

The MATHeCADEMY.net Channel




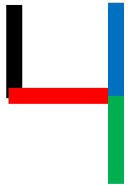



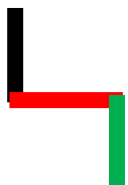




welcomes you to

Linearity & Integration in PreSchool:

Icon-C Counting & NextTo-A Addition

MATH as MANYology - the Natural Science about Many













Bundling Four Ones to One Four Icon 4

One 	Four Ones 	One Fours 	One Four- 	Icon 4
One 	Three Ones 	One Threes 	One Three- 	Icon 3
One 	Two Ones 	One Twos 	One Two- 	Icon 2

Bundling Eight Ones to One Eights: $8 \text{ 1s} = 1 \text{ 8s}$

One	Two	Three	Four	Five	Six	Seven	Eight	Nine
I	II	III	IIII	IIIII	IIIIII	IIIIIII	IIIIIII	IIIIIII
1	2	3	4	5	6	7	8	9

Counting Sticks in different Bundle-Sizes

												
5s	1	2	3	4	B	1B1	1B2	1B3	1B4	2B	2B1	2B2
7s	1	2	3	4	5	6	B	1B1	1B2	1B3	1B4	1B5
Tens	1	2	3	4	5	6	7	8	9	B	1B1	1B2

B: Bundle. When counting, the bundle-icon is not used.

Icon-Counting a Total of 7 Sticks in 5s, 3s & 2s

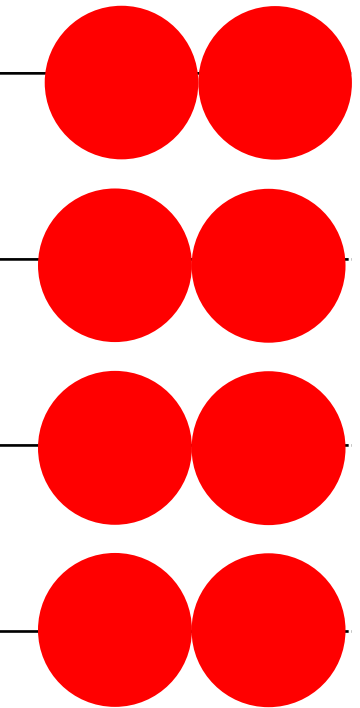
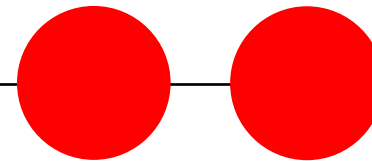
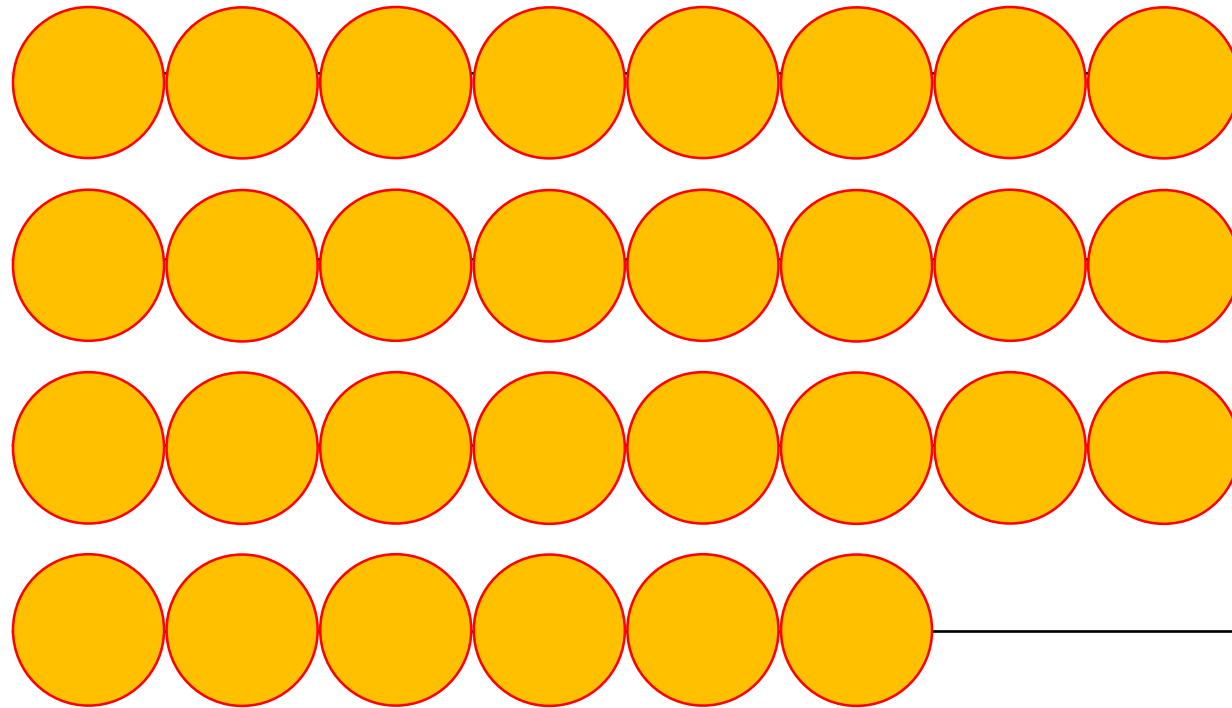
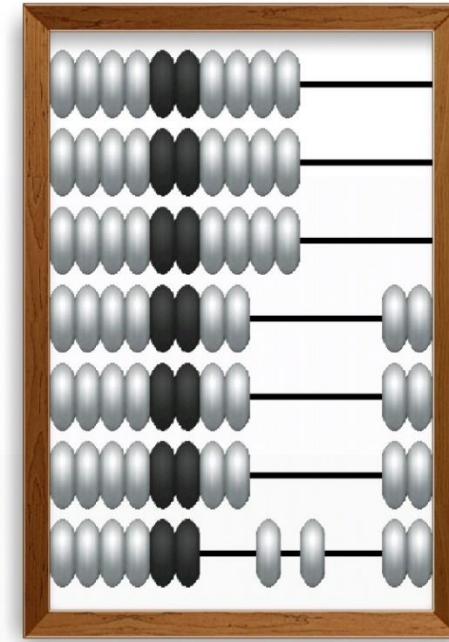
	$T = 7 = 1 \text{ } 5s + 2 = 1)2) \text{ } 5s = 1.2 \text{ } 5s$
	$T = 7 = 2 \text{ } 3s + 1 = 2)1) \text{ } 3s = 2.1 \text{ } 3s$
	$T = 7 = 3 \text{ } 2s + 1 = 3)1) \text{ } 2s = 3.1 \text{ } 2s$



Cup-writing: $T = 1)2) \text{ } 5s$

Decimal-writing: $T = 1.2 \text{ } 5s$

Icon-Counting on an Abacus



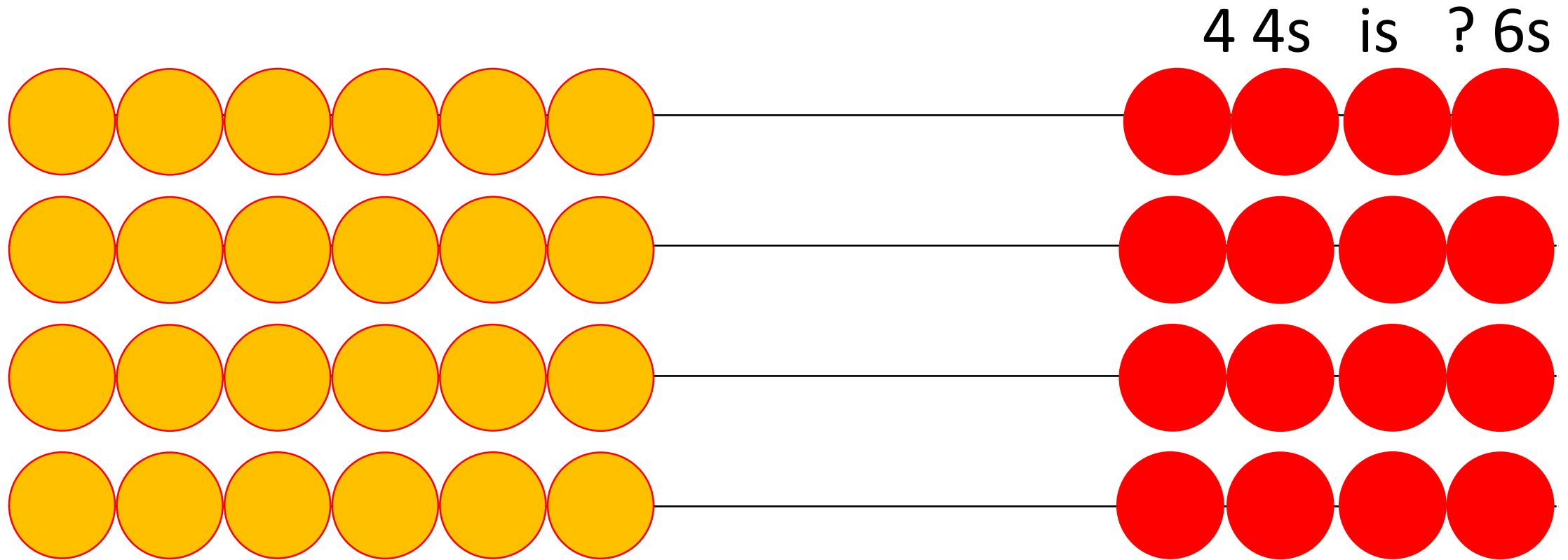
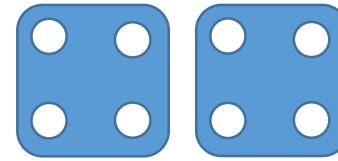
T = 4 2s

2 1s

1 2s

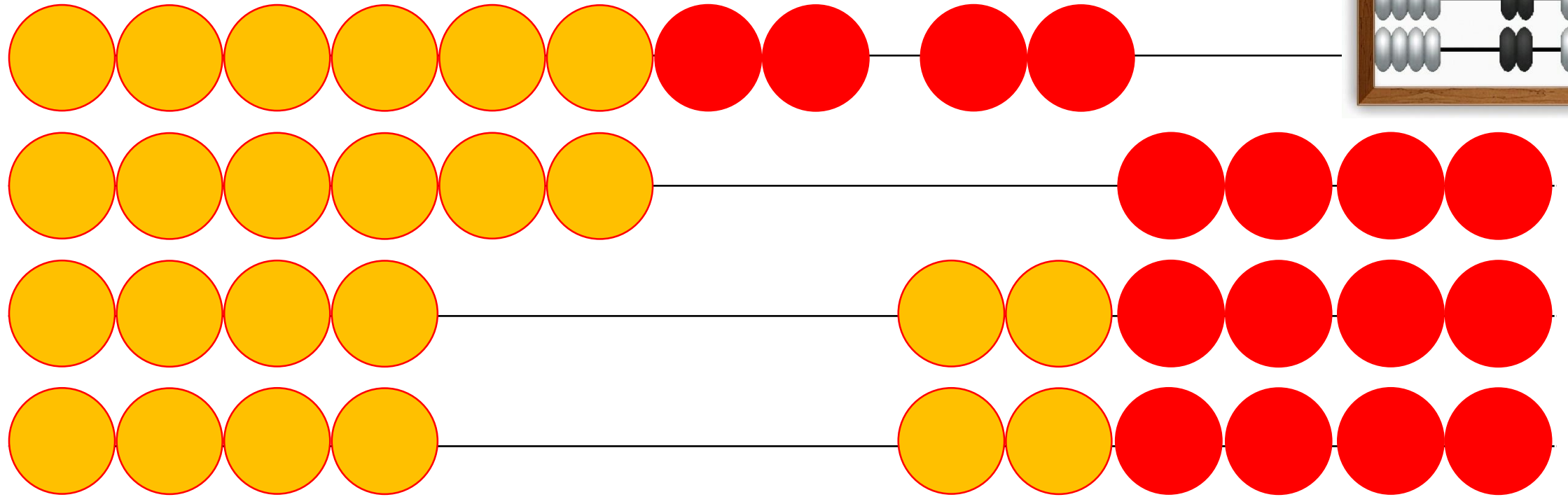
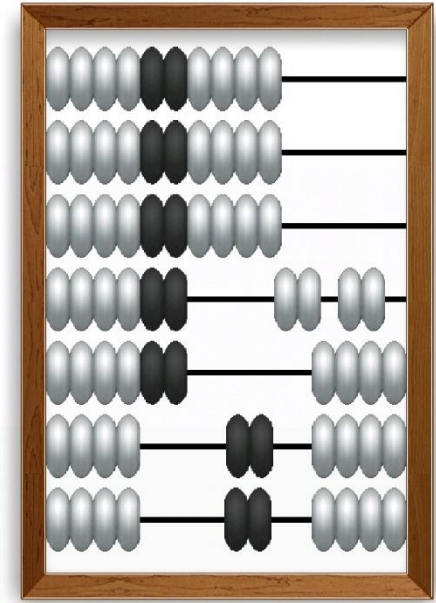
Changing Unit by ReCounting

T = 4 4s is ? 6s



ReCounting $T = 4 \text{ } 4s = 2.4 \text{ } 6s$

Changing unit = Proportionality = Linearity



Predicted on a Calculator

ReCounting: $T = 4 \text{ 4s} = ? \text{ 6s}$

- 4 4s **c**ounted in 6s gives 2.some 6s
- From 4 4s, take away 2 6s, gives 4
- Answer: **4 4s = 2.4 6s**

$$4 \times 4 / 6$$

2.some

$$4 \times 4 - 2 \times 6$$

4


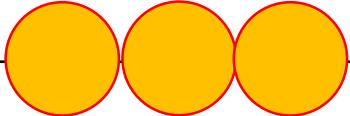
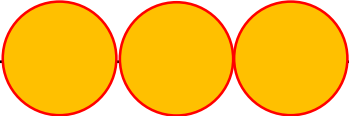
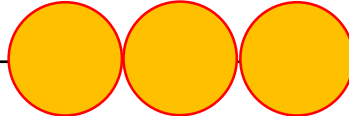

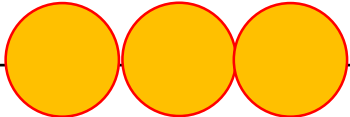
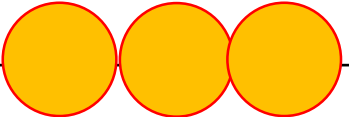
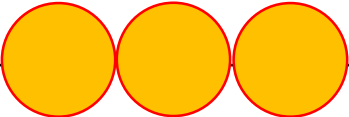

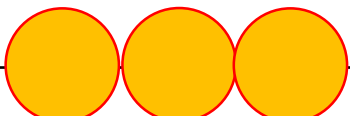
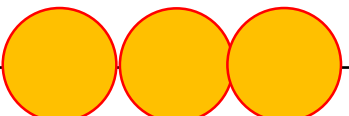
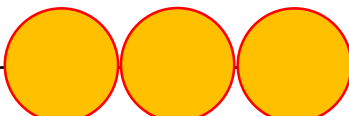
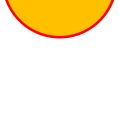
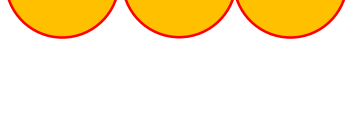
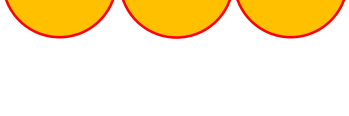


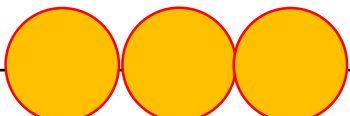
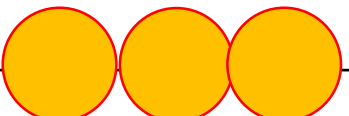





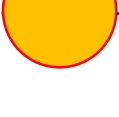
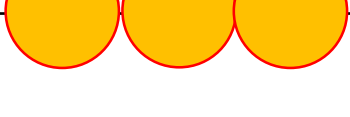
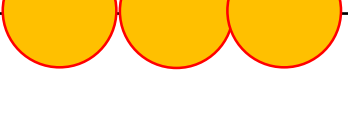
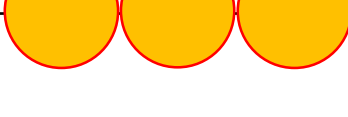








A total T of 4 4s is iconized as $T = 4 \times 4$

A total T **c**ounted in 5s is iconized as $T/5$

From T take away 2 6s is iconized as $T - 2 \times 6$

Decimals as Fractions: $T = 2 = 0.2 \text{ 5s} = 2/5 \text{ 5s} = 2 \text{ c} \text{ounted in } 5, \text{ 5s}$

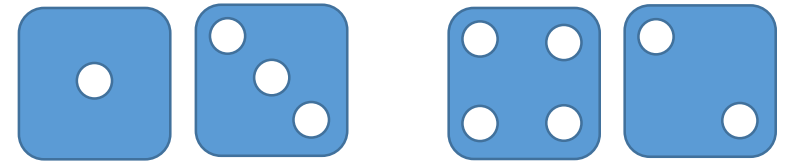
Tables: ReCounting IconBundles in Tens

				$1 \times 3 = 3$
				$2 \times 3 = 6$
				$3 \times 3 = 9$
<hr/>				
				$4 \times 3 = 1.2 \text{ tens} = 12$
				$5 \times 3 = 1.5 \text{ tens} = 15$
				$6 \times 3 = 1.8 \text{ tens} = 18$
<hr/>				
				$7 \times 3 = 2.1 \text{ tens} = 21$
				$8 \times 3 = 2.4 \text{ tens} = 24$
				$9 \times 3 = 2.7 \text{ tens} = 27$
<hr/>				
				$10 \times 3 = 3 \text{ tens} = 30$

Predicted on a Calculator

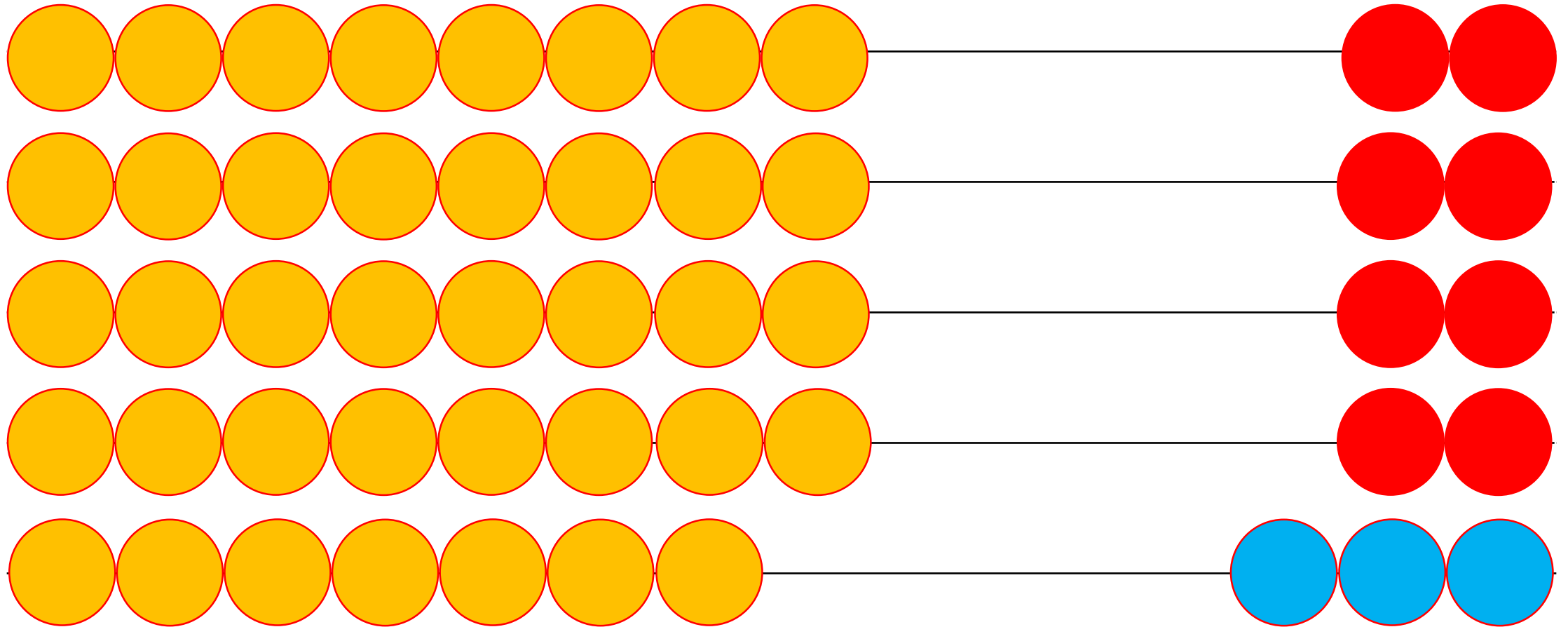
1 3s
2 3s can be re**c**ounted to 6 1s
3 3s can be re**c**ounted to 9 1s
4 3s can be re**c**ounted to 1.2 tens
5 3s can be re**c**ounted to 1.5 tens
6 3s can be re**c**ounted to 1.8 tens
7 3s can be re**c**ounted to 2.1 tens
8 3s can be re**c**ounted to 2.4 tens
9 3s can be re**c**ounted to 2.7 tens

1x3	3
2x3	6
3x3	9
4x3	12
5x3	15
6x3	18
7x3	21
8x3	24
9x3	27

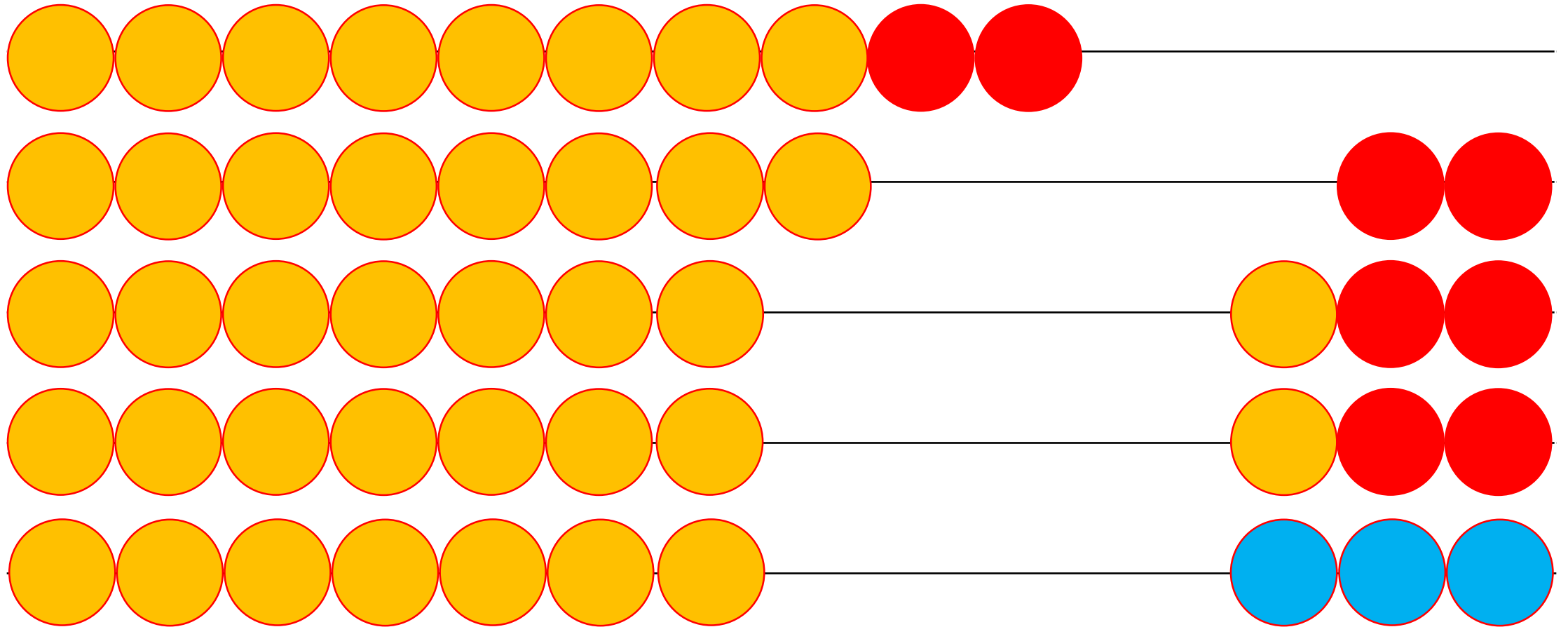


Adding On Top

$T = 13s + 42s$ is $?3s$

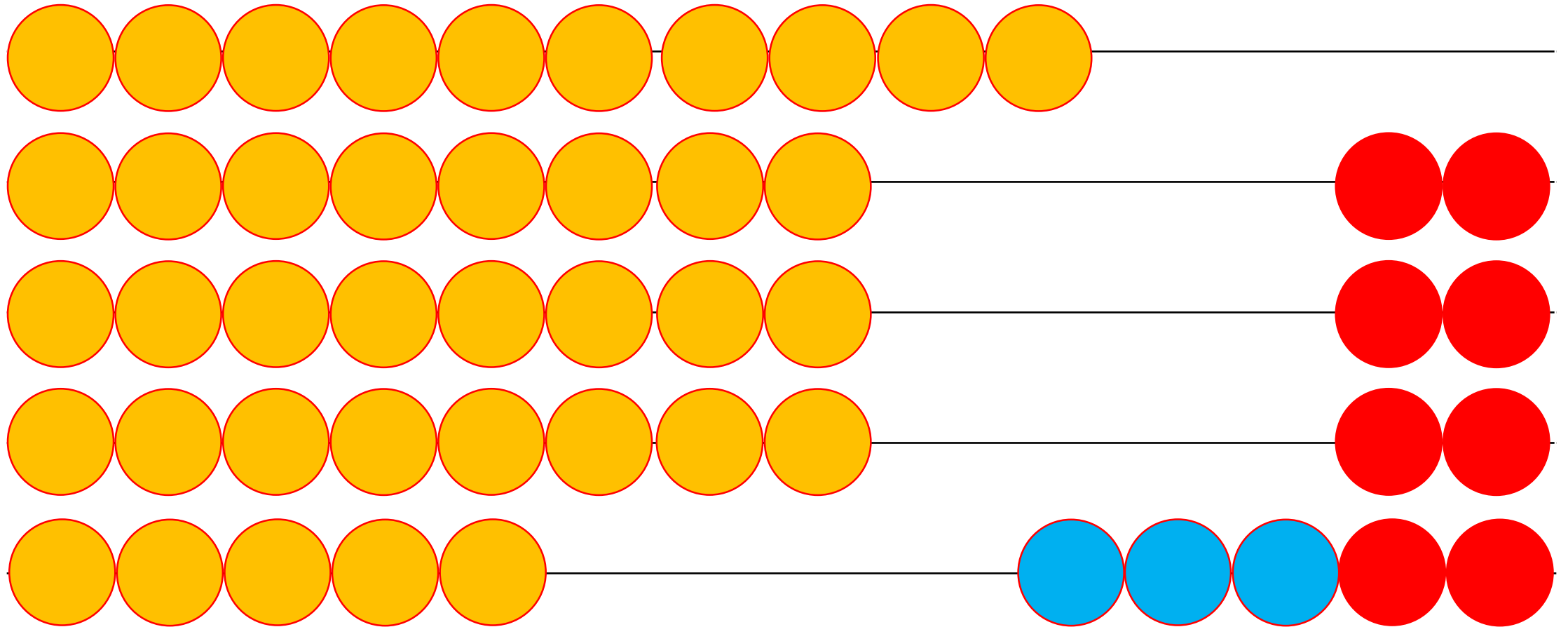
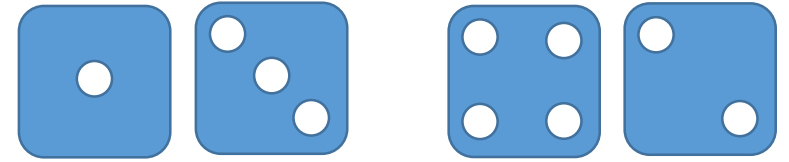


Adding OnTop: $T = 1\ 3s + 4\ 2s = 3.2\ 3s$



Adding NextTo

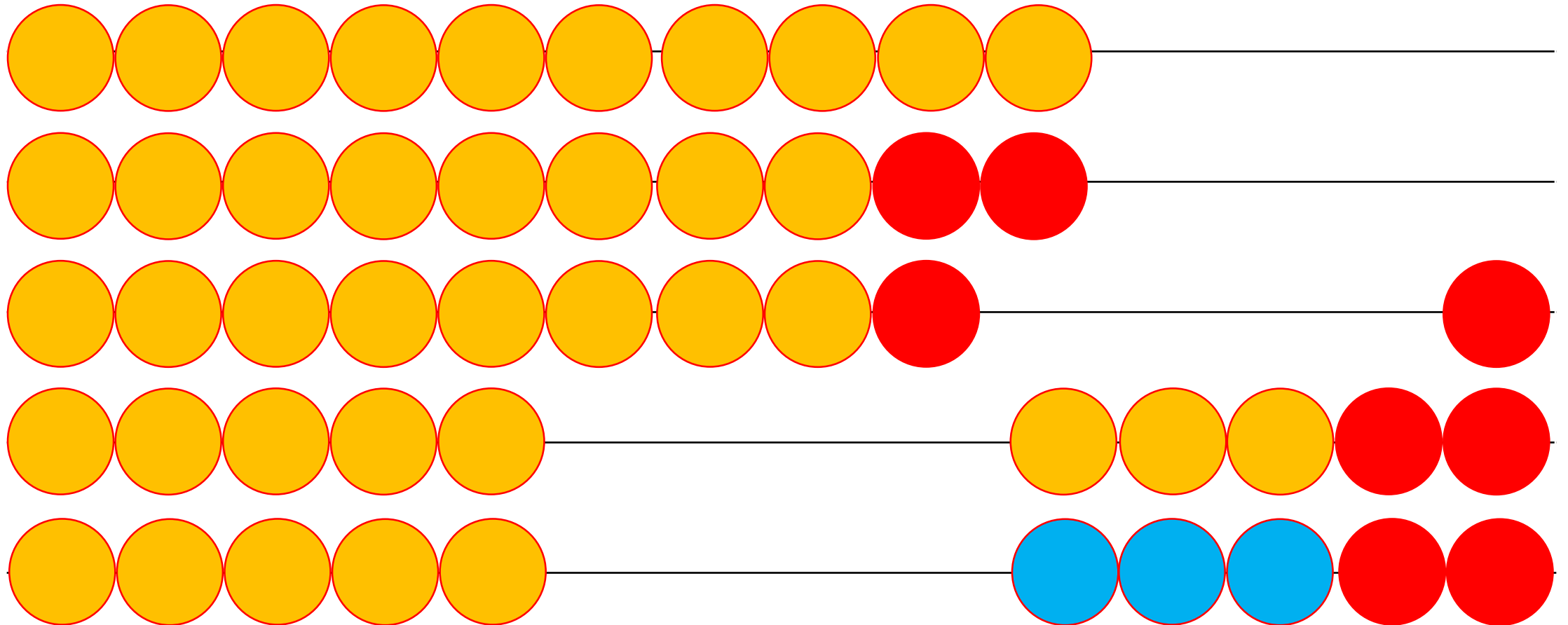
$T = 13s + 42s$ is $?5s$



Adding NextTo: 1 3s + 4 2s is 2.1 5s

Adding NextTo = Integrating Areas (first multiply, then add)

$$T = 345 = 3 \text{ tentens} \& 4 \text{ tens} \& 5 \text{ ones} = 3 \times 100 + 4 \times 10 + 5 \times 1$$



Predicted on a Calculator

OnTop: $T = 1 \text{ } 3s + 4 \text{ } 2s = ? \text{ } 3s$

1 $3s + 4 \text{ } 2s$ counted in $3s$ gives 3.some

From $1 \text{ } 3s + 4 \text{ } 2s$, take away 3 $3s$ gives 2

Answer: $1 \text{ } 3s + 4 \text{ } 2s = \mathbf{3.2} \text{ } 3s$

$$(1 \times 3 + 4 \times 2) / 3 \quad \mathbf{3.some}$$

$$1 \times 3 + 4 \times 2 - 3 \times 3 \quad \mathbf{2}$$

NextTo: $T = 1 \text{ } 3s + 4 \text{ } 2s = ? \text{ } 5s$

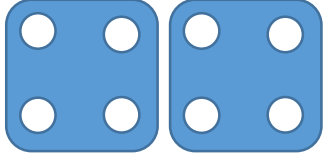
1 $3s + 4 \text{ } 2s$ counted in $5s$ gives 2.some

From $1 \text{ } 3s + 4 \text{ } 2s$, take away 2 $5s$ gives 1

Answer: $1 \text{ } 3s + 4 \text{ } 2s = \mathbf{2.1} \text{ } 5s$

$$(1 \times 3 + 4 \times 2) / 5 \quad \mathbf{2.some}$$

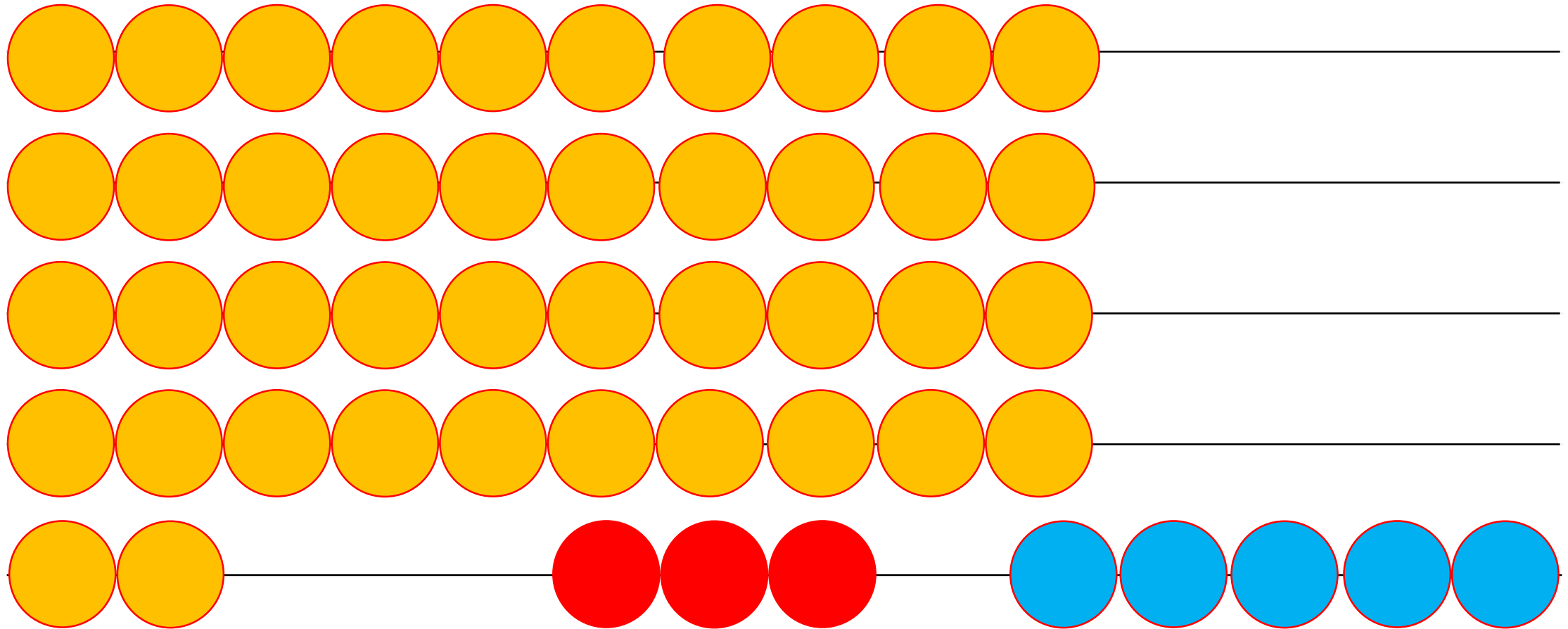
$$1 \times 3 + 4 \times 2 - 2 \times 5 \quad \mathbf{1}$$



Addition reversed: ? + 3 is 8

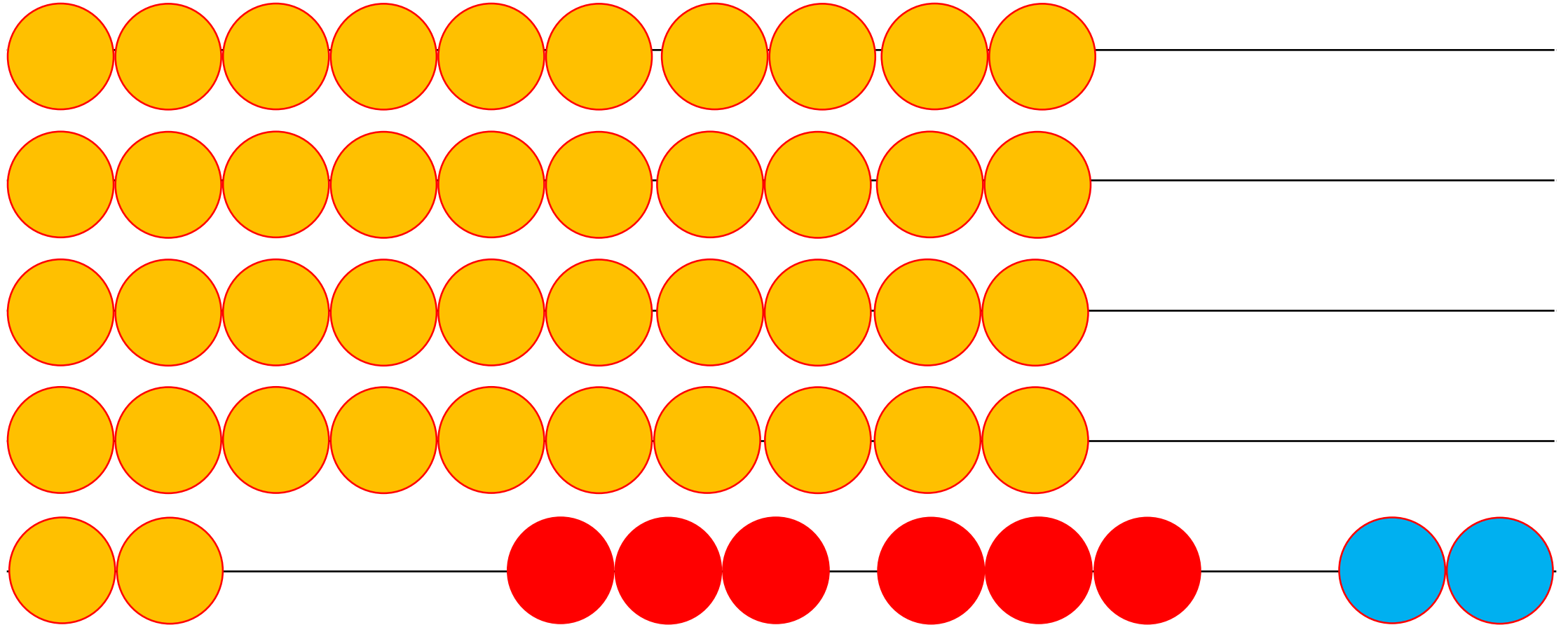
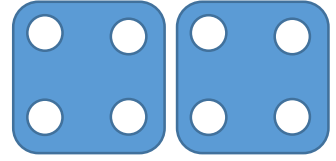
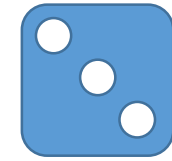
Answer: ? = 8 - 3 = 5

The MATHeCADEMY.net Channel



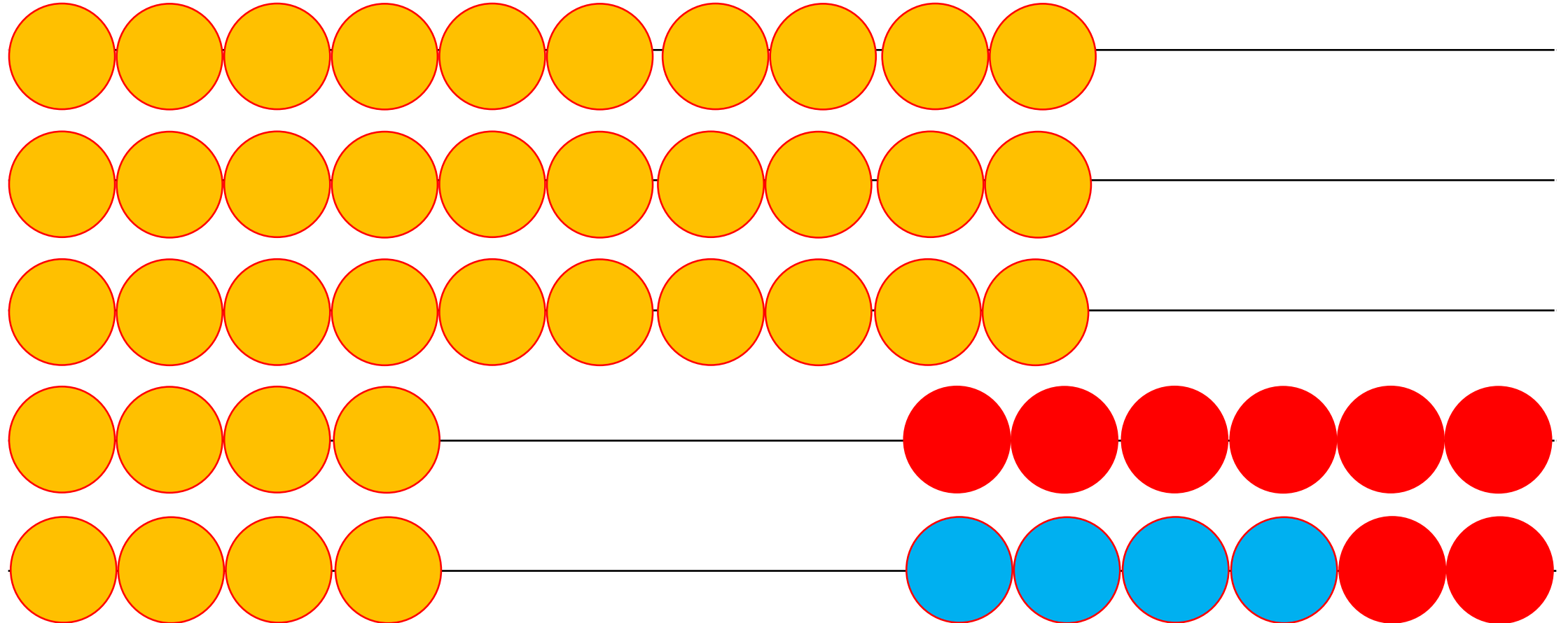
Multiplication reversed: ? x 3 is 8

Answer: ? = $8/3 = 2.2\ 3s$



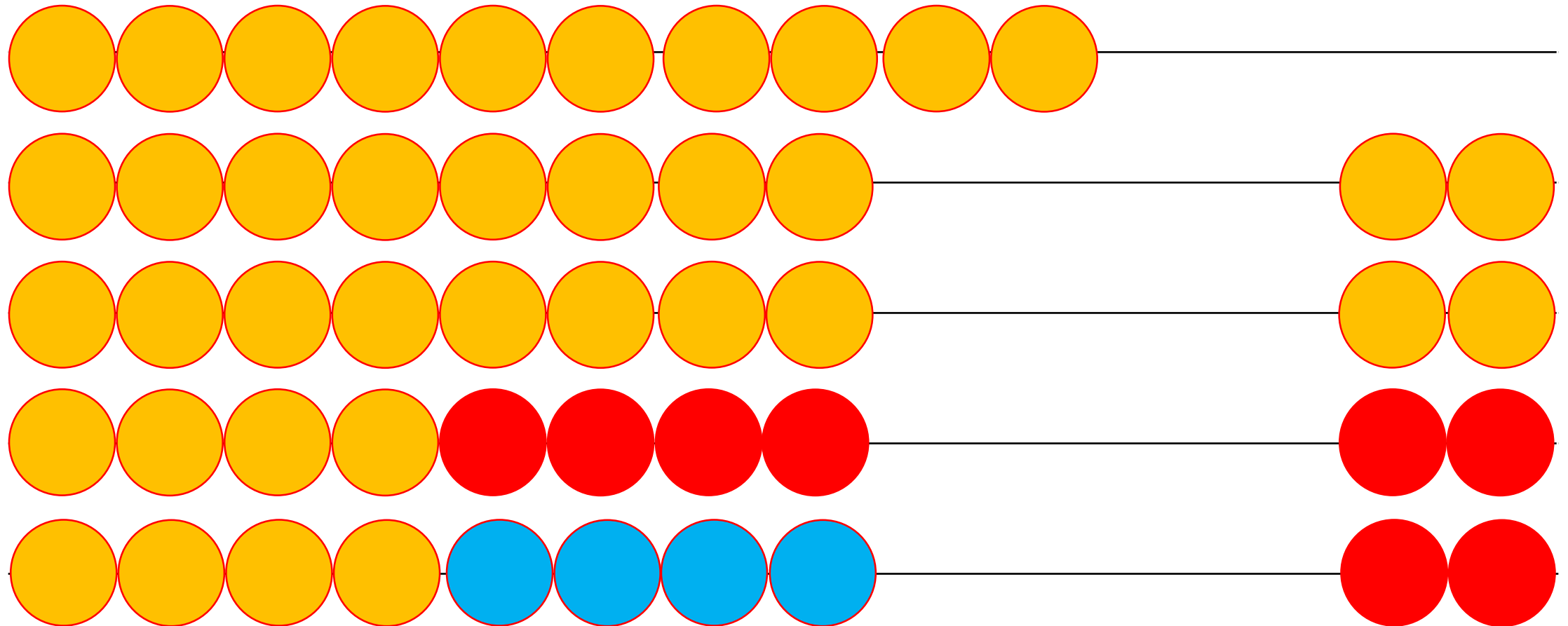
NextTo-Addition reversed:

1 4s + ? 2s is 2 6s



NextTo-**A**ddition reversed: 1 4s + 4 2s is 2 6s

Integrating Areas reversed is Differentiation (first subtract, then divide)



Reversing on a Calculator

Reversing Calculations is called Solving Equations

Add

$$? + 3 = 8$$

$$? = 8 - 3$$

$$? = 5$$

Rule: Opposite side, Opposite sign

Multiply

$$? \times 3 = 8$$

$$? = 8/3$$

$$? = 2.2\ 3s$$

$$8 - 3$$

$$5$$

$$8/3$$

$$2.\text{some}$$

$$8 - 2 \times 3$$

$$2$$

Add NextTo: 1 4s + ? 2s = 2 6s

From 2 6s, take away 1 4s gives 8

8 counted in 2s gives 4

Answer: 1 4s + 4 2s = 2 6s

$$2 \times 6 - 1 \times 4$$

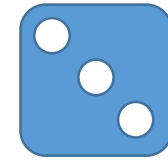
$$8$$

$$8/2$$

$$4$$

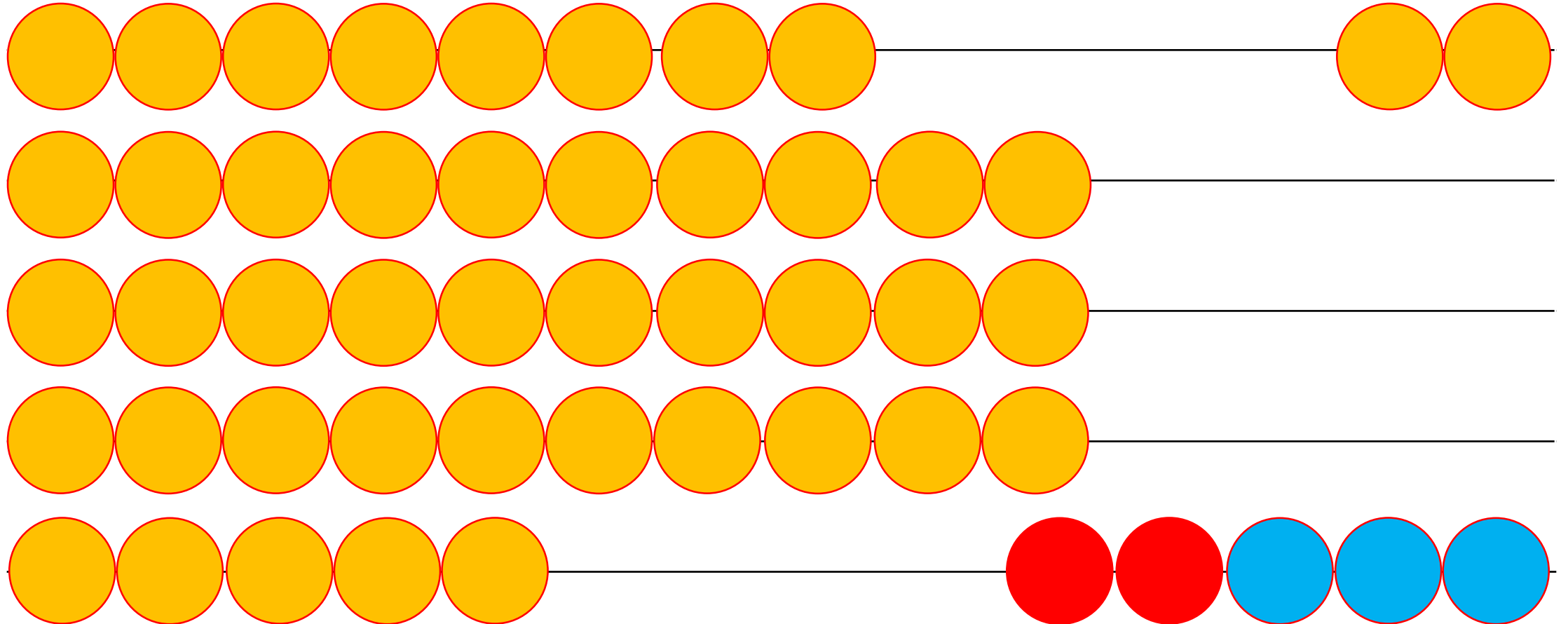
Negative Numbers: $3 - 5 = ?$

Answer: $3 - 5 = -2$



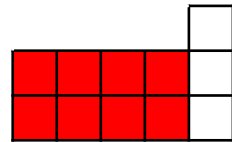
$3 - 5$

-2



Read the book
ManyMath – MyMath

Watch the video
PreSchool Math



$$T = 2.3 \ 4s$$

ManyMath - MyMath

Math – the Natural Science about MANY

Allan Tarp
MATHeCADEMY.net

Adding NextTo

Q: $2 \ 3s + 3 \ 4s = ? \ 7s$

A: $2 \ 3s + 3 \ 4s = 2.4 \ 7s$

MrAlTarp: youtu.be/qgCwVZnALXA

The
MATHeCADEMY.net
Channel

hopes you enjoyed the video
welcomes you to other videos presenting

MATH as MANYology
the Natural Science about **Many**

The
MATH**e**CADEMY.net
Channel