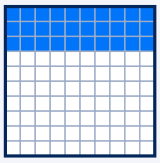
PERCENTAGE CHANGE

BUILDING BLOCKS

NAME _____ CLASS _____ DATE _____

KEY IDEA

Percent means "out of 100".

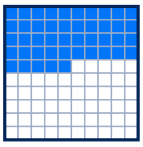


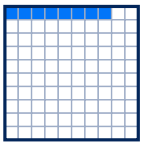
30 out of 100 = 30%

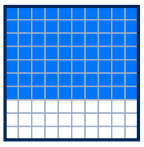
Not out of 100? Make it out of 100:

$$\frac{12}{20} \overset{\times 5}{=} \frac{60}{100} = 60\%$$

1 What percentage of each hundred square is shaded?

 ☐ %

 ☐ %

 ☐ %

2 Make each fraction out of 100. Then write it as a percentage.

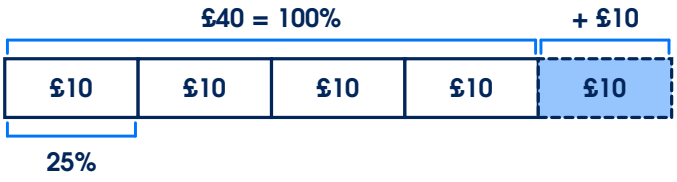
a) $\frac{3}{10} = \frac{\square}{100} = \square$ %

b) $\frac{9}{20} = \frac{\square}{100} = \square$ %

c) $\frac{12}{25} = \frac{\square}{100} = \square$ %

d) $\frac{18}{50} = \frac{\square}{100} = \square$ %

3 A game cost £40. The price went up to £50.



a) Change = £☐

b) Increase = ☐ %

Each part is 25% of £40.

4 A pair of trainers is in a sale. What percentage has been taken off?



a) Difference = £50 – £35 = £☐

b) 10% of £50 = £☐

c) The difference is ☐ lots of 10%, so it is ☐ % off.

PERCENTAGE CHANGE

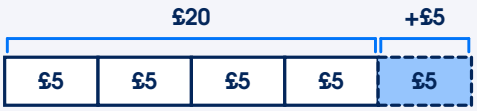
SUPPORT

NAME _____ CLASS _____ DATE _____

KEY IDEA

Percentage change = $\frac{\text{change}}{\text{original}}$ × 100

Always divide by the ORIGINAL amount.

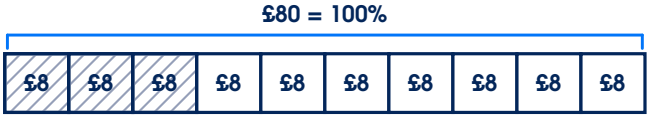


$\frac{5}{20}$ × 100 = 25% increase

1 Complete the table.

ORIGINAL	NEW	CHANGE	CHANGE ÷ ORIGINAL	% CHANGE
£20	£25	£25 – £20 = £5	5 ÷ 20 = 0.25	25%
£50	£40			
£80	£100			
£200	£150			

2 Kai took £80 shopping. He came home with £56.



Striped: the money he spent.

a) Spent = £ ____

b) He spent ____ % of his money.

3 Find the change and the percentage change. Circle INCREASE or DECREASE.

a) **40 → 46** change = ____ ____ % INCREASE DECREASE

b) **25 → 20** change = ____ ____ % INCREASE DECREASE

c) **120 → 150** change = ____ ____ % INCREASE DECREASE

d) **300 → 291** change = ____ ____ % INCREASE DECREASE

4 Choose the correct calculation.

A price goes from £40 to £65. Which calculation finds the percentage change?

A $\frac{25}{65}$ × 100 B $\frac{25}{40}$ × 100 C $\frac{40}{65}$ × 100

Correct calculation: ____ Percentage change = ____ %

PERCENTAGE CHANGE

CORE

NAME _____ CLASS _____ DATE _____

KEY IDEA

Percentage change = $\frac{\text{new} - \text{original}}{\text{original}}$ **× 100**

Divide by the original, not the new amount. Profit or loss is a change from the cost price.

FLUENCY

1 Find each percentage change (to 1 d.p. where needed). Circle increase or decrease.

a) 64 to 80 ☐ % increase / decrease

b) 250 to 185 ☐ % increase / decrease

c) 4500 to 4950 ☐ % increase / decrease

d) 38 to 51 ☐ % increase / decrease

e) 72 to 63 ☐ % increase / decrease

f) 0.8 to 1.3 ☐ % increase / decrease

2 Work out the percentage profit or loss. Circle PROFIT or LOSS.

a) Bought for £24, sold for £30 ☐ % PROFIT LOSS

b) Bought for £150, sold for £126 ☐ % PROFIT LOSS

c) Bought for £8.50, sold for £11.05 ☐ % PROFIT LOSS

REASONING

3 A plant grew from 12 cm to 15 cm.

Sam says, "3 ÷ 15 × 100 = 20%, so it grew by 20%."

a) Explain Sam's mistake.

.....

b) Work out the correct percentage increase. ☐

4 Compare the two towns. Use the key idea to find each percentage change.

Town A grew from 2400 to 3000 people. Town B grew from 800 to 1100 people.

Amir says, "Town A grew by more people, so it had the bigger percentage increase."

Town A: $\frac{\square}{\square}$ × 100 = ☐ % **Town B:** $\frac{\square}{\square}$ × 100 = ☐ %

Is Amir correct? YES NO

PERCENTAGE CHANGE

GREATER DEPTH

NAME _____ CLASS _____ DATE _____

REASONING

1 Is each statement always, sometimes or never true? Circle your answer.

If it is sometimes true, give an example of when it is true and when it is not.

a) 20% of one amount is less than 50% of another amount. ALWAYS SOMETIMES NEVER

b) If an amount doubles, the percentage increase is 200%. ALWAYS SOMETIMES NEVER

c) A change from x to x + 10 is a 10% increase. ALWAYS SOMETIMES NEVER

d) A decrease in price is at most 100%. ALWAYS SOMETIMES NEVER

2 A price goes up from £40 to £50. Later it goes back down from £50 to £40.

Ben says, "The percentage increase and the percentage decrease are both 25%."

Is Ben correct? Explain why or why not.

PROBLEM SOLVING

3 The mass of a parcel increases by 18 kg. This is a 24% increase. Work out the original mass and the new mass.

Original mass = ☐ kg New mass = ☐ kg

★ CHALLENGE FOR ALL

4 A square has sides of 10 cm. Each side is increased to 12 cm.

a) Percentage increase in the perimeter = ☐ %

b) Percentage increase in the area = ☐ %

c) Explain why the two answers are different.

PERCENTAGE CHANGE

ANSWERS

BUILDING BLOCKS

1 45% 8% 70%
2 a) 30/100 = 30% b) 45/100 = 45% c) 48/100 = 48% d) 36/100 = 36%
3 a) £10 b) 25%
4 a) £15 b) £5 c) 3 lots of 10%, so 30% off

SUPPORT

1 £50 → £40: £10, 0.2, 20% (decrease) · £80 → £100: £20, 0.25, 25% (increase) · £200 → £150: £50, 0.25, 25% (decrease)
2 a) £24 b) 24/80 c) 30%
3 a) 6, 15% increase b) 5, 20% decrease c) 30, 25% increase d) 9, 3% decrease
4 B (25/40 × 100) · 62.5%

CORE

1 a) 25% inc b) 26% dec c) 10% inc d) 34.2% inc e) 12.5% dec f) 62.5% inc
2 a) 25% profit b) 16% loss c) 30% profit
3 a) Sam divided by the new height (15 cm) instead of the original height (12 cm) b) 3 ÷ 12 × 100 = 25%
4 Town A: (3000 − 2400)/2400 × 100 = 600/2400 × 100 = 25%. Town B: (1100 − 800)/800 × 100 = 300/800 × 100 = 37.5%. Amir is not correct: Town B had the bigger percentage increase because its change is a bigger fraction of its original population.

GREATER DEPTH

1 a) Sometimes: 20% of 100 = 20 < 50% of 100 = 50, but 20% of 500 = 100 > 50% of 100 = 50; a percentage depends on its whole b) Never (doubling is a 100% increase) c) Sometimes: only true when x = 100 d) Always (you cannot take away more than all of it)
2 No. Increase: 10 ÷ 40 = 25%. Decrease: 10 ÷ 50 = 20%. The change is £10 both times but the original amount is different (£40, then £50).
3 24% = 18 kg, so 1% = 0.75 kg: original mass = 75 kg, new mass = 93 kg
4 a) Perimeter 40 cm → 48 cm: 20% b) Area 100 cm² → 144 cm²: 44% c) The area uses two lengths multiplied together, so it increases by 1.2 × 1.2 = 1.44.