

## Compound Interest

In banks interest, in general, is paid in one of two ways. Simple interest is where you would accrue the same amount each year.

Simple Interest -  $5\%$  of  $\pounds 2000 = 0.05 \times 2000 = \pounds 100$  p.a.

So Total after year 1 =  $2000 + 100 = \pounds 2100$

Total after year 2 =  $2000 + (100 \times 2) = \pounds 2200$

Total after year 3 =  $2000 + (100 \times 3) = \pounds 2300$

Compound interest is where the amount added due to the interest each year also accrues interest the year after.

So Total after year 1 =  $2000 + 100 = \pounds 2100$

Interest year 2 =  $0.05 \times 2100 = \pounds 105$

Total after year 2 =  $2100 + 105 = \pounds 2205$

Interest year 3 =  $0.05 \times 2205 = \pounds 110.25$

Total after year 3 =  $2205 + 110.25 = \pounds 2315.25$

A quicker way:

Instead of finding the interest and adding it on, we can use the  $1 +$  the decimal as the multiplier.

So adding  $5\%$  multiply by  $1.05$

adding  $8.2\%$  multiply by  $1.082$

Then each year all we are doing is multiplying by this number.

Year	Year	Year
1	2	3

So  $2000 \times 1.05 \times 1.05 \times 1.05$

really this is  $2000 \times (1.05)^3 = \pounds 2315.25$  as before