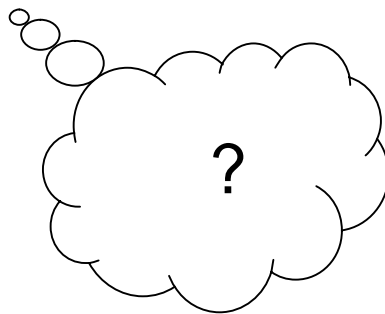


HELPING CHILDREN

TO SOLVE

WORD PROBLEMS



HELPING CHILDREN TO SOLVE

WORD PROBLEMS

The following document has been put together by the Cumbria Numeracy Team in response to schools' concerns about teaching children to tackle word problems more effectively. It tries to draw together a range of sources, cross-referencing material from INSET Book 3 : Raising standards in mathematics in Key Stage 2. Chapter 4 from INSET Book 3 gives a suggested format for INSET with school staff. Ideas have also been taken from 'An ABC of Number', Open University Press.

The following notes are intended to complement the sessions, as well as giving some practical suggestions for adopting a common approach to problem solving through the school.

Calculating

There is a variety of ways of doing calculations, each of which makes different demands on understanding and recall. There is a need to strike an appropriate balance in classroom work in Years 5 and 6 between mental methods, written methods and those using a calculating device.

Try doing the following everyday calculations, but be aware of **how you** are going about them.

- What change would you get from £10 if you spent £5.45?
 - There are 25 children in your class, but 7 are absent, so what number will you enter in the register total?
 - The class trip bus costs £50, and 26 children are going swimming. If it costs £1.50/pupil to go, is the money correct?
 - Everything is 25% off in the sale and the full-priced pair of socks is marked £4.50. How much will you be charged?
-
- What methods did you use, and why?
 - Do you think everyone would do the calculations the same way?
 - Did you reach for paper and pencil, or a calculator?
 - How do you know your answers are right - and what constitutes 'right': exactly right or roughly correct? When does it matter?
 - Do you do mental calculations the same way as you would on paper?
 - What methods would your pupils use for similar problems at their level?

What Is A Method?

What makes something a *method* for solving a particular problem (not necessarily a numerical problem). Are the words 'routines', 'systems', 'procedures', 'rules' any different from the term 'method' or does method relate to the words 'methodical', 'systematic', 'everyday'?

(from An ABC of Number)

The skills children need for problem solving

The skills of using and applying mathematics include :

- ★ reading the problem, highlighting crucial words, numbers and information in charts and tables, ignoring irrelevant words and numbers;
- ★ using a diagram to show the problem if possible
- ★ making an estimate of the answer
- ★ breaking a problem down into a series of steps, including changing measurements to same units if necessary;
- ★ recognising the mathematics that can be used to solve it;
- ★ applying mathematical skills, deciding what calculations to do and in which order;
- ★ choosing the best ways of carrying out the calculations (method) – for example, mentally, written or using calculator;
- ★ checking and deciding whether the answer makes sense; and
- ★ giving the answer in a way that relates it to the problem asked – for example using appropriate units of measurement.

These skills need to be taught.

See INSET Book 3 - Chapter 4 - Introduction p. 80-82

The actual mathematical operation required to solve the problem is often the easiest part of word problem work for children. The parts they find hard are extracting from the problems the relevant information, and deciding what to do with that information.

See INSET Book 3 - p. 85-87, OHT 4.1, 4.2, 4.3

Number Problems in Context

Textbooks and published schemes purport to offer a range of contexts or settings for tasks that are offered in perhaps under the heading of 'applied number' or ATI. Despite the claims of many commercial schemes that 'using and applying' is catered for throughout, it is worth examining this a little more closely the type of word problems offered in whichever textbook you use.

Questioning the questions in books

Here are a couple of mathematical problems. What *in the world* might these problems be about?

- It takes three men six hours to dig a ditch. How long does it take two men to dig the same ditch'? (Traditional)
- Suppose a scribe says to thee, four overseers have drawn 100 great quadruple hekat of grain, their gangs consisting, respectively, of 12, 8, 6 and 4 men. How much does each overseer receive'? (Problem 68, *Rhind Mathematical Papyrus*, ca 1700BC)

What do you make of questions such as these? The style of writing makes them stand out as word problem texts and they are unlikely to be mistaken for anything else. Pupils' school experience with such questions teaches them that these problems are supposed to be self-contained, that all the information necessary for dealing with them is contained within them. There is no need for them to go elsewhere to search for further information or to carry out their own activity. How do they learn how to abstract away the 'irrelevant aspects' of the problem and to read a calculation *into* the text, rather than apparently extract one *from* it? Many textbook questions do not give children this opportunity.

Suppose you were asked the question: Sally made 32 buns. One eighth were chocolate, how many were not?

What responses or reactions are possible other than just trying to work it out?

One might be to ask: 'Why might I want to know this?', 'Is it plausible in my experience?', 'Can I imagine myself *asking* such a question?'

A second set of questions might be: 'How important is the context to the mathematical task that has been set?', 'Am I asked to carry out any activity *in* the context itself?'

Therefore whilst it is important to give word problems which are essentially mathematical problems dressed up in everyday language for practise, it is also important to give real problems for children to try to solve drawn *from* their lives or *from* situations which arise in other subjects of the curriculum.

- I am saving my pocket money for a new CD which costs £12.99. I get £3 per week. How long will it take me to save enough for my CD?

(from an ABC of Number)

Opportunities for children to practice their problem solving skills

- ★ in the daily mathematics lesson in focused lessons on problem solving;
- ★ in other subjects, eg science, design and technology, history (See Framework, Section 1, p. 16,17)
- ★ in occasional events in or around school, such as sports day

See INSET Book 3 - p. 88, OHT 4.4

There is a range of ways in which problems can be introduced to a class. These include :

- ⇒ as a short aural problem
- ⇒ a short aural problem with key facts written on the board by the teacher as he/she recounts the problem to the class
- ⇒ a selection of written problems for children to work at individually, in pairs or small groups

Problems may be very short taking only a minute or two to solve;
medium length, taking half a lesson or more;
extended, such as an investigation perhaps spread over several lessons.

See INSET Book 3 - Chapter 4, p. 89-92

Planning for problem solving

When planning for problem solving bear these things in mind :

- ⇒ move away from the textbook pattern of a page of word problems at the end of a unit of work - it is far better to incorporate them into each unit of work. The supplement of examples in the Framework will help you do this.
- ⇒ use a range of short, medium and extended problems.
- ⇒ don't forget that not all problems have to be written down.
- ⇒ children need to be encouraged to think their way through a problem. If all the problems tackled in one session are solved by using the same operation children will stop thinking about the problem and will move onto auto-pilot! It's better to mix problems up.
- ⇒ children need experience of problems with one step, and multi-step operations. Again see the supplement of examples and the problems later in this document.

See INSET Book 3, p. 93, OHT 4.5

Don't forget that the supplement of examples in the Framework gives lots of ideas for problems. There are more ideas at the end of this pack. Problems can also be found in textbooks (but beware as they are usually in blocks with similar problems grouped together) and in books recently published – for example, Think Maths published by Devon Curriculum Services and in many of the books on the booklist on CLEO.

Helping children to find their way through a word problem

One way of helping children to find their way through the process is to use a proforma as a teaching technique.

Schools may find it useful to adopt a structured approach and introduce a pro-forma to help 'train' pupils to use a systematic approach. Pro-forma A reproduced below is a possible approach. A child works through the boxes explaining their thinking and possibly writing their answers on the OHT. The second pro-forma attached here gives guidelines as to the kind of prompts and questions which can be used to both help the child demonstrating and involve the rest of the class.

For example, the child could write the problem directly on to the OHT. Other suggestions to consider include having problems typed onto acetate so that the problem can just be superimposed on the pro-forma, and having the problems on a typed sheet for children who find it hard to follow work on the board.

Points to consider :

1. Would this pro-forma be useful for the children in your school?
2. For which year group is it most appropriate?
3. Would you expect to move away from this structure?
4. If so when, and what to?

As teachers, we need to encourage children to think their way into a problem. With younger children it may be most appropriate to act it out or draw a picture together. Younger children can act out many familiar songs and rhymes which involve counting.

Ideas include : 10 green bottles 5 currant buns 1,2 buckle my shoe
5 speckled frogs Once I caught a fish alive 6 little snails

(Also see Raps & Rhymes & Maths, published by Eleanor Curtain Publishing, ISBN No. 1-875327-07-X)

This can lead to children using "a story" to illustrate a simple equation such as $5+3=8$.

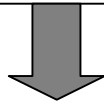
Older children can be encouraged to find their way into a problem by hearing it read aloud and then using a highlighter pen to highlight important numbers and information.

The emphasis with children needs to be on getting to grips with the process and so sometimes with older children you may want to concentrate on discussing the number operations required rather than the actual working out of the answer. INSET Book 3, Video Clip 3, concentrates on the latter.

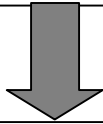
See *INSET Book 3*, p. 94-97, OHT 4.6, 4.8, 4.9

Solving Word Problems in Mathematics – Proforma A

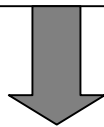
THE PROBLEM :



CALCULATION NEEDED :



ANSWER TO THE CALCULATION :

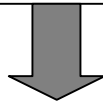


ANSWER TO THE PROBLEM :

Solving Word Problems in Mathematics – Proforma B

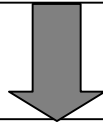
THE PROBLEM :

*Read through the problem.
Look carefully for mathematical words.
Underline the important words and numbers.
Use a diagram or picture to represent the problem if possible or helpful*



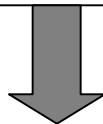
CALCULATION NEEDED :

*Break the problem down into a series of steps
Recognise the mathematics that can be used to solve it
Decide what calculations to do and in which order
Make an estimate of the answer*



ANSWER TO THE CALCULATION :

*Chose the best way to carry out the calculation
Do the calculation
Can children explain their methods?
Is there a way to check the answer? (e.g. using the inverse operation)
Does it make sense?*



ANSWER TO THE PROBLEM :

*Re-read the problem.
Relate the answer to the original problem
Use appropriate units of measurement if needed
Does the answer make sense?*

Increasing children's skills in problem solving

Another way of building up children's skill in extracting the *relevant* information from problems is to include some problems where they are given *irrelevant* information.

One way into this is to make it into a game -
eg after children have solved a word problem, ask them to put some irrelevant information into it -

so that - "There were 25 people in the cinema. 10 more people arrived. How many people were there altogether?" - might become -

"There were 25 people in the cinema to see the film Tarzan. They all had popcorn. 10 more people arrived by bus. How many people were there altogether?"

This process could then be refined by getting the children to put in one bit of irrelevant number information as well.

"There were 25 people in the cinema to see the film Tarzan. There were 20 adults and 5 children. They all had popcorn. 10 more people arrived by bus. How many people were there altogether?"

When children get more confident you might like to consider giving them an occasional problem which can't be solved because there is some *missing* information. Children could be asked to suggest how they would rewrite the problem so that it becomes possible.

Summary of key points

- ⇒ Children need to learn to use and apply their calculating skills. They do this not just by doing problems, but by trying different approaches and discussing them.
- ⇒ Using and applying maths (the old AT1) is now embedded in the programme of study and given greater emphasis. It develops essential skills.
- ⇒ Use of variety of approaches within a whole school framework.

See *INSET Book 3*, p. 100-102, *OHT 4.10, 4.11, 4.12*

The problems which follow give some extra examples for use in teaching word problems. They are grouped for Reception, Key Stage 1, Lower Key Stage 2 and Upper Key Stage 2.

See also Framework

Reception	:	Number, one step	Section 4	P 20
		Money, one step	Section 4	P 21
KS1	:	Number, one step	Section 5	P 66
		Number, two step		
		Number, irrelevant information		
		Number, missing information		
	:	Money, one step	Section 5	P 68
		Money, two step		
		Money, irrelevant information		
		Money, missing information		
	:	Measures and Time	Section 5	P 70
	Lower KS2	:	Number, one step	Section 5
		Number, multi-step	Section 6	P 82
:		Money, one step	Section 5	P 69
		Money, multi-step	Section 6	P 84
:		Measures and Time	Section 5	P 71
			Section 6	P 86

Upper KS2	:	Number, one step	Section 6	P 83
	:	Number, multi-step		
	:	Money, one step	Section 6	P 85
	:	Money, multi-step		
	:	Measures and Time	Section 6	P 87

Irrelevant information

Missing information

RECEPTION

NUMBER

One Step Problems

- There were 4 fish in the river. 1 swam off. How many were left?
- There are 5 children playing in the sand. 1 more comes to play. How many are playing now?
- There are 7 cars in the car park. Another 2 cars arrive. How many cars are there altogether?
- I eat 3 cakes, Tom eats 2 cakes and Sam eats just 1 cake. How many cakes have been eaten altogether?
- Mum puts 5 sweets in a bag. Gran puts in another 3. How many sweets are there in the bag altogether?
- One cow has 4 legs. How many legs will two cows have?
- You have 10 jelly babies. If you eat 2 of them, how many are there left?
- There were 10 cars in the garage this morning. There are only 5 cars there this afternoon. How many cars have been driven away?
- Six children need to sit round the table. There are only 4 chairs. How many more chairs do we need?
- There are 8 bears and 5 pots of honey. How many more bears are there than honey pots?
- There were 10 sandwiches on the plate. The children ate 5 of them. How many were left?
- There are 8 dinner plates and only 7 children in the queue. How many more plates are there than children?

RECEPTION

MONEY

One Step Problems

- Tom had £3. He spent £2. How much did he have left?
- In your purse you've got 1p. Mum gives you another 1p and another 1p and another 1p. How much have you got altogether?
- Chris spent 2p and 7p on sweets. How much did he spend altogether?
- There were 10 pennies in your purse. You spent 5 of them. How many were left?

KEY STAGE ONE

NUMBER

One Step Problems

- Jill has 5 pencils. Jack has 4 pencils. How many do they have altogether?
 - How many fewer pens has Jack than Jill?
 - How many more pens has Jill than Jack?
- Jo has 23 sweets. Sam has 19. Who has more sweets? How many more sweets has Jo than Sam?
- Carl has 8 cars. Dan has 6 cars. Who has fewer cars? How many more cars has Carl than Dan?
- Carol ate 1 more biscuit than I did. I ate 5 biscuits. How many biscuits did Carol eat?
- Conor had 35 felt pens in his pencil case. I had 10 less. How many felt pens did I have?
- An elephant has 4 legs. How many legs are there on 3 elephants?
- There are 12 children in the obstacle race. How many teams of 6 can there be?
- There are 10 beads in a necklace. How many beads will there be in 5 necklaces?
- There are 50 beads altogether. It takes 10 beads to make a necklace. How many necklaces can I make?
- Two children have 8 pieces of orange each. How many oranges are there altogether?
- I want to share 20 Smarties equally. There are 10 children. How many will they each get?

KEY STAGE 1

NUMBER

Two Step Problems

- There were 10 sandwiches on a plate. The children ate half of them. How many were left?
- There are 25 sandwiches on a plate. John eats 6 and Sue eats 10. How many are left?
- There are 6 red sweets and 2 green sweets in a packet. How many sweets are there in 10 packets.
- There are 20 people on a bus. 10 get off at one stop and 5 at the next stop. How many are left on the bus?
- Sam is at 12 on the snakes and ladders game. He rolls double five on his dice. What number will he land on?
- I made 10 cakes. John made double that number. How many cakes did we make altogether?
- Colin has 10 marbles and John has 8 marbles. How many marbles do they have altogether? They share them out equally. How many do they each have?
- I throw a 6 and a 3 with 2 dice. Graeme throws double 6. Who is nearer to 10?
- There are 14 chocolates. Two people share them equally. How many does each person get? Could 3 people share them equally?
- 20 sweets are divided equally between 5 children. How many will they each get? What if there were 21 sweets?

KEY STAGE 1

NUMBER

Irrelevant Information

- There are 10 people on a red bus. 5 are sitting on top. At the next stop 3 more get on the bus. How many are there are on the bus?
- I made 6 brandy snaps. Tom made 10 brandy snaps and Jo made 12 gingerbread men. How many brandy snaps did we make altogether?

Missing Information

- There were 20 chicken spread sandwiches on a plate. The children ate 10 of them. How many children were there?

KEY STAGE 1

MONEY

One Step Problems

- Ann had 15p. She spent 4p. How much did she have left?
- Carol spent 40p. She spent 15p less than Joe. How much did Joe spend?
- Sally had £21. She was given another £6. How much does she have altogether?
- Craig bought 5 lollies at 3p each. How much did he spend?
- Everything in the shop cost £1. How much would it cost if I bought 5 things.
- A chocolate bar costs 5p. A fudge bar costs 10p more. How much does the fudge bar cost?
- Mum has £20 in £2 coins. How many people can she give a £2 coin to?

Two Step Problems

- Sam spent 3p and 5p on chews. How much change did he get from 10p?
- Kate spent 30p. She spent 15p more than Jane. How much did Jane spend? How much did they spend altogether?
- Sweets are 5p each. What do 2 sweets cost? Which two coins would pay for them exactly?
- Craig bought 5 lollies at 6p each. How much change did he get from 50p?
- Everything in the shop costs £1. How much would it cost me if I bought 2 boxes of chocolates, 2 bottles of shampoo and 2 pairs of socks? How much change would I have from £10?

KEY STAGE 1

MONEY

Irrelevant information

- Scott bought 6 ice cream cones for his family. He gave them to his mum, dad, 2 brothers and 2 sisters. They cost £1 each. How much did he spend?
- Ann invited 7 people to her 10th birthday party in July. They all ate 2 raspberry jellies. How many jellies did they eat altogether?

Missing information

- Carol spent 50p on Monday, 50p on Tuesday and £1 on Wednesday. How much did she spend altogether? How much money did she have left?

KEY STAGE 1

MEASURES AND TIME

- A red ribbon is 15cm long. A yellow ribbon is 11cm long. The red ribbon is longer than the yellow ribbon. How much longer is it?
- The front lawn is 10m long. The back garden is 15m long. How much longer is the back garden than the front lawn?
- My toy train is 20 straws long. Jo's train is 15 straws longer. How many straws long is his toy train?
- Mum's journey to work is 10km. Dad's journey is 15km. How much longer is Dad's journey than Mum's?
- 6 fir cones balance a toy car and 10 fir cones balance a lorry. If the car and the lorry are both together on the scales, how many fir cones will we need to balance them?
- If 8 bricks balance one apple, how many bricks will it need to balance 2 apples?
- There are 2kg of potatoes in one sack. How many kilograms of potatoes are there in 2 sacks?
- If Jon's school bag weighs 1kg and Josie's weighs 1kg more, how much does Josie's school bag weigh?
- A bucket holds 4 bottles of water. How many bottles will 2 buckets hold?
- A bottle of lemonade holds 2 litres. How many litre bottles can you fill?
- How long is it from 8 o'clock to 12 o'clock?
- It's now 8 o'clock. What time was it an hour ago? What time will it be in 2 hours?
- Dad got in the car at 7 o'clock. He got to work at 8 o'clock. How long was he in the car?
- The train started from the station at 10 o'clock. The journey to the next station took half an hour. What time did the train get there?
- We started tea at 5.00. We finished at 5.45. How long did it take to eat tea?

- Anna's favourite TV programme started at 10.30 and finished at 11.00. How many minutes did it last?
- The video switched on at 7.45 and off at 8.15. How many minutes was it on for?
- The football match started at 4.00. The first half lasted 45 minutes. What time did half time start?

LOWER KEY STAGE 2

NUMBER

One Step Problems

I think of a number and subtract 15. The answer is 31. What was my number?
(A : 46)

I think of a number and add 21. The answer is 85. What was my number?
(A : 64)

A box holds 5 cakes. How many cakes do 4 boxes hold? (A : 20) How many cakes do 8 boxes hold?
(A : 40)

There are 28 sweets in a bag. If they were shared between 4 people, how many would each person get?
(A : 7)

There are 45 people on a bus. 17 people get off. How many are left on the bus?
(A : 28)

Peter has 16 conkers. Anne has twice as many. How many conkers does Anne have?
(A : 32)

John collects stamps. He has 82 stamps already. If he buys 16 more, how many stamps does he have altogether?
(A : 98)

In a game, Jill scored 28 and Paul scored 47. How many more did Paul score than Jill?
(A : 19)

Tom is 35 years old and Jane is 16 years old. What is the difference in their ages?
(A : 19)

3 eggs are used to make a cake. How many eggs are needed to make 8 cakes?
(A : 24)

Multi Step Problems

There are 45 people on a bus. 18 get off and 31 get on. How many are now on the bus?

(A : 58)

I think of a number and double it. Then I add 18. The answer is 58. What was my number?

(A : 20)

A school goes on a trip on 4 buses. 3 buses have 55 children each and the other has 51 children on. How many children are there altogether?

(A : 216)

In a game Pat scored 226, Richard scored 75 and Phil scored 111. How many more did Pat score than the other two put together?

(A : 40)

There are 99 black cars, 135 blue cars and 76 white cars in a car park. If 62 cars leave, how many are left?

(A : 248)

I think of a number, subtract 5 and multiply by 7. The answer is 77. What was my number?

(A : 16)

There are 7 shelves with 25 books on each shelf. If I remove 47 books, how many books are left?

(A : 128)

There are 3 spiders and 5 ants on a leaf. How many legs are there?

(A : 54)

There are 24 red socks and 30 blue socks in a drawer. If I take half of each, how many socks do I have?

(A : 27)

John has 31 felt pens and 6 pencils. Ellie has 16 felt pens and 13 pencils. How many more felt pens are there than pencils?

(A : 28)

Sue scores 37 on a dartboard and Jane scores 62. Who is closest to 50?

(A : Jane)

LOWER KEY STAGE 2

MONEY

One Step Problems

- It costs 25p for one bag of sweets. How much does it cost for 8 bags?
(A: £2)
- It costs 80p bus fare for Parminder to get to her gran's. How much would it cost for her and her sister?
(A: £1.60)
- A computer game costs £5. Jack saves 50p a week towards it. How many weeks does it take to save up?
(A: 10)
- Sam pays for his sweets with four coins. The bill is £1.25. Which four coins could he have used?
(A: £1, 10p, 10p, 5p/50p 50p 20p 5p)
- A book cost £4.99. How much would 2 books cost?
(A: £9.98)
- The ghost train costs £1.25 for a ride. How much does it cost for 3 rides?
(A: £3.60)
- A box of chocolates cost £4.99. What 3 coins could you use to pay for it?
(A: £2, £2, £1)
- Joe spent half of his Christmas money on a football. What did he spend if his Christmas money was £10, £20, £3?
(A: £5, £10, £1.50)
- At a football match it cost £17 for an adult ticket and £12 for a child. How much does it cost for 2 adults and 1 child to go to the match?
(A: £46)
- A money box has only 4 silver coins in it. Their value is 55p. What are the coins?
(A: 20p, 20p, 10p, 5p)

Multi Step Problems

- Sue has a £1 coin and two 20p coins. She pays £1.30 for a magazine. How much change does she get?
(A: 10p)
- A computer game costs £7.50. Jack saves £1 a week towards it. How many weeks does it take him to save up?
(A: 8)
How much pocket money does he have left?
(A: 50p)
- Joe buys 4 comics at 40p each. How much change does he get from £2?
(A: 40p)
- The big wheel costs 80p for a ride. Siobhan has 4 rides. How much change will she get from £5?
(A: £1.80)
- A comic costs 75p. How many can you buy for £2?
(A: 2)
How much change would you get?
(A: 50p)
- Jane has three 50p coins and five 20p coins. She spends £2. How much does she have left?
(A: 50p)
- Gran buys 2 boxes of chocolates at £3.98 each. How much change does she have from £10?
(A: £2.04)
- There were three piles of coins. Two piles each have five 20p coins in them, one pile has six 20p coins. How much money is there altogether?
(A: £3.20)
- There is £2.50 in one purse and 75p in another. I take 50p pocket money. How much money is left?
(A: £2.75)
- The shopkeeper gave Kate 20p change. She had bought a comic for 80p and some sweets for 50p. How much money had Kate given to the shopkeeper?
(A: £1.50)

LOWER KEY STAGE 2

MEASURES AND TIME

- One dose of medicine is 10ml. How many doses would there be in a bottle which holds 60ml?
(A : 6)
- One building is 40m tall and another is 29m tall. What is their combined height? How much taller is one than another?
(A : 69m/11m)
- One letter weighs 35g. How much do four letters weigh?
(A: 140g)
- Jon is 120cm tall and Sam is 133cm tall. What is their combined height in metres?
(A: 2.53m)
- The perimeter of an equilateral triangle is 36cm. How long is each side?
(A: 12cm)
- A driver has travelled 196 miles before stopping for petrol. He has another 132 miles to travel. How far will the whole journey be?
(A: 328 miles)
- A bucket holds 10 litres. A bowl holds $\frac{1}{2}$ litre. How many full bowls will the bucket hold?
(A: 20)
- Lunchtime starts at 12.10. It finishes at 12.45. How long is lunchtime?
(A: 35 minutes)
- A television programme starts at 4.30pm. It last for 40 minutes. What time does it end?
(A: 5.10pm)
- A cross country race started at 11.12. The winner crosses the line at 12.00. What was their time?
(A: 48 minutes)
- Chris' birthday is on Saturday 20th May. Jamie's birthday is 2 weeks later. What date is his birthday on?
(A: Saturday 3rd June)
- Peter had tea at 4.30. Fifteen minutes later he put a video game on. He played for 40 minutes. What time was it when he finished playing?
(A: 5.25)

UPPER KEY STAGE 2

NUMBER

One Step Problems

In a game Sadie scored 132 and Jake scored 227. What was their total score?
(A : 359)

A train was carrying 926 passengers. 258 got off. How many were left on the train?
(A : 668)

There are 12 candles in a box. How many candles are there in 7 boxes?
(A : 84)

Anita has 130 stick insects. Sally has half as many. How many stick insects does Sally have?
(A : 65)

I think of a number and divide it by 13. The answer is 11. What was my number?
(A : 143)

A school has 558 pupils. There are 31 pupils in each class. How many classes are there?
(A : 18)

There are 624 marbles in a jar. Joe sells $\frac{3}{4}$ of them. How many does he sell?
(A : 468)

Paul counts 1321 red cars. Gail counts 635 blue cars. How many more red cars are there than blue?
(A : 686)

The average age of pupils in a class is 11. If there are 32 pupils, what is their total age?
(A : 352)

A jar contains 138 red buttons, 97 green buttons and 245 yellow buttons. How many buttons are there altogether?
(A : 480)

Multi Step Problems

A ferry can take 271 passengers. There are already 184 on board. A travel agent has booked another 95 people for the cruise. How many people will not be able to travel?

(A: 8)

A school has 376 children. 159 of them visit a museum and 148 go to a farm. How many are left in the school?

(A: 69)

Lisa buys a television for £398 and a video recorder for £299. If she has £750, can she afford also to buy a radio for £54? How much will she have left or be short?

(A: No, -£1)

The thickness of 6 coins is 6 millimetres. How many coins are needed to make a pile 1 metre high?

(A:1000)

An adult rail ticket costs £112 and a child's ticket costs half price. How much short would a family of two adults and three children travel be if they had £390?

(A: £2)

A jumbo airliner holds 382 passengers. How many jumbos are needed for 3000 passengers? Would there be any empty seats and if so how many?

(A: 8, Yes, 56)

A shop is giving a 15% discount on tapes and 20% on CDs. How much discount will there be on a £15 tape and a £20 CD pack?

(A: £6.25)

A 37 centimetre length and a 45 centimetre length are cut off a 25 metre ball of string. What length of string is left?

(A: 24.18m)

A bus left London at 09:00 and arrived at Leeds at 13:00. The journey is approximately 200 miles. On average how many miles did the bus travel each hour?

(A: 50 miles)

The edge of a solid cube is 5 centimetres long. What is the surface area of the whole cube?

(A:150cm²)

Irrelevant Information

- There are 10 people on a red bus. 5 are sitting on top. At the next stop 3 more get on the bus. How many are there on the bus?
- I made 6 brandy snaps. Tom made 10 brandy snaps and Jo made 12 gingerbread men. How many brandy snaps did we make altogether?
- Scott bought 6 ice cream cones for his family. He gave them to his mum, dad, 2 brothers and 2 sisters. They cost £1 each. How much did he spend?
- Ann invited 7 people to her 10th birthday party in July. They all ate 2 raspberry jellies. How many jellies did they eat altogether?

Missing Information

- There were 20 chicken spread sandwiches on a plate. The children ate 10 of them. How many children were there?
- Carol spent 50p on Monday, 50p on Tuesday and £1 on Wednesday. How much did she spend altogether? How much money did she have left?