

SOLVING PROBLEMS

Pupils should be taught to:

Use all four operations to solve word problems involving numbers in 'real life'

As outcomes, Year 4 pupils should, for example:

Solve 'story' problems about numbers in real life, choosing the appropriate operation and method of calculation.

Explain and record using numbers, signs and symbols how the problem was solved.

Examples of problems

Single-step operations

- I think of a number, then subtract 18.
The answer is 26.
What was my number?
- A beetle has 6 legs.
How many legs have 9 beetles?
How many legs have 15 beetles?
- Kate has 38 toy cars.
John has half as many.
How many toy cars has John?
- A box holds 70 biscuits.
How many biscuits are left if you eat 17 biscuits?
How many people can have 5 biscuits each?
How many biscuits are there in 6 boxes?
How many boxes are needed to hold 200 biscuits?
- To cook rice, you need 5 cups of water for every cup of rice.
You cook 3 cups of rice.
How many cups of water do you need?

Multi-step operations

- There are 129 books on the top shelf.
There are 87 books on the bottom shelf.
I remove 60 of the books.
How many books are left on the shelves?
- There are 4 stacks of plates.
3 stacks have 15 plates each.
1 stack has 5 plates.
How many plates altogether?
- I think of a number, add 2, then multiply by 3.
The answer is 15.
What was my number?
- There are 36 children in the class.
Half of them have flavoured crisps.
One third of them have plain crisps.
How many children have crisps?

See also problems involving money (page 84), measures (page 86), time (pages 88 and 100), and puzzles (page 78).

As outcomes, Year 5 pupils should, for example:

Solve 'story' problems about numbers in real life, choosing the appropriate operation and method of calculation.

Explain and record using numbers, signs and symbols how the problem was solved.

Examples of problems

Single-step operations

- Three children play Tiddlywinks.
What was each child's score?
Yasmin $258 + 103$
Steven $177 + 92$
Micky $304 + 121$
- I think of a number, then divide it by 15.
The answer is 20.
What was my number?
- There are 12 eggs in a box.
How many eggs in 9 boxes?
How many boxes will 192 eggs fill?
- A bus seats 52 people. No standing is allowed.
17 people got off a full bus. How many were left on?
How many seats for two people are there?
How many people can sit on 6 buses?
How many buses are needed to seat 327 people?

Multi-step operations

- I have read 134 of the 512 pages of my book.
How many more pages must I read to reach the middle?
- There are 8 shelves of books.
6 of the shelves hold 25 books each.
2 of the shelves have 35 books each.
How many books altogether are on the shelves?
- I think of a number, subtract 17, and divide by 6.
The answer is 20. What was my number?
- You start to read a book on Thursday.
On Friday you read 10 more pages than on Thursday.
You reach page 60.
How many pages did you read on Thursday?
- Ravi bought a pack of 30 biscuits.
He ate one fifth of them on Thursday.
He ate one eighth of the remaining biscuits on Friday.
How many biscuits did he have left?

See also problems involving money (page 85), measures (page 87), time (pages 89 and 101), and puzzles (page 79).

As outcomes, Year 6 pupils should, for example:

Solve 'story' problems about numbers in real life, choosing the appropriate operation and method of calculation.

Explain and record using numbers, signs and symbols how the problem was solved.

Examples of problems

Single-step operations

- 12 500 people visited the museum this year.
This is 2568 more than last year.
How many people visited the museum last year?
- There are 35 rows of chairs.
There are 28 chairs in each row.
How many chairs are there altogether?
How many rows of chairs do 420 people need?
- A school has 486 pupils and 15 classes.
What is the average class size?
- Gwen has a box of 250 staples to make kites.
She uses 16 staples to make each kite.
How many complete kites can she make?
- Use a calculator or a written method.
A full box has 180 pins.
How many full boxes can be made from 100 000 pins?

Multi-step operations

- There is space in the multi-storey car park for 17 rows of 30 cars on each of 4 floors.
How many cars can park?
- 196 children and 15 adults went on a school trip.
Buses seat 57 people.
How many buses were needed?
- 960 marbles are put into 16 bags.
There is the same number of marbles in each bag.
How many marbles are there in 3 of these bags?
- In a dance there are 3 boys and 2 girls in every line. 42 boys take part in the dance.
How many girls take part?
- I think of a number, add 3.7 and multiply by 5.
The answer is 22.5. What was my number?
- Of the 96 children in Y6, three quarters have pets.
45 children have a dog. 21 children have a cat.
How many Y6 children have other kinds of pets?

See also problems involving money (page 85), measures (page 87), time (pages 89 and 101), and puzzles (page 79).

SOLVING PROBLEMS

Pupils should be taught to:

Use all four operations to solve word problems involving money

As outcomes, Year 4 pupils should, for example:

Use, read and write:

money, coin, pound, £, pence, note, price, cost, cheaper, more expensive, pay, change, total, value, amount...

Solve problems involving money, choosing the appropriate operation. Explain and record how the problem was solved. For example:

Shopping problems

- What is the total cost of a £4.70 book and a £6.10 game?
- It costs 80p for a child to swim.
How much does it cost for 6 children to swim?
- A jigsaw costs 65p. How many can you buy for £2?
How much change do you get?
- A CD costs £4.
Parveen saves 40p a week.
How many weeks must she save to buy the CD?
- Lauren has three 50p coins and three 20p coins.
She pays 90p for a Big Dipper ride.
How much does she have left?
- Dad bought 3 tins of paint at £5.68 each.
What was his change from £20?
- Peter offered two silver coins to pay for a 14p pencil.
Investigate how much change he got.
- A chocolate bar costs 19p.
How many bars can be bought for £5?
- For her party Asmat spent:

£2.88 on apples

£3.38 on bananas

£3.76 on oranges

Will a £10 note cover the cost? Explain your reasoning.

Converting pounds to pence and vice versa

- How many pence is: £1.57... £10.50... £31.06...?
- Write in pounds: 356p... 970p... 2040p...

Calculating fractions

- Harry spent one quarter of his savings on a book.
What did the book cost if he saved: £8... £10... £2.40...?
- Gran gave me £8 of my £10 birthday money.
What fraction of my birthday money did Gran give me?

As outcomes, Year 5 pupils should, for example:

Use, read and write, spelling correctly, the vocabulary of the previous year, and extend to: *discount...*

Solve problems involving money, choosing the appropriate operation. Explain and record how the problem was solved. For example:

Shopping problems

- Find the total of:
£9.63, £15.27 and £3.72;
66p, 98p, 48p and £3.72.
- How much does one of each cost?

4 for £1.00

10 for £2.50

6 for £3.24

- What change do you get from £20 for £13.68?
- Kobi saved 15p a week for one year. How many pounds did he save?
- Four people paid £72 for football tickets. What was the cost of each ticket? How much change did they get from £100?
- Petrol costs 64.2p per litre. What do you pay to fill a 5 litre can?
- Which amounts up to £1 cannot be paid exactly with fewer than six coins?
- You have four 35p and four 25p stamps. Find all the different amounts you could stick on a parcel.
- Take £1 worth of coins: four 1p, three 2p, four 5p, three 10p and two 20p. Find all the different ways of using the coins to pay 50p exactly.

Converting foreign currency

- Exchange rates for £1 are:

1.6 US dollars
8.7 French francs
220 Spanish pesetas

How many dollars, francs, pesetas do you get for £5?

Calculating fractions and percentages

- The deposit on a £230 chair is 50%. How much is the deposit?
- There is 25% off prices in a sale. How much do you get off £36... £1.80...?

As outcomes, Year 6 pupils should, for example:

Use, read and write, spelling correctly, the vocabulary of the previous year.

Solve problems involving money, choosing the appropriate operation. Explain and record how the problem was solved. For example:

Shopping problems

- What is the total of £110.12, £3.43 and £11.07?
- How much does one of each cost?

10 for £3.90

100 for £16.00

5 for £1.55

- Find the cost of 145 bottles of lemonade at 21p each. What change do you get from £50?
- Things at half price now cost:
£36.18 £111 £27.34 £274.30
What was the original price of each item?
- Three people won £363 630 on the lottery to be shared equally between them. How much does each one get?
- Costs of rides are:

Galaxy	£1.65
Laser	£2.80
Big wheel	£1.45
Spaceship	£2.70

Amy went on two rides. She had £5.65 change from £10. Which two rides did she go on?

- Use a calculator or a written method. 4030 people go to a football match. Each ticket costs £4.25. What is the total cost of all the tickets?

Converting to European or foreign currency

- There are 1.43 euros to £1. What is the price in pounds of a car costing 14 300 euros?
- Use a calculator or a written method. There are 2560 lira to £1. Find the price in lira of a house costing £60 000.

Calculating fractions and percentages

- The agent's fee for selling a house is 5%. Calculate the fee on a house sold for £80 000.
- Use a calculator or a written method. There is a 15% discount in a sale. How much is the discount on £200... £25...?

SOLVING PROBLEMS

Pupils should be taught to:

Use all four operations to solve word problems involving length, mass or capacity

As outcomes, Year 4 pupils should, for example:

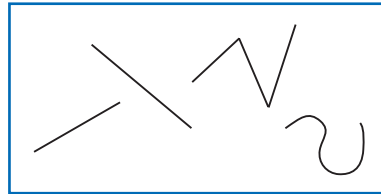
Solve 'story' problems involving:

- kilometres, metres, centimetres, millimetres...
- kilograms, half kilograms, grams...
- litres, half litres, millilitres...
- miles, pints...

and explain and record how the problem was solved.

For example:

- Measure the lengths of these lines to the nearest mm.



- Two shelves are 75 cm and 87 cm long.
What is their total length in metres?
What is the difference in their lengths in centimetres?
- A family sets off to drive 524 miles.
After 267 miles, how much further do they have to go?
- A potato weighs about 250 g.
Roughly how much do 10 potatoes weigh?
How many times heavier is a 1 kg potato?
- A bottle of salad dressing holds 300 millilitres.
A tablespoon holds 15 millilitres.
How many tablespoons of dressing are in the bottle?
- A full jug holds 2 litres.
A full glass holds $\frac{1}{4}$ of a litre.
How many glasses full of water will the jug fill?
- Change this recipe for ginger nuts for 6 people to a recipe for 12 people for a party.

125 g	flour
50 g	fat
75 g	sugar
30 ml	treacle
1 teaspoon	ground ginger

- Each side of a regular hexagon is 14 centimetres long.
How long is its perimeter?

See also problems involving numbers in 'real life' (page 82), money (page 84), time (pages 88 and 100), and puzzles (page 78).

As outcomes, Year 5 pupils should, for example:

Solve 'story' problems involving:

- kilometres, metres, centimetres, millimetres...
- kilograms, grams...
- litres, millilitres...
- miles, gallons, pints...

and explain and record how the problem was solved.

For example:

- There is 365 ml of milk in a jug. Another 450 ml of milk is added. How much milk is in the jug now?
- Dad bought a 2 kg bag of carrots. He used 400 grams of carrots to make some soup. How many grams of carrots were left?
- The football club has 400 litres of soup for the fans. One cup of soup is 250 ml. How many fans can have a cup of soup?
- Mum's car holds 40 litres of petrol. Dad's van holds two and half times as much. How much petrol does the van hold?
- Greg uses 5 tomatoes to make $\frac{1}{2}$ a litre of sauce. How much sauce can he make from 15 tomatoes?
- A full bucket hold $5\frac{1}{2}$ litres. A full jug holds $\frac{1}{2}$ a litre. How many jugs full of water will fill the bucket?
- Change this pancake recipe for 4 people to a recipe for 6 people.

240 g	flour
300 ml	milk
2	eggs

Use a written method or a calculator to solve, for example:

- There is 2.2 kg of sugar in a bag. How much sugar is there in 10 bags?

See also problems involving numbers in 'real life' (page 83), money (page 85), time (pages 89 and 101), and puzzles (page 79).

As outcomes, Year 6 pupils should, for example:

Solve 'story' problems involving:

- kilometres, metres, centimetres, millimetres...
- kilograms, grams... newtons...
- litres, millilitres, centilitres...
- miles, gallons, pints, pounds, ounces...

and explain and record how the problem was solved.

For example:

- Sarah travelled 34.24 km by car, 2.7 km by bus and 1000 m on foot. How many kilometres did she travel? How many metres?
- I cut 65 cm off 3.5 metres of rope. How much is left?
- How many grams of carrots must be added to 2.76 kg to make 5 kg of carrots altogether?
- Which is more: 10 lb of potatoes or 10 kg of potatoes?
- There is 300 ml of oil in the small bottle. There is six and one quarter times as much in the big bottle. How much oil is in the big bottle?
- A full bucket hold 3.2 litres. A full jug holds 0.2 of a litre. How many jugs full of water will fill the bucket?
- Change this cake recipe to metric units.

half a pint	water
3 oz	butter
4 oz	sugar
10 oz	flour
1 teaspoon	almond essence
2	eggs

Use a written method or a calculator to solve, for example:

- A pin is made from 14 mm of wire. How many pins can be made from 1 m of wire?
- There are exactly 2.54 cm to 1 inch. 1 yard is 36 inches. About how many centimetres are there in 1 yard?
- A garage orders 50 000 litres of petrol. It sells an average of 1250 litres per day. How long does its supply of petrol last?

See also problems involving numbers in 'real life' (page 83), money (page 85), time (pages 89 and 101), and puzzles (page 79).

SOLVING PROBLEMS

Pupils should be taught to:

Use all four operations to solve word problems involving time

As outcomes, Year 4 pupils should, for example:

Solve 'story' problems involving units of time, and explain and record how the problem was solved.

For example:

- Raiza got into the pool at 2:26. She swam until 3 o'clock. How long did she swim?
- The cake went in the oven at 1:20. It cooked for 75 minutes. What time did it come out?
- Lunch takes 40 minutes. It ends at 1:10 pm. What time does it start?
- Mary got up at 7:35. She left for school 45 minutes later. Her journey took 15 minutes. What time did she arrive at school?
- The football team kicked off at 1:30 pm. They played 45 minutes each way. They had a 10 minute break at half time. At what time did the game finish?
- Jan went swimming on Wednesday, 14 January. She went swimming again 4 weeks later. On what date did she go swimming the second time?
- The swimming pool shut for repairs on Friday, 20 March. It opened again on Friday, 10 April. For how many weeks was the swimming pool shut?

See also using timetables (page 100), problems involving numbers in 'real life' (page 82), money (page 84), measures (page 86), and puzzles (page 78).

As outcomes, Year 5 pupils should, for example:

Solve 'story' problems involving units of time, and explain and record how the problem was solved.

For example:

- The car race began at 08:45 and finished at 14:35. How long did the race last?
- The sun sets at 19:30 and rises again at 06:30. How many hours of darkness? Of daylight?
- A train leaves at 09:45 h and arrives at 15:46 h. How long does the journey last?
- These are the start and stop times on a video cassette recorder.

START 14:45
STOP 17:25

For how long was the video recording?

- Four children in a relay team swim in a race. Here are their times for each lap.

LAP 1 Craig 92.4 seconds
LAP 2 Fiona 86.3 seconds
LAP 3 Harun 85.1 seconds
LAP 4 Jenny 91.8 seconds

What is their total time for the four laps?

See also using timetables (page 101), problems involving numbers in 'real life' (page 83), money (page 85), measures (page 87), and puzzles (page 79).

As outcomes, Year 6 pupils should, for example:

Solve 'story' problems involving units of time, and explain and record how the problem was solved.

For example:

- Lamb must be cooked for 60 minutes for every kg. Chicken must be cooked for 50 minutes for every kg. Complete this table of cooking times.

kilograms	1	1.5	2	2.5	3	3.5
Cooking time in minutes (lamb)						
Cooking time in minutes (chicken)						

See also using timetables (page 101), problems involving numbers in 'real life' (page 83), money (page 85), measures (page 87), and puzzles (page 79).