Compound interest occurs when capital is invested over a number of years.

Suppose £10000 is invested at 10% per annum for 4 years.

| | | |
|---|---|---|
| Yr 0 | £10000 | |
| | 1000 | 10% |
| Yr 1 | £11000 | |
| | 1100 | 10% |
| Yr 2 | £12100 | |
| | 1210 | 10% |
| Yr 3 | £13310 | |
| | 1331 | 10% |
| Yr 4 | £14641 | |

In effect, you receive interest on the previous year's interest. The amount invested after 4 years is £14641 so the total interest received is £4641. Contrast this with £4000 simple interest that would have been paid if the interest had been paid out annually instead of remaining in the account.

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Formula for Compound Interest

$$\text{Amount} = \text{Principal} \times \left(1 + \frac{\text{Rate}}{100}\right)^{\text{number of years}}$$

$$A = P\left(1 + \frac{r}{100}\right)^n$$

Ex 1 Find the amount when £4600 is invested for 7 years at 3.5% p.a.

$$A = 4600 \times 1.035^7$$

$$= £5852.48$$

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Exercise Find the amount when £5200 is invested at 4% per annum for 18 years

$$A = P\left(1 + \frac{r}{100}\right)^n$$

$$A = 5200 \times 1.04^{18}$$

$$A = £10534.25$$

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