



POWER OF TEN—FRAMING STUDENTS' UNDERSTANDING

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mathsolutions.com/presentations



Subitizing

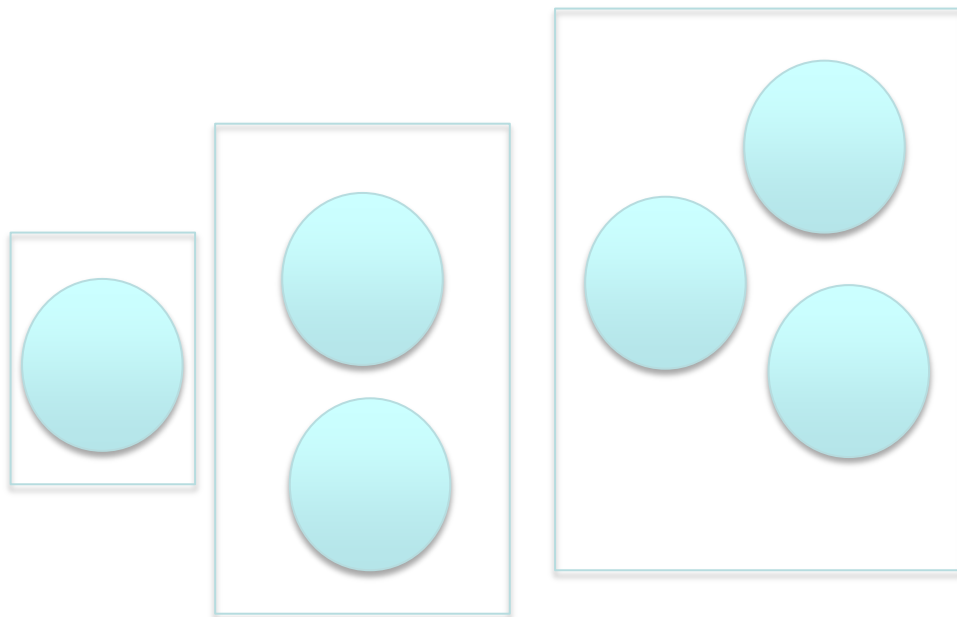
- ***What is Subitizing?*** (Turn and talk)
- The term is derived from the Latin adjective **subitus** (meaning "sudden") and captures a feeling of immediately knowing how many items lie within the visual scene
- **“instantly seeing how many”**

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





What did you see?

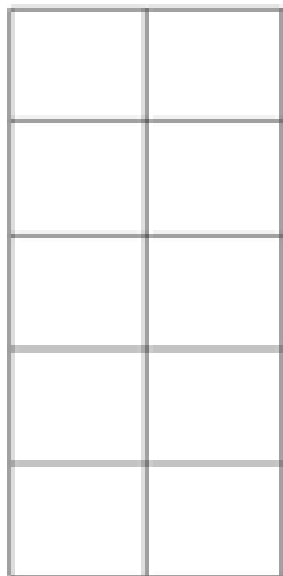
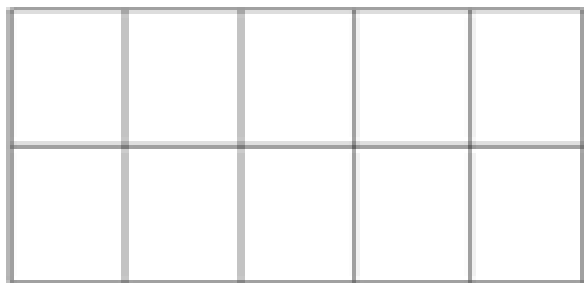
How did you see it?



Dot Arrangements



Ten Frames



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



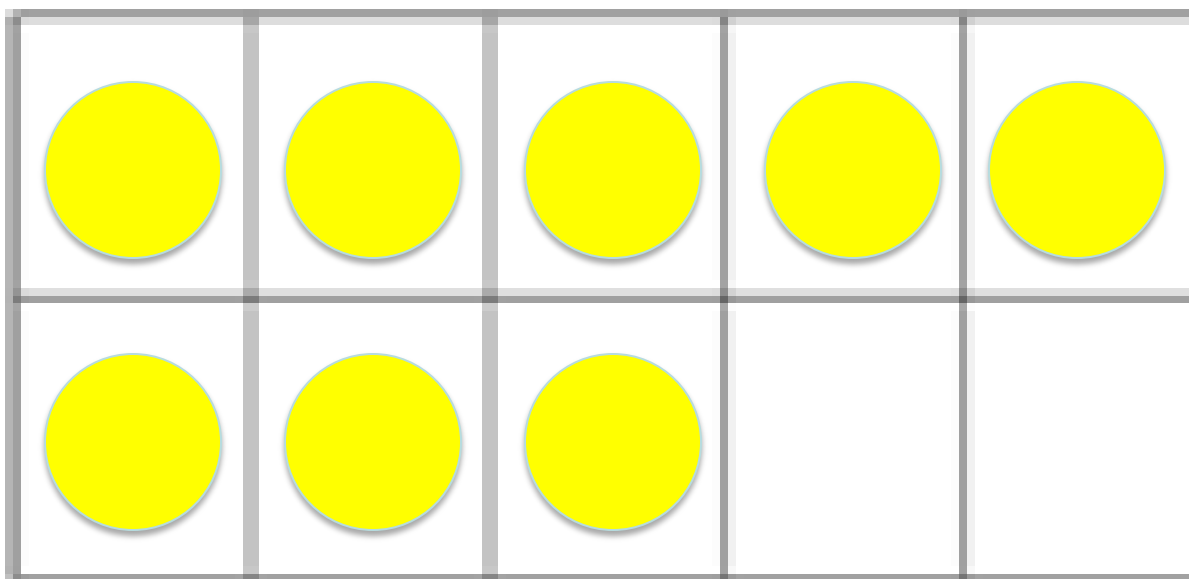
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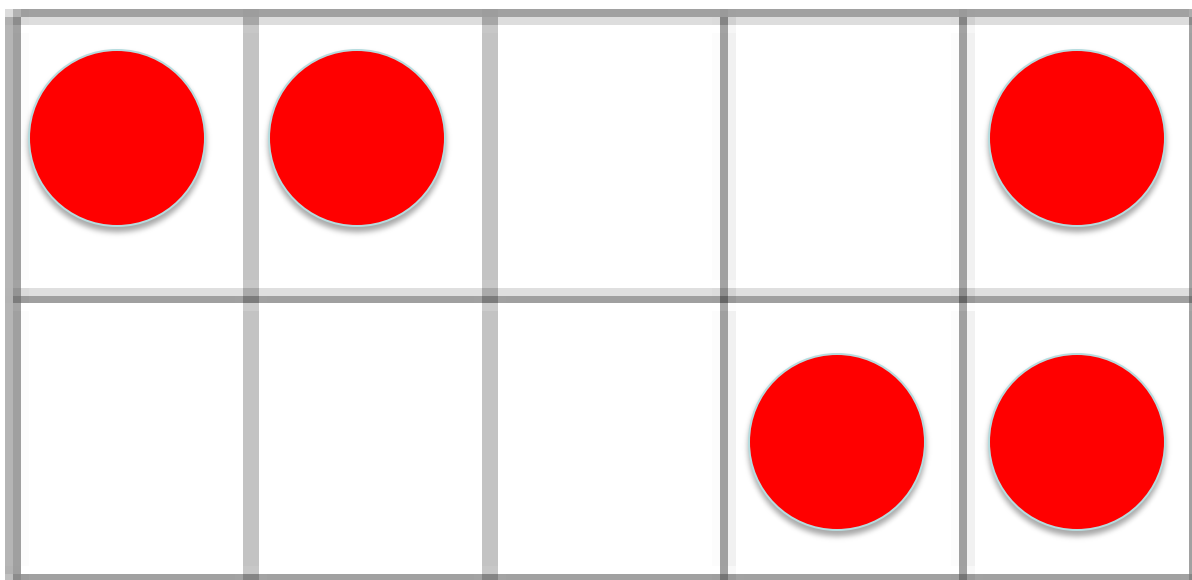
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**How many dots are in the ten—frame?
How did you figure it out?**





Build what you see.





Process Standards

Express Regularity in
Repeated **Reasoning**

MODEL WITH
Mathematics

Make Sense
of Problems &
Persevere

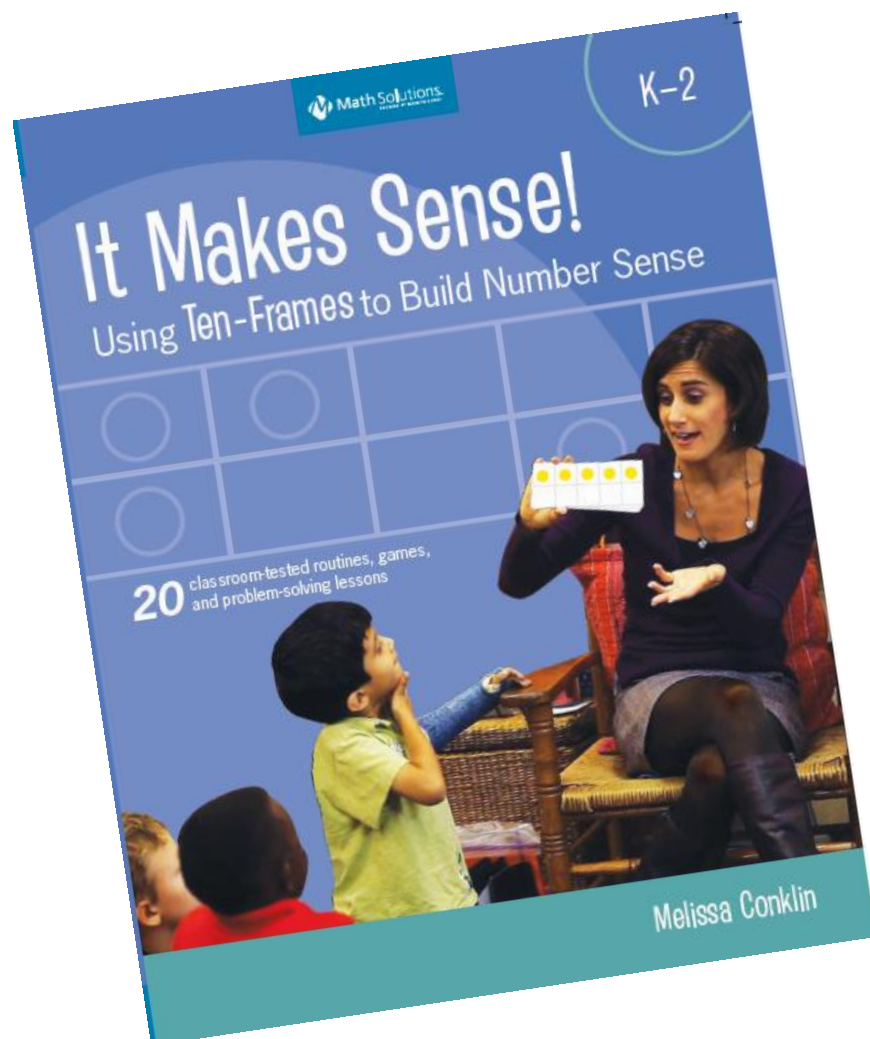
Use **Appropriate** Tools

Look for &
Make Use of
Structure

Reason Abstractly &
Quantitatively

Attend to
Precision

CONSTRUCT
Viable
Arguments



Ten Frames



Riddles



Riddles

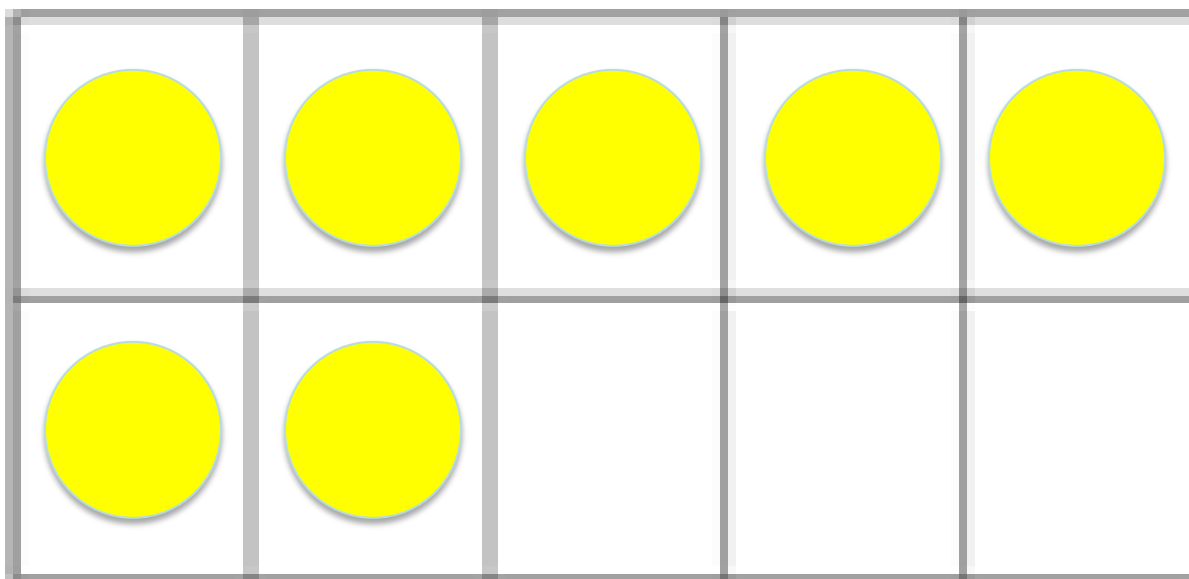
My ten—frame has fewer than 9 counters.

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.

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



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



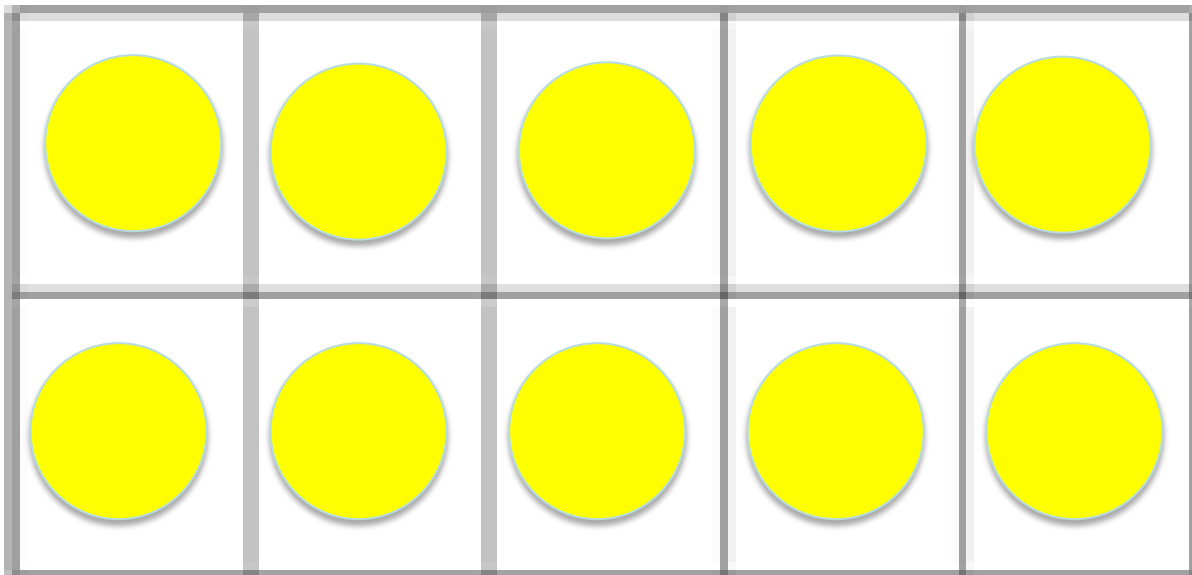
Riddles Using a Double Ten—Frame

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?

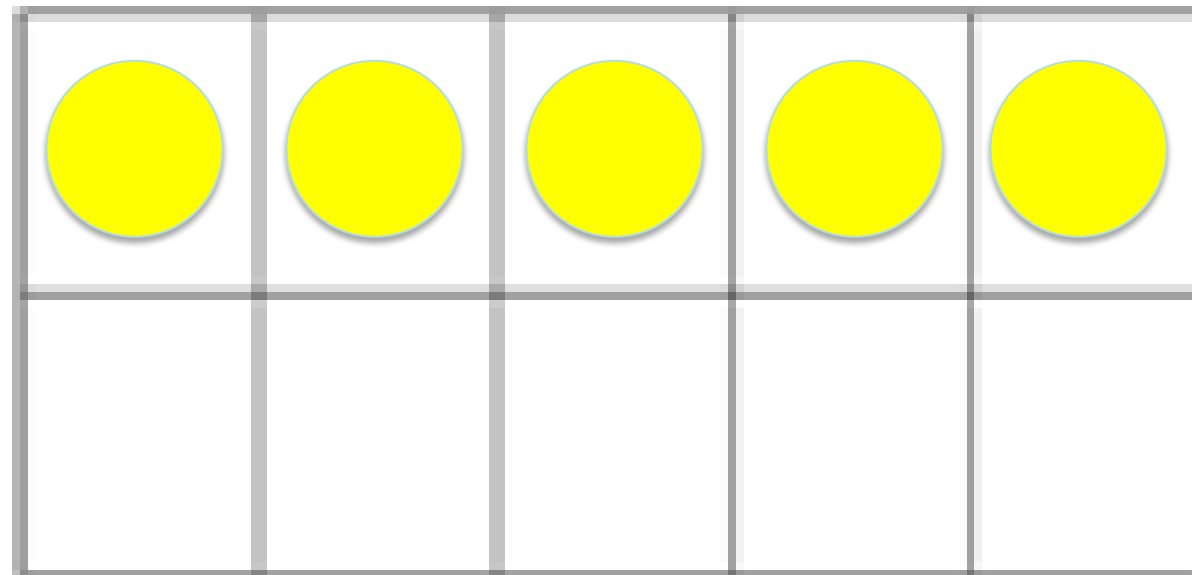
$$15 > 8$$

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.



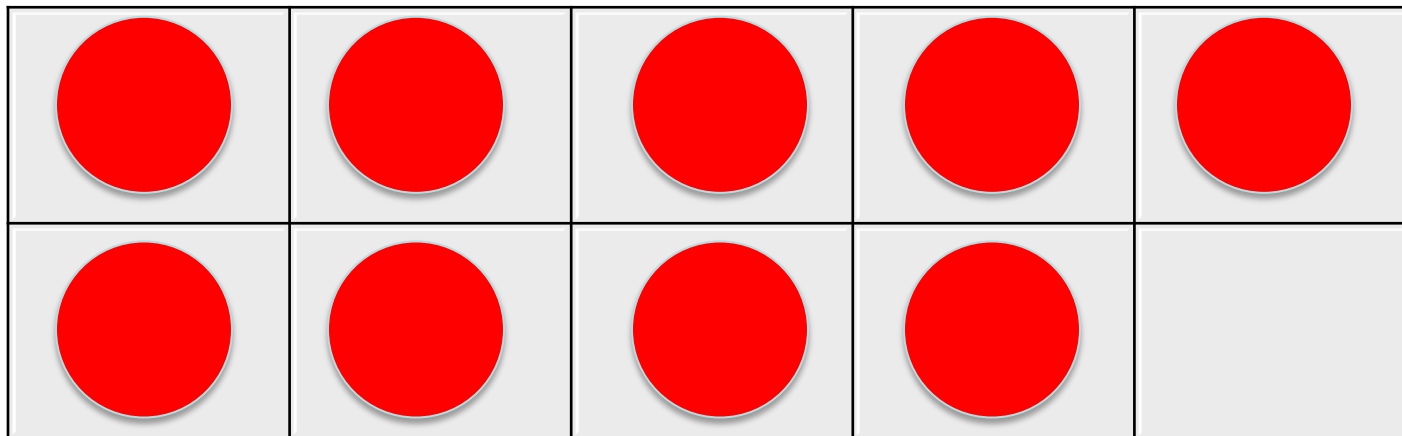
Basic Facts

“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.

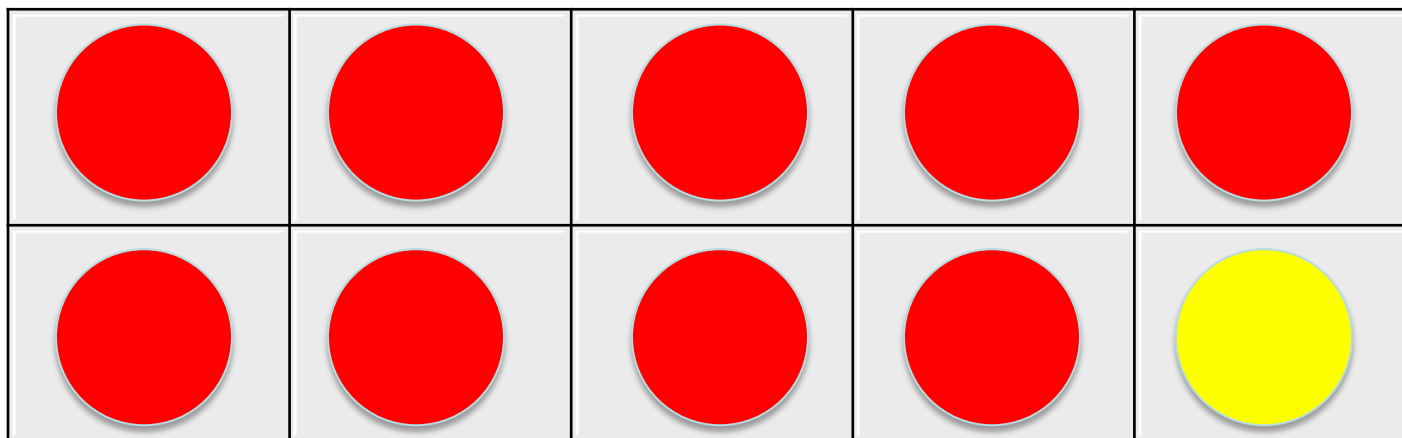
Suzanne Chapin Math Matters p. 43




$$9 + 4$$



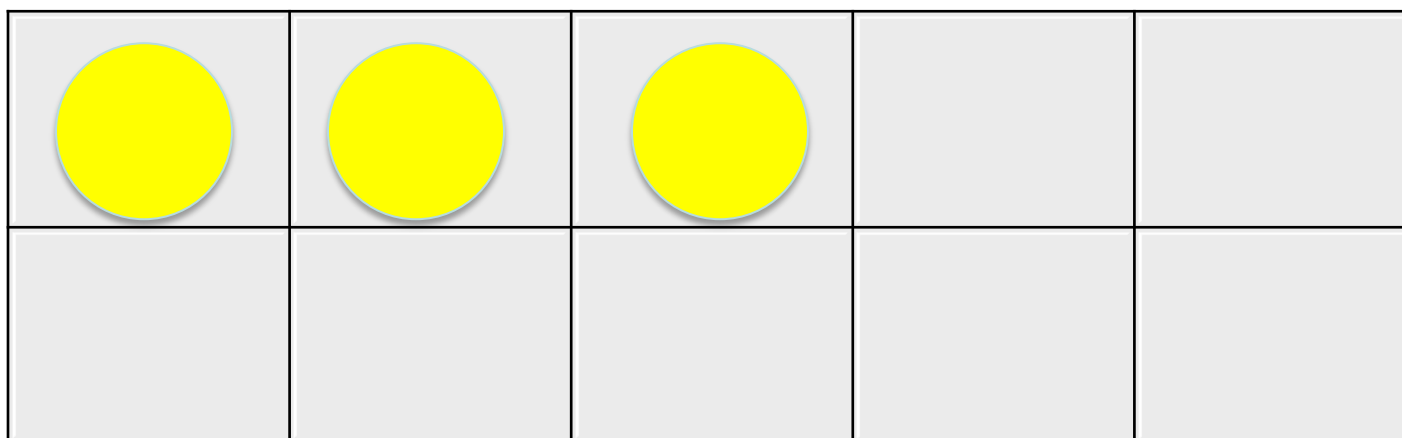
$$9 + 4 = 10 + 3$$



$$9 + 4$$

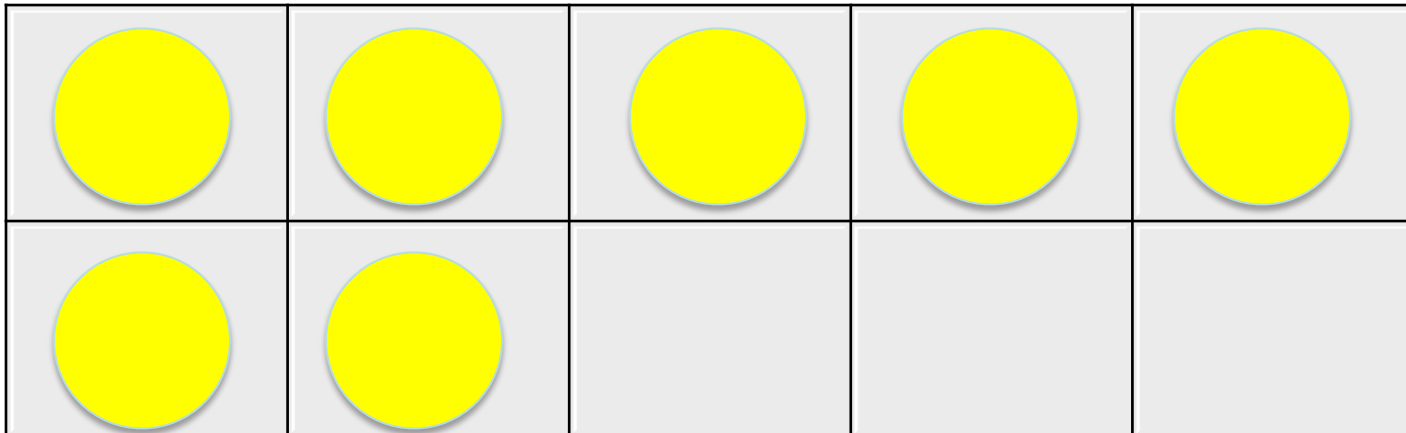
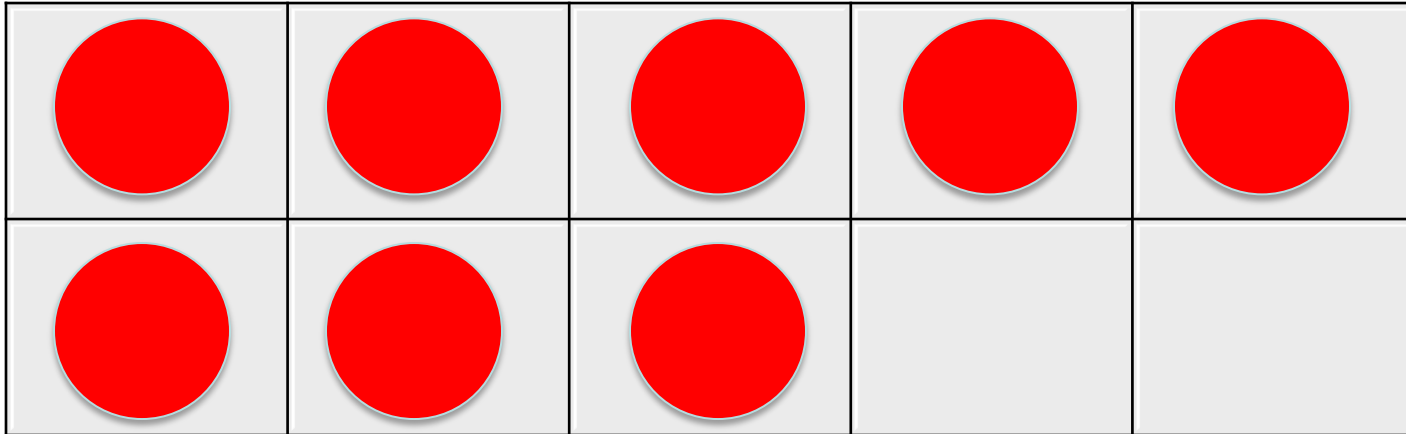


$$1 + 3$$



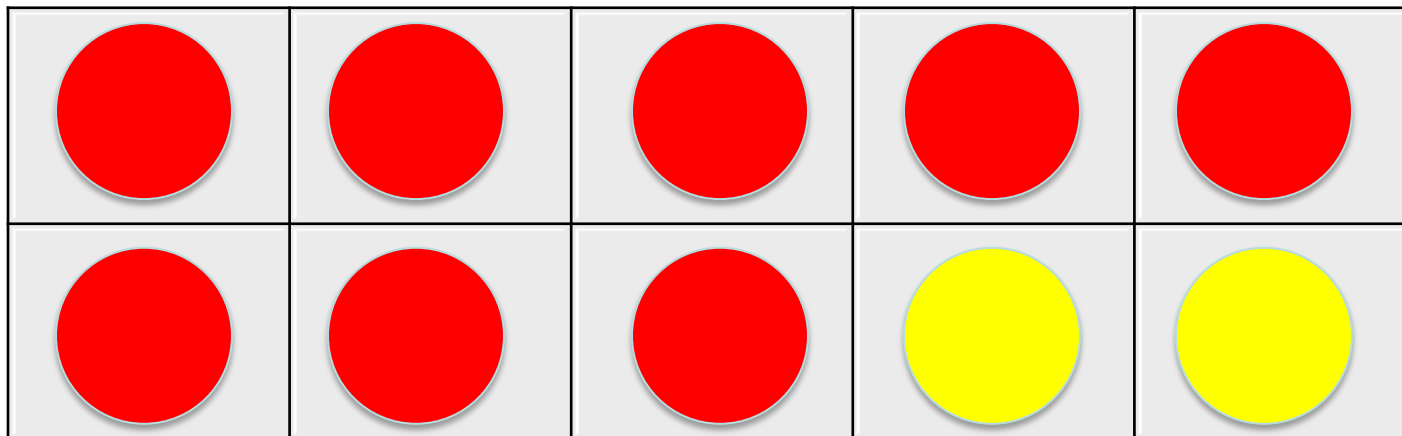


$$8 + 7$$

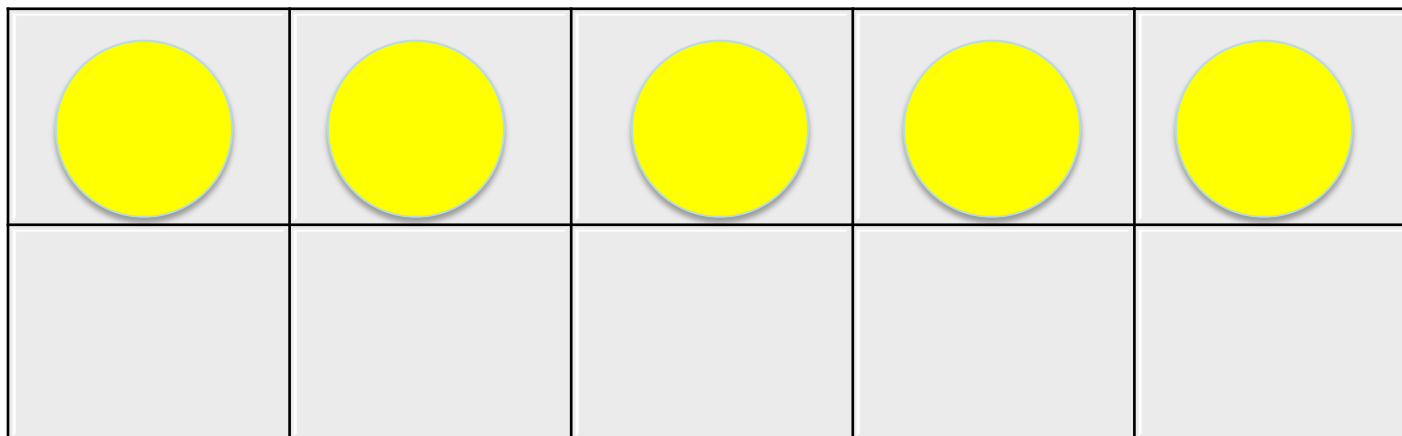




$$8 + 7 = 10 + 5$$



$$\begin{array}{r} 9 + 6 \\ 1 + 5 \end{array}$$





How does making a ten help
you solve:

$$19 + 16 =$$

$$18 + 27 =$$



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?





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?

I have 4 pets...

$$1 + 3$$

$$2 + 2$$

$$4 + 0$$

$$3 + 1$$

$$0 + 4$$



I have 4 pets...

$$2 + 2$$

$$1 + 3$$

$$4 + 0$$

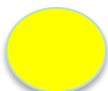
$$3 + 1$$

$$0 + 4$$

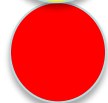
cats	dogs
0	4
1	3
2	2
3	1
4	0



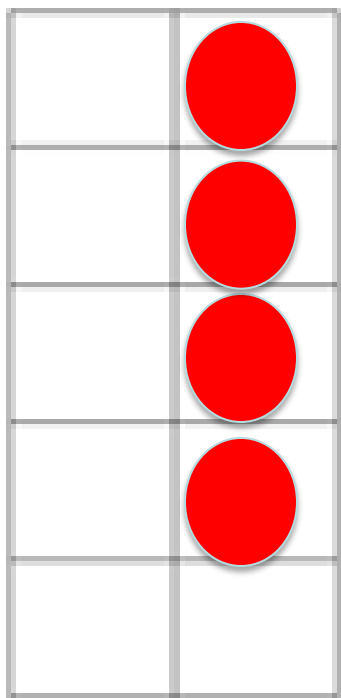
Cats



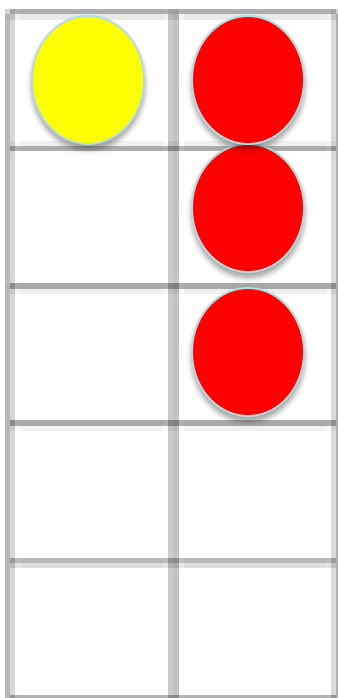
Dogs



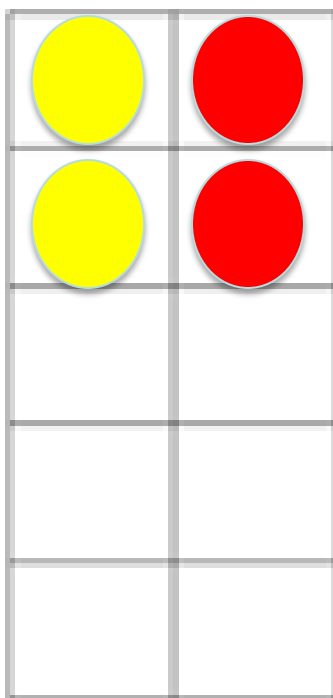
I have 4 pets...



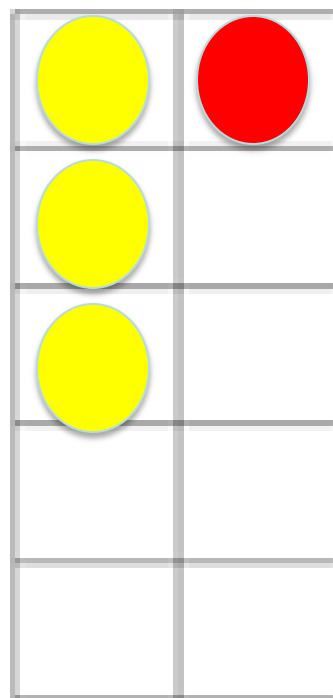
$$0 + 4$$



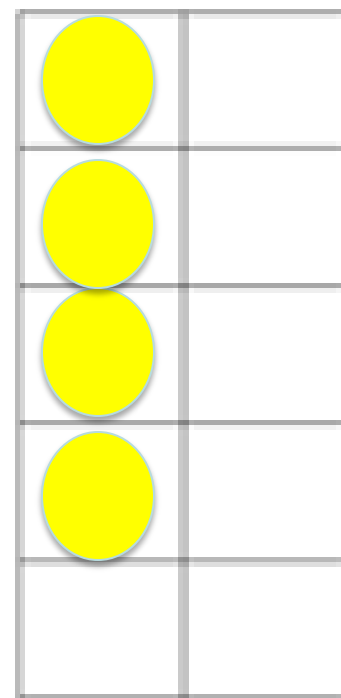
$$1 + 3$$



$$2 + 2$$



$$3 + 1$$



$$4 + 0$$

I have....



Ranger



Gracie



Max



Abby

I have....a new pet



Ranger



Max



Gracie



Abby



Practice

Create the possibilities on ten frames using two color counters.

What number sentences match the ten frames?

Organize information into T-chart.



Meet Lily

**Create an
example of an
open ended
problem your
students
could solve
on ten frames.**



Ashley with Mackenzie





Mathematical Practices

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

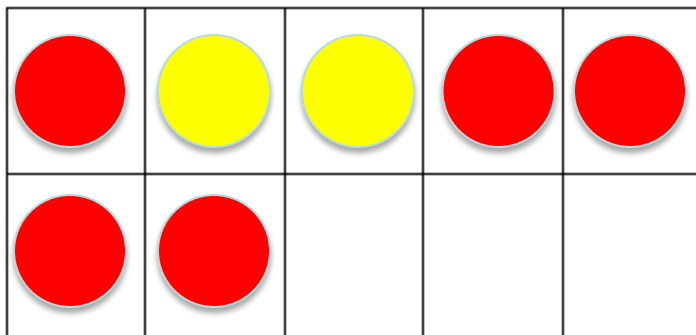
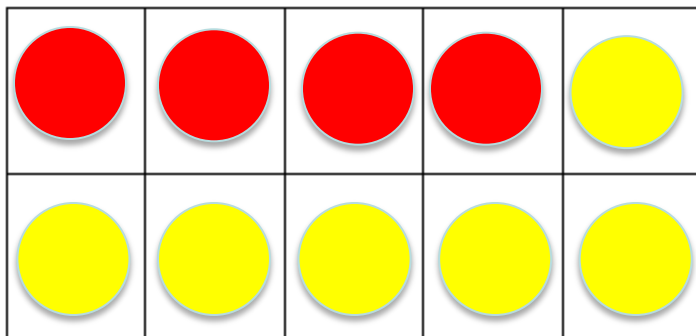
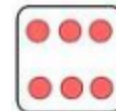
Attend to precision

Look for and make use of structure

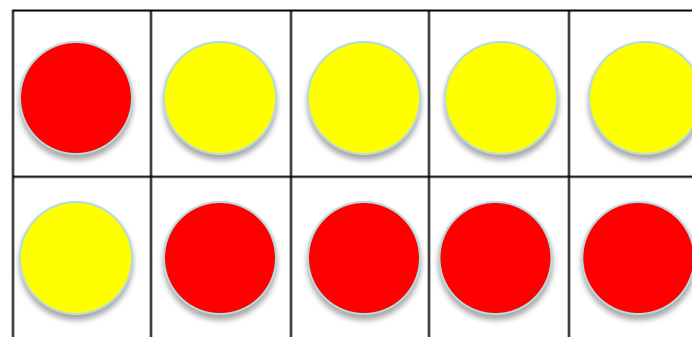
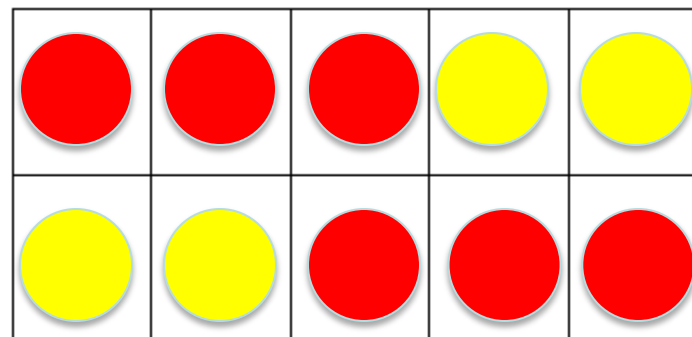
Look for and express regularity in repeated reasoning



Race for 20



$$4 + 6 + 1 + 2 + 4$$



$$3 + 4 + 4 + 5 + 4$$



Race to 20

Decide who will go first.

Roll the die.

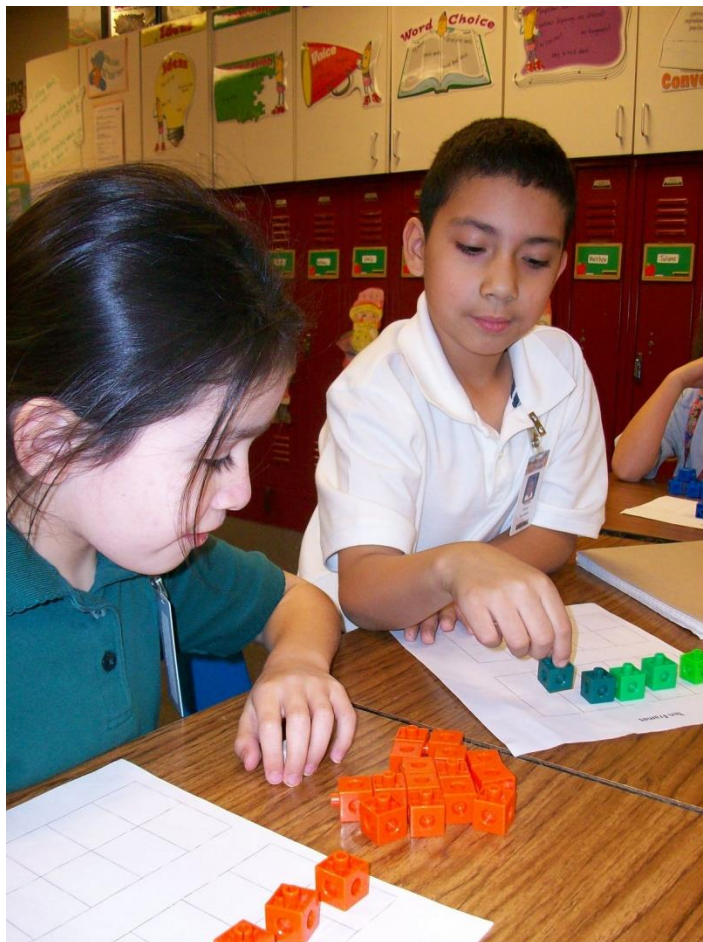
Using two color counters, mark the amount you rolled. Remember to switch colors each round.

Play until someone reaches or goes over 20.

Practice asking questions as you play.

Record your number sentences.

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.

Race to 20 Assessment

Name: _____

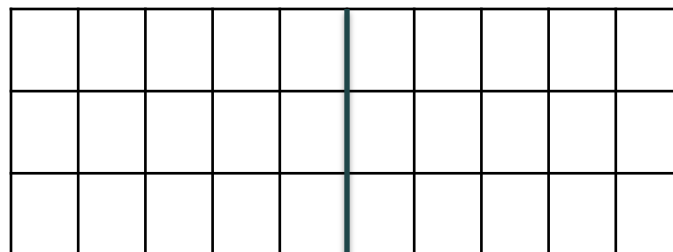
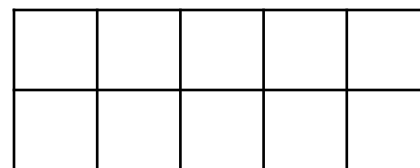
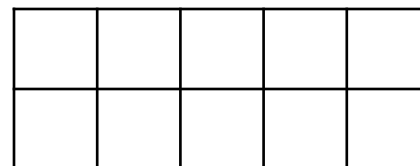
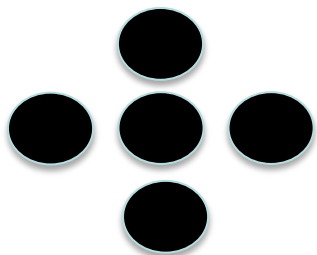


What number sentences match the game board?

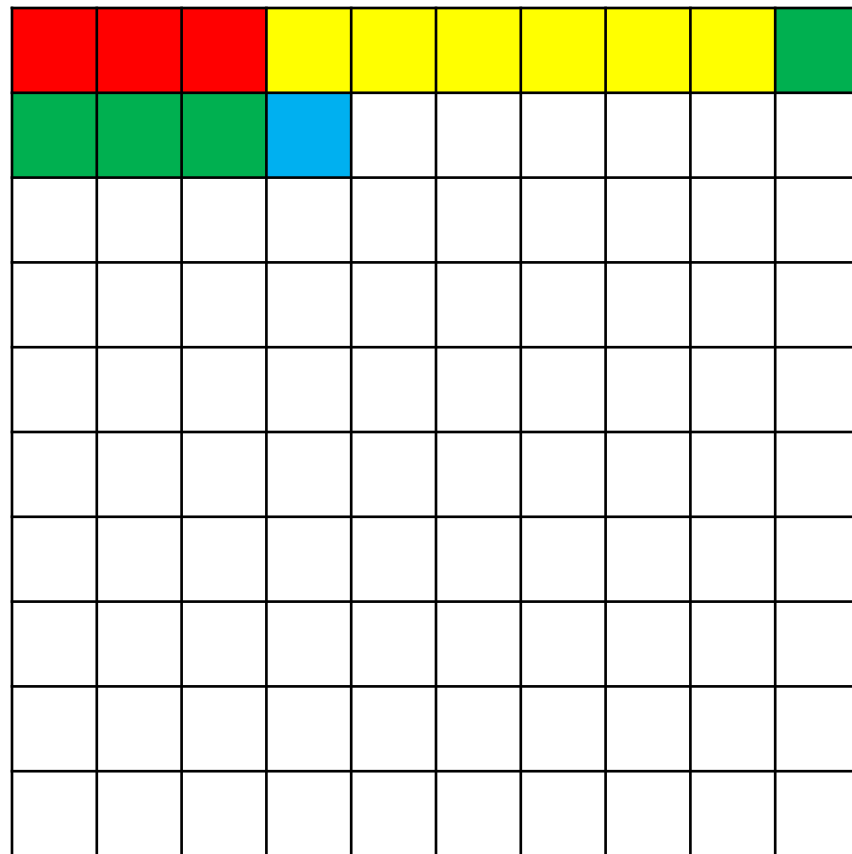
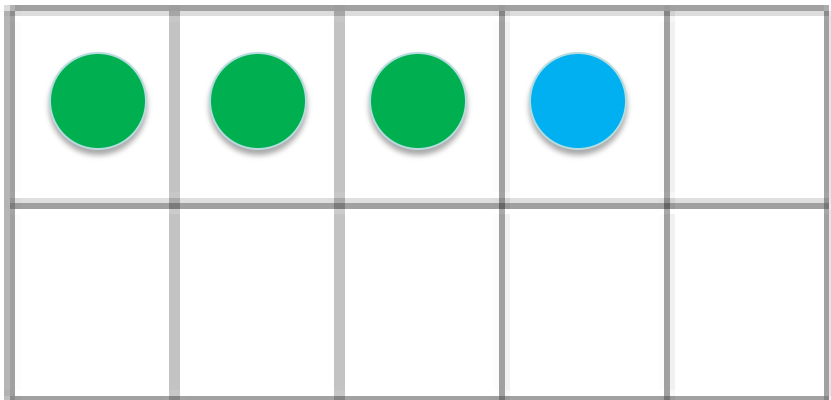
How would you add these numbers together?



Progression



or $10+4=14$





THANK YOU!

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Race for 20

Ten-Frames

