# Multiplication and Division Parent Forum

23rd May 2024

OAKRIDGE FEDERATION

# Multiplication check

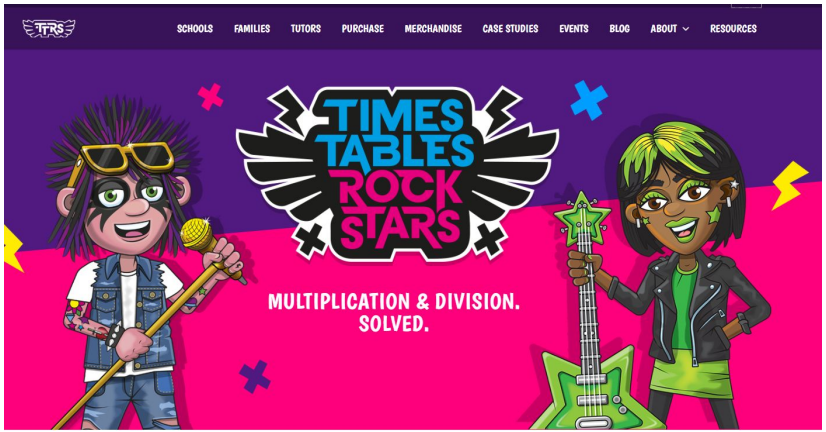
Statutory assessment to check fluency of multiplication facts recall.

Takes place in June when the children are in Y4.

Computer based timed test of 25 questions, 6 seconds per question.

Layout is very similar to TT rockstars, which the children are familiar with.

# Times Table Rockstars




https://ttrockstars.com

Game for practising recall of times table facts. (This is not for teaching times tables or for completing multiplication calculations using formal methods.)
Children can 'battle' with other classes in school and children in their class.
All children have a login stuck into their reading diaries. Please ask your child's teacher if you have lost it.
Numbots-runs on the same platform for children in YR and Y1 and the login is the same.

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# Multiplication tables

Children learn multiplication tables in the following year groups

Year 2:  2, 5, 10

Year 3:  3, 4, 8

Year 4:  6, 9, 7, 11, 12

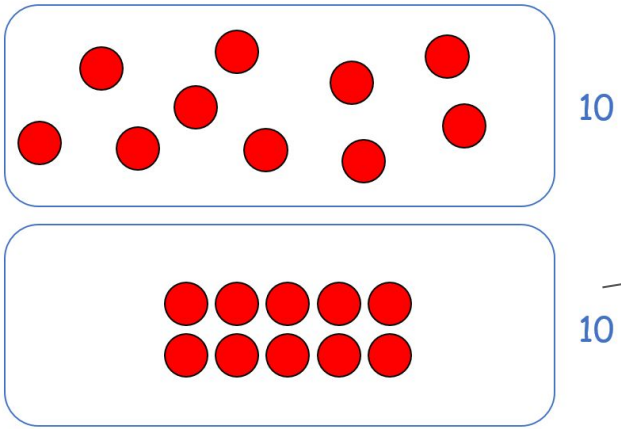
# Early introduction of multiplication skills

Counting in smaller groups of numbers makes the counting of larger groups quicker and is more efficient way.

Children will work practically as we know that they need to 'do' the maths in order to be able to understand how the numbers are changing. They will then move onto working with pictorial representations and finally calculations, which are a more abstract way of working.

(CPA- Concrete Pictorial Abstract)

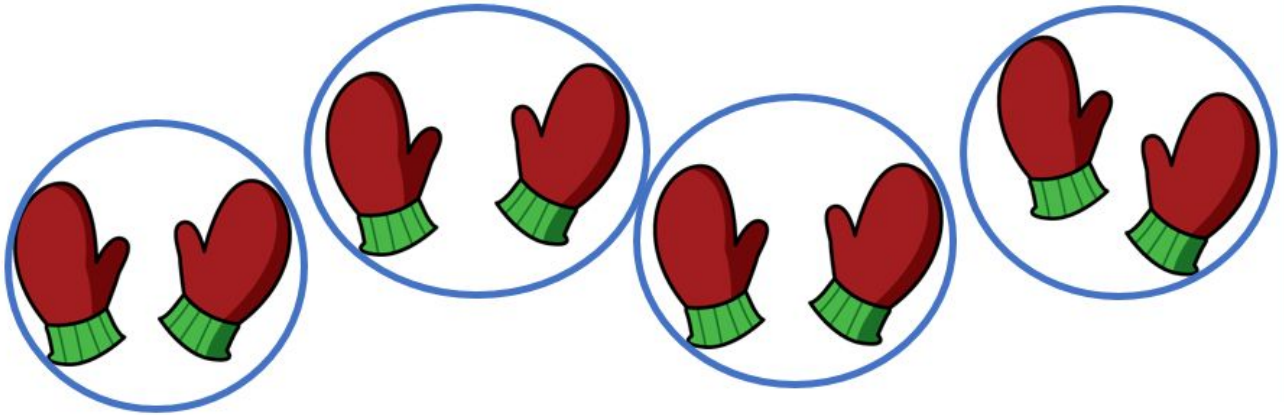
Which counters are easier to count?




Organised this way this group of counters can be more easily counted in 2s

# Recognising equal groups

Children need to understand and be able to create equal groups before learning multiplication tables.

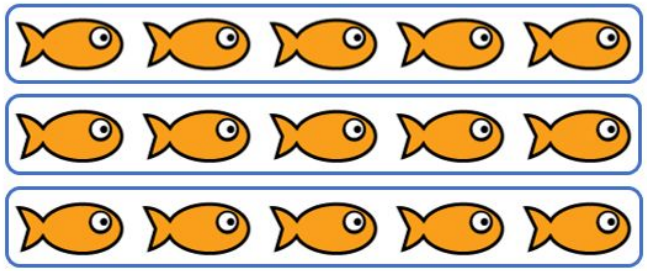


Stem sentences are used to support the development of the vocabulary needed to understand the process of multiplication

There are 4 groups of 2 mittens.

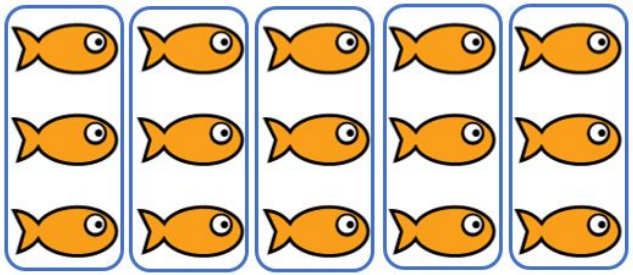
# Arrays

An array is a pictorial way of showing multiplication groups and be interpreted in two ways, showing the commutative nature of multiplication.



There are 3 rows of 5

There are 15 altogether.



There are 5 columns of 3

There are 15 altogether.

Stem sentences are used and children are encouraged to use this vocabulary when they talk about what they are doing.

# Repeated addition

Children are first taught repeated addition and then the links made to multiplication.

2 add 2 add 2 add 2 add 2 equals 10

$2 + 2 + 2 + 2 + 2 = 10$

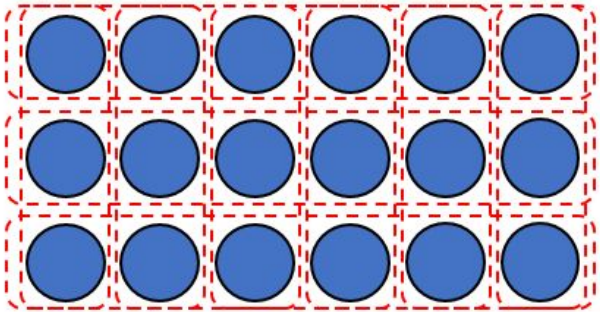
$5 \times 2 = 10$

5 groups of two equals 10

The two calculations mean the same, the second is a more efficient way to record what is being shown.

# Introducing the multiplication symbol

The multiplication symbol is introduced in Year 2 as the children can now verbalise what they have done using the mathematical resources and ready to start to work in a more abstract way.



$$6 + 6 + 6 = 18$$

$$3 \times 6 = 18$$

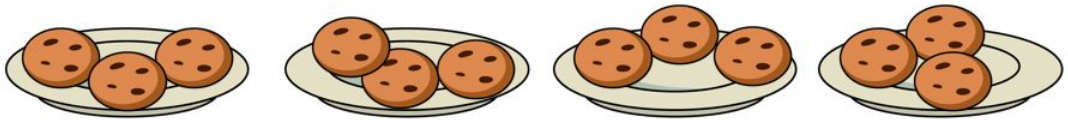
$$3 + 3 + 3 + 3 + 3 + 3 = 18$$

$$6 \times 3 = 18$$

Links continue to be made between repeated and addition and multiplication to support children's understanding

# Early division

Practical sharing activities are the early steps to understanding the concept of division.
Again the understanding of equal groups is important knowledge here.



There are 12 cookies.
They are shared equally between 4 plates.
There are 3 cookies on each plate.

Stem sentences are used to support the children in explaining what has been done.

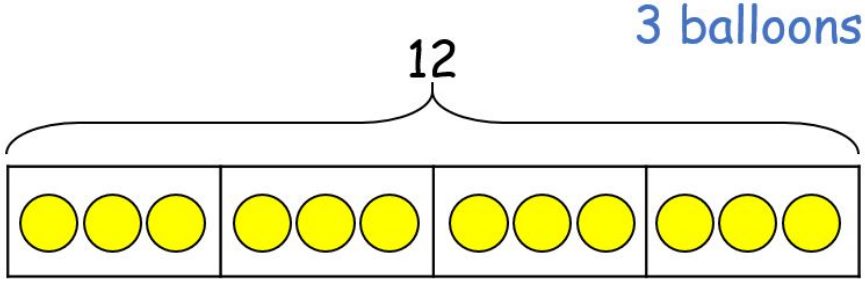
# Introducing more formal pictorial representations

Resources such as the bar model are used to support children's understanding and recording of problems involving division.

Rosie has 12 balloons.

She shares them between 4 bags.

How many balloons are in each bag?



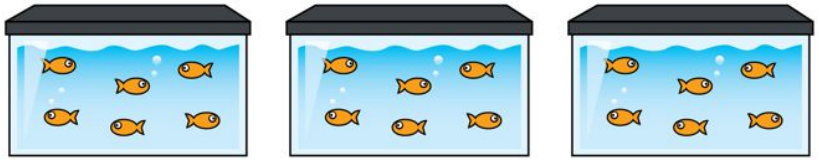

The division symbol is introduced.

Complete the division.

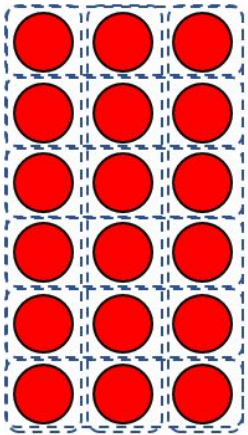
12 ÷ 4 = 3

# Making the link between multiplication and division

In the lower junior school all representations are used to continue to build children's knowledge and understanding.



$$6 + 6 + 6 = 18$$



$$3 \times 6 = 18$$

$$6 \times 3 = 18$$

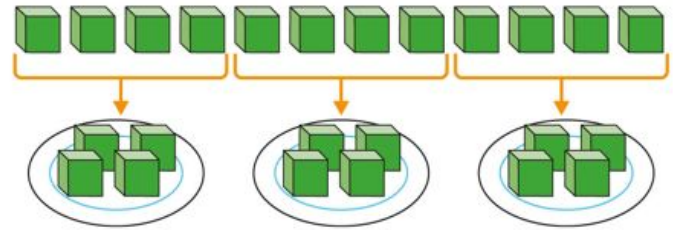
$$18 \div 6 = 3$$

$$18 \div 3 = 6$$

Children learn to recognise fact families to develop and support their understanding of inverse relationship between multiplication and division

When children are in year 3 and 4, they continue to understand the building blocks of division. From their knowledge of inverse procedures, children start to make equal amounts of whole numbers to see how many times it fits in. They also use the part-whole model, using multiplication knowledge, can provide children with a clear written method that matches the concrete representation.

Flexible partitioning in a part whole model helps children rely on number facts and make the method more efficient.



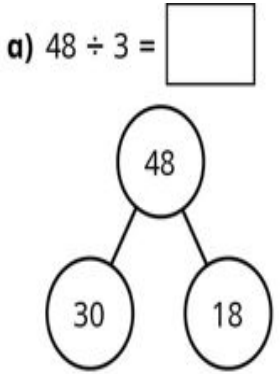
Complete the sentences.

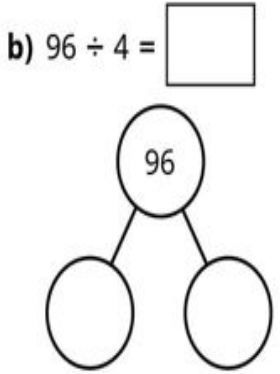
There are 12 cubes.

There are ☐ plates.

Each plate has ☐ cubes.

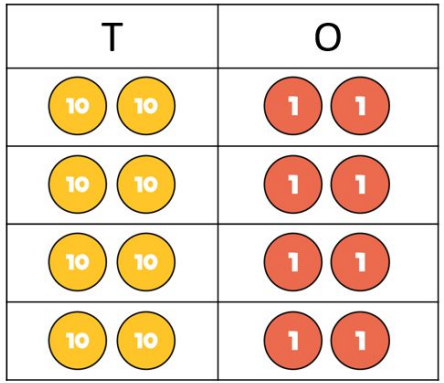
12 divided into ☐ equal groups is ☐



# Moving to more formal methods

Practical equipment, in this case place value counters, is still used in the junior school to support the children's understanding of the calculation process and what this means.

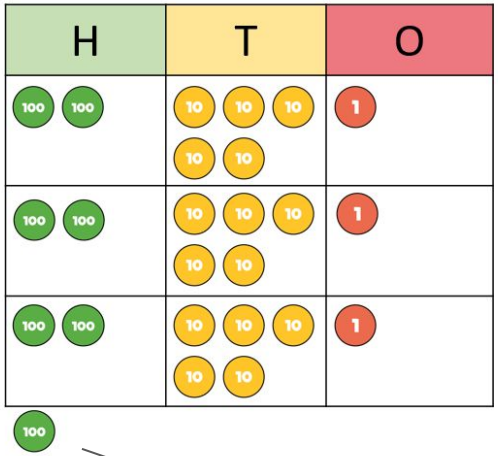



$22 \times 4 = 88$

The number 22 is shown on the grid 4 times, therefore the calculation is 22x4=88

$251 \times 3 = 753$

The number shown here is 251, 3 times. 251x3=753



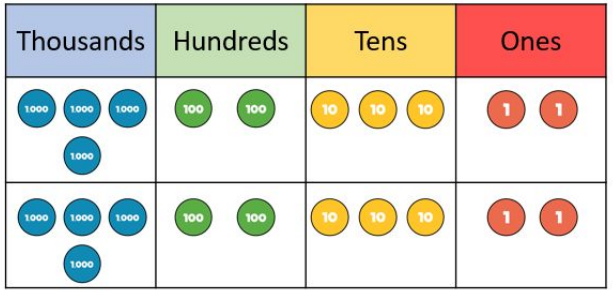

| | H | T | O | |
|---|---|---|---|---|
| | 2 | 5 | 1 | |
| × | | | 3 | |
| | 7 | 5 | 3 | |
| | 1 | | | |

Children can manipulate the counters to show where exchanging has taken place.

Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4.

Number sentences help children to secure their understanding of how a procedure works, whilst getting them to question the maths and process the method.

Complete the sentences to describe the multiplication.




There are 4 ones altogether.

There are 6 tens altogether.

There are 4 hundreds altogether.

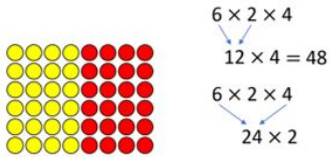
There are 8 thousands altogether.

$4{,}232 \times 2 = 8{,}464$

# Efficiency

In the upper junior school when children are confident with their times tables facts they can use them to calculate with larger numbers. We often use this question to make links between the knowledge the children have developed. If I know……then I also know……

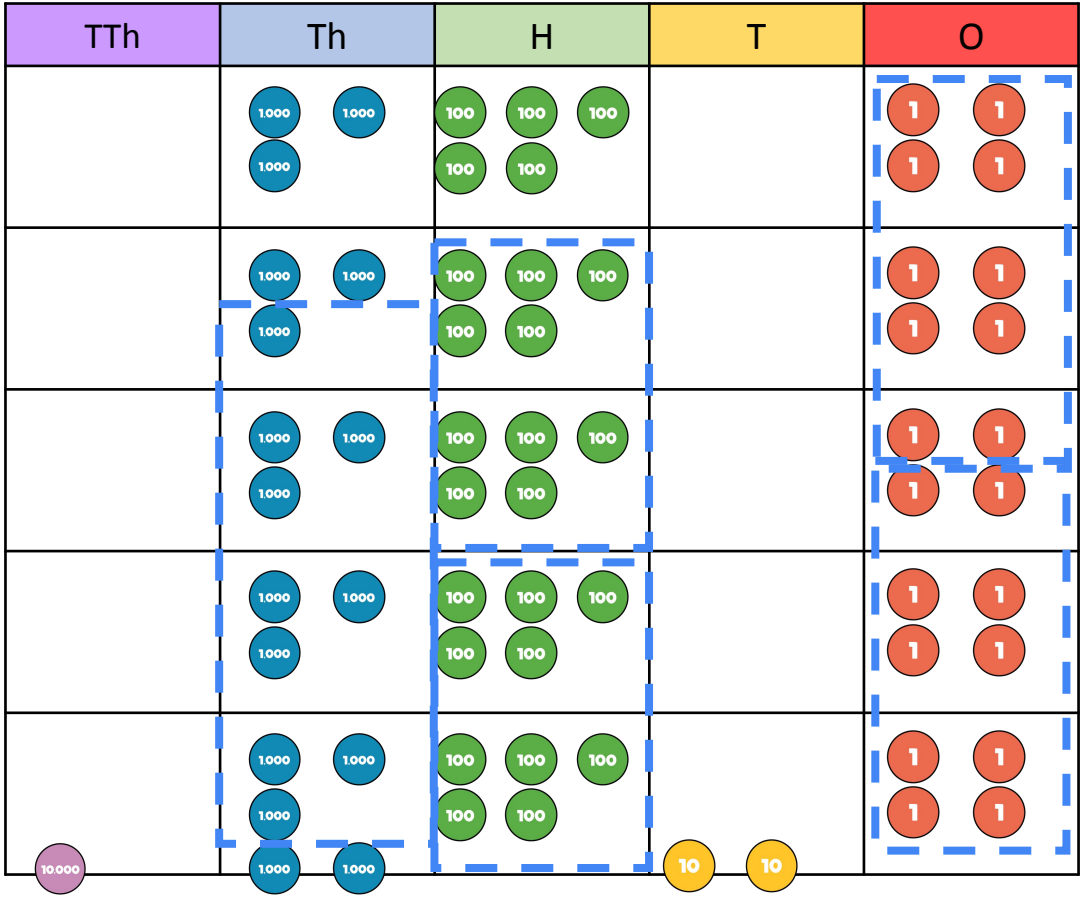
$$5 \times 28 = \boxed{140}$$


$$5 \times 2 \times 14$$
$$10 \times 14 = 140$$

$$5 \times 7 \times 4$$
$$20 \times 7 = 140$$

Looking for known facts within calculations simplifies them and makes them easier to solve




$3{,}504 \times 5$

$= 17{,}520$

| | | | | | |
|---|---|---|---|---|---|
| | 3 | 5 | 0 | 4 | |
| X | | | | 5 | |
| 1 | 7 | 5 | 2 | 0 | |
| 1 | 2 | | 2 | | |

This the process of how short multiplication works, which progresses through from multiplying by a single digit to two digits in year 5

What is the smallest product you can make that's also an odd number?

| 5 | 2 | 7 | 3 | 6 |
|---|---|---|---|---|

| | Th | H | T | O |
|---|---|---|---|---|
| | | 3 | 6 | 7 |
| X | | | 2 | 5 |
| | | | | |
| + | | | | |
| | | | | |

odd × odd = odd

odd × even = even

even × even = even

Could these calculations be correct?
Explain your reasons.

Have a think

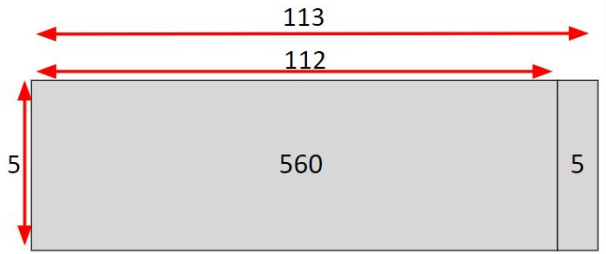
$214 \times 5 = 1{,}071$

$2 \times 293 = 576$

$3 \times 431 = 1{,}292$

| Could be correct | Definitely incorrect |
|---|---|
| $2 \times 293 = 576$ | $214 \times 5 = 1{,}071$<br>$3 \times 431 = 1{,}292$ |

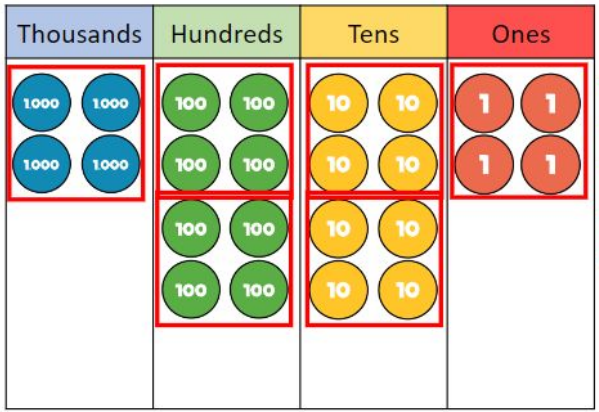
If I know $112 \times 5 = 560$
How can I work out $113 \times 5$?

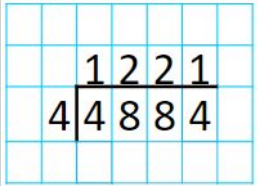



$113 \times 5 = 112 \times 5 + 5 = 565$

As children work their way into year 5 and 6, questions become increasingly more abstract. Not only are question based solely in multiplication and division, but these methods are needed in a broad range of topics.

There are 4,884 crayons and they come in packs of 4
How many packs are there?

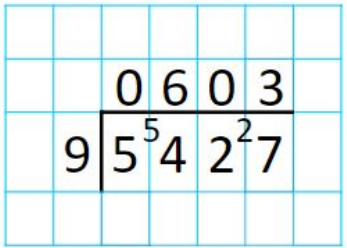


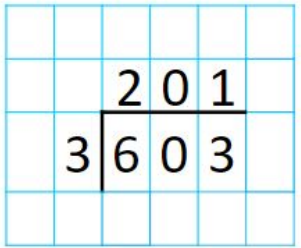




Word problems are used increasingly, which requires the children to have a strong understanding of the language being used.

Without the earlier years smaller steps, children can start to develop learning gaps, making this type of questions difficult to understand.

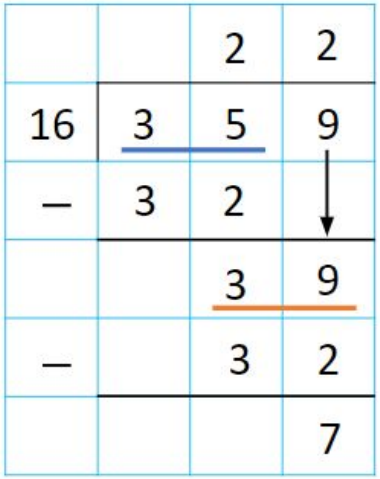
5,427 marbles are put into bags with 9 marbles in each bag.
The bags are shared equally between three boxes.
How many bags of marbles are in each box?



Calculate 359 ÷ 16 = 22 r7

| 16 | 32 | 48 | 64 | 80 | 96 | 112 | 128 | 144 | 160 |
|---|---|---|---|---|---|---|---|---|---|




Ron is thinking of a number between 700 and 730

He divides it by 4 and there is a remainder of 1

He divides it by 5 and there is a remainder of 1

| Multiples of 4 end in: | If there's a remainder 1 | Multiples of 5 end in: | If there's a remainder 1 |
|---|---|---|---|
| 4 | 5 | 5 | 6 |
| 8 | 9 | 0 | 1 |
| 2 | 3 | | |
| 6 | 7 | | |
| 0 | 1 | | |

In year six, children need a strong understanding of all multiplication facts and procedures as they are often required to draw up on these to systematically work through problems.

SATs are a statutory assessment in year six. For this, children are required to solve a number of abstract problems.

These problems are based on different concepts, using children's learning from year one to year 6.

9. Miss Mills is making jam to sell at the school fair.

Strawberries cost £7.50 per kg.

Sugar costs 79p per kg.

10 glass jars cost £6.90

She uses 12 kg of strawberries and 10 kg of sugar to make 20 jars full of jam.

Calculate the total cost to make 20 jars full of jam.

Amir has a box of counters.

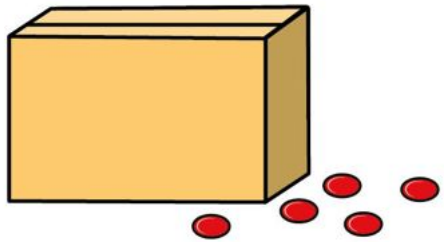
For every 5 red counters in the box, there are 2 green counters.

Amir removes 21 red counters.

There are now the same number of red and green counters in the box.

How many green counters are in the box?

Show all your workings.



Fractions can be expressed as divisions.

For example, $\frac{1}{2} = 1 \div 2$

Write the fractions as divisions.

a) $\frac{1}{3} = \square \div \square$

b) $\frac{2}{3} = \square \div \square$

c) $\frac{4}{7} = \square \div \square$

d) $\frac{\square}{\square} = 3 \div 5$

e) $\frac{\square}{7} = 3 \div \square$

f) $\frac{1}{10} = \square \div \square$