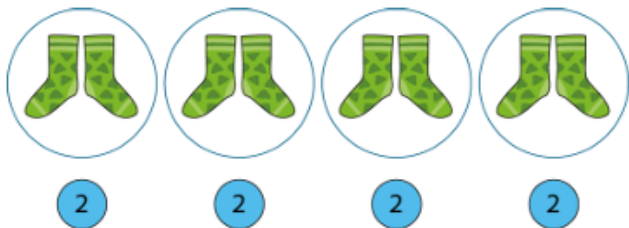


Step 1: To understand that we can group objects for division



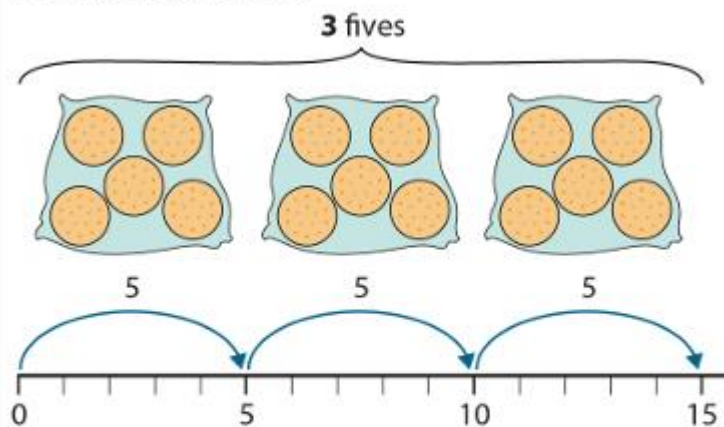
'There are eight socks. If I put them into pairs, how many pairs will there be?'



- 'Eight is divided into groups of two. There are four groups.'
- 'There are four groups of two in eight.'
- 'Eight is the total number of socks.'
- 'Two is the number of socks in each group/pair.'
- 'Four is the number of pairs of socks.'

Step 2: To know that we can show this grouping on a numberline

Making groups of five:



$$5 + 5 + 5 = 15$$

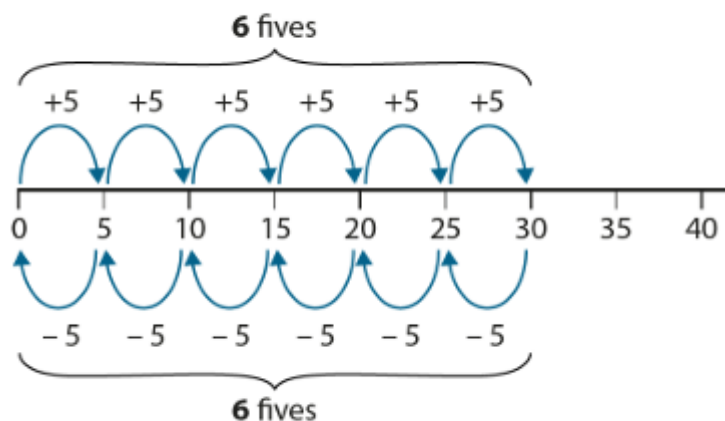
$$15 \div 5 = 3$$

'Fifteen divided into groups of five is equal to three.'

Step 3: To know that we can also group by counting backwards on a numberline

Counting forwards or backwards – number line:

$$5 + 5 + 5 + 5 + 5 + 5 = 30$$



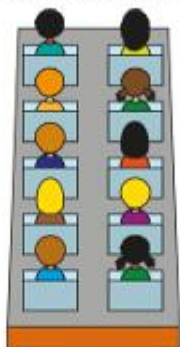
$$30 - 5 - 5 - 5 - 5 - 5 - 5 = 0$$

30	÷	5	=	6
dividend	÷	divisor	=	quotient

Step 4: To know that we can link division with known multiplication facts

Linking multiplication and division facts – contextual quotitive problem:

'A carriage on a fairground ride holds ten people.'



- *'If there are thirty people, how many carriages are needed?'*

$$30 \div 10 = \square$$

'There are three groups of ten in thirty, so thirty divided into groups of ten is three.'

$$3 \times 10 = 30$$

so

$$30 \div 10 = 3$$

Step 5: To know that multiplication is commutative and division is not.

Identifying the correct division equation:

'I have fifteen flowers. If I put five flowers in each vase, how many vases do I need?'



$$\square \times 5 = 15$$

$$5 \times \square = 15$$

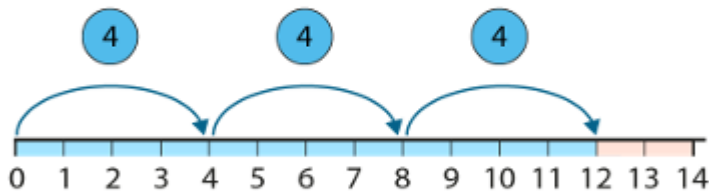
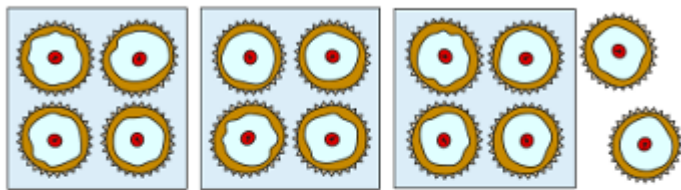
- *'Which calculation represents this problem?'*

$$15 \div 5 = \square \quad \checkmark$$

$$5 \div 15 = \square \quad \times$$

Step 6: To know that we can divide with remainders

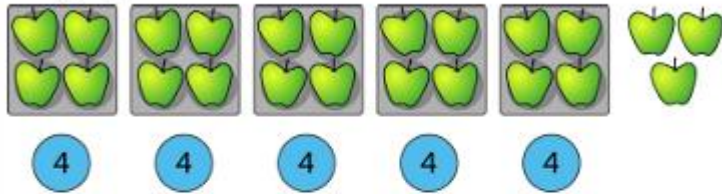
Quotitive division *with* remainder – skip counting to find the solution:



- *'One box of four is four.'*
- *'Two boxes of four are eight.'*
- *'Three boxes of four are twelve.'*
- *'There are two cakes left over.'*

Step 7: To understand how to interpret the remainder depending on the context

'A grocer has twenty-three apples. He sells apples in trays of four. How many full trays of apples can he make? How many apples are left over?'



$$23 \div 4 = 5 \text{ r } 3$$

- 'The "23" represents the total number of apples.'
 - 'The "4" represents the number of apples in each tray.'
 - 'The "5" represents the number of full trays that can be made.'
 - 'The "3" represents the number of apples left over.'
-
- 'So, the grocer can make five full trays of apples; he will have three apples left over.'

'Four scouts can fit in each tent. How many tents will be needed for thirty scouts?'



$$30 \div 4 = 7 \text{ r } 2$$

- 'The "30" represents the total number of scouts.'
 - 'The "4" represents the number of scouts in each tent.'
 - 'The "7" represents the number of full tents.'
 - 'The "2" represents the number of scouts left over.'
-
- 'We need another tent for the two left-over scouts. Eight tents are needed.'



Step 8: To explore dividing by partitioning

Adding the partial quotients:



$$\begin{array}{rclcl}
 8 \text{ tens} & \div & 4 & = & 2 \text{ tens} \\
 4 \text{ ones} & \div & 4 & = & 1 \text{ one} \\
 \hline
 84 & \div & 4 & = & 21
 \end{array}$$

- 'Eight tens and four ones divided between four is equal to two tens and one one.'
- 'Each child gets twenty-one sticks.'

Step 9: To use partitioning and exchanging

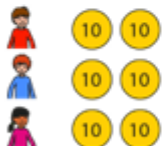
Presenting the problem:

'Eighty-one marbles are shared equally between three children. How many marbles does each child get?'

$$81 \div 3 = ?$$

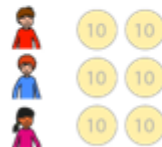


Skip counting according to a multiple of the divisor – sharing the tens:



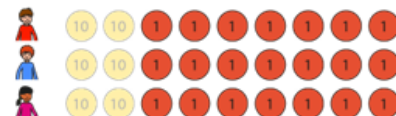
- 'Three tens are one ten each. That's thirty.'
 - 'Six tens are two tens each. That's sixty.'
 - 'There are two tens left over.'
- $$8 \text{ tens} \div 3 = 2 \text{ tens r } 2 \text{ tens}$$
- 'Eight tens divided between three is equal to two tens each, with a remainder of two tens.'

Exchanging the remaining tens for ones:



- 'Two tens and one one is equal to twenty-one ones.'

Skip counting according to a multiple of the divisor – sharing the ones:



- 'Three ones are one each. That's three.'
 - 'Six ones are two each. That's six...'
 - 'Twenty-one ones is seven each. That's twenty-one.'
- $$21 \text{ ones} \div 3 = 7 \text{ ones}$$
- 'Twenty-one ones divided between three is equal to seven ones each.'

Adding the partial quotients:



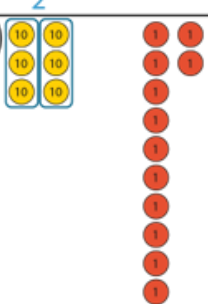
$$\begin{array}{rclcl}
 6 \text{ tens} & \div & 3 & = & 2 \text{ tens} \\
 21 \text{ ones} & \div & 3 & = & 7 \text{ ones} \\
 \hline
 81 & \div & 3 & = & 27
 \end{array}$$

- 'Each child gets twenty-seven marbles.'

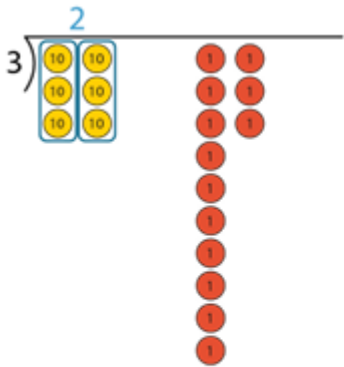
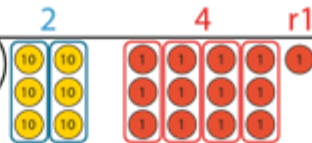
Step 10: To use the algorithm of short division

Step 1 – write the divisor and dividend  	Step 2 – sharing the tens  
10s 1s $\begin{array}{r} 4 \overline{) 84} \end{array}$ 'Eighty-four divided by four.'	10s 1s $\begin{array}{r} 2 \\ 4 \overline{) 84} \end{array}$ 8 tens $\div$ 4 = 2 tens 'Eight tens divided by four is equal to two tens.'
Step 3 – sharing the ones  	Summary  
10s 1s $\begin{array}{r} 2 1 \\ 4 \overline{) 84} \end{array}$ 8 tens $\div$ 4 = 2 tens 4 ones $\div$ 4 = 1 one 'Four ones divided by four is equal to one one.'	10s 1s $\begin{array}{r} 2 1 \\ 4 \overline{) 84} \end{array}$ 'Each child gets twenty-one sticks.'

Step 11: To use short division with exchanging

Step 1 – write the divisor and dividend 	Step 2 – sharing the tens... 
3) 72 'Seventy-two divided by three.'	3) 72 7 tens $\div$ 3 = 2 tens r 1 ten 'Write "2" in the tens column...'
Step 3 – ...and exchanging 	Step 4 – sharing the ones 
1 ten = 10 ones '...and write "1" to the left of the ones digit of the dividend to make twelve ones.'	12 ones $\div$ 3 = 4 ones 'Write "4" in the ones column.'

Step 12: To use short division with remainders

Step 1 – write the divisor and dividend		Step 2 – sharing the tens...	
	$3 \overline{) 73}$		$3 \overline{) 73} \begin{array}{l} 2 \\ 2 \end{array}$
'Seventy-three divided by three.'		7 tens $\div$ 3 = 2 tens r 1 ten 'Write "2" in the tens column...'	
Step 3 – ...and exchanging		Step 4 – sharing the ones	
	$3 \overline{) 7} \begin{array}{l} 2 \\ 13 \end{array}$		$3 \overline{) 7} \begin{array}{l} 2 \\ 4r1 \\ 13 \end{array}$
1 ten = 10 ones '...and write "1" to the left of the ones digit of the dividend to make thirteen ones.'		13 ones $\div$ 3 = 4 ones r 1 one 'Write "4 r 1" in the ones column.'	

Step 13: To divide decimal numbers using known comparison facts

Comparing the equations:

$$\begin{array}{ccc} \textcircled{12} \div 3 = \textcircled{4} & & \\ \times 0.1 \downarrow \div 10 & & \times 0.1 \downarrow \div 10 \\ \textcircled{1.2} \div 3 = \textcircled{0.4} & & \end{array}$$

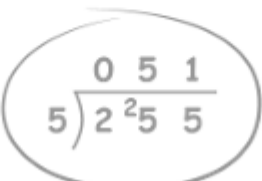
- 'One-point-two is one-tenth the size of twelve, so one-point-two divided by three is one-tenth the size of twelve divided by three.'

$$\begin{array}{ccc} \textcircled{12} \div 3 = \textcircled{4} & & \\ \times 0.01 \downarrow \div 100 & & \times 0.01 \downarrow \div 100 \\ \textcircled{0.12} \div 3 = \textcircled{0.04} & & \end{array}$$

- 'Zero-point-one-two is one-hundredth the size of twelve, so zero-point-one-two divided by three is one-hundredth the size of twelve divided by three.'

Decimal fraction with one decimal place and three significant figures divided by a single-digit number:

$$\begin{array}{ccc} 25.5 \div 5 = \boxed{5.1} & & \\ \times 10 \downarrow & & \div 10 \uparrow \\ 255 \div 5 = 51 & & \end{array}$$



$\begin{array}{r} 21 \\ 3 \overline{)63} \end{array}$ 63 ones $\div 3 = 21$ ones so 63 tenths $\div 3 = 21$ tenths 6.3 $\div 3 = 2.1$	$\begin{array}{r} 21 \\ 3 \overline{)6.3} \end{array}$
$\begin{array}{r} 17 \\ 5 \overline{)85} \end{array}$ 85 ones $\div 5 = 17$ ones so 85 hundredths $\div 5 = 17$ hundredths 0.85 $\div 5 = 0.17$	$\begin{array}{r} 0.17 \\ 5 \overline{)0.85} \end{array}$
$\begin{array}{r} 051 \\ 5 \overline{)255} \end{array}$ 255 ones $\div 5 = 51$ ones so 255 tenths $\div 5 = 51$ tenths 25.5 $\div 5 = 5.1$	$\begin{array}{r} 051 \\ 5 \overline{)25.5} \end{array}$

Step 14: To divide by 3 digit divisors using short division and to include remainders

Short division

$$\begin{array}{r} 014 \\ 31 \overline{)432} \end{array}$$

Short division

$$\begin{array}{r} 021 \text{ r } 25 \\ 33 \overline{)715} \end{array}$$

Step 15: To use short division and represent the remainder as a decimal

$$\begin{array}{r} 0 \quad 2 \quad 9 \quad . \quad 2 \\ 25 \overline{) 7 \quad 3 \quad 0 \quad . \quad 5 \quad 0} \end{array}$$