Year 8 Unit 4
Proportional Reasoning

PERCENTAGE CALCULATIONS

multiplier	a **percentage written** as a **decimal** you can then use **multiplication** to **find the percentage**
percentage increase	**adding a percentage** to the original amount, multiplier method: use **1.__ and multiply** by original
percentage decrease	**subtracting a percentage** from the original amount, multiplier method: do **100 - %** to give **0.__ and multiply** by original
percentage change	the change between the **old value** and the **new value** as a percentage, put **change in amount over original** amount and **multiply by 100** to give a percentage change
reverse percentage	working **backwards** to find **100%** use the **box method**
simple interest	the **same amount** is **added each year**, **find the percentage**, **x by years** and **add on**
compound interest	exponential growth, **accumulated interest** paid on the original amount, each year a **larger amount** of interest is paid. **final total = principal x multiplier^n** principal = **original / starting amount** multiplier = **% increase / decrease** n = **number of time periods** (per annum = per year)

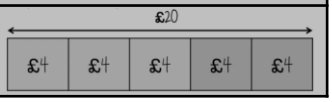
COMMON PERCENTAGES

percentage	parts per **100,** symbol **%**
find 10%	divide by **10** (because **100% ÷ 10 = 10%**)
find 1%	divide by **100** (because **100% ÷ 100 = 1%**)
find 50%	divide by **2** (because **100% ÷ 2 = 50%**)
find 25%	divide by **4** (because **100% ÷ 4 = 25%**)
find 75%	add together **50% and 25%**

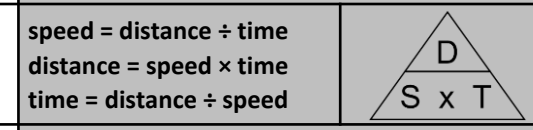
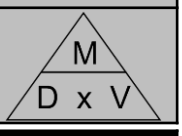
STANDARD UNITS: TIME

time	how to quantify the **passing of events**
time conversions	1 minute = **60 seconds** 1 hour = **60 minutes**
hours to minutes	half an hour = **0.5 hours** = **30mins** quarter of an hour = **0.25 hours** = **15mins**

RATIO

ratio	**compares** the **size** of one part to **another part**
ratio notation	the ratio of **A to B** is written as **A:B**
part (*share*)	a **proportion** of the original amount
whole	the **total** amount
proportion	proportion **compares** the **size** of **one part** to the **size of the whole**
sharing ratios	use a **bar model** to **represent** the number of **parts**, **find the value** of **one part** by **division**, **multiply** up to find the **value** of **each side** of the ratio
given a part, find the whole	use a **bar model** to **represent** the number of **parts, find the value** of **one part** from **one side** of the ratio by **division**, **multiply** up to find the **total value of all parts**
bar model example	sharing £20 in a ratio 3:2 

COMPOUND UNITS

compound units	a measure made up of **two other units** e.g. miles per hour includes miles and hours	
speed	how **fast** something is **moving,** the amount of **time** taken to travel a **distance**	
distance	a measurement of **how far from one point to another**	
time	how to **quantify** the **passing of events**	
speed formula	**speed = distance ÷ time** **distance = speed × time** **time = distance ÷ speed**	
density	how **tightly matter** is **packed together**	
mass	the **amount** of **matter** in an object	
volume	the **amount** of **space** an object **takes up**	
density formula	**density = mass ÷ volume** **mass = density × volume** **volume = mass ÷ density**	

FDP CONVERSIONS