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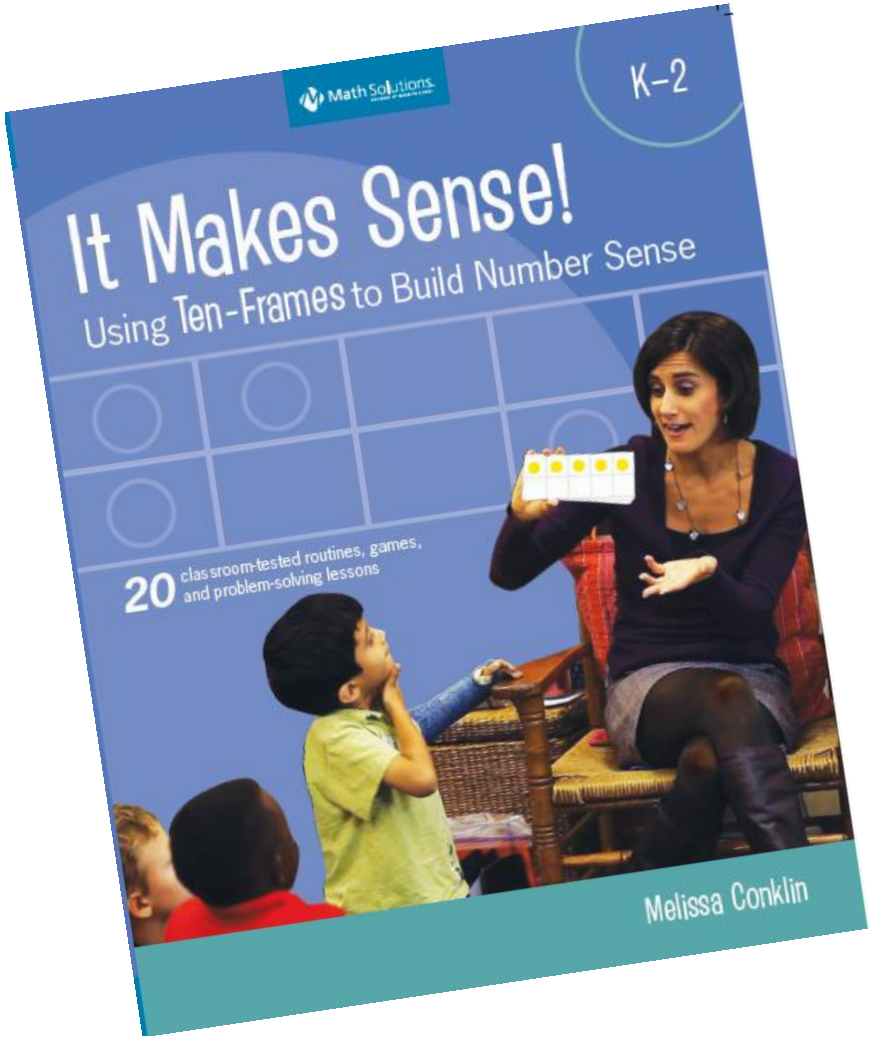
Power of Ten—Framing Students' Understanding

Lisa Rogers

NCSM Conference---Philadelphia, PA

April 25-28, 2012

mathsolutions.com/presentations



Ten Frames

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8 Standards for Mathematical Practice

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

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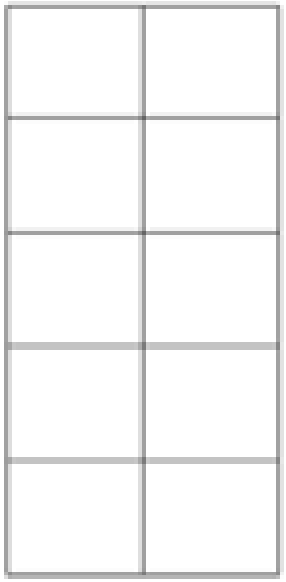
Ten Frames



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

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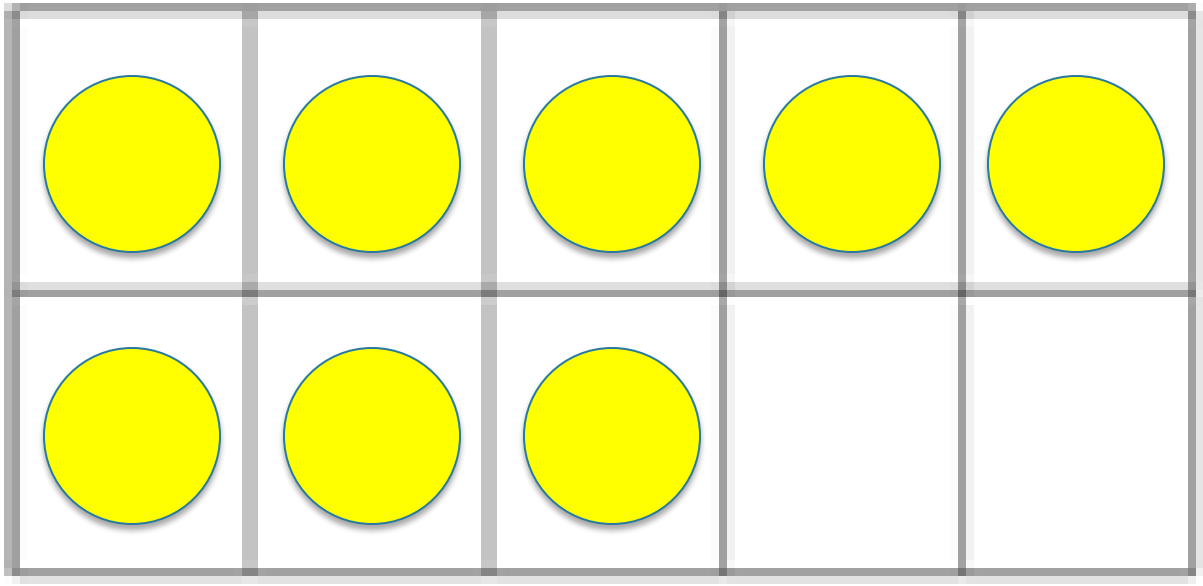
How many dots are in the ten—frame? How did you figure it out?



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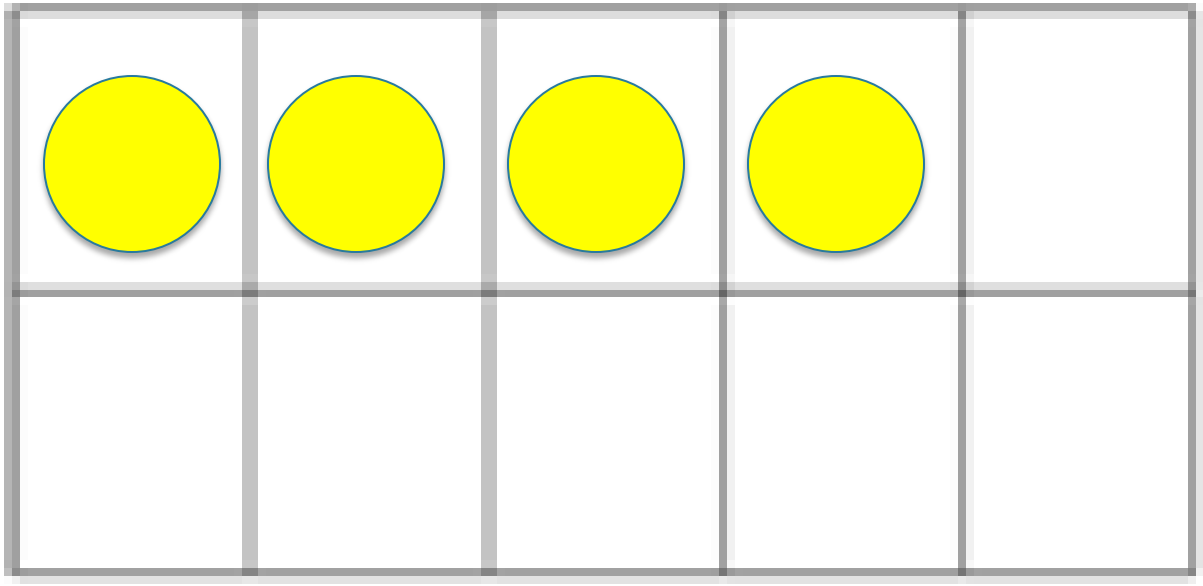

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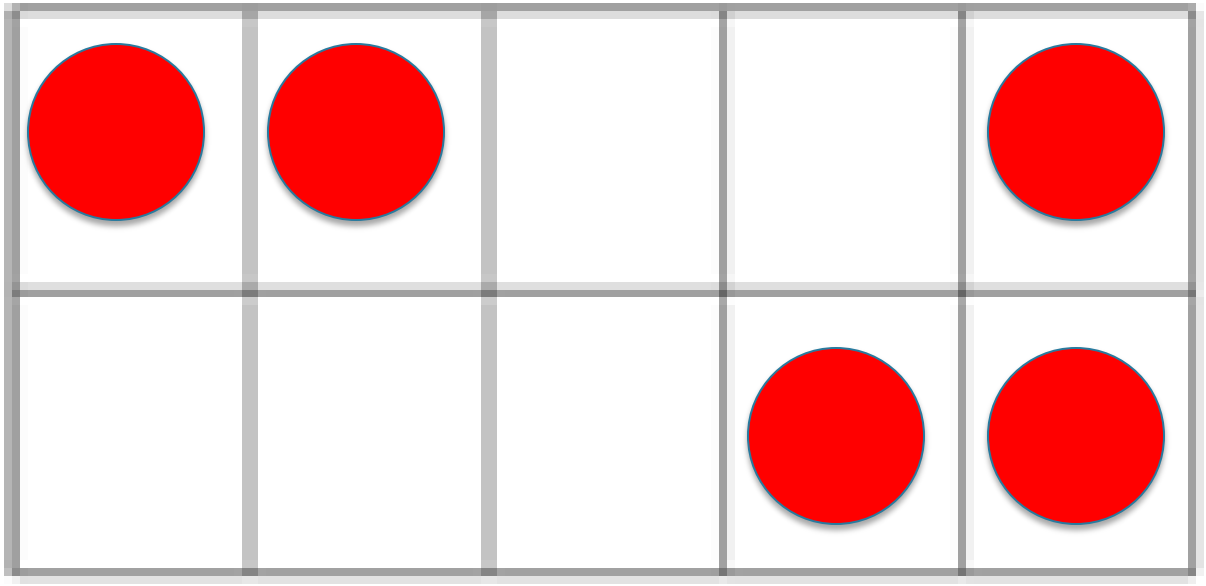
Build what you see.



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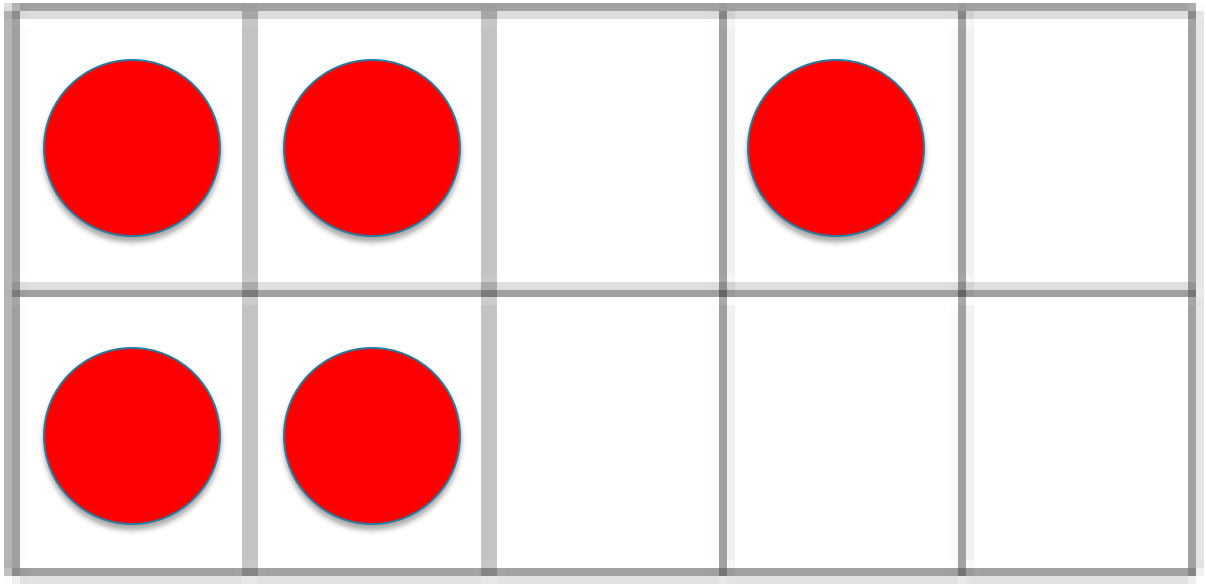

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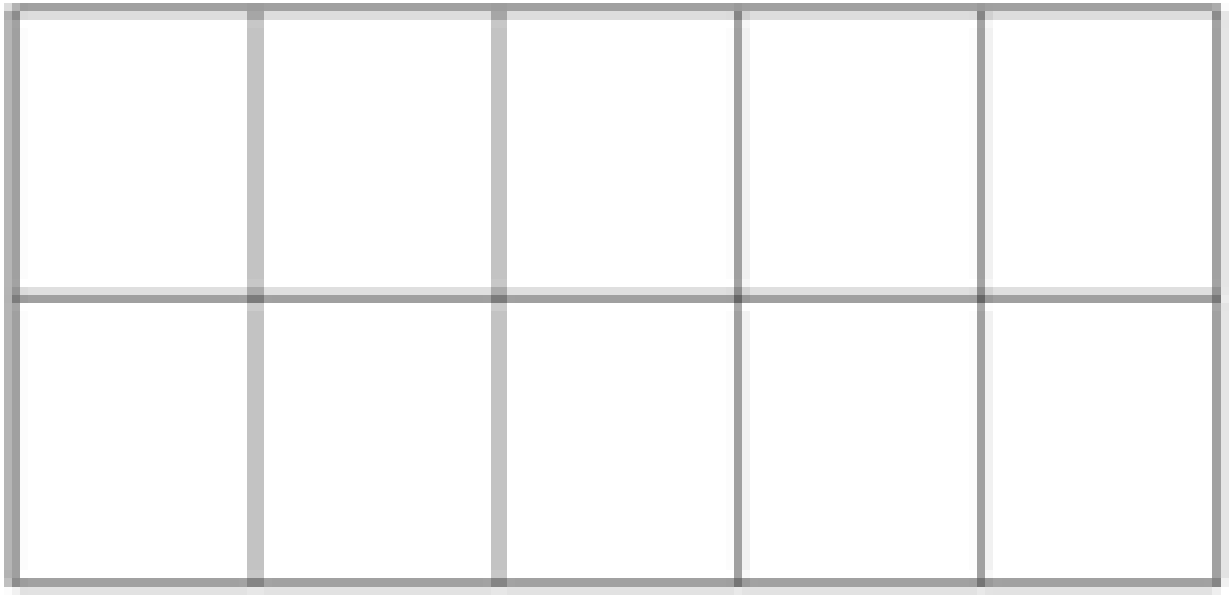
Riddles



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Riddles

- My ten—frame has fewer than 9 counters.
- My ten—frame has more than 4 counters.
- My ten—frame has an odd number of counters.
- My ten—frame has one more than 6 counters.

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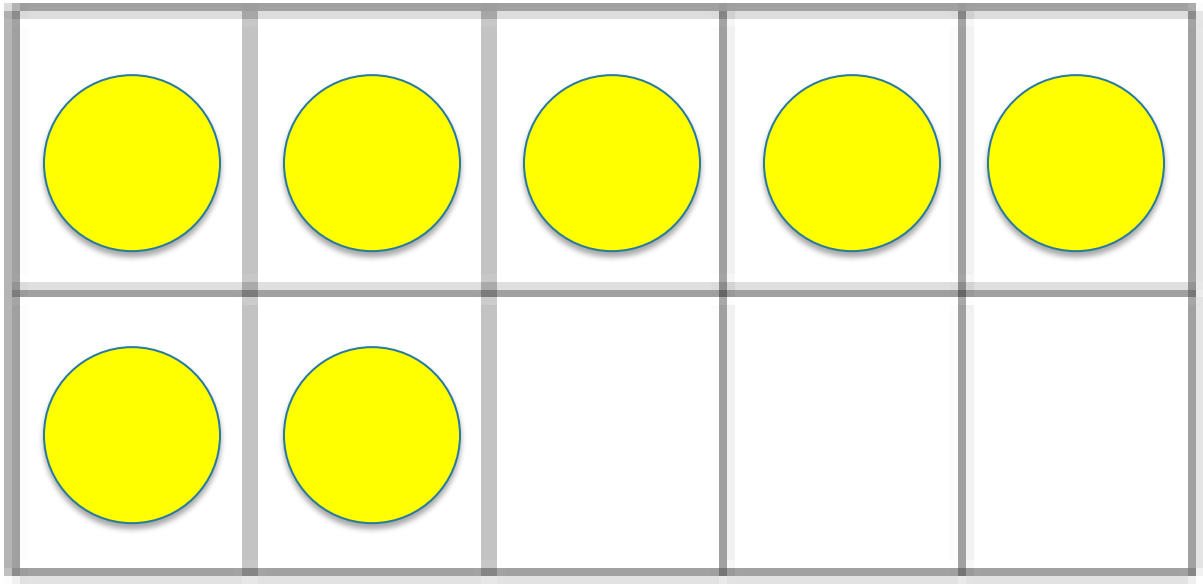
- fewer than 9 counters? 7<9
- more than 4 counters? 7>4
- an odd number of counters?



- one more than 6 counters? 7=1 + 6

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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.

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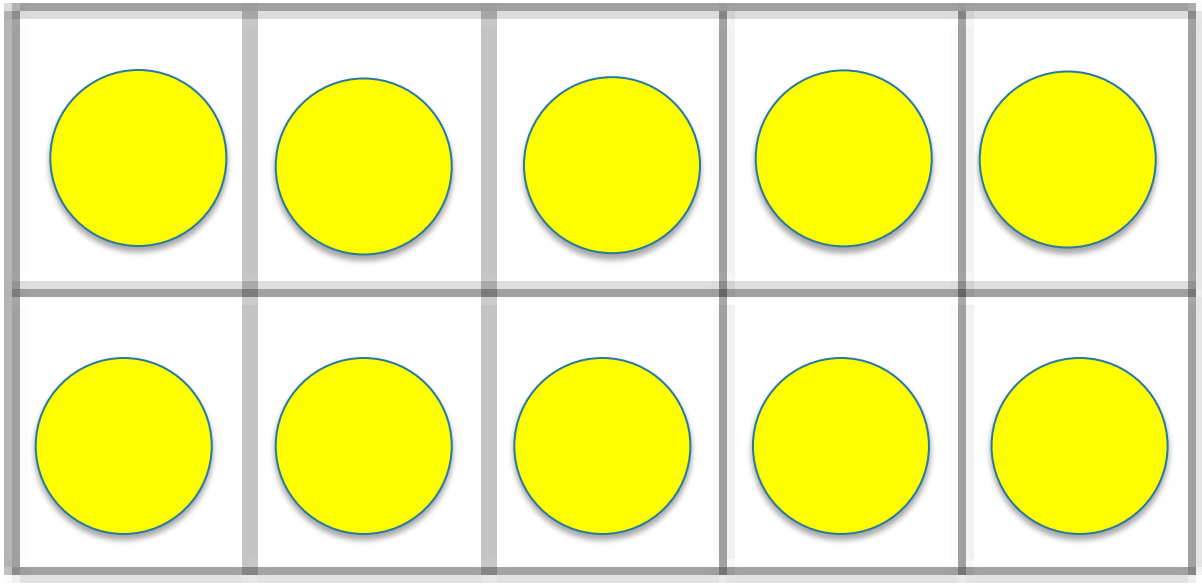
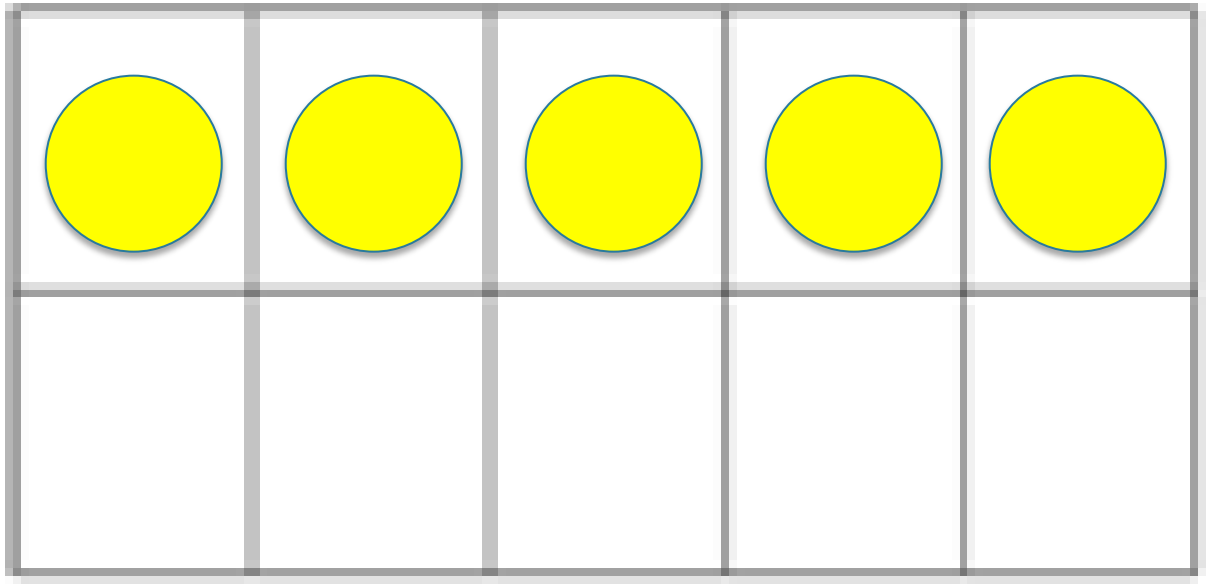


More than 8?
15 > 8

Fewer than 17?
15 < 17



Skip count by 3s?

3 rows of 5?

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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.

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Basic Facts

"Mastery" does not imply that students are human calculators able to perform at lightning speed. It means that they know the facts well enough to be efficient and accurate in other calculations.

Math Matters p. 43

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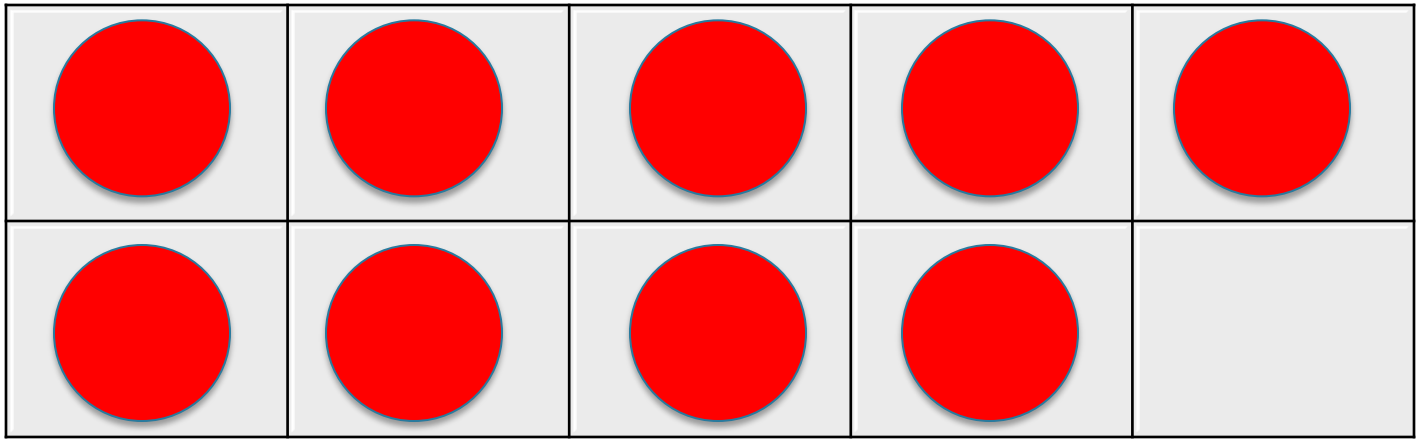
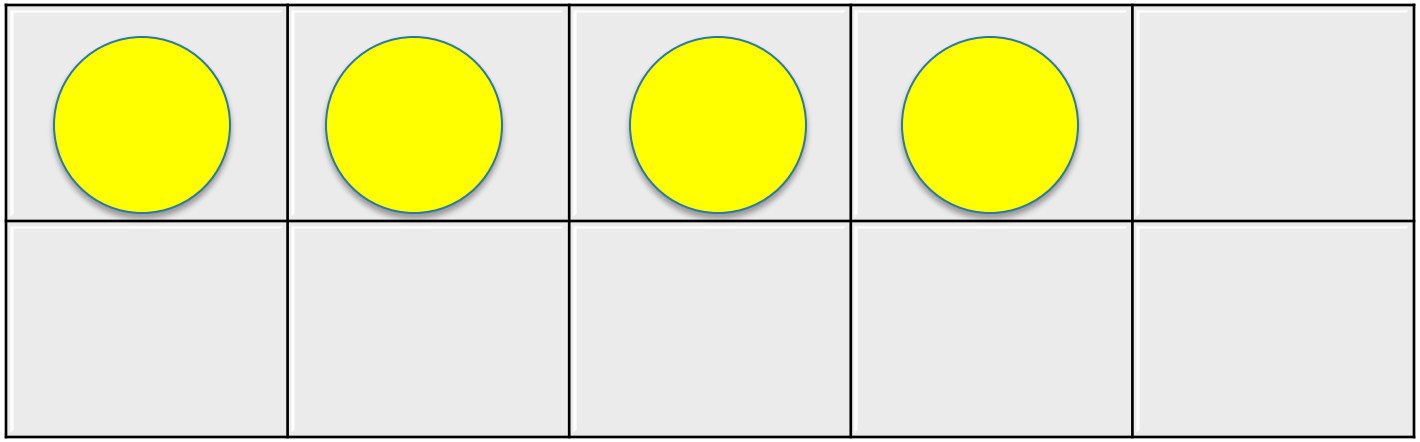
9 + 4





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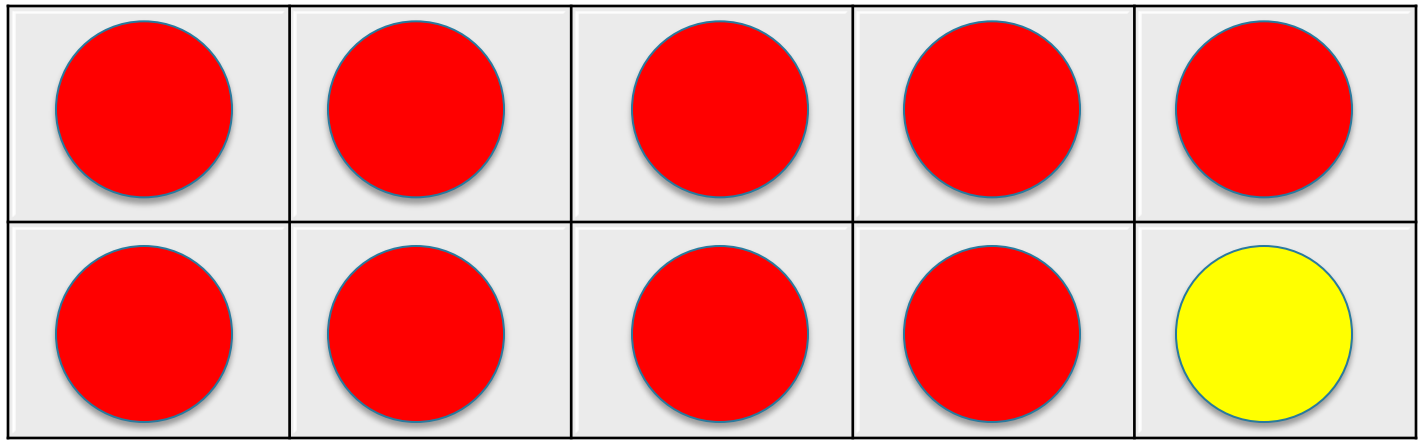
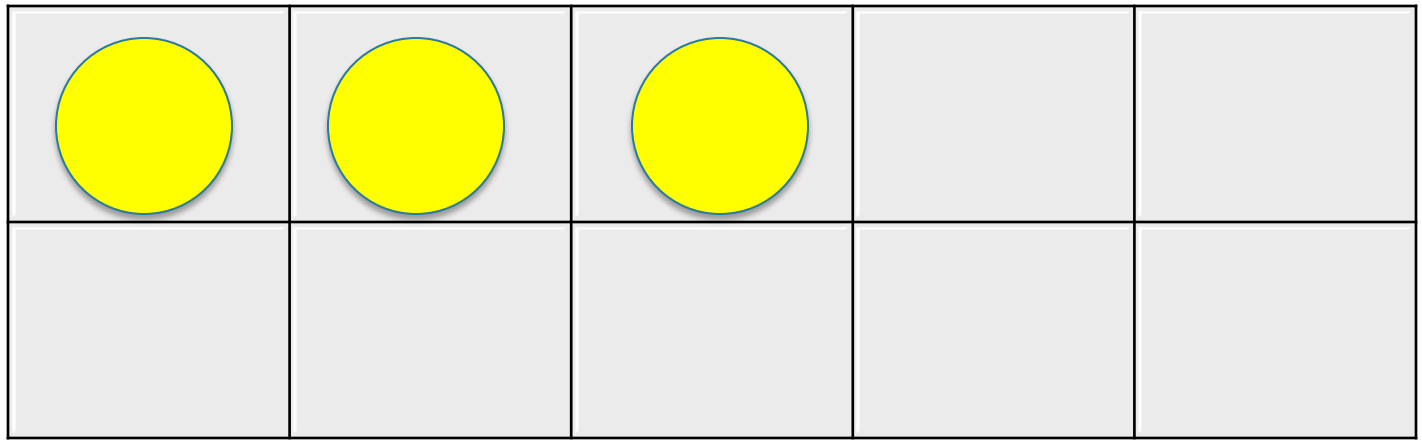
9 + 4 = 10 + 3



9 + 4

1 + 3



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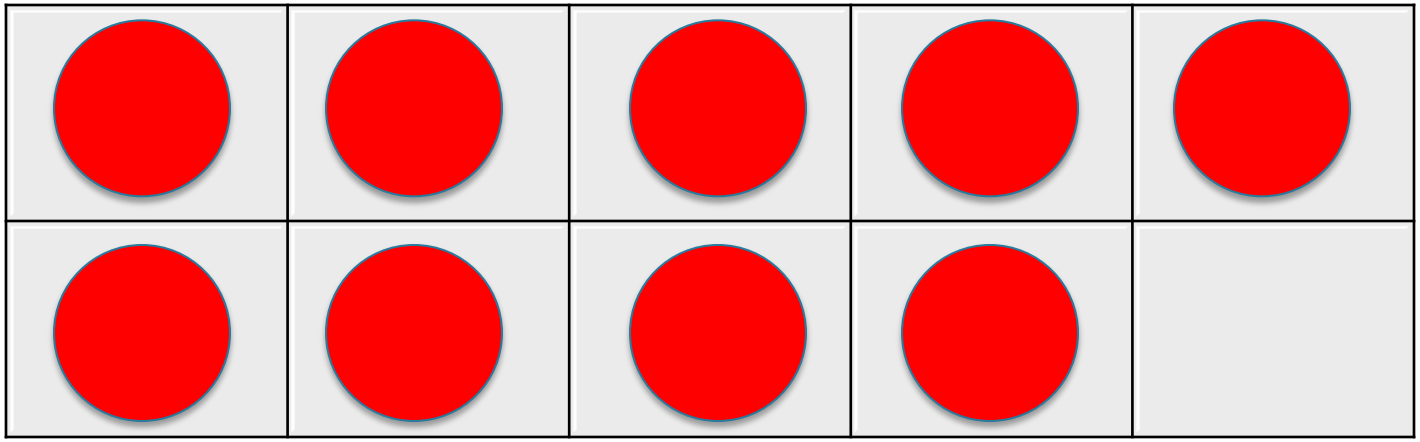
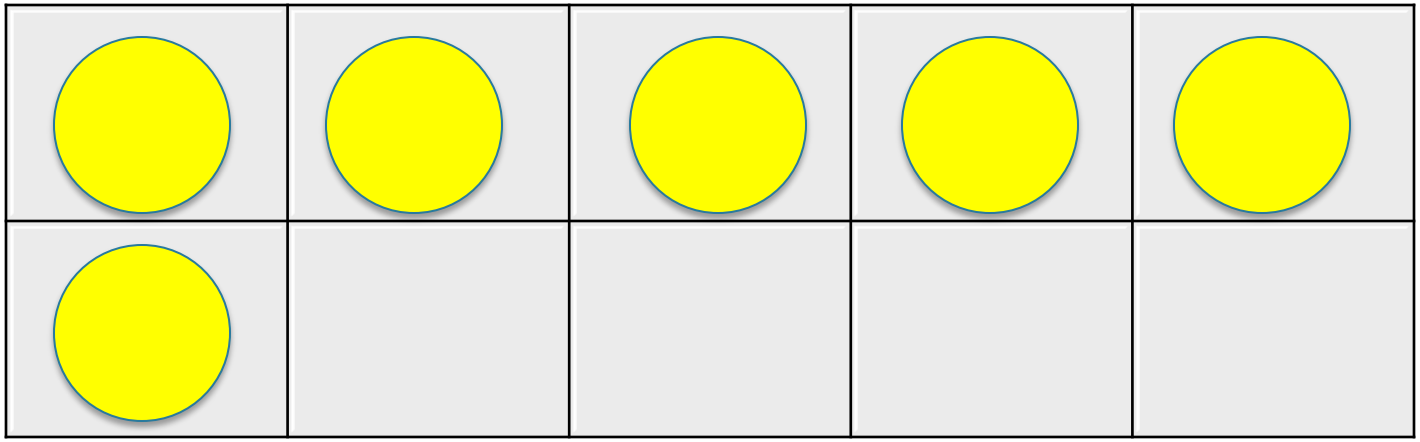
9 + 6





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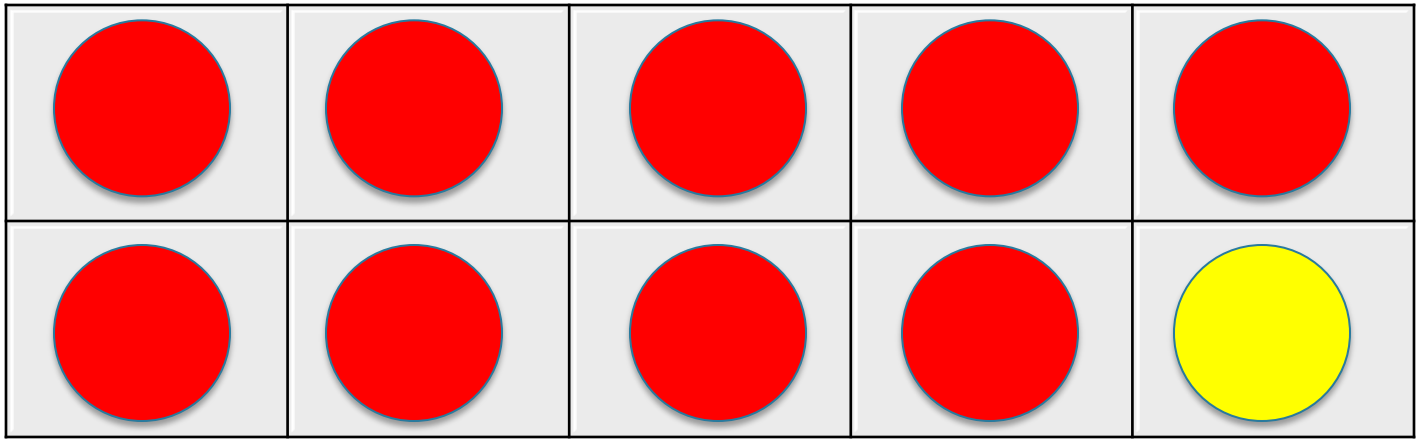
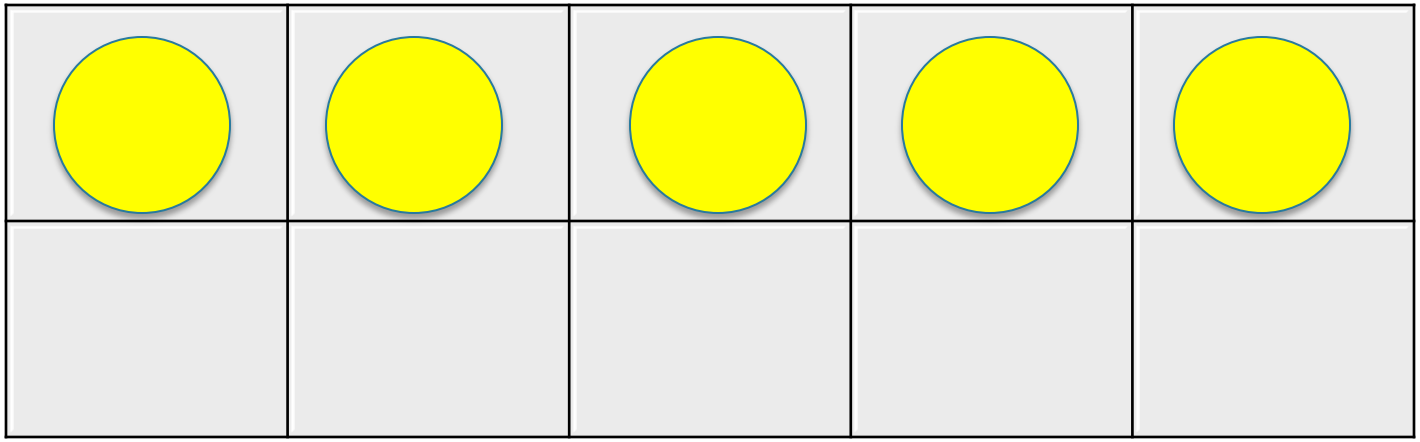
9 + 6 = 10 + 5



9 + 6

1 + 5



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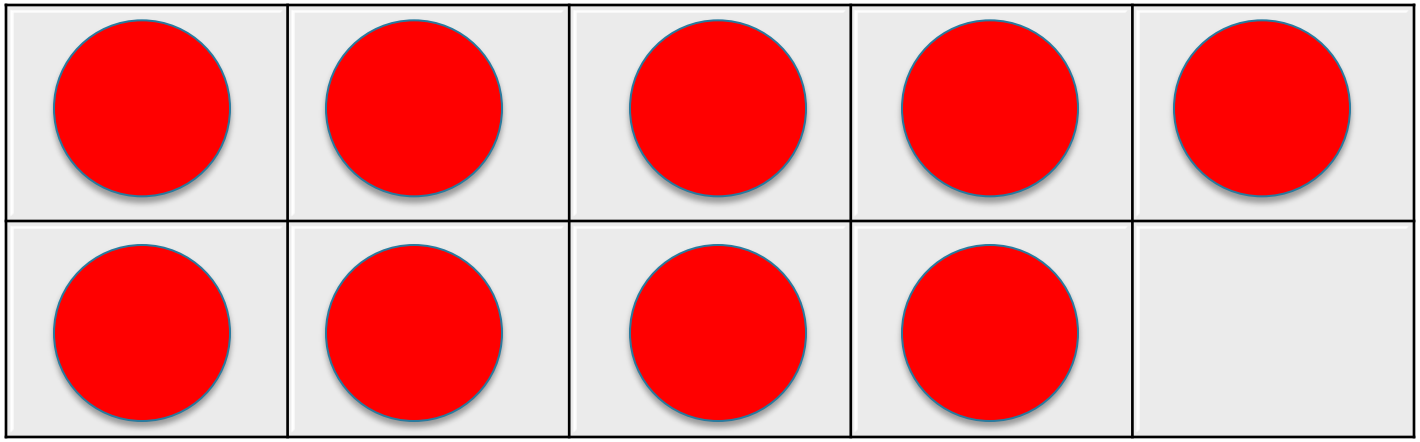
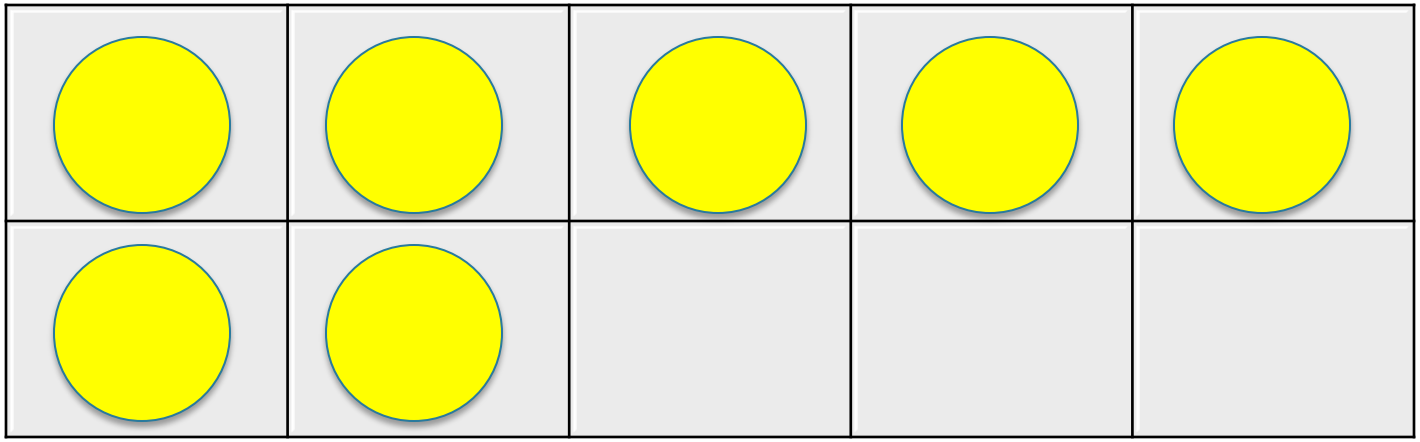
9 + 7





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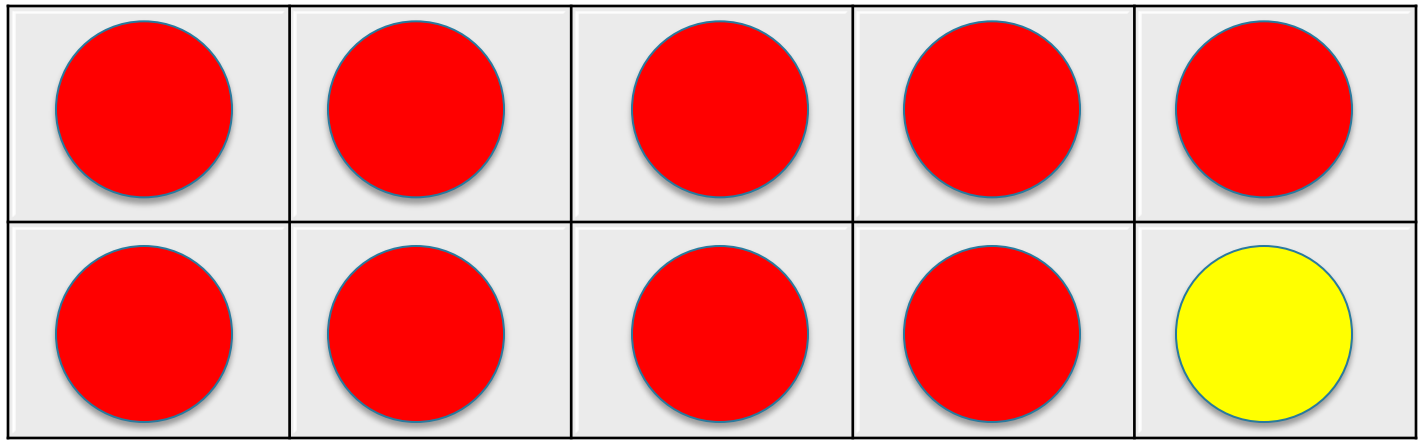
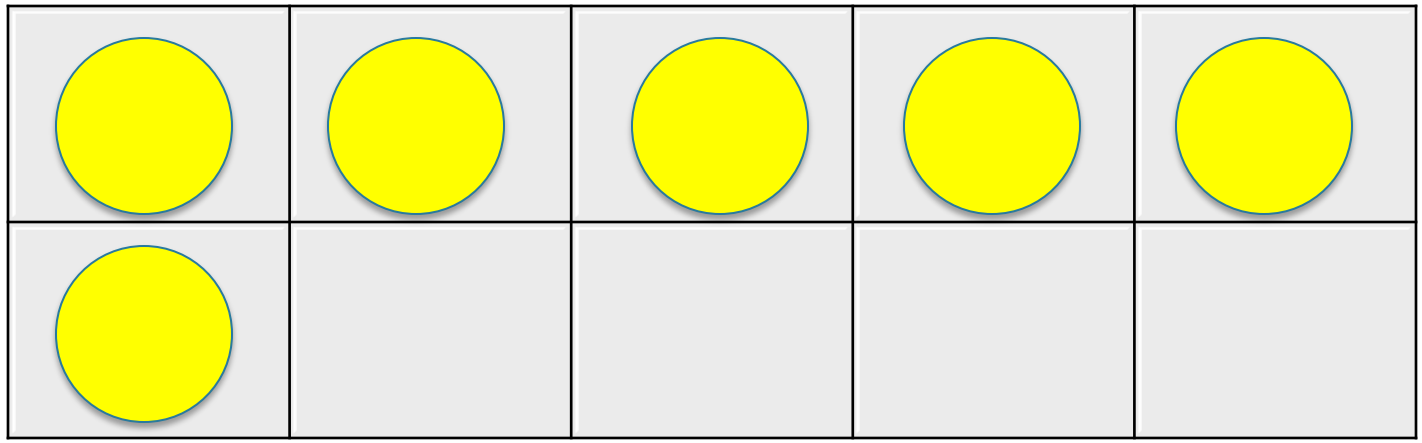
$$9 + 7 = 10 + 6$$



$$9 + 7$$
$$1 \quad + 6$$



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9+6=10+5
15 = 15

9+4=10+3
13=13

9+7=10+6
16=16

- What do you notice about the first number in the number sentences? How does it change?
- What do you notice about the second number in the number sentences? How does it change?
- Why are the sums the same of 9+6 and 10 + 5?

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- Why might it be important to scaffold this routine?

- When would you implement this in your classroom?

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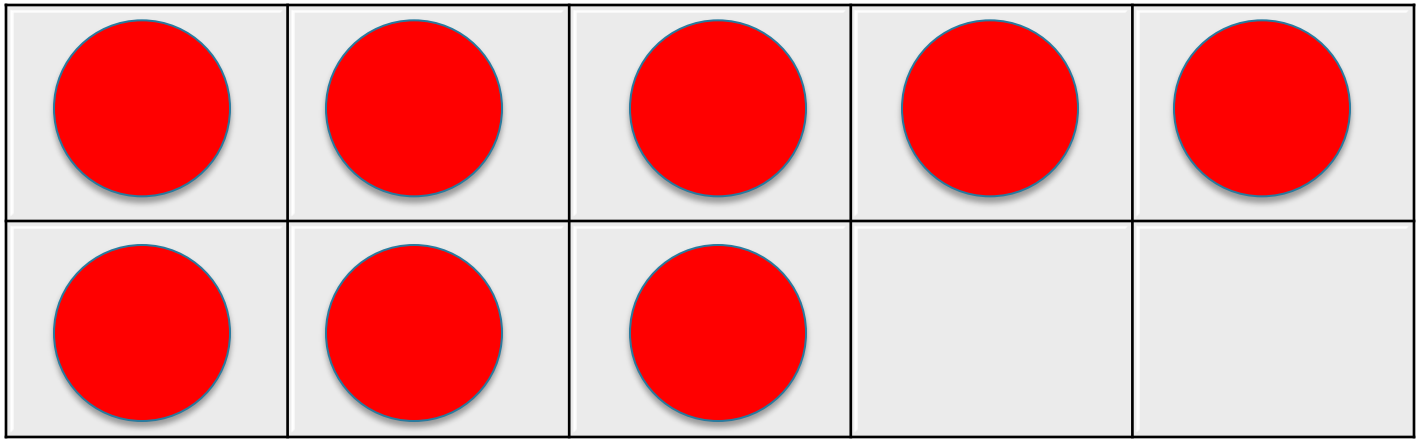

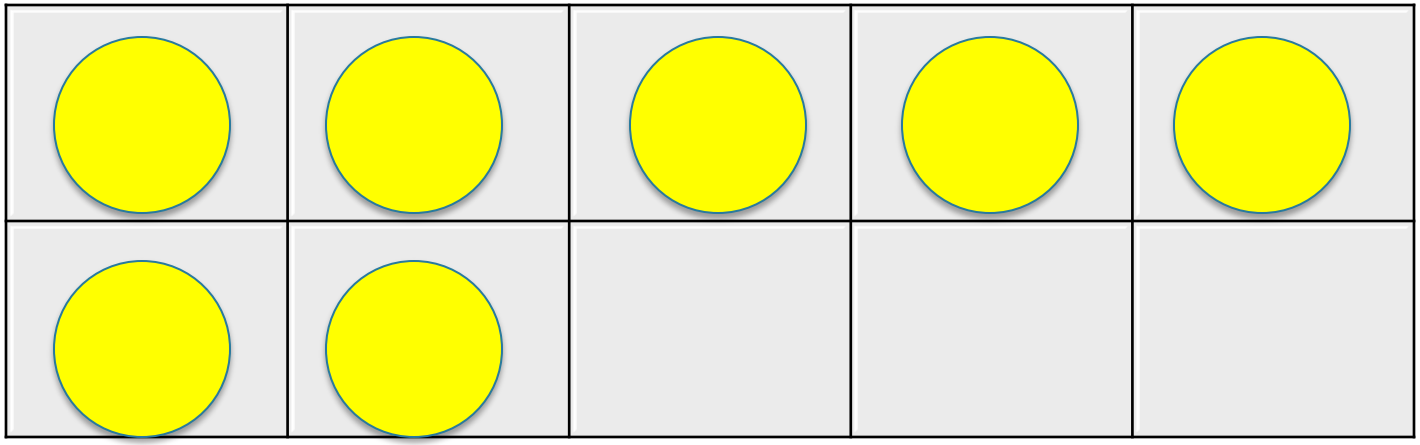

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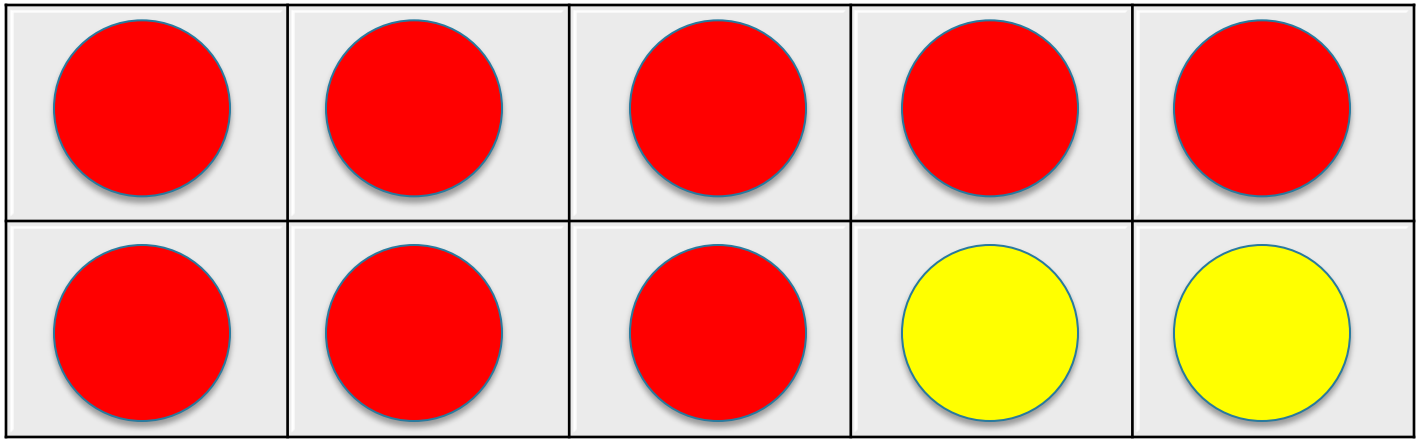

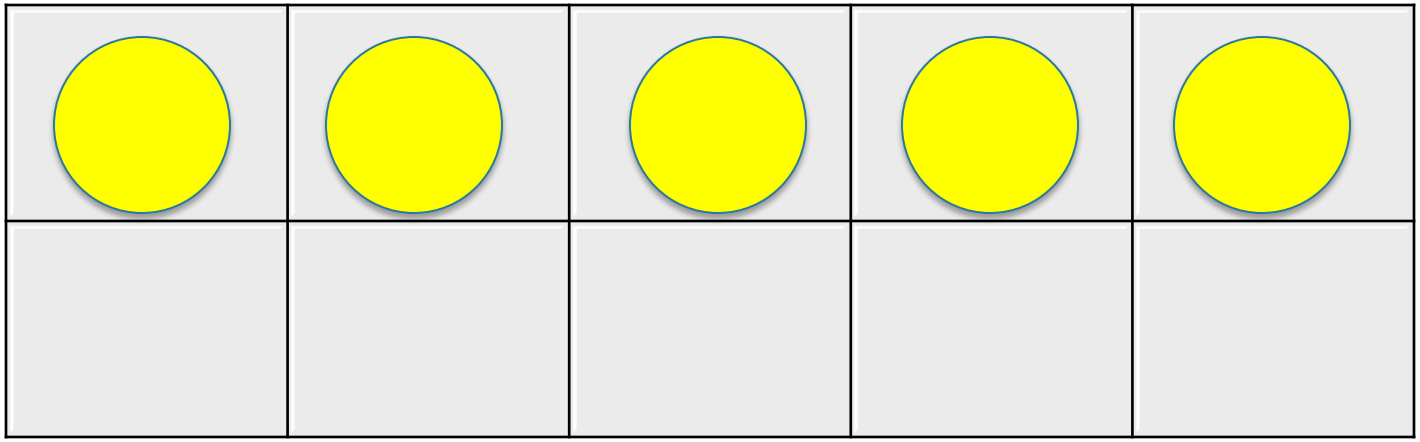

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How does making a ten help you solve:

19 + 16=

18 + 27 =

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Ten Frames in the Classroom

As you watch this clip, focus on the students. Consider:

- What strategies are the students using to build meaning of the numbers?
- What opportunities are created for the students to understand and use 10 as a unit?
- How do the students demonstrate composing and decomposing numbers?

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- Insert 2nd grade ten frames clip

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Ten Frames in the Classroom

- What strategies are the students using to build meaning of the numbers?
- What opportunities are created for the students to understand and use 10 as a unit?
- How do the students demonstrate composing and decomposing numbers?

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My friend has 4 pets…

cats	dogs
0	4
1	3
2	2
3	1
4	0

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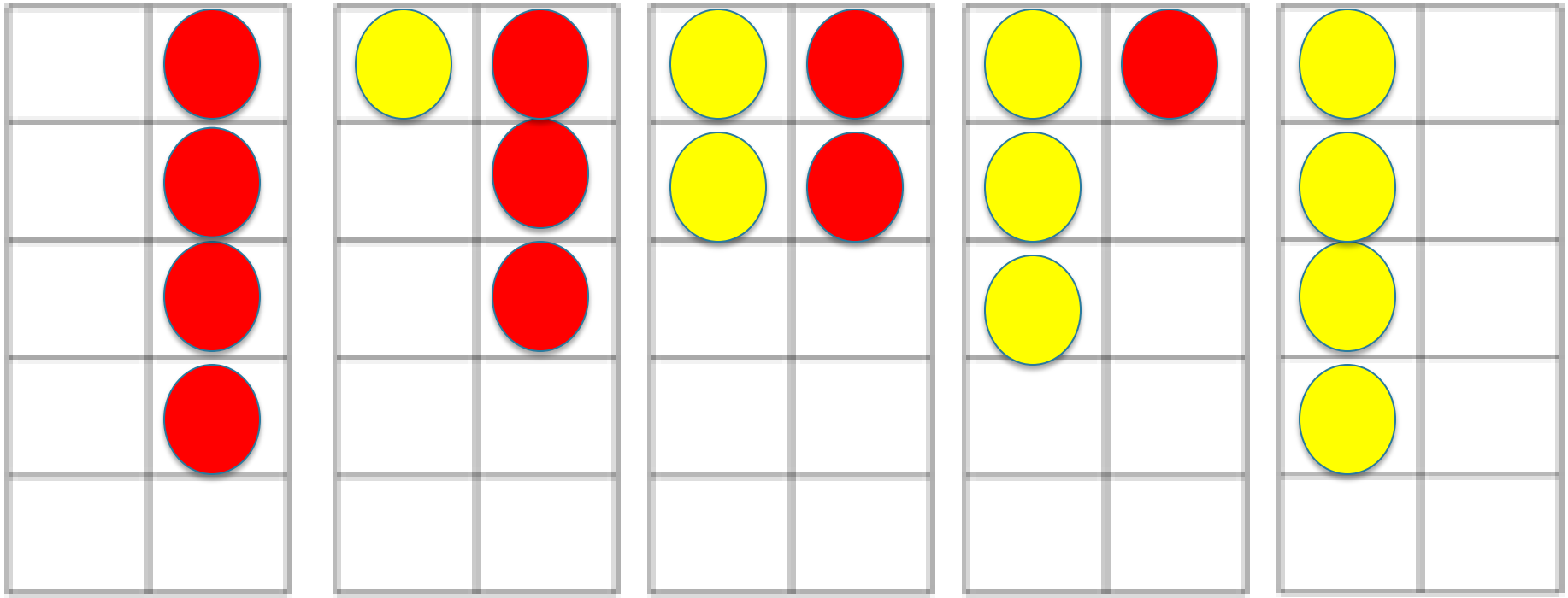
My friend has 4 pets…



0 + 4 1 + 3 2 + 2 3 + 1 4 + 0

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My friend has….

Ranger

Gracie

Max

Abby

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My friend has….a new pet

Ranger

Gracie

Max

Abby

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Practice

- Create the possibilities on ten frames using two color counters.
- What number sentences match the ten frames?
- Organize information into T-chart.

➢ Create an example of an open ended problem you students could solve on ten frames.

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Meet Lily

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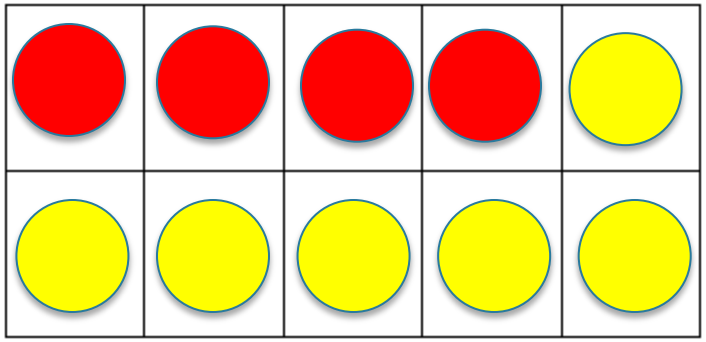
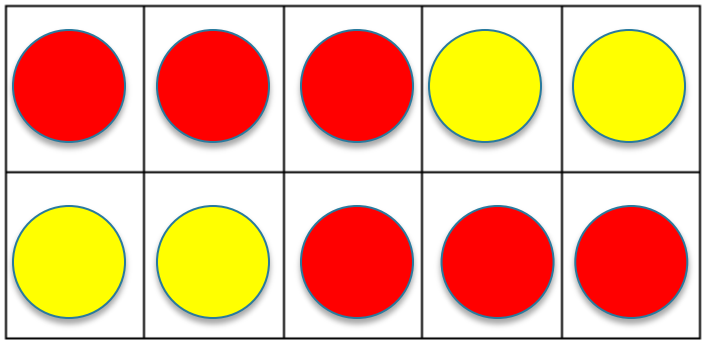
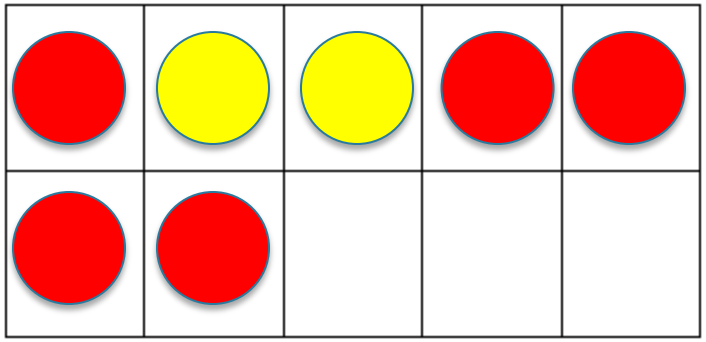
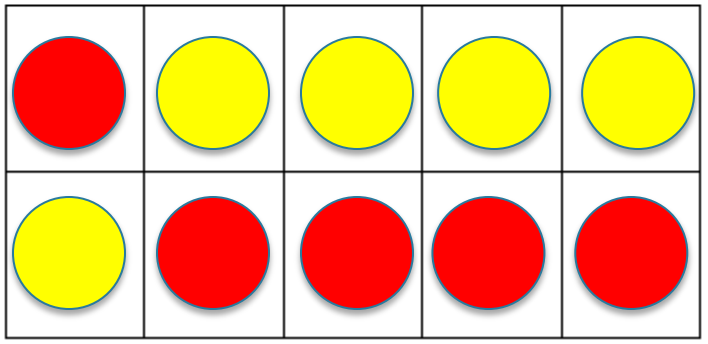
Race for 20









4 + 6 + 1 + 2 + 4

3 + 4 + 4 + 5 + 4

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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.

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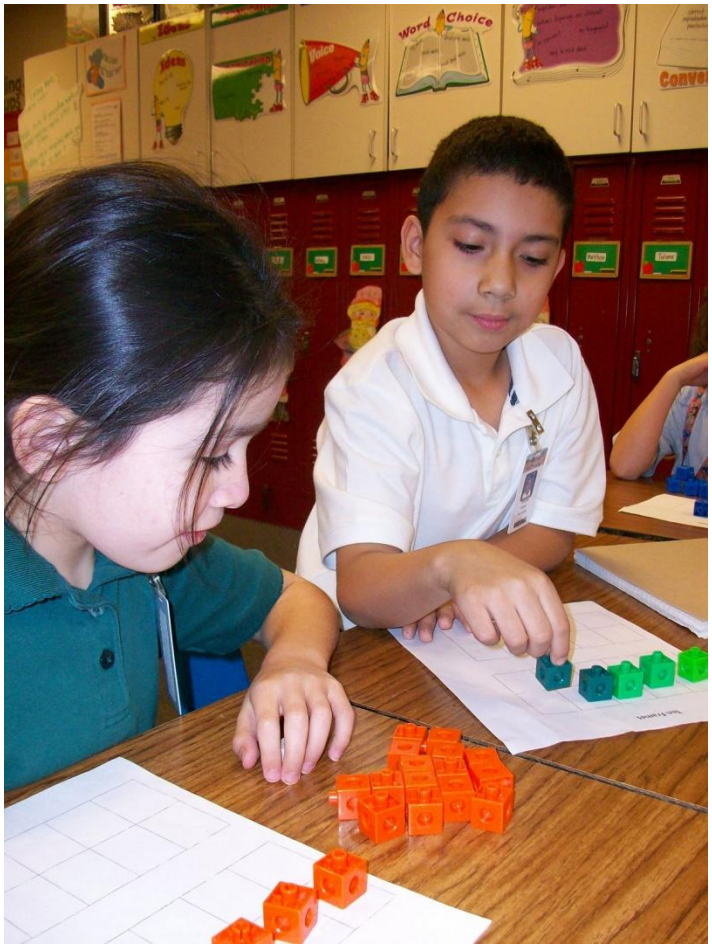
Options for the Game



- 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)

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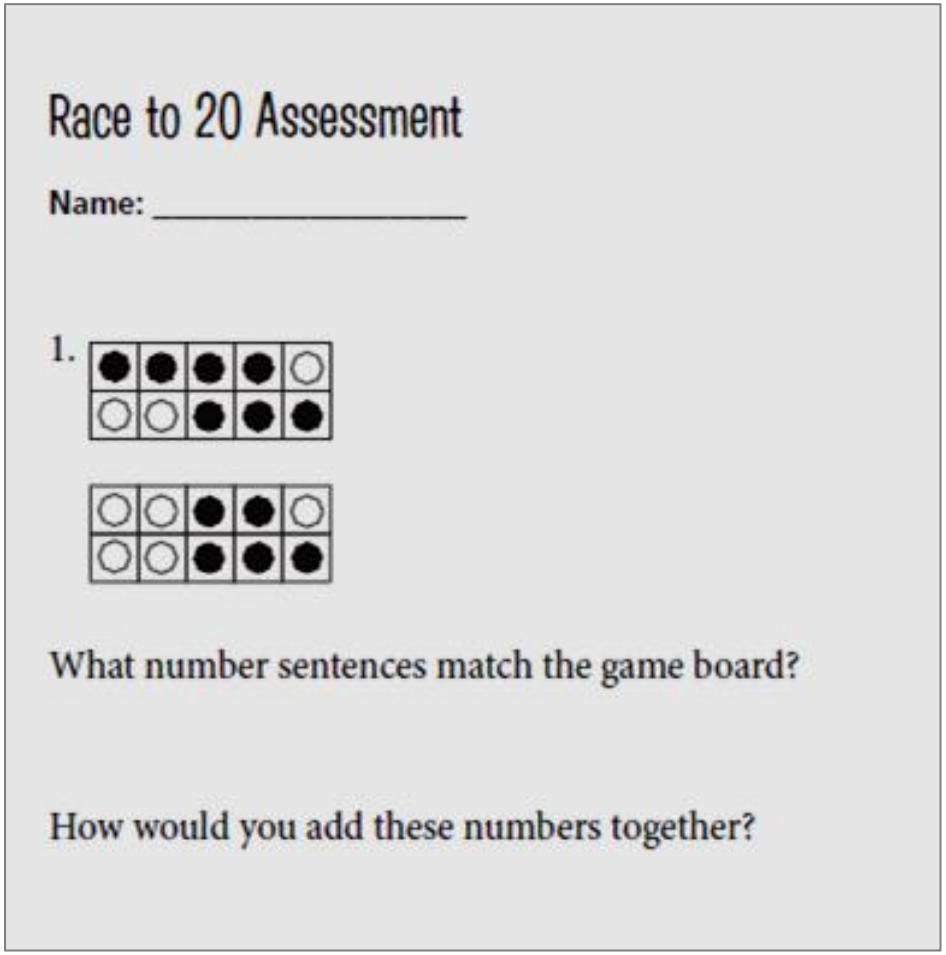
Assessing

Use previously played games to connect pictures to number sentences.



Race to 20 Assessment

Name: _____

1.

What number sentences match the game board?

How would you add these numbers together?

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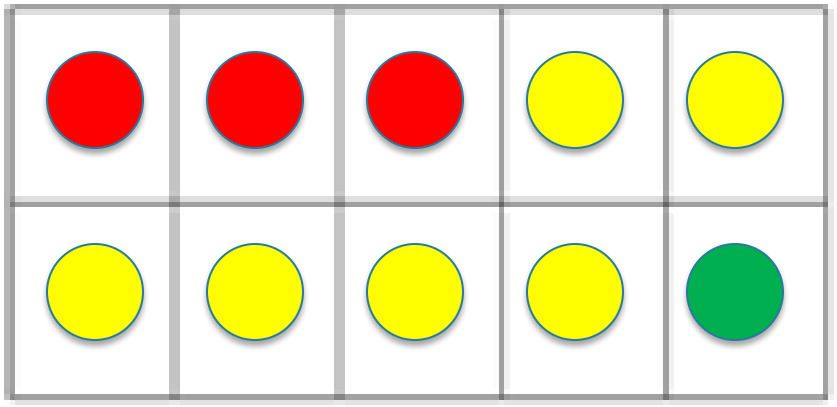
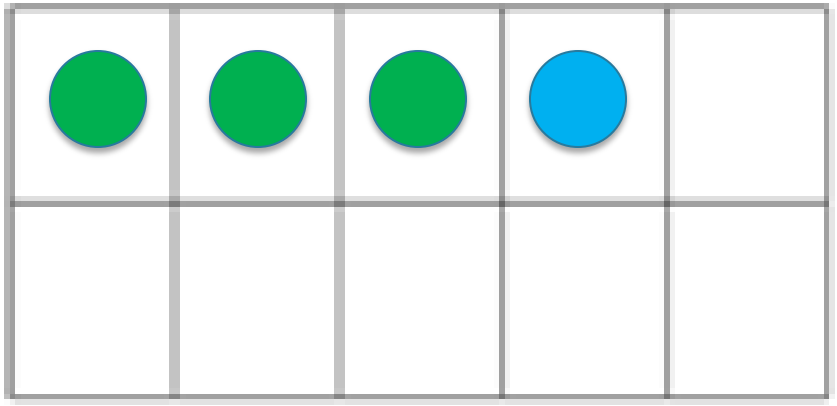
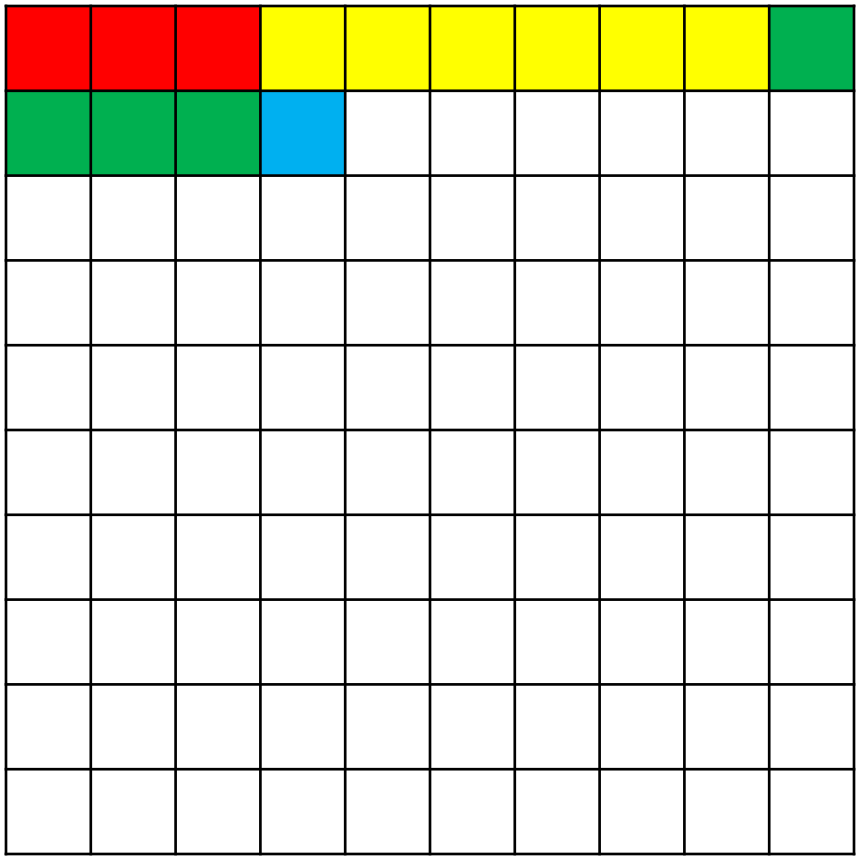
3+6+4+1=14 or 10+4=14







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http://commoncoretools.me/category/progressions

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