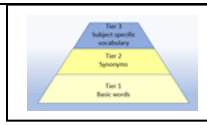
Oakmeadow Primary School Calculation Policy

Division

Year 1

Basic to subject specific (Beck's Tiers):
share, share equally, one each, two each…, group, groups of, lots of, array



Generalisations

- True or false? I can only halve even numbers.
- Grouping and sharing are different types of problems. Some problems need solving by grouping and some by sharing. Encourage children to practically work out which they are doing.

Some Key Questions
How many groups of…?
How many in each group?
Share… equally into…
What can do you notice?

NC: Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Year 2

Basic to subject specific (Beck's Tiers):
group in pairs, 3s … 10s etc, equal groups of, divide, ÷, divided by, divided into, remainder

Generalisations
Noticing how counting in multiples if 2, 5 and 10 relates to the number of groups you have counted (introducing times tables)
An understanding of the more you share between, the less each person will get (e.g. would you prefer to share these grapes between 2 people or 3 people? Why?)
Secure understanding of grouping means you count the number of groups you have made. Whereas sharing means you count the number of objects in each group.

Some Key Questions
How many 10s can you subtract from 60?
I think of a number and double it. My answer is 8. What was my number?
If 12 x 2 = 24, what is 24 ÷ 2?
Questions in the context of money and measures (e.g. how many 10p coins do I need to have 60p? How many 100ml cups will I need to reach 600ml?)

NC 2014 Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs.
Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
Find fractions 1/3, 1/4, 2/4, and 3/4 of a length, shape, set of objects or quantity.

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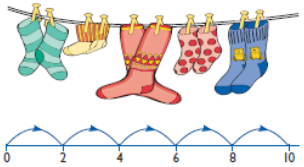
Mental Strategies

Children should experience regular counting on and back from different numbers in 1s and in multiples of 2, 5 and 10.
Children must have secure counting skills- being able to confidently count in 2s, 5s and 10s.
Children should be given opportunities to reason about what they notice in number patterns.
They should begin to recognise the number of groups counted to support understanding of relationship between multiplication and division.

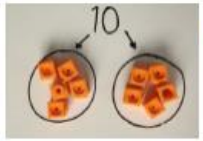


2 + 2 + 2 + 2 + 2 = 10
2 × 5 = 10
2 multiplied by 5
5 pairs
5 hops of 2

Group AND share small quantities- understanding the difference between the two concepts.
Sharing – 6 sweets are shared between 2 people. How many do they have each?

Sharing using concrete apparatus, pictorial and abstract

Sharing objects into groups



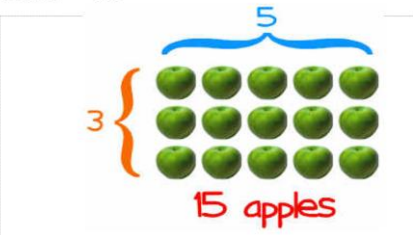
I have 10 cubes, can you share them equally in 2 groups?

Mental Strategies

Children should count regularly, on and back, in steps of 2, 3, 5 and 10.
Children who are able to count in twos, threes, fives and tens can use this knowledge to work out other facts such as 2 × 6, 5 × 4, 10 × 9.

Know and understand sharing and grouping- introducing children to the ÷ sign.
Children should continue to use grouping and sharing for division using practical apparatus, arrays and pictorial representations. Children should use jottings alongside the abstract to show their understanding.

5 x 3 = 15
3 x 5 = 15

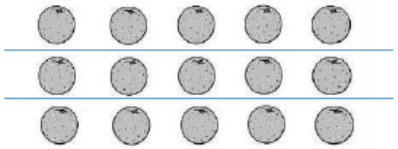


Division with arrays

Link division to multiplication by creating an array and thinking about the number sentences that can be created.

Eg 15 ÷ 3 = 5 5 x 3 = 15
15 ÷ 5 = 3 3 x 5 = 15

To recognise the dividend of 15 and the associated division facts such as: 15 ÷3 = 5
It is essential that children use jottings to draw around their equal groups to show accurate representations of the number sentence



Draw an array and use lines to split the array into groups to make multiplication and division sentences.

Find the inverse of multiplication and division sentences by creating four linking number sentences.

5 x 3 = 15
3 x 5 = 15
15 ÷ 5 = 3
15 ÷ 3 = 5

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Children use pictures or shapes to share quantities.

8 ÷ 2 = 4

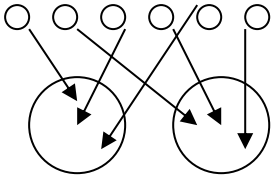
Share 9 buns between three people.

9 ÷ 3 = 3

They should use objects to group and share amounts to develop understanding of division in a practical sense. They should use jottings alongside the abstract to show their understanding.
E.g. using counters to find out how many 5's are in 30? How many pairs of gloves if you have 12 gloves?

Record sharing by using pictorial notation

There are 6 cakes and 2 children. How many cakes will they each get?
One for you and one for you.



5 hops in 15. How big is each hop?

Know and understand sharing and grouping- introducing children to the ÷ sign.

Children should continue to use grouping and sharing for division using practical apparatus, arrays and pictorial representations. Children should use jottings alongside the abstract to show their understanding.

15 pencils shared between 3 pots, how many in each pot?

Pat has no more than 20 sweets in a bag.

She counts her sweets in groups of two. She has one left over.

Then she counts her sweets in groups of five. She has 2 left over.

How many sweets could Pat have? Is there another answer?

Division as grouping: concrete, pictorial and abstract.

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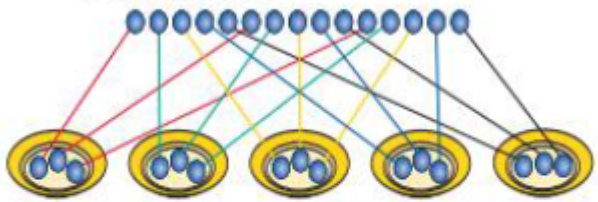
Develops importance of one-to-one correspondence.

15 ÷ 5 = 3

15 shared between 5



Jottings should be used alongside the abstract to show their understanding.

Children should be taught to share using concrete apparatus.

Grouping

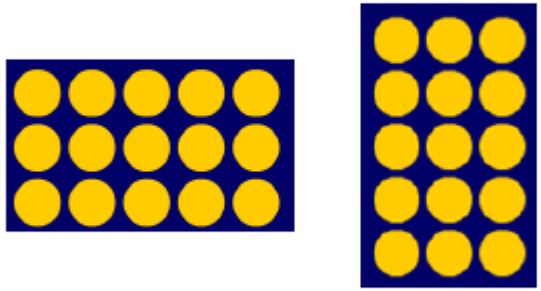
Children should apply their counting skills to develop some understanding of grouping.

15 ÷ 3 = 5

Use of arrays as a pictorial representation for division.

15 ÷ 3 = 5 There are 5 groups of 3.

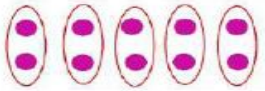
15 ÷ 5 = 3 There are 3 groups of 5.



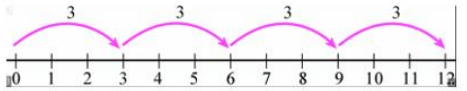
Children should be able to find ½ and ¼ and simple fractions of objects, numbers and quantities.

Grouping

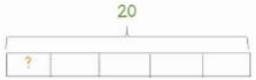
Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.



Use a number line to show jumps in groups. The number of jumps equals the number of groups.



Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.



20 ÷ 5 = ?

5 x ? = 20

28 ÷ 7 = 4

Divide 28 into 7 groups. How many are in each group?

Use the number line to show jumps in groups. Each jump up is an equal group. How many equal groups of 3 are there in 15?

The bar model should be used as a visual representation to show division as equal groups.

This should show how to use the bar method to show division as equal grouping. Should reflect the above images.

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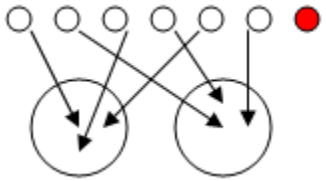
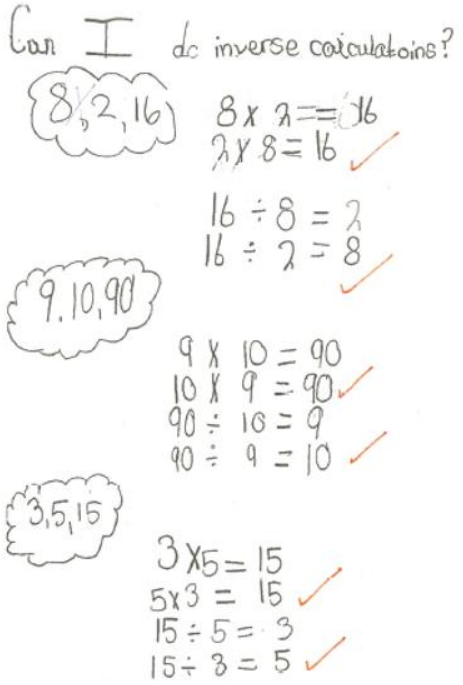
Children should begin to explore finding simple fractions of objects, numbers and quantities.

E.g.*16 children went to the park at the weekend. Half that number went swimming. How many children went swimming?*

There are 7 cakes and 2 children. How many cakes will they each get?

'Leftovers' introduced.

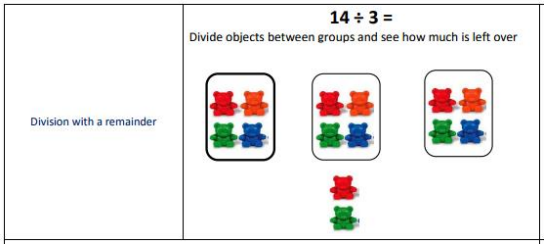


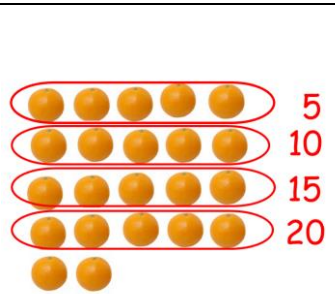


÷ = signs and missing numbers

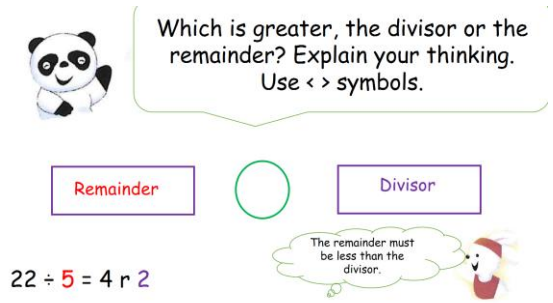
6 ÷ 2 = □	□ = 6 ÷ 2
6 ÷ □ = 3	3 = 6 ÷ □
□ ÷ 2 = 3	3 = □ ÷ 2
□ ÷ ∇ = 3	3 = □ ÷ ∇

Pupils to recognise when a dividend will leave a remainder, for example, 14 ÷ 3 .





Children should use jottings alongside the abstract to show their understanding. They must understand that the remainder must be less than the divisor or you would be able to make another equal group.

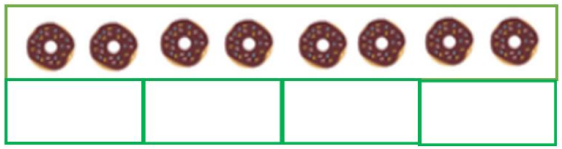


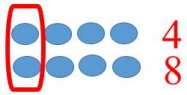
Children should be given opportunities to find a half, a quarter and a third of shapes, objects, numbers and quantit1ies. Finding a fraction of a number of objects to be related to **grouping**. Jottings are essential to build conceptual understanding.

Jottings to use bar model concept.

Tom needs to give one quarter of his eight cookies to his friend.
What is $\frac{1}{4}$ of 8 cookies?

The whole is divided into ( ) equal parts. $8 \div 4 =$



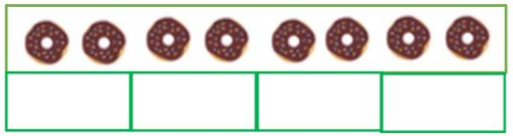


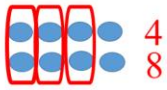
$\frac{1}{4}$ of eight is_____.

Children should find the unit fraction first and understand this concept before moving onto non-unit fractions. Example below. Some children will be able to see the relationship between one quarter of an amount and three quarters of the same amount.

Tom needs to give one quarter of his eight cookies to his friend.
What is (three, one quarters) $\frac{3}{4}$ of 8 cookies?

The whole is divided into ( ) equal parts. $8 \div 4 =$





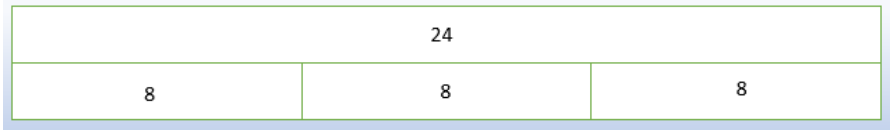
$\frac{1}{4}$ of eight is_____.

What is $\frac{3}{4}$ of eight?

They will explore visually and understand how some fractions are equivalent – e.g. two quarters is the same as one half.

Teachers should use pictorial representations first.

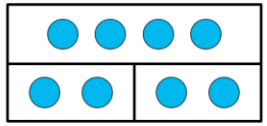
24 is divided equally into 3 groups.



$\frac{1}{2}$ (half) of 4 =

What is the number sentence?

$4 \div 2 =$

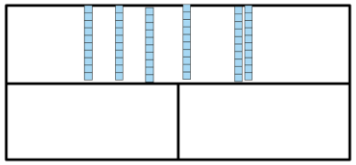


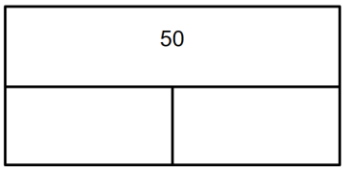
Half of 4 is equal to 2.

Double 2 is equal to 4.

$\frac{1}{2}$ (half) of 50 =

What is the number sentence?





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