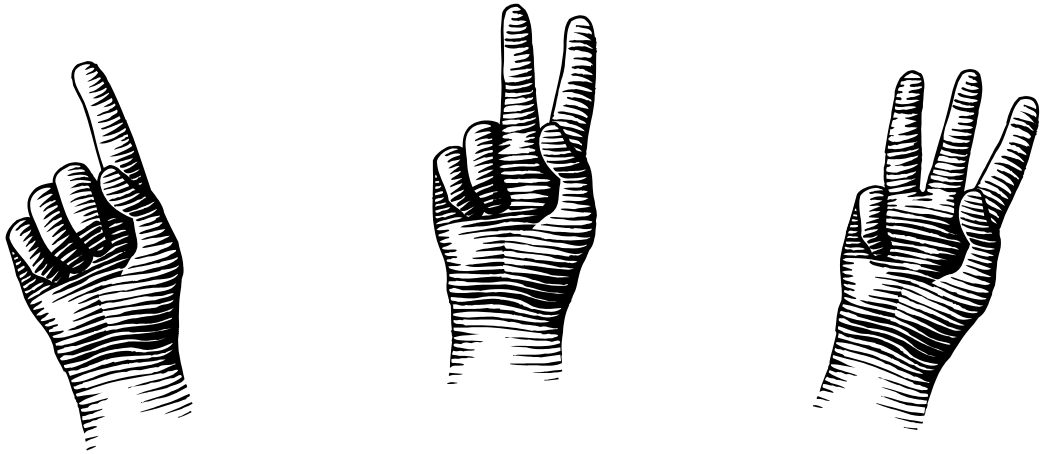
Houghton Mifflin Harcourt

Presenter: Lisa Rogers

Tool Time! Implementing tools to help students achieve number sense.

@math_solutions #NCTMannual



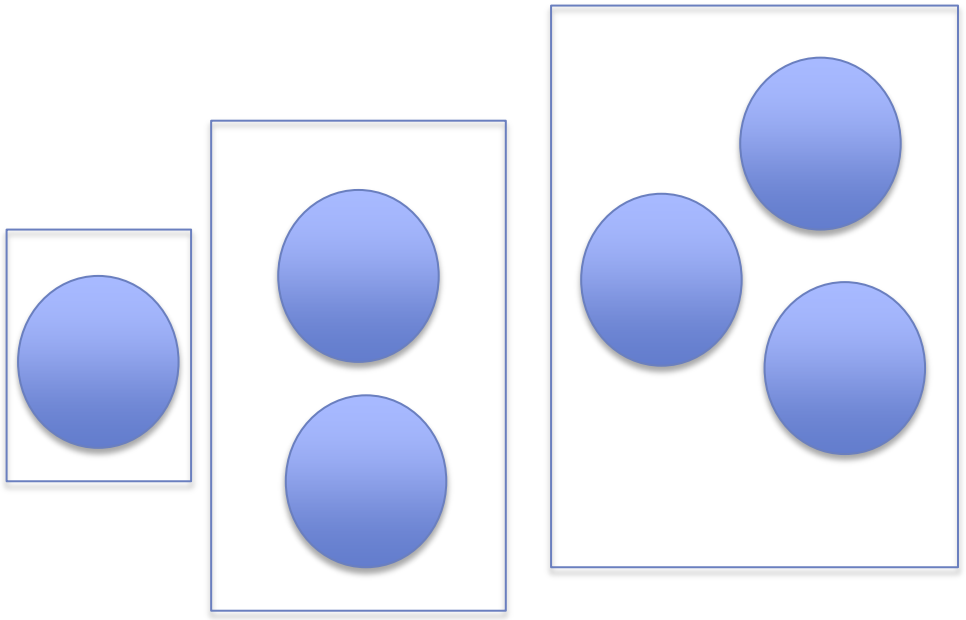
Subitizing

- ***What is Subitizing***? (Turn and talk)
- The term is derived from the Latin adjective ***subitus*** (meaning "sudden") and captures a feeling of immediately knowing how many items lie within the visual scene
- **“instantly seeing how many”**

Rational- lays the groundwork for operations

- Quick images give students experience counting and seeing (*subitizing*) numbers.
- Students can make connections between how they see the dots and the possible symbolic equations.
- 2 phases of Subitizing:
  - **Perceptual subitizing**- ability to see a group and know how many without counting
  - **Conceptual subitizing**- ability to see more than one group and add them together to find the total.

Subitizing Research

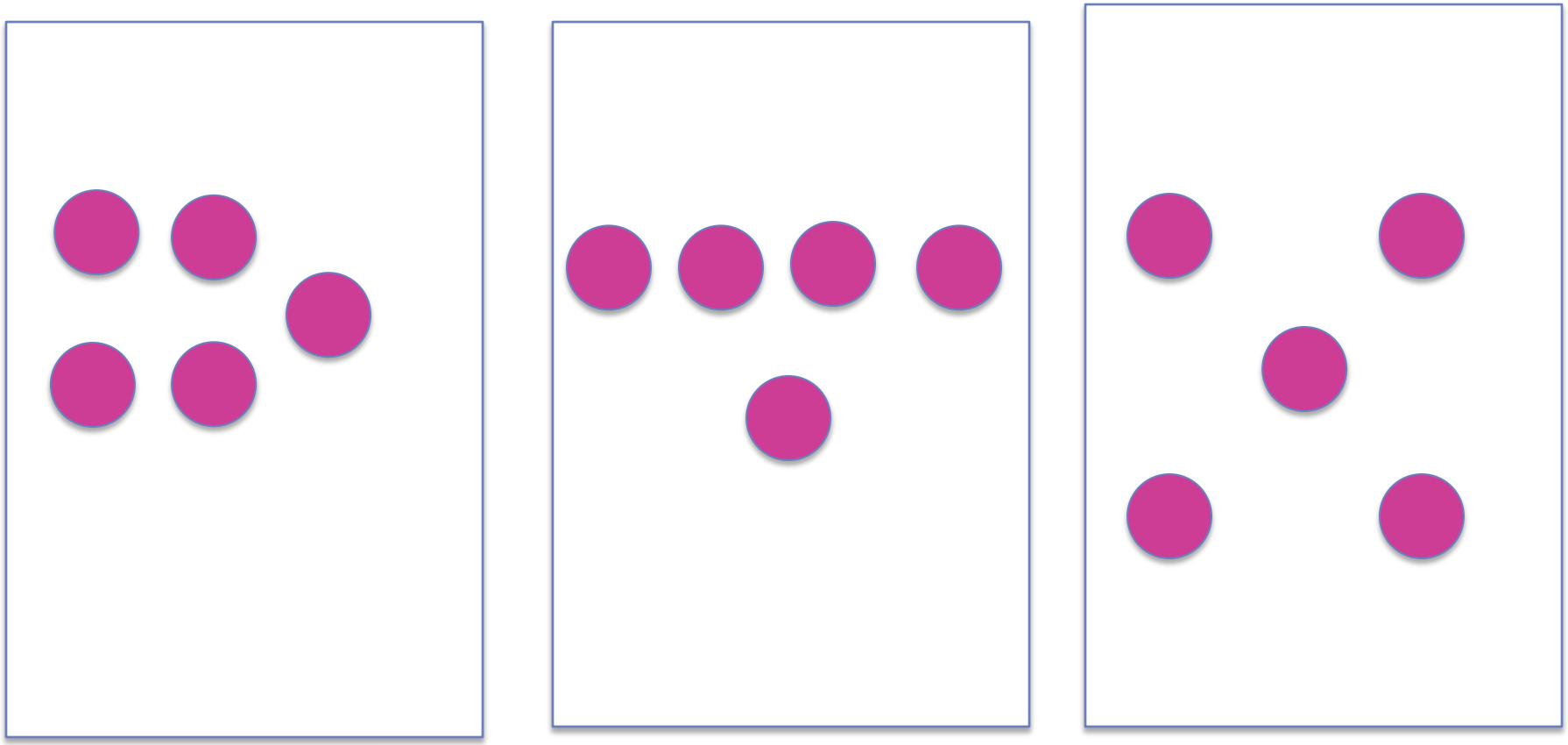


Number Strings

A collection of purposefully chosen computation problems that build on one another to support students' mathematical thinking.

Note: The problems within each string should be presented in sequential order.

Number String Example
Kindergarten



What did you see?

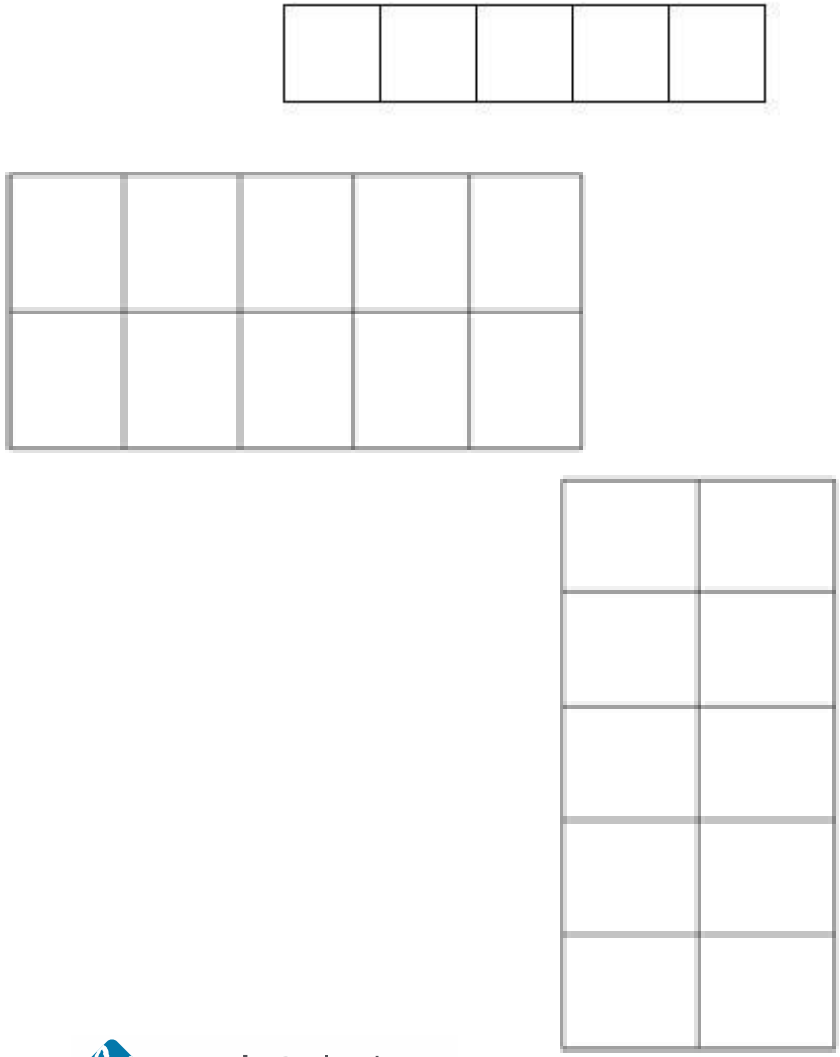
How did you see it?

Dot Arrangements

Subitizing Supports

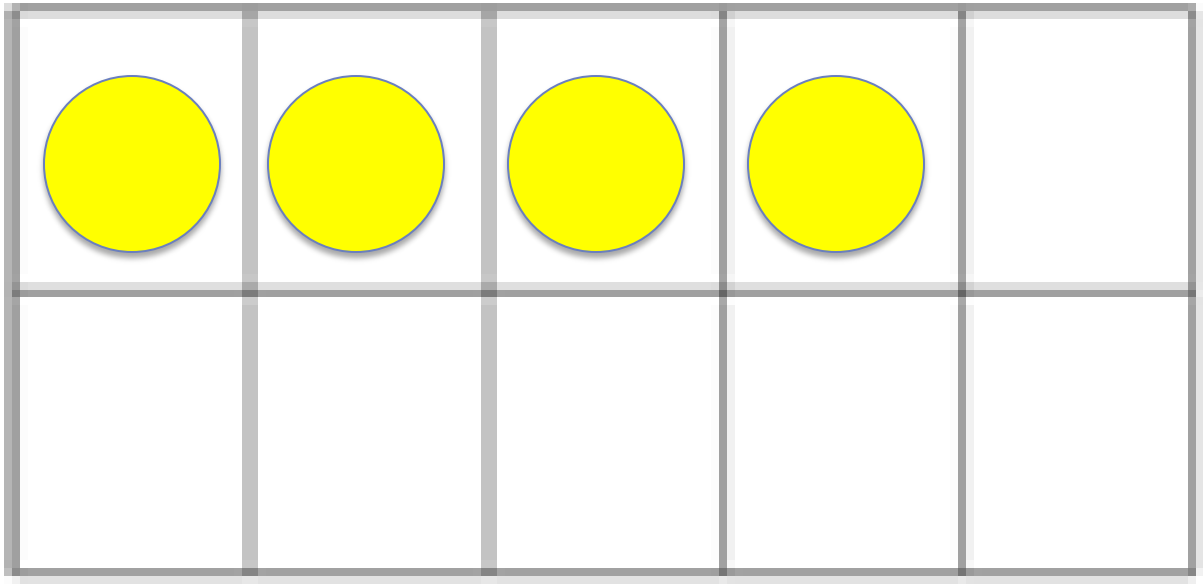
- Counting on strategies
- Learning basic facts
- Decomposing numbers
- Development of addition strategies
- Development of multiplication strategies

Ten Frames

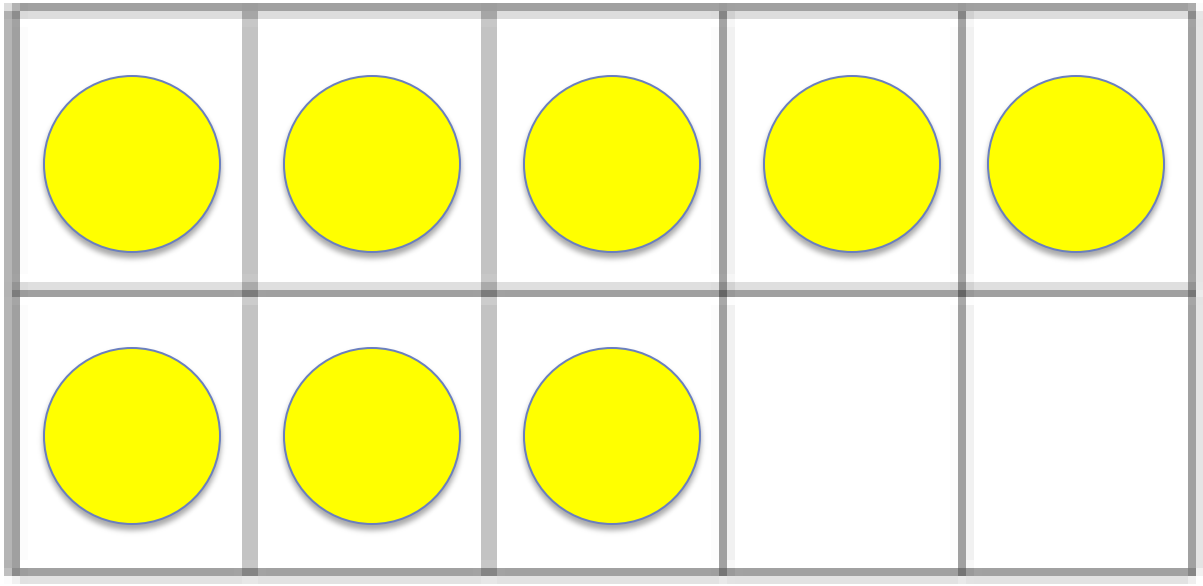


- Deepens the understanding of landmark numbers; 5 and 10
- Develops the ability to use landmark numbers
- Develops computational fluency

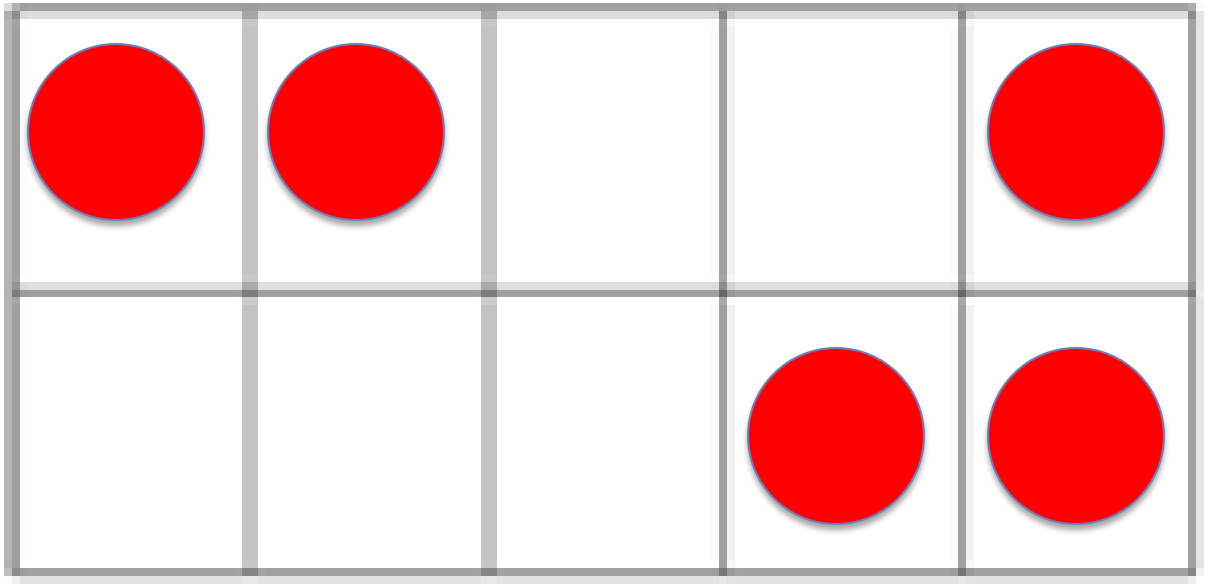
How many dots are in the ten—frame? How did you figure it out?



How many dots are in the ten—frame? How did you figure it out?

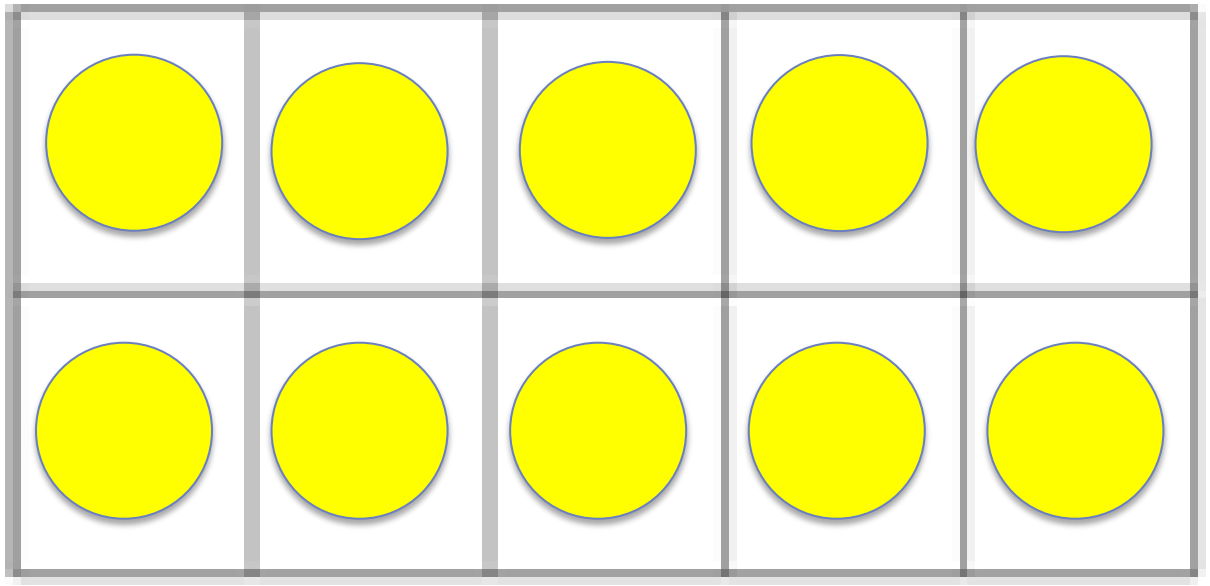


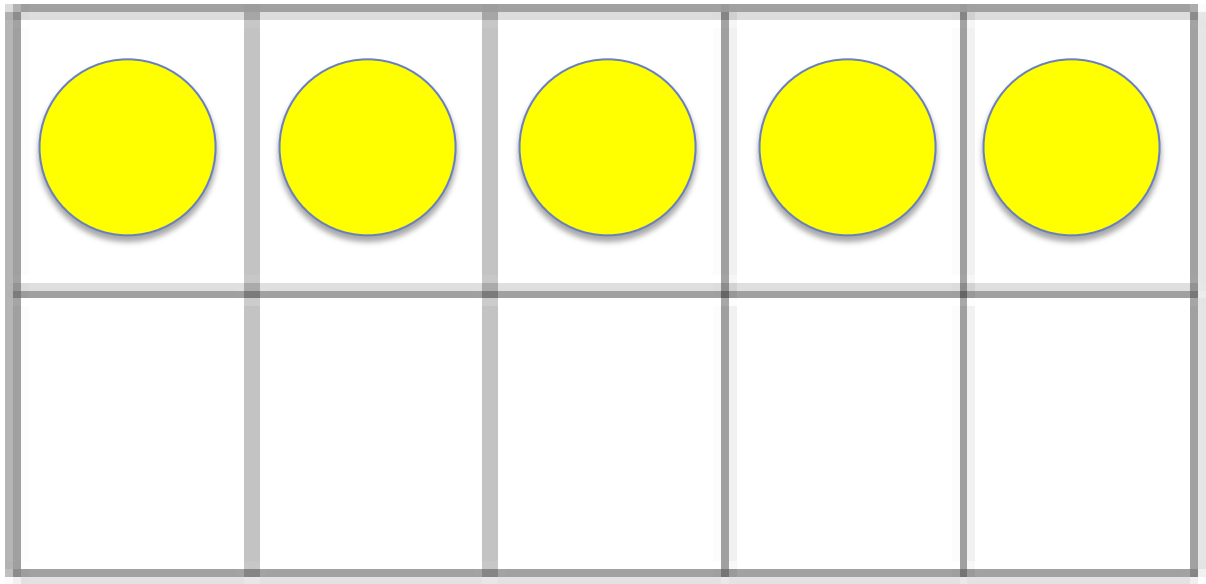
Build what you see.



Riddles Using a Double Ten—Frame

- My double ten—frame has more than 8 counters.
- My double ten—frame has fewer than 17 counters.
- My double ten—frame has a number of counters you say when you skip count by threes.
- My double ten—frame has 3 rows of five counters.





More than 8?
15 > 8

Fewer than 17?
15 < 17

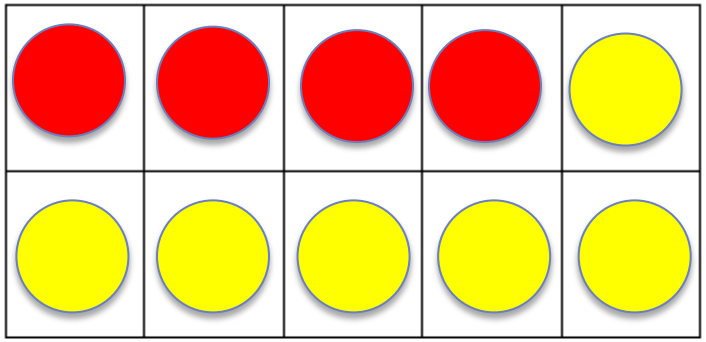
Skip count by 3s?
3, 6, 9, 12, 15

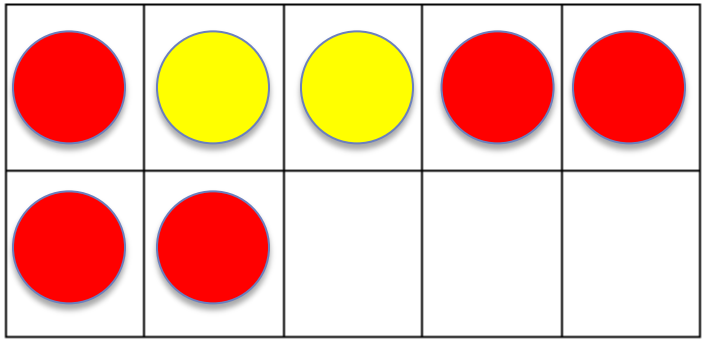
3 rows of 5?
5 + 5 + 5

Riddles

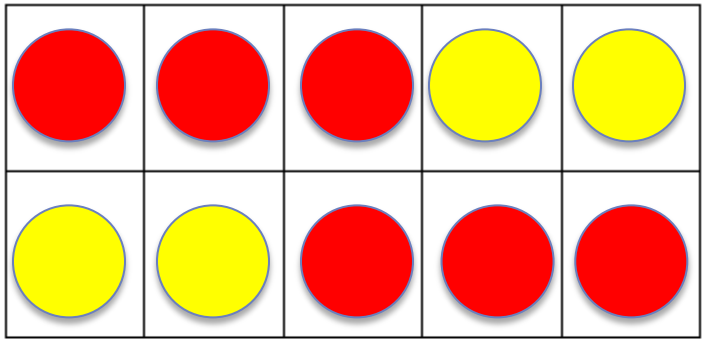
- Pick a number 1—10.
- Write a comparison statement.
- Write a comparison statement using the opposite phrase as the one used in the first clue.
- Write a clue referring to a skill you want the class to work on.
- Write a clue incorporating an arithmetic calculation to reveal the amount.

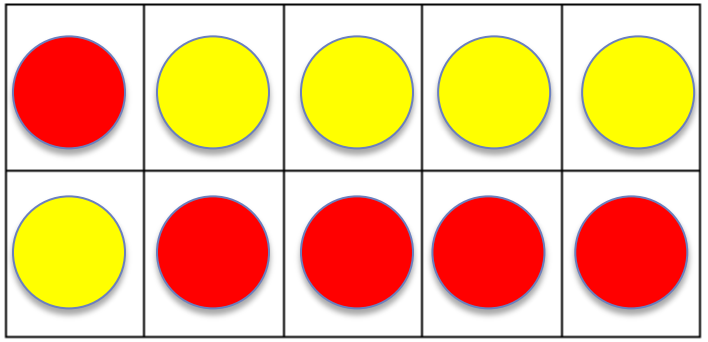
Race for 20





4 + 6 + 1 + 2 + 4





3 + 4 + 4 + 5 + 4

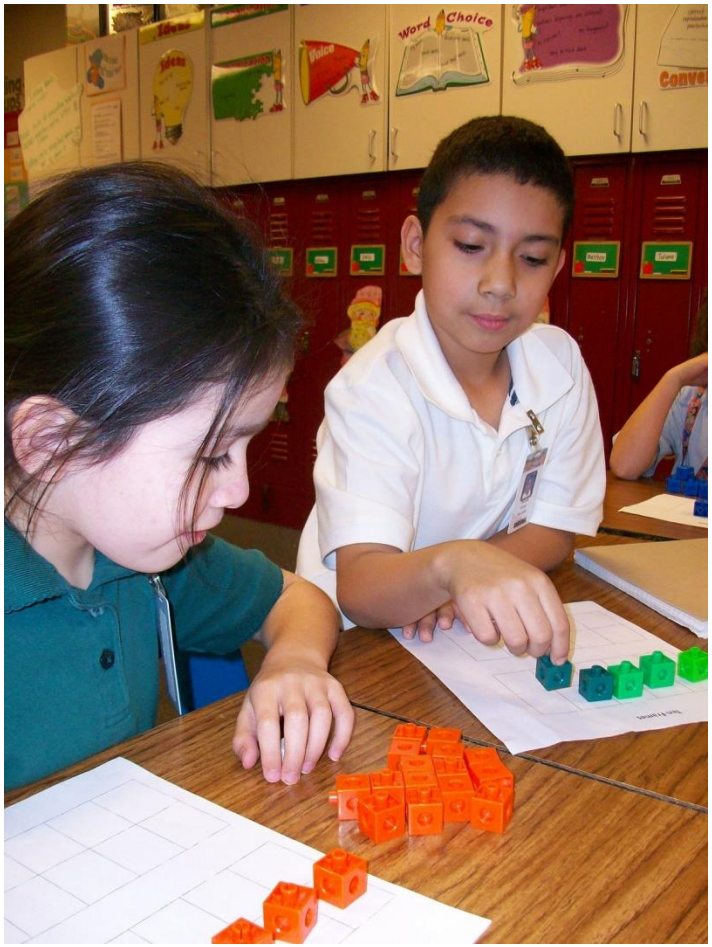
Race to 20

- Decide who will go first.
- Roll the die.
- Using two color counters, mark the amount you rolled. Remember to switch colors each round.
- Play until someone reaches or goes over 20.
- Practice asking questions as you play.
- Record your number sentences.

Possible key questions

- How many do you need to fill the ten frame (or both ten frames)?
- How would that look in a number sentence? (Ex 4 + ____= 10)
- Who has more, how many more?
- What do you hope to roll and why?

Options for the Game



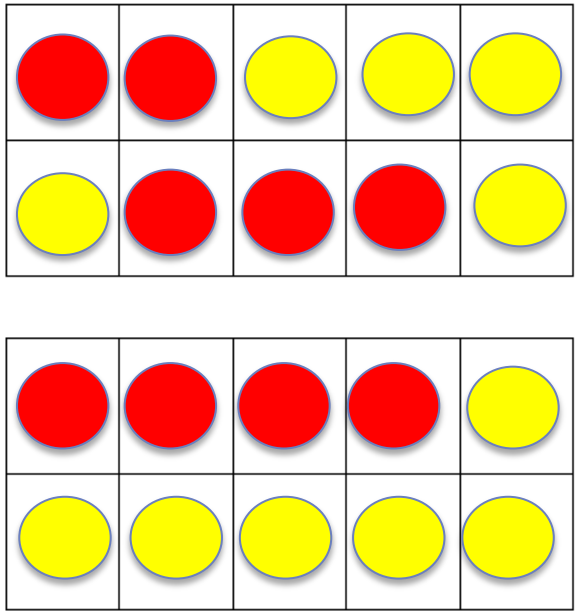
- Cover the 6 with a small sticker. Have students answer a key question when they roll the side with the sticker.
- Race for 10 (dice 1,1,2,2,3,3)

Assessing

Use previously played games to connect pictures to number sentences.

What number sentences match the game board?

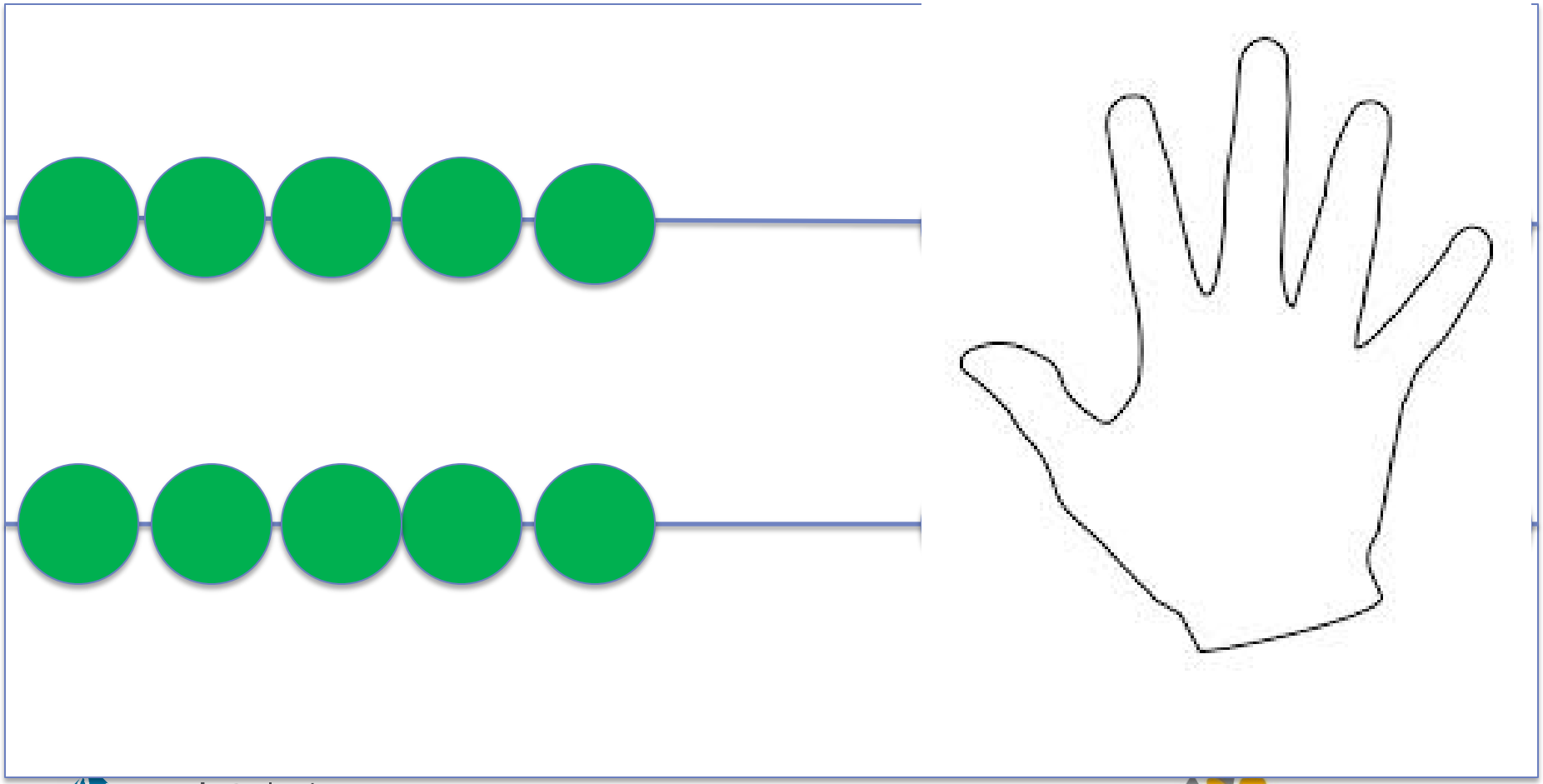
How would you add these numbers together?



Look Quick with Rekenreks

- How many dots do you see?
- How do you see them?

Look Quick with Rekenreks



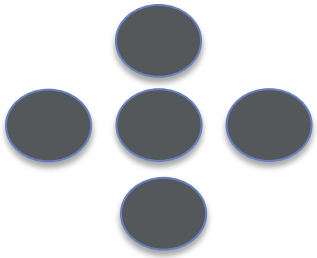
Look Quick with Rekenreks

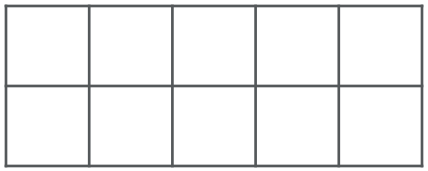
- How many dots do you see?
- How do you see them?

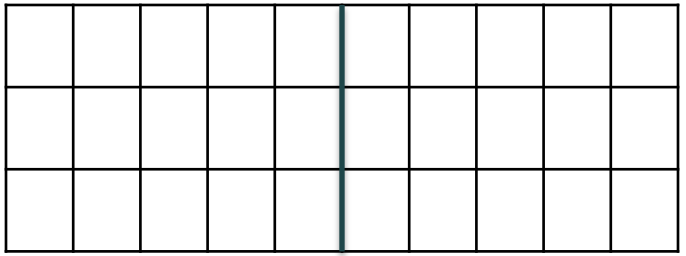
Processing the Video

- What *instructional strategies* does the teacher use to engage the students in the mathematics?
- What *conditions* are present that foster a safe learning community?
- How does the teacher use the rekenreks as a *tool to build fluency* with small numbers?

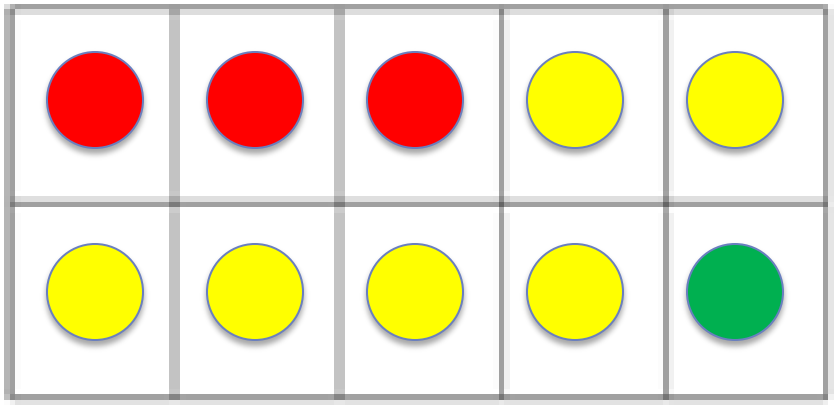
Progression

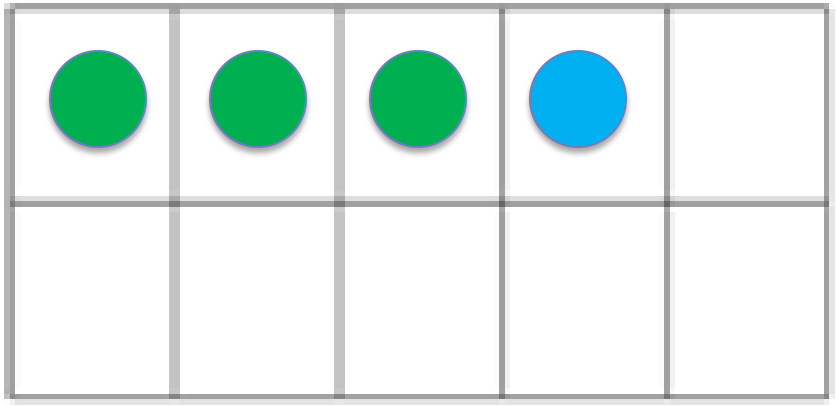


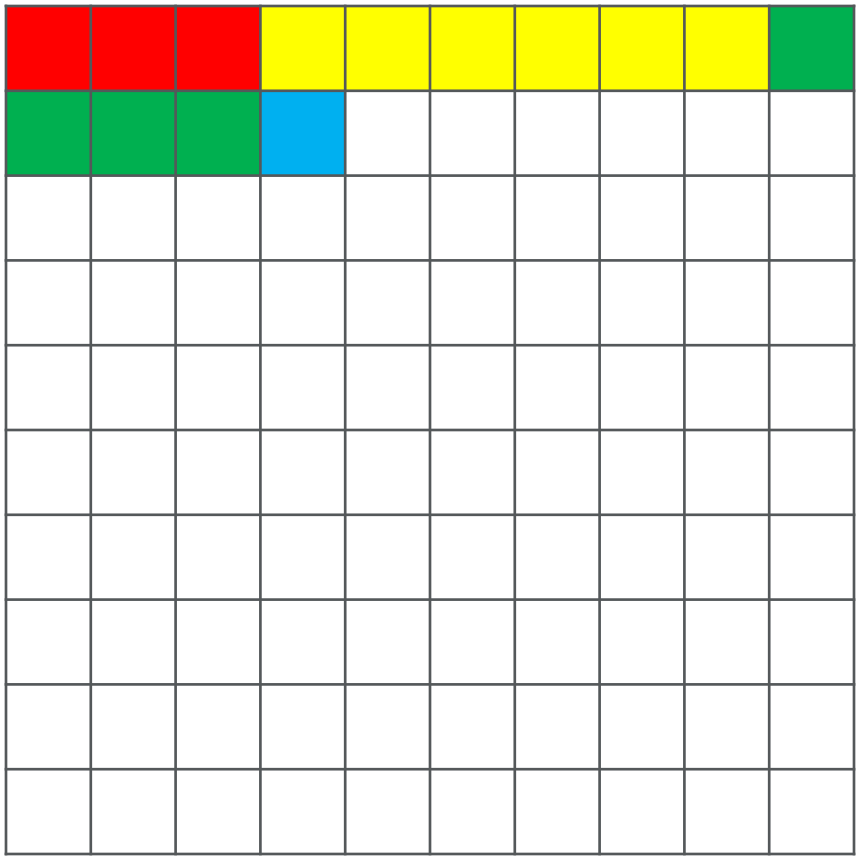




14 = 3 + 6 + 4 + 1 or 14 = 10 + 4







1–100 Chart

Target Number!

+ or -

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

You can make hops of:

- Ones
- Tens
- Hundreds

Hippity Hop

With a partner, investigate the following target numbers:

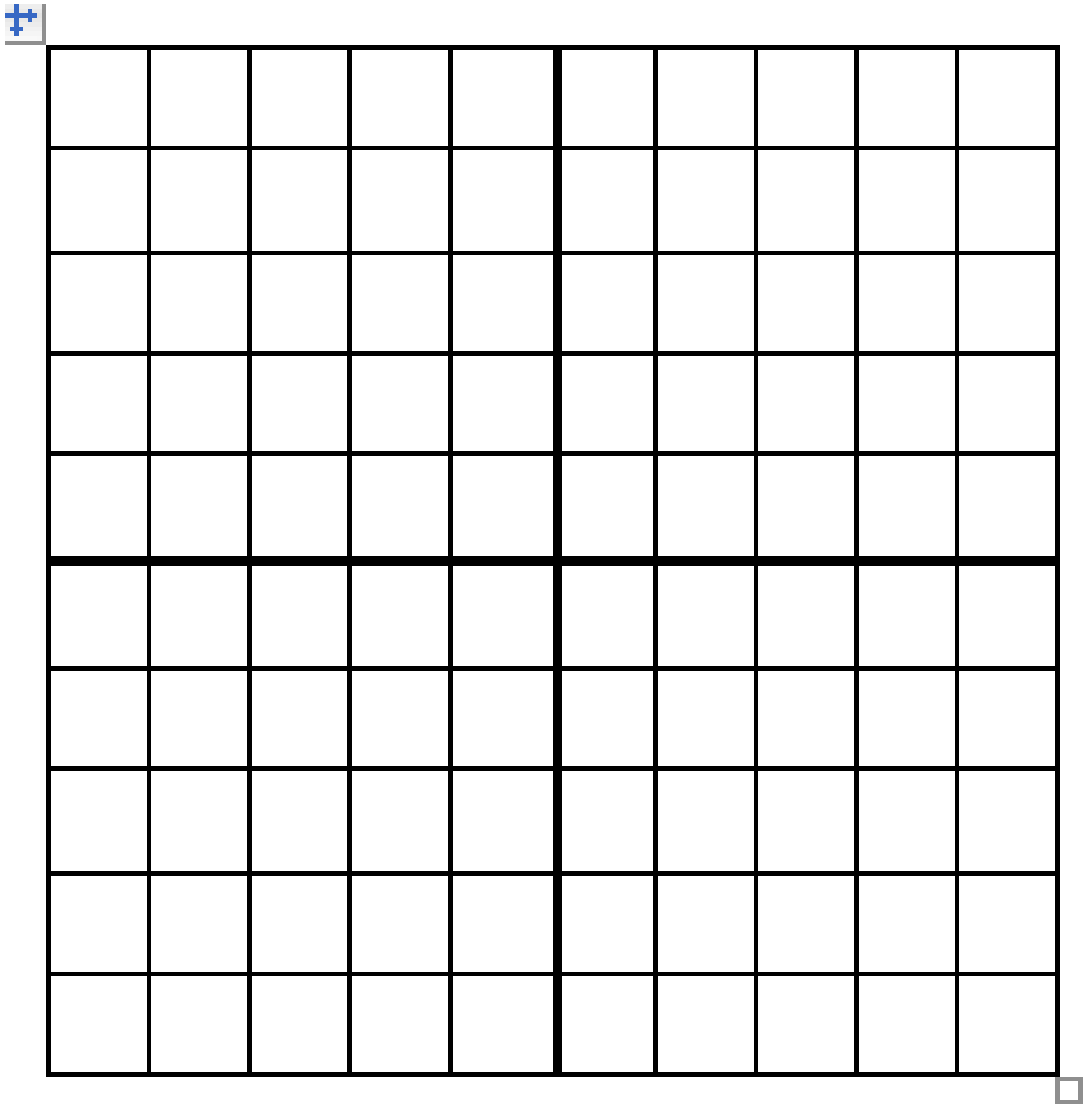
33 78 82

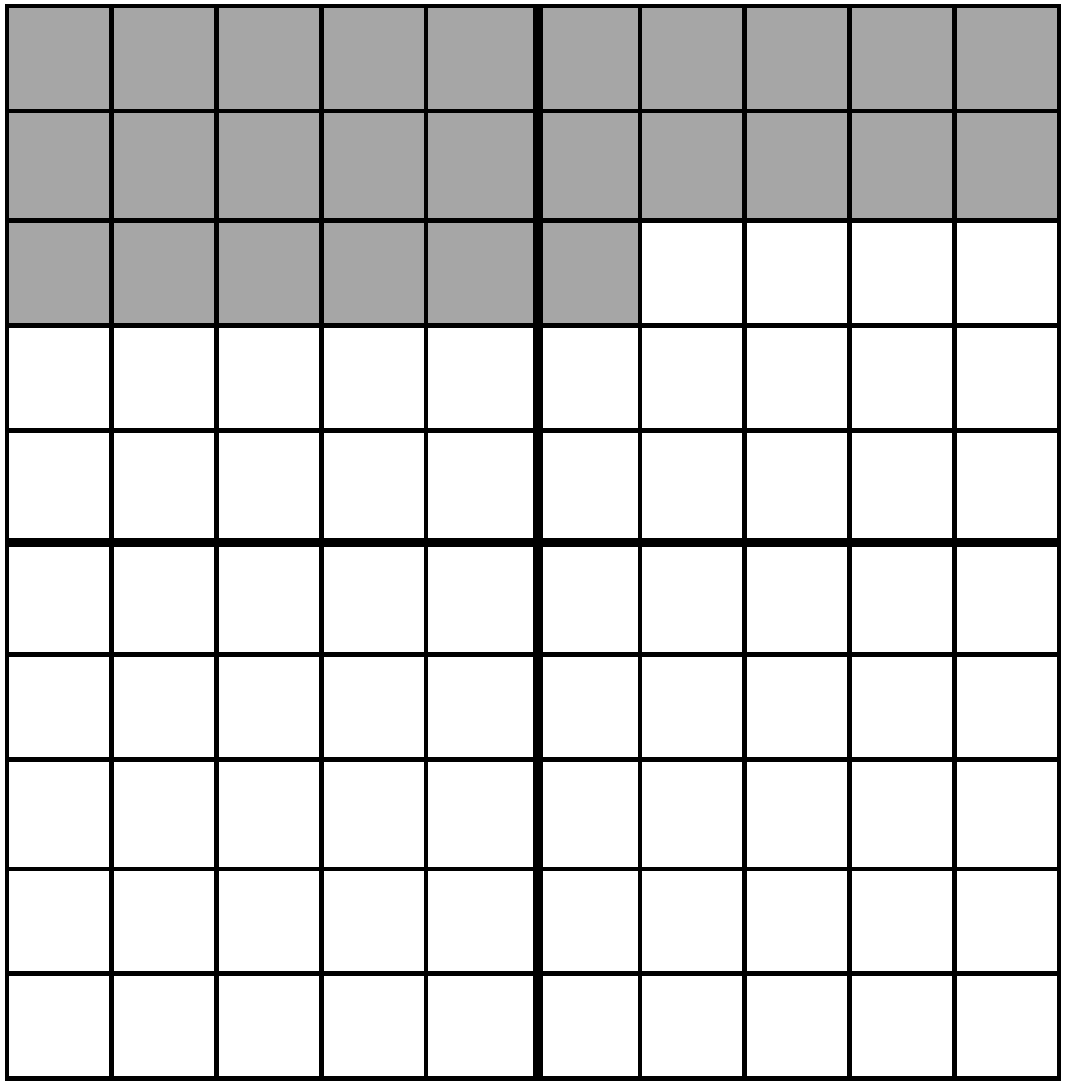
Hundreds Chart

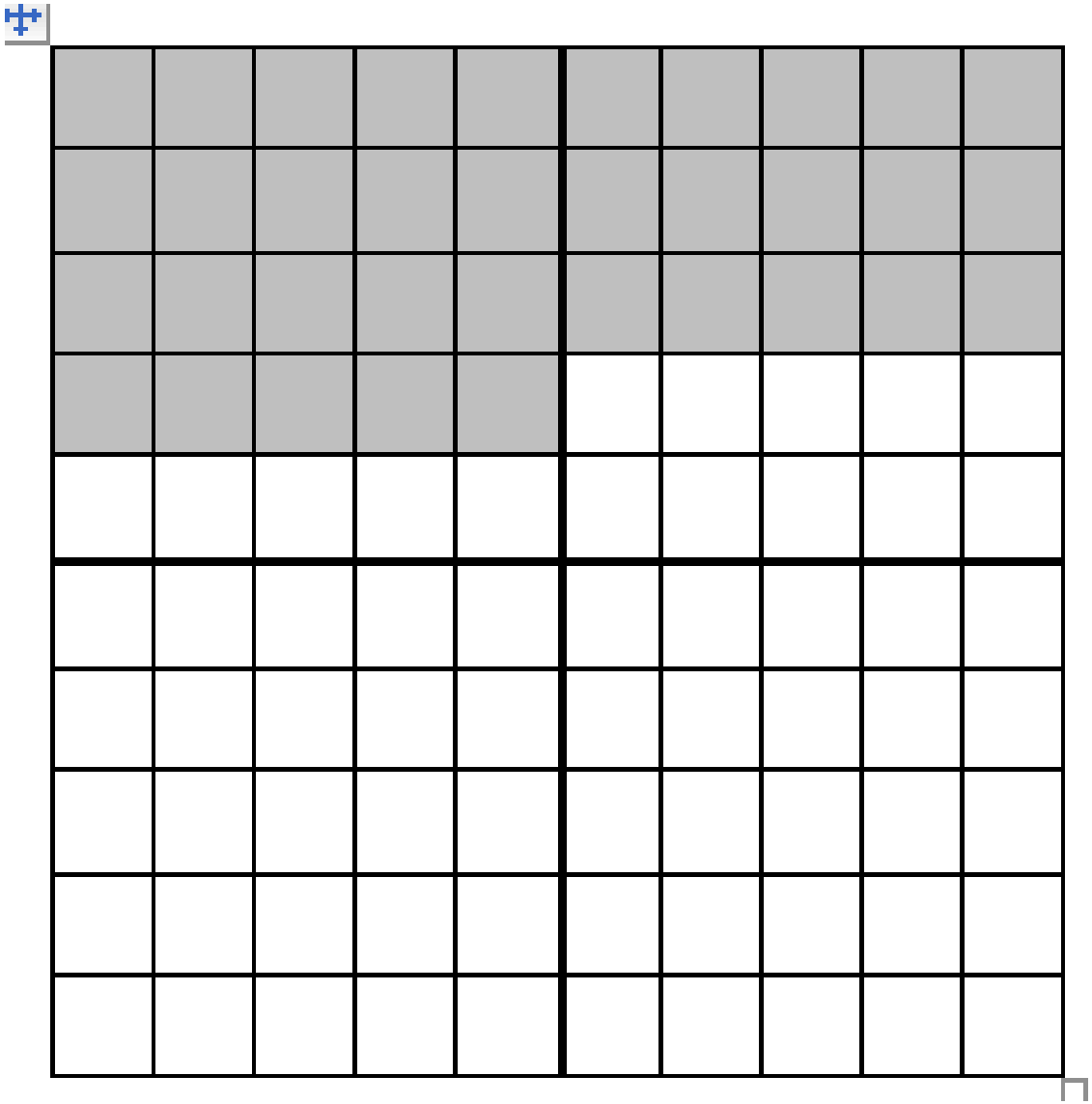
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Processing Hippety Hop

- What's the value in requiring students to record an equation for each strategy doing this?
- How do you think your students would benefit from this routine?
- One way you can use this routine is as a lesson for an entire math class. What are other ways you could give students' opportunities to revisit it?





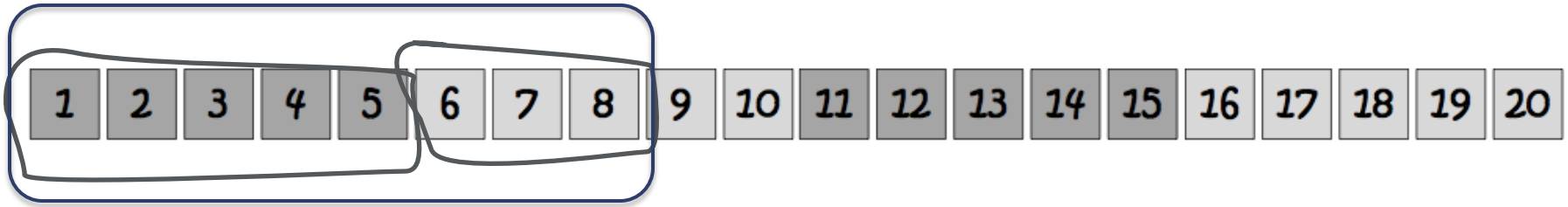


Hundred Charts Help Students:

- Count
- Model addition and subtraction strategies
- Notice important ideas about our system of tens
- Solve problems once they are comfortable with its structure

Number Lines and Number Paths

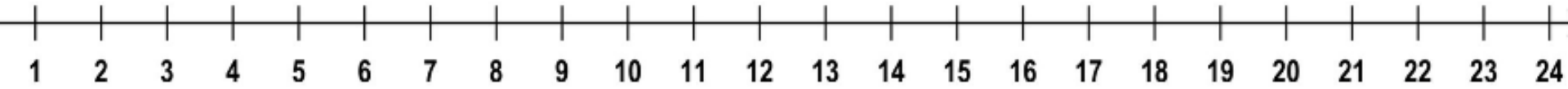
5 + 3 = 8



Guess My Number

- My number is between ____ and ____. It's less than ___ and greater than _____.

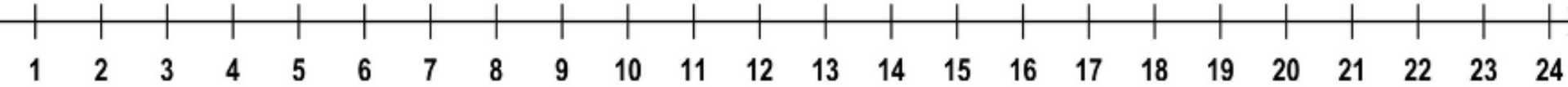
Guess My Number



The secret number is less than _____.
The secret number is greater than _____.
The secret number is between _____ and _____.

Guess My Number

Guess My Number



0 50

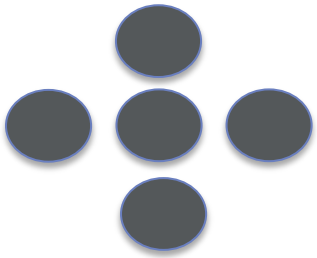
- You choose which version…
- Play in pairs: 2 rounds: each take a turn guessing

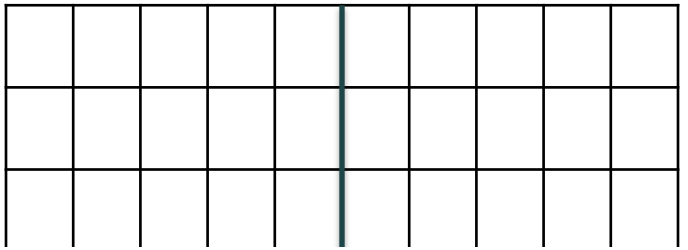
- The third version highlights the importance of benchmark numbers. Why are these important to think about?
- Do you think the number line is an effective tool for thinking about number relationships? Why or why not?

Number Lines Help Students:

- Count
- Model addition and subtraction strategies
- Number Relationships (whole, integers, fractions, decimals)
- Solve problems once they are comfortable with its structure
- Explore Measurement

Progression





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