

YEAR 9 — REASONING WITH NUMBER... Maths & Money

What do I need to be able to do?

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

- Solve problems with bills and bank statements
- Calculate simple interest
- Calculate compound interest
- Calculate wages and taxes
- Solve problems with exchange rates
- Solve unit pricing problems

Keywords

- Credit:** money being placed into a bank account
- Debit:** money that leaves a bank account
- Balance:** the amount of money in a bank account
- Expense:** a cost/ outgoing
- Deposit:** an initial payment (often a way of securing an item you will later pay for)
- Multiplier:** a number you are multiplying by. (Multiplier more than 1 = increasing, less than 1 = decreasing)
- Per Annum:** each year
- Currency:** the type of money a country uses.
- Unitary:** one — the cost of one.

Bills and Bank Statements

Bills — tell you the amount items cost and can show how much money you need to pay.

Some can include a total
Look for different units
(Is it in pence or pounds)

Menu	Price
Milk	89p
Tea	£1.50

Bank Statements

Bank statement can have negative balances if the money spent is higher than the money coming into the account

Date	Description	Credit	Debit	Balance
19 th Sept	Salary	£1500		£1500
19 th Sept	Mortgage		£600	£900
25 th Sept	Bday Money	£15		£915

Simple Interest

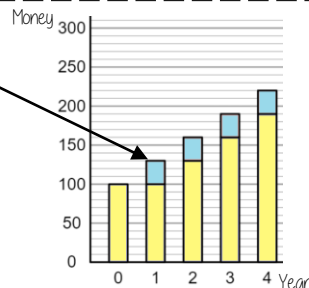
For each year of investment the interest remains the same

$$\frac{\text{Principal amount} \times \text{Interest Rate} \times \text{Years}}{100}$$

Principal amount is the amount invested in the account
e.g. Invest £100 at 30% simple interest for 4 years

$$\frac{100 \times 30 \times 4}{100} = \text{£120}$$

This account earned **£120** interest.
At the end of year 4 they have **£220**



Compound Interest

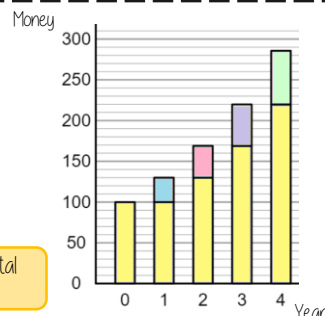
Interest is added to the current value of investment at the end of each year so the next year's interest is greater.

$$\text{Principal amount} \times \text{Multiplier}^{\text{Years}}$$

e.g. Invest £100 at 30% compound interest for 4 years

$$100 \times 1.3^4 = \text{£285.61}$$

This account has **£285.61** in total at the end of the 4 years.



Value Added Tax (VAT)

VAT is payable to the government by a business. In the UK VAT is 20% and added to items that are bought.

Essential items such as food do not include VAT.

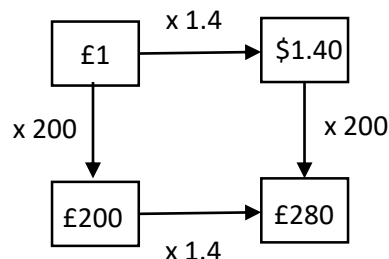
Wages and Taxes

Salaries fall into tax brackets — which means they pay this much each month from their salary.

Taxable Income	Tax Rate
£12 501 to £50 000	20%
£50 001 to £150 000	40%
over £150 000	45%

Over time:
Time and a half — means 1.5 times their hourly rate
Double — 2 times their hourly rate

Exchange Rates



When making estimates it is also useful to use estimates to check if our solution is reasonable.

Use inverse operations to reverse the exchange process

Common Currencies

United Kingdom	£	Pounds
United States of America	\$	Dollars
Europe	€	Euros

Unit Pricing

4 Oranges £1	5 cupcakes £1.20
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$$\begin{array}{l} 4 = \text{£}1.00 \\ 2 = \text{£}0.50 \\ 1 = \text{£}0.25 \end{array} \left. \begin{array}{l} \div 2 \\ \div 2 \end{array} \right\} \begin{array}{l} 5 = \text{£}1.20 \\ 1 = \text{£}0.20 \end{array}$$

Cost per Unit

To calculate unit per cost you divide by the cost.

Cupcakes are the best value as one item has the cheapest value

There is a directly proportional relationship between the cost and number of units.