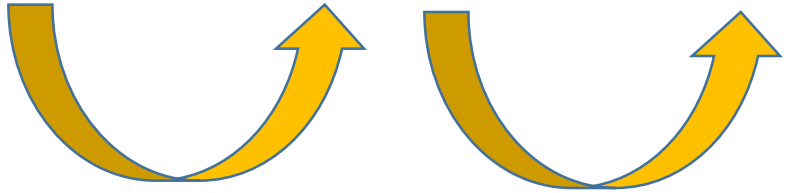


*Addition & Subtraction  
Conceptual Progress  
Sort Cards*



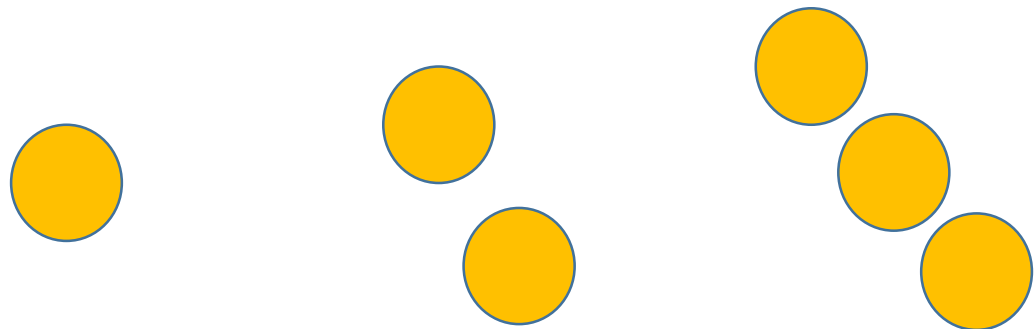
"One, two, three..."



"There are  
three bears"



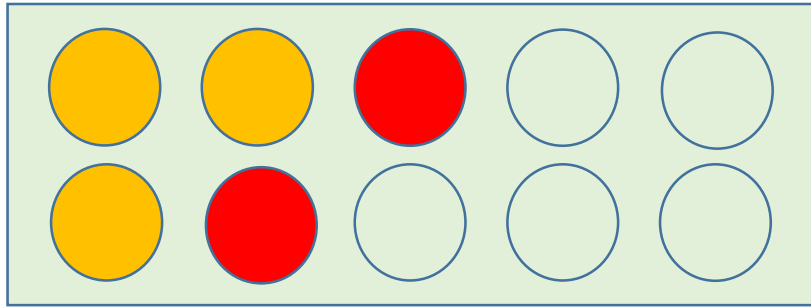
"One, two, three..."



1

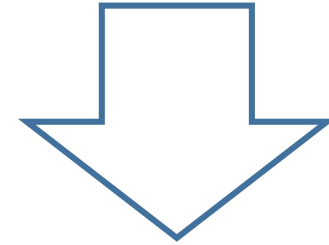
2

3

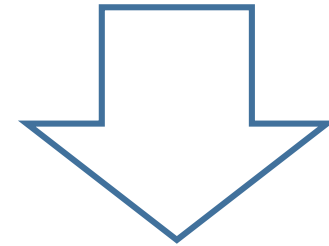


$$3 + 2 = 5$$

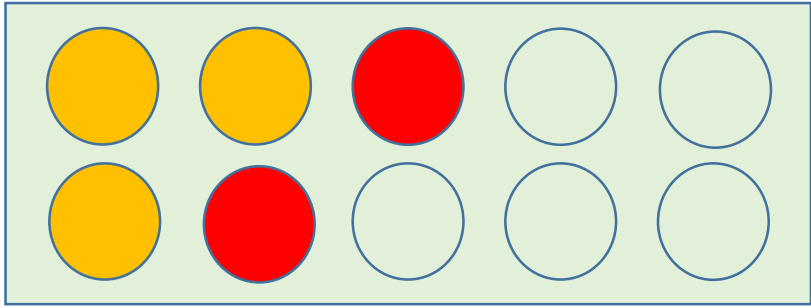
Concrete



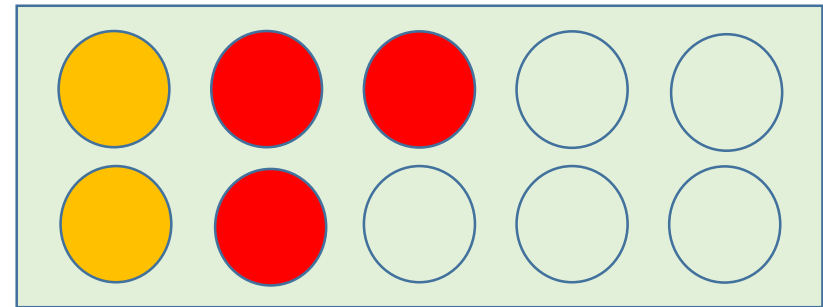
Pictorial



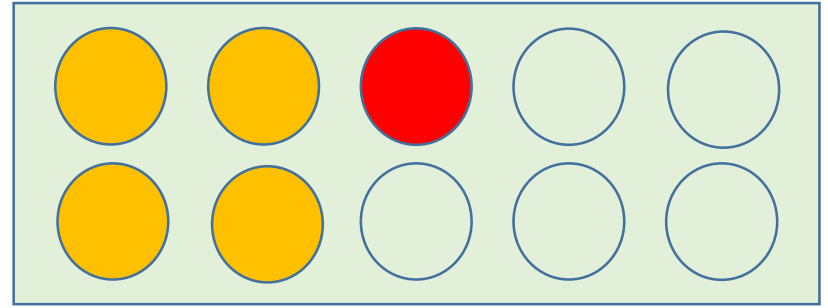
Abstract



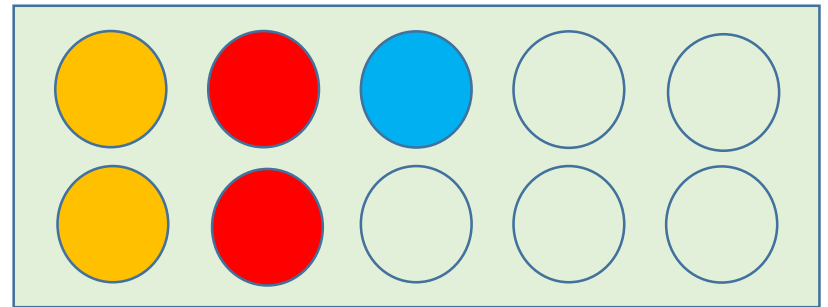
$$3 + 2 = 5$$



$$2 + 3 = 5$$

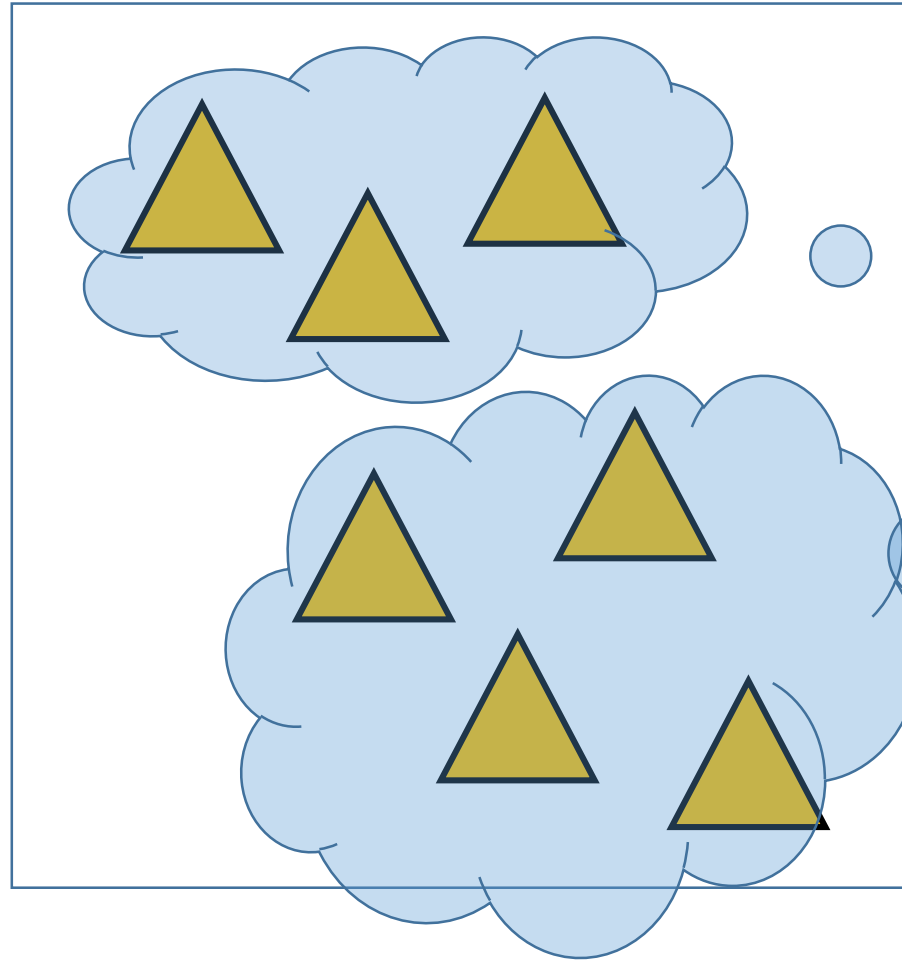
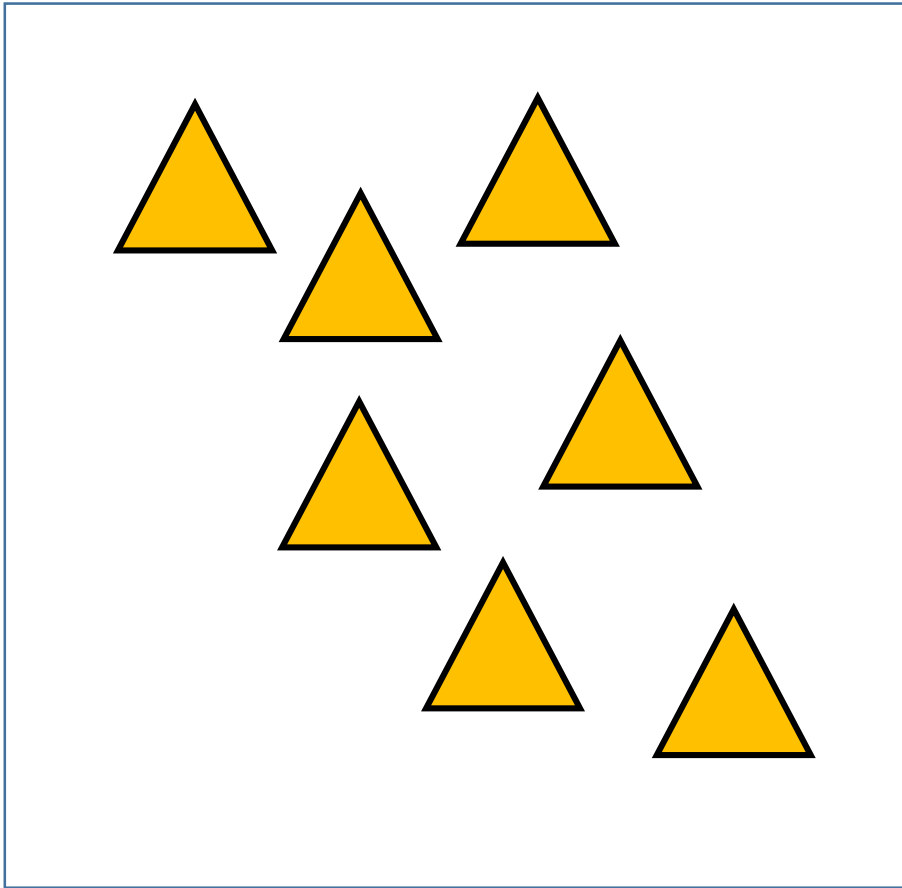


$$4 + 1 = 5$$



$$2 + 2 + 1 = 5$$

# Developing mental “counting” skills through addition of small “subitized” amounts



e.g.

3

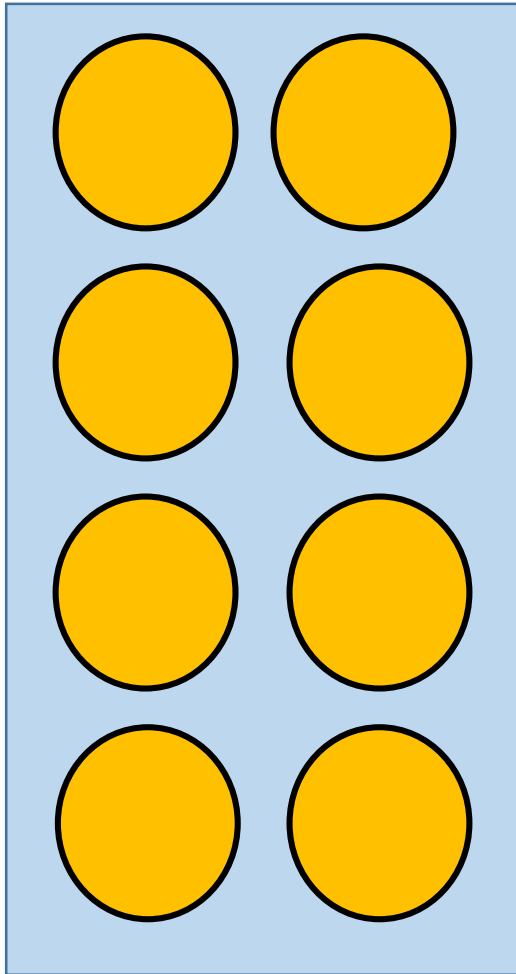
+

4

=

7

Use “make & break” to create equivalent number sentences



$$4 + 4 = 8$$

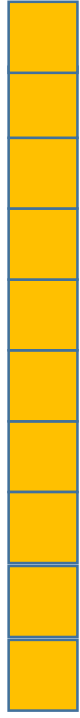
$$(2 + 2) + 4 = 8$$

$$2 + (2 + 4) = 8$$

$$2 + 6 = 8$$



10



10



23

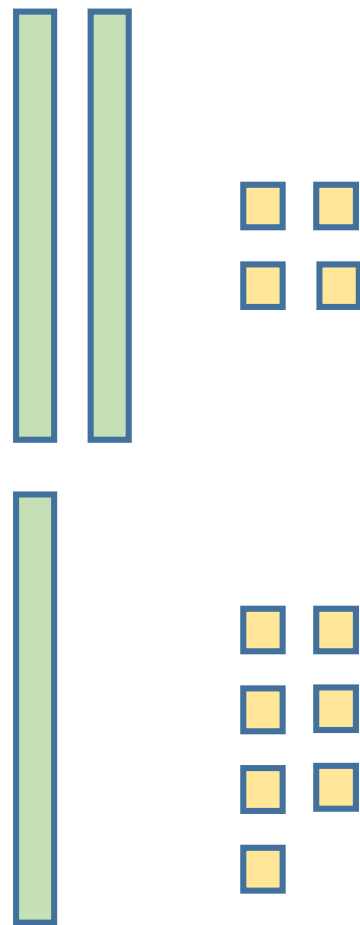


17



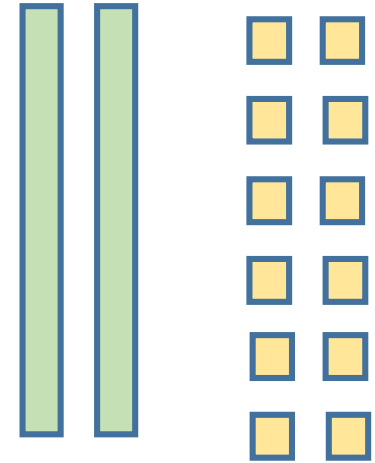
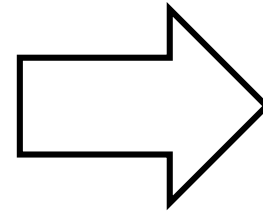
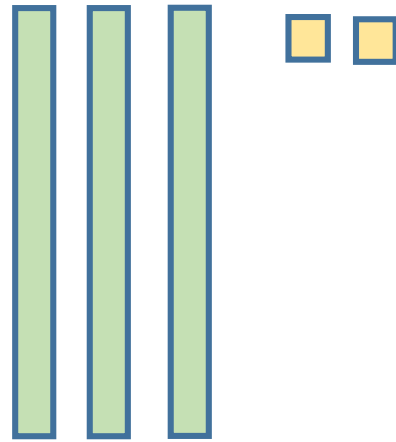
# Develop column addition using manipulatives to scale

$$\begin{array}{r} 24 \\ + 17 \\ \hline 41 \end{array}$$



# Develop column subtraction using manipulatives to scale

$$\begin{array}{r} \overset{2}{\cancel{3}} \overset{1}{2} \\ - 14 \\ \hline \end{array}$$



Write numerical sentences to describe a situation

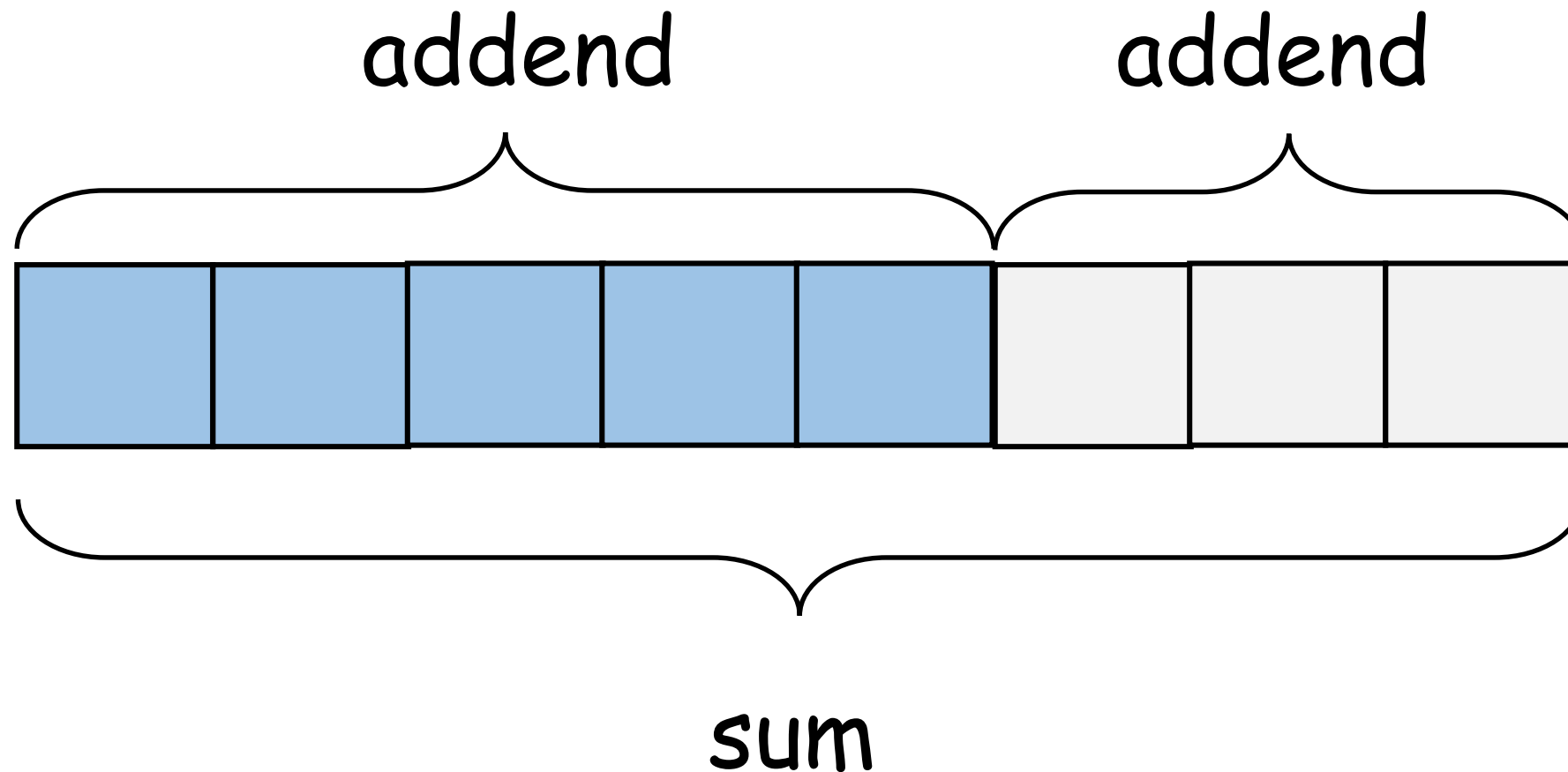


$$3 + 2 = 5$$

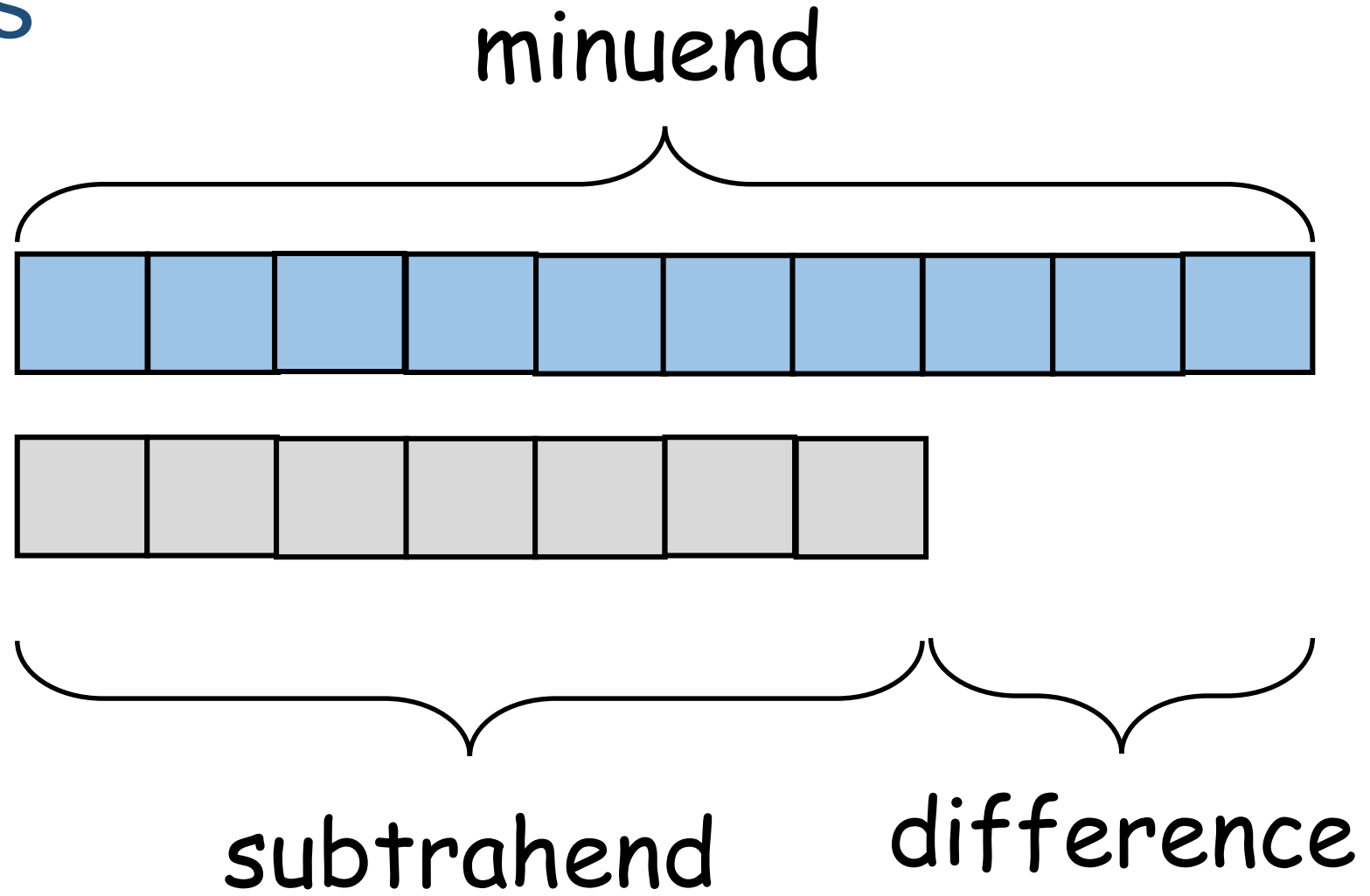


$$47 - 35 = 12$$

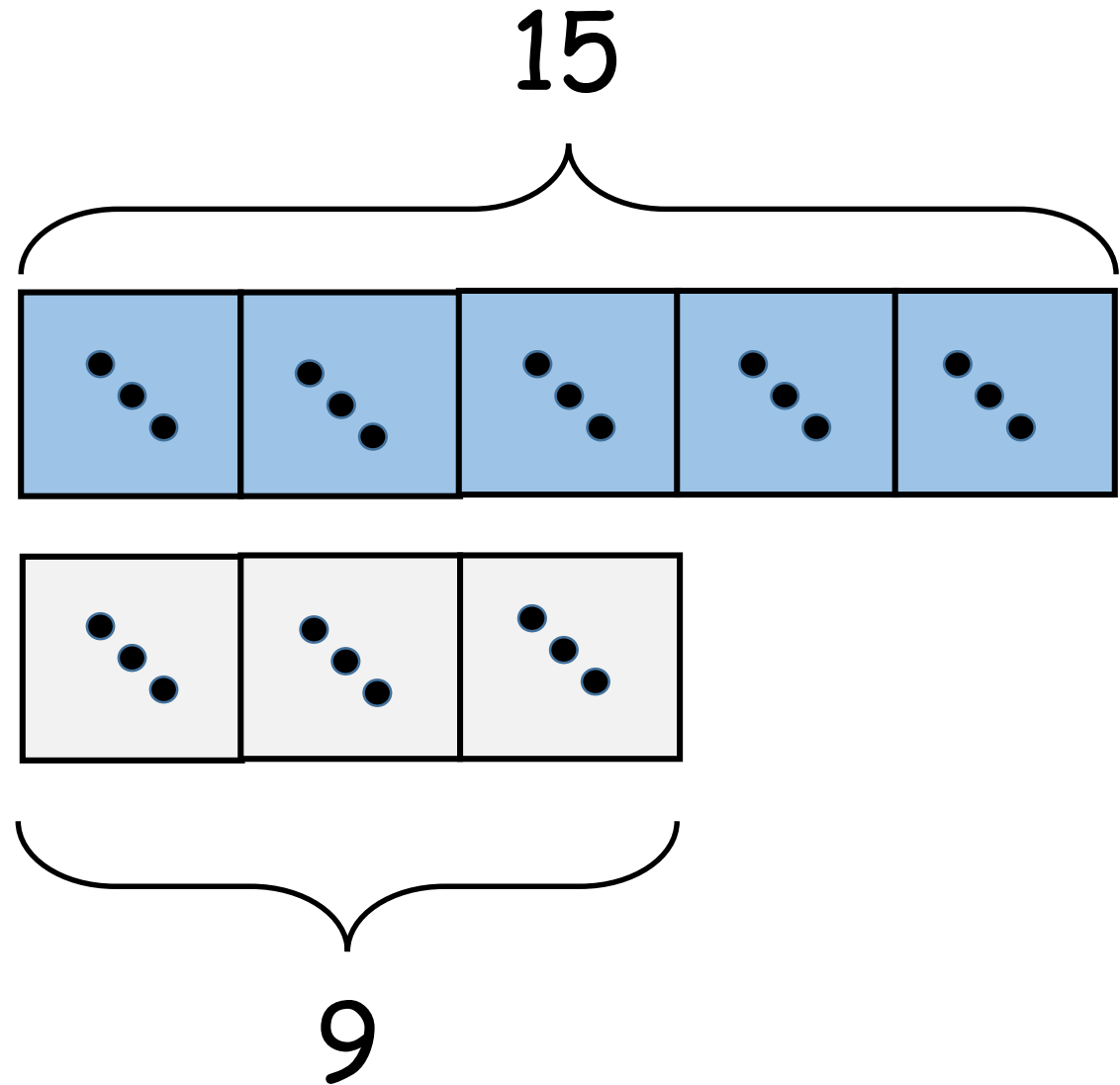
# Using precise language in combination diagrams



# Using precise language in comparison diagrams



Use boxes to represent more than one object



# Count number of objects



"One, two,  
three cars."

# Subitizing small amounts



"Three cars."



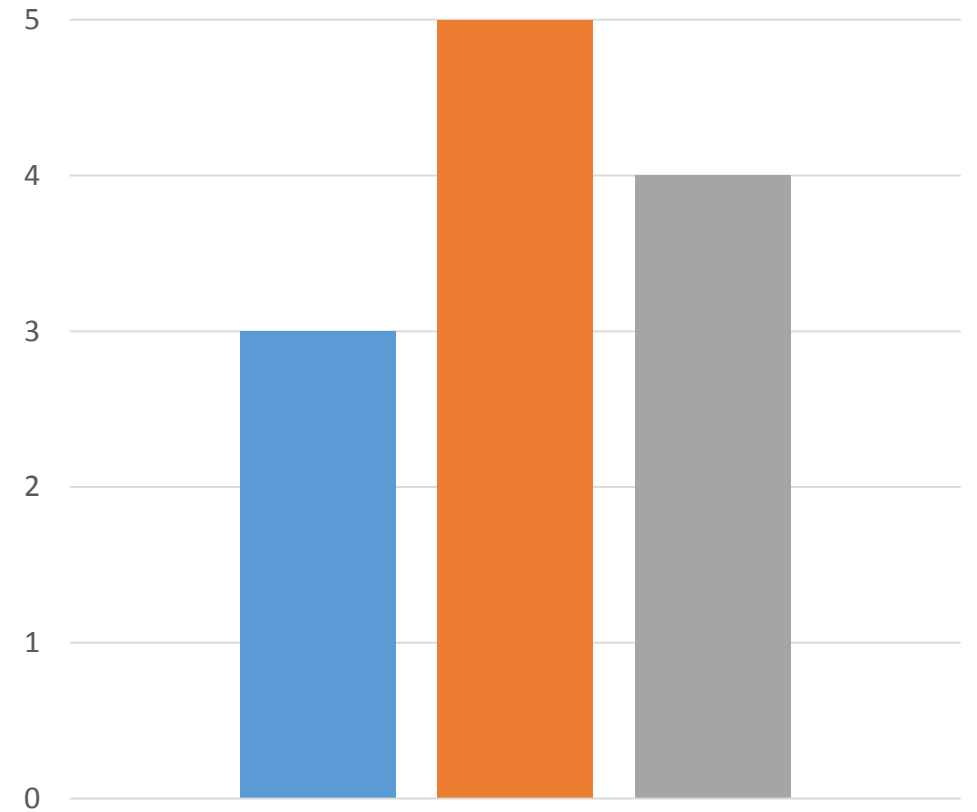
Line them up to count & compare



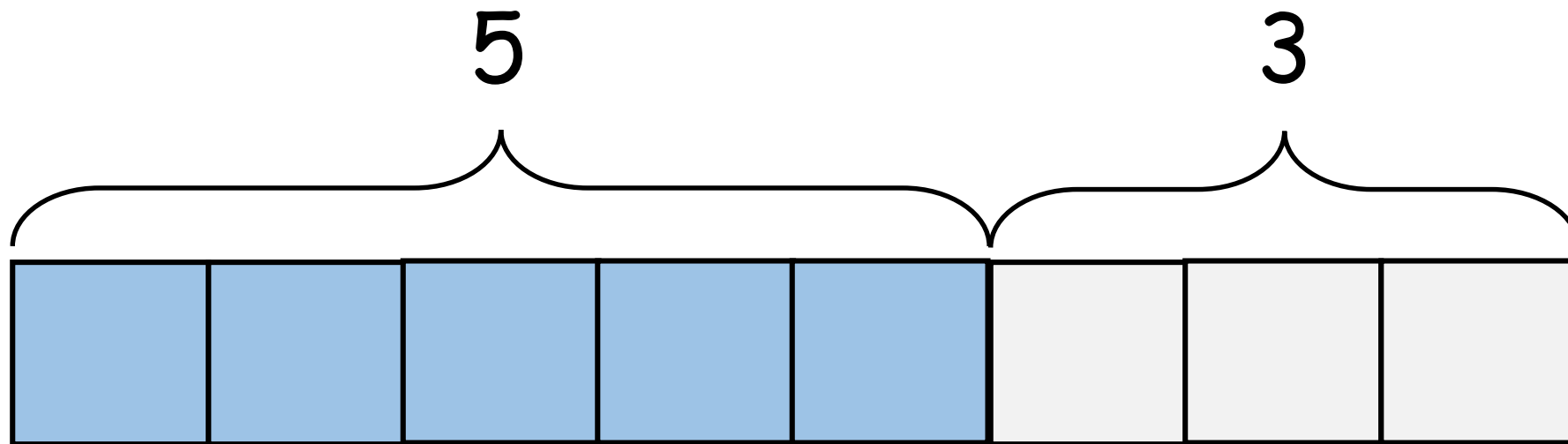
# Put boxes around pictures



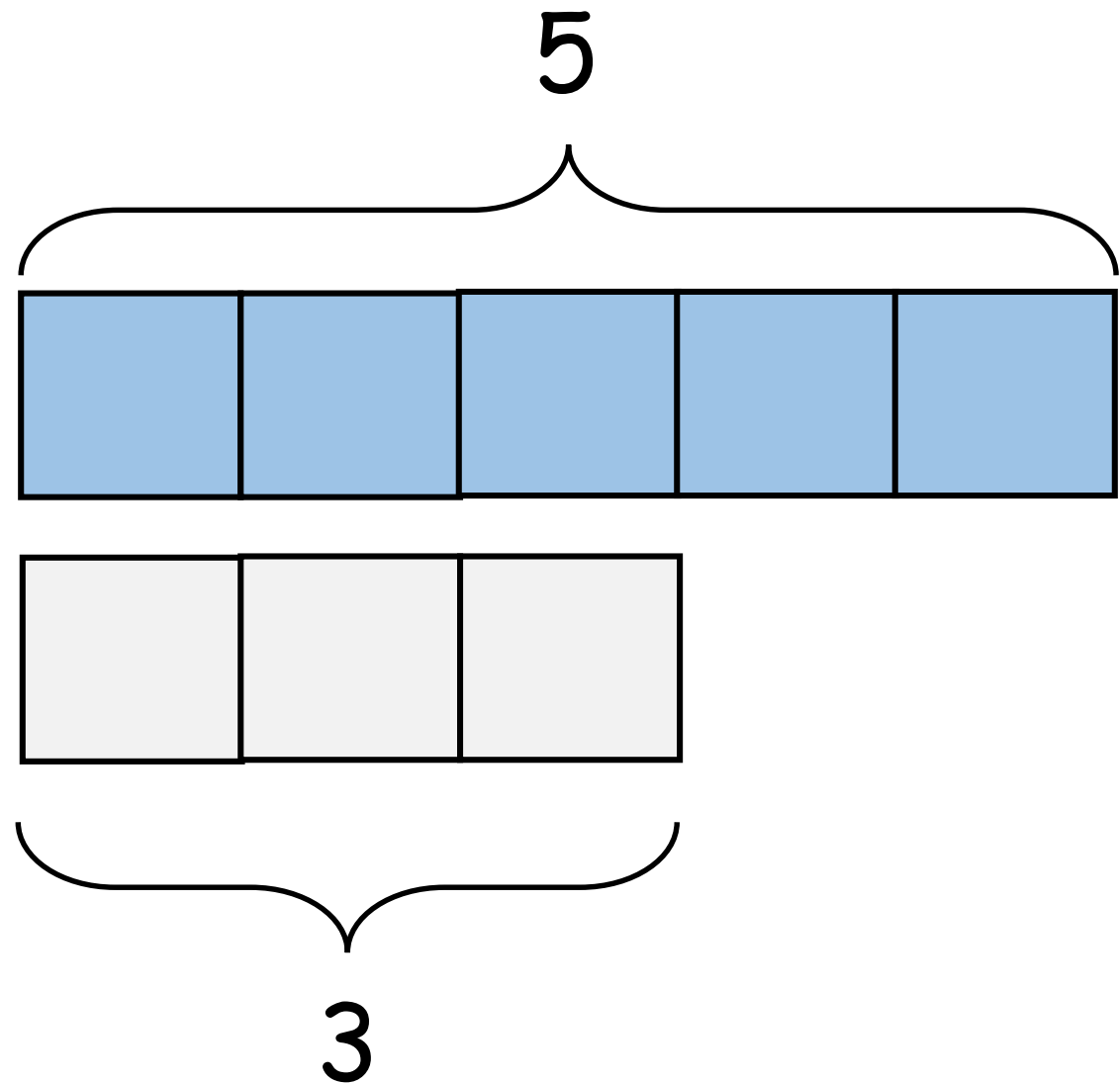
# Use one to one representation of objects eg boxes & tally



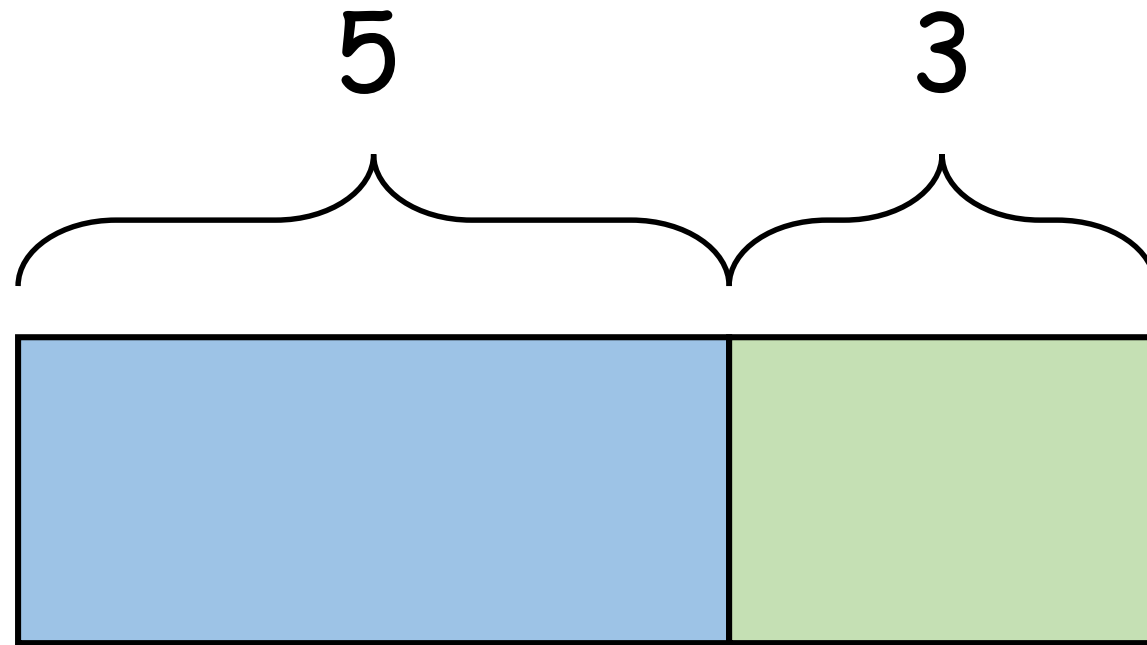
Use different coloured boxes to represent the sum of different amounts



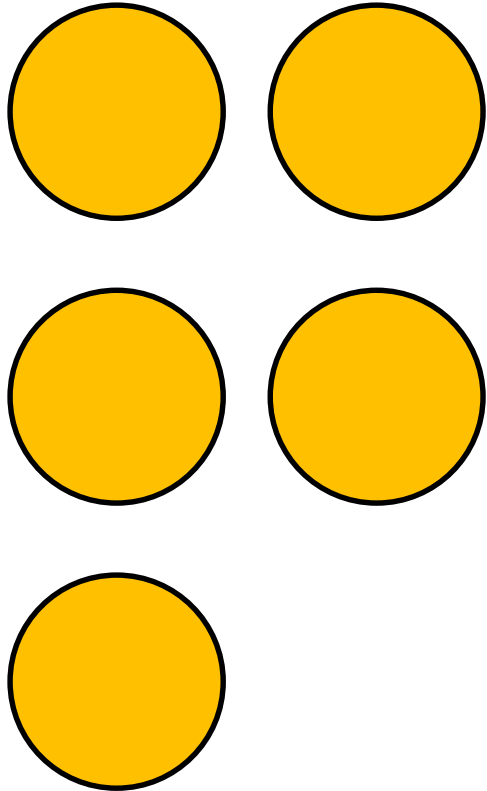
Use different coloured boxes to compare different amounts



Use different sized boxes to represent different amounts

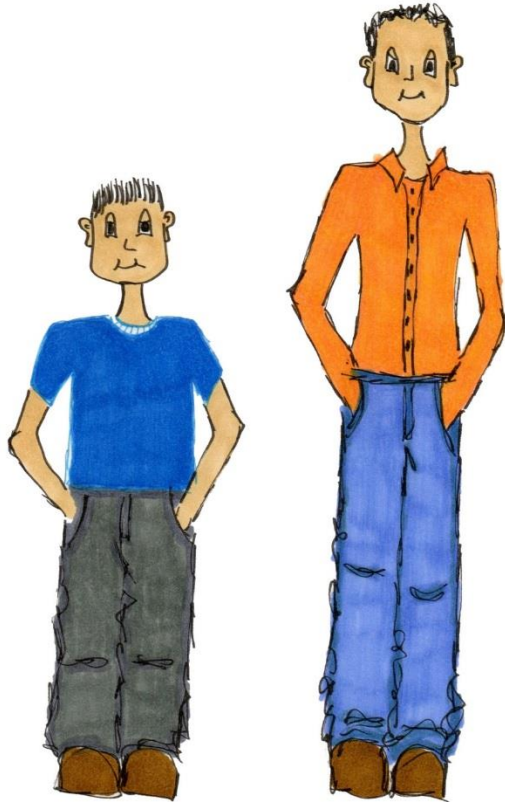


# Use numerical abstract representation



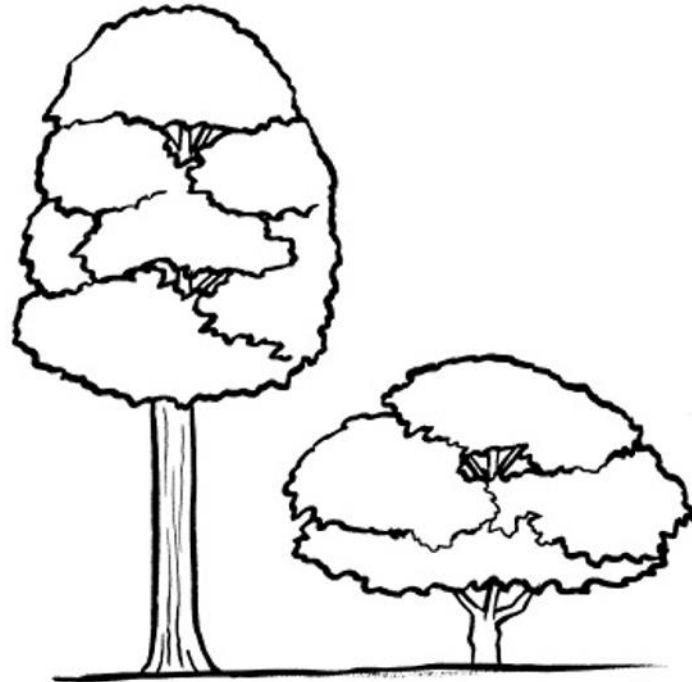
5

Use language to compare e.g. more, less, longer, shorter, taller, shorter, bigger, smaller



short

tall





Use numerical comparisons, e.g. ....  
more than, ..... less than

**MANY**



**FEW**



Use precise language to refer to parts of a number sentence

$$8 + 3 = 11$$

Addend      Addend      Sum

The diagram shows the equation 8 + 3 = 11. The number 8 is blue, the plus sign is black, the number 3 is red, the equals sign is black, and the number 11 is black. A blue arrow points from the label 'Addend' to the number 8. A red arrow points from the label 'Addend' to the number 3. A green arrow points from the label 'Sum' to the number 11.

$$8 - 3 = 5$$

Minuend      Subtrahend      Difference

The diagram shows the equation 8 - 3 = 5. The number 8 is blue, the minus sign is black, the number 3 is red, the equals sign is black, and the number 5 is black. A blue arrow points from the label 'Minuend' to the number 8. A red arrow points from the label 'Subtrahend' to the number 3. A green arrow points from the label 'Difference' to the number 5.

Group number sentences together that relate a similar or equivalent fact

$$2 + 3 = 5$$

$$5 = 2 + 3$$

$$3 + 2 = 5$$

$$5 = 3 + 2$$

$$5 - 3 = 2$$

$$3 = 5 - 2$$

$$5 - 2 = 3$$

$$2 = 5 - 3$$

Build up a set of easily recalled facts that relate to specific number sentences

$$\begin{array}{l} 1 + 9 \\ 2 + 8 \\ 3 + 7 \\ 4 + 6 \\ 5 + 5 \end{array} = 10$$

$$\begin{array}{l} 11 + 9 \\ 12 + 8 \\ 13 + 7 \\ 14 + 6 \\ 15 + 5 \end{array} = 20$$

Find missing values in a number sentence

$$7 = \square + 3$$

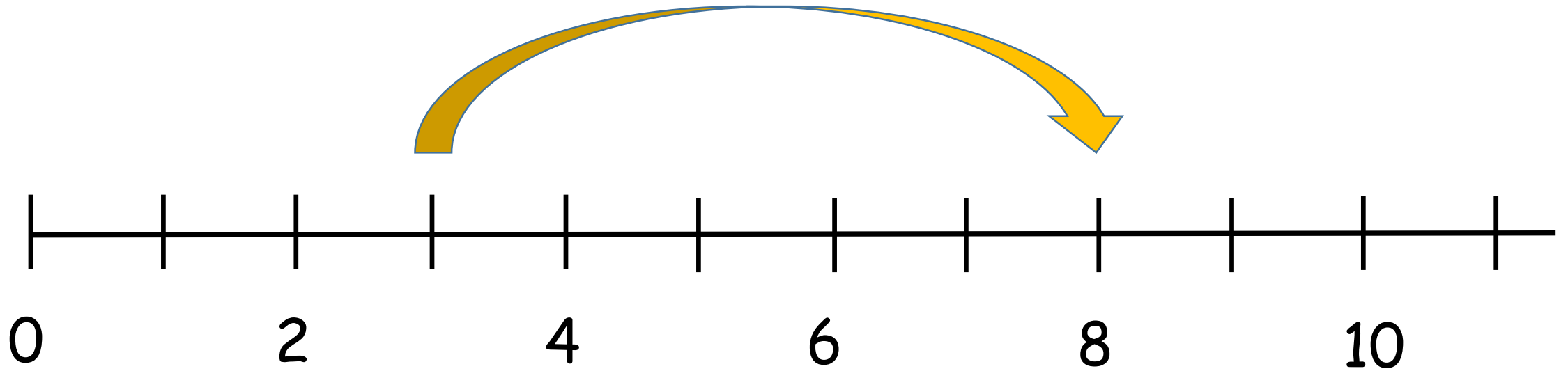
$$\square + 3 = 8$$

$$10 = \square - 3$$

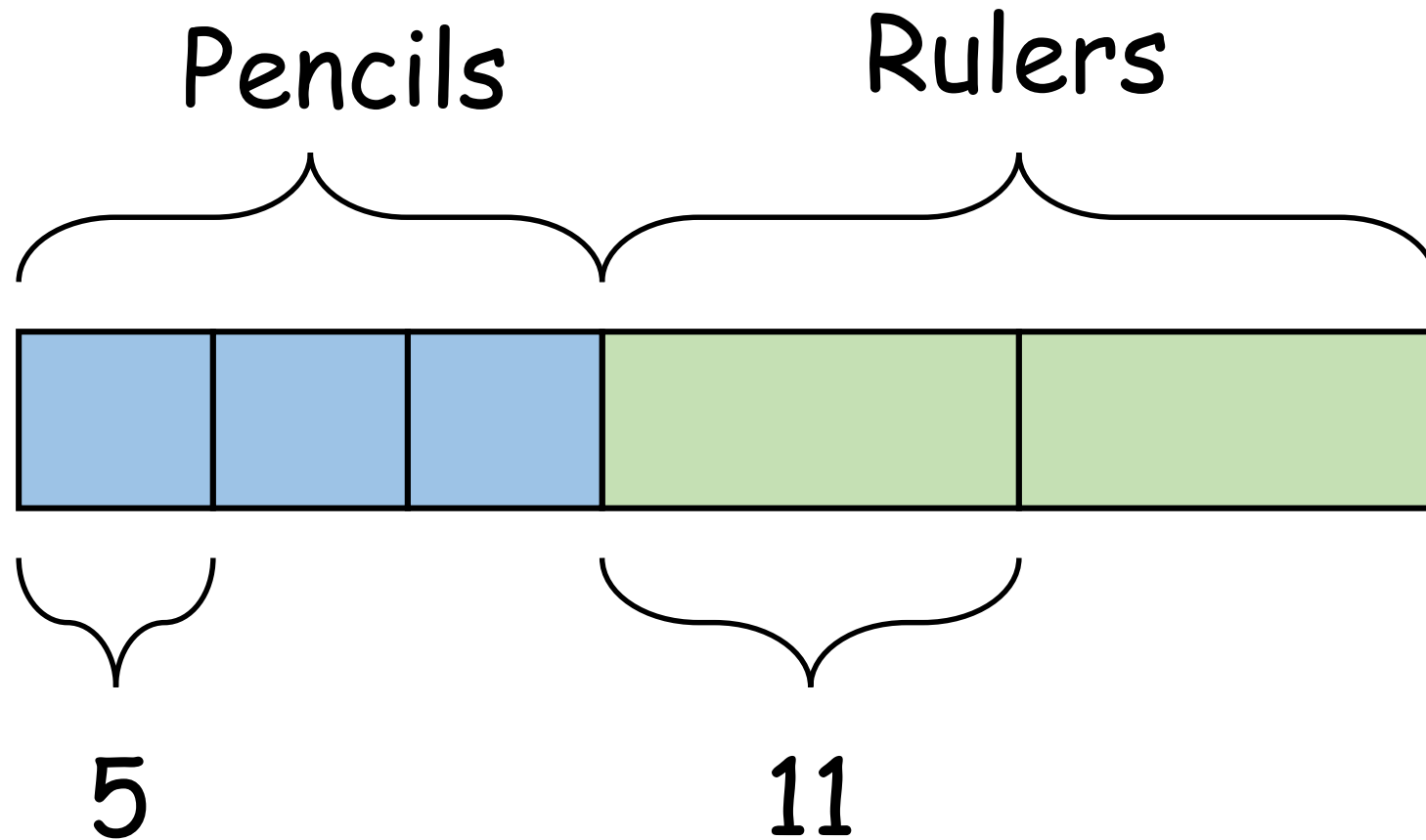
$$12 - \square = 8$$

Illustrate a number sentence on a number line

$$3 + 5 = 8$$



# Illustrate a number problem as a bar diagram



*How much would you need to spend in order to buy three pencils that cost 5 pence each and two rulers that cost 11 pence each?*

# Illustrate number sentences in a “Maths story”

$$3 + 5 = 8$$

$$8 = 4 + 4$$

Three friends in the park are joined by five more so there are eight altogether.

They decide to play a game of football, there are four players in each team.



Develop an understanding that a single fact can reveal associated facts

$$18 + 7 = 25$$

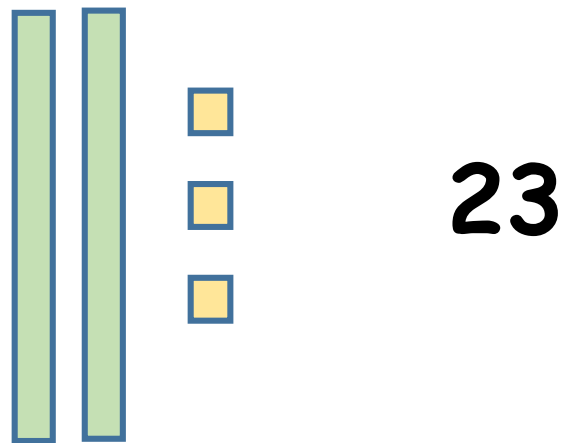
$$8 + 9 = 17$$

$$8 + 7 = 15$$

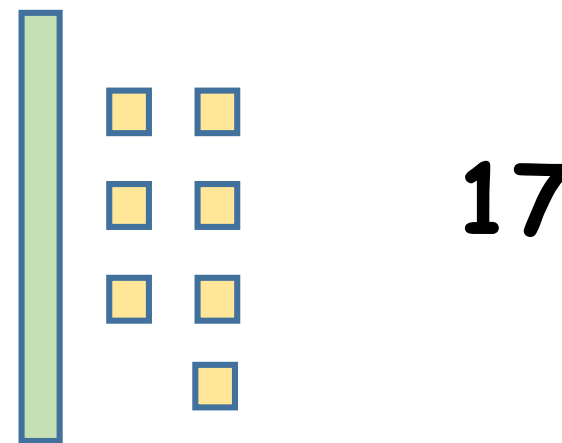
$$508 + 7 = 515$$

$$80 + 70 = 150$$

Say & read two digit numbers as N tens, M  
AND know the common number "name"

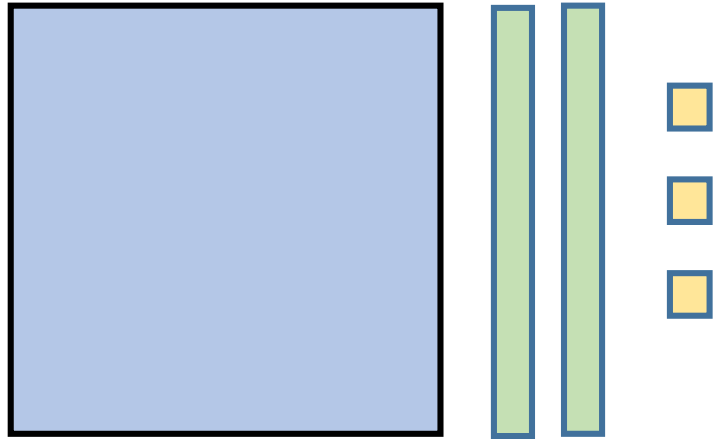


*"Two tens, three ; Twenty-three"*

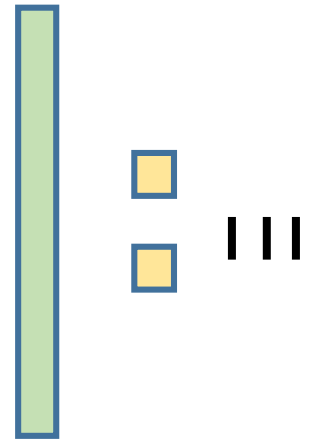


*"One ten and seven ; Seventeen"*

# Appreciate the size of a number



**123**



**12·3**

Know the equivalence of place value in tens and use “make & break” to support addition and subtraction

$$24 + 37$$

$$(20 + 4) + (30 + 7)$$

$$20 + 30 + 11$$

$$20 + 30 + 10 + 1$$

$$= 61$$

$$54 - 28$$

$$(50 + 4) - (20 + 8)$$

$$(40 + 10 + 4) - (20 + 8)$$

$$(40 + 14) - (20 + 8)$$

$$= 26$$

# Counting up and down in tens.....

134

87

172

144

97

182

154

107

192

164

117

202

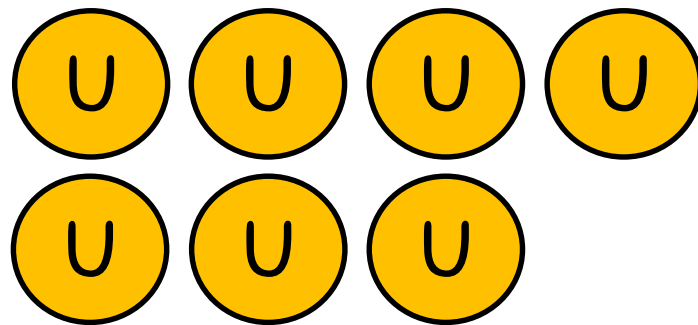
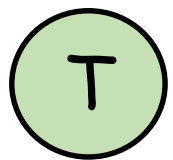
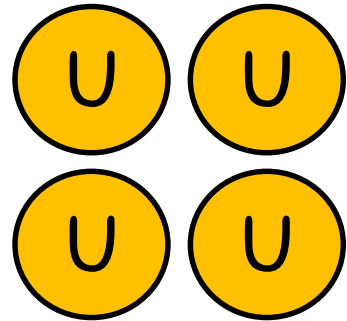
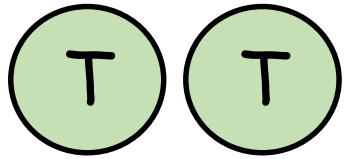
...

....

212

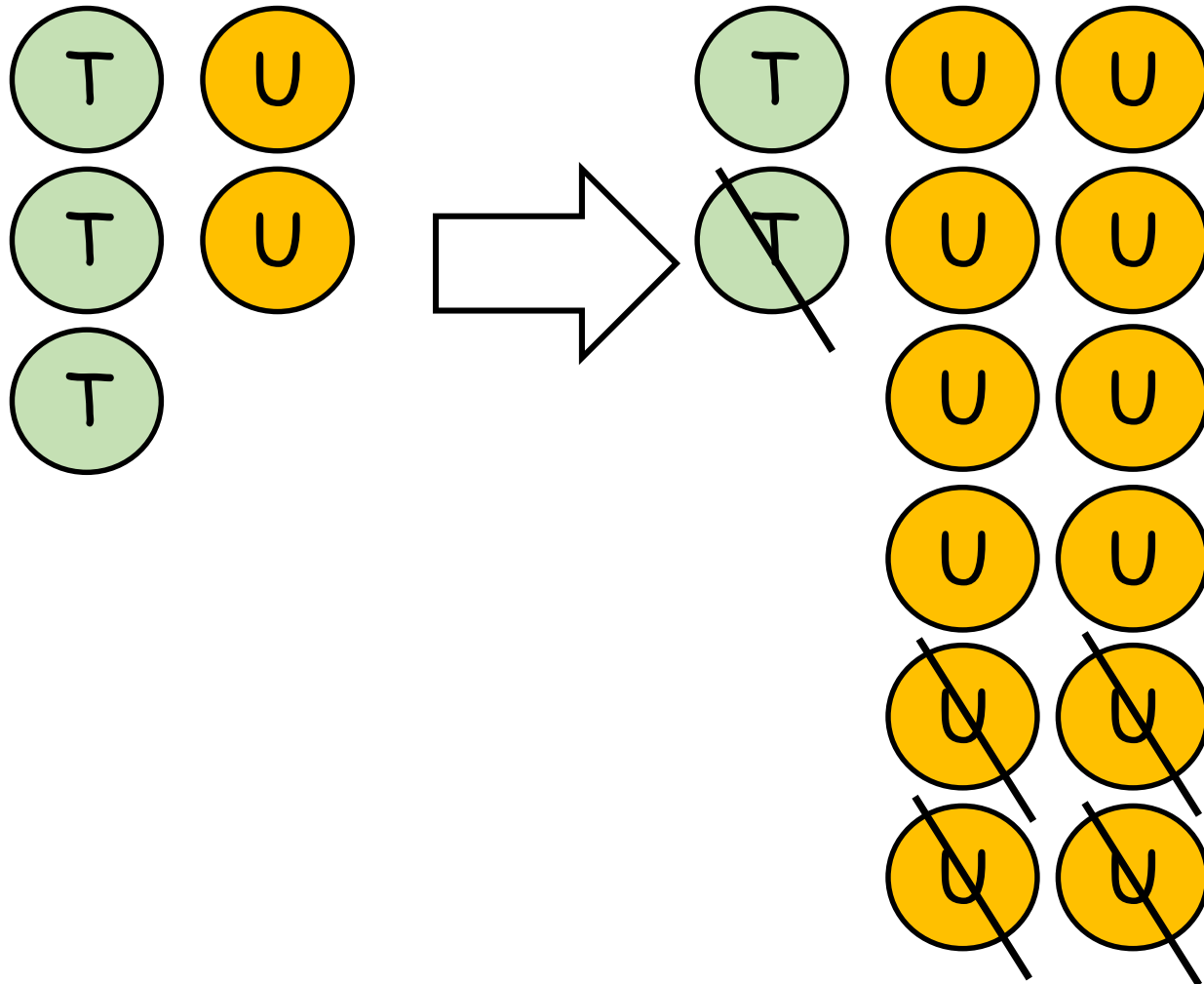
....

# Consolidate column addition through use of “scaled” manipulatives



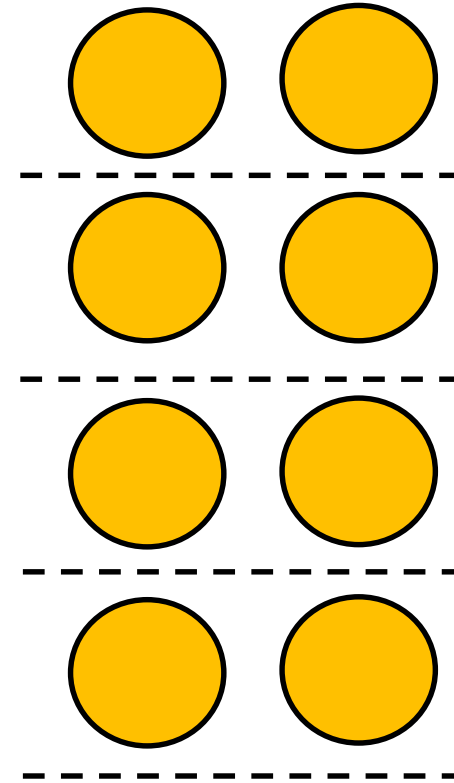
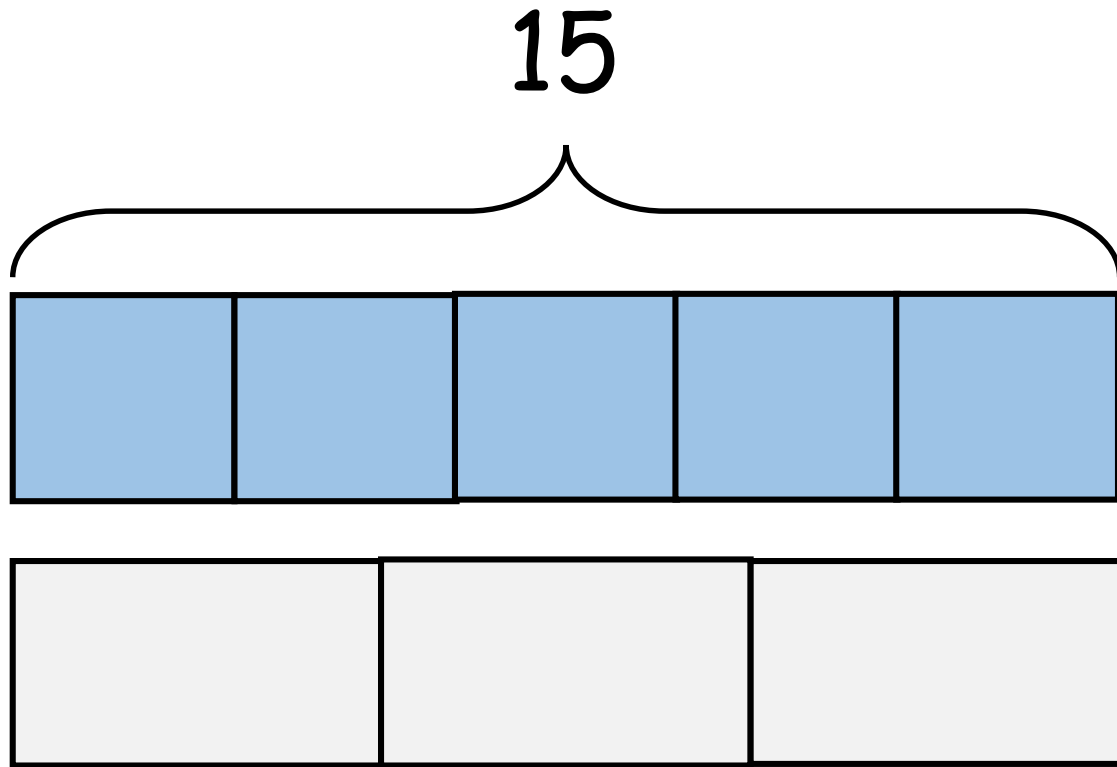
$$\begin{array}{r} 24 \\ + 17 \\ \hline \end{array}$$

# Consolidate column subtraction through use of “scaled” manipulatives



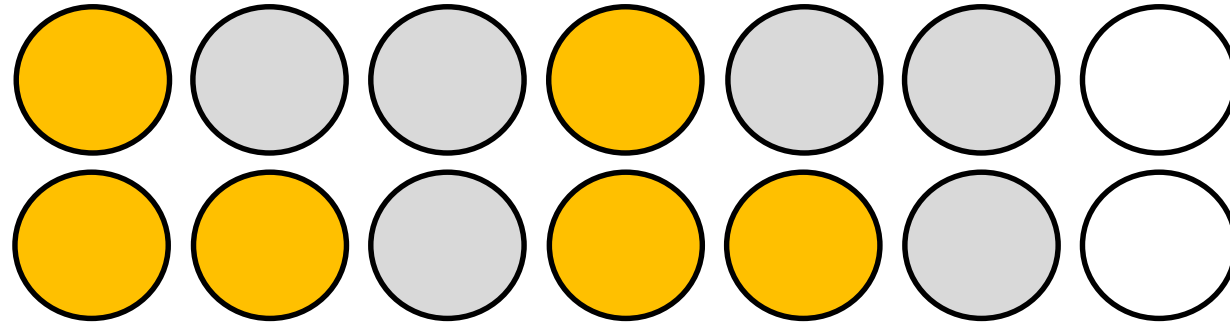
$$\begin{array}{r} \overset{2}{\cancel{3}} \overset{1}{2} \\ - 14 \\ \hline \end{array}$$

Use repeated addition groups to introduce “lots of”



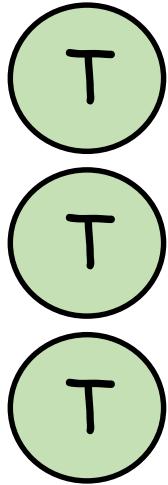


“Break” quantities into “lots of” and  
“remainders”



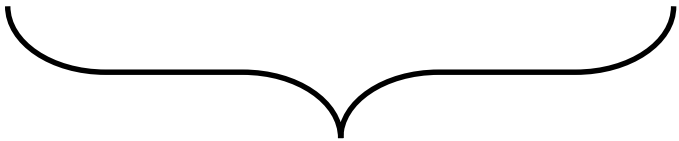
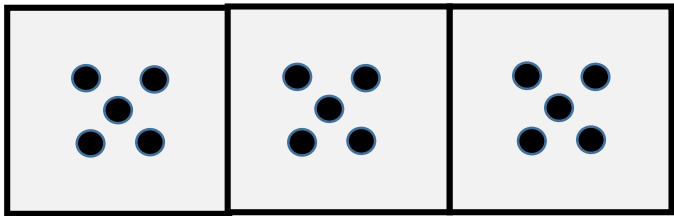
$14 = \text{four lots of } 3 \text{ with } 2 \text{ left over}$

Develop easily recalled facts based on knowledge of “lots of” tens

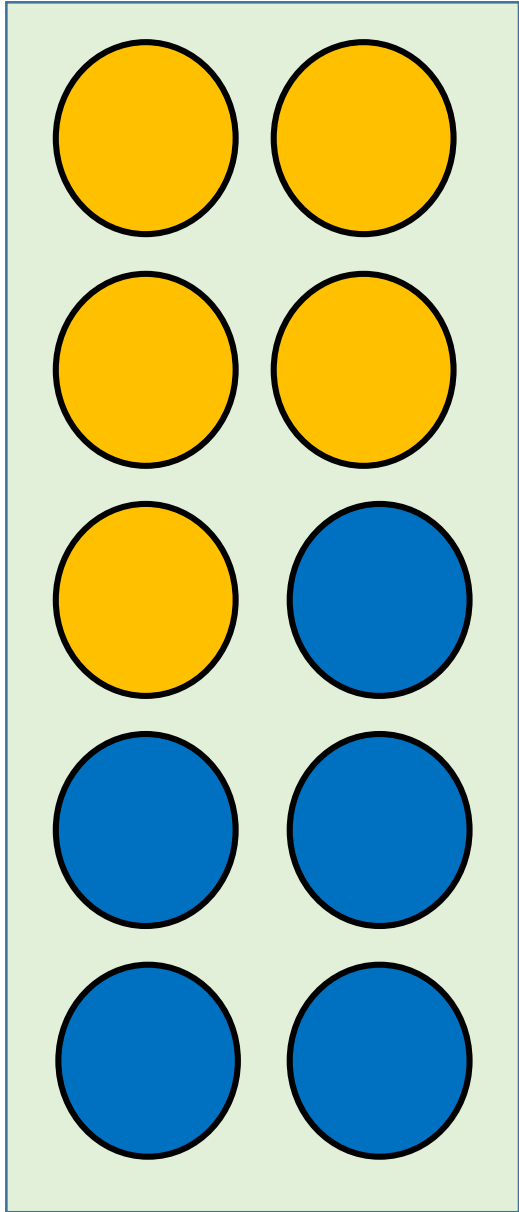
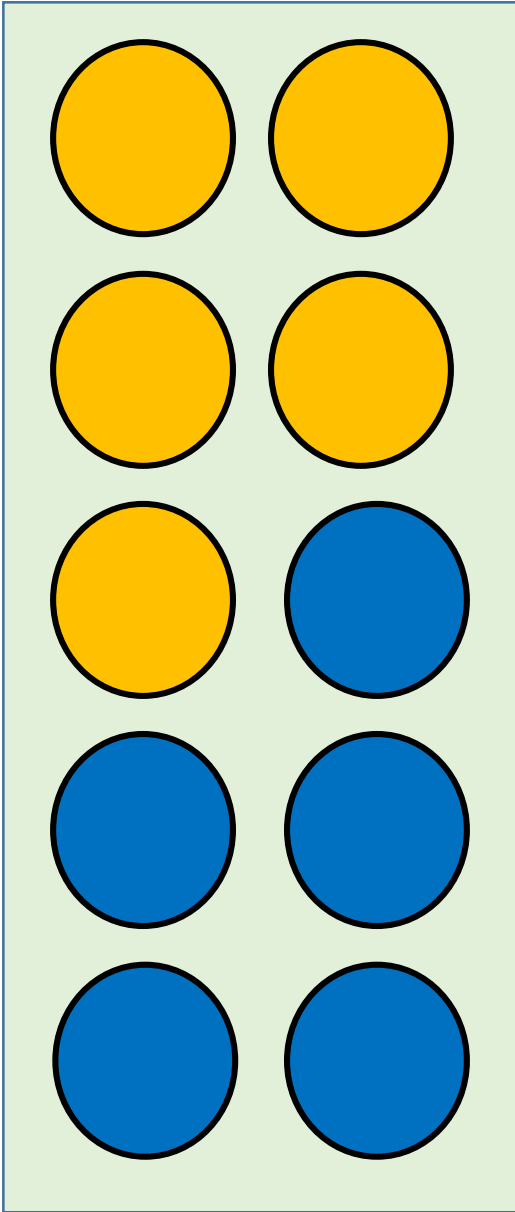


Three lots of 10  
is equal to 30

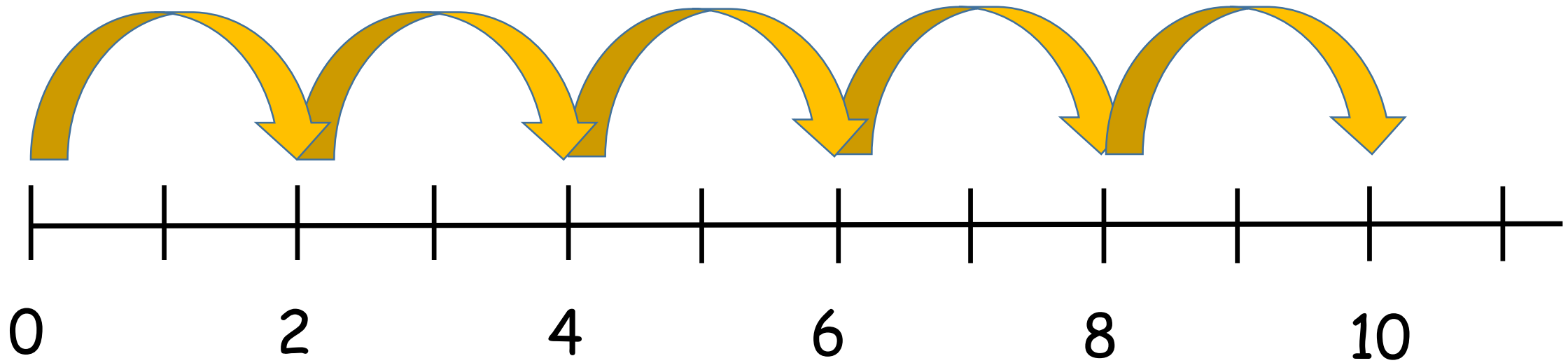
Develop easily recalled facts based on knowledge of “lots of” fives



15



Develop easily recalled facts based on knowledge of “lots of” twos

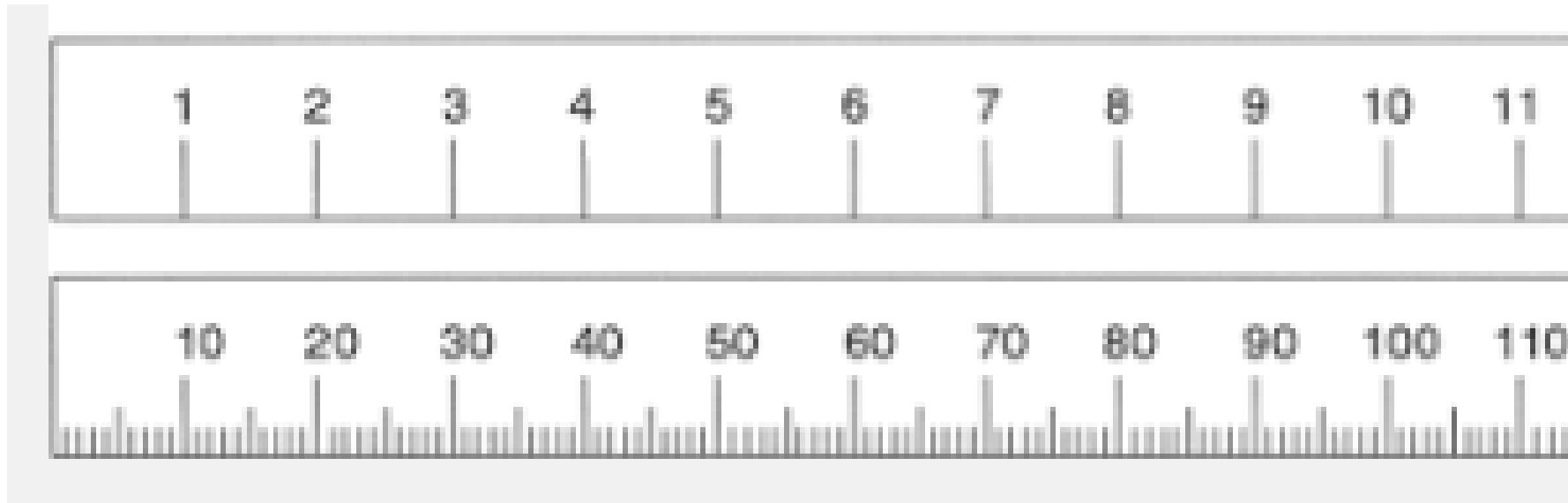


Extend knowledge and skills in two columns  
to include hundreds

$$\begin{array}{r} 234 \\ + 175 \\ \hline \end{array}$$

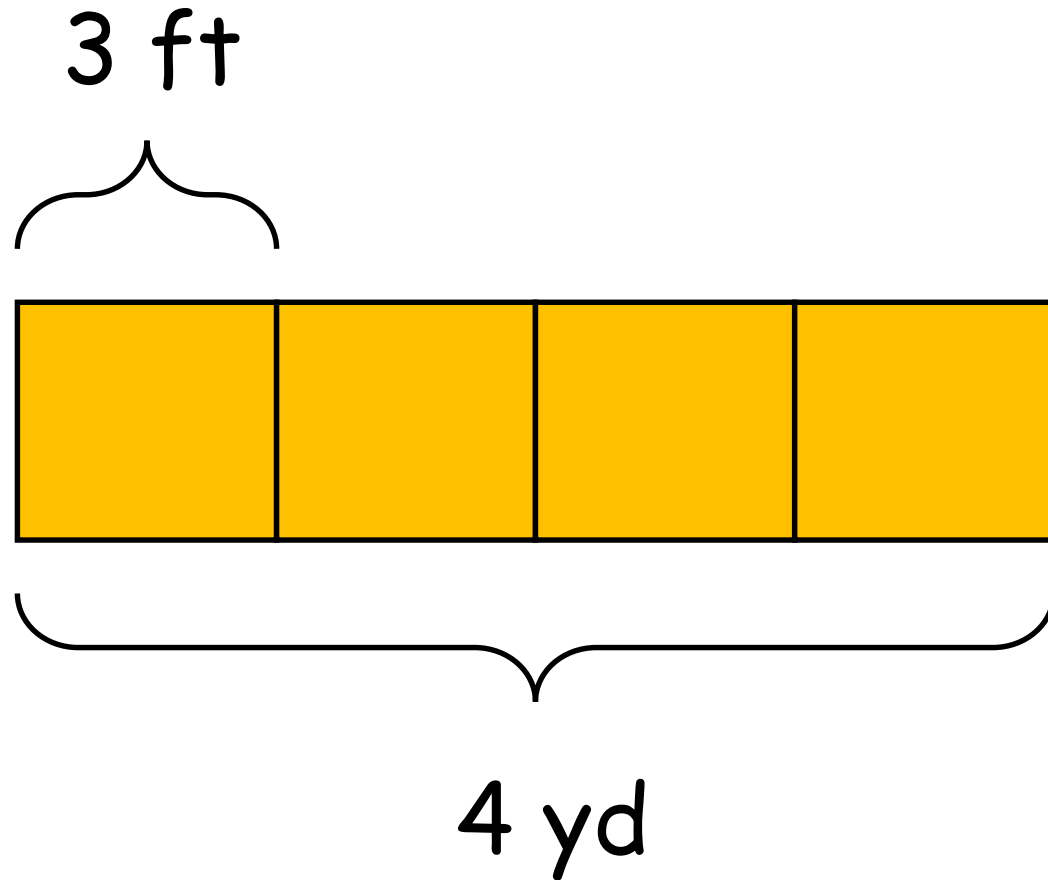
$$\begin{array}{r} 584 \\ - 325 \\ \hline \end{array}$$

Know that numbers expressed with different units of measure mean different “sizes”



11 mm  $\neq$  11cm

Use knowledge of unit equivalence to convert amounts



Understand “negative” in context of a directed number



Know the distinction between subtraction and the addition of negative integers