

Y7 Maths Knowledge Organiser Topic 12: Percentages 1

What must I be able to do?

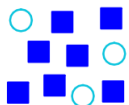
- Understand percentage as a fractional operator with denominator of 100
- Express a part of a whole as a percentage
- Convert between fractions, decimals and percentages
 - Sparx M264
- Find fractions and percentages of given quantities
 - Sparx M695, M684, M437, M905
- Find the whole given a part and the percentage
- Increase and decrease by a percentage
 - Sparx M476, M533
- Calculate simple interest

Key vocabulary

| | |
|-------------------|---|
| Percentage | A number or ratio expressed as a fraction out of 100. Per-cent means per-hundred (or out of 100). |
| Convert | To <u>change</u> between percentages, decimals and fractions whilst <u>keeping the value the same</u> . |
| Increase | To increase something is to make it <u>larger</u> . |
| Decrease | To decrease something it to make it <u>smaller</u> or to take something away. |
| Interest | Interest is a <u>percentage increase</u> on a value <u>over</u> a period of <u>time</u> . |

Express as a percentage %

Non calculator: Write as a fraction and then rewrite it as an equivalent fraction out of 100.


 $\frac{3}{10}$ are circles. This is equivalent to $\frac{30}{100}$ which is 30%. 30% are circles and 70% are squares

Finding a percentage of an amount (non calc)

To find this % of an amount:

- 50% we divide by 2 (as $2 \times 50\% = 100\%$)
- 25% we divide by 4 (as $4 \times 25\% = 100\%$)
- 10% we divide by 10 (as $10 \times 10\% = 100\%$)
- 1% we divide by 100 (as $100 \times 1\% = 100\%$)

We can use these to find other %s by dividing/multiplying or combining with other known %s: e.g.

5% is half of 10% so to find 5% we find 10% and $\div 2$

30% is 3 lots of 10% so find 10% and multiply by 3

75% is 50% plus 25% so we find 50% and 25% then add them together.

Converting between fractions, decimals and %s

Any fraction can be written as a decimal or as a % and vice versa.

| Fraction | Decimal | % | Fraction | Decimal | % |
|-----------------|---------|--------|-----------------|---------|--------|
| $\frac{1}{2}$ | 0.5 | 50% | $\frac{1}{1}$ | 1 | 100% |
| $\frac{1}{4}$ | 0.25 | 25% | $\frac{3}{4}$ | 0.75 | 75% |
| $\frac{1}{10}$ | 0.1 | 10% | $\frac{2}{10}$ | 0.2 | 20% |
| $\frac{1}{5}$ | 0.2 | 20% | $\frac{2}{5}$ | 0.4 | 40% |
| $\frac{1}{100}$ | 0.01 | 1% | $\frac{2}{100}$ | 0.02 | 2% |
| $\frac{1}{3}$ | 0.3̇ | 33.3̇% | $\frac{2}{3}$ | 0.6̇ | 66.6̇% |

Recurring symbol (the dot). Not the same as 0.3 or 0.6

- To turn a fraction into a decimal we divide the numerator by the denominator.
- To turn a decimal into a % we multiply it by 100.
- To turn a % into a fraction, just write it as a fraction out of 100 and simplify.

e.g. $\frac{5}{8} = 5 \div 8 = 0.625 = 62.5\% = \frac{62.5}{100} = \frac{125}{200} = \frac{5}{8}$

Using a calculator $\times 100$ $\times 2$ $\div 25$

Increase and decrease by a percentage

Find the percentage you are looking for and then for an increase add it to the original value or for a decrease subtract it from the original value.

e.g. Increase £120 by 30%.

10% of £120 is $120 \div 10 = £12$

30% is $10\% \times 3 = £12 \times 3 = £36$

Therefore the new value is $£120 + £36 = £156$

e.g. Decrease £72 by 71%

50% of £72 is $72 \div 2 = £36$

10% of £72 is $72 \div 10 = £7.20$

20% is $£7.20 \times 2 = £14.40$

1% is $£72 \div 100 = £0.72$

So 71% is $£36 + £14.40 + £0.72 = £51.12$

Therefore the new value is $£72 - £51.12 = £20.88$