



Percentages

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

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		0.98	

2 Write each percentage as a fraction in its lowest terms.

- a 25% b 24% c 72% d 62%
e 98% f 45% g 3% h 12.5%

3 Write each decimal as a percentage.

- a 0.69 b 0.12 c 0.05 d 0.39
e 0.485 f 0.027 g 1.64 h 3.51

- 4** Molly asked 60 pupils in her year to name their favourite flavour of crisp. Her results are in the 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 each amount by first changing the percentage to a fraction.

- a** 14% of 36 **b** 15% of 24 **c** 21% of 18 **d** 33% of 12
e 35% of 40 **f** 48% of 9 **g** 75% of 42 **h** 8% of 96
i 40% of 32 **j** 64% of 10 **k** 18% of 15 **l** 55% of 3

- 6** Find these amounts. If you use a calculator *do not* use the % key.

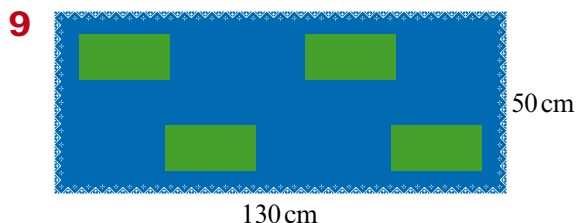
- a** 37% of 84 kg **b** 52% of 48 cm **c** 18% of £72
d 44% of 92 m **e** 2.9% of 51 km **f** 12.5% of 68 g
g 32.6% of 28 m **h** 18.7% of 55 km **i** 120% of £32
j 105% of 47 kg **k** 2.5% of 576 cm **l** 6.9% of £120

- 7** Work out each amount.

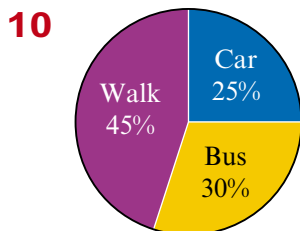
- a** 46% of £95 **b** 24.5% of £70 **c** 35.5% of £52
d 82.5% of £48 **e** 18% of £64 **f** 51.7% of £70

- 8** Peter puts £200 into a bank account which pays 4.5% interest a year. How much interest will he receive after one year?





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



The pie chart shows how pupils in a class travel to school. 30 pupils travel by car.

- a** How many pupils are in the class?
- b** How many pupils walk to school?

explanation 3

11 Work out these percentages.

- a** 45 as a percentage of 60
- b** 15 as a percentage of 75
- c** 32 as a percentage of 128
- 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 Peter receives £75 for his birthday. He saves £50 and spends the rest on CDs. What percentage did he save?

14 Steve's test scores are given in the table.

- a** Copy and complete the table by working out Steve's percentage score for each subject.

Subject	Score	Percentage
English	$\frac{35}{40}$	
Maths	$\frac{68}{80}$	
Geography	$\frac{28}{35}$	
History	$\frac{54}{60}$	
Science	$\frac{56}{64}$	

- b** In which subject did Steve achieve his best result?

15 Work out these percentages.

- a** 40p as a percentage of £5
- b** 18 minutes as a percentage of 4 hours
- c** 30 g as a percentage of 1.5 kg
- d** 63 cm as a percentage of 2.8 m
- e** 15 mm as a percentage of 20 cm
- f** 63 m as a percentage of 3 km

16 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?

17 Kasia buys a sandwich and an apple for her lunch. The sandwich costs £1.20 and the apple costs 30p.

- a** Find the cost of the sandwich as a percentage of the total cost of her lunch.
- b** Find the cost of the apple as a percentage of the total cost of her lunch.

explanation 4

18 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 23%
- d** £16 is increased by 45%
- e** £124 is increased by 32%

19 The cost of electricity goes up by 11%. Find the new cost of electricity for each of these original costs.

- a** £70 **b** £360 **c** £470 **d** £550

20 Council tax bills are increased by 4% this year.

- a**
 - i** Write this year's council tax bill as a percentage of last year's bill.
 - ii** Write the percentage in decimal form.
- b** How much will the council tax be this year if it was this much last year?
 - i** £800 **ii** £1050 **iii** £1720

21 1640 people visited an art exhibition in September. The number of visitors in October was 5% higher. How many people visited the exhibition in October?



22 £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?

- 23** Martin and Susie bought a house for £150 000 and a year later its value had increased by 4.5%. What was the value of their house after the increase?

explanation 5

- 24** The following prices are reduced by the percentage shown. Calculate the new values.
- a** £30 is reduced by 25%
 - b** £65 is reduced by 65%
 - c** £98 is reduced by 77%
 - d** £130 is reduced by 12%
 - e** £456 is reduced by 21%
- 25** 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?
- 26** Tom wants to buy a car which cost £5600. He can either pay the total in cash or pay a 20% deposit followed by 24 equal monthly payments of £190. Tom buys the car using the second method.
- a** How much is the deposit?
 - b** How much will Tom pay in instalments?
 - c** How much will he pay altogether?
 - d** How much more is this than if he paid cash?



- 27** House prices increase by 4% in June. In November it is reported that house prices have fallen by 4%. A house was valued at £240 000 in May. Work out the value of this house in December.