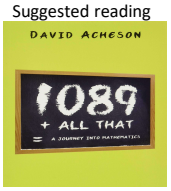
Waingels Maths

Year 9 – Reasoning with Numbers

Using Percentages

Suggested reading



Want to know more? Scan the QR code to visit the curriculum overview for Year 9 Maths, including topic summaries, key words, and books that you may want to read in your own time

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What do I need to be able to do?

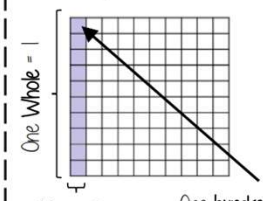
By the end of this unit you should be able to:

- Use FDP equivalence
- Calculate percentage increase and decrease
- Express percentage change
- Solve reverse percentage problems
- Solve percentage problems (calculator and non calculator problems)

Keywords

Percent: parts per 100 – written using the % symbol.
Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals.
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.
Invest: use money with the goal of it increasing in value over time (usually in a bank).
Multiplier: the number you are multiplying by.
Profit: the income take away any expenses/ costs.

FDP Equivalence (R)



Percentage
100% = a whole = 100 hundredths

10 hundredths
10 out of 100
10%

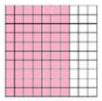
$\frac{10}{100} = \frac{1}{10} = 0.10$

One **hundredth** (one whole split into 100 equal parts)

ones	tenths	hundredths
	●	●

Converting FDP (R)

$\frac{70}{100}$ → This also means 70 ÷ 100 → 70 out of 100 squares → 70 "hundredths" = 7 "tenths" = 0.7



→ 70 hundredths = 70%

Using a calculator

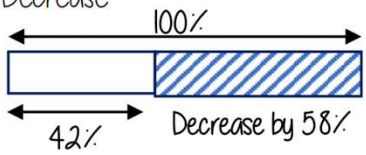
S⇄D Convert to a decimal

× 100 converts to a percentage

Be careful of recurring decimals
e.g $\frac{1}{3} = 0.3333333$
$= 0.\dot{3}$
The dot above the 3

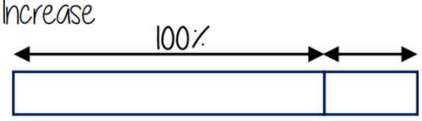
Percentage Increase/ Decrease (R)

Decrease



Decrease by 58%

Increase



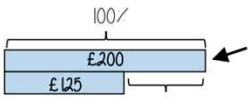
Increase by 12%

100 − 0.58 = 0.42 ← Multiplier Less than 1

100% + 12% = 112%
100 + 0.12 = 1.12 ← Multiplier More than 1

Percentage change (R)

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



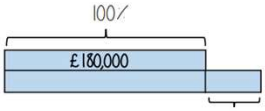
All values of change compare to the ORIGINAL value

Percentage loss

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

$$\frac{Difference\ in\ values}{Original\ value} \times 100$$

I bought a house for £180,000, I later sold it for £216,000



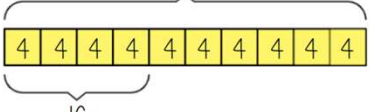
Percentage profit

Money made (profit value) → $\frac{36000}{180000} \times 100 = 20\%$

Reverse Percentages

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

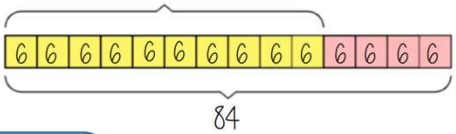
Original Number (100%)



40% = 16
10% = 4
100% = 40

140% of my number is 84. What is the original number?

Original Number (100%)



140% = 84
10% = 6
100% = 60

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