



Maths curriculum evening

Number addition and subtraction

Year 3

- add and subtract numbers mentally:
 - a three-digit number and 1s
 - a three-digit number and 10s
 - a three-digit number and 100s
- add and subtract numbers with up to **3** digits, using formal written methods of columnar addition and subtraction.
- Estimate the answer to a calculation and use inverse operations to check answers .
- Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

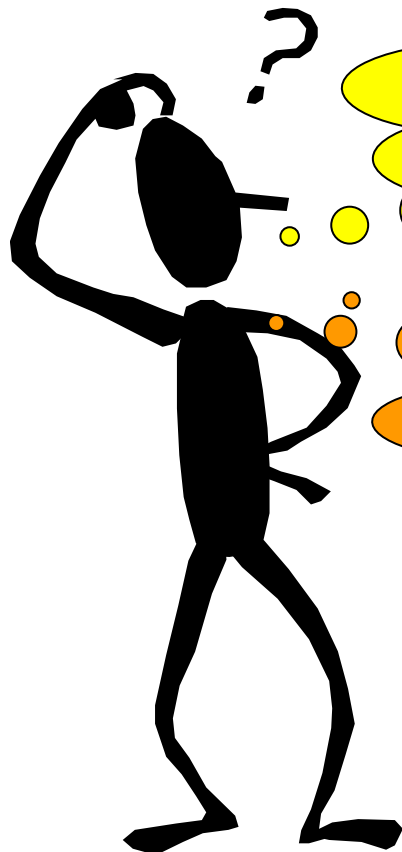
Year 4

- add and subtract numbers with up to **4** digits, using the formal written methods of columnar addition and subtraction where appropriate.
- Estimate and use inverse operations to check answers to a calculation.
- Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why

Progression in Addition

The ability to calculate mentally forms the basis of all calculations and therefore up to year 3 we focus on number facts. Pupils develop counting strategies, place value and number facts and use number lines or number squares to do so.

As they become confident and increase speed and accuracy, we can remove those resources.



Number bonds to 10
eg, $10 + 0 = 10$, $9 + 1 = 10$
Addition facts for numbers up to 10
 $6 + 0 = 6$; $5 + 1 = 6$; $4 + 2 = 6$...

Numbers bonds to 20 → $19 + 1$; $18 + 2$; $17 + 3$
All addition facts to 11, 12, 13 ...20

Multiples of 10 and multiples of 5 which
add up to 100...
 $70 + 30$, $45 + 55$ etc

Doubles and near doubles
 $6 + 6 = 12$, $6 + 7 = 13$, $6 + 5 = 11$
 $35 + 35 = 70$, $35 + 36 = 71$ etc

Progression in Addition

After we have covered mental strategies, then we move on to more formal written methods.

Mental strategies.

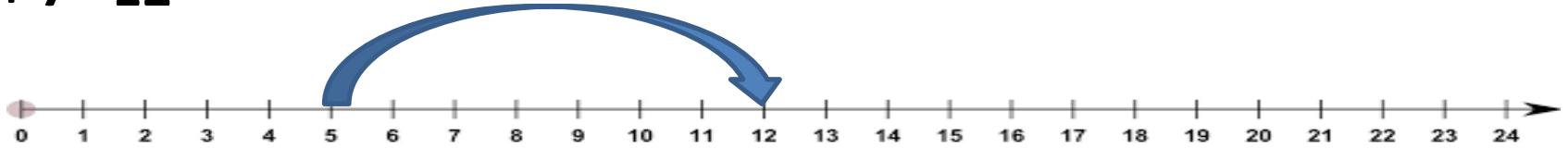
$6+7 = 13$, so $60+70=130$

$12 + 9 = 21$ 9 is nearly 10 so say $12 + 10=22$, then subtract 1.

$12 + 19 = 31$ 19 is nearly 20 so say $12 + 20=32$ then subtract 1.

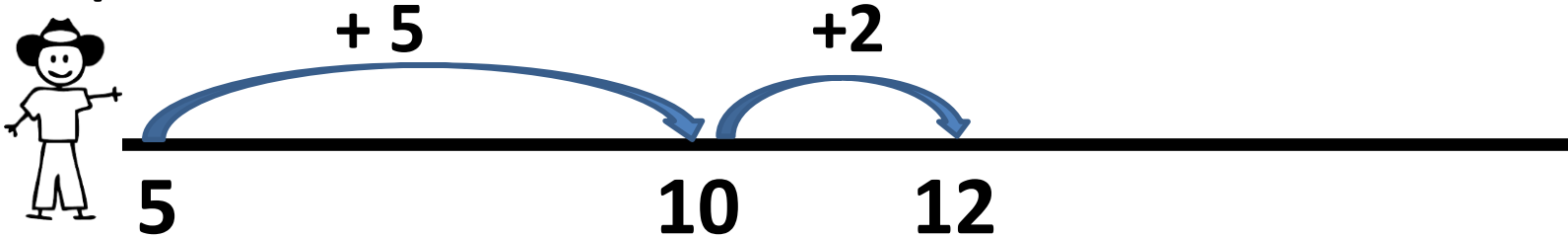
Progression in Addition (Practically)

$$5 + 7 = 12$$



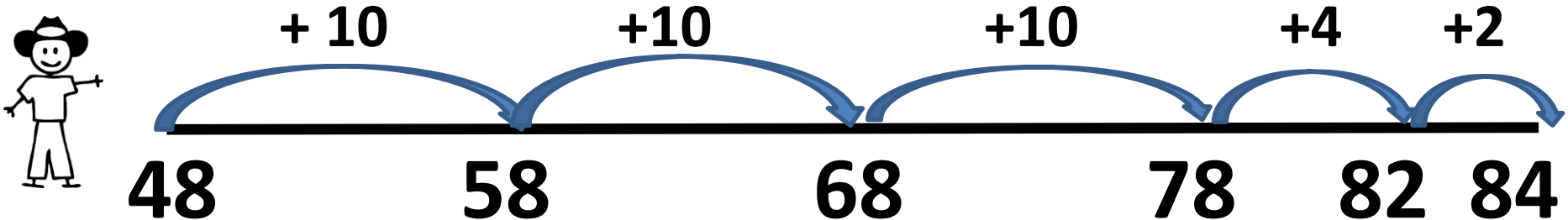
Empty numberline. Use partitioning and bridging through 10.

7 partitioned to 5 + 2.



$$48 + 36 = 84$$

Partition 36 down to 10+10+10+4+2



Progression in Addition

Formal written method.

$$83 + 42 = 125$$

Vertical expansion

$$\begin{array}{r} 83 \\ + \underline{42} \\ 5 \\ \underline{120} \\ 125 \end{array}$$

Horizontal

$$\begin{array}{r} 80 + 3 \\ + \underline{40 + 2} \\ 120 + 5 = 125 \end{array}$$

Note: it is 80 plus 40, not 8 + 4. Need to know place value!

Progression in Addition

Formal written method.

$$83 + 42 = 125$$

Vertical expansion

$$\begin{array}{r} 83 \\ + \underline{42} \\ 5 \\ \underline{120} \\ 125 \end{array}$$

Emphasises the value of each digit ↓

Horizontal

$$\begin{array}{r} 80 + 3 \\ + \underline{40 + 2} \\ 120 + 5 = 125 \end{array}$$

Note: it is 80 plus 40, not 8 + 4. Need to know place value!

Progression in Addition

Compact column method.

Numbers not partitioned. Progression to carry 10, or carry hundred etc, not carry one!

$$\begin{array}{r} 47 \\ + 76 \\ \hline 123 \\ \hline 11 \end{array}$$

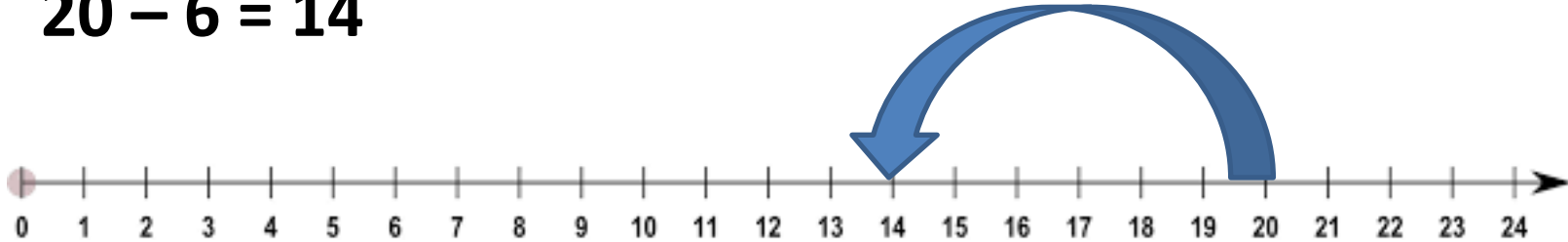
$$\begin{array}{r} 258 \\ + 87 \\ \hline 345 \\ \hline 11 \end{array}$$

$$\begin{array}{r} 366 \\ + 458 \\ \hline 824 \\ \hline 11 \end{array}$$

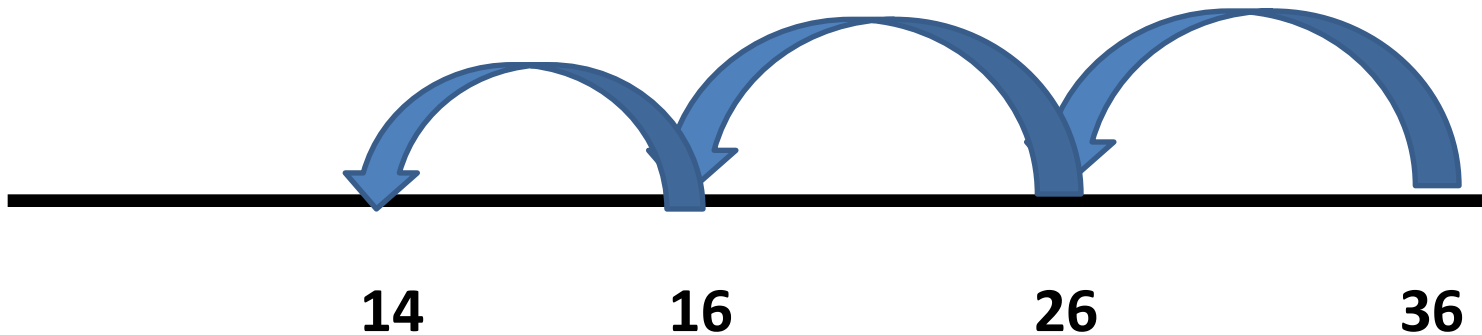
$$\begin{array}{r} 3587 \\ + 675 \\ \hline 4262 \\ \hline 111 \end{array}$$

Progression in subtraction (Practically)

$$20 - 6 = 14$$



$$36 - 22 = 14 \quad \text{partition 22 to 10, 10, 2}$$



Progression in subtraction

Find the difference. If the difference between the 2 sets of numbers is small, then find difference by counting up.

$$42 - 39 = 3$$



Progression in subtraction

Work out missing numbers.

$$7 - 3 = \square$$

$$7 - \square = 4$$

$$\square - 3 = 4$$

Progression in subtraction

Pencil and paper methods.

$$89 - 57 = 32$$

$$\begin{array}{r} 89 \\ - 57 \\ \hline \end{array} \quad = \quad \begin{array}{r} 80 + 9 \\ \underline{50 + 7} \\ 30 + 2 = 32 \end{array}$$

Progression in subtraction

Pencil and paper methods.

$$71 - 46 = 25$$

$$\begin{array}{r} 71 \\ - 46 \\ \hline \end{array} \quad = \quad \begin{array}{r} 60 \\ \cancel{70} + 1 \\ \hline 40 + 6 \\ \hline 20 + 5 = 25 \end{array}$$



Language for Multiplication and Division Year 3

lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times..., times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each, group in pairs, threes... tens, equal groups of, divide, division, divided by, divided into, left, left over, remainder

Language for Multiplication and Division Year 3

lots of, groups of, times, multiply, multiplication, multiplied by, multiple of, product, once, twice, three times... ten times..., times as (big, long, wide... and so on), repeated addition, array, row, column, double, halve, share, share equally, one each, two each, three each..., group in pairs, threes... tens, equal groups of, divide, division, divided by, divided into, remainder, factor, quotient, divisible by, inverse

Objectives year 3

- Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- Solve problems, including missing number problems, involving multiplication and division, including integer scaling problems and correspondence problems in which n objects are connected to m objects.

Objectives year 4

- Recall multiplication and division facts for multiplication tables up to 12×12
- Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers
- Recognise and use factor pairs and commutativity in mental calculations
- Multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.

Multiplicarion

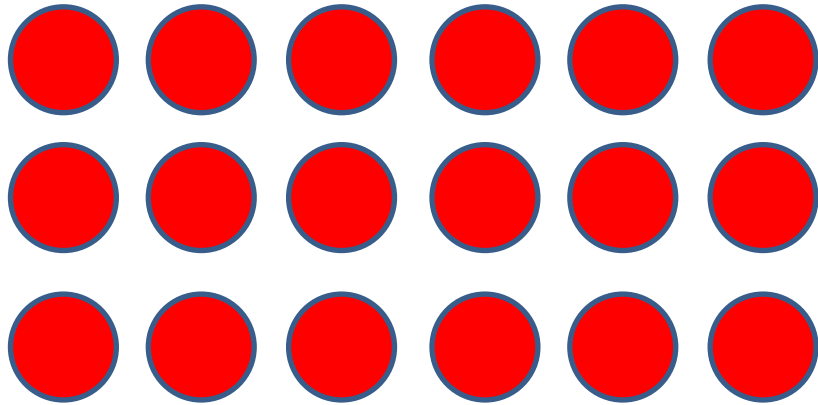
X signs and missing numbers

$$3 \times \boxed{?} = 6$$

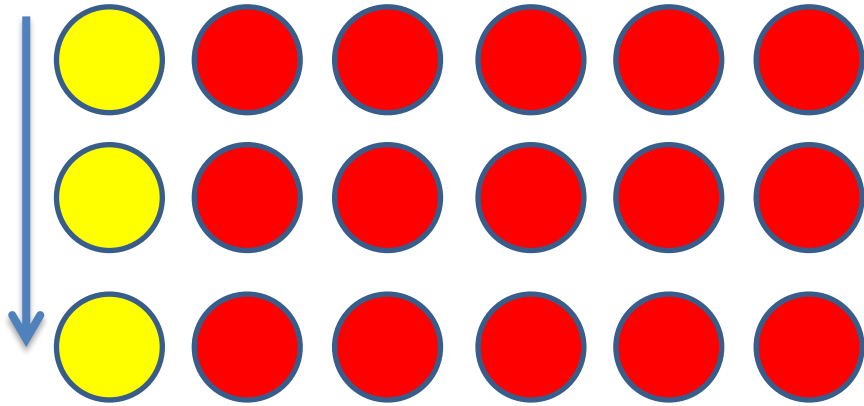
$$\boxed{?} \times 4 = 20$$

$$2 \times 5 = \boxed{?}$$

Arrays and repeated addition

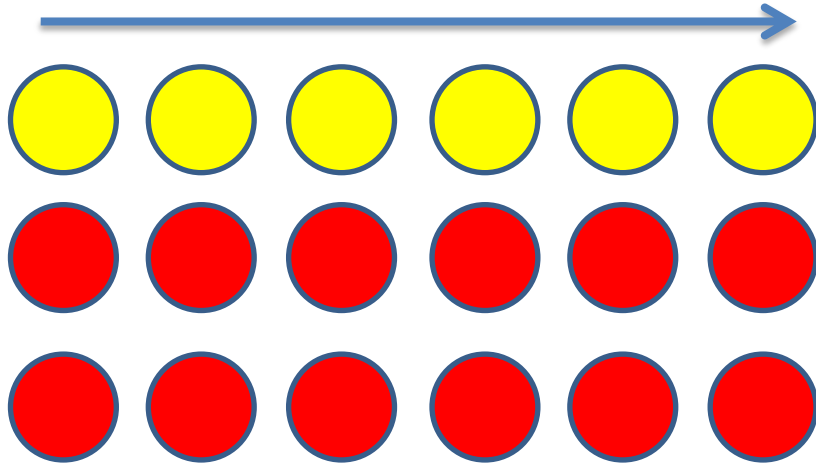


Arrays and repeated addition



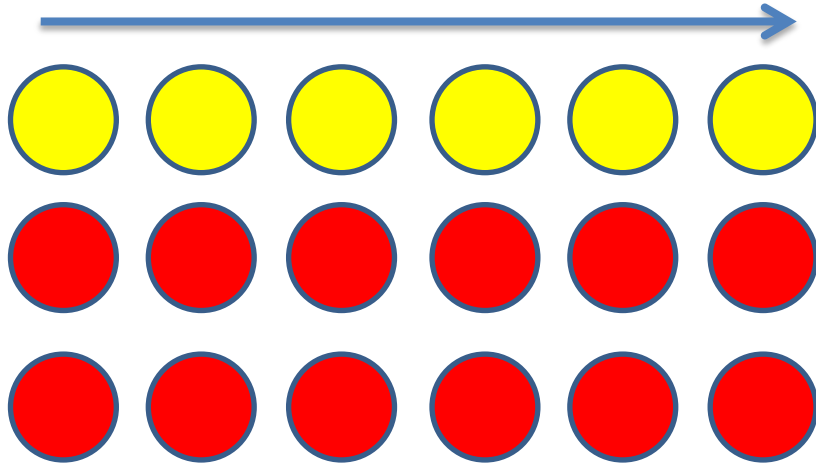
$$6 \times 3 = 18$$

Arrays and repeated addition

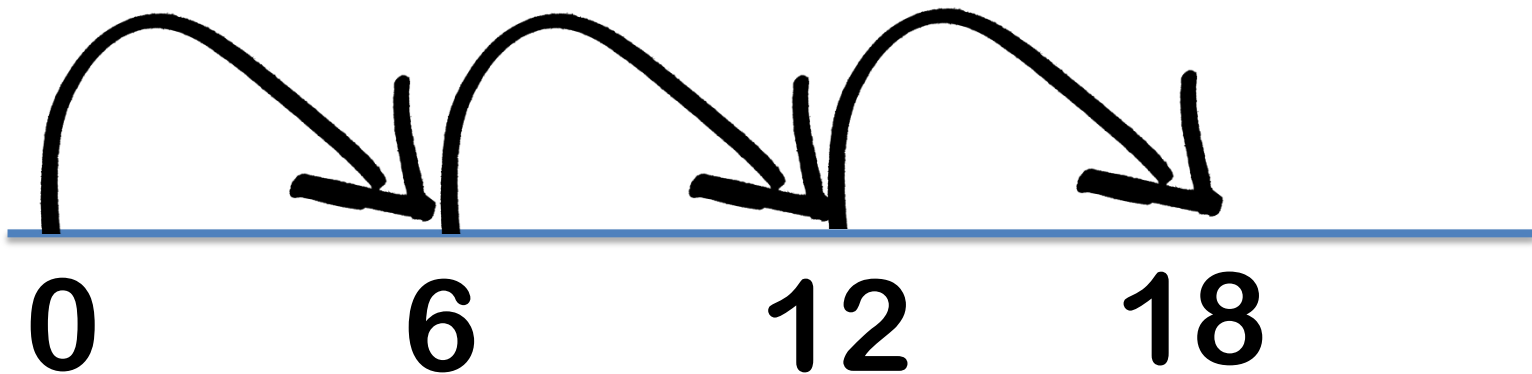


$$3 \times 6 = 18$$

Arrays and repeated addition



$$3 \times 6 = 18$$



Double multiples of 5 up to 50

$$5 \longrightarrow 10$$

$$15 \longrightarrow 30$$

$$35 \longrightarrow 70$$

Partitioning

3416 \rightarrow **3000** **400** **10** **6**

Partitioning into the grid method

$$14 \times 3 =$$

x	10	4
3		

Partitioning into the grid method

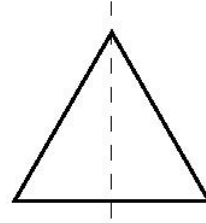
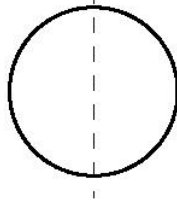
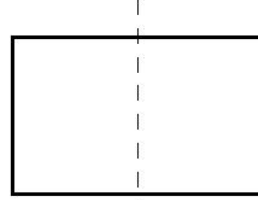
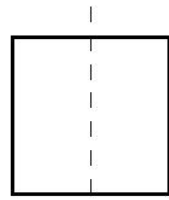
$$23 \times 7 =$$

x	20	3
7		

Division

Fractions of shapes

Find a half of



How many more need to be shaded to shade $\frac{3}{4}$ of this shape?

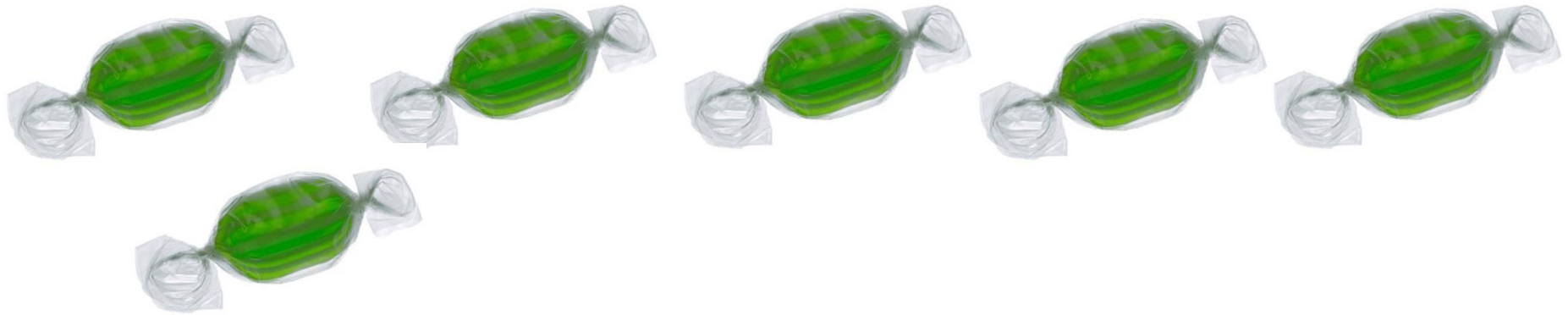
Fractions of groups or numbers

Find a half of



Find $\frac{1}{4}$ of 24

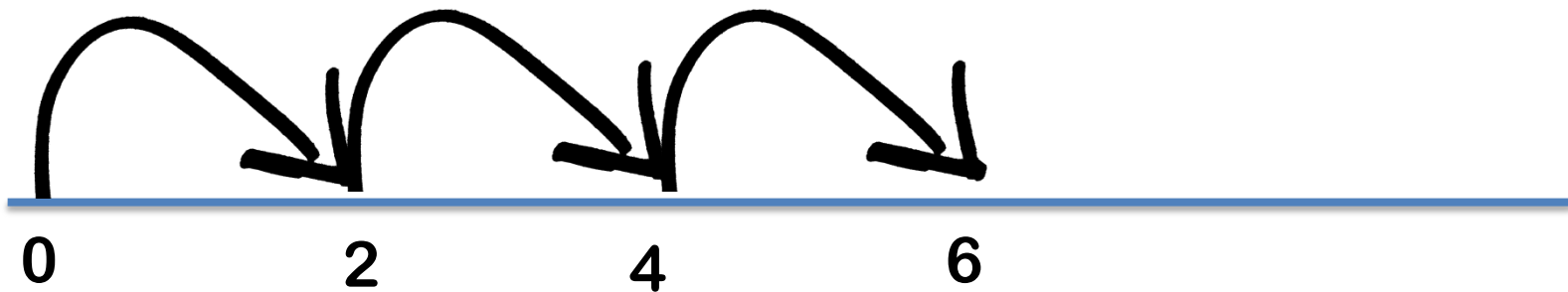
Simple sharing



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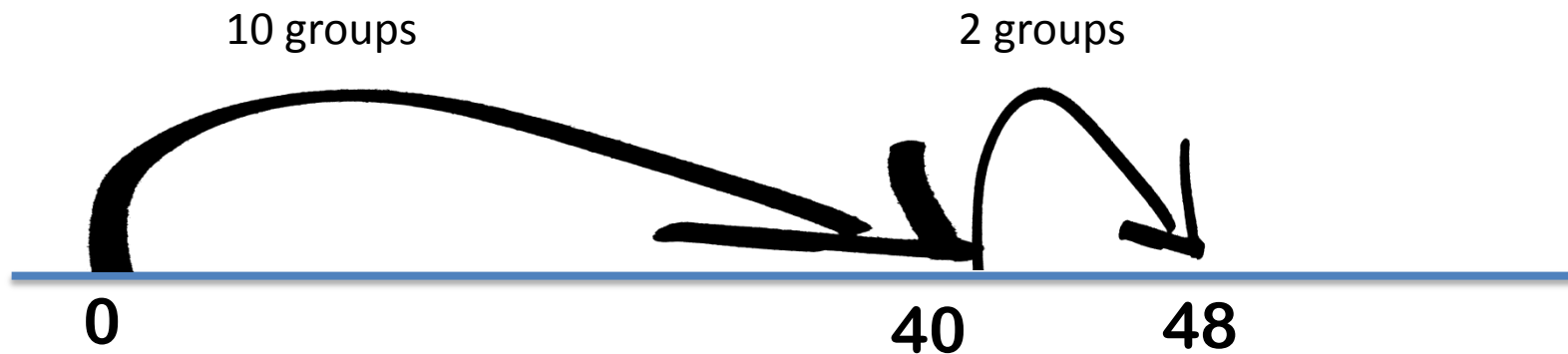
Using known multiplication facts

$$6 \div 2 =$$



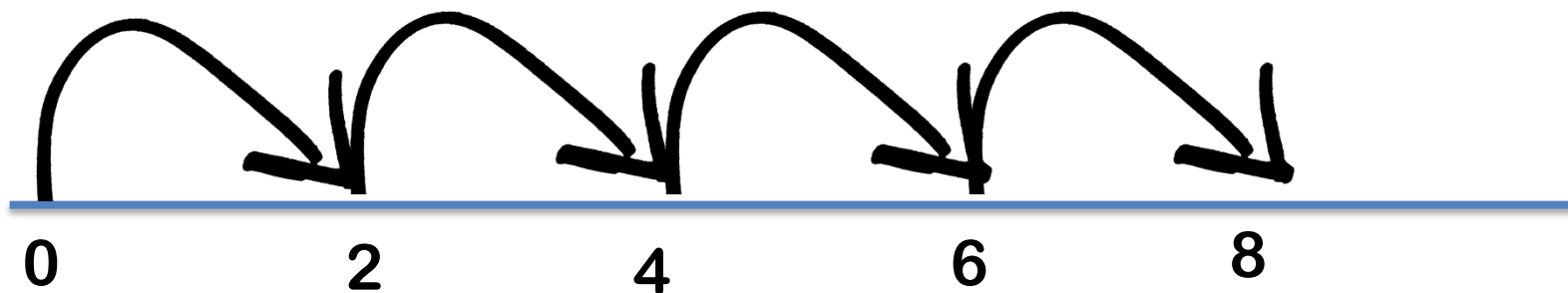
Using known multiplication facts

$$48 \div 4 =$$



Using known multiplication facts

$$9 \div 2 =$$



Application

Children need to be able to apply all of the strategies that are taught to them.

This may be through an investigation, a word problem or a real life problem.

Application

Peter has 24 sweets. He shares them between his 8 friends. How many sweets do they have each?

Application

Sarah had £5.50. She doubled it on a slot machine then gave £2.50 to her friend. How much money does she have left?

Application

Martin has £6, David has £5 and Steven has double what Martin has. How much money do the children have altogether?