

Essential knowledge

- Calculate percentage increase and decrease
- Calculate percentage change
- Calculate reverse percentages
- Calculate interest and solve money problems

Key Vocabulary

Percent: parts per 100 – written using the % symbol.
 Fraction: a fraction represents how many parts of a whole value you have.
 Equivalent: of equal value.
 Reduce: to make smaller in value.
 Growth: to increase/ to grow.
 Integer: whole number, can be positive, negative or zero.
 Multiplier: the number you are multiplying by.
 Profit: the income take away any expenses/ costs.

Prior learning links

Year 7- Fractions and percentages of amounts

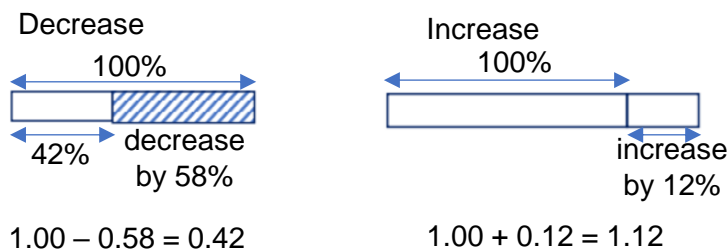
Year 8- Fractions and Percentages

FDP Equivalence

Percentage - 100% = a whole = 100 hundredths

$$70\% \rightarrow \frac{70}{100} \rightarrow 70 \text{ hundredths} = 7 \text{ tenths} = 0.7$$

Percentage Increase and Decrease



Percentage Change

I bought a phone for £200.
A year later sold it for £125

All values of change compare to the **original value**

Change- $£200 - £125 = £75$

Percentage loss
 $\frac{75}{200} \times 100 = 37.5\%$

$$\frac{\text{difference in values}}{\text{original value}} \times 100$$

Compound Interest

I invest £300 into a savings account at 5% compound interest for 2 years...

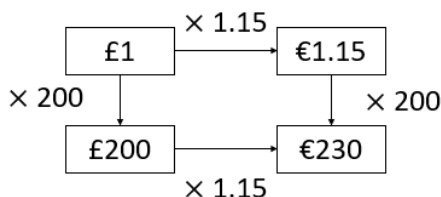
capital \rightarrow $300 \times 1.05^2 = £330.75$ \leftarrow years

multiplier \rightarrow

Exchange Rates

Exchange rates use ratio and proportion to convert between currencies

The exchange rate here is $£1 = €1.15$



Reverse Percentages

40% of my number is 16.
What am I thinking of?

Original number (100%)



16 (40%)

$40\% = 16$

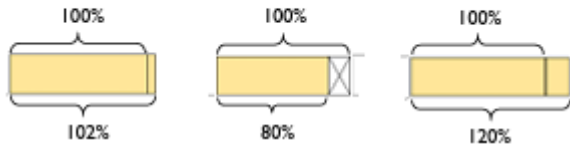
$10\% = 4$

$100\% = 40$

Try to scale down to 10% or 1% and then scale back up to 100%

Prior learning links

Draw lines to match the bar model to the correct percentage increase/decrease and multiplier.



20% decrease 2% increase 20% increase

1.02 1.2 0.8

FDP Equivalence

Express as a decimal

- a) $\frac{3}{4}$ b) 72% c) 125%

Express as a fraction

- a) 0.25 b) 65% c) 0.4

Express as a percentage

- a) $\frac{3}{4}$ b) 0.125 c) 1.5

Percentage Increase and Decrease

- a) Increase 120 by 5%
 b) Increase £1.50 by 20%
 c) Decrease £66 by 10%
 d) Decrease £2.20 by 5%

Alex increases 30 g by 20%
 She then decreases her answer by 20%
 Dora says she will have less than her original amount of 30 g
 Alex disagrees. Who is correct?
 Justify your answer.

Key Vocabulary

Define the words:

Percent-
 Fraction-
 Equivalent-
 Reduce-
 Integer-
 Multiplier-
 Profit-

Reverse Percentages

a) In a sale, a shop reduces all its prices by 10%. On the last day of the sale, the shop reduces the sale prices by 20%. On the last day of the sale, a mobile phone costs £432. How much was the mobile phone before the sale?

b) Evie is given a 22% pay rise. Her new salary is £21,960. What was Evie's salary before the pay rise?

c) Trevor is a car salesman. He bought a car for £5000. Currently he is holding a sale with 35% off the price of all cars. Trevor wants to sell the car so that he makes a 10% profit on the price he paid. How much should Trevor advertise the car for?

Percentage Change

- a) In January, a puppy weighed 4kg. Three months later, the same puppy weighed 5kg. What was the percentage increase in the puppy's weight?
 b) Daisy bought a car for £20,000. She sold the car for £15,000. Work out the percentage loss.

Mo buys a rare comic for £120 and sells it again for £170

Compare these methods to work out his percentage profit.

Method 1

$$170 - 120 = 50$$

$$\frac{50}{120} = 0.41666 \approx 42\%$$

Method 2

$$\frac{170}{120} = 1.41666 \approx 142\%$$

$$142\% - 100\% = 42\%$$