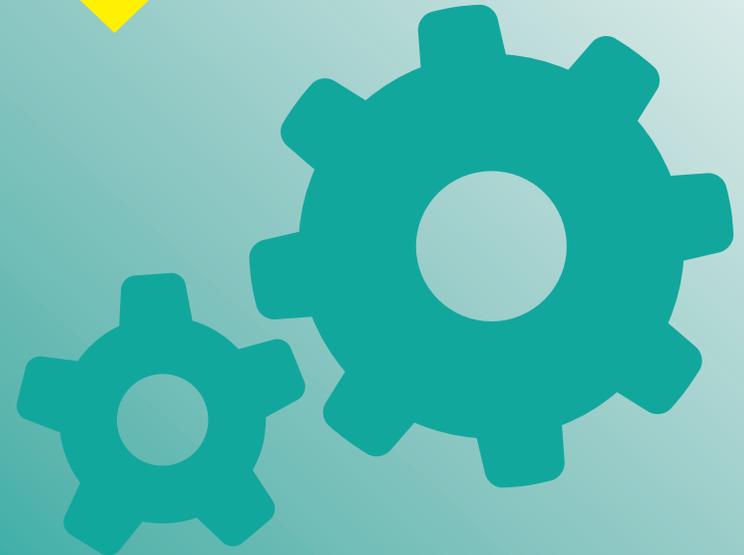
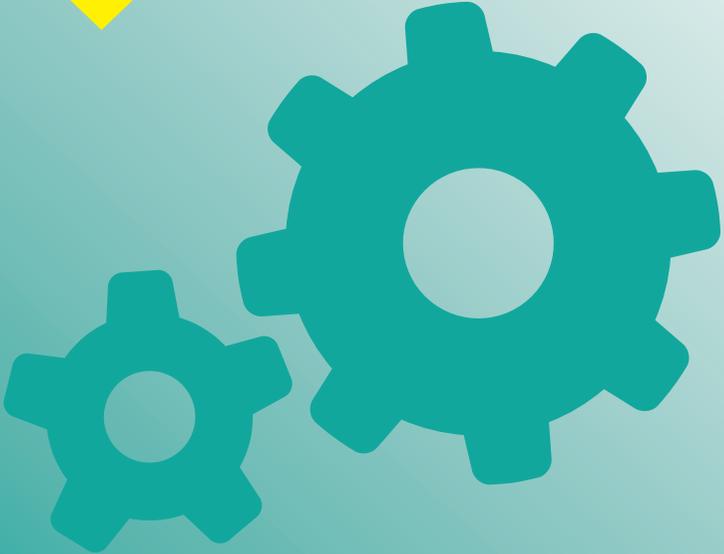
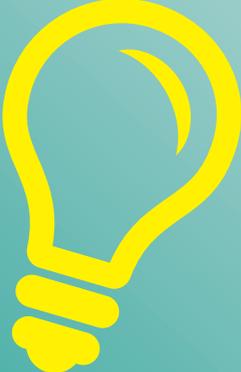
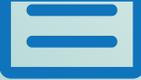




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# Maths



	Percentage (non calc)
Original (100% figure)	The 100% figure is often the original figure given in the question "James has £76"
10% of the original	Divide by 10 to find 10% of a number "James gives 10% to his brother" £76 divided by 10 = £7.60
1% of the original	Divide the 10% figure by 10 (or divide the original 100% figure by 100) "James loses 1% of his money" £7.60 divided by 10 = £0.76
50% and 5% of the original	50% - Divide the 100% figure by 2 £76 divided by 2 = £38  5% - Divide the 50% figure by 10 £38 divided by 10 = £3.80
Percentage Increase	<p>Increase £70 by 10%</p> <p>Find a percentage of the original and ADD it onto the original</p> <p>10% of 70 = <math>70 \div 10 = 7</math>  <math>70 + 7 = £77</math>            ↑            increase</p>
Percentage Decrease	<p>Decrease £90 by 20%</p> <p>Find a percentage of the original and SUBTRACT from the original</p> <p>20% of 90 = <math>(90 \div 10) \times 2 = 18</math>  <math>90 - 18 = £72</math>            ↑            decrease</p>

### Converting a fraction to a decimal

$\frac{3}{5}$  → 0.6

Divide the numerator by the denominator

Fraction → Decimal

### Converting between percentage and decimal

0.6 → 60% (× 100)

60% → 0.6 (÷ 100)

### Converting a decimal to a fraction

0.6 →  $\frac{6}{10}$  →  $\frac{3}{5}$

Simplified to  $\frac{3}{5}$

Write down the decimal divided by 1, like this:  $\frac{0.6}{1}$   
 Multiply both top and bottom by 10 for every number after the decimal point.  
 It turns the numerator into a integer (whole number)

Fraction	Decimal	Percentage
$\frac{1}{2}$	0.5	50%
$\frac{1}{4}$	0.25	25%
$\frac{3}{4}$	0.75	75%
$\frac{1}{8}$	0.125	12.5%
$\frac{1}{10}$	0.1	10%
$\frac{1}{5}$	0.2	20%
$\frac{2}{5}$	0.4	40%
$\frac{3}{5}$	0.6	60%
$\frac{4}{5}$	0.8	80%

Mixed Number		Improper Fraction
$1\frac{1}{2}$		$\frac{3}{2}$
$\frac{(1 \times 2) + 1}{2}$	One and a half can be expressed as 1 whole split into 2 equal parts + 1 more part left over	3 divided by 2 gives 1 whole with a remainder of 1 half
$2\frac{1}{3}$		$\frac{7}{3}$
$\frac{(2 \times 3) + 1}{3}$	Two and a third can be expressed as 2 wholes split into 6 equal parts + 1 more part left over	7 divided by 3 gives 2 wholes with a remainder of 1 third

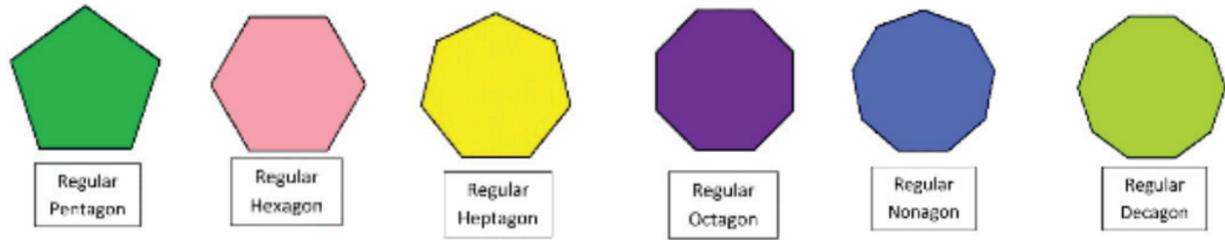
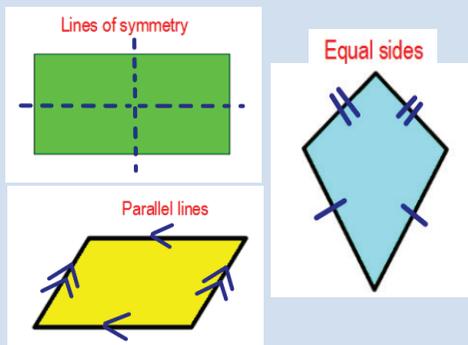


Example—Basic angle facts	
Angles around a point add up to $360^\circ$	
Angles on a straight line add up to $180^\circ$	
Vertically opposite angles are equal.	
Angles in a triangle add up to $180^\circ$	
Angles in a quadrilateral add up to $360^\circ$	
Base angles in an isosceles triangles are equal.	
Angles in an equilateral triangle are all $60^\circ$	
The exterior angles of a triangle is equal to the sum of the two opposite interior angles	

## Quadrilaterals ---- Special Properties

	<b>Square</b> 4 Lines of Symmetry 4 Equal Angles 4 Equal Sides 2 Pairs of Parallel lines		<b>Kite</b> 1 Line of Symmetry 1 Pair of Equal Angles 2 Pairs of Equal Sides 0 Parallel lines
	<b>Delta / Arrowhead</b> 1 Line of Symmetry 1 Pair of Equal Angles 2 Pairs of Equal Sides 1 Pair of Parallel lines		<b>Parallelogram</b> 0 Lines of Symmetry 2 Pairs of Equal Angles 2 Pairs of Equal Sides 2 Pairs of Parallel lines
	<b>Rectangle</b> 2 Lines of Symmetry 4 Equal Angles 2 Pairs of Equal Sides 2 Pairs of Parallel lines		<b>Trapezium (Isosceles)</b> 1 Line of Symmetry 2 Pairs of Equal Angles 1 Pair of Equal Sides 1 Pair of Parallel lines
	<b>Rhombus</b> 2 Lines of Symmetry 2 Pairs of Equal Angles 4 Equal Sides 2 Pairs of Parallel lines		<b>Trapezium (Right Angled)</b> 0 Lines of Symmetry 1 Pair of Equal Angles 0 Pairs of Equal Sides 1 Pair of Parallel lines

### Annotating Properties





# indices

## Addition/ Subtraction Laws

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

## Powers of powers

$$(x^a)^b = x^{ab}$$

$$(2^3)^4 = \underbrace{2^3 \times 2^3 \times 2^3 \times 2^3}$$

The same base and power is repeated Use the addition law for indices

$$(2^3)^4 = 2^{12} \leftarrow a \times b = 3 \times 4 = 12$$

NOTICE the difference

$$(2x^3)^4 = \underbrace{2x^3 \times 2x^3 \times 2x^3 \times 2x^3}$$

The addition law applies ONLY to the powers  
The integers still need to be multiplied

$$(2x^3)^4 = 16x^{12}$$

## Zero and negative indices

$$x^0 = 1$$

Any number divided by itself = 1

$$\left\{ \begin{aligned} \frac{a^6}{a^6} &= a^6 \div a^6 \\ &= a^{6-6} = a^0 = 1 \end{aligned} \right.$$

Negative indices do not indicate negative solutions

$$2^2 = 4$$

$$2^1 = 2$$

$$2^0 = 1$$

$$2^{-1} = \frac{1}{2}$$

$$2^{-2} = \frac{1}{4}$$

Looking at the sequence can help to understand negative powers



# Standard form

## Standard form

Any number between 1 and less than 10

$$A \times 10^n$$

Any integer

$$\begin{aligned} &0.001 \\ &1 \times \frac{1}{1000} \\ &1 \times 10^{-3} \end{aligned}$$

10	1	$\frac{1}{10}$	$\frac{1}{100}$	$\frac{1}{1000}$
$10^1$	$10^0$	$10^{-1}$	$10^{-2}$	$10^{-3}$
10	1	0.1	0.01	0.001

R

### Example

$$\begin{aligned} &3.2 \times 10^4 \\ &= 3.2 \times 10 \times 10 \times 10 \times 10 \\ &= 32000 \end{aligned}$$

### Non-example

$$\begin{aligned} &0.8 \times 10^4 \\ &5.3 \times 10^{0.7} \end{aligned}$$

Any value to the power 0 always = 1

Numbers in standard form with negative powers will be less than 1

$$3.2 \times 10^{-4} = 3.2 \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} \times \frac{1}{10} = 0.00032$$

Negative powers do not indicate negative solutions

## Standard form calculations

R

### Addition and Subtraction

Tip: Convert into ordinary numbers first and back to standard form at the end

#### Method 1

$$\begin{aligned} &6 \times 10^5 + 8 \times 10^5 \\ &= 600000 + 800000 \\ &= 1400000 \\ &= 1.4 \times 10^6 \end{aligned}$$

#### Method 2

$$\begin{aligned} &= (6 + 8) \times 10^5 \\ &= 14 \times 10^5 \\ &= 1.4 \times 10^1 \times 10^5 \\ &= 1.4 \times 10^6 \end{aligned}$$

This is not the final answer

### Multiplication and division

$$\begin{aligned} &1.5 \times 10^5 \\ &0.3 \times 10^3 \end{aligned}$$

$$(1.5 \times 10^5) \div (0.3 \times 10^3)$$

$$(15 \div 0.3) \times 10^5 \div 10^3$$

$$= 5 \times 10^2$$

Division questions can look like this

For multiplication and division you can look at the values for A and the powers of 10 as two separate calculations



### Form expressions

For unknown variables, a letter is normally used in its place

More than – ADD

Less than/ difference – SUBTRACT

eg 4 more than t  $\longrightarrow$   $t + 4$

8 less than k  $\longrightarrow$   $k - 8$

Only similar terms can be grouped together



eg Find the perimeter of this shape  
(Perimeter = length around outside of shape)

$t + 2t + 1 + t + 2t + 1 \longrightarrow 6t + 2$

### Directed numbers

$++ \longrightarrow +$

$-- \longrightarrow +$

$+ - \longrightarrow -$

$- + \longrightarrow -$

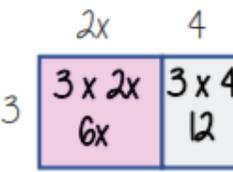
eg  $a = -5$  and  $b = 2$

$a^2 = a \times a = -5 \times -5 = 25$

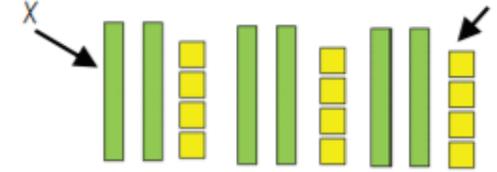
$b + a = 2 + -5 = -3$

### Multiply single brackets

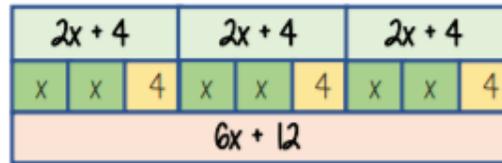
$3(2x + 4)$



$6x + 12$



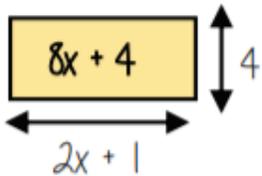
$6x + 12$



Different representations of  $3(2x+4) = 6x + 12$

### Factorise into a single bracket

$8x + 4$



Try and make this the highest common factor

The two values multiply together (also the area) of the rectangle

$8x + 4 \equiv 4(2x + 1)$

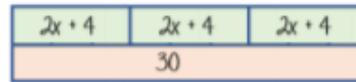
Note:

$8x + 4 \equiv 2(4x + 2)$

This is factorised but the HCF has not been used

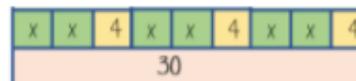
### Solve equations with brackets

$3(2x + 4) = 30$



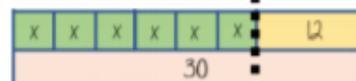
$3(2x + 4) = 30$

Expand the brackets



$6x + 12 = 30$

$-12 \quad -12$



$6x = 18$

$-6 \quad -6$

Substitute to check your answer. This could be negative or a fraction or decimal

$x = 3$



# inequalities

## Keywords

- Solution:** a value we can put in place of a variable that makes the equation true
- Variable:** a symbol for a number we don't know yet
- Equation:** an equation says that two things are equal – it will have an equals sign =
- Expression:** numbers, symbols and operators grouped together to show the value of something
- Identity:** An equation where both sides have variables that cause the same answer includes  $\equiv$
- Linear:** an equation or function that is the equation of a straight line
- Intersection:** the point that two lines meet
- Inequality:** an inequality compares two values showing if one is greater than, less than or equal to another.

## Form and solve inequalities R



Two more than treble my number is greater than 11

Form

$$x \rightarrow x3 \rightarrow +2 \rightarrow 11$$

$$3x + 2 > 11$$

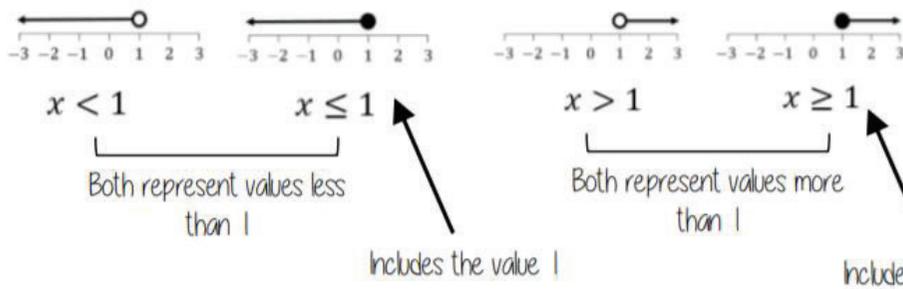
Solve

$$x \leftarrow -3 \leftarrow -2 \leftarrow 11$$

$$x > 3$$

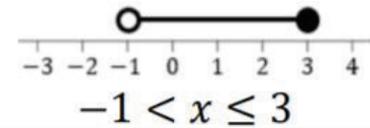


## Solutions on a number line



- Includes the value it sits above
- Does NOT include the value it sits above

Values less than or equal to 3 but also more than -1



This includes the integer values 0, 1, 2, 3



## Averages from lists R

### The Mean

A measure of average to find the central tendency... a typical value that represents the data

24, 8, 4, 11, 8

Find the sum of the data (add the values)

55

Divide the overall total by how many pieces of data you have

$$55 \div 5$$

$$\text{Mean} = 11$$

### The Mode (The modal value)

This is the number OR the item that occurs the most (it does not have to be numerical)

24, 8, 4, 11, 8

This can still be easier if the data is ordered first

$$\text{Mode} = 8$$

### The Median

The value in the center (in the middle) of the data

24, 8, 4, 11, 8

Put the data in order

4, 8, 8, 11, 24

Find the value in the middle

4, 8, 8, 11, 24

$$\text{Median} = 8$$

NOTE: If there is no single middle value find the mean of the two numbers left

### For Grouped Data

The modal group – which group has the highest frequency

## Averages from a table R

### Non-grouped data

Number of Siblings	0	1	2
Frequency	6	8	6
Subtotal	0	8	12

Overall Frequency: 20

Total number of siblings: 20

The data in a list: 0,0,0,0,0,0,1,1,1,1,1,1,1,2,2,2,2,2,2

$$\text{Mean} = \frac{\text{total number of siblings}}{\text{Total frequency}} = 1$$

### Grouped data

x Weight(g)	Frequency	Mid Point	MP x Freq
$40 < x \leq 50$	1	45	45
$50 < x \leq 60$	3	65	195
$60 < x \leq 70$	5	65	325

Overall Frequency: 9

Overall Total : 565

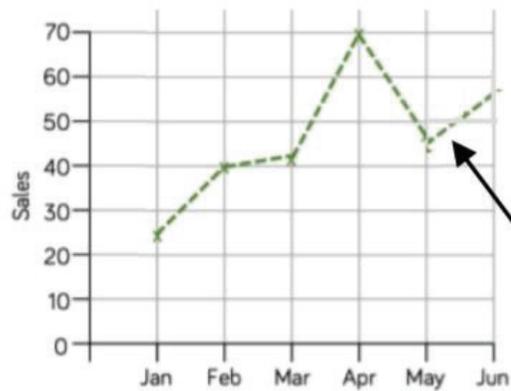
Mean: 62.8g

The data in a list: 45, 55, 55, 55, 65, 65, 65, 65, 65



## Time-Series

This time-series graph shows the total number of car sales in £ 1000 over time



Look for general trends in the data. Some data shows a clear increase or a clear decrease over time.

Readings in-between points are estimates (on the dotted lines). You can use them to make assumptions.

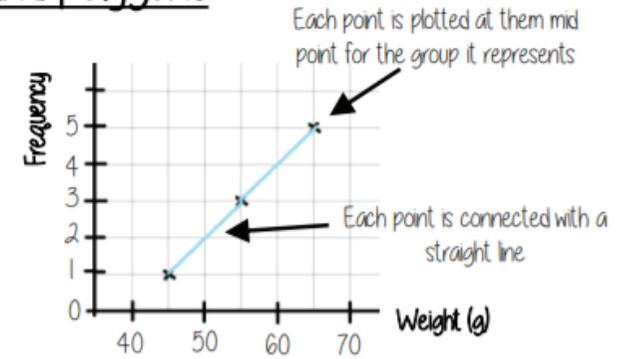
## Frequency tables and polygons

x Weight(g)	Frequency
$40 < x \leq 50$	1
$50 < x \leq 60$	3
$60 < x \leq 70$	5

We do not know from grouped data where each value is placed so have to use an estimate for calculations

### MID POINTS

Mid-points are used as estimated values for grouped data. The middle of each group



The data about weight starts at 40. So the axis can start at 40

**Mid-point**

$$\frac{\text{Start point} + \text{End point}}{2}$$



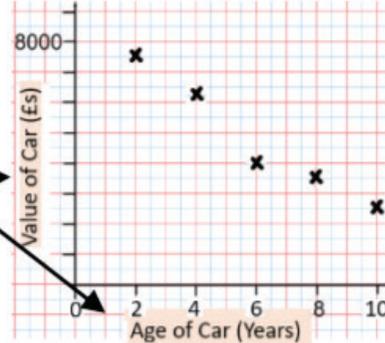
## Draw and interpret a scatter graph

Age of Car (Years)	2	4	6	8	10
Value of Car (£s)	7500	6250	4000	3500	2500

- This data may not be given in size order
- The data forms information pairs for the scatter graph
- Not all data has a relationship

**R**

All axes should be labelled



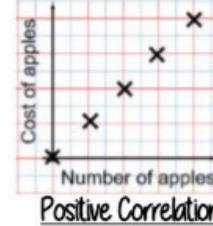
The axis should fit all the values on and be equally spread out

"This scatter graph shows as the age of a car increases the value decreases"

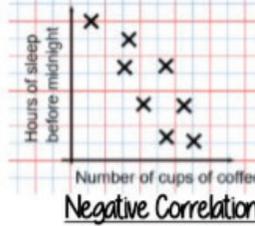
The link between the data can be explained verbally

## Linear Correlation

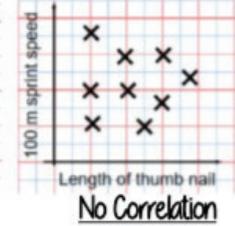
**R**



As one variable increases so does the other variable



As one variable increases the other variable decreases



There is no relationship between the two variables

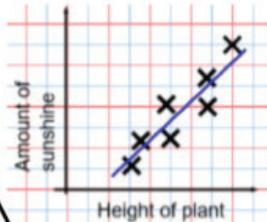
## The line of best fit

**R**

The Line of best fit is used to make estimates about the information in your scatter graph

### Things to know:

- The line of best fit **DOES NOT** need to go through the origin (The point the axes cross)
- There should be approximately the same number of points above and below the line (it may not go through any points)
- The line extends across the whole graph



It is only an estimate because the line is designed to be an average representation of the data

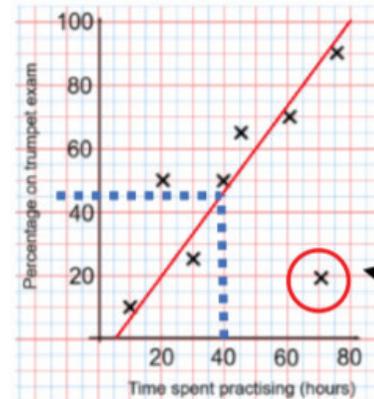
It is always a straight line.

## Using a line of best fit

**R**

**Interpolation** is using the line of best fit to estimate values inside our data point

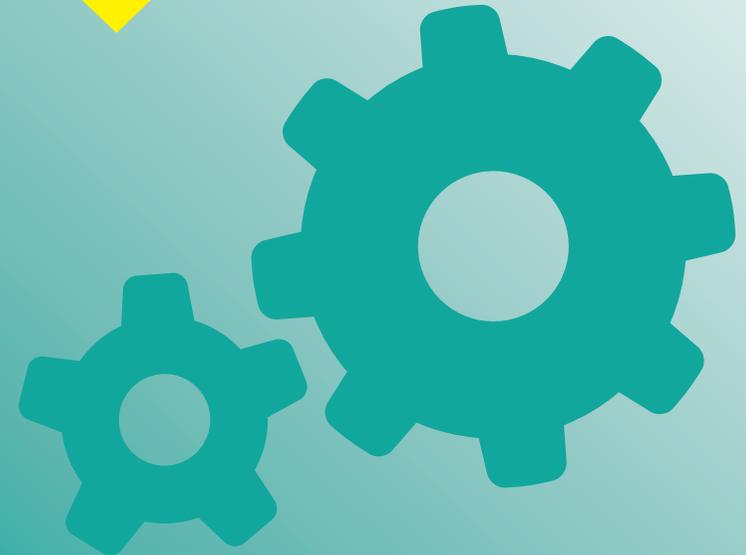
e.g 40 hours revising predicts a percentage of 45



**Extrapolation** is where we use our line of best fit to predict information outside of our data

\*\*This is not always useful – in this example you cannot score more than 100%. So revising for longer can not be estimated\*\*

This point is an "outlier" It is an outlier because it doesn't fit this model and stands apart from the data



# English



## Quote Explosion – Example

### AO1: knowledge of character & plot

- Narrator describing the consequences of Mrs Johnstone's actions
- Links to the theme of fate – no matter what the Johnstones do, they are always destined to remain poor and disadvantaged

"But y'know the devil's got your number"

### AO2: writer's methods (language and structure)

- "number" – noun – links to the idea of a countdown to the inevitable
- "devil" – noun – connotations of evil, links to the idea of sin

### AO3: Historical Context

- Comment on social class and the cycle of poverty – the Johnstones are fated to remain working class, and with that comes a cycle of disadvantage

What/How/Why	Key Vocabulary		Historical Context
<p>The three key questions in English:</p> <p><b>What</b> is the writer doing?</p> <ul style="list-style-type: none"> <li>• In this extract, the writer presents...</li> </ul> <p><b>How</b> is the writer doing this?</p> <ul style="list-style-type: none"> <li>• This is shown through the quote "_____"</li> <li>• This quote suggests...</li> <li>• The word "_____" implies...</li> </ul> <p><b>Why</b> is the writer doing this?</p> <ul style="list-style-type: none"> <li>• Russell does this to represent...</li> <li>• This could link to...</li> <li>• This creates an impression of...</li> </ul>	<b>Accent</b>	The pronunciation of words associated with a specific region	<p><b><u>Nature vs Nurture</u></b></p> <p>An age old argument – are we who we are because of how we've been raised, or are we who we are simply because that's the way we were born?</p> <p>Russell weaves this argument into his social commentary on the effects of the damaging class system: is it ever possible to escape poverty?</p>
	<b>Dialect</b>	Words that are specific to a region	
	<b>Social Class</b>	A division of society into a rank based on social and economic factors	
	<b>Fate</b>	The development of events outside a person's control	
	<b>Inequality</b>	Difference in size, degree, circumstance etc.	



## Subject – Verb – Object

Sentences in English generally follow a set order – **subject** → **verb** → **object**

<b>Subject:</b> The person or thing (noun/noun phrase) which is carrying out the <b>verb</b>	<b>Verb:</b> What the <b>subject</b> does	<b>Object:</b> The person/thing (noun/noun phrase) being acted upon
Mickey	talked	to Sammy.
Linda	walked	to the cinema

All sentences must have a **subject** and a **verb**, but not all sentences need an **object** – this is determined by the type of **verb** the sentence has

### Transitive Verbs (verbs that require an object)

- I **made** a cake.
- She **sent** a letter.
- They **took** the last slice.

### Intransitive Verbs (verbs that **don't** require an object)

- It **rained**.
- I **walked**.
- They **sang**.

## Word Classes

<b>Noun</b>	Identifies a person, place or thing	<i>Ryan, Chester, sky</i>
<b>Verb</b>	Describes an action	<i>run, cook, sing</i>
<b>Adjective</b>	Describes a noun	<i>big, red, beautiful</i>
<b>Adverb</b>	Describes the way a verb is carried out	<i>quickly, carefully</i>
<b>Pronoun</b>	Replaces a noun	<i>he, she, they, it</i>
<b>Preposition</b>	Expresses relation between words	<i>on, in, before, after</i>
<b>Conjunction</b>	Connects phrases, clauses and sentences	<i>and, but, because</i>
<b>Determiner</b>	Introduces a noun	<i>the, a, that, this</i>

## Clauses

**Main Clause**  
Sentence that makes sense on its own  
*Mickey talked to Sammy.*

**Subordinate Clause**  
Part of a sentence that **doesn't** make sense on its own  
*Mickey talked to Sammy **as they got on to the bus.***

## Homophones

**There**  
He is stood over **there**.

**They're**  
**They're** best friends.

**Their**  
It is **their** favourite TV show.



# Science



## B1: Biology key concepts

### Lesson sequence

1. Microscopes
2. Plant and animal cells
3. Measuring cells
4. Core practical: using microscopes
5. Specialised cells
6. Bacterial cells
7. Digestive enzymes
8. How enzymes work
9. Factors affecting enzymes
10. Core practical: enzymes and pH
11. Cell transport
12. Core practical: osmosis in potatoes

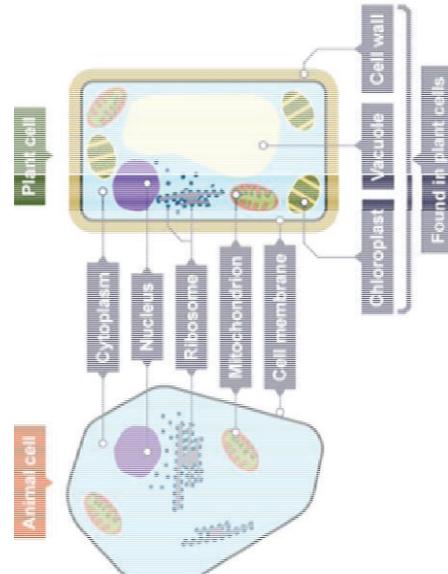
### 1. Microscopes

<b>Magnification</b>	The number of times bigger something appears under a microscope.
<b>Eyepiece lens</b>	The lens on a microscope that you look through.
<b>Objective lens</b>	The lens at the bottom of a microscope. There are normally three you can choose from.
<b>Total magnification</b>	Eyepiece lens x objective lens.
<b>Resolution</b>	The smallest distance between two points so that they can still be seen as two separate points.
<b>Stains</b>	Dyes added to microscope slides to show the details more clearly.
<b>Milli</b>	Thousandth, $1 \times 10^{-3}$ (a millimetre is a thousandth of a metre).
<b>Micro</b>	Millionth, $1 \times 10^{-6}$ (a micrometre is a millionth of a metre).
<b>Nano</b>	Billionth, $1 \times 10^{-9}$ (a nanometre is a billionth of a metre).
<b>Pico</b>	Trillionth, $1 \times 10^{-12}$ (a picometre is a trillionth of a metre).



### 2. Plant and animal cells

<b>Cell</b>	The basic structural unit of all living things (the building blocks of life).
<b>Parts of an animal cell</b>	Cell membrane, cytoplasm, nucleus, ribosomes, mitochondria.
<b>Parts of a plant cell</b>	Cell membrane, cytoplasm, nucleus, ribosomes, mitochondria, cell wall, permanent vacuole, chloroplasts.
<b>Cell membrane</b>	Controls what enters and leaves the cell.
<b>Cytoplasm</b>	A jelly-like substance where chemical reactions take place.
<b>Nucleus</b>	Contains DNA and controls the cell.
<b>Ribosome</b>	Produces proteins.
<b>Mitochondria</b>	Releases energy by aerobic respiration.
<b>Cell wall</b>	Protects and supports the cell, made of cellulose.
<b>Permanent vacuole</b>	Stores sap and helps to support the cell.
<b>Chloroplast</b>	Where photosynthesis happens, contains chlorophyll.



### 3. Measuring cells

<b>Micrograph</b>	A picture produced by a microscope.
<b>Light microscope</b>	A microscope that uses light, can magnify up to 1500 times.
<b>Electron microscope</b>	A microscope that uses electrons to produce an image, can magnify up to 1,000,000 times.
<b>Actual size of a cell</b>	Actual size = measured size / magnification
<b>Convert mm to <math>\mu\text{m}</math></b>	Micrometres ( $\mu\text{m}$ ) = millimetres (mm) x 1000

### 4. Core practical – using microscopes (CP1)

<b>CP1 – key question</b>	What do cells look like under a light microscope?
<b>CP1 – Prepare and place the slide</b>	Collect the cells you are studying and place them on the slide. Add a drop of stain and cover with a cover slip.
<b>CP1 – Select lens</b>	Choose between the 4x, 10x and 40x objective lenses.
<b>CP1 – Place slide in microscope</b>	Place slide on microscope stage, adjust the coarse focus until the lens is just touching the slide.

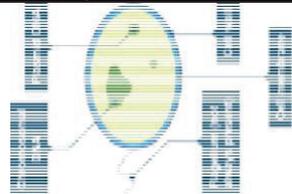
<b>CP1 – Rough focus</b>	Looking through the eyepiece, slowly adjust the coarse focus until you see a rough image.
<b>CP1 – Fine focus</b>	Looking through the eyepiece, slowly adjust the fine focus until you see a sharply focussed image.
<b>CP1 – Record the image</b>	Draw what you see, label any cell parts you can recognise and repeat with different objective lenses.
<b>CP1 - Results</b>	As you increase the magnification of the objective lens, the cells appear larger and more detailed.

### 5. Specialised cells

<b>Small intestine cell</b>	<b>Job:</b> To absorb small food molecules produced during digestion. <b>Adaptations:</b> Tiny folds called microvilli that increase their surface area.
<b>Sperm cell</b>	<b>Job:</b> Fertilise an egg and deliver male DNA. <b>Adaptations:</b> A tail to swim, mitochondria to give energy for swimming, an acrosome to break through the egg's jelly coat, haploid nucleus with only half the total DNA.
<b>Egg cell</b>	<b>Job:</b> To be fertilised by a sperm and then develop into an embryo. <b>Adaptations:</b> Jelly coat to protect the cell, many mitochondria and nutrients to provide energy for growth, haploid nucleus with only half the total DNA.
<b>Ciliated epithelial cell</b>	<b>Job:</b> To clear mucus out of your lungs (and other internal surfaces). <b>Adaptations:</b> Small hairs on the surface – called cilia – which wave to sweep mucus along.



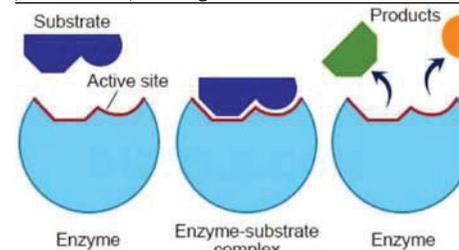
6. Bacterial cells	
<b>Parts of a bacterial cell</b>	<b>All bacteria:</b> Cell membrane, cell wall, cytoplasm, ribosomes, chromosomal DNA, plasmid DNA <b>Some bacteria:</b> flagellum.
<b>Chromosomal DNA</b>	Large piece of DNA containing most genes.
<b>Plasmid DNA</b>	Small loops of DNA containing a few genes.
<b>Flagellum</b>	A tail used for movement.
<b>Eukaryotic cells</b>	Cells with a nucleus.
<b>Prokaryotic cells</b>	Cells without a nucleus.
<b>Standard form</b>	A way of writing numbers in terms of powers of ten. E.g.  $0.015 = 1.5 \times 10^{-2}$ $0.000458 = 4.56 \times 10^{-4}$  The index of ten (the 'minus' number) tell you which decimal point to start on.



7. Digestive enzymes	
<b>Digestion</b>	Breaking large food molecules down into ones small enough to be absorbed by the small intestine.
<b>Catalyst</b>	A substance that speeds up a chemical reaction without being used up.
<b>Enzyme</b>	A protein that works as a catalyst to speed up the reactions in our cells.
<b>Digestive enzymes</b>	Enzymes that break large food molecules down into smaller ones.

<b>Amylase</b>	<b>Where found:</b> saliva, small intestine <b>What it does:</b> breaks down starch into simple sugars such as maltose
<b>Lipase</b>	<b>Where found:</b> small intestine <b>What it does:</b> breaks down fats into fatty acids and glycerol
<b>Protease</b>	<b>Where found:</b> stomach (pepsin), small intestine (trypsin) <b>What it does:</b> breaks down proteins into amino acids

8. How enzymes work	
<b>Substrate</b>	The chemical(s) that an enzyme works on.
<b>Active site</b>	An area of an enzyme with the same shape as the substrate.
<b>Lock and key mechanism</b>	The substrate moves into the active site and reacts to form the products. The products leave the active site so another substrate can then enter and so on.
<b>Specificity</b>	Each enzyme can only work on one substrate because the shape of the active site has to match.
<b>Denature</b>	When the shape of the active site changes shape so the enzyme stops working.



9. Factor affecting enzymes	
<b>Optimum temperature</b>	The temperature when an enzyme works fastest (about 37 <sup>o</sup> for human enzymes). <b>Changing the temperature:</b> rate increases because particles move faster <b>Increasing past optimum:</b> rate decreases as enzyme denatures

<b>Optimum pH</b>	The pH when enzymes work fastest (around pH 6-8 for most human enzymes)
<b>Changing pH</b>	Rate decreases as you move away from the optimum because the enzyme denatures.
<b>Increasing substrate then concentration</b>	At first the rate increases, but it levels out as the enzyme is working as fast as possible.
10. Core practical – enzymes and pH (CP2)	
<b>CP2 – key question</b>	How does the rate that amylase change as you change the pH?
<b>CP2 – Prepare your reactants</b>	Place starch solution, amylase solution and pH 7 buffer into separate test tubes and warm them in a water bath at 40 <sup>o</sup> C
<b>CP2 – Prepare your dropping tile</b>	Place a few drops of iodine solution into each well of a spotting tile.
<b>CP2 – Start the reaction</b>	Mix reactants together, start the stop watch and keep the mixture warm in the water bath.
<b>CP2 – Test for starch</b>	Remove a small amount of mixture and place in a well on the spotting tile.
<b>CP2 – Record your results</b>	Repeat the test until the mixture does not go black (no starch). Record the time.
<b>CP2 – Vary the pH</b>	Repeat with different pH buffers from pH 3 to pH 10
<b>CP2 – Results</b>	The amylase works fastest around pH 7 and more slowly at pH high or lower than this.

11. Cell transport	
<b>Concentration</b>	The number of particles in a given volume (the strength of a solution).
<b>Concentration gradient</b>	The difference in concentration between two neighbouring areas.
<b>Diffusion</b>	The movement of particles from high to low concentration (down a concentration gradient).

<b>Diffusion examples</b>	<b>Lungs:</b> oxygen into blood, carbon dioxide out of blood <b>Leaf:</b> carbon dioxide into leaf, oxygen out of leaf.
<b>Partially permeable membrane</b>	A membrane that allows some molecules but not others to pass through it (like a cell membrane).
<b>Osmosis</b>	The movement of water across a partially permeable membrane from high water/low solute conc to low water/high solute conc.
<b>Osmosis examples</b>	Water into plant roots, water in/out of any cells.
<b>Active transport</b>	Using energy to move substances from low to high concentration (up a concentration gradient).
<b>Active transport examples</b>	Minerals being absorbed into plant roots.

12. Core practical – osmosis in potatoes (CP3)	
<b>CP3 – Prepare potatoes blot</b>	Cut six similar pieces of potato, then dry and weigh them. <b>CP3 – Run the experiment</b>
<b>CP3 – Record results</b>	Place each potato piece in a test tube with sucrose (sugar) solutions with concentrations from 0% to 50% Blot each potato piece dry and re-weigh it.
<b>CP3 – Calculate percentage mass change</b>	% change = (final value – starting value) / starting value x 100
<b>CP3 – Results</b>	Potato in weaker sucrose solutions gain mass because water enters potatoes by osmosis, those in stronger solutions lose mass as water leaves by osmosis.



## B2: Cells and control

Lesson sequence
1. Mitosis
2. Animal growth
3. Plant growth
4. Stem cells
5. Nervous system
6. Neurotransmission
7. Controlling movement

### 1. Mitosis

<b>Cell cycle</b>	The life of a cell comprising interphase and mitosis.
<b>Interphase</b>	Preparation for mitosis in which extra cell parts are made and DNA chromosomes are replicated (copied).
<b>Mitosis</b>	When one cell divides into two genetically identical daughter cells.
<b>(I)PMATC</b>	The stages of mitosis: interphase (not mitosis), prophase, metaphase, anaphase, telophase, cytokinesis.
<b>Prophase</b>	The membrane of the nucleus breaks down and spindle fibres start to form.
<b>Metaphase</b>	Spindle fibres fully form and chromosomes line up across the middle of the cell.
<b>Anaphase</b>	Chromosome copies separate and move to each end of the cell.
<b>Telophase</b>	A new membrane forms around each set of chromosomes to form two nuclei.
<b>Cytokinesis</b>	The two new cells fully separate.
<b>Cancer</b>	When mitosis happens out of control forming large lumps of cells called tumours.

### 2. Animal growth

<b>Growth</b>	Increase in size due to increased numbers of cells.
<b>Percentile</b>	A measure of the growth of a child that compares them to other children of the same age.

<b>90<sup>th</sup> percentile</b>	A child is taller than 90% of children of the same age.
<b>50<sup>th</sup> percentile</b>	Average for height/mass for the age.
<b>Percentile graphs</b>	Graphs showing how height/mass change with age with different lines for each percentile.
<b>Cell differentiation</b>	When a cell divides by mitosis to produce two different types of cell (not two identical ones).
<b>Specialised cell</b>	A cell special features designed for a specific job.
<b>Importance of differentiation in animals</b>	To produce all the different types of cell the body needs such as red blood cells, fat cells, nerve cells and muscle cells.

### 3. Plant growth

<b>Plant growth</b>	Cell division creates more cells, elongation makes these cells get bigger.
<b>Meristems</b>	Areas just behind the tips of roots and shoots where cell division and differentiation happens.
<b>Importance of differentiation in plants</b>	To produce all the different types of cell a plant needs such as root hair cells and xylem cells.
<b>Calculating % change</b>	$\text{change} = (\text{final value} - \text{starting value}) / \text{starting value} \times 100$

### 4. Stem cells

<b>Stem cell</b>	A cell that can differentiate when it divides, to produce two different cells.
<b>Embryonic stem cell</b>	A stem cell that can become any kind of cell. Found in developing embryos.
<b>Adult stem cell</b>	A stem cell that can only become a few types of cell. Found in animals after birth.
<b>Stem cells in medicine</b>	It is hoped they can be used to replace damaged cells in diseases like type 1 diabetes or leukaemia, or to grow new organs for transplant.

<b>Problems with stem cells</b>	They may potentially cause cancer, stem cells can only be used in the person they have come from.
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### 5. Nervous system

<b>Nervous system</b>	All the nerves in your body working together to gather information, make decisions and control responses.
<b>Central nervous system</b>	The brain and spinal cord – makes decisions (aka CNS).
<b>Peripheral nervous system</b>	All your other nerves – gathers information from your sense and carries messages from the CNS to your muscles.
<b>Neurone</b>	A nerve cell
<b>Impulse</b>	Electrical message carried by a neuron.
<b>Cell body</b>	The central part of a nerve cell containing its nucleus.
<b>Dendron and axon</b>	The long parts of a nerve cell carrying impulses towards the cell body (dendron) and away from it (axon)
<b>Myelin sheath</b>	A fatty layer around the axon and dendron that insulates it to prevent the impulse from escaping and speeds the impulse up.

### 6. Neurotransmission

<b>Neurotransmission</b>	The travelling of an impulse along a neuron and into another.
<b>Dendrites</b>	Branches at the beginning of a dendron that connect to receptor cells or another neuron.
<b>Axon terminals</b>	Branches at the end of an axon that connect to a muscle or another neuron.
<b>Synapse</b>	Small gap between two neurons where the axon terminals of one meet the dendrites of another.

	Chemicals released by axon terminals that diffuse across the synapse to trigger a new impulse the dendrite of another neuron.
<b>Sensory neuron</b>	Nerve cell that carries impulses from sense organs to the CNS. Has a long dendron and a long axon.
<b>Relay neuron</b>	Nerve cell in the CNS that makes decisions. Dendrites join onto cell body, short axon.
<b>Motor neuron</b>	Nerve cell that carries impulses from the CNS to muscles. Dendrites join onto cell body, long axon.

### 7. Controlling movement Stimulus

	A piece of information detected by the nervous system. <b>Receptor</b>
	Cells that detect a stimulus. <b>Response</b> The action that the nervous system makes happen.
	<b>Effector</b> The body part that produces the response, often a muscle.
<b>Voluntary movement</b>	A stimulus is detected by a receptor, causing an impulse to be carried by a sensory neuron to the brain. Relay neurones in the brain decide what to do and send another impulse down a motor neuron to the effector (muscle) to cause a response.
<b>Reflexes</b>	Automatic responses that happen very quickly without conscious thought to keep the body safe.
<b>Reflex arc</b>	Movement is caused in the same way as for voluntary movement, except the spinal cord makes the decision without needing the brain to think.

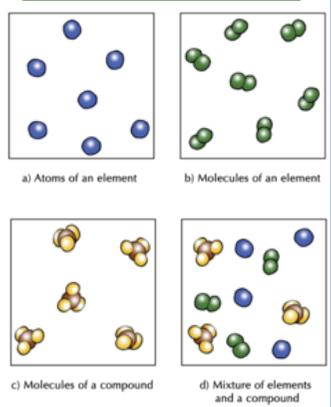


## Atoms, elements and compounds

All substances are made of **atoms** that cannot be chemically broken down. It is the smallest part of an **element**.

**Elements** are made of only one type of atom. Each element has its own **symbol**.  
e.g. Na is sodium.

**Compounds** contain more than one type of atom.  
**Naming compounds**  
Two elements = **ide**  
e.g. Na<sub>2</sub>S Sodium sulphide  
Two or more including oxygen = **ate**  
e.g. Na<sub>2</sub>SO<sub>4</sub> = sodium sulphate



There are two elements here - Magnesium and chlorine  
magnesium — **MgCl<sub>2</sub>** — 2 x chlorine  
Magnesium chloride

There are 3 atoms, 1 x Mg and 2 x Cl

Small numbers (subscripts) after symbols tell you how many of the element BEFORE the number.

## Methods of Separating Substances

A mixture consists of **two or more** elements or compounds **not** chemically combined together.

**Filtration**  
This technique separates substances that are insoluble in a solvent from those that are soluble.

**Crystallisation**  
This technique separates a soluble substance from a solvent by heating.

**Simple distillation**  
This technique separates a liquid from a mixture by evaporation followed by condensation.

**Fractional distillation**  
This technique differs from distillation only in that it separates a mixture into a number of different parts, called fractions.

**Chromatography**  
This technique separates small amounts of dissolved substances by running a solvent along absorbent paper.

**Example - filtering a mixture of sand, salt and water to collect the sand**

**Example - crystallisation of sodium chloride from salt solution**

**Example - obtaining water from sea water**

**Example - obtaining ethanol from a mixture of ethanol and water**

**Example - separating the different colours in ink**

SC1, SC2 & SC3

## Atomic Structure

**Dalton – atoms can't be divided**

**JJ Thompson discovered electrons – Plum pudding model**

**Geiger-Marsden The Nuclear Model of the Atom**

**Bohr – electrons in shells**

**Chadwick – the neutron**

**Atomic radius = 0.1nm**

**Nucleus - almost all of the mass of an atom is here**  
Radius of a nucleus is less than 1/10 000 of that of an atom (about 1 x 10<sup>-14</sup>m)

**The first shell (energy level) can hold 2 electrons**

**The second can hold 8 electrons**

**The third can hold 8 electrons**

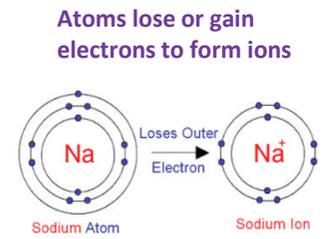
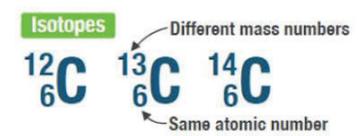
	Mass	Charge	Location
<b>Proton</b>	1	+	nucleus
<b>Neutron</b>	1	0	nucleus
<b>Electron</b>	Very small	-	shells

**Mass number** = Number of protons and neutrons → <sup>7</sup>Li

**Atomic number** = Number of protons → <sub>3</sub>

Number of protons(+) = Number of electrons (-)

Number of neutrons = mass number – atomic number



**1nm = 1x10<sup>-9</sup>m**

# Science- Forces and Motion



Each Kg has a gravitational pull of 9.8N.

Gravitational field strength: Gravity exerted around an object. Earth's gfs = 9.8N/kg.

$W = m \times g$

Weight = mass X gravitational field strength

Weight	Force acting upon an object due to gravity	Newton (N)
Mass	How much matter	Kilograms (Kg)

**Core Practical**

Investigate force, mass and acceleration

Acceleration is proportional to resultant force.

Acceleration is inversely proportional to mass.

Vary mass added to trolley.

Frictional forces decelerate a moving object and bring it to rest.

Force = mass X acceleration.  $F = m \times a$

Conservation of momentum: When two objects collide, the momentum they have before the collision = the momentum they have after the collision. Closed system = no external forces acting on it.

$F = (mv - mu) \div t$  Is a vector.

Force = change in momentum ÷ time. Momentum = mass X velocity.  $p = m \times v$

**Crumple zones**

Changes in momentum: Force is applied to stop momentum. If momentum changes slowly, the force applied is small so less damage.

Car travelling around a bend: Constant speed, direction changes.

Satellite orbiting the Earth: Constant speed, direction changes.

An object travelling in a circle at a constant speed, is constantly changing direction so it is constantly changing velocity which means it is accelerating.

There must be a resultant force acting upon the object.

Centripetal force: This force acts towards the centre of the circle.

Objects in a circular motion, change direction but keep a constant speed.

Resultant force: The overall effect of all of the forces acting upon an object.

Two forces acting in the same direction are added.

Two forces acting in the opposite direction are taken away.

Free body diagram: Show magnitude and direction of all forces upon an object.

Weight	Newton (N)
Mass	Kilograms (kg)
Gravitational field strength	Newton per kilogram (N/kg)
Force	Newton (N)
Acceleration	Kilogram metre per second (Kg m/s)
Momentum	Joules (J)
Velocity	Metre per second (m/s)
Time	Second (s)

Frictional forces decelerate a moving object and bring it to rest.

An alert driver has a reaction time of 1s.

Speed affects both thinking and braking distances.

Thinking distance: Distance travelled whilst the driver reacts.

Braking distance: Distance travelled whilst the car is stopped by the brakes.

Stopping distance: Total thinking and braking distances.

Factors affecting stopping distances: Drivers reaction times, Drinking alcohol, taking drugs, tired.

Braking distances: Weather conditions, worn brakes or tyres, road surface, size of braking force.

Braking and kinetic energy: Work done by braking force, reduces kinetic energy. Kinetic energy decreases, temperature of brakes increases due to frictional forces.

**Forces**

**EDExcel TOPIC 2 - MOTION AND FORCES (part 2)**

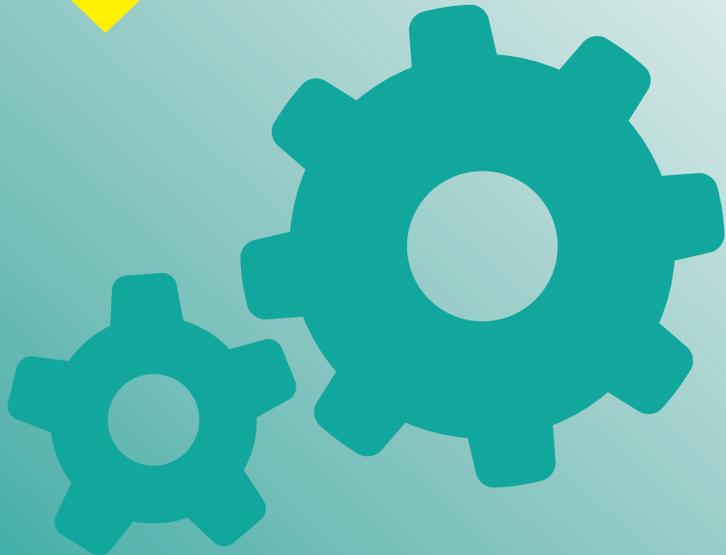
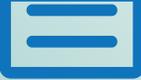
**Newton's Laws and Momentum**

**Contact and Resultant forces**

**Reactions and stopping**

**PHYSICS ONLY**

**HIGHER ONLY**



# History



## Workers

Hitler had promised 'Arbeit und Brot' work and bread. The National Labour Service was set up for 18-25 year olds. Public Work Scheme built the autobahns, schools and hospitals. Rearmament also provided jobs and conscription for 18-25 year olds was introduced in 1935. Jews were sacked and women did not count in the figures. Hjalmar Schacht was given the job of getting Germany ready for war with the Four Year Plan. This created jobs in steel, textiles and shipbuilding. Farmers were seen as vital and were supported. The DAF replaced trade unions and ran the Beauty of Labour (SDA) to improve working conditions and the Strength through Joy (KDF) with rewards (including saving for a VW beetle) to control workers.

## Young people

Schools were controlled by the Nazis. All teachers had to be Nazis and other were sacked. Textbooks and history were rewritten. They were indoctrinated (brainwashed) to think a certain way which included hatred of the Jews. Eugenics (race studies) was taught and there was a real emphasis on PE. Outside school were youth groups that were compulsory to join. For boys the 'Little Fellows' 6-10, 'Young folk' 10-14 and then the Hitler Youth. This included how to march, fight and keep fit. Girls - 'Young girls 10-14 and League of German Girls 14-17 keeping fit, preparing for motherhood. 7,287,470 members. Some youth groups resisted including the White Rose, Swing Youth and Edelweiss Pirates.

## Women

'The world of women is a smaller one. For her world is her husband, her family, her children and her house.' The Nazis had a clear idea of the role of women - Kinder, Kirche, Küche (children, church, cooking). They wanted to increase the population and go back to traditional values e.g. wearing heels or trousers was 'unladylike'. Professional women were sacked but marriage loans were given to married couples of 1000 marks. For each child they kept 250 and this was linked to the Mutterkreuz (Mothercross). Bronze - 4 children silver - 6 and gold - 8. Lebensborn were also set up for women to give a child to the Reich - 8000 births came from here. Gertrud Scholtz-Klink was the figurehead of the Women's League which gave advice. The birth rate rose from 970, 000 in 1933 to 1, 413, 000 in 1939 however during the war the women were needed to help with the war effort.

## Christians

There were 20 million Catholics and 40 million Protestants. Some Nazi ideas matched Christian ideas e.g. marriage, family, moral values and fear of Communism. In 1933 Hitler signed the Concordat with the Pope but Hitler soon broke this and the Catholics were harassed. Archbishop Galen criticised Hitler and euthanasia, he was put under house arrest. Some Protestants supported Nazi ideas and Hitler appointed Ludwig Müller as Reich Bishop. Other Protestants formed the Confessional Church led by Pastor Martin Niemöller who criticised the Nazis. 800 pastors were arrested and he was sent to a camp.

## Jews and undesirables

Hitler believed in a pure Aryan master race of strong tall, blond haired, blue eyed Germans. Jews, gypsies, homosexuals, disabled were classed as undesirable. As soon as Hitler came to power they began passing laws to drive out Jews including sacking lawyers and teachers. The Nuremberg Laws 1935 took away more rights and dissolved marriages. November 1938 - Kristallnacht (Night of Broken Glass) saw synagogues burned, shop windows smashed, Jews beaten, arrested and 100 killed. 20 000 were sent to concentration camps. Many Jews left but were in countries occupied by the Germans in WW2 including Holland. Once the war started the Nazis used ghettos, execution squads (Einsatzgruppen) and camps. At the Wannsee Conference a Final Solution was planned including 6 extermination camps including Auschwitz where 1.1 million died. There was an uprising in the Warsaw Ghetto and Treblinka in 1943 but both put down. Around 6 million Jews were killed.

## WW2 1939 - 1945

The start of the war was positive with many victories and luxury goods from the conquered countries. This changed after they invaded the USSR in 1941 including battles like Stalingrad and by 1944 Germany was facing a defeat. By November 1939 there was food and clothing rationing e.g. one egg per week. There were many ersatz (substitute) products. Hot water was rationed to two days per week. 1942 - Total War, everything was focussed on making weapons and growing food for soldiers. Factories were open longer, women were brought in and 7 million foreign workers as slave labour. British bombing had a real impact from 1942 disrupting water, electric, transport and there were many unexploded bombs.

## KEY VOCABULARY/TERMS - Tier 3

Anti-Semitism (discrimination against Jews), rearmament, conscription, Four Year Plan, self-sufficient, DAF, SDA, KDF, Volkswagen, rationed, Total War, refugee, indoctrinate, eugenics, Swing Youth, Edelweiss Pirates, Kinder, Kirche, Küche, Lebensborn, Mutterkreuz, euthanasia, pacifist, persecute, Aryan, master race, death camp, ghetto, Nuremberg Laws, Kristallnacht, Final Solution, Einsatzgruppen, Holocaust.



## Key people

Hjalmar Schacht - Minister of Economics, Albert Speer - Armaments Minister, Gertrud Scholtz-Klink, Archbishop Galen, The Pope, Pastor Martin Niemöller, Hitler

## 4. Describe... 4 marks

- Describe two ways in which Hitler reduced unemployment in Germany.
- Describe two main features of the education of children in Nazi Germany.
- Describe how the Nazi gained control over German Christians.
- Describe two examples of armed resistance by Jews to the Nazis.

## 5. In what ways were... 8 marks

- In what ways were the lives of women in Germany affected by Nazi social policies? Explain your answer.

## 6. Bullet point question 12 marks

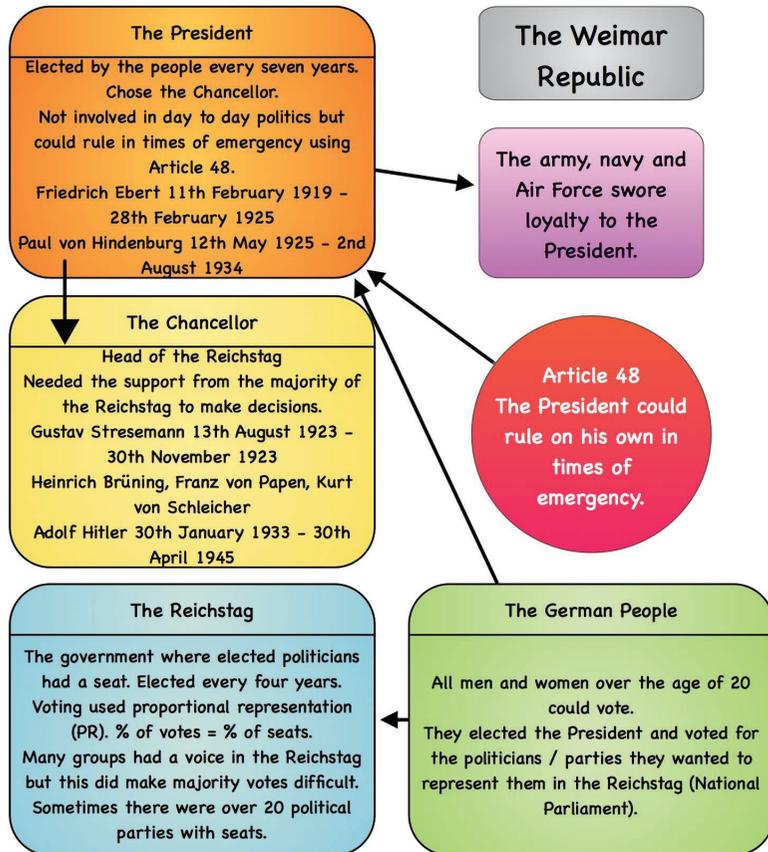
- Which of the following groups were more affected by Nazi policies?
  - farmers and agricultural workers
  - industrial and factory workersExplain your answer with reference to both reasons.

## KEY VOCABULARY/TERMS - Tier 2. Try to use these when answering exam questions.

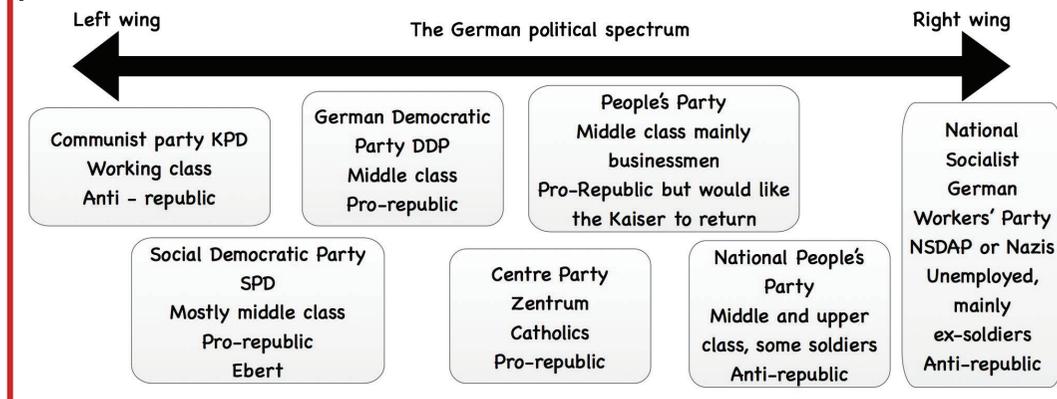
benefit, consist, create, environment, establish, evident, finance, labour, method, period, policy, significant, similar, achieve, affect, complex, construct, feature, focus, impact, potential, previous, primary, restrict, considerable, contribute, ensure, imply, outcome, attitude, contrast, impose, job, overall, resolve, subsequent, stress, conflict, generate, objective, welfare, discriminate, gender, ignorance, incentive, motive, recover, eliminate, ideology, infer, media, prohibit, conform, contradict, exploit, manual, sphere.



## Structure



## The Political Spectrum



## Threats to Weimar

- Treaty of Versailles
- November Criminals
- Proportional Representation
- Revolts
- Hyperinflation
- Reparations

## Key dates

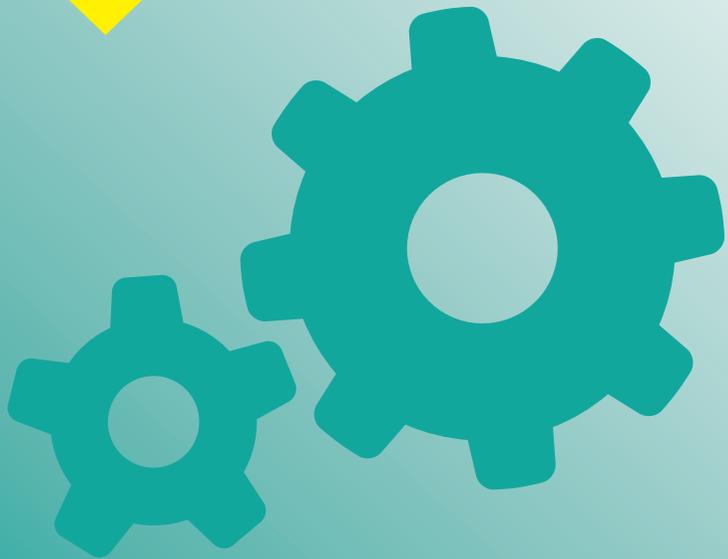
11/11/18	Armistice signed ending WW1
6/1/19	Spartacist revolt
28/1/19	Treaty of Versailles
13/3/20	Kapp Putsch
Jan 1923	Invasion of the Ruhr
1923	Hyperinflation
8-9/11/23	Munich Putsch

## KEY VOCABULARY/ TERMS

armistice, democratic republic, Spartacists, communism, Freikorps (Free Corps), Weimar Republic, left wing, right wing, constitution, proportional representation, majority, Article 48, Reichstag, Chancellor, President, November Criminals, Treaty of Versailles, diktat, reparations, hyperinflation, putsch, Ruhr.



# Geography





## Year 9 Ecosystems

**What is an Ecosystem?**  
 An ecosystem is a system in which organisms interact with each other and with their environment.

**Ecosystem's Components**

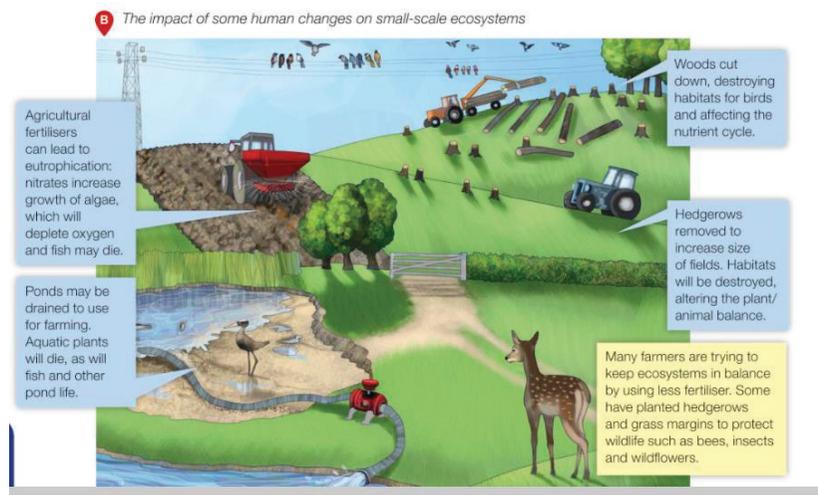
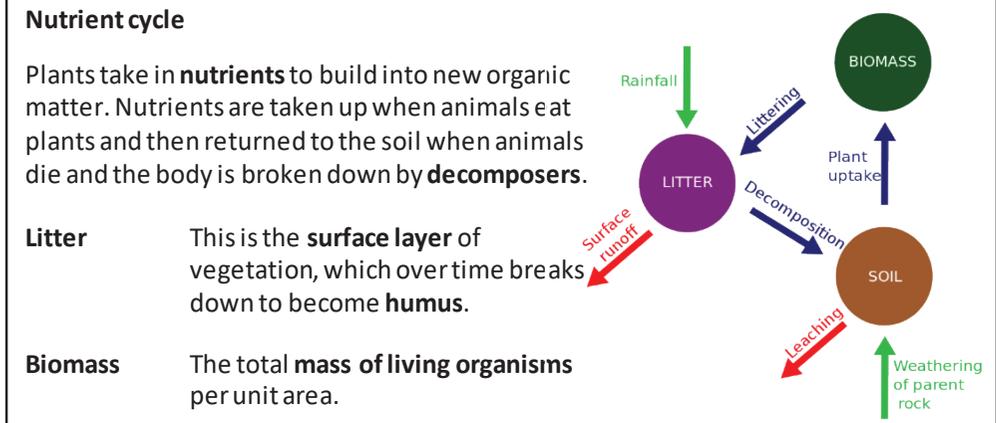
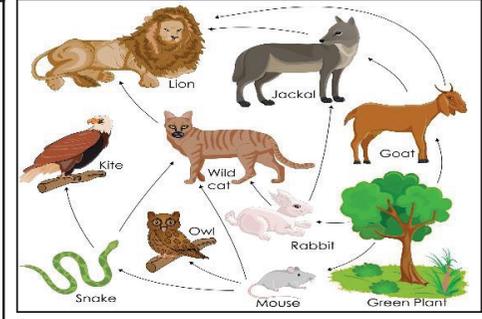
<b>Abiotic</b>	These are <b>non-living</b> , such as air, water, heat and rock.	
<b>Biotic</b>	These are <b>living</b> , such as plants, insects, and animals.	
	<b>Flora</b>	<b>Plant life</b> occurring in a particular region or time.
	<b>Fauna</b>	<b>Animal life</b> of any particular region or time.

**Impacts of change on an ecosystem**  
 Ecosystems can take thousands of years to develop a sustainable balance. Global changes like climate change and local changes like hedge removal can upset this balance

**Natural change:**  
 Slow and natural changes have very few harmful effects but rapid changes have serious consequences. For example extreme weather events like droughts can be devastating to freshwater ponds killing plants and animals in the water and the birds that depend on these

**Human activities**  
 Human activities can have serious impacts on an ecosystem. Any one change can have serious knock on effects

**Food Web and Chains**  
 Simple **food chains** are useful in explaining the basic principles behind ecosystems. They show only one species at a particular trophic level. **Food webs** however consist of a network of many food chains interconnected together.



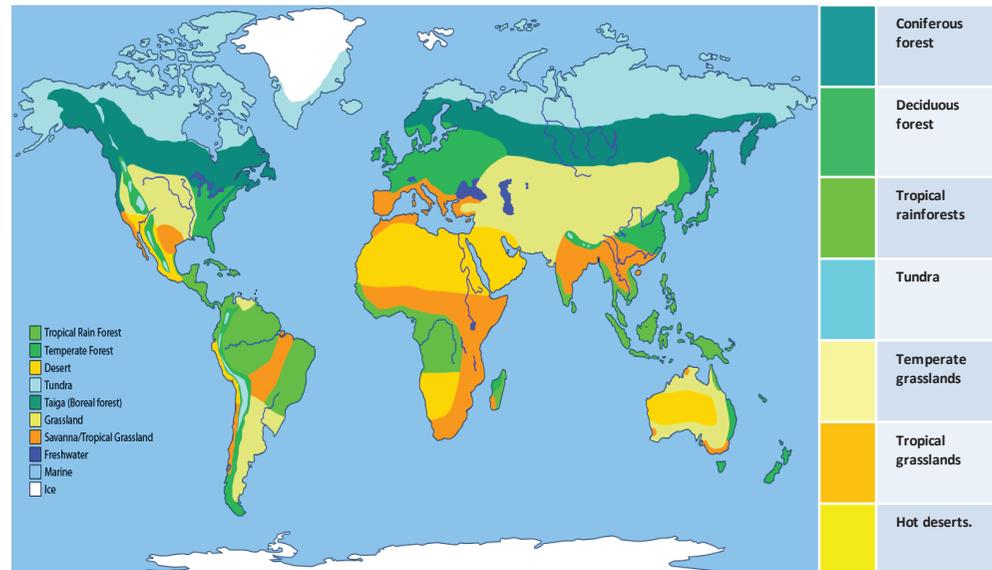


## Biomes

A biome is a **large geographical area of distinctive plant and animal groups**, which are adapted to that particular environment. The climate and geography of a region determines what type of biome can exist in that region.

**Biomes** are mainly identified **by one dominant type of vegetation**. They form **broad belts** usually parallel to lines of **latitude**. This is because the climate and characteristics of an ecosystem are determined by global atmospheric circulation.

**Variations** occur in these west to east belts of vegetation due to factors such as ocean currents, winds and the distribution of land and sea. These can create small changes in temperature which can in turn affect the ecosystem

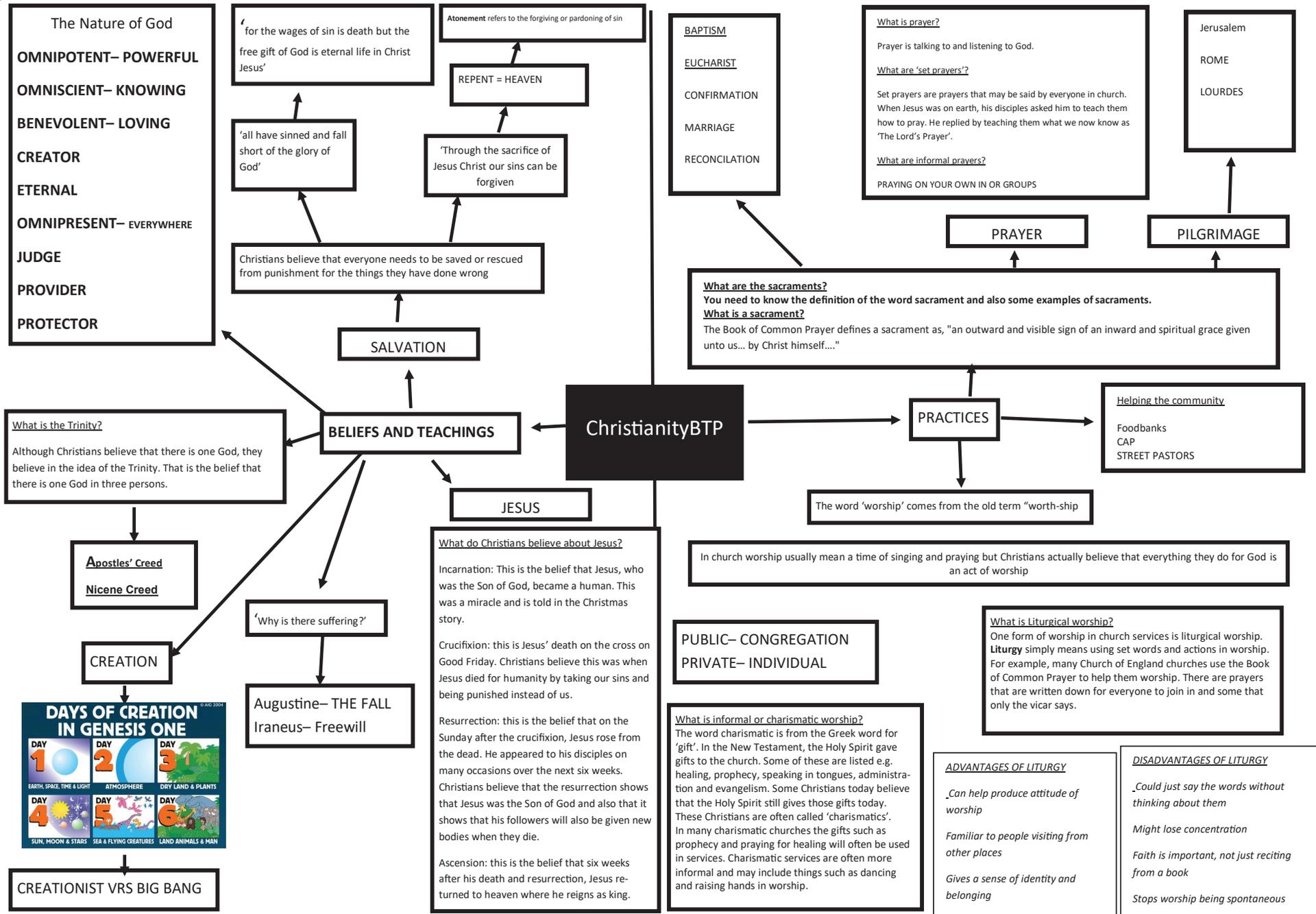
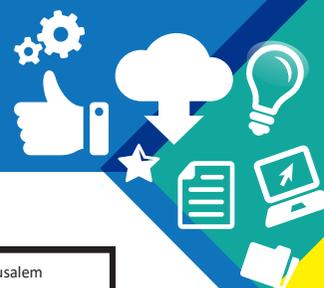


### Biome's climate and plants

Biome	Location	Temperature	Rainfall	Flora	Fauna
Tropical rainforest	Centred along the Equator.	Hot all year (25-30°C)	Very high (over 200mm/year)	Tall trees forming a canopy; wide variety of species.	Greatest range of different animal species. Most live in canopy layer
Tropical grasslands	Between latitudes 5°- 30° north & south of Equator.	Warm all year (20-30°C)	Wet + dry season (500-1500mm/year)	Grasslands with widely spaced trees.	Large hoofed herbivores and carnivores dominate.
Hot desert	Found along the tropics of Cancer and Capricorn.	Hot by day (over 30°C) Cold by night	Very low (below 300mm/year)	Lack of plants and few species; adapted to drought.	Many animals are small and nocturnal: except for the camel.
Temperate forest	Between latitudes 40°-60° north of Equator.	Warm summers + mild winters (5-20°C)	Variable rainfall (500-1500m/year)	Mainly deciduous trees; a variety of species.	Animals adapt to colder and warmer climates. Some migrate.
Tundra	Far Latitudes of 65° north and south of Equator	Cold winter + cool summers (below 10°C)	Low rainfall (below 500mm/ year)	Small plants grow close to the ground and only in summer.	Low number of species. Most animals found along coast.
Coral Reefs	Found within 30° north – south of Equator in tropical waters.	Warm water all year round with temperatures of 18°C	Wet + dry seasons. Rainfall varies greatly due to location.	Small range of plant life which includes algae and sea grasses that shelters reef animals.	Dominated by polyps and a diverse range of fish species.



# Religious Studies





# Spanish



**1**

1. ¿Llevas una dieta sana?	1. Do you have a healthy diet?
2. Llevo una dieta sana	2. I have a healthy diet
3. Me gusta bastante el pan y me gusta mucho el arroz	3. I quite like bread and I really like rice
4. No me gustan nada las galletas	4. I really don't like biscuits
5. ¿Con qué frecuencia comes pescado?	5. How often do you eat fish?
6. <b>Lo / La</b> como cada día	6. I eat <b>it</b> every day
7. ¿Con qué frecuencia bebes refrescos?	7. How often do you drink soft drinks?
8. <b>Los / Las</b> bebo a veces	8. I drink <b>them</b> sometimes
9. Bebo la leche tres veces al día	9. I drink milk three times a day
10. (Casi) nunca lo / la / los / las como.	10. I (almost) never eat it / them.

**3**

1. ¿Cuál es tu rutina diaria?	1. What is your daily routine?
2. Me despierto (muy temprano)	2. I wake up very early
3. Me levanto enseguida y me ducho	3. I get up straight away and I get dressed
4. Me lavo los dientes luego me visto	4. I brush my teeth then I get dressed
5. Desayuno a las nueve y meriendo a las dos	5. I have breakfast at 8 and I have an afternoon snack at 2
6. Después del insti corro quince kilometros	6. After school I run 15 kilometres
7. Me acuesto y duermo ocho horas	7. I go to bed and I sleep for 8 hours

**2**

1. ¿Qué haces para estar en forma?	1. What do you do to keep fit?
2. Para estar en forma juego al baloncesto	2. In order to keep fit I play basketball
3. Es mi deporte preferido	3. It is my favourite sport
4. <b>Además</b> , hago footing	<b>4. Furthermore</b> , I do jogging
5. ¿Qué deportes prefieres?	5. What sports do you prefer?
6. Prefiero los deportes en equipo	6. I prefer team sports
7. ¿Cuándo empezaste jugar al voleibol?	7. When did you start to play volleyball?
8. Empecé a jugar al voleibol el año pasado	8. I began to play last year
9. Voy a empezar a (hacer) el baile	9. I am going to start (doing) dance

**4**

1. ¿Cuáles consejos tienes para estar en forma?	1. What advice do you have to keep in shape?
2. <b>Se debe</b> beber agua frecuentemente	2. <b>You/one must</b> drink water frequently
3. Y <b>no se debe fumar o</b> beber alcohol	3. <b>You/one must not</b> smoke or drink alcohol
4. Debo admitir que soy adicto/a al chocolate	4. I must admit that I am addicted to chocolate
5. A partir de ahora voy a comer <b>menos</b> comida basura	5. From now on I am going to eat <b>less</b> junk food
6. <b>También</b> voy a comer <b>más</b> verduras	6. <b>Also</b> I am going to eat <b>more</b> vegetables



5

1. ¿Qué tal estás?	1. How are you?
2. No me encuentro bien y estoy cansado/a	2. I don't feel well and I am tired
3. Tengo catarro <b>pero</b> no tengo tos	3. I have a cold <b>but</b> I don't have a cough
4. ¿Qué te duele?	4. What hurts?
5. Me duele el estómago y me duele la garganta	5. My stomach hurts and my throat hurts
6. Me duelen los oídos	6. My ears hurt (I have ear ache)
7. Tengo quemaduras del sol.	7. I have sunburn



<u>C</u> onnectives		<u>O</u> pinions		<u>R</u> easons		<u>T</u> ime Phrases		phrases followed by <u>I</u> nfinitives		
y	and	me chifla/me flipa/me mola	I really love / I am crazy about	emocionante	exciting	ayer	yesterday	Any <b>INFINITIVE</b> can follow these phrases*	se puede* <b>jugar</b>	you can play
pero	but	en mi opinion	in my opinion	alucinante	amazing	el año pasado	Last year		acabo de* <b>bailar</b>	I have just danced
sin embargo	however			pienso que	I think that	entretenido/a	entertaining		la semana pasada	last week
no obstante	nevertheless	creo que	I believe that	gracioso/a	funny	el fin de semana pasado	last weekend		despues de* <b>estudiar</b>	after studying
además	furthermore	me gusta / No me gusta	I like / I don't like	inolvidable	unforgettable	el año pasado	last year		suelo* <b>comer</b>	I usually eat
también	also	debo admitir que	I must admit that	guay	cool	la próxima semana	next week		solía* <b>beber</b>	I used to drink...
luego	then	me fascina (n)	it/they fascinate me	molesto/molesta	annoying	el fin de semana que viene	next weekend		tengo que* <b>correr</b>	I have to run
después	because	no aguanto	I can't stand	una pérdida de tiempo	a waste of time	el año que viene	next year		espero* <b>salir</b>	I hope to go out...
porque / ya que /	because	diría que	I would say that	una tontería	a joke	todos los dias	everyday		se debe* <b>escribir</b>	you must write
por lo tanto	therefore	desde mi punto de vista	from my point of view	formidable	fantastic / terrific	a menudo	often		tengo la intención de* <b>ir</b>	I plan to go
con	with	me da igual	I don't mind	un rollo	a bore	a veces	sometimes			
sin	without			útil	useful	de vez en cuando	from time to time			
o	or			inútil	useless	una vez a la semana	once a week			
tampoco	neither/nor									



## PRESENT TENSE VERBS

Remove the infinitive ending (AR/ER/IR) and add the following for each person...

	<u>- Ar</u>	<u>- Er</u>	<u>- Ir</u>
Yo (I)	o	o	o
Tu (you)	as	es	es
El/ella (he/she)	a	e	e
Nosotros (we)	amos	emos	imos
Vosotros (y'all)	áis	éis	ís
Ellos/Ellas (they)	an	en	en

e.g.  
montamos = we ride / bebemos = we drink / compartimos = we share

### IRREGULARS (I form)

Ser	Soy	Poder	Puedo
Estar	Estoy	Poner	Pongo
Dar	Doy	Saber	Sé
Ir	Voy	Traer	Traigo
Hacer	Hago	Querer	Quiero
Tener	Tengo	Ver	Veo
Salir	Salgo	Conocer	Conozco
Jugar	Juego	Traducir	Traduzco

**Haber = hay (there is /are)**

## PAST TENSE VERBS

Remove the infinitive ending (AR/ER/IR) and add the following for each person...

	<u>- Ar</u>	<u>- Er</u>	<u>- Ir</u>
Yo (I)	é		í
Tu (you)	aste		iste
El/ella (he/she)	ó		io
Nosotros (we)	amos		imos
Vosotros (y'all)	asteis		isteis
Ellos/Ellas (they)	aron		ieron

e.g.  
montamos = we rode / bebimos = we drank / compartimos = we shared

### IRREGULARS (I form)

Ser	Fui	Poder	Pude
Estar	Estuve	Poner	Puse
Dar	Di	Saber	Supe
Ir	Fui	Jugar	Jugué
Hacer	Hice	Llegar	Llegué
Tener	Tuve	Haber	Hubo

## IMMEDIATE FUTURE TENSE

	<b>IR</b>	<b>A +</b>	<b>INFINITIVE</b>
YO (I)	<b>VOY</b>		e.g. beber / comer / vivir / jugar / tener etc
TU (YOU)	<b>VAS</b>		
EL/ELLA (HE/SHE)	<b>VA</b>		
NOSOTROS (WE)	<b>VAMOS</b>		
VOSOTROS (Y'ALL)	<b>VAIS</b>		
ELLOS/ELLAS (THEY)	<b>VAN</b>		

e.g.  
voy a beber coca-cola = I am going to drink coca-cola  
vas a comer caramelos = you are going to eat sweets



## STEM CHANGING VERBS

These verbs have a vowel change in their stem in the 'I', 'YOU', 'HE/SHE/IT' and 'THEY' form of the present tense. Some people call them the **1, 2, 3 and 6 verbs**.

<u>JUGAR</u>	<u>TO PLAY</u>
<u>J</u> uego	I play
<u>J</u> egas	You play
<u>J</u> ega	He/she/it plays
Jugamos	We play
Jugáis	You all play
<u>J</u> uegan	They play

<u>PREFERIR</u>	<u>TO PREFER</u>
<u>P</u> refiero	I prefer
<u>P</u> refieres	You prefer
<u>P</u> refiere	He/she/it prefers
Preferimos	We prefer
Preferís	You all prefer
<u>P</u> refieren	They prefer

## SER/ESTAR

There are **two verbs** for 'to be' in Spanish: **Ser & Estar**.  
**ser** – for **permanent** states  
**estar** - for **temporary** states

<u>Estar</u>	<u>To be</u>	<u>Ser</u>	<u>To be</u>
Estoy	I am	Soy	I am
Estás	You are	Eres	You are
Está	He/she/it is	Es	He/she/it is
Estamos	We are	Somos	We are
Estáis	You all are	Sois	You all are
Están	They are	Son	They are

## DIRECT OBJECT PRONOUNS

'It' and 'them' are direct object pronouns. These words replace the **OBJECT** of the verb. E.g...

	<u>IT</u>	<u>THEM</u>
<b>Masc</b>	LO	LOS
<b>Fem</b>	LA	LAS

- Bebo limonada                      I drink lemonade
- La bebo todos los días        I drink it every day
- Como caramelos                    I eat sweets
- Los como                            I eat them

## REFLEXIVE VERBS

Reflexive verbs are verbs describe actions that we do to **ourselves**. Their infinitives end in 'se' after AR/ER/IR.

- Step 1 - Take off the 'se' part at the end and put it at the **front** of the verb and **change** it to match who is doing the action

<b>Me</b> = I
<b>Te</b> = You
<b>Se</b> = He/She/It
<b>Nos</b> = We
<b>Os</b> = You (pl)
<b>Se</b> = They

- Step 2 – take off the AR/ER/IR
- Step 3 – add on the relevant present tense ending

	<u>- Ar</u>	<u>- Er</u>	<u>- Ir</u>
Yo (I)	o	o	o
Tu (you)	as	es	es
El/ella (he/she)	a	e	e
Nosotros (we)	amos	emos	imos
Vosotros (y'all)	áis	éis	ís
Ellos/Ellas (they)	an	en	en

**(NO) SE DEBE** - When giving commands e.g. 'you must / should / ought to'

you can use **SE DEBE + INFINITIVE**

**Examples:**

**Se debe beber** agua frecuentemente                      You must drink water frequently

**No se debe beber** muchos refrescos                      You must not drink fizzy drinks



**1**

1. ¿Llevas una dieta sana?	1. Do you have a healthy diet?
2. Llevo una dieta bastante sana	2. I have a quite healthy diet
3. ¿Qué comes?	3. What do you eat?
4. Como pan <b>a menudo</b>	4. I eat bread <b>often</b>
5. <b>Nunca</b> como pescado	5. I <b>never</b> eat fish
6. ¿Qué bebes?	6. What do you drink?
7. Bebo café <b>una vez a la semana</b>	7. I drink coffee <b>once a week</b>
8. Bebo agua <b>todos los días</b>	8. I drink water <b>every day</b>

**2**

1. ¿Por qué comes fruta?	1. Why do you eat fruit?
2. Porque es rica	2. Because it's tasty
3. ¿Por qué comes verduras?	3. Why do you eat vegetables?
4. Porque son sanas	4. Because they are healthy
5. ¿Por qué <b>NO</b> comes carne?	5. Why do you <b>NOT</b> eat meat?
6. Porque soy vegetarian/a	6. Because I'm vegetarian
7. ¿Por qué <b>NO</b> bebes leche?	7. Why do you <b>NOT</b> drink milk?
8. Porque soy alérgico / a	8. Because I'm allergic

**3**

1. ¿Qué haces para estar en forma?	1. What do you do to keep in shape?
2. <b>Juego</b> al baloncesto y al fútbol	2. I <b>play</b> basketball and football
3. <b>Hago</b> footing	3. I <b>do</b> jogging
4. <b>Juego</b> al rugby <b>los</b> martes	4. I <b>play</b> rugby on Tuesdays
5. ¿Que deportes prefieres?	5. Which sports do you prefer?
6. Prefiero deportes en equipo	6. I prefer team sports
7. Prefiero hacer natación	7. I prefer to do swimming
8. Es mi deporte favorito	8. It's my favourite sport

**4**

1. Describe tu rutina diaria	1. Describe your daily routine
2. Me despierto a las siete	2. I wake up at 7
3. Me levanto en mi dormitorio	3. I get up in my room
4. Me ducho en el baño	4. I shower in the bathroom
5. Me visto a las ocho y media	5. I get dressed at half past 8
6. Me lavo los dientes	6. I brush my teeth
7. Voy al trabajo en coche	7. I go to work by car
8. Ceno a las seis y cuarto	8. I have dinner at quarter past 6
9. Me acuesto a las once	9. I go to bed at 11



<b>5</b>	1. ¿Qué tal estás?	1. How are you
	2. Estoy enfermo/a	2. I am tired
	3. Estoy cansado/a	3. I am ill
	4. Tengo tos y fiebre	4. I have a cough and a temperature
	5. ¿Qué <b>te</b> duele?	5. What hurts <b>(you)</b> ?
	6. Me duele el brazo	6. My arm hurts
	7. <b>Y</b> me duele el estómago	7. <b>And</b> my stomach hurts
	8. Me duele <b>N</b> los oídos	8. My ear <b>S</b> hurt

<b>6</b>	1. Consejos para estar en forma	1. Advice for keeping in shape
	2. <b>Se debe</b> beber agua frecuentemente	2. <b>You/one must</b> drink water frequently
	3. <b>Se debe</b> entrenar una hora al día porque es sano	3. 2. <b>You/one must</b> train one hour a day because it is healthy
	3. <b>No se debe fumar</b> porque es peligroso	3. <b>You/one must not</b> smoke because it is dangerous
	4. Soy adicto/a al chocolate	4. I am addicted to chocolate
	5. Voy a entrenar tres veces a la semana.	5. I am going to train 3 times a week
6. No voy a beber refrescos porque es malsano	6. I am not going to drink fizzy drinks. because it is unhealthy	



<u>C</u> onnectives		<u>O</u> pinions		<u>R</u> easons		<u>T</u> ime Phrases		<u>I</u> ntensifiers	
y	and	en mi opinión	in my opinion	emocionante	exciting	normalmente	normally	muy	very
pero	but	pienso que	I think that	increíble	amazing	todos los días	everyday	bastante	quite
sin embargo	however	creo que	I believe that	entretenido/a	entertaining	a veces	sometimes	un poco	a bit
o	or	me gusta / no me gusta	I like / I don't like	gracioso/a	funny	nunca	never	demasiado/a	too many
también	also	me encanta / adoro / amo	I love	inolvidable	unforgettable	mañana	tomorrow	más	more
tampoco	nor / neither	odio / detesto	I hate	guay	cool	la próxima semana	next week	menos	less
porque	because	prefiero	I prefer	molesto/molesta	annoying	el próximo fin de semana	next weekend	mucho/a	A lot
además	furthermore			una tontería	a joke	el próximo año	next year		
con	with					ayer	yesterday		
						anoche	last night		
						la semana pasada	last week		



## PRESENT TENSE VERBS

Remove the infinitive ending (AR/ER/IR) and add the following for each person...

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Nosotros (we)	amos	emos	imos
Vosotros (y'all)	áis	éis	ís
Ellos/Ellas (they)	an	en	en

e.g.  
montamos = we ride / bebemos = we drink /  
compartimos = we share

### IRREGULARS (I form)

Ser	Soy	Poder	Puedo
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Haber = hay (there is /are)

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Remove the infinitive ending (AR/ER/IR) and add the following for each person...

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Nosotros (we)	amos		imos
Vosotros (y'all)	asteis		isteis
Ellos/Ellas (they)	aron		ieron

e.g.  
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Ser	Fui	Poder	Pude
Estar	Estuve	Poner	Puse
Dar	Di	Saber	Supe
Ir	Fui	Jugar	Jugué
Hacer	Hice	Llegar	Llegué
Tener	Tuve	Haber	Hubo

## IMMEDIATE FUTURE TENSE

	IR	A +	INFINITIVE
YO (I)	VOY		e.g. beber / comer / vivir / jugar / tener etc
TU (YOU)	VAS		
EL/ELLA (HE/SHE)	VA		
NOSOTROS (WE)	VAMOS		
VOSOTROS (Y'ALL)	VAIS		
ELLOS/ELLAS (THEY)	VAN		

e.g.  
voy a beber coca-cola = I am going to drink  
coca-cola  
vas a comer caramelos = you are going to eat  
sweets



## STEM CHANGING VERBS

These verbs have a vowel change in their stem in the 'I', 'YOU', 'HE/SHE/IT' and 'THEY' form of the present tense. Some people call them the **1, 2, 3 and 6 verbs**.

JUGAR	TO PLAY
J <u>ue</u> go	I play
J <u>ue</u> gas	You play
J <u>ue</u> ga	He/she/it plays
Jugamos	We play
Jugáis	You all play
J <u>ue</u> gan	They play

PREFERIR	TO PREFER
Pre <u>fi</u> ero	I prefer
Pre <u>fi</u> eres	You prefer
Pre <u>fi</u> ere	He/she/it prefers
Preferimos	We prefer
Preferís	You all prefer
Pre <u>fi</u> eren	They prefer

## SER/ESTAR

There are **two verbs** for 'to be' in Spanish: **Ser & Estar**.

**ser** – for permanent states

**estar** - for temporary states

Estar	To be	Ser	To be
Estoy	I am	Soy	I am
Estás	You are	Eres	You are
Está	He/she/it is	Es	He/she/it is
Estamos	We are	Somos	We are
Estáis	You all are	Sois	You all are
Están	They are	Son	They are

## DIRECT OBJECT PRONOUNS

'It' and 'them' are direct object pronouns. These words replace the OBJECT of the verb. E.g...

	<u>IT</u>	<u>THEM</u>
<b>Masc</b>	LO	LOS
<b>Fem</b>	LA	LAS

- Bebo limonada                      I drink lemonade
- La bebo todos los días        I drink it every day
- Como caramelos                  I eat sweets
- Los como                            I eat them

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Reflexive verbs are verbs describe actions that we do to **ourselves**. Their infinitives end in 'se' after AR/ER/IR.

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<b>Te</b> = You
<b>Se</b> = He/She/It
<b>Nos</b> = We
<b>Os</b> = You (pl)
<b>Se</b> = They

- Step 2 – take off the AR/ER/IR
- Step 3 – add on the relevant present tense ending

	<b>- Ar</b>	<b>- Er</b>	<b>- Ir</b>
Yo (I)	o	o	o
Tu (you)	as	es	es
El/ella (he/she)	a	e	e
Nosotros (we)	amos	emos	imos
Vosotros (y'all)	áis	éis	ís
Ellos/Ellas (they)	an	en	en

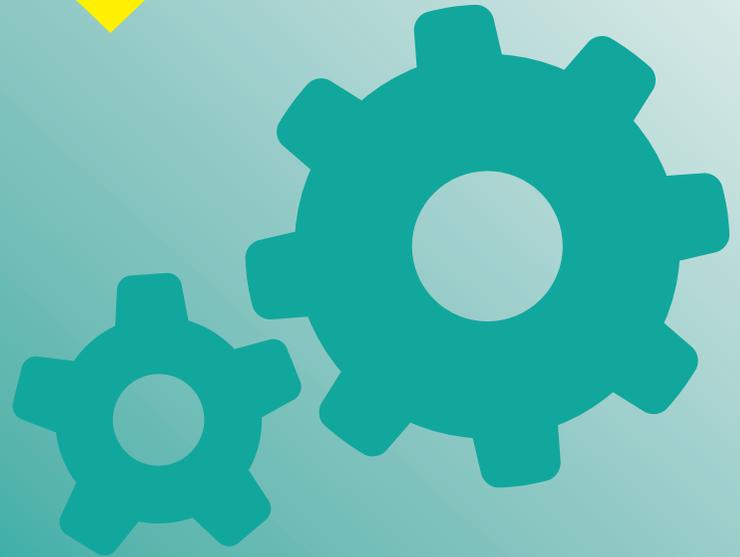
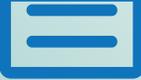
**(NO) SE DEBE** - When giving commands e.g. 'you must / should / ought to'

you can use **SE DEBE + INFINITIVE**

**Examples:**

**Se debe beber** agua frecuentemente                      You must drink water frequently

**No se debe beber** muchos refrescos                      You must not drink fizzy drinks



# IT

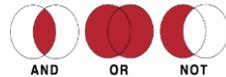


## Browsers

A browser is a piece of software that allows a user to access the internet. Without the browser the user would not be able to use the internet. There are various types of browsers available and users can choose whichever one suits them best depending on the features they need/want.



## Browsing for information



When looking for information, the user must consider how accurate and how reliable the source is. One way a user can narrow down search results when browsing online is through **Advanced searches**:

AND	Results must contain both criteria	Harry AND potter which would only return results containing both words.
OR	Results must contain at least one of the search criteria	Harry OR Potter would return all results containing the words either Harry or Potter
NOT	Results must not contain the specified criteria	Harry NOT Potter would only return results containing the word Harry.

## Airbrushing

Airbrushing is the manipulation and altering of an image or photo. It is mostly done using a piece of software called Adobe Photoshop.

### Benefits

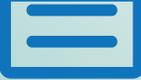
- Helps businesses market their products
- Can increase self confidence
- Can remove unwanted parts of photos

### Drawbacks

- Gives people a false image of "perfection"
- Can be misleading
- Overused in media to create fake news

## Key terms

Key Term	Definition
<b>Browsers</b>	A piece of software that allows a user to access the internet. An example of this is Safari, Chrome, Edge etc
<b>Accuracy</b>	This refers to how up to date a source of information is. If information hasn't been updated/isn't updated regularly it will not be reliable.
<b>Reliability</b>	This refers to how trustworthy and truthful information is.
<b>Advanced Searches</b>	Making use of Boolean terms to ensure you get relevant results when searching for information online.
<b>Photoshop</b>	A piece of software used to manipulate and edit photos/images
<b>Airbrushing</b>	The process of editing an image.
<b>Spot healing brush</b>	A tool in Photoshop that removes blemishes/spots on the skin in photos.
<b>Quick Selection Tool</b>	A tool in Photoshop that allows the user to quickly select parts of a photo
<b>Cloning</b>	A tool in Photoshop that allows the user to select parts of an image, which can then be copied and used elsewhere within the image.
<b>Composition</b>	Where two or more images are combined.
<b>Liquify</b>	A tool in Photoshop where the user can push/pull/smudge pixels within an image. This method quickly distorts images as the pixels are turned to "liquid"
<b>Masking</b>	This allows the user to manipulate layers within an image.



# Art



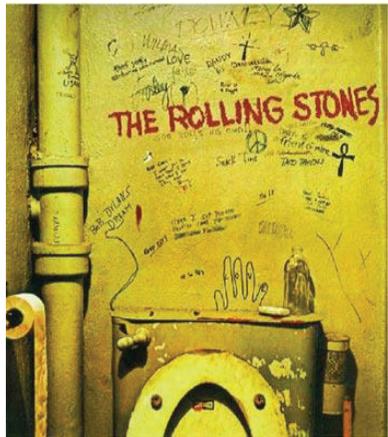
**Graffiti** is a form of visual communication involving writing or drawing on a wall or other surface, often without permission and within public view. Graffiti ranges from simple written words to elaborate wall paintings, and has existed since ancient times, with examples dating back to ancient Egypt, ancient Greece, and the Roman Empire.

Graffiti introduction - <https://youtu.be/4UI4mhho03M>

[Graffiti, Art or Vandalism](#)

<https://m.youtube.com/watch?feature=youtu.be&v=azolNnTCnMI>

Art or Vandalism – Watch the video and consider this argument.



## Independent study

### Graffiti research task

Select a graffiti artist to complete a research page on. You can select an artist from the list below or research your own artist.

### Graffiti artists

- Blek Le Rat
- Banksy
- Chris Daze
- Lee Quinones (Fab 5)
- Shepherd Fairey
- Zane Lewis
- Freddy (Fab 5)
- Keith Haring

**Task – research page this should include the following**

Creative presentation (Use of colour, interesting font style)

The name of the artist as a title

Information about the artist

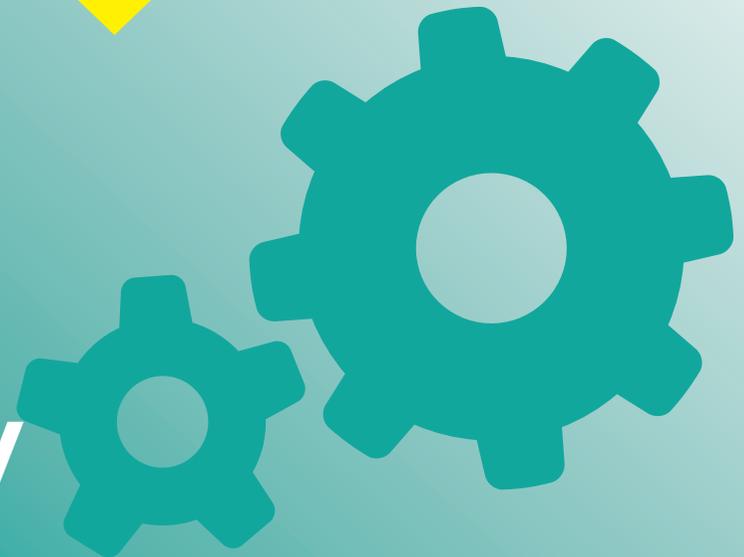
A copy of the artist's work either printed or drawn

A written paragraph about why you like the artist's work, give your own opinions.



### Key words

Tag Hip-Hop Expression Wildstyle  
Stencil Font Flow Dynamic



# Design Technology



## Design & Technology Knowledge Organiser - Y9 Control

An iconic design is usually a design that is 'ground breaking' and one that sets new standards in its field. It is a design that other designers and manufacturers follow, as it becomes a bench mark for other similar products. Furthermore, an iconic design is one that stands up to the test of time, remaining a good design, despite the passing of years, decades and even centuries.



### ART NOUVEAU

Art Nouveau was the dominant style from the 1870s to 1920s, for the rich, not the working class. It involved the use of elaborate decorative detail. Examples include wrought iron scroll work, highly skilful jewellery, prominent architecture and elaborate interior design. Art Nouveau designs were manufactured by highly skilled workers, in factories / workshops. They were either 'one off' or small batch.



### THE BAUHAUS (GERMANY)

1919 - 1930s

A Design and Architecture School called Bauhaus was established in 1919. Its name is still regarded as a mark of quality of design. It developed into an international arts / design movement and its influence on design has been considerable.

The Bauhaus encouraged designers, to design and develop products that were stylish and aesthetically interesting and mass produced.

The Bauhaus has influenced architecture, furniture design, interior and exterior design. There is even a Bauhaus font / writing style.

# BAUHAUS

### CHARACTERISTICS OF BAUHAUS DESIGNS

Bauhaus approached product design in a fresh way. They moved away from traditional skills and fashion to new ideas and ways of manufacturing on an industrial scale.

Bauhaus design characteristics

- PRODUCTS MASS PRODUCED
- NEW MATERIALS APPLIED TO PRODUCTS
- SIMPLICITY, FUNCTION AND AESTHETICS
- INNOVATIVE DESIGNS
- NEW MANUFACTURING TECHNIQUES
- AFFORDABLE PRODUCTS
- PRODUCTS FOR THE GENERAL PUBLIC

### THE ARTS AND CRAFTS MOVEMENT

1880 to 1910

The Arts and Crafts Movement was one of the most influential design movements of all. During the industrial revolution, skilled craftsmen saw the increased use of machines, replacing their skills.

Before the industrial revolution, craftsmen trained for many years, perfecting their skills and this was reflected in the products they made. The industrial revolution changed all this.

Members of the Arts and Crafts Movement, saw the industrial revolution removing craft skills from the manufacturing process, making workers less creative.

### SAMPLE ARTS AND CRAFTS PRODUCTS

HAND MADE CHAIR

HAND PRINTED WALL PAPER

WROUGHT IRON TABLE

STAIN GLASS

### THE MEMPHIS GROUP

Established in the 1980s. Composed of designers based in Italy. Memphis designers, regarded aesthetics as the most important aspect of a product, not its function. Memphis designs/products can be regarded as pieces of art or exhibition pieces, not useable, practical items.

The best known 'Memphis' designer was, Ettore Sottsass.

DRESSER

LAMP

### ETTORE SOTTASS

Ettore Sottsass led the Memphis design group. He designed products that were unusual, with bright colour schemes, producing imaginary designs for everyday objects.

His designs were controversial and unusual.

This Ceramic Totem was designed by Sottsass, as part of the Memphis Group. 171cm in height. The ceramic finish is coated in polychrome glazes, producing a colourful reflective surface.

### WHAT IS POP ART ?

Pop Art was originally an Art Movement, with artists such as Andy Warhol and David Hockney producing colourful screen prints.

Every day objects were often painted and reproduced as cheap prints and sold to the general public. These include coke tins, dollar bills and comic strips.

Pop Art has been applied to product design - e.g. furniture.

Warhol produced his art work 'Campbell's Soup' in 1962.

Pop Artwork like this is regarded as an Iconic drawing of the 1960s.

### CHARACTERISTICS OF POP ART

Images stand for popular culture.

The images are often consumer products - e.g. soup cans and coke bottles.

Pop Art is colourful and distinctive.

Multiple copies printed and sold to the general public.

Comic strips are popular.

Multiple images often used in art work (see above).

### ART DECO 1924 - 1940

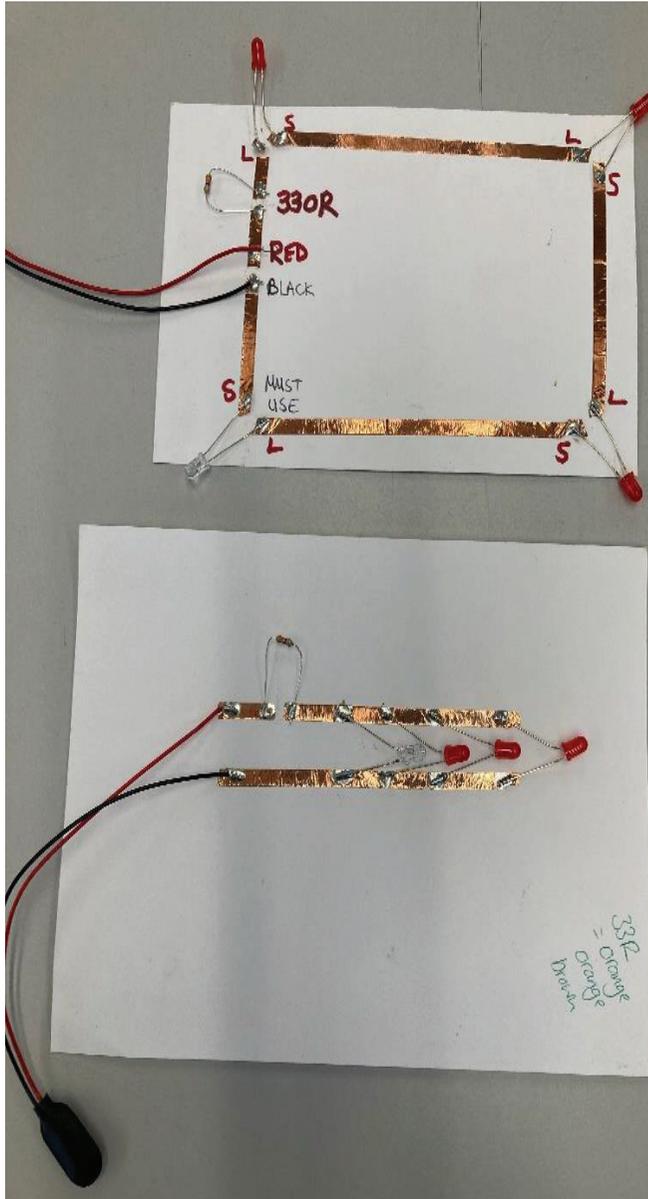
Art Deco is an international decorative arts movement, popular between the years 1924 - 1940. Art Deco is usually associated with the architecture of the 1930s and speed and luxury. Recently it has seen a revival.

It is a style, that relies on bold designs, clear lines, vibrant colours and patterns. Geometric shapes and intense colour schemes are prominent.

### KEY FEATURES

- BOLD DESIGNS
- GEOMETRIC SHAPES AND PATTERNS
- VIBRANT COLOUR SCHEME
- SYMMETRICAL DESIGNS
- ELEGANT
- STYLISH
- STREAMLINED

### ART DECO - SHAPES AND FORMS - 1





## 1. CAD – Computer Aided Design

Advantages of CAD	Disadvantages of CAD
Designs can be created, saved and edited easily, saving time	CAD software is complex to learn
Designs or parts of designs can be easily copied or repeated	Software can be very expensive
Designs can be worked on by remote teams simultaneously	Compatibility issues with software
Designs can be rendered to look photo-realistic to gather public opinion in a range of finishes	Security issues - Risk of data being corrupted or hacked
CAD is very accurate	<p>CAD Software</p>
CAD software can process complex stress testing	

## 2. CAM – Computer Aided Manufacturing

Advantages of CAM	Disadvantages of CAM
Quick – Speed of production can be increased.	Training is required to operate CAM.
Consistency – All parts manufactures are all the same.	High initial outlay for machines.
Accuracy – Accuracy can be greatly improved using CAM.	Production stoppage – If the machines break down, the production would stop.
Less Mistakes – There is no human error unless pre programmed.	Social issues . Areas can decline as human jobs are taken.
Cost Savings – Workforce can be reduced.	



### Modelling—Key Terms:

**Model**—an accurate copy of a product, sometimes on a smaller scale

**Mock Up**—put together quickly and simply to test a design idea

**Prototype**—a real size, working model of a product made to demonstrate a design

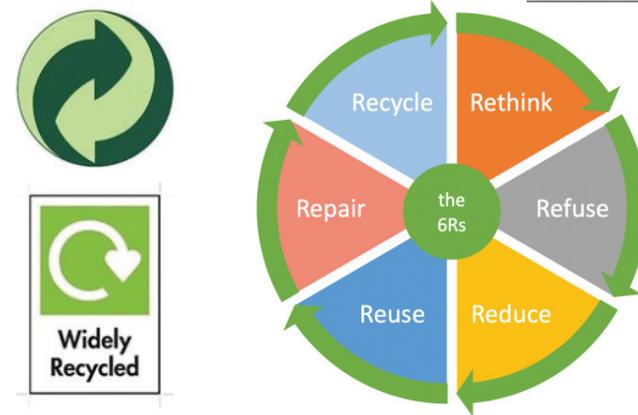
**Modelling materials might include:** card, foam board, corrugated board, plywood, MDF, dowel, clay, plasticine, polymorph, Styrofoam, lego, mechano etc





**Thermoplastics** are flexible when heated, can be re-shaped, 'magic memory, good for recycling:

- High Density Polyethylene—HDPE
- Low Density polyethylene—LDPE
- Polypropylene—PP
- High Impact Polystyrene—HIPS



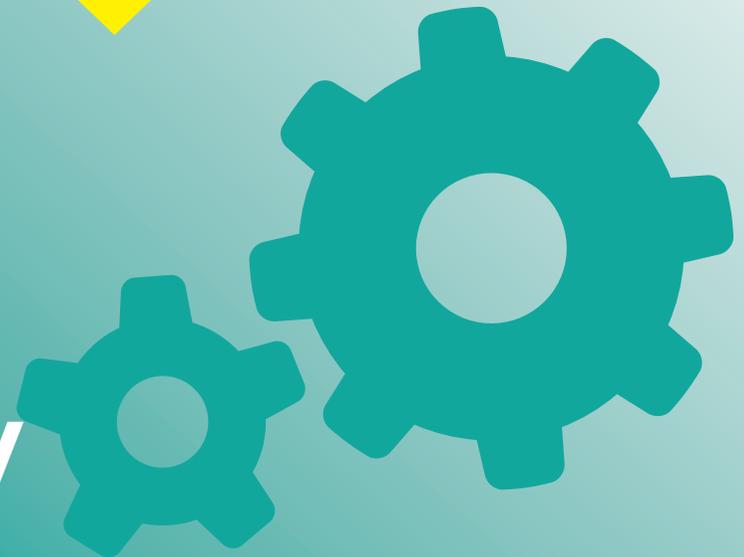
**Thermoset Plastics** are rigid, more heat resistant, once set in shape they cannot be reformed (like concrete):

- Epoxy Resin—ER
- Melamine Formaldehyde—MF
- Urea Formaldehyde—UF
- Phenol Formaldehyde—PF



**Finite Resources** - limited in supply and cannot be reproduced. These WILL runout e.g coal, oil, metal ores etc

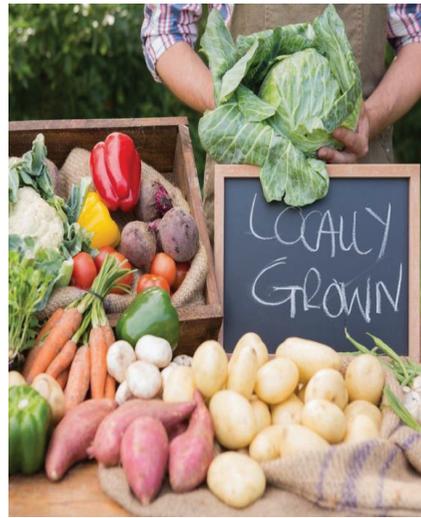
**Non Finite Resources** - are abundant in supply and can be grown/replaced at the rate they are being used. These WILL NOT run out if managed correctly. e.g Solar, wind, bio oils, wood etc



# Food Technology



## KS3 Y9 Food Tech Knowledge Organiser



### Food Provenance: Where your food originally comes from

**Grown Food** includes fruits & vegetables + cereals: e.g. wheat, rice etc. 2 methods of farming: **Intensive**



Organic



**Reared Food** are animals raised by humans for their meat and other products: **Chickens= eggs.**



Cows= Milk



**Caught Food** applies to seafood. **Wild/caught** fish come from seas, rivers, & other bodies of water.



### Foods from around the world

	<b>Indian cuisine</b> very popular in the UK
	<b>Italians</b> are famous for pizzas and pasta
	<b>Chinese noodles</b> are a favourite takeaway meal around the world
	<b>South American</b> foods use corn as the main ingredient
	<b>African meals</b> are often based around rice
	<b>French Pastries</b> are famous the world over.



**Genetically Modified (GM)** foods have had their genes altered to give it useful characteristics, such as improving its growth or changing its colour. **Disadvantages:** long term health effects aren't known. Also modified genes could affect other non GM crops. GM can't be sold everywhere. The EU restricts the import of some GM foods



### Special Dietary Needs:



In **sports**, dietary needs can differ widely. Some need lots of protein to build muscle for strength, others focus more on carbs for endurance.



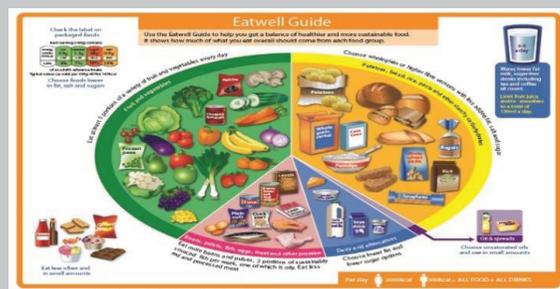
Diets also vary widely between different **religions**. Some eat meat, whilst for others it may be totally forbidden or need to be prepared in a particular way.



People can choose a plant based diet for different reasons. Some for health benefits, for **ethical reason**: e.g. animal right etc.



**Allergies and medical** issues can often lead to individuals requiring a special diet. E.g. coeliac's need to avoid food with gluten.



When **planning meals** for special dietary needs it is essential that you first have a good understanding of



what a **balanced diet** should include. And what you should avoid.



See FoodTech 101 for all KS3 practicals



### Diet-Related Health Problems

In many cases, making a few small changes in our foods choices can have a massive effect on our long term health & well-being.



**Obesity** is very common. It affects roughly one in every four adults in the UK.



**Coronary Heart Disease** is when the arteries which supply the heart with blood narrow due to fatty deposits



**Type 2 Diabetes** is a disorder where blood glucose levels stay too high because the pancreas can't produce enough insulin.



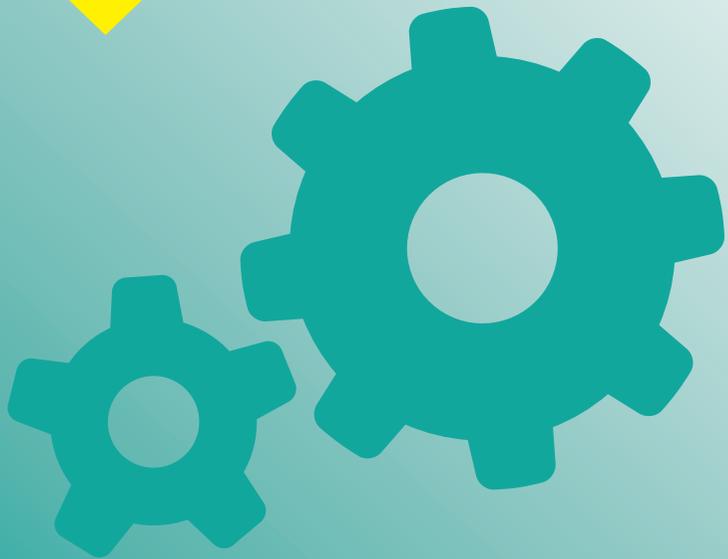
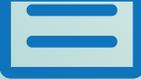
**Poor Diet** can affect the skeleton too! Your bones & teeth can become diseased if you don't get the right amount of nutrients



### Food Ethics

Do animals have rights, even the tasty ones? What principles govern or determine the foods you eat?

- Customs
- Culture
- Where you're from
- education
- travelling
- necessity



# Music



## Calvin Harris "My Way"

### Vocal melody

D D D B A A G G G G G A B D D D D D D D B A A G G A

You are the one thing in my way you are the one thing in my way . You are the one thing in my way -

### Riff and hook

G E F# A B C G

E E E D D D G G G A A A A E E E D D D A A A A A A A

As bar 1

**Composition task:** Compose a riff over a bass line. You can use the chord structure Am F Dm Dm.

These are two similar riffs where the second one has been developed using a more complicated rhythm

$\text{♩} = 120$

A A C B A C B

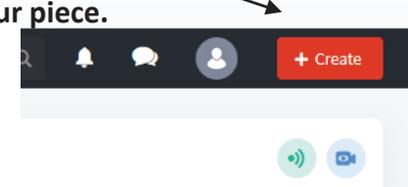
A A C B A C B



***Bandlab is a free web based software that allows you to record multi tracks of audio and MIDI instruments and turn it all into one mp3.***

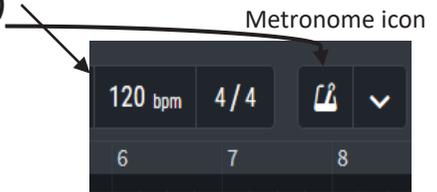
Go to Bandlab.com and login through your google account. You may have to answer some music profile questions to get to the home screen.

On the home screen is the red create button that takes you into the mix editor window where you create your piece.



Choose instruments from the list that appears. The default setting is piano and a piano keyboard should be showing. Change the instrument category and instrument from the drop down menus in the bottom left hand corner of the screen.

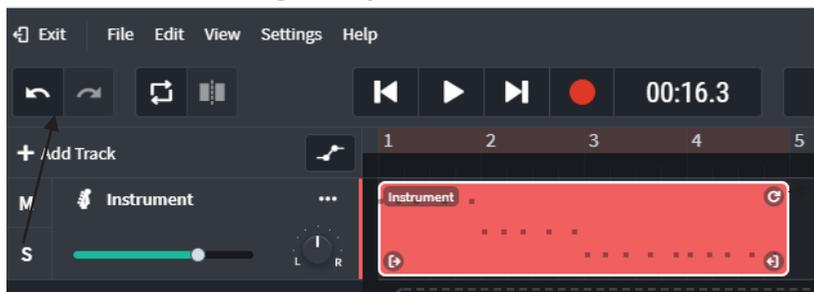
Set your click track to a speed you can manage to play at. (You can always speed it up once you've recorded!) Click on the metronome icon to turn it green. This means it will click whilst you record to keep you in time. The drop down menu next to the metronome icon allows you to set a 2 bar intro which will click before it starts recording. This is really important to keep you in time and give you time to get ready.



Your qwerty keyboard on the computer will allow you to play the notes and chords on the virtual keyboard. Have a go to get used to it!

## LETS START

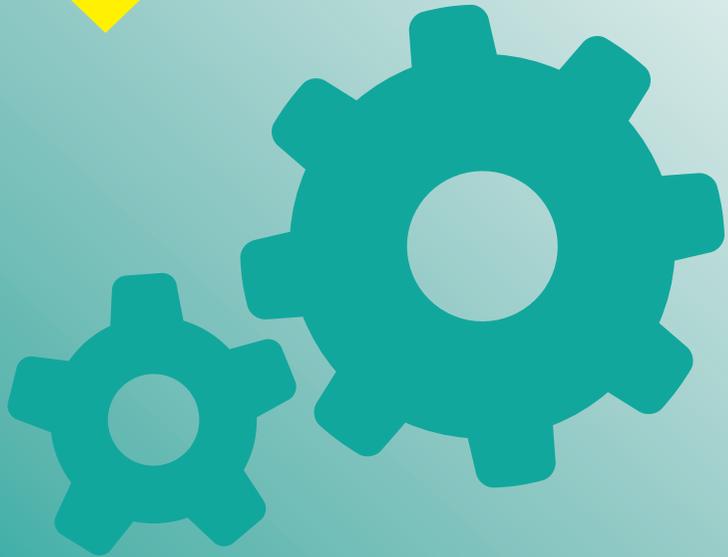
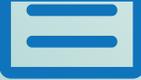
Let's start with a BASS line. Create 4 bars. One bar of A's, one of F's and 2 bars of D's. You could play a rhythm or play on every beat of the bar along with your click track.



Here is my bass track. To copy and paste it drag the loop icon in the top right hand corner of the red rectangle to the right. This will loop your track.

Add another track for your CHORDS by clicking add track.

Now have a go at recording some chords. Am F Dm Dm. You could play them to a rhythm or hold them down. You could start them later in the piece if you wish.



# Sport



## Forehand Clear

The forehand clear shot enables players to move their opponent to the back of the court, creating space in the mid and front court to exploit.

### Stage one

Stand in position on the balls of your feet, with knees slightly bent. Turn sideways with your left foot pointing towards the target and your right foot parallel to the baseline. The left shoulder and fully extended elbow will be pointing towards the shuttlecock. The racket elbow should be extended backwards behind the head at 90° with the face of the racket above head height. Transfer weight onto the back foot.

### Stage two

Keep your eyes on the shuttlecock. Flex your wrist and elbow backward until the racket is parallel with the floor. Rotate your body and step forward towards the shuttle with your racket leg, transferring your weight through the shot. Extend your racket elbow upwards into a throwing position.

### Stage three

Keep your eyes on the shuttlecock. Extend your racket elbow quickly towards the shuttlecock, with the non-racket arm rotating backwards. Make contact with the shuttlecock as high as possible in front of your body. Extend your elbow and flex your wrist on contact, to allow for a 'whip' action. Drive the shuttlecock with a high trajectory towards the back of the court.

### Stage four

Your body should have fully rotated with your racket foot now bearing all the weight and facing towards the target. The racket will follow through finishing to the left hand side of your body. Return back to ready position for the next shot.

## Forehand Drop Shot

The forehand drop shot enables players to move their opponent to the front court to either win a point or create space in the mid and back court to exploit.

### Stage one

As the shuttlecock is returned, stand in position on the balls of your feet, with knees slightly bent. Turn sideways with your left foot pointing towards the target and your right foot parallel to the baseline. The left shoulder and fully extended elbow will be pointing towards the shuttlecock. The racket elbow should be extended backwards behind the head at 90° with the face of the racket above head height. Transfer weight onto the back foot.

### Stage two

Keep your eyes on the shuttlecock. Flex your wrist and elbow backward until the racket is parallel with the floor. Rotate your body and step forward towards the shuttlecock with your racket leg, transferring your weight through the shot. Extend your racket elbow upwards into a throwing position.

### Stage three

Keep your eyes on the shuttlecock. Extend your racket elbow towards the shuttlecock, with non-racket shoulder rotating backwards. Make contact with the shuttlecock as high as possible in front of your body. Extend your elbow and flex your wrist on contact. Slice across the shuttlecock with the face of the racket slightly open, or just before contact, slow the speed of the racket down, tapping the shuttle gently over the net. Hit the shuttlecock at a flat trajectory, allowing it to drop just over the net.

### Stage four

Your body should have fully rotated with your racket foot now bearing all the weight and facing towards the target. The racket will follow through, finishing to the left hand side of your body. Return back to ready position.

## Forehand Smash

The forehand smash shot is hit with power and speed downward into the opponent's court. The angle/steepness of the shuttlecock's trajectory make it hard for the opponent to return.

### Stage one

As the shuttlecock is returned, stand in position on the balls of your feet, with knees slightly bent. Turn sideways with your left foot pointing towards the target and your right foot parallel to the baseline. Left shoulder and fully extended elbow will be pointing towards the shuttlecock. The racket elbow should be extended backwards behind the head at 90° with the face of the racket above head height. Transfer weight onto the back foot.

### Stage two

Keep your eyes on the shuttlecock. Flex your wrist and elbow backward until the racket is parallel with the floor. Rotate your body and step forward towards the shuttle with your racket leg, transferring your weight through the shot. Extend your racket elbow upwards into a throwing position.

### Stage three

Keep your eyes on the shuttlecock. Extend your racket elbow quickly towards the shuttlecock, with the non-racket elbow extended and shoulder rotating backwards. Make contact with the shuttlecock as high as possible in front of your body. Extend your elbow and flex your wrist on contact, to allow for a 'whip' action. Drive the shuttlecock downwards towards the floor of your opponent's court with a low trajectory.

### Stage four

Your body should have fully rotated with your racket foot now bearing all the weight and facing towards the target. The racket will follow through, finishing to the left hand side of your body. Return back to ready position for the next shot.



**Passing** – there are a number of different passes such as, the push pass and the slap pass/hit

**Stage one**- maintaining correct hockey posture of straight back and bent knees, stand sideways on to the ball with your right foot inline with the ball and your left pointing in the direction the ball will be passed. The stick and ball remain in contact until the release point which is in line with the left foot .

**Stage two**- complete a push pass whilst dribbling with the ball on open stick, still keeping contact with the stick and ball until release point - this time the direction of the ball can be changed by pushing the ball across your body whilst dribbling but still releasing the ball on the left foot.

**Stage three** – releasing the ball off the right foot, whilst dribbling the ball can be pushed passed off the right foot, this pass will be disguised , there will be limited contact time with the stick and the ball before release

**Dribbling** – this enables us to run with the ball

**Stage one** - maintaining the correct hockey position of straight back and bent knees. Keep the ball on the open stick side, you can use a clock reference e.g. dribble with the ball at 2 o'clock. The ball should remain on the right hand side of the participant and pushed out away from their feet so that they can move easily without kicking the ball .

**Stage two**- open to reverse stick dribbling, the ball will now move between 1 and 11 o'clock on the clock face reference (side to side), whilst keeping contact with the ball on the flat side of the stick, the left hand at the top of the stick will do the turning , and the right hand will act as a guide and will allow the stick to turn.

**Stage three**- v-drag elimination- using the previous 2 stages, the participants will dribble the ball towards their opponents stick side and engage the defender, they will then drag the ball back (bottom point of the V) and drive with the ball towards the defenders non stick side

**Tackling**- this is how we win possession of the ball

**Stage one** - block tackle pick up. Participants will lead with their left hand at the top of the stick, they will keep their stick parallel to the ground , they will squeeze the ball between them and their partners stick and pick up the ball (flat side of the stick)

**Stage two** - participant A will dribble straight with the ball, whilst Participant B will perform a block tackle, they will get low to the ground , they will lead with their left foot followed by their left hand, keeping their stick parallel to the ground.

Their right hand remains on the stick and will provide the strength in the tackle.

**Stage three** - the participant with possession of the ball will dribble open to reverse stick , the tackling participant will need to track the ball and time their tackle to maintain good contact with the ball and not to make contact with the oppositions stick.

## Tick List

### Passing:

- Sideways on
- Low to the ground
- Left foot pointing in the direction of the pass
- Stick and ball contact unit release
- Passing off both left and right feet

### Dribbling

- Correct hockey posture
- Contact with the flat side of the stick
- Open stick ball positioning – 2 o'clock
- Open to reverse stick dribbling
- Elimination skills finding the none stick side

### Tackling

- Stick parallel to the ground
- Leading with left foot
- Right hand provided the strength in the tackle



## Training Methods

Training can be aerobic or anaerobic. In aerobic exercise, which is steady and not too fast, the heart is able to supply enough oxygen to the muscles. Aerobic training improves cardiovascular fitness. Anaerobic exercise is performed in short, fast bursts where the heart cannot supply enough oxygen to the muscles. Anaerobic training improves the ability of the muscles to work without enough oxygen when lactic acid is produced.

Specific training methods can be used to improve each fitness factor. Circuit training involves performing a series of exercises in a special order called a circuit. Each activity takes place at a 'station'. It can be designed to improve speed, agility, coordination, balance and muscular endurance. Continuous training involves working for a sustained period of time without rest. It improves cardiovascular fitness. Cross training involves using another sport or activity to improve your fitness. It happens when an athlete trains in a different environment. For example a volleyball player uses the power training for that sport to help with fitness for long jump. Fartlek training or 'speed play' training involves varying your speed and the type of terrain over which you run, walk, cycle or ski. It improves aerobic and anaerobic fitness. Interval training involves alternating between periods of hard exercise and rest. It improves speed and muscular endurance. Weight training uses weights to provide resistance to the muscles. It improves muscular strength (high weight, low reps), muscular endurance (low weight, high reps, many sets) and power (medium weight and reps performed quickly).

## Advantages and Disadvantages of Training Methods

### Continuous Training

Good for aerobic fitness, lose weight accessible, health benefits, good for beginners of all ages, little equipment Boring, not always sport specific, risk of injury does not improve anaerobic fitness

### Fartlek Training

Good for team sports, less boredom, easy to use, can mimic the sport, good for team sports Too easy to cheat, can be difficult

### Circuit Training

Less boring, easily adapted for fitness/skill, easily adapted to sports, stations can target specific muscle groups Take time to set up, requires equipment

### Interval Training

Can be both aerobic and anaerobic, less technical, can mimic a sport, good for sports that require a change of pace Can be boring, easy to cheat hard aspects,

### Free weights

Full range of sporting movement, large muscle groups can be worked Risk of injury, need a spotter, more suitable for advance performers, requires good knowledge

### Resistance machines

Safer, good for beginners, good for injury rehabilitation Expensive, no functional everyday movements, only focuses on one muscle group

## Training Zones

Anaerobic Threshold  
80-100%  
Peak Performance  
80-90%  
Aerobic Fitness  
70-80%  
Aerobic  
60-80%  
Fat Burning  
60-70%  
Active Recovery  
60%  
Warm-up Cool-down  
50%



# Table Tennis - Serve, Forehand Drive, Forehand Push, Smash and Block



## Forehand Serve

The tennis serve is the shot selected to begin a point in tennis. A table tennis serve can be hit either forehand or backhand. It must be thrown up from a flat palm into the air to a minimum height of six inches and visible to their opponent at all times.

### Stage one

Stand in position on the balls of your feet, with knees slightly flexed. Face sideways with your shoulder pointing towards the target. Hold the ball in front of your body with left hand, right hand held back. Body weight should be on the back foot. Keep low.

### Stage two

Throw the ball gently into the air (about 6 inches) with the palm of your hand. As the ball begins to drop, hold a forward stance and strike the ball flat with a fast arm in the middle of the ball. Transfer body weight from back to front foot.

### Stage three

Follow through with the bat pointing towards the intended target. Return back to ready position for the next shot.

## Forehand Drive

A forehand drive in table tennis is an offensive stroke that is used to force errors and to set up attacking positions. A successful shot should land close to your opponent's baseline or side-line.

### Stage one

As the ball is returned, stand in position on the balls of your feet, with knees slightly flexed. Face sideways with your shoulder pointing towards the target. Body weight should be on the back foot.

### Stage two

When ready to strike the ball, point your free arm towards the ball. At impact, rotate your body quickly to face forwards. Aim to hit the ball at its highest point. Transfer body weight from back to front foot.

### Stage three

Follow through with the bat pointing towards the intended target. Return back to ready position for the next shot.

## Forehand Push

A forehand push is a difficult defensive shot that requires the player to strike downwards on the back and underneath the ball to create backspin. When performed correctly, a forehand push is used to change the pace of an exchange or to return the ball in a very low manner.

### Stage one

Stand square to the table in slight position and keep your feet shoulder width apart. Slightly flex your knees, leaning forward and hold your arms out in front. Keep close to the table.

### Stage two

When ready to strike the ball, draw the bat backwards to the side of the body (strongest side). Hold the bat in an open angle with a straight wrist and your playing arm just in front of the body.

### Stage three

On impact, bring the arms forward and ensure that power comes from the elbow and forearm (it is not a swing shot). Aim to hit the ball at its highest point. Transfer body weight from back to front foot.

### Stage four

After impact, point the bat to where you want to hit the ball. Ensure that your arm does not swing across your body to the left. Return back to ready position for the next shot.

## Forehand Smash

The forehand smash is a fast, hard and powerful stroke that aims to force the opponent away from the table or to win a point outright. However, the shot is not always about force and requires the player to use good timing, technique and precision simultaneously.

### Stage one

As the ball is returned, stand in position on the balls of your feet, with knees slightly flexed. Face sideways with your shoulder pointing towards the target. Body weight should be on the back foot.

### Stage two

When ready to strike the ball, point your free arm towards the ball. Raise the racket to a high position to generate downwards and forwards power.

### Stage three

As the ball bounces off the table, rotate your body quickly to face forwards. Aim to hit the ball at its highest point. Transfer body weight from back to front foot. Return back to ready position for the next shot.

## Block

The block shot is a defensive stroke that allows a player to use the speed of their opponent's shot against them. It needs to be completed straight after the bounce to ensure that the player maintains control of the ball.

### Stage one

Stand square to the table in slight position and keep your feet shoulder width apart. Slightly flex your knees, leaning forward and hold your arms out in front. Keep close to the table.

### Stage two

When ready to strike the ball, draw the bat backwards to the side of the body (strongest side). Hold the bat in an open position with a straight wrist and your playing arm just in front of the body.

### Stage three

On impact, bring the arms forward and ensure that power comes from the elbow and forearm (it is not a swing shot). Aim to hit the ball at its highest point. Transfer body weight from back to front foot.

### Stage four

After impact, point the bat to where you want to hit the ball. Ensure that your arm does not swing across your body to the left. Return back to ready position for the next shot.



## Serve

A volleyball serve can be hit either overarm or underarm. A player is allowed to travel with the ball and jump whilst serving, and providing it reaches the opponent's court, it is deemed legal.

### **Stage one**

Stand in position on the balls of your feet, with knees slightly flexed.

Face forwards with your chest facing towards the target. Hold the ball in front of your body with left hand, right hand held back. Body weight should be on the back foot.

### **Stage two**

Throw the ball gently into the air, swing the straight arm forward to strike underneath the ball with the heel of the hand, with your fingers clenched. Transfer bodyweight from back to front foot.

### **Stage three**

Follow through with the fist pointing towards the intended target or the sky.

## Dig

The dig shot requires players to get low and to stop the ball touching the ground. When completed successfully the shot provides accurate and consistent passing, which is essential to create a multiple attack.

### **Stage one**

Stand in position on the balls of both feet, with knees slightly flexed. Drive off from legs to get towards the path of the ball.

### **Stage two**

Keep both eyes on the ball. Place the back of the right hand on top of the palm of the left hand. Bring both thumbs together and place them side by side. Keep fingers and thumbs close together. Lock your elbows together.

Hold arms out straight in front.

### **Stage three**

Hands start low in front of the body and swing up to strike the ball upwards. Strike the ball with the lower forearms. Follow through with the hands pointing towards the intended target or the sky.

## Set

The set shot is a delicate attacking shot that is an important part of the pass-set-spike sequence required for a successful attack.

### **Stage one**

Stand in position on the balls of your feet, with knees slightly flexed. Drive off from legs to get towards the path of the ball. Call for the ball. Get in line with the ball's path. Keep your eyes on the ball at all times.

### **Stage two**

Move towards the ball. Extend your elbows so that your arms are out in front of you at head height. Slightly flex your elbows. Have your palms facing up and fingers spread. Keep your eyes on the ball.

### **Stage three**

Watch the ball. Face the ball in ready position with knees slightly flexed. Hands are held above the head, palms up. Move body underneath the ball and push the ball into the air with your fingertips. Extend knees to help with the push into the air. Follow through with fingers pointing at the sky.

## Block

The block is not technically a maintaining possession shot, but a well-timed and effective block diffuses an offensive attack.

### **Stage one**

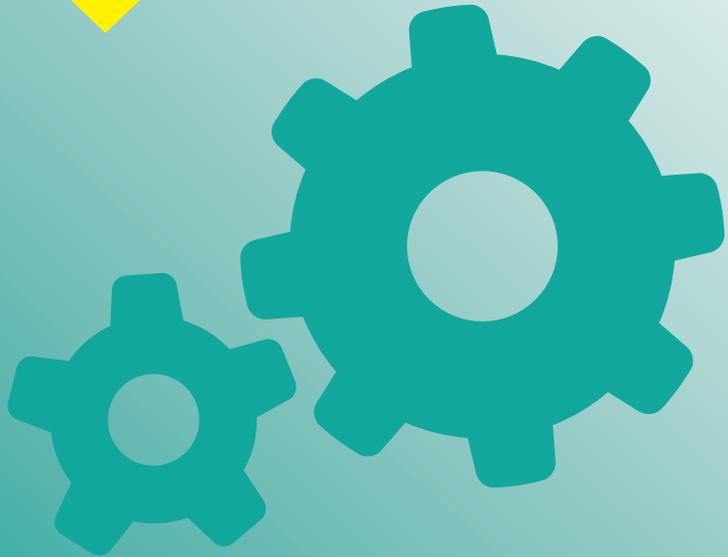
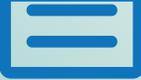
Stand in position on the balls of your feet, with knees slightly flexed. Drive off from legs to get towards the path of the ball. Get in line with the ball's path. Keep your eyes on the ball at all times.

### **Stage two**

Move towards the ball. Extend arms up above head. Have your palms facing forward and fingers spread. Keep your eyes on the ball.

### **Stage three**

Upon contact, try to angle the ball downwards. Begin to land move arms outwards for balance. Flex knees to help cushion landing. Get back into position to regain formation.



# Dance



A motif can be a single movement or a phrase of movement (for pupils in school, short phrases are often more helpful as they provide greater scope for development)

A motif contains 'the essence' of the dance; a dominant feature that is repeated, like a reoccurring theme throughout a dance

A motif is usually introduced at the start of a dance, then once established is developed and varied

An entire dance can be built around the development and variation of a few contrasting motifs.

## CREATING A DANCE MOTIF

A motif is the main, often recurring theme or element in a movement sequence.

When creating a dance motif always consider:

<b>ACTION</b>	<b>SPACE</b>
<b>DYNAMICS</b>	<b>RELATIONSHIPS</b>

Motifs can be created through the use of **5** basic actions:

<b>1</b>	<p><b>TRAVELLING</b></p> <p>Includes stepping, transferring body weight and sliding.</p>	
<b>2</b>	<p><b>JUMPING</b></p> <p>There are various ways of jumping: 2 feet to 2 feet, 2 feet to 1 foot etc.</p>	
<b>3</b>	<p><b>TURNS</b></p> <p>1/4, 1/2, 1/3 or full turns. Turns can be performed as a jump.</p>	
<b>4</b>	<p><b>GESTURES</b></p> <p>A body movement that portrays a concept or mood.</p>	
<b>5</b>	<p><b>STILLNESS</b></p> <p>A motionless pose during the dance sequence.</p>	