

# Teaching children to solve word problems

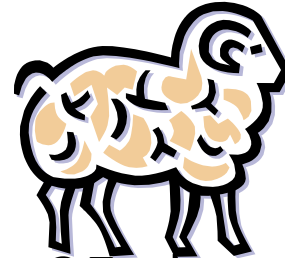
# Strategies to help children solve word problems...

- Focus on key words?
- Visualise, draw, act out
- Reword to change the position of the unknown
- Reword with no numbers
- Sort by operation
- Include unsolvable problems
- Include too much information and discard
- Focus on a small number of problems each lesson
- Get children to write their own

A shepherd owns 19 sheep and 13 goats.

How old is the shepherd?

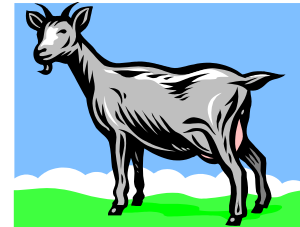
(Answer given: 32)



A 27-year-old shepherd owns 25 sheep and 10 goats.

How old is the shepherd?

(Answers given: 62, 35, 42)



If it's like 78 and 54, then I'd probably add. But if they are 78 and 3, it looks like a share because of the size of the numbers

Sowder 1988 p228

- Laura had \$240. She spent  $\frac{5}{8}$  of it.
- How much money did she have left?

*Overall percent correct:*

*Singapore: 78%,  
United States: 25%*

Why were Singapore so successful?

*They used a particular representation which enabled pupils to access the structure of the mathematics*

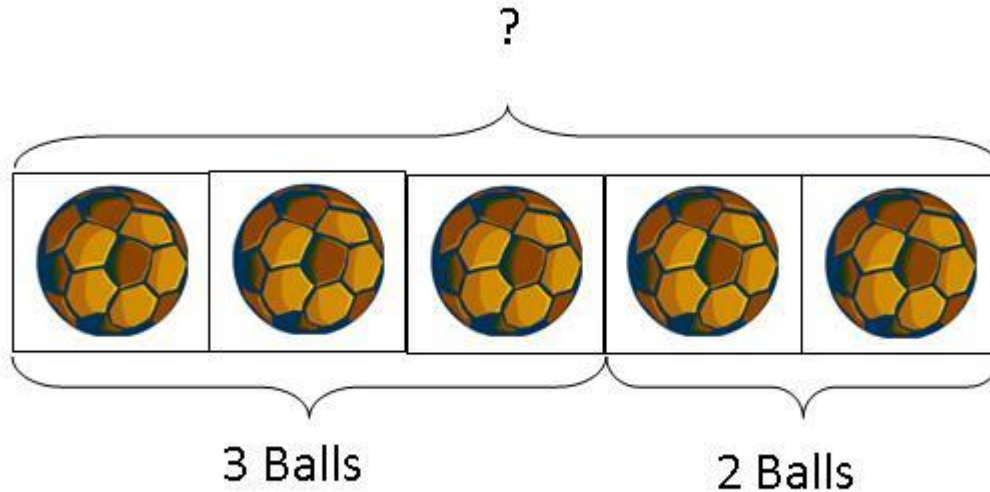
# The bar model

- Understand the problem
  - What is known?
  - What is being compared?
  - What is being asked?
- Develop a plan
  - Draw and label bars – what don't you know?
- Carry it out (the maths)
  - Work out your answer
- Relate your solution to the problem
  - Relate your answer to the problem

# Addition - Aggregation

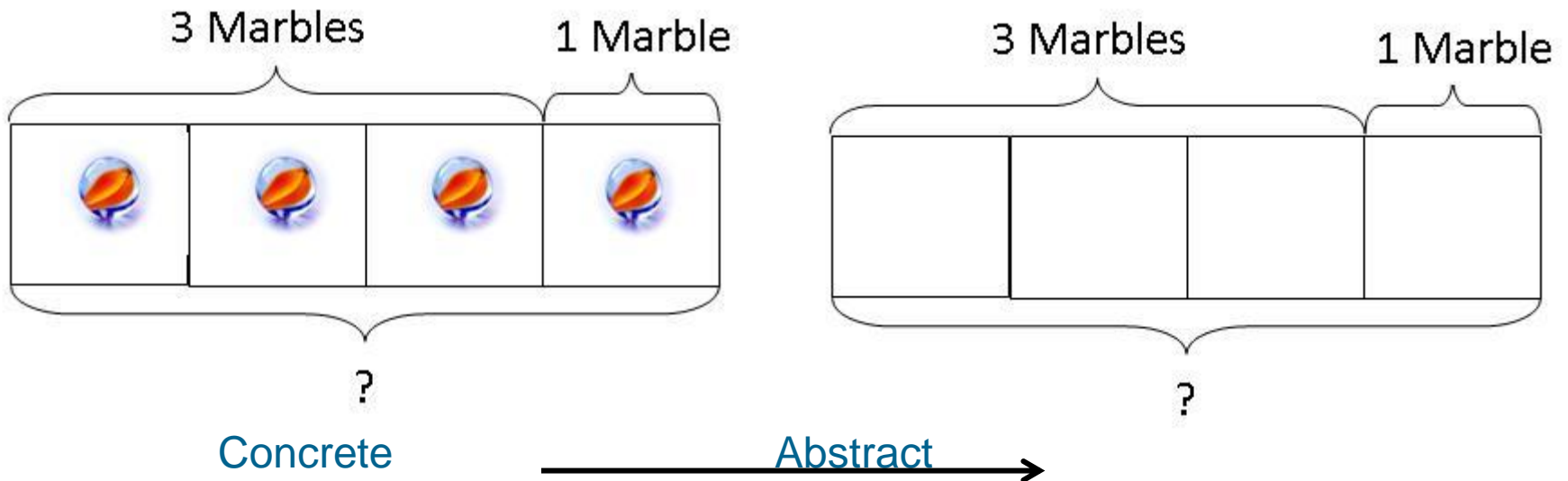
There are 3 footballs in the red basket and 2 footballs in the blue basket.

How many footballs are there altogether?



# Addition: Augmentation

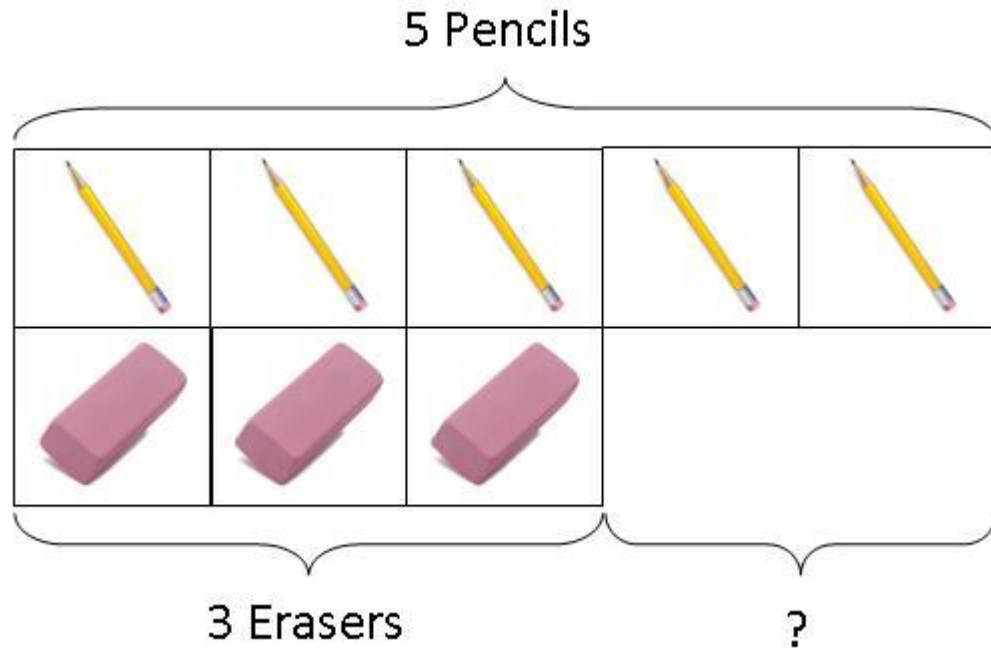
- Peter has 3 marbles. Harry gives Peter 1 more marble. How many marbles does Peter have now?





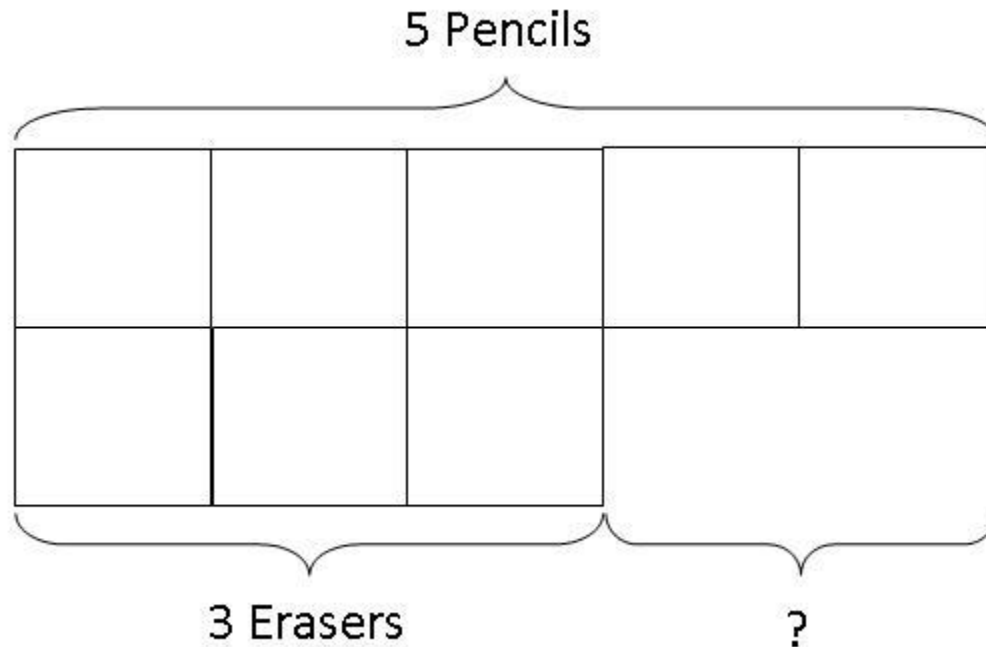
# Subtraction: Comparison Model

- Peter has 5 pencils and 3 erasers. How
- many more pencils than erasers does he
- have?

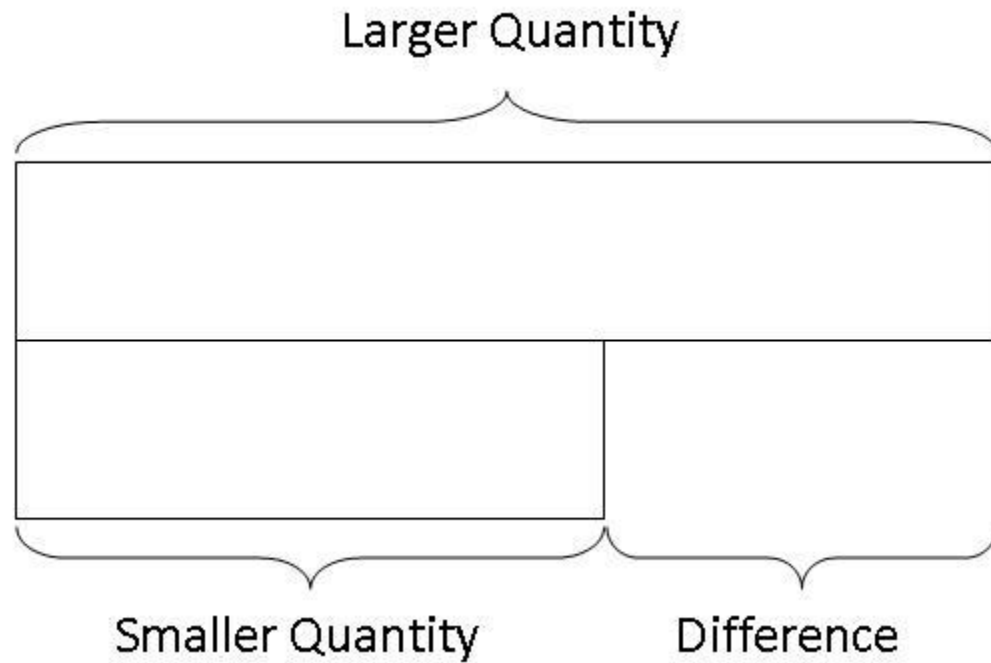


# Moving to the abstract

- Peter has 5 pencils and 3 erasers. How many more pencils than erasers does he have?



# Generalisation



# Multiplication

- John has 4 toy cars. Michael has 5 times as many cars as John. How many cars do they have in total?

John

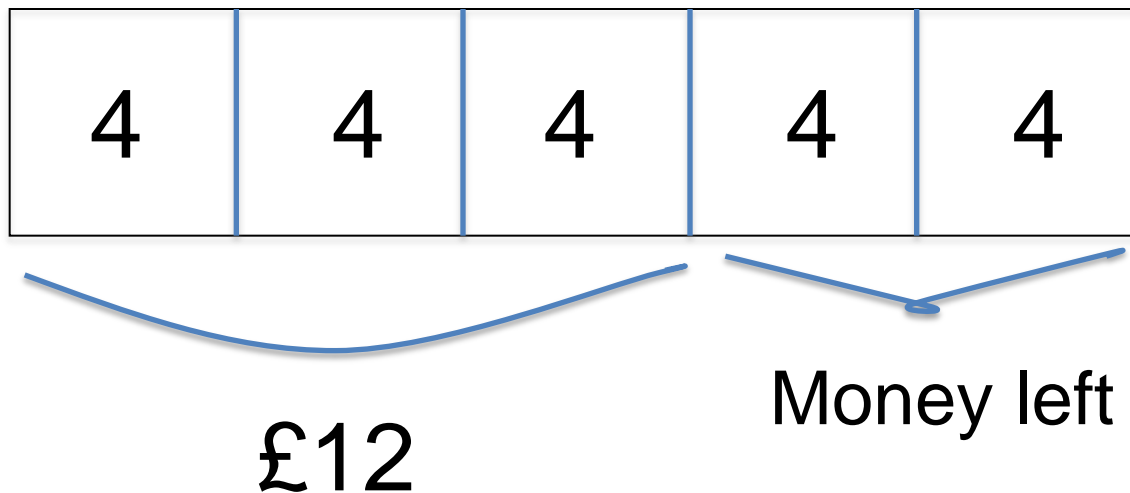


Michael



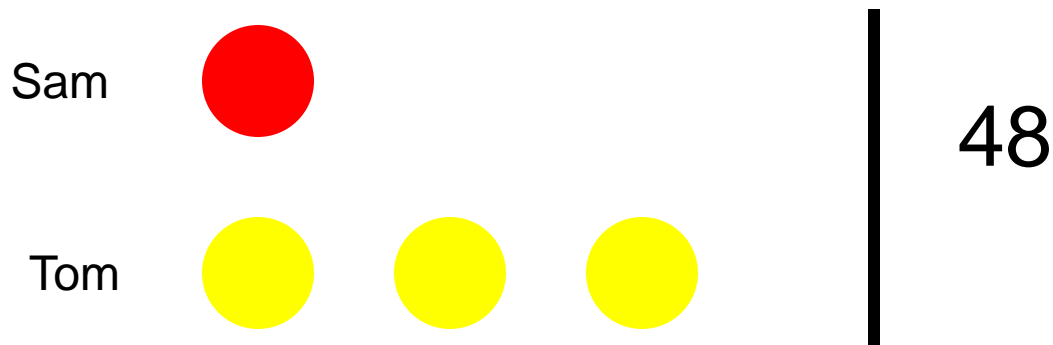
# Fractions

- Clive spends  $\frac{3}{5}$  of his pocket money on a watch costing £12. How much of his pocket money does he have left?



# Ratio

- Sam and Tom share football stickers in the
- ratio of 1 to 3. Altogether they have 48
- Stickers. How many does Tom have?

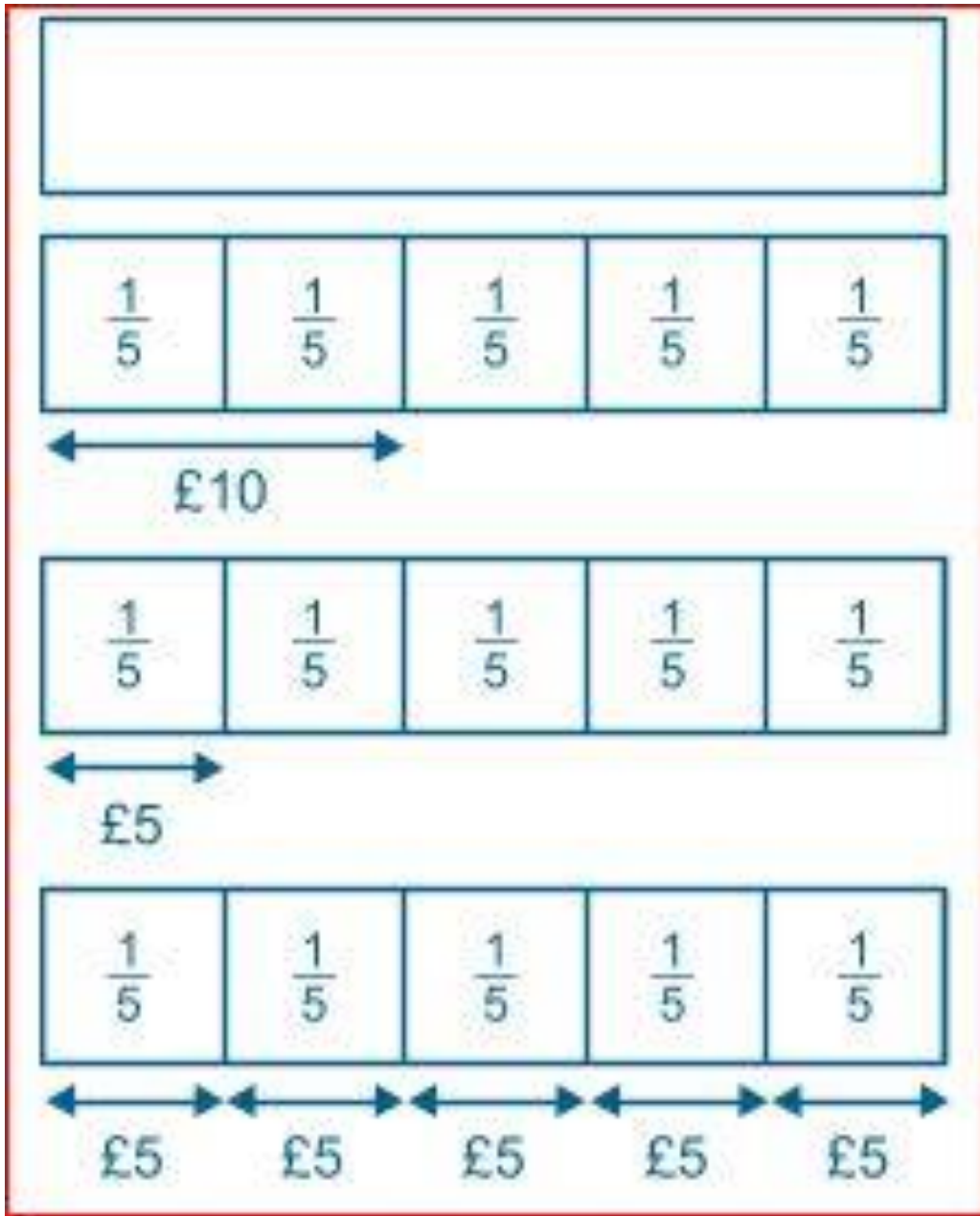


How many more stickers does Tom have than Sam?



# Use the bar method to solve...

- *'Ben spent  $\frac{2}{5}$  of his money on a CD. The CD cost £10. How much money did he have at first?*



*'Ben spent  $\frac{2}{5}$  of his money on a CD. The CD cost £10. How much money did he have at first?'*



Peter has four books, Harry has five times as many books as Peter. How many more books does Harry have?


1. Peter has four books. Harry has five times as many books as Peter. How many more books does Harry have?

Peter's books 

4
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Harry's books 

4	4	4	4	4
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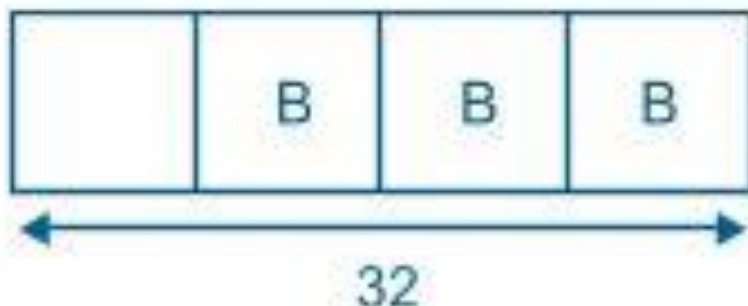
  


Harry has 16 more books.

There are 32 children in a class,  
and there are three times as many  
boys as girls. How many girls are  
there?

2. There are 32 children in a class.

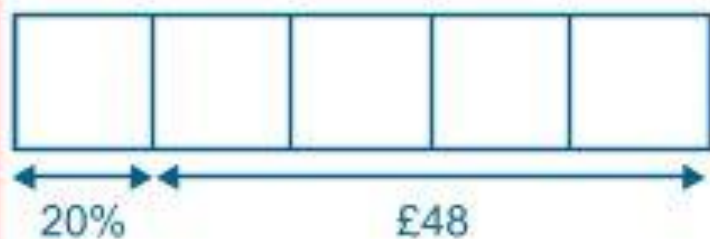
There are 3 times as many boys as girls. How many girls?



Each square is 8, so there are 8 girls and 24 boys.

A computer game was reduced in a sale by 20%. It now costs £48.  
What was the original price?

4. A computer game was reduced in a sale by 20% and it now costs £48. What was the original price?

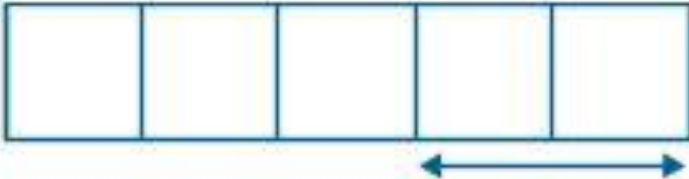


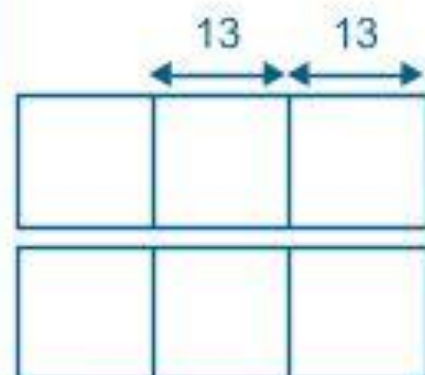
Each part is £12, so the original price was £60.

Sam has 5 times as many marbles as Tom. If Sam gives 26 marbles to Tom, the two will have exactly the same number. How many marbles will they have altogether?

3. Sam had 5 times as many marbles as Tom. If Sam gives 26 marbles to Tom, the two friends will have exactly the same amount. How many marbles do they have altogether?

Tom's marbles

Sam's marbles 



Each part is 13, so 78 marbles altogether