

Multiplication

KS1

Bar models for multiplication start with the same 5 steps as addition and subtraction.

5 Step Guide to Bar Models

1) Concrete resources (real objects) 1:1 representation



2) Substituted concrete resources (counters, cubes, buttons) 1:1 representation



3) Pictorial representations (circles) 1:1 representation



4) Objects as part of a bar (individual squares) 1:1 representation



5) Rectangular bars (approximates)



How to use a bar model to teach number facts:



Focus on verbalising thinking:
e.g.

‘eight is two taken four times’

‘two taken four times is eight’

‘eight equals four times two’

‘there are four twos in eight’

KS2

$_x_ = 6$		

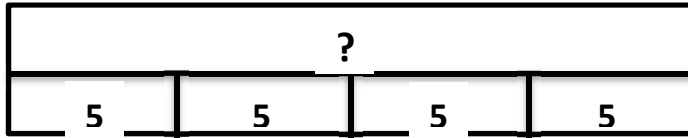
2	2	2
$_x_ = 6$		

2	2	2
$_x_ =$		

2	2	2
$3 \times 2 =$		

Solving problems involving multiplication:

Each box contains 5 cookies. Lionel buys 4 boxes. How many cookies does Lionel have?

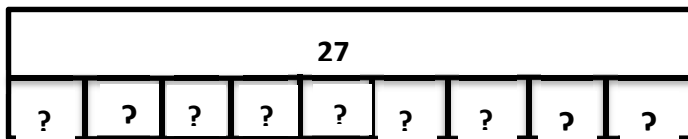


Division

KS1

Sharing

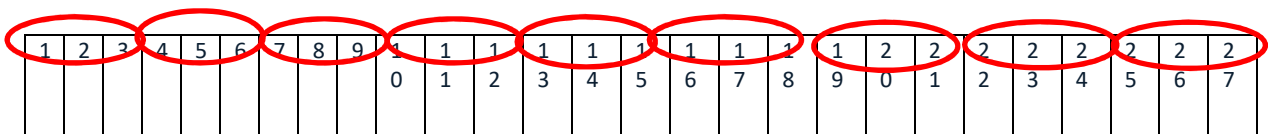
Grace has 27 lollies. She wants to share them into 9 party bags for her friends. How many lollies will go into each party bag?



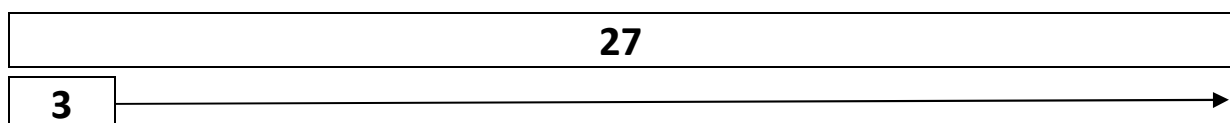
Grouping

Grace has 27 lollies for her party friends. She wants each friend to have 3 lollies. How many friends can she invite to her party?

The bar model isn't as clear for grouping as sharing. There would be three ways to look at grouping:



There are 9 groups of 3 so the answer is 9 friends.



Count in 3s until 27 is reached. How many groups of 3?

Link back to sharing and see the problem as $27 \div 3$

27		
?	?	?

KS2

The above models for KS1 apply for KS2. In addition the bar model is very useful for ratio problems:

Peter has 4 books
Harry has five times as many books as Peter.
How many books has Harry?

Peter: 

Harry: 

$4 \times 5 = 20$
Harry has 20 books

Example Multiplication and Division Problems

Year 1 1. How many gloves are there altogether in 6 pairs of gloves? 2. Twelve people are split into two groups. How many are in each group? 3. Mrs Morton puts five 5p coins into her purse. How much is in her purse altogether?	Year 2 1. Amelia writes the calculation below as a multiplication calculation? What might she write? $3 + 3 + 3 + 3 + 3 = 15$ 2. Mr Siddique shares £18 equally between his three sons. How much does each son get?
Year 3	Year 4

1. Aiden has seven marbles and Harvey has fifteen. They decide to share them equally between them. How many do they get each?

2. Seven people each put five pens into a pot. Carmen then takes out fifteen pens. How many pens are left?

3. If five apples cost fifty pence, how much would two apples cost?

4. Emma buys seven markers for 30p each. How much change does she get from £3.00?

5. A bookcase in the library holds 5 shelves with 46 books on each shelf. How many books are there in the bookcase altogether?

6. How many 5p stickers can Alexis buy with his 55p pocket money?

1.8 children each download 59 songs to play on their iPod. How many songs do they have altogether?

2. Calculate how many fives there are in 85?

3. At the dressmakers, Debbie buys buttons weighing 3 grams each. If she has 81 grams of buttons, how many buttons does she buy?

Year 5

1. Every day for 4 days Helen scored 7.5 in a test. On the fifth day she scored 8. What was her total score?

2. I cut 60 cm from 3.3m of string and shared the rest between 3

Year 6

1. A bag of 5 lemons costs £1. A bag of 4 oranges costs £1.80. How much more does one orange cost than one lemon?

friends. How much string did they get each?

3. How many jugs with a capacity of 250ml could you fill with 10 litres of water?

4. All the children in the school are going on a residential trip to the outdoor activity centre. They will be divided into 6 equal groups. If there are 246 children in the school how many will be in each group?