



Percentages

- Calculating percentages of numbers, quantities and measurements
- Using percentages to solve problems
- Finding the outcome of a percentage increase or decrease
- Calculating successive percentage increases or decreases

Keywords

You should know

explanation 1

1 Copy and complete the table.

	Fraction	Decimal	Percentage
a	$\frac{1}{4}$		
b		0.54	
c			16%
d	$\frac{1}{3}$		
e		0.625	
f			81%
g			4%

2 Write each percentage as a fraction in its simplest form.

a 72% **b** 98% **c** 45% **d** 3% **e** 12.5%

3 Write each decimal as a percentage.

a 0.69 **b** 0.05 **c** 0.485 **d** 1.64 **e** 3.516

- 4** Molly asked 60 pupils to name their favourite flavour of crisp. Her results are in this table.

Plain	Cheese and onion	Salt and vinegar	BBQ	Prawn cocktail
4	15	8	21	12

- a** 21 out of the 60 pupils chose BBQ flavour.

This can be written as a fraction $\frac{21}{60} = \frac{7}{20}$.

What fraction of the group chose each of the other flavours?

- b** What percentage of the group chose each flavour?



explanation 2a

explanation 2b

- 5** Work out these percentages.

a 15% of 24

b 33% of 12

c 35% of 40

d 75% of 42

e 44% of 75

f 57% of 80

- 6** Find these amounts.

a 37% of 84 kg

b 18% of £72

c 2.9% of 51 km

d 32.6% of 28 m

e 120% of £32

f 105% of 47 kg

g 123% of 27 litres

h 0.4% of 13 tonnes

i 112.5% of 65 cm

- 7** Work out these amounts, rounding each answer to the nearest penny.

a 46% of £21

b 33% of £52

c $18\frac{1}{4}\%$ of £65

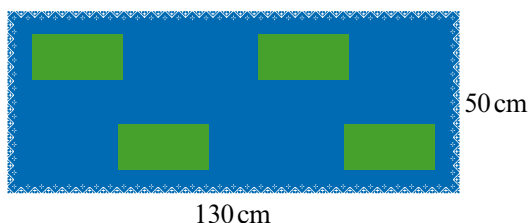
- 8** Peter puts £200 into a bank account that pays 4.5% interest.

a How much interest will he receive after one year?

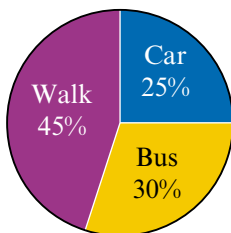
b How much will he now have in the account?



- 9** 20% of this piece of fabric is green. What area of the fabric is green?



10



The pie chart shows how pupils in a class travel to school.
If 30 pupils travel by car, how many walk to school?

explanation 3

- 11** Work out these percentages.

- a** 45 as a percentage of 60
c 32 as a percentage of 128

- b** 15 as a percentage of 75
d 42 as a percentage of 112

- 12** The human body consists of 206 bones.
There are 26 bones in each foot.
What percentage of the bones in the human skeleton are in the feet?



- 13** Steve's test scores are given in the table.

Subject	English	Maths	Geography	History	Science
Score	$\frac{35}{40}$	$\frac{80}{90}$	$\frac{28}{35}$	$\frac{54}{60}$	$\frac{56}{64}$
Percentage					

- a** Copy and complete the table by working out Steve's percentage score for each subject.
- b** In which subject did Steve achieve his best result?
- 14** Work out these percentages.
Give your answers to 1 decimal place.
- a** 40p as a percentage of £5 **b** 20 minutes as a percentage of 4 hours
- c** 35 g as a percentage of 1.5 kg **d** 62 cm as a percentage of 2.8 m
- 15** Sophie puts £250 into her savings account.
After one year she receives £8.75 in interest.
What was the rate of interest paid on her savings?

explanation 4

- 16** Each price is increased by the percentage shown.
Calculate the new values.
- a** £30 is increased by 15% **b** £65 is increased by 12%
- c** £82 is increased by 3% **d** £16 is increased by 45.6%
- e** £124 is increased by 132% **f** £240 is increased by 0.5%
- 17** Electricity prices go up by 11%.
Find the new cost of electricity that originally cost these amounts.
- a** £70 **b** £360 **c** £470 **d** £550

- 18** Council tax bills are increased by 4% this year.
- a** Copy and complete this statement.
 This year's council tax bill will be % of last year's bill.
% is equivalent to .
- b** How much will the council tax be this year if it was this much last year?
- i** £800 **ii** £1050 **iii** £1720
- 19** £2020 was raised at the school fair last year.
- a** This year the amount raised was 8% more than last year.
 How much money was raised this year?
- b** 5% of the amount raised last year came from the ice-cream stall.
 How much money did it take?
- 20** In 1994 Martin and Susie bought a house for £150 000 and a year later its value had increased by 4.5%.
- a** What was the value of their house after the increase?
- b** The following year its value increased by another 4.5%.
 What was its value then?
- 21** Last year at Albany Community school 67.5% of pupils passed their end of year exams
- a** This year 204 pupils out of 296 passed their exams.
 Has the school's percentage changed? If so, by what percentage has it increased or decreased?
- b** If the school had 280 candidates for the exams last year, how many of them passed?

explanation 5

- 22** Each price is reduced by the percentage shown. Calculate the new values.
- a** £65 is reduced by 65%
- b** £98 is reduced by 77%
- c** £456 is reduced by 21%

- 23** A reduction of 5% is given if a customer buys gas and electricity from the same supplier. The total bill for gas and electricity is £784 before the discount is applied. How much will the customer actually pay?

- 24** Tom wants to buy a car which costs £5600. He can either pay the total in cash or pay a 20% deposit followed by 24 equal monthly payments of £190. How much extra will Tom pay using the second method?



explanation 6

- 25** House prices increased by 4% in June 2007. In November it was reported that house prices had fallen by 4% since June. A house was valued at £240 000 in May. Work out the value of that house at the start of December 2007.

- 26** Karan keeps koi carp.

His biggest fish weighed 7 kg before it got carp pox (CHV-1) and began to lose weight at 5% per day.

However, after a week it started to recover and gained weight at 8% per day.

- a** What did it weigh the day after it got carp pox?
 - b** What did it weigh a week after it got carp pox?
 - c** How many days after it got carp pox did it regain its 7 kg weight?
- 27 a** In 2007 an energy report said that the wind industry generated 1% of the world's electricity and that if generation of wind power grew by 20% per year for 15 years, it would still only generate 10% of the world's electricity. Is this a true claim?
- b** The report also said that solar energy contributed only 0.06% of world electricity and that if generation of solar energy increased by 35% per year, it would still generate less than 5% of world electricity in 15 years. Is this a true claim?

