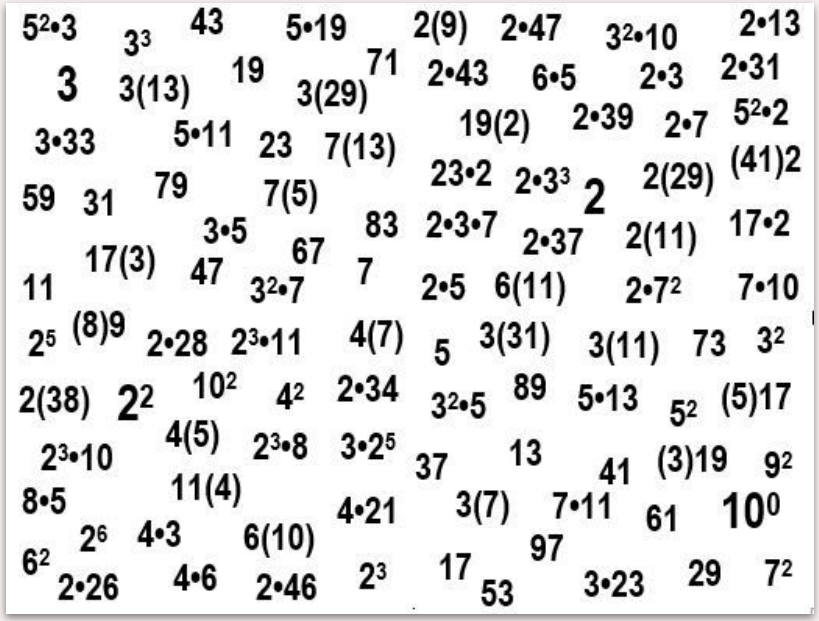




100 Activity

Other versions of this activity with various operations

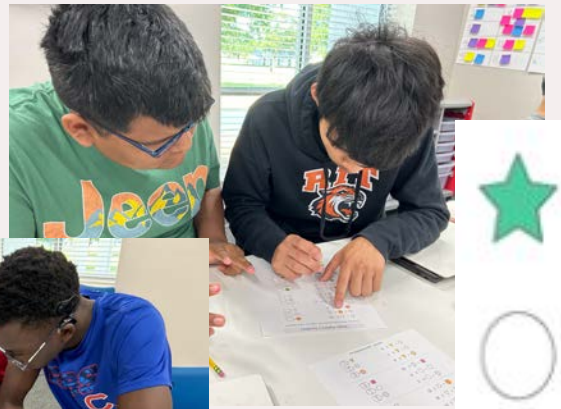


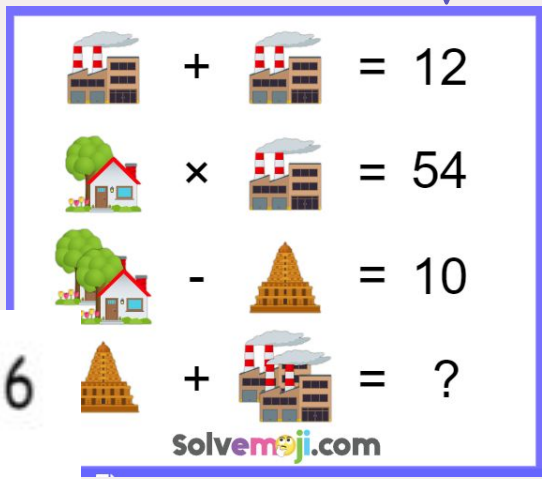


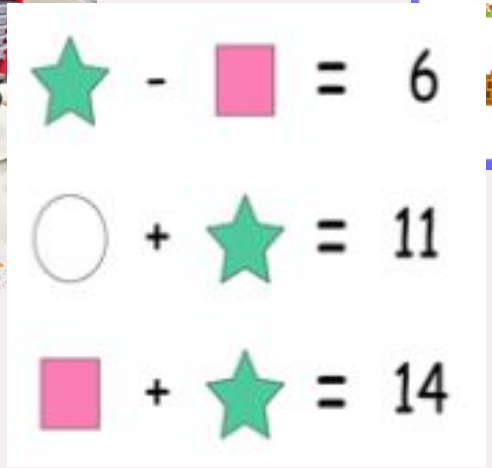
Shape IQ / Solvemoji

These type activities can help students with foundational skills for solving equations
Can be very helpful for solving systems of equations

Good way to make connections to variables.

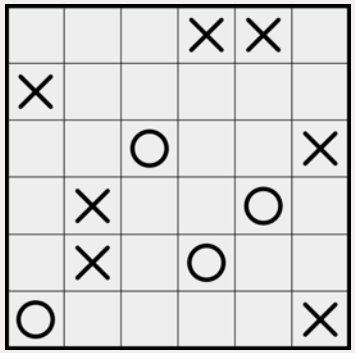


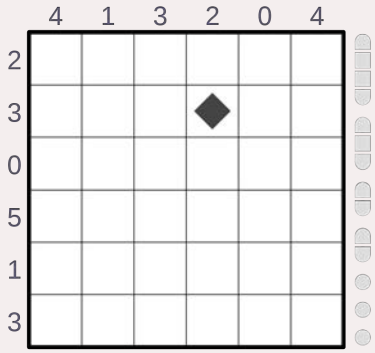


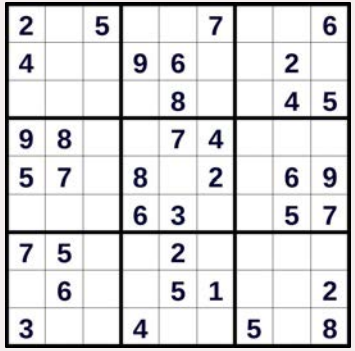


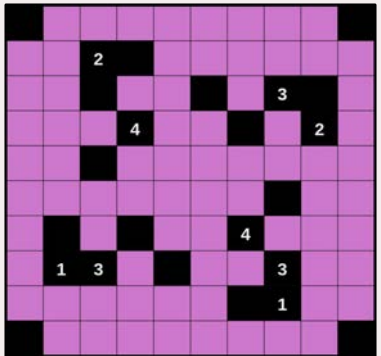
KrazyDad Puzzles

- These puzzles have both interactive (for the smart board) as well as printable resources
- Logic puzzles are good for teaching students to take their time, and that sometimes problems require multiple steps, and creativity.
- Student favorites include
  Binox, Battleship, Sudoku, and Akari



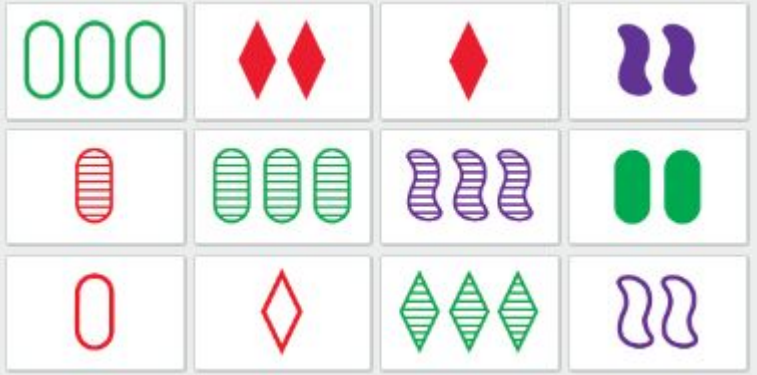






SET Puzzle

- Good for encouraging students to group similar/different items together
- Good for individuals or small groups to work together
- This game has online, as well as a card version.
  - card game is good for students who are more experienced
  - online is good as it gives the students immediate feedback about their solution, if it is right/wrong



SET Puzzle

A SET Solution must have
-the ***numbers*** of shapes on the cards are either all the same or all different AND
-the ***colors*** of the shapes on the cards are either all the same or all different AND
- the ***shapes*** on the cards are either all the same or all different AND
-the shapes on the cards have the same or all different ***shading*** (fill in)

Here are some examples of SET solutions:

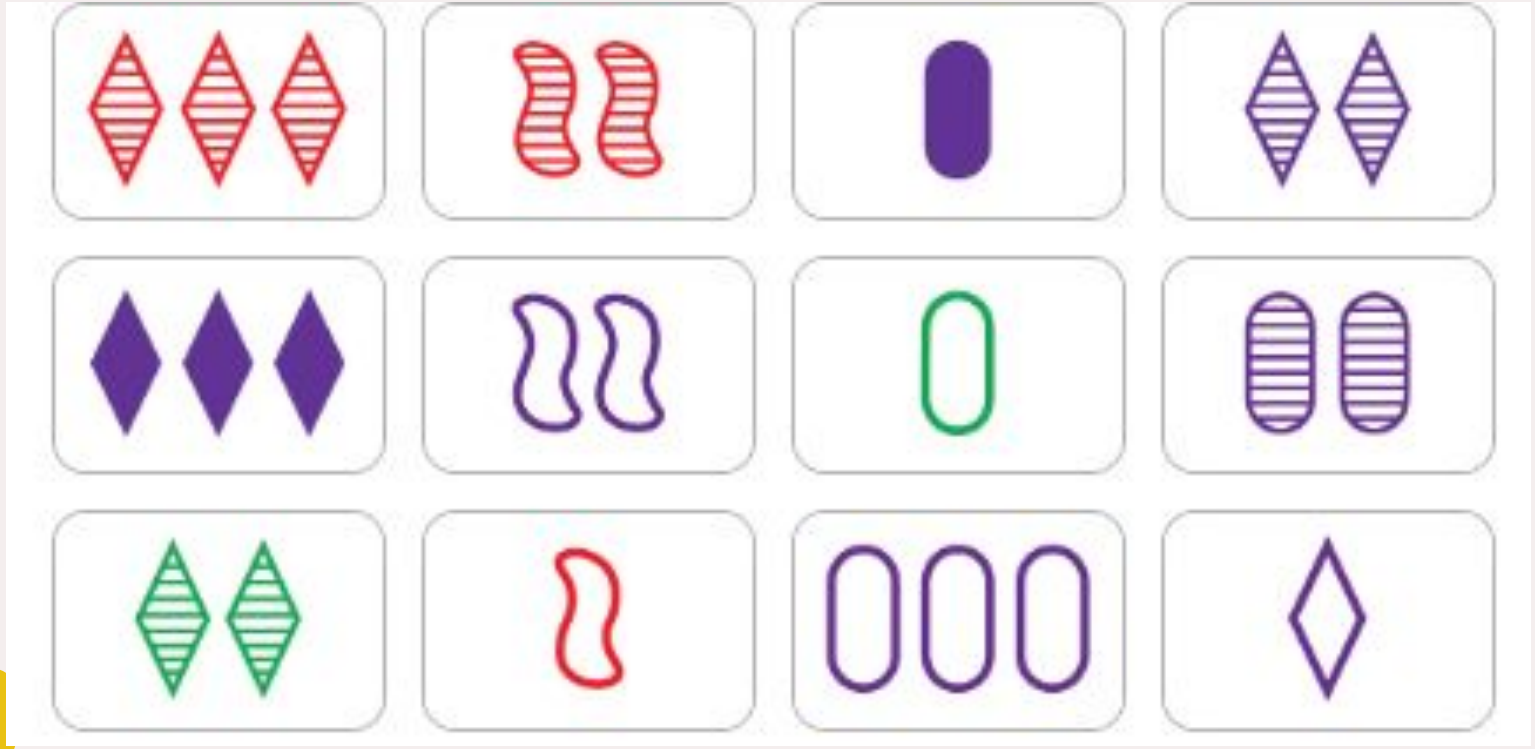
-same color
-same shape
-different shading in
-different number

-same color
-same shading
-different shapes
- different numbers

-same shape
-different colors
-different numbers
-different filling in

SET Puzzle

Try this one with the people at your table. How many sets can you find? Hint: There are 6 solutions.



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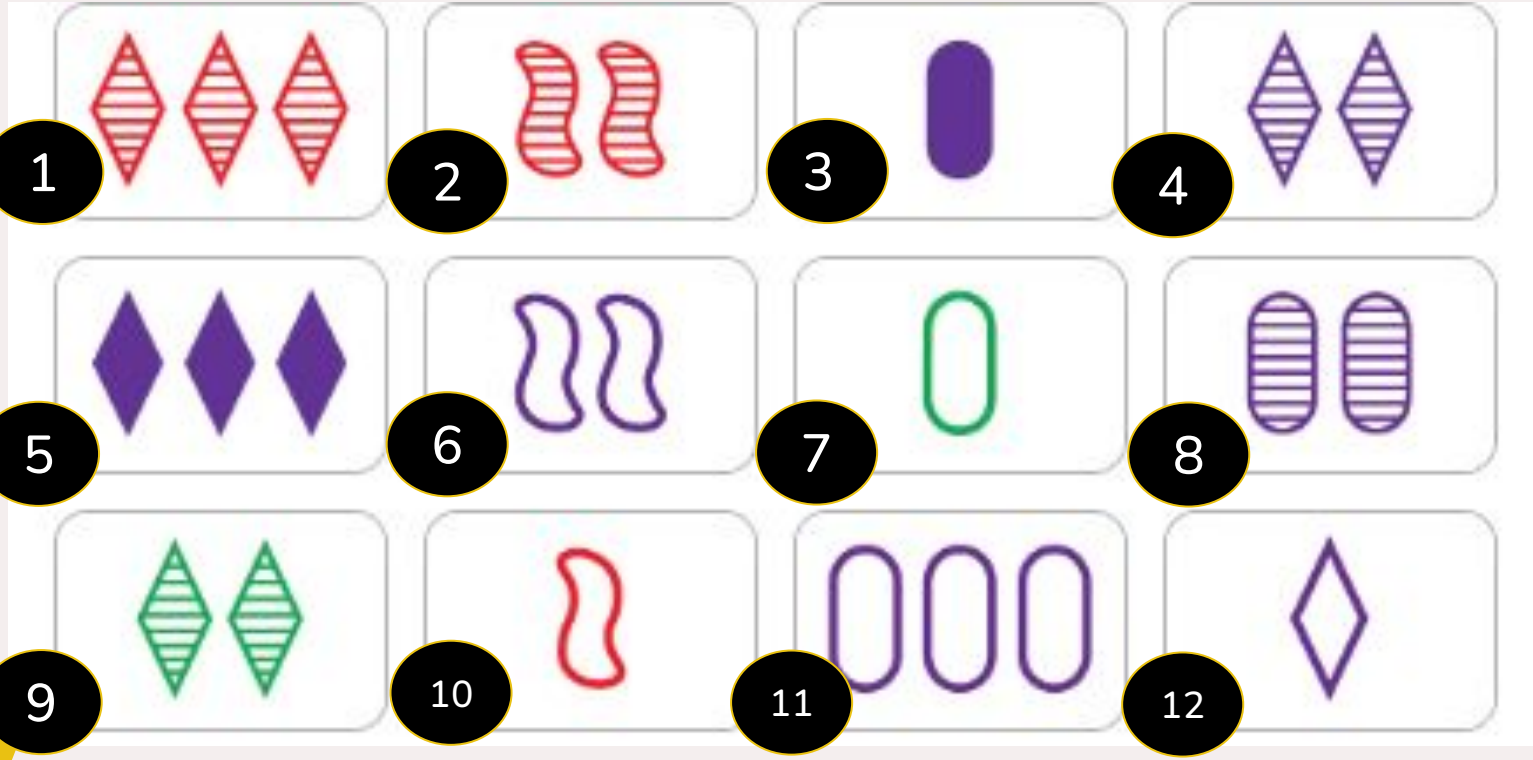

Solutions:

Would You Rather

- Can be applied to any math topic. Example, would you rather buy 5 apples for $5, or 20 apples for $15? Either answer can be justified, encourages discussion
- The website linked above contains many such examples that can be used in class.
- Can you think of any that relate to a lesson you recently taught?

Thanks!

Do you have any questions?
Do you have any activities that you'd like to share?

Feel free to contact us any time!

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Resources & Citations

- Esti-Mysteries
- Estimation Clipboards
- W.O.D.B.
- Four Fours
- Visual Patterns
- SPLAT!
- Math 24 Game
- SolveMe Mobiles
- Who Am I
- 100 Numbers Activity
- Shape IQ / SolveEmoji
- KrazyDad Puzzles
- SET Game
- Would You Rather
- Math Pyramids

Handouts

- Four Fours Warm-Up Activity
- Shape IQ Warm-Up Activity