YEAR 11 KNOWLEDGE ORGANISER

MICHAELMAS TERM 2020/21

Trinity

Name:

Family Group:

LEARNING - LOVING - LIVING

CONTENTS PAGE

GENERAL INFORMATION

The knowledge organiser is a book that sets out the **important**, **useful** and **powerful knowledge** of a single topic on one page.

When used effectively, Knowledge Organisers are useful in:

- Helping build a foundation of **factual knowledge.**
- Embedding **revision techniques** for now and future studies (A-Level, College, University)
- Allowing knowledge to become stored in **long term memory** which frees up working memory for more complex ideas. It also allows you to connect concepts together, even across subjects

HOMEWORK EXPECTATIONS

EACH NIGHT you should spend *at least* **1 hour** per night on homework.
3 subjects per night x 20 minutes per subject= 1 hour. Use the homework timetable as a guide to what subjects to complete each night.

Complete all work in your exercise book and make sure you bring your knowledge organiser to school EVERYDAY (in your coloured folder).

Every FRIDAY morning the week's worth of KNOWLEDGE ORGANISER homework will be checked in Family Group time and detentions issued for work not complete, or not up to standard.

SUBJECT HOMEWORK

All students will also be assigned **ENGLISH** reading activities on www.CommonLit.org with each assignment taking 20-30 minutes to complete and **MATHS** activities with short explanatory videos on the online platform of https://mathswatch.co.uk.

It is also recommended to take advantage of FREE online revision tools such as www.senecalearning.com or the recently updated BBC BITESIZE.

It is also recommended that students regularly **READ** a variety of **fiction and non fiction books** of their choosing. This extra reading will develop and broaden general understanding and context in all subjects.

HOMEWORK TIMETABLE

Year 11	Subject 1	Subject 2	Subject 3
Monday	Maths	Option A	Option C
Tuesday	English	Option B	Option C
Wednesday	Maths	RE	Option D
Thursday	English	Science	Option A
Friday	Maths	Science	Option B

EQUIPMENT CHECKLIST

Pencil case	Knowledge Organiser	2 Black or Blue pens
2 pencils and Eraser	Green Pen	Pencil Sharpener
Mini whiteboard and pen	Calculator	Ruler
Maths geometry set	Class book	

HOMEWORK CHECKLIST

Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7
Half term						
Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7

Here are some activities that you can try at home with your knowledge organiser to help revise. There are even more strategies on page 3.

4 Methods of Retrieval Practice

@ImpactWales

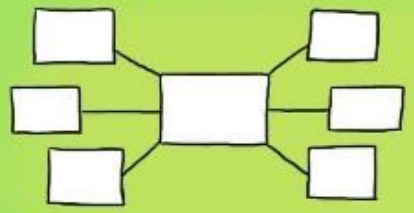
Before you start put away all your books & classroom materials.

Retrieval Practice Examples

- Exit Tickets
- Starter quizzes
- Multiple choice quizzes
- Short answer tests
- Free write
- Think, pair, share
- Ranking & sorting
- Challenge grids

BRAIN DUMP

Write, draw a picture, create a mind-map on everything you know about a topic.



Give yourself a time limit, say 3 minutes, then have a look at your books & add a few things you forgot.

QUIZZING

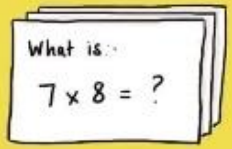
Create practice questions on a topic. Swap your questions with a partner & answer.

Question - What is a metaphor?

- ☐ A comparison using 'like, as, than'.
- ☐ A comparison where one thing is another.
- ☐ A comparison with a human attribute.

FLASHCARDS

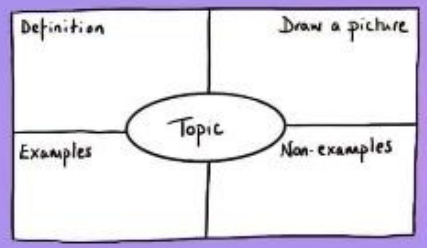
Create your own flashcards, question on one side answer on the other. Can you make links between the cards?



You need to repeat the Q & A process for flashcards you fail on more frequently & less frequently for those you answer correctly

KNOWLEDGE ORGANISERS

Complete a knowledge organiser template for key information about a topic.



You can use knowledge organisers to learn new vocab & make links in between subjects or ideas.

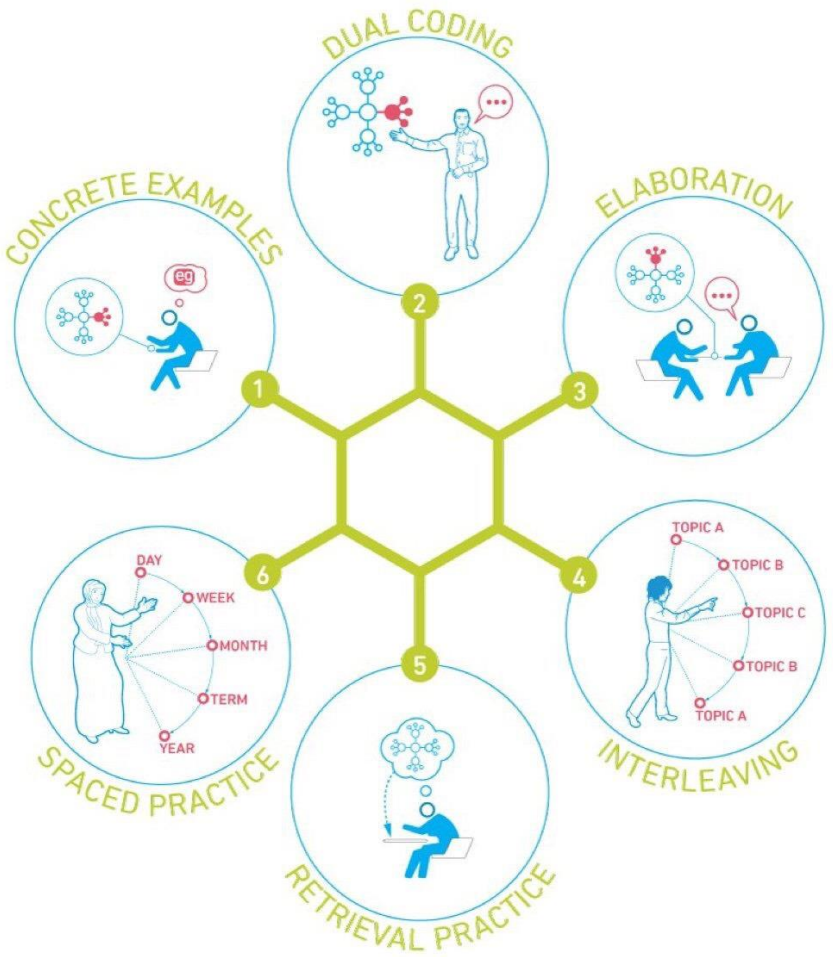
After you have retrieved as much as you can go back to your books & check what you've missed. Next time focus on that missing information

DUAL CODING

Dual coding is the process of combining visual and written materials. You can visually represent materials using methods such as info graphics, timelines, cartoon/comic strips, diagrams and graphic organisers. Combing images with words or explaining an image makes it more likely to 'stick'.

CONCRETE EXAMPLES

When you're studying, try to think about how you can turn ideas you're learning into concrete examples. Making a link between the idea you're studying and a real life example, concrete example, can help students understand abstract ideas and make it 'stick'.



ELABORATION

When talking about studying, elaboration involves explaining and describing ideas with many details. Elaboration also involves making connections among ideas you are trying to learn. Ask yourself questions about a topic to delve deeper. The more information you have about a specific topic the stronger your grasp and ability to recall.

SPACED PRACTISE

Divide up your revision into short manageable chunks of time . When revising aim for 20 - 30 minutes per session. Five hours spread out over two weeks is better than the same five hours all at once. This is **spaced practice** and it is regarded as one of the most effective revision strategies.

INTERVEAVING

Interleaving is a process where you combine multiple subjects and topics while you study in order to improve learning. Switch between ideas and make links between them during a study session. Interleaving has been shown to lead to better long-term retention

RETRIEVAL PRACTICE

Through the act of retrieval, or calling information to mind, our memory for that information is strengthened and forgetting is less likely to occur. Retrieval practice ideas include: Read, cover, write, check, flashcards and brain dumps.

Poetic Techniques

1) Alliteration: When words in a sentence start with the same letter
2) Caesura: A pause within or at the end of a line, often using a full stop
3) Enjambment: the continuation of a sentence without a pause beyond the end of a line, or stanza
4) Consonance: Repetition of consonant sounds
5) Assonance: Internal vowel rhyme
6) Sibilance: The 'S' sound, normally several of these in a row.
7) Symbolism: The idea of words or phrases representing something else
8) Onomatopoeia: Words that sound like the noise they describe
9) Metaphor: a figure of speech in which a word or phrase is applied to an object or action to which it is not literally applicable
10) Simile: comparing things using 'like' or 'as'
11) Oxymoron: When contradictory terms or ideas are put next to each other
12) Rhythm: The pattern or beat of a poem
13) Juxtaposition: Putting two things close together to create a contrasting effect
14) Stanza: The name for a verse in a poem
15) Refrain: A repeated part in a poem, like a chorus

Form / Structural Features and Techniques

16) Blank Verse: Poetry written in non-rhyming ten syllable words per line
17) Couplet : Pair of rhyming lines which follow on from each other
18) Chiasmus: reversal of ideas in a sentence - "… his hands, which did not tremble then / though seem to now." (War Photographer)
19) Free Verse: Non-rhyming, non-rhythmical poetry which follow the rhythm of natural speech
20) Iamb : A pair of syllables in which the second is stressed and the first is unstressed.
21) Pentameter : Five pairs of syllables per line
22) Tetrameter : Four pairs of syllables per line of poetry
23) Trimeter: Three pairs of syllables per line of poetry
24) Trochee (n) / Trochaic (adj) : A pair of syllables in which the first is stressed and the second unstressed (opposite of an iamb).
25) Volta : A turning point in the line of thought or argument in the poem
26) Quatrain : A four line stanza
27) Dramatic Monologue : A poem in which an imagined speaker addresses the reader
28) Narrative Poem: A poem which tells the story of an event
29) Petrarchan Sonnet : A sonnet consisting of an octave (8 lines) and a sestet (6 lines) – 'Ozymandias'

High Utility Quotations to Learn

Ozymandias

1) (human power and pride v power of nature/time, power of art/words)
2) 'Two vast and trunkless legs of stone'
3) 'Look on my works, ye Mighty, and despair!'
4) 'Nothing beside remains'
5) 'Of that colossal wreck, boundless and bare The lone and level sands stretch far away'

Exposure

6) (power of nature v human, effects of conflict, experience of conflict, patriotism)
7) 'In the merciless iced east winds that knive us…'
8) 'But nothing happens'
9) 'Sudden successive flights of bullets streak the silence'
10) 'Slowly our ghosts drag home: glimpsing the sunk fires'

Kamikaze

11) (reality of conflict, patriotism, nature, memory)
12) 'a shaven head full of powerful incantations'
13) 'the little fishing boats strung out like bunting on a green-blue translucent sea'
14) 'like a huge flag waved first one way'
15) 'he must have wondered which had been the better way to die'

War Photographer

16) (Effects of conflict, experience of conflict, power of memory/picture, human power)
17) 'As though this were a church and he a priest preparing to intone a Mass.'
18) 'Belfast. Beirut. Phnom Penh. All flesh is grass.'
19) 'blood stained into the foreign dust'
20) 'The readers' eyeballs prick with tears between the bath and pre-lunch beers'

Storm on the Island

21) Storm on the Island (Human power, power of nature, conflict (context)'
22) 'We are prepared.'
23) You might think that the sea is company, Exploding comfortably down on the cliffs'
24) 'spits like a tame cat Turned savage.'
25) 'We are bombarded by the empty air.'

		Term	Definition
Ozymandias	1	**Immortalise(v)** **Immortal (adj)**	Living forever, never dying
	2	**Contempt (n)** **Contemptuous (adj)**	the feeling that a person or a thing is worthless or beneath consideration
	3	**Vainglorious (adj)**	vain, excessively boastful, and have swelled pride
	4	**Transient (adj)** **Transience (n)**	lasting only for a short time; impermanent
	5	**Imperious (adj)**	Arrogant and domineering
	6	**Insignificant (adj)** **Insignificance (n)**	too small or unimportant to be worth consideration
London	7	**Indignant (adj)** **Indignance (n)**	Shock or annoyance at something that is unfair
	8	**Corrupt (adj)** **Corruption (n)**	Dishonest or fraudulent behavior by those in power
	9	**Marginalised (adj)**	People on the edges of society: the poor, minorities and those thought of as insignificant
	10	**Oppression (n)** **Oppressive (adj)**	inflicting harsh and authoritarian treatment
	11	**Vulnerable (adj)** **Vulnerability (n)**	Weak and easily hurt or injured
The Prelude	12	**The sublime**	Duality of nature: beautiful but scary
	13	**Pastoral (adj)**	A beautiful and idealized country scene
	14	**Formative (adj)**	An experience that has a lasting effect
	15	**Profound (adj)**	Very great, powerful and intense
	16	**Baleful (adj)**	Threatening, harmful, menacing
	17	**Sinister (adj)**	Threatening and evil like

		Term	Definition
My Last Duchess	18	**Domineering (adj)**	Bossy and arrogant
	19	**Objectify (v)** **Objectification (n)**	Treating someone like an object
	20	**Authoritarian (n)**	Bossy in a cruel and strict way
	21	**Repress (v)** **Repressive (adj)**	Controlling someone by force
	22	**Subjugate (v)** **Subjugation (n)**	Bring under your control, dominate
	23	**Euphemism (n)** **Euphemistic (adj)**	A word or phrase used to replace something rude, uncomfortable or taboo
	24	**False modesty**	Behaviour that is supposed to seem humble but comes across as being fake
Charge of the Light Brigade	25	**Dynamic (adj)** **Dynamism (n)**	characterized by constant change, activity, or progress
	26	**Audacious (adj)** **Audacity (n)**	showing a willingness to take surprisingly bold risks.
	27	**Venerate (v)** **Veneration (n)**	regard with great respect; revere.
	28	**Tribute (n)**	an act, statement, or gift that is intended to show gratitude, respect, or admiration
Exposure	29	**Tedium (n)** **Tedious (adj)**	too long, slow, or dull; tiresome or monotonous.
	30	**Pernicious (adj)**	having a harmful effect, especially in a gradual or subtle way.
	31	**Macabre (adj)**	disturbing because concerned with or causing a fear of death
	32	**Harrowing (adj)**	Acutely and strongly distressing
	33	**Agony (n)** **Agonise (adj)**	extreme physical or mental suffering
	34	**Nemesis (n)**	a long-standing rival; an arch-enemy.
	35	**Ostracise (v)** **Ostracisation (n)**	To be excluded from something

		Term	Definition			Term	Definition
Storm on the Island	35	**Isolated (adj)** **Isolation (n)**	far away from other places, buildings, or people; remote; lonely	War Photographer	52	**Desensitised (adj)** **Desensitisation (n)**	make (someone) less likely to feel shock or distress at scenes of cruelty or suffering by overexposure to such images.
	36	**Robust (adj)**	(of an object) sturdy in construction		53	**Commodify (v)** **Commodification (n)**	To turn something into something that can be sold
	37	**Colloquial (adj)** **Colloquialism (n)**	(of language) used in ordinary or familiar conversation; not formal or literary.		54	**Ceremony (n)** **Ceremonial (adj)**	a formal religious or public occasion
	38	**Volatile (adj)** **Volatility (n)**	liable to change rapidly and unpredictably		55	**Detached (adj)** **Detachment (n)**	the state of being objective or aloof; unaffected and uninvolved
Bayonet Charge	39	**In media res**	A narrative that begins in the middle of the action.	Tissue	56	**Extended metaphor**	a comparison between two unlike things that continues throughout a series of sentences in a paragraph or lines in a poem
	40	**Bewildered (ad)**	confused		57	**Enduring (adj)** **Endure (v)**	lasting over a period of time; durable.
	41	**Disparage (v)** **Disparaging (adj)**	expressing the opinion that something is of little worth; derogatory.		58	**Chronicle (v)**	record (a series of events) in a factual and detailed way
	42	**Frantic (adj)**	distraught with fear, anxiety, or other emotion	Emigree	59	**Nostalgia (n)** **Nostalgic (adj)**	a sentimental longing or wistful affection for a period in the past
Remains	43	**Nonchalant (adj)** **Nonchalance (n)**	Relaxed, casual, not bothered		60	**Sentimental (adj)** **Sentimentality (n)**	of or prompted by feelings of tenderness, sadness, or nostalgia
	44	**Anecdote (n)** **Anecdotal (adj)**	A personal story		61	**Immutable (adj)**	unchanging over time or unable to be changed.
	45	**Grotesque (adj)**	Disgusting, horrible perhaps comical too	Kamikaze	62	**Indoctrinate (v)** **Indoctrination (n)**	To accept a set of beliefs uncritically; brainwashed
	46	**Torment (v/n)**	severe physical or mental suffering.		63	**Ignominious (adj)** **Ignominy (n)**	Public shame and humiliation
	47	**Unsentimental (adj)**	not displaying or influenced by sentimental feelings.		64	**Catch-22**	a dilemma or difficult circumstance from which there is no escape because of mutually conflicting or dependent conditions.
Poppies	48	**Poignant (adj)** **Poignancy (n)**	Evoking sadness and regret	Checking out me History	65	**Anglocentric (adj)**	centred on Britain or England
	49	**Allude (v)** **Allusion (n)**	Make a link to something, hint at something		66	**Sardonic (adj)**	Grimly mocking
	50	**Composure (n)**	the state or feeling of being calm and in control of oneself		67	**Vernacular (adj)**	Spoken language from a specific region
	51	**Domestic (adj)**	Relating to the running of a home or to family relations.		68	**Dismissive (adj)**	showing that something is unworthy of consideration

Important Ideas

To simplify an expression you collect together all the terms that are alike. Look carefully at the sign before each term.

When substituting into expressions, use the correct order of operations i.e. $3x^2$ means 3 x *x*2 BUT $(3x)^2$ means you multiply 3 by x then square the answer.

To expand a single bracket, the term on the outside of the brackets needs to be multiplied by EVERY term on the inside of the bracket

To factorise and expression is the opposite of expanding. Find the HCF and take this outside of the brackets

Vocabulary

Variable	A variable is an unknown letter used to represent a number and can take any value
Expression	An expression is made up of numbers and or letters that represent unknown values. There is no equal, For example 3a +5
Terms	Separate parts of an expression e.g. in 5x + 3y, 5x is a term and 3y is a term
Coefficients	These are the numbers in front of the variables, e.g. in 6x 6 is the coefficient
Equation	An equation contains an = sign and at least one variable e.g. 3x+1 =7
Formula	A formula is a special type of equation which gives us a rule for working things out, e.g. A = b x h

Question	Answer
x + x + x + x	4x
5e + 2e - 3e	4e
4x + 2y – x +5y +6	3x +7y + 6
Be careful when there are square terms $3x^2 + 5x + 2x^2 - 4x$	$5x^2 + x$
5 x 4g	20g
3b x 4c	12 bc (normally written in alphabetical order but 12 cb is the same as 12bc
Find the value of 5c when c =4	5c = 5 x c = 5x 4 = 20
Evaluate $3a^2$ when a = 5	Use BIDMAS to help with this. We do the indices part first then multiply by 3 3×5^2 $3 \times 25 = 75$
Expand 2(3m +5)	$2(3m + 5)$ $= 6m + 10$
Expand 4r(2r-3)	$4r(2r - 3)$ $8r^2 - 12r$
Factorise 10 x +15	Find the HCF for 10 and 15 (5) outside the brackets, then work out what you need to multiply 5 by to get 10 and 15. ANS : 5(2x+3)

Key Facts & Formula

a + 3 a - 3 3 - a	Means add 3 to a Means subtract 3 from a Means subtract a from 3
3a	Means 3 x a
a + a + a	Simplifies to 3a
a x a x a	Simplifies to a^3
BIDMAS	• Gives the order we carry out operations: • Brackets, Indices, divide, Multiply, Add and subtract. • If there are just + and - in the expression we calculate from left to right. They have equal precedence

Expand and simplify $2(4m + 3) + 3(5m + 2)$
$= 8m + 6 + 15m + 6$
$= 23m + 12$

Expand and simplify $3(5m + 4) - 2(m + 3)$
$= 15m + 12 - 2m - 6$
$= 13m + 6$

MathsWatch References

33,34,35	Simplifying expressions
134	Expanding and simplifying expressions
136	Rearranging formulae
93	Expanding brackets
94	Simple factorisation
95	Substitution
75	BIDMAS

Important Ideas

Two lines are parallel if they are an equal distance apart, the two lines will never intersect (meet)

Two lines are perpendicular if their product is -1 OR in other words if they are the negative reciprocal of each other.

The general equation of a linear graph is y =mx +c, where m is the gradient and c is the intercept

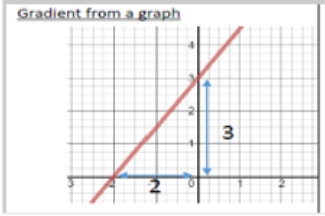
When changing the subject of the formula, you need to keep the equation balanced, i.e. , what you do to one side you must do to the other. If we need to make x the subject for y = 3x +1, subtract one from both sides leaving y = 3x, then divide both sides by 3, leaving x = y/3

Vocabulary

Gradient	Gradient or m is a measure of steepness of a line, the higher the value of m the steeper the line
Intercept	The intercept (or c in y = mx +c)) is the y value where the line crosses the y axis
Parallel	Two lines are parallel if the have the same gradient; when y = mx +c , 'm' will be equivalent. y=2x + 1, y = 2x +3 , both have a gradient of 2
Perpendicular	Two lines are perpendicular if they intersect at right angles
Intersect	The point of intersection of two lines is where the point where the lines meet
Quadratic	A quadratic equation must contain an x^2 term, a quadratic curve is a parabola
Linear	A straight line graph is a linear graph. A linear equation will have an x term
Subject	The subject of a formula is the single variable on one side of the equal sign
inequality	An *inequality* is like an equation that uses symbols for "less than"(<) and "greater than"(>) where an equation uses a symbol for "is equal to" (=).
Reciprocal	The reciprocal of a number is 1 divided by that number.

Questions / Answers

Gradient



$$m = \frac{\text{change in y}}{\text{change in x}}$$

$$m = \frac{3}{2}$$

Example:

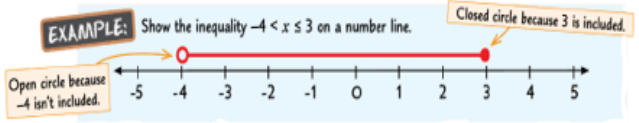
Find the gradient of the line segment between (2, -3) and (6, 9).

$$m = \frac{9 - -3}{6 - 2} = \frac{12}{4} = 3$$

So the gradient of this line segment is 3.

Inequalities

Drawing inequalities on a number line is dead easy — all you have to remember is that you use an open circle (○) for > or < and a coloured-in circle (●) for ≥ or ≤.



1. Solve $3x - 2 \leq 13$.

Just solve it like an equation — but leave the inequality sign in your answer:

+2) $3x - 2 + 2 \leq 13 + 2$

$3x \leq 15$

÷3) $3x \div 3 \leq 15 \div 3$

$x \leq 5$

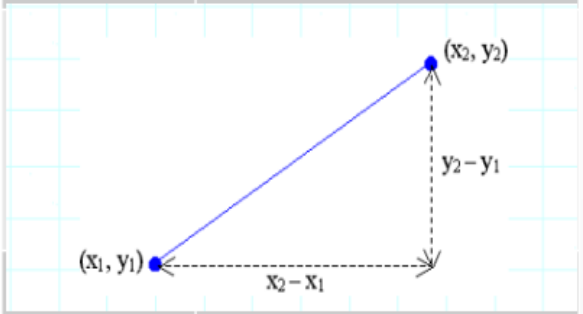
MathsWatch References

138,139,198	Solving In equalities and shading regions
212	Solving quadratic Inequalities
136,190	Rearranging formula
96,97	Straight line graphs and gradients
133,159	Midpoints and finding the equation of a line

Key Facts & Formula

$y=mx+c$

The equation of a straight line. M is the gradient of the line and c is the y intercept



$$\text{gradient 'm'} = \frac{\text{change in 'y'}}{\text{change in 'x'}} = \frac{y_2 - y_1}{x_2 - x_1}$$

Pythagoras

$A^2 + b^2 = c^2$

We can use Pythagoras to find the distance between two points.

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

To make something the subject of a formula we need to isolate the variable on one side of the equation

Example 1

Make r the subject of $C = 2\pi r$.

To isolate r, divide by 2π.

$$\frac{C}{2\pi} = r$$

We often write formulae with the subject on the left-hand side, so this becomes

$$r = \frac{C}{2\pi}$$

Example 4

Make x the subject of $3x + 5 = y - ax$.

When a formula contains the new subject more than once, start by isolating any terms including it on one side of the equals sign.

Here, add ax and subtract 5.

$$3x + ax = y - 5$$

Now we factorise the side with our new subject.

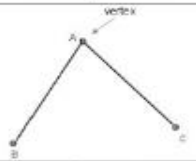
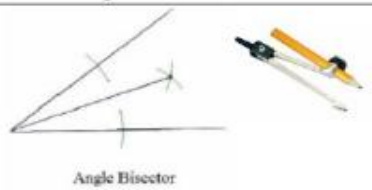
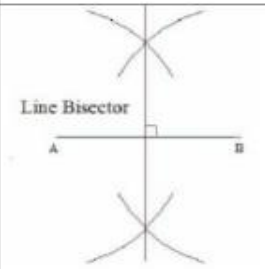
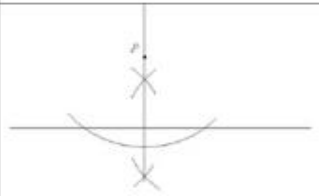
$$x(3 + a) = y - 5$$

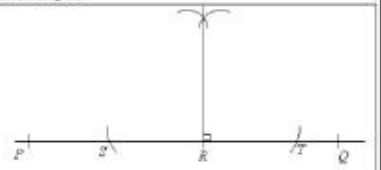
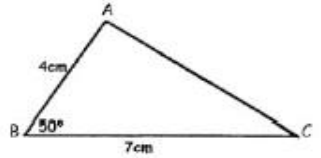
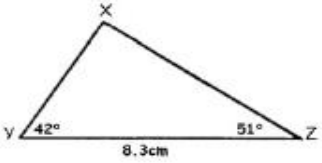
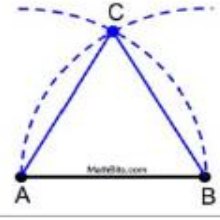
Then divide by the bracket to leave x on its own.

$$x = \frac{y - 5}{3 + a}$$

> means 'Greater than' ≥ means 'Greater than or equal to'

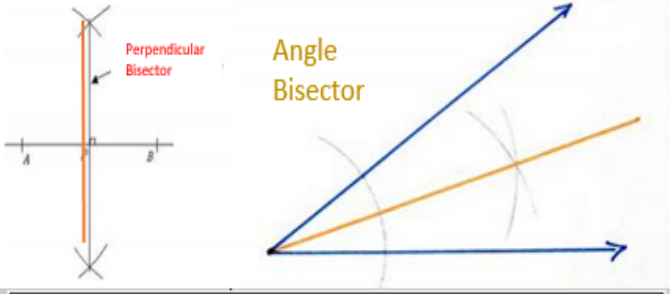
< means 'Less than' ≤ means 'Less than or equal to'

Topic/Skill	Definition/Tips	Example
1. Parallel	Parallel lines never meet.	
2. Perpendicular	Perpendicular lines are at right angles. There is a 90° angle between them.	
3. Vertex	A corner or a point where two lines meet.	
4. Angle Bisector	**Angle Bisector: Cuts the angle in half.** 1. Place the sharp end of a pair of compasses on the vertex. 2. Draw an arc, marking a point on each line. 3. Without changing the compass put the compass on each point and mark a centre point where two arcs cross over. 4. Use a ruler to draw a line through the vertex and centre point.	
5. Perpendicular Bisector	**Perpendicular Bisector: Cuts a line in half and at right angles.** 1. Put the sharp point of a pair of compasses on A. 2. Open the compass over half way on the line. 3. Draw an arc above and below the line. 4. Without changing the compass, repeat from point B. 5. Draw a straight line through the two intersecting arcs.	
6. Perpendicular from an External Point	The **perpendicular distance** from a point to a line is the **shortest distance** to that line. 1. Put the sharp point of a pair of compasses on the point. 2. Draw an arc that crosses the line twice. 3. Place the sharp point of the compass on one of these points, open over half way and draw an arc above and below the line. 4. Repeat from the other point on the line. 5. Draw a straight line through the two intersecting arcs.	

Topic/Skill	Definition/Tips	Example
7. Constructing a perpendicular from a point on the line	Given line PQ and point R on the line: Put the sharp point of a pair of compasses on point R. 2. Draw two arcs either side of the point of equal width (giving points S and T) 3. Place the compass on point S, open over halfway and draw an arc above the line. 4. Repeat from the other arc on the line (point T). 5. Draw a straight line from the intersecting arcs to the original point on the line.	
8. Constructing Triangles (Side, Side, Side)	1. Draw the base of the triangle using a ruler. 2. Open a pair of compasses to the width of one side of the triangle. 3. Place the point on one end of the line and draw an arc. 4. Repeat for the other side of the triangle at the other end of the line. 5. Using a ruler, draw lines connecting the ends of the base of the triangle to the point where the arcs intersect.	
9. Constructing Triangles (Side, Angle, Side)	1. Draw the base of the triangle using a ruler. 2. Measure the angle required using a protractor and mark this angle. 3. Remove the protractor and draw a line of the exact length required in line with the angle mark drawn. 4. Connect the end of this line to the other end of the base of the triangle.	
10. Constructing Triangles (Angle, Side, Angle)	1. Draw the base of the triangle using a ruler. 2. Measure one of the angles required using a protractor and mark this angle. 3. Draw a straight line through this point from the same point on the base of the triangle. 4. Repeat this for the other angle on the other end of the base of the triangle.	
11. Constructing an Equilateral Triangle (also makes a 60° angle)	1. Draw the base of the triangle using a ruler. 2. Open the pair of compasses to the exact length of the side of the triangle. 3. Place the sharp point on one end of the line and draw an arc. 4. Repeat this from the other end of the line. 5. Using a ruler, draw lines connecting the ends of the base of the triangle to the point where the arcs intersect.	

Important Ideas

Vectors	A vector between two points A and B is described as: $\overrightarrow{AB}$, or a
Iteration	An algebraic method used to estimate the roots of an equation
A Circle	The circle - the locus of points which are equidistant from a fixed point, the centre

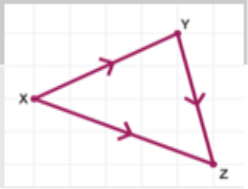


Vocabulary

Vector	describes a movement from one point to another. A vector quantity has both direction and magnitude (size)
Roots	Where the graph cuts the x-axis; otherwise, the value(s) of x when the equation is equal to zero
Bisect	To cut into two equal halves
Midpoint	The middle of a line segment; it cuts the line segment exactly in half
Construct	To produce a geometrical drawing using rulers and compasses only
Loci (Locus singular)	A set of points that satisfy a certain condition

Q& A

Show, using vectors that: $\overrightarrow{XY} + \overrightarrow{YZ} = \overrightarrow{XZ}$

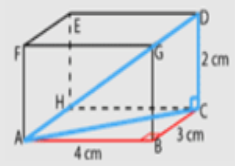


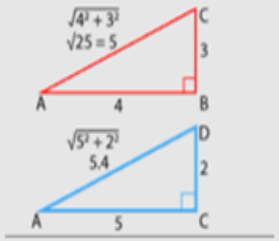
$$\begin{pmatrix}4\\2\end{pmatrix} + \begin{pmatrix}1\\-4\end{pmatrix} = \begin{pmatrix}4+1\\2+-4\end{pmatrix} = \begin{pmatrix}5\\-2\end{pmatrix}$$

Show that $x = 1 + \frac{11}{x-3}$ is a rearrangement of the equation $x^2 - 4x - 8 = 0$

multiply everything by $(x - 3)$:
$x(x - 3) = 1(x - 3) + 11$
so $x^2 - 3x = x + 8$
so $x^2 - 4x - 8 = 0$

Calculate the Length AD



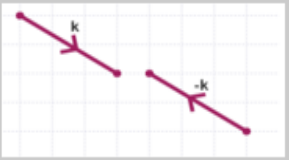


MathsWatch References

174, 219	vectors
180	Iterative processes
165	loci
146a, 146b	Constructing perpendiculars
217	Pythagoras in 3D
218	Trigonometry in 3D

Key Facts & Formula

Negative Vectors



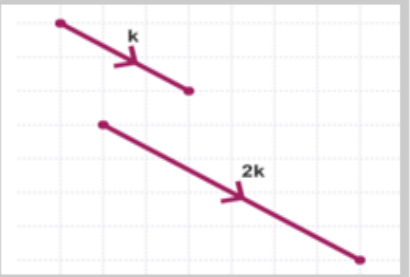
A negative vector has the same magnitude but different direction

$k = \begin{pmatrix}3\\-2\end{pmatrix}$ $-k = \begin{pmatrix}-3\\2\end{pmatrix}$

Scalor multiples

$k = \begin{pmatrix}3\\-2\end{pmatrix}$

$2k = \begin{pmatrix}2 \times 3\\2 \times -2\end{pmatrix} = \begin{pmatrix}6\\-4\end{pmatrix}$



Pythagoras' Theorem

The theorem is: $a^2 + b^2 = c^2$

Where: Side c is always opposite the right-angle

When calculating the length of side c, use $a^2 + b^2 = c^2$

When calculating the length of a shorter side (a or b) use $c^2 - b^2 = a^2$

Trigonometry

$\sin\theta = \frac{opposite}{hypotenuse}$ $\cos\theta = \frac{adjacent}{hypotenuse}$ $\tan\theta = \frac{opposite}{adjacent}$

Where:

SOH-CAH-TOA!

To calculate angles, the trigonometry function needs to change sides – to do this, the inverse of the function must be used:-

$\sin^{-1}$; $\cos^{-1}$; $\tan^{-1}$

The Atmosphere

For 200 million years, the amount of different gases in the atmosphere have been much the same as they are today:

- 78% nitrogen
- 21% oxygen
- The atmosphere also contains small proportions of various other gases, including carbon dioxide, water vapour and noble gases.

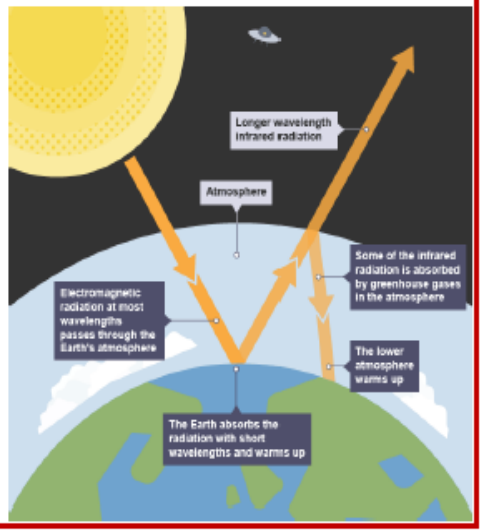
The Greenhouse Effect

The Earth has a layer of gases called the **Greenhouse layer.** These gases, which include carbon dioxide, methane and water vapour, maintain the temperature on Earth high enough to support life.

The greenhouse layer allows the short wave infrared radiation emitted by the Sun to pass through it but absorbs the long wave infra red radiation which is emitted by the Earth, preventing rapid heat energy transfer to space. This is how it insulates the Earth.

Some human activities increase the amounts of greenhouse gases in the atmosphere. These include:

- combustion of fossil fuels
- deforestation
- methane release from farming
- more animal farming (digestion, waste decomposition)



Key Terms	Definitions
greenhouse layer	The layer of gases which absorb infra red radiation emitted from the Earth

The Evolution of the Atmosphere

Scientists are not sure about the gases in the early atmosphere, as it was so long ago (4.6 billion years) and there's a lack of evidence. Many scientists believe the early atmosphere was made up of mainly carbon dioxide, water vapour and small amounts of methane, ammonia and nitrogen, released by **volcanoes. There was little or no oxygen around at this time.** The early Earth was very hot, but as it cooled the water vapour in the atmosphere condensed and **formed the oceans.**

As the oceans formed, carbon dioxide dissolved in the ocean. The carbon dioxide formed carbonates and precipitated out (formed solids). This process reduced the amount of carbon dioxide in the atmosphere.

Approximately 2.7 billion years ago, plants and algae evolved. This decreased the amount of carbon dioxide in the atmosphere and increased the amount of oxygen in the atmosphere.

When sea animals evolved they used the carbon dioxide in the ocean to form their shells and bones (which are made of carbonates). When these sea creatures died their shells and bones became limestone (calcium carbonate), which is a sedimentary rock.

Once enough oxygen was in the atmosphere, it could support animals, which carry out respiration. These processes have caused the levels of gases in the atmosphere to be where they are today.

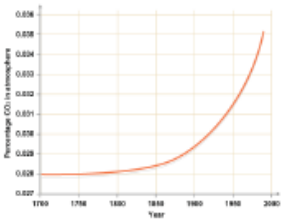
Changes in the atmosphere

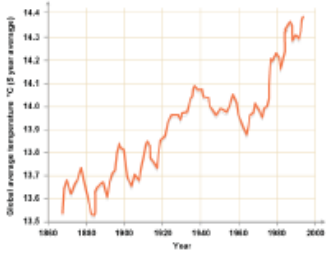
Recent activity by humans has changed the composition of the atmosphere.

- Combustion of fossil fuels has increased the amount of carbon dioxide in the atmosphere
- It has increased the amount of harmful gases such as **nitrous oxides**, which are made by nitrogen reacting with oxygen from the air in engines.
- Sulphur is also present in many fuels; this has increased the amount of **sulphur dioxide**, which causes acid rain.
- **Carbon particles (aka particulates)** can also released, which cause smog
- The toxic gas **carbon monoxide** is produced during incomplete combustion.

The Enhanced Greenhouse Effect

In the last 100 years humans have added to the greenhouse effect through combustion of fossil fuels, increased farming and deforestation. Many scientists believe this has lead to a **rise in global temperature.**





However, this is such a complex system that misunderstandings of it can lead to **inaccurate or biased** opinions being reported in the media.

Consequences of Climate Change

An increase in average global temperature is a major cause of **climate change.**
The potential effects of global climate change include:

- sea level rise, which may cause flooding and increased coastal erosion
- more frequent and severe storms
- changes in the amount, timing and distribution of rainfall
- water shortages for humans and wildlife
- changes in the food producing capacity of some regions
- changes to the distribution of wildlife species.

Students should be able to discuss the scale, risk and environmental implications of global climate change.

Waste water and Sewage

Waste water from houses and farming needs to **be treated** before it can be released into rivers and lakes. It is firstly filtered to remove large particles and is then left so that the sediment drops to the bottom. The "sludge," this is the name given to the sediment at the bottom, is then anaerobically digested (broken down by bacteria) to make methane gas. Any remaining **effluent** is broken down by aerobic respiration. The water is then released back into the rivers and lakes.

Key Terms	Definitions
carbon footprint	The **carbon footprint** is the total amount of carbon dioxide and other greenhouse gases released over the life of a product
carbon neutral	There is no net increase in **carbon dioxide in the atmosphere**

Carbon Footprint

The **carbon footprint** is the total amount of carbon dioxide and other greenhouse gases released over the life of a product. Many people or businesses look to reduce their carbon footprint by:

- increased use of alternative energy supplies
- energy conservation
- carbon capture and storage
- carbon taxes and licences

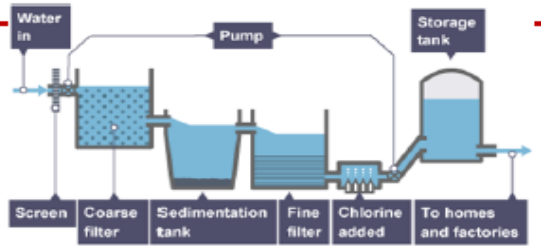
People also try to **offset** their carbon by planting trees.
If something is carbon neutral, this means that there is no net increase in **carbon dioxide in the atmosphere** when it is used.

Water

Water of appropriate quality is **essential for life**. For humans, drinking water should have low levels of dissolved **salts and microbes**. Water that is safe to drink is called **potable water**.
The methods used to produce potable water depend on available supplies of water and local conditions.
In the United Kingdom (UK), rain provides water with low levels of dissolved substances (fresh water) that collects in the ground and in lakes and rivers, and most potable water is produced by:

- passing the water through filter beds to remove any solids
- sterilising to kill microbes, using chlorine or UV light

In some parts of the world there is not enough fresh water so the salt has to be removed from water. This process is called **desalination**.
Desalination can be done by distillation or reverse osmosis. This requires a **large amount of energy**.



LCAs

Life cycle assessments (LCAs) are carried out to assess the environmental impact of products in each of these stages of a products life:

1. extracting and processing raw materials
2. manufacturing and packaging
3. use and operation during its lifetime
4. disposal at the end of its useful life, including transport and distribution at each stage.

Some things are easy to measure; for example: the energy required to make the product. However some things like how much pollution it releases are hard to measure and therefore difficult to give a value to.

Example of two Life Cycle Assessments:

Product	Plastic Bag	Paper Bag
Raw Material	Crude Oil	Timber
Manufacturing and Packaging	Made form crude oil by fractional distillation, then cracking and polymerisation, high energy process. Little waste as other fractions are used for other things	Made by pulping timber. Lots of waste, high energy process
Use of product	Has multiple uses, can be reused.	Usually only used once.
Disposal/End of Life	Can be recycled but are not biodegradable	Can be recycled and are biodegradable

Key Terms	Definitions
LCA	An evaluation of the environmental impact a product had over its lifetime

Recycling

Many of the Earth's resources are finite: for example, metals and crude oil. It is therefore vital we recycle resources. The processes for extracting these materials are often high energy and damaging to the environment.

Metals can be recycled by melting and **recasting or reforming** into different products.

Some products, such as glass bottles, can be reused. Glass bottles can be **crushed and melted t**o make different glass products. Other products cannot be reused and so are recycled for a different use.

Homeostasis

Unless chemical and physical conditions in the body are kept within strict limits, cells die. Thus, our bodies constantly and automatically regulate the internal conditions in the body to maintain optimum functions. This regulation is called **homeostasis**. It is vital for proper enzyme functioning, and indeed all cell functions.

Some factors that need controlling by homeostasis in the human body:

- Blood glucose concentration
- Body temperature
- Water levels
- Nitrogen levels.

The regulation that takes place can be carried out by the **nervous system**, the **endocrine system** (which produces hormones), or a combination of the two. These automatic control systems we use for homeostasis all include:

- Receptor cells – these detect changes in the environment. Changes are called **stimuli**.
- Coordination centres – these receive information from receptor cells (electrical or chemical information) and process the information. Examples include the brain, spinal cord and pancreas.
- Effectors – these are muscles or glands, which carry out the responses as directed by the control centre. Muscles **contract** and glands release chemicals, such as hormones.

The human nervous system

The nervous system is a network of neurones (nerve cells), bundled into nerves. It includes the nerves all over the body and the **central nervous system**, which consists of the **brain** and **spinal cord**. The nervous system allows us to react to the surroundings and control our behaviour. It can act involuntarily (in **reflexes**) or voluntarily.

Information from receptors, in the form of electrical impulses, passes along neurones to the central nervous system (CNS for short); the CNS coordinates the response by transmitting electrical impulses to the effectors (see above).

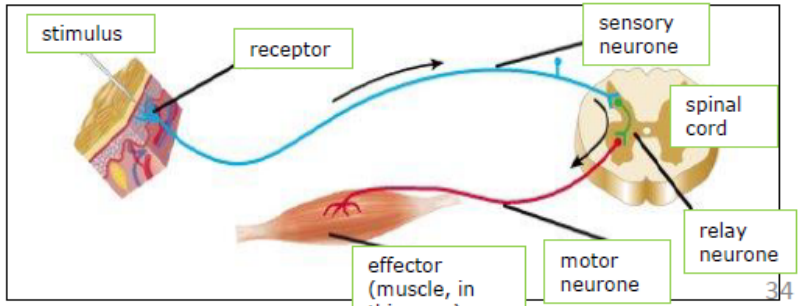
A reflex arc causes reflex actions, which are rapid and automatic (automatic because they don't involve the conscious part of the brain).

Key Terms	Definitions
homeostasis	Regulating the internal conditions of the body in response to internal or external changes, to maintain optimum conditions for the body's functioning
endocrine system	The network of hormone-producing glands in the body. Hormones are chemical messengers that travel in the bloodstream to their target tissues.
blood glucose	Glucose (a simple sugar) is transported in the blood, as all cells require it for respiration. The concentration of blood glucose must be kept within very tight limits at all times.
stimulus	A change in the environment, detected by a receptor cell. E.g. light, sound, chemicals (smells and tastes), pressure, pain, temperature etc.
nerve	A nerve is just a collection of many nerve cells; nerve cells are called **neurones**. Neurones transmit (carry) information as **electrical impulses**.

The reflex arc and reflex actions

Reflex actions, for instance pulling your hand away from a pain stimulus, follow a simple pathway.

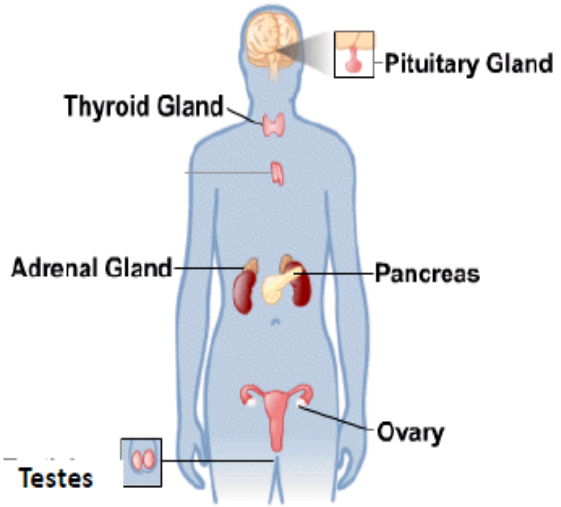
1. The **receptor** detects the **stimulus** and passes electrical impulses along the **sensory neurone** to the CNS (the spinal cord part, in this case).
2. There is a junction (tiny gap) between the sensory neurone and the **relay neurone** called a **synapse**. Here, a chemical is released that diffuses across the gap and causes an electrical impulse to pass along the relay neurone.
3. There is another synapse between the relay neurone and the **motor neurone**, again a chemical is released that causes the electrical impulse to pass along the motor neurone.
4. The impulse arrives at the **effector** – in this example, a muscle that contracts to pull your hand away from the source of pain.



The human endocrine system

Hormones are released by endocrine glands directly into the bloodstream so they can be transported to a target organ or tissue and cause an effect. In comparison with the nervous system, the effects caused by the endocrine system are slower but act for longer. The hormones themselves are large chemical molecules.

The most important endocrine gland is the **pituitary gland** – think of it as a master gland that secretes many hormones that act on *other endocrine glands*, which then release hormones of their own. Learn the positions of the endocrine glands indicated on the diagram.



Diabetes

Diabetes is a group of disorders where blood glucose cannot be properly regulated by the body, which is potentially very dangerous. There are two types, with different causes and treatments. More on this in topic 13: how do organisms get sick?

Controlling blood glucose concentration

The monitoring and control of blood glucose concentration are both carried out by the **pancreas**. When blood glucose concentration rises (for instance, soon after eating), the pancreas detects this and releases the hormone **insulin**. Insulin causes glucose to move out of the blood and into cells. In particular, muscle and liver cells take in glucose and convert it to a much bigger molecule called **glycogen** for storage, rather than keeping it as glucose in their cytoplasm. This, obviously, *lowers* the blood glucose concentration back down to what it should be.

HT: when blood glucose concentration drops too low, the pancreas detects this and releases a different hormone: **glucagon**. Glucagon causes muscle and liver cells to convert glycogen back into glucose and release it into the blood. This obviously *raises* the blood glucose concentration back up. Therefore, using insulin and glucagon, the pancreas can keep your blood glucose concentration within very tight limits – an excellent example of homeostasis.

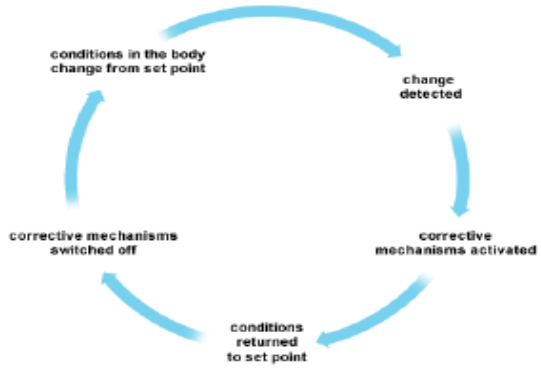
Key Terms	Definitions
hormone	A large chemical released by an endocrine gland; hormones have target tissues/organs and they produce an effect when they reach them.
target organ/tissue	The destination of a hormone and the place where the effect caused by the hormone actually happens.
secrete	The proper term for 'release' of a chemical in the body, such as a hormone from an endocrine gland.
insulin	The hormone released by the pancreas that lowers blood glucose concentration, by making cells take in glucose from the blood.
glycogen	Large chemical, made from glucose, that acts as a store of glucose in liver and muscle cells.
pituitary gland	The 'master gland' of the endocrine system, since, through its hormone release, it can make other endocrine glands release hormones.

HT: negative feedback

Negative feedback is an important concept in homeostasis. Secretion of hormones is stimulated by a change from the normal level of a condition in the body. The hormone brings the condition back under control, so its release is no longer stimulated. In a round about way, hormones end up preventing their own release – this is called negative feedback. The diagram shows this in general. The level of many hormones can be controlled in this way.

Thyroxine, secreted by the thyroid gland, is controlled by negative feedback, for example. Thyroxine stimulates the **basal metabolic rate** – the baseline for the speed of chemical reactions in the body. This is important in growth and development.

Another hormone you need to know about is adrenaline. This is released by the adrenal glands when you are scared or stressed. It increases the heart rate, increasing the delivery of oxygen and glucose to the brain and muscles. This prepares the body for 'fight or flight' – combat or running away.



Controlling water and nitrogen balance in the body

Maintaining water levels in the body is essential for proper functioning of body cells. You must regularly 'top up' your water (by having a drink!), as it is constantly being lost from the body. Water is lost in these ways:

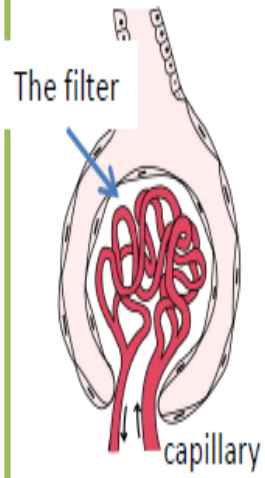
- Water vapour is lost from the **lungs** when we exhale (breathe out)
- Water (along with ions and urea) is lost from the **skin** in sweat
- Water (along with ions and urea) is lost through the **kidneys** in urine.

We can't control the first two methods of water loss – you have to breathe and sweating is unavoidable (and varies according to temperature of the surroundings, of course). However, the amount of water lost in urine can be controlled – by the endocrine system. So, your body can remove excess water in the urine, or keep some water back by not putting so much in the urine.

Key Terms	Definitions
urea	A chemical that must be removed from the body, as it is mildly toxic. It is produced in the liver from excess (too much) amino acids. Urea contains nitrogen.
urine	Wee! Urine contains water (in variable amounts), ions and, most importantly, urea. Urine is produced in the kidneys.
excretion	Any process that removes substances from the body.
filtration	In the kidney, filtration of the blood means large particles/cells/molecules remain in the blood (e.g. red blood cells) and small molecules go through the filter (e.g. water, ions, glucose, urea).
reabsorption	In the kidney, many substances are taken back into the blood even though they were just filtered out. 100% of glucose is reabsorbed (unless someone has diabetes) and most of the water and ions.

Kidney function

Kidneys produce urine in two stages: by **filtration** of the blood then **selective reabsorption** of useful substances. Only small molecules can get through the filter (which is why there aren't any red blood cells in your urine). The kidney then **reabsorbs** (takes back in) the substances you need – **all** the glucose, many of the ions and most of the water.



HT: urea formation and hormonal control of water level

Urea is a product made in the liver. The digestion of proteins (from the diet) results in excess amino acids which need to be excreted safely. The liver removes the amino part of the amino acids (NH_3) – a process called **deamination**. The **ammonia** produced is toxic so it is immediately converted to **urea** in the liver cells, which is far less harmful. The urea enters the bloodstream so it can be filtered out in the kidneys.

ADH is the hormone that controls water level in the body. It is released by the pituitary gland when the water level drops (the blood is too concentrated). The target organ for ADH is the kidney – ADH causes the kidneys to reabsorb more water into the blood, so the water level increases again. The release of ADH is controlled by negative feedback.

Experiment: The affect of practise on Reaction Time

Equipment List

- metre ruler
- chair
- table
- partner.

Method

1. You should use your weaker hand for this experiment. If you are right handed then your left hand is your weaker hand.
2. Sit down on the chair with good upright posture and eyes looking across the room.
3. Place the forearm of your weaker arm across the table with your hand overhanging the edge of the table.
4. Your partner will hold a ruler vertically with the bottom end (the end with the 0 cm) in between your thumb and first finger. Practice holding the ruler with those two fingers.
5. Your partner will take hold of the ruler and ask you to remove your fingers.
6. Your partner will hold the ruler so the zero mark is level with the top of your thumb and tell you to prepare to catch the ruler.
7. Your partner will then drop the ruler without telling you.
8. You must catch the ruler as quickly as you can when you sense that the ruler is dropping.
9. After catching it, look at the number level with the top of your thumb on the ruler. Record this as a measure of how fast you caught it in a table such as the one here.
10. Have a short rest and then repeat the drop test. Record the number on the ruler as attempt 2.
11. Continue to repeat several times.
12. Swap places with your partner and repeat the experiment to get their results.
13. Use a conversion table to convert your ruler measurements into reaction times.

Expected Results

The results that you get will depend on the person that is carrying out the experiment. If they do not have a lot of practice with their weaker hand practise may make a lot of difference to their reaction time. However if they use their weak hand a lot then practise might make very little difference and no difference will b observed.

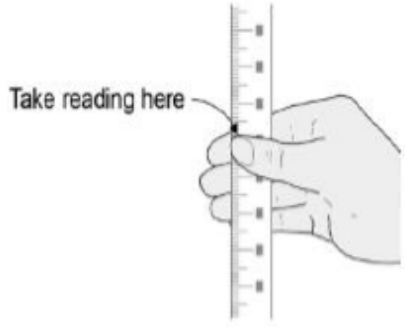
Variables

I.V Amount of practise
D.V Reaction time
C.Vs Hand used, potion ruler is dropped from, conditions (distractions)

Diagram

Figure 1

Figure 2



Experimental improvements

Computer programs can record reaction time For example clicking the mouse when the colour changes . Computer programs have high levels of precisions as most will measure to at least 0.01s.
A computer will also reduce the chances of random errors occurring and from someone getting used to when someone will drop the ruler.

Experimental Variations

This experiment can be completed but with a different independent variable. For example, how much caffeine the person has consumed, how tired the person is or how distracted they are.

Magnets

The poles of a magnet are where the magnetic forces are strongest. This is because the magnetic field lines are *most concentrated* at the poles, as you can see on the diagram below.

Magnets exert forces on one another when they are brought together: a **non-contact** force. If like poles (N-N or S-S) are brought together, the force is of repulsion. If unlike poles are brought together (N-S), the force is of attraction.

Magnets can be classified as **permanent** or **induced** (temporary). Permanent magnets have their own magnetic field, and it doesn't go away. Induced magnets are made when a material is placed in a magnetic field. (In most cases, this needs to be a magnetic material. The only magnetic materials are iron, steel, cobalt and nickel.) Induced magnets are always **attracted** to the magnet that turned them into a magnet – this is why you can pick up paper clips or nails with a bar magnet: the paper clip becomes an induced magnet with poles that are aligned so there is a force of attraction. See the poles labelled on the diagram. Induced magnetism is quickly lost when the material is removed from the magnetic field that induced it.

Magnetic fields

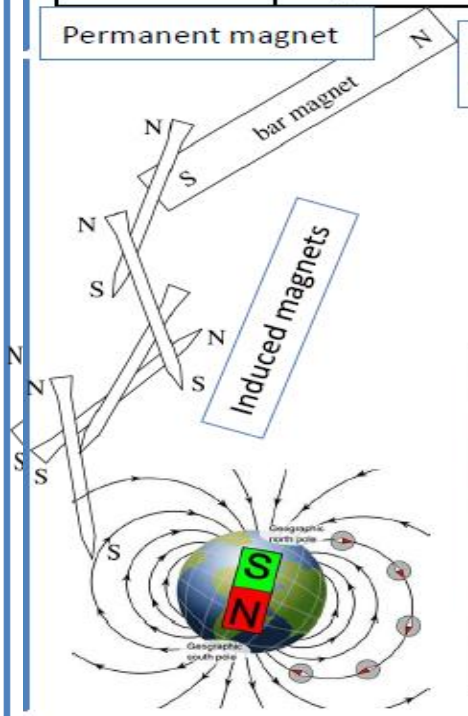
Magnetic fields are around all magnets (permanent or induced). The **direction** of the magnetic, as the diagram shows, is from **north** to **south.** The north pole of a magnet is properly defined as: *the pole that causes a force away from it, if a north pole is placed at that end.* This makes sense when you remember that like poles repel. So you can decide which end in north on an 'unknown magnet' by looking at the direction of the force that acts if a north pole (on another magnet) is brought to one end of your magnet. Repulsion (force away) means that end must be a north pole. Sometimes the north pole is called the **north seeking pole**, because it will point north on Earth if left freely suspended.

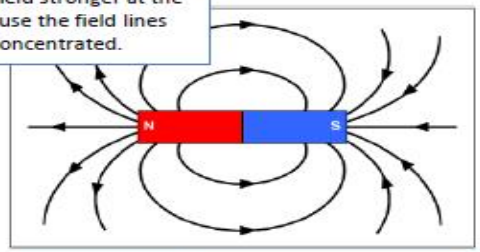
Magnetic fields are *strongest* at the poles and get weaker as the distance from the magnet increases. Using a **magnetic compass** (sometimes called a plotting compass), we can find out the direction of a magnetic field – the diagram shows how to do this.

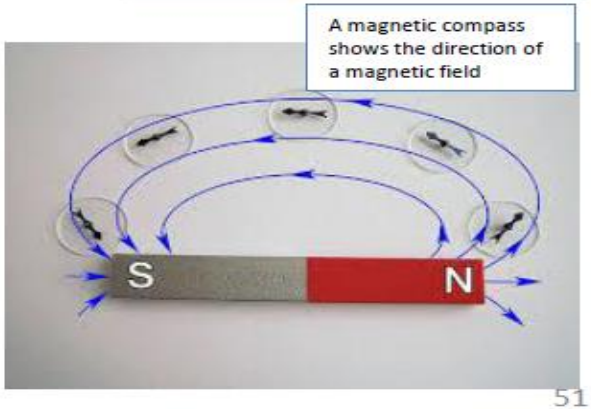
Earth has a **magnetic field**. Using a compass, you can tell that the magnetic field points towards the north pole (Santa's house), so this actually means that the geographic north pole of Earth is a south pole of a magnet! See diagram.

Furthermore, we know it is the **core** of the Earth that is magnetic (not the whole thing) because a compass at the north pole (in the Arctic circle) points down below your feet. It is worth realising, too, that the geographic north pole (the top of Earth's axis) is in a different location to 'magnetic north' – the latter is actually in northern Canada. So a magnetic compass actually wouldn't be much use if you were trying to get to Father Christmas's house.

Key Terms	Definitions
permanent magnet	A magnet that always has its own magnetic field. Attracts magnetic materials, and can attract or repel other magnets.
induced magnet	A temporary magnet: make one by putting a suitable material in a magnetic field.
poles	The ends of a magnet. Named north and south, based on which way on Earth they'd point if suspended freely. The other name is 'north seeking' or 'south seeking' as a result.
magnetic field	The region around a magnet where a force acts on other magnets or on magnetic materials. (3D, unlike diagrams usually show)
magnetic compass	A small bar magnet balanced on a pin so it can spin around. Points towards Earth's magnetic north due to Earth's magnetic field, but can also be used to find the direction of a magnetic field for another magnet.







Electromagnetism – current and magnetic fields

A wire that is carrying a current has a magnetic field around it. No current means no magnetic field, but switch it on and you get a magnetic field. As the diagram shows, switching the direction of the current switches the direction of the magnetic field. Also notice that the magnetic field gets stronger as you get closer to the wire carrying the current – this is shown by the field lines getting closer together (more concentrated).

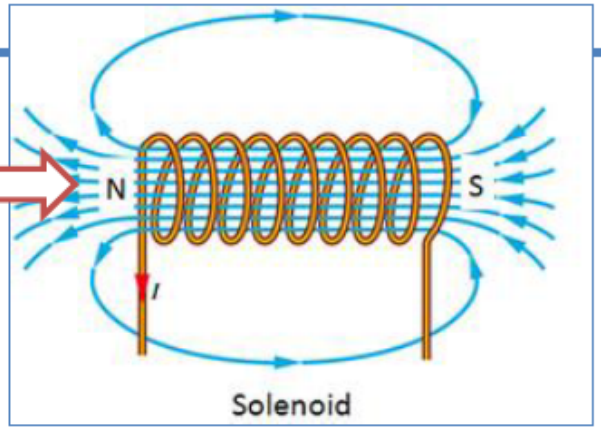
Not surprisingly, increasing the current increases the strength of the magnetic field. You can easily check the *direction* of the magnetic field with a magnetic compass, just like with bar magnets. We can dramatically increase the strength of the magnetic field by winding the current-carrying wire into a coil called a **solenoid**. Even with the same size current, the magnetic field is stronger in a solenoid. Once you've made a solenoid, notice that the magnetic field is very similar in shape to the magnetic field of a bar magnet – it has a north and south pole, and it strongest at the poles. The magnetic field is also strong *inside* the coil – as the concentrated field lines show.

We can increase the strength of the magnetic field even further by putting a magnetic (e.g. iron) **core** in the solenoid – literally a cylinder of iron. We call this an **electromagnet**. (see diagram)

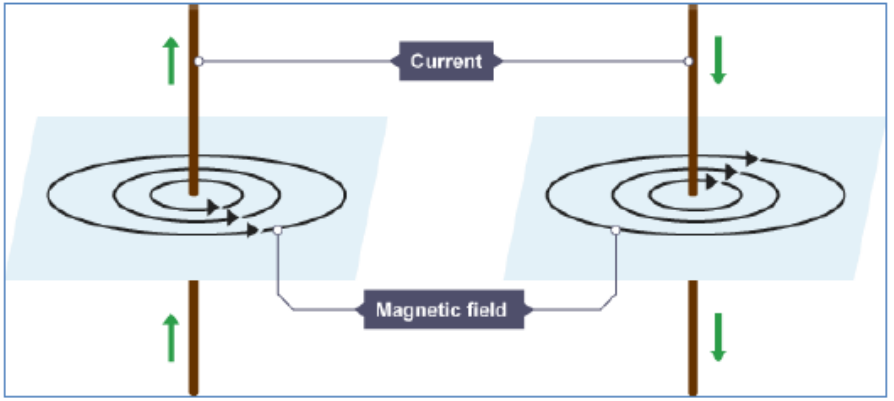
You can make an electromagnet **stronger** by:

- Increasing the **current** in the wire (probably by increasing the potential difference of the power supply)
- Increasing the **length** of wire in the solenoid – perhaps by adding more turns to the coil of wire.

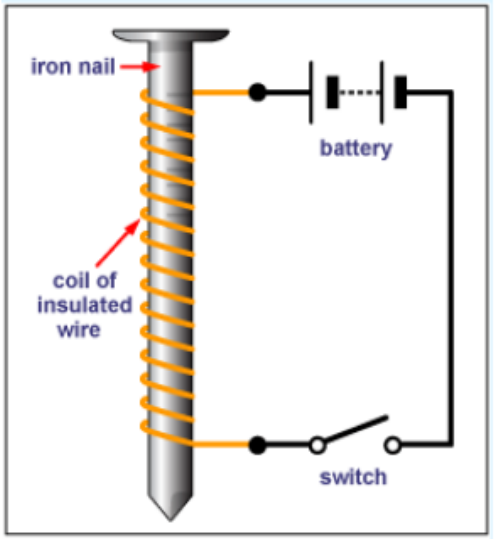
A north pole, since another north pole brought to this end would be repelled.



Key Terms	Definitions
current	The rate of flow of charges in a circuit. If a current is flowing in a component, charges (e.g. electrons) are flowing through it.
solenoid	A coil of wire.
iron core	A piece of iron placed in the middle of a solenoid.
electromagnet	A coil of wire with an iron core



In school, an iron nail is an easy choice for the iron core of an electromagnet.



Fleming's left hand rule and the motor effect

If you have a current-carrying wire and a permanent magnet, each have their own magnetic fields. This means that if you put them near each other, there'll be a force acting on each of them – just thanks to magnetic attraction or repulsion. This is called the **motor effect**.

You can work out the direction that the force acts if you know the direction of the magnetic field and the direction of the current – we use **Fleming's left hand rule**. It has to be your left hand to work. Hold it as shown, and you can work out the direction of whichever quantity you don't know. You have to think in three dimensions here. You can twist your hand at the wrist to get it right – confirm using the example of the wire cutting through the magnetic field in the diagram – field from N to S with first finger, current with middle finger pointing downwards, meaning force must be out of the page towards you, like the diagram shows.

Now, the size (or *magnitude*) of the force on the conductor (the bit of wire) depends on three factors:

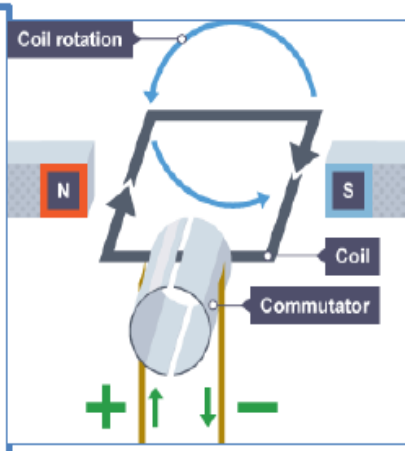
1. The **length** of the wire in the magnetic field, measured in metres
2. The **strength** of the magnetic field (formally, the **magnetic flux density**, in teslas, T)
3. The **size** of the **current** (A, as usual).

As the equation shows, increasing any or all of these factors will increase the size of the force on the conductor. [NB this equation only applies when the current and magnetic field are at right angles to each other]

Electric motors

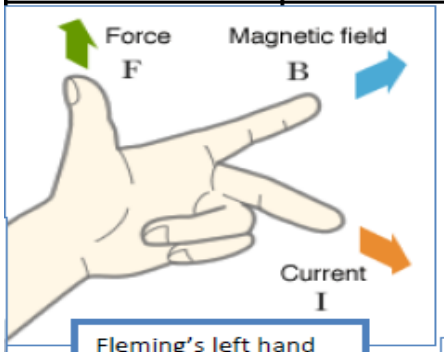
Electric motors make use of the motor effect. A coil of wire carrying a current is placed in a magnetic field; as you know, the magnetic fields interact to cause a force on each part of the motor. If the coil is set up so it can spin, it most certainly will. In fact, it will spin round and round (**rotate**). This is thanks to the force acting **up** on one side of the coil, and **down** on the other – see the diagram and use Fleming's left hand rule to understand why...

The magnetic field goes from N to S of course, and the arrows on the coil show the direction of the current. So, the left side of the coil has a force **downwards** exerted on it (use the left hand rule). The right side of the coil has a force **upwards** exerted on it, so it rotates as shown. (NB the commutator just allows the coil to spin without the wires getting tangled up or the current flipping direction!)

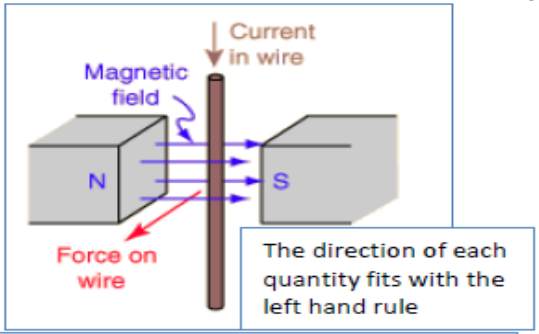


Key Terms	Definitions
motor effect	The forces exerted on each other by a wire carrying a current and a magnetic field, thanks to the two magnetic fields interacting.
magnetic flux density	A measure of the strength of a magnetic field – think of it as the number of magnetic field lines going through a set area – see diagram to help explain.
electric motor	Device that causes rotation of a coil of wire carrying a current when it is placed in a magnetic field.

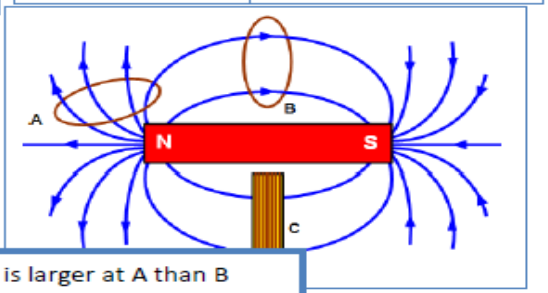
Equation	Meanings of terms in equation
$F = B\,I\,l$	*F = force (newtons, N)* *B = magnetic flux density (tesla, T)* *I = current (amps, A)* *l = length (m)*



Fleming's left hand rule. FBI – easy to remember!



The direction of each quantity fits with the left hand rule

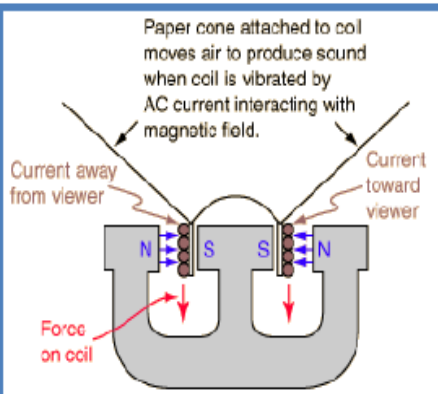


Magnetic flux density is larger at A than B since more magnetic field lines cut through a given area (area shown by the oval).

Loudspeakers and microphones

The motor effect is also put to good use in loudspeakers and headphones. They have a 'moving coil' which moves in a magnetic field according to the current running through the coil. This moving coil is connected to a cone that moves with it. The cone causes vibrations in the air around it – in other words, it causes sound waves. Microphones do the exact opposite: sound waves (pressure variations) cause the cone the move, which causes a changing current in the coil.

Study the diagram. Just like in a motor, a force is produced on the coil of wire by placing it in a magnetic field (that's a permanent magnet at the bottom) and turning on the current. As the current alternates in direction (i.e. AC is used), and the size of the current is varied, the coil moves back and forth. As you can see, the coil is joined to a cone, which moves with it. The cone vibrates the air according to the current, then. The current transfers the information about the sound being played.



Key Terms	Definitions
moving coil	Describes a loudspeaker that involves a coil of wire moving in a magnetic field, to vibrate a cone and produce sound waves.
induce	To cause something to happen.
AC	Alternating potential difference – the direction of the current switches back and forth.
cone	Literally a cone-shaped piece of material found in loudspeakers. They vibrate, causing pressure changes in the air – i.e. sound waves.
induced potential	A potential difference caused by either: a) moving a coil in a magnetic field, or b) changing the magnetic field around a coil.
generator effect	Using the interaction between a magnetic field and a conductor to generate electric current.

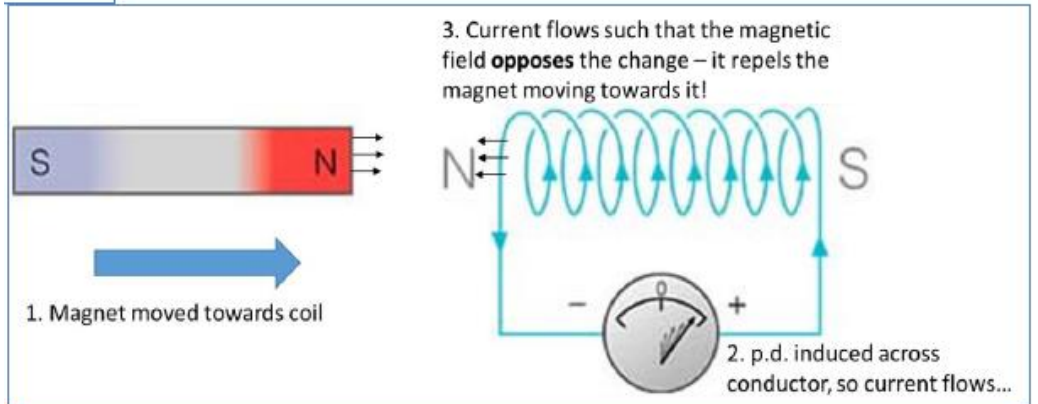
Induced potential and the generator effect

You can switch the motor effect around – instead of using interacting magnetic fields to produce movements, you can use movements to produce a current in a wire. Here's how it works:

1. Place a conductor (e.g. coil of wire/solenoid) in a magnetic field and move it around (e.g. rotate the coil)
2. OR keep the coil still but change the magnetic field (e.g. flip N and S back and forth)
3. Either of these **induces** a potential difference across the ends of the conductor
4. Assuming your conductor is part of a complete circuit, a current starts to flow in the conductor thanks to this potential difference.

This is called the GENERATOR EFFECT, because the method is used to generate electricity. It is also known as electromagnetic induction.

Now, importantly, the current in the conductor produces a magnetic field, as always. But the direction of the magnetic field acts to oppose the change, the 'change' being the original 1 or 2 from the steps above. This is shown in the diagram right.



Factors affecting induced potentials

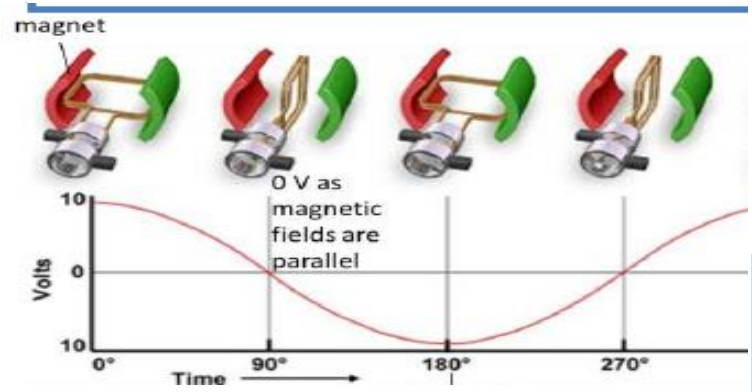
The size of the induced potential in the generator effect depends on:

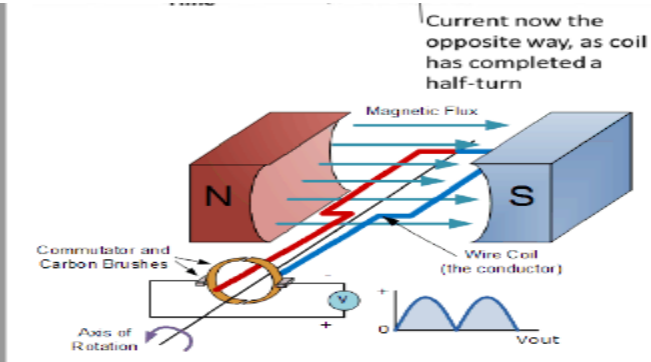
- The size/strength of the magnetic field (larger magnetic field → larger induced potential)
- The number of turns on the solenoid (more turns → larger induced potential)
- The speed of movements/changes to magnetic fields (faster → larger induced potential)

Using the generator effect

Depending on the set-up, you can use the generator effect to generate ac or dc.

- ac is generated in an alternator. In this set-up, each end of the coil of wire spin inside, and make contact with, a complete loop of conductor that's connected to the rest of the circuit. Since every 180º of turn of the coil the current flips direction (just like the left hand rule tells us), you get ac. This is shown on the diagram below, with a graph showing alternating potential difference.
- dc is generated in a dynamo. To prevent the current flipping direction every half-turn, a clever **commutator** is used. This ensures the current is restricted to one direction only in the coil – i.e. direct potential difference. See second diagram and graph.



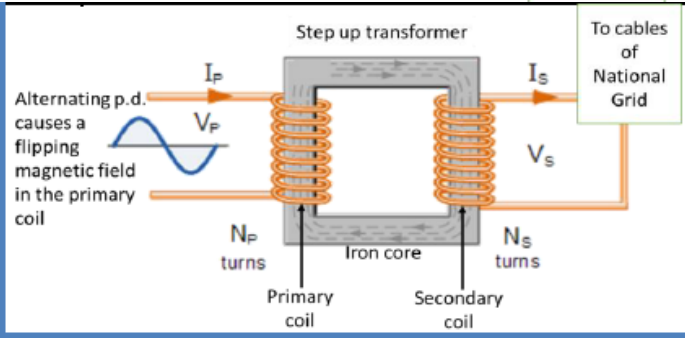


Key Terms	Definitions
national grid	A system of cables and transformers linking power stations to consumers of electricity. The National Grid is used to transfer electrical power from the power stations to users.
commutator	Device used in dynamo, made of two half-rings of conductor, not quite joined up to each other. Keeps the current flowing one way only.
step-up transformer	Device that increases potential difference in an electric supply, using more turns on the secondary coil than the primary coil. Step-down transformers do the opposite.

Equation	Meanings of terms in equation
$\frac{V_p}{V_s} = \frac{N_p}{N_s}$	V_p = *potential difference across primary coil* (V) V_s = *potential difference across secondary coil* (V) N_p = *number of turns on primary coil* N_s = *number of turns on secondary coil*
$V_p \times I_p = V_s \times I_s$	V_p = *potential difference across primary coil* (V) V_s = *potential difference across secondary coil* (V) I_p = *current in primary coil* (A) I_s = *current in secondary coil* (A)

Transformers

Transformers exist to firstly, massively increase the p.d. of electric power to transmit it efficiently through cables from power stations, then, secondly, to dramatically decrease it again for safe use by consumers. They work using the second sort of generator effect – a changing magnetic field inducing a p.d. in a conductor nearby. Transformers are made of two coils of wire, wrapped around each end of a square-shaped iron core. Iron is used because it is easily magnetised. An alternating current in the primary coil causes a magnetic field in this coil, that constantly changes direction. This in turn induces a changing magnetic field in the iron core, which then induces a changing magnetic field (and therefore current) in the secondary coil.



Transformer equations

In transformers, the ratio of the potential differences across the coils is equal to the ratio of the number of turns on each coil. This is shown in the first equation.

Assuming transformers are 100% efficient, the power input is equal to the power output. This leads to the second equation (since $P = IV$).

Rate of Reaction

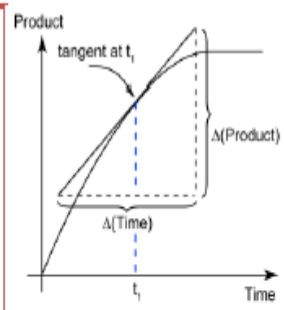
The rate of reaction is the speed at which a chemical reaction is happening. This can vary hugely from reaction to reaction.

The rate of reaction can be calculated either by measuring the quantity of **reactant used or the quantity of product made in a certain length of time**. The quantity can either be a volume measured in cm^3, a mass measured in grams (g), or even a concentration (g/dm^3).

Higher Tier: Measuring Rate of Reaction at a point in time

The gradient of a volume or mass/time graph will give you the rate of reaction at a given point. However when the line is a curve you need to draw **a tangent** to measure the gradient. To draw a tangent follow the following steps

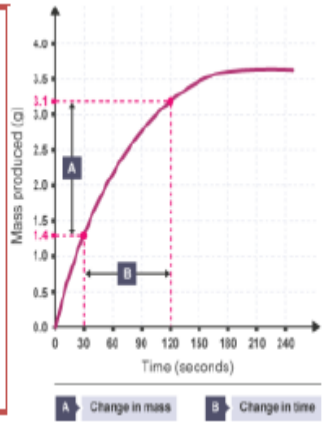
1. Line you ruler up across your graph, so that it touches the line on the point that you want to find out the gradient
2. Adjust the ruler until the space between the ruler and the curve is equal on both sides
3. Draw the line and pick two easy points that will allow you to calculate the gradient of the line.



Higher Tier: Calculating the Mean Rate of Reaction

To calculate the mean rate of reaction between specific times from a graph you need to:

- choose the two times on the x-axis,
- use the line to complete the y part of the coordinate,
- Find the change in y and the change in x
- and then divide the change in y by the change in x



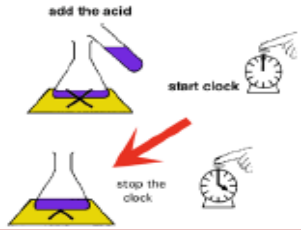
Key Terms	Definitions
rate of reaction	The rate at which reactants are being turned into products
reactant	What is used in a chemical reaction
product	What is made in a chemical reaction
catalyst	A substance which speeds up a chemical reaction without being used up
tangent	A straight line that touches a curve at a point

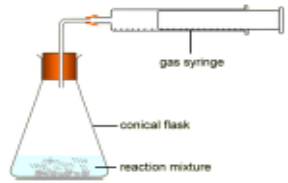
Equation	Meanings of terms in equation
Rate of Reaction= $\frac{Reactant\ used}{time}$	*Reactant used can either be measured in grams or cm^3*
Rate of Reaction= $\frac{Product\ Made}{time}$	*Reactant used can either be measured in grams or cm^3*

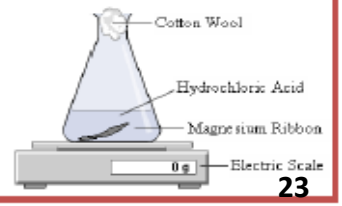
Measuring the Rate of Reaction

There are several experiments that can be used to measure the rate of a chemical reaction.

1. Measuring the mass lost in a chemical reaction (marble chips and acid is a good example)
2. Measuring the volume of gas produced (decomposition of hydrogen peroxide is a good example)
3. Time taken to make an X disappear (sodium thiosulphate and acid is a good example)



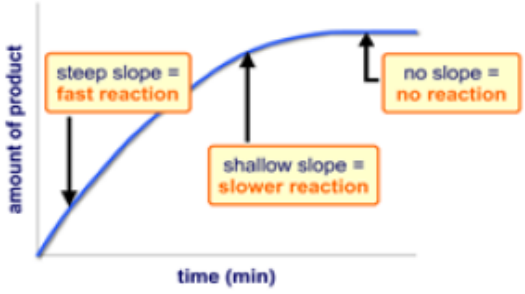


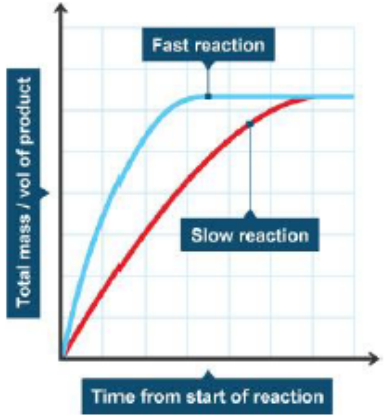


Interpreting Rate of Reaction Graphs

The results from rate of reaction experiments can be plotted on a line graph. For example how the mass changes against time or how much gas is made against time. Different lines can be plotted for different conditions, the **steeper the gradient, the faster the reaction.**

It is important to remember that the graphs flatten off (plateau) at the same point as the same amount of reactant is being used.





Key Terms	Definitions
activation energy	The minimum energy required for a chemical reaction to take place
collision theory	The theory that states for a chemical reaction to happen, particles must collide with sufficient energy
gradient	The measurement of how steep a line is on a graph
frequency	The amount of times something happens in one second
concentration	The number of particles in a given volume

Factors which affect Rate of Reaction

Being able to slow down and speed up chemical reactions is important in everyday life and in industry. We can change the rate of a reaction by:

· Changing temperature
· Changing pressure
· Changing the concentration of a solution
· Changing the surface area
· Adding a catalyst

Collision Theory

Collision Theory: reactions occur when particles of reactants **collide** with a certain amount of **energy**.

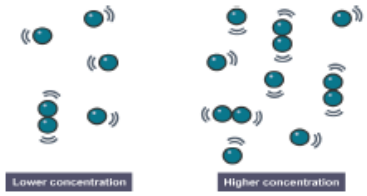
The minimum amount of energy needed for the particles to collide successfully and react is called the **activation energy**, which is different for each reaction.

The rate of a reaction depends on two things:

· the **frequency** of collisions between particles. The more often particles collide, the more likely they are to react.
· the **energy** with which particles collide. If particles collide with less energy than the activation energy, they will not react.

The effect of concentration is explained with collision theory

If the concentration of a solution is increased then there are more particles in a given volume, therefore collisions are **more frequent** and the chemical reaction is faster. Concentration **is directly proportional** to rate of reaction (if you double the concentration you double the rate).

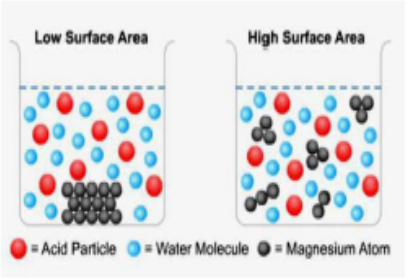


The effect of temperature is explained by collision theory

When you increase the temperature of something the particles will move around faster (greater kinetic energy). This increases the **frequency of the collisions.** As well as that, as the particles are moving faster the particles collide with more energy making it more likely that collisions exceed the **activation energy.**

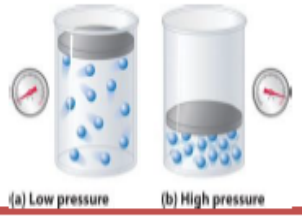
The effect of surface area is explained by collision theory

When you increase the surface area of a solid (you cannot increase the surface area of a liquid or gas). You increase the number of particles that are available for collision, therefore increasing the frequency of collisions therefore increase the rate of reaction.



The effect of pressure in gases is explained by collision theory

If the reaction is carried out in the gaseous state, then increasing the pressure will increase the rate of reaction. If there are more particles in a given volume of gas, then collisions will be more frequent and therefore the reaction will be faster.

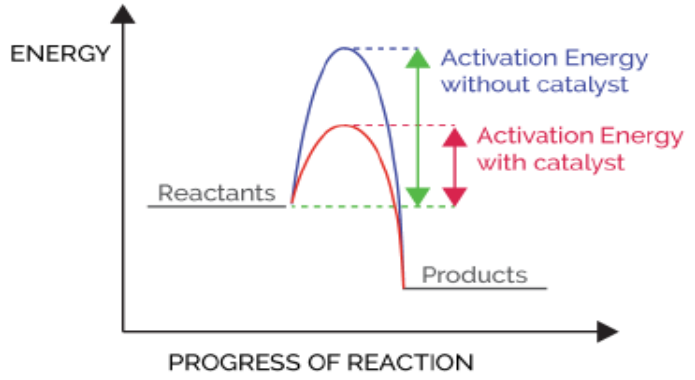


Key Terms	Definitions
enzymes	A biological catalyst
reaction profile	A graph which show the energies of the reactants and products at different stages of the chemical reaction

The effect of catalysts is explained by collision theory

A catalyst is a substance which speeds up a chemical reaction without being used up. It speeds up a reaction because it lowers the activation energy by providing an alternative pathway for the reaction and this means that there are more **successful collisions and a faster reaction.**

The effect of a catalyst is shown on the reaction profile below:



Catalysts are not included in a chemical equation as they are not used up in a chemical reaction.

Enzymes **are biological catalysts**, they speed up chemical reactions in biological systems for example in digestion in animals. Unlike non-biological catalysts, enzymes have an optimum temperature where they work best. This is usually around 37°C.

Experiment: Rates of Reaction and Concentration

Equipment List

- 40g/dm³ sodium thiosulfate solution.
- 2.0M dilute hydrochloric acid
- 10cm³ and 100cm³ measuring cylinders
- 100cm³ conical flask
- printed black paper cross
- stopclock

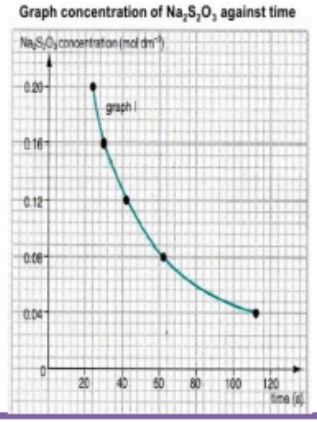
Method- When the reaction produces a precipitate

1. Use a measuring cylinder to place 10cm³ sodium thiosulfate solution into the conical flask. Again using a measuring cylinder, dilute this by adding 40cm³ water. This will make a solution of thiosulfate with a concentration of 8g/dm³. Put the conical flask on the black cross.
2. Put 10cm³ of dilute hydrochloric acid into the small measuring cylinder.
3. As you tip this acid into the flask, swirl it gently and at the same time start the stopclock.
4. Looking down through the top of the flask, stop the clock when you can no longer see the cross
5. Write the time taken **in seconds** in the first blank column of the table on the back of this sheet. You will need to multiply any minutes by 60 and then add the extra seconds.
6. Repeat **steps 1 - 4** four times, but **in step 1** use:
7. 20cm³ sodium thiosulfate + 30cm³ water (concentration 16g/dm³)
8. 30cm³ sodium thiosulfate + 20cm³ water (concentration 24g/dm³)
9. 40cm³ sodium thiosulfate + 10cm³ water (concentration 32g/dm³)
10. 50cm³ sodium thiosulfate + no water (concentration 40g/dm³)
11. Repeat the **whole investigation** (steps 1 – 5) twice more and record the results in the second and third blank columns of the table.

Expected Results

When plotting time taken for the cross to disappear against time. There should be an inversely proportional relationship between the two variables. As the concertation increases, the time taken for the cross to disappear decreases.

Using this method we cannot calculate rate Of reaction as we have only taken one time per concertation.

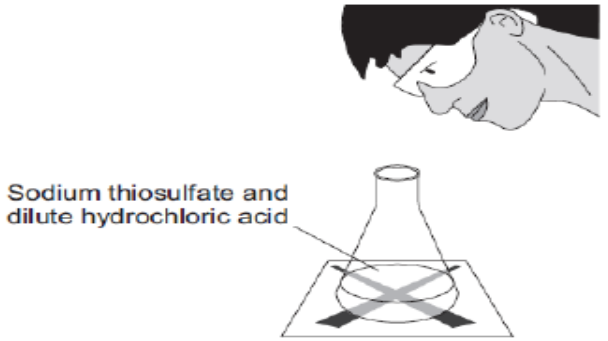


Key Terms	Definitions
Precipitate	When a solid is formed from the reaction of two solutions.

Variables

I.V- Concentration of sodium thiosulphate
D.V- Time taken for cross to disappear
C.V- Volume of sodium thiosulphate, volume of hydrochloric acid, person judging when the X has disappeared.

Diagram



Conclusions

As you increase the concertation the time taken for the cross disappear decreased. This is because there are more particles in a given volume. Therefore collisions are more frequent and the reaction is faster.

The equation for the reaction is:

HCl + sodium thiosulfate → sodium chloride + sulfur dioxide + sulfur + water.

$2HCl_{(aq)} + Na_2S_2O_{3(aq)} \rightarrow 2NaCl_{(aq)} + SO_{2(g)} + S_{(s)} + H_2O_{(l)}$

The reason it goes cloudy is because the solid sulphur forms as a precipitate.

Experiment: Rates of Reaction and Concentration

Equipment List

- 1.0M, 1.5M and 2.0M dilute hydrochloric acid
- 100 cm^3 measuring cylinders
- 250 cm^3 conical flask
- Stopclock
- Magnesium strips
- Ruler
- Scissors
- Gas Syringe or
- 250 cm^3 measuring cylinders
- Trough

Key Terms	Definitions
Gas syringe	A piece of equipment that can be used to measure a volume of gas

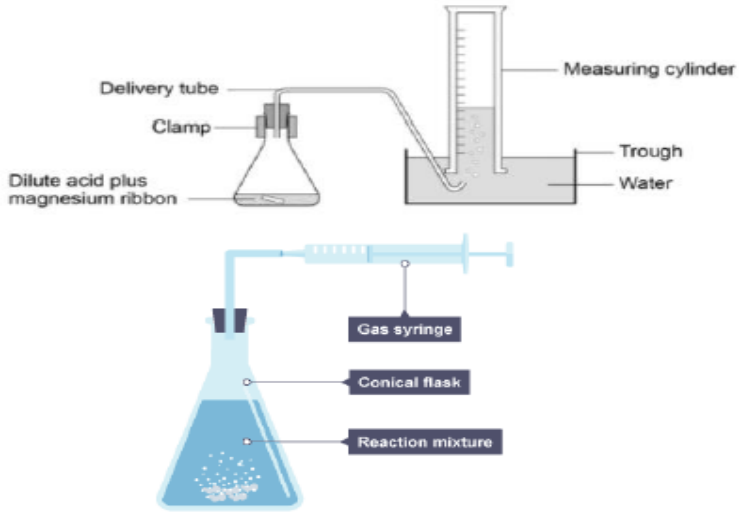
Variables

I.V- Concentration of hydrochloric acid
D.V- Rate of reaction
C.V- Volume of acid, length of magnesium, temperature of acid,

Method- When producing a gas

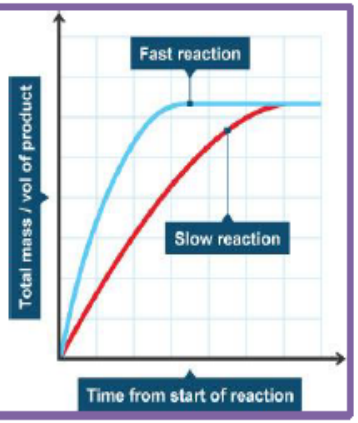
1. Set up the apparatus as shown in the diagram. Note there are two possible ways of measuring the gas given off. Either using a gas syringe or using a filled, upturned measuring cylinder in a trough of water.
2. Measure 100 cm^3 of 1.0 M hydrochloric acid, using a measuring cylinder. Pour this into the conical flask.
3. Measure and cut a 3 cm strip magnesium. Place the magnesium in the conical flask with acid and immediately fit the bung.
4. Record the volume of gas every 10 seconds, until no more gas is given off.
5. Repeat this experiment with different concentrations of acid for example 1.5 M and 2M

Diagram



Expected Results

The graph should look like those to the right.
The graph will start off with a steep gradient which will gradually reduce until it plateaus,
This is where the reaction has stopped.
The higher the concertation the steeper the gradient and the sooner it will plateau. The rate of reaction Can be calculated by calculating the gradient
The mean rate can be calculated between 2 points.
It can also be calculated at a point using a tangent



Conclusions

The higher the concentration the faster the rate of reaction. As there are more particles in a given volume, the frequency of collisions increases and therefore the rate of reaction increases.

The graph is steeper initially as there is a higher concentration of reactant particles as the reaction goes on, the amount of reactant particles decreases the collision become less frequent and therefore the rate of reaction decreases.

Anomalies can be caused in this experiment by gas being lost through some of apparatus.

Number	Key term	Definition
1	**Biome**	A large scale ecosystem
2	**Latitude**	Measures how far north or south a location on the Earth's surface is from the equator.
3	**Biosphere**	A living layer of Earth between the lithosphere and atmosphere
4	**Precipitation**	Anything wet falling from the sky i.e. rain, sleet, snow.
5	**Ecosystems**	A localised biome made up of living things and non living environment.
6	**Altitudinal Zonation**	The change in ecosystem at different altitudes, caused by alterations in temperature, precipitation, sunlight and soil type.
7	**Biotic**	Living part of an ecosystem (flora and fauna)
8	**Abiotic**	Non living part of an ecosystem (atmosphere, water, rock and soil)
9	**Goods**	Physical materials of products that have value to us.
10	**Services**	Functions that satisfy our need.
11	**Indigenous people**	The original people of a region.

Number	Key term	Definition
12	**Ecosystem services**	Is a collective term for all the ways humans benefit from ecosystems.
13	**Provisioning Services**	Products obtained from ecosystems. Food, nuts, berries, fish, game, crops, fuel wood, firewood.
14	**Regulating Services**	Services link to other physical systems and keep areas and the whole planet healthy. = Storing carbon, emitting oxygen, purifying water, regulating the hydrological cycle.
15	**Supporting Services**	These keep the ecosystems healthy so it can provide the other services: nutrient cycling, photosynthesis and soil formation
16	**Cultural Services**	These are benefits people get from visiting or living in a healthy ecosystem: Recreation and tourism, education and science, spiritual well being and happiness.
17	**Carbon Sink**	Natural stores for carbon-containing chemical compounds, like carbon dioxide or methane.
18	**Nutrient Cycle**	Nutrients like nitrogen and phosphorous move between the biomass, litter and soil as part of the continuous cycle which keeps both plants and soil healthy.

Number	Key term	Definition
19	**Biodiversity**	Means the number of different plants and animal species in an area.
20	**Emergent layer**	Hardwood, evergreen trees that have broken through the dense canopy layer below to reach the sunlight. Monkeys and birds live up there/
21	**Canopy layer**	The dense canopy layer is home to tree snakes, birds, tree frogs and other animals because there is so much food available.
22	**Understory Layer**	This layer contains young trees and those with large leaves to capture sunlight; huge numbers of insects live in the understory layer.
23	**Forest floor**	The darkness of the forest floor means shade loving ferns with large leaves live here along with mammals like the jaguar.
24	**Biomass**	The total of living matter in the ecosystem.
25	**Leaching**	When nutrients are washed out of the soil by water moving through it.
26	**Taiga**	Biome located 50°C and 60°C latitude mostly in the northern hemisphere. Sometimes it is referred to as boreal forest.

Number	Key term	Definition
27	**Taiga Climate**	Short wet summers. Three months when temperatures can get up to 20°C. Long cold, dry winters with several months of below freezing, as low as -20°C. Low precipitation- below 20mm for 5 months of the year.
28	**Hibernate**	Animals go into a dormant state in the winter months to avoid the cold and food shortage.
29	**NPP**	Net primary productivity- is a measure of how much new plant and animal growth- biomass- is added each year. It is measured in grams per square meter.
30	**Deforestation**	The deliberate cutting down of forests to exploit forest resources.
31	**Direct threats**	This involve deliberate cutting down of trees for timber, to make roads or to convert forest into farm land.
32	**Indirect threats**	These come from pollution, global warming or disease.
33	**Wildfire**	Uncontrolled burning through forest, grassland or shrub. Such fires can “jump” roads and rivers and travel at high speed.
34	**Invasive species.**	Is a (sometimes called alien species) plant, animal or disease introduced from one area to another.

Number	Key term	Definition
35	**Non-renewable**	Finite resources such as the fossil fuels (coal, oil and gas)
36	**Renewable**	These will never run out and can be used over and over again e.g. wind power, solar power and HEP.
37	**Recyclable**	These provide energy from sources that can be recycled or reused i.e. biofuel energy.
38	**Energy poor**	Lack of access to energy sources either due to a lack of resource of a lack of money.
39	**Energy diversification**	Getting energy from a variety of different sources to increase energy security.
40	**Energy Security.**	Having access to reliable and affordable energy sources.
41	**Ecological debt**	When the Earth's resources are being used up faster than the Earth can replace them.
42	**Ecological footprint**	This is a calculation measured in global hectares (gha). It is the amount of land and water required to produce resources to deal with waste from each country.

Number	Key term	Definition
43	**Black gold**	A term used for oil as it is regarded as such a valuable commodity.
44	**Peak oil**	The theoretical point at which half of the known reserves of oil in the world have been used.
45	**OPEC**	Organisation of Petroleum Exporting Countries. This was established to regulate the global oil market, stabilise prices and ensure a fair return for its 12 member states who supply 45% of the world's oil.
46	**Demand**	High demand causes prices to rise, and falling demand causes lower prices.
47	**Supply**	Supply affects the price- too much oil and the price falls, too little and it rises.
48	**Fracking**	Water is blasted at very high pressure into rock fractures to extract shale gas.
49	**Liquefaction of natural gas.**	Converting gas into liquid.
50	**Tar Sands**	A mixture of sand, clay, water and a very dense sticky form of petroleum called bitumen.
51	**Biofuels**	Any kind of fuel made from living things, or from the waste they produce.

The Weimar Republic	
1	This was the name given to Germany after the Kaiser had abdicated in November 1918. This was a time of despair and hope for Germany. At first, the country faced lots of chaos but under Gustav Stresemann, there was some stability.
Key events	
2	**1918** World War One ended. The Kaiser abdicated and Germany became a country without a monarch (a Republic).
3	**1919 January** Spartacist Uprising
4	**1919 June** Signing of the Treaty of Versailles
5	**1919 August** Weimar Constitution finalised
6	**1920** Kapp Putsch
7	**1923** French occupation of the Ruhr and hyperinflation
8	**1924** Dawes Plan
9	**1925** Locarno Pact
10	**1926** Germany joins League of Nations
11	**1928** Kellogg Briand Pact
12	**1929** Young Plan
Key Concepts	
13	**The Weimar Republic** faced much opposition, It was disliked by the left wing who wanted Germany to be like Communist Russia and it was disliked by the right wing who wanted the monarchy back.
14	**The Treaty of Versailles** caused many problems for Germany. The German people disliked the politicians for signing it and it caused political problems and economic problems.
15	**Gustav Stresemann** helped to bring about recovery in Germany after 1924. He solved economic problems by making friends with other countries. However, historians have very different views about the extent of this recovery**.**
16	**The Golden Age** was the period from 1924-29 and it saw significant changes in culture, the standard of living and the position of women.

Key Words		
17	**Abdication**	When a monarch leaves the throne
18	**Republic**	A country without a King or a Queen
19	**Ebert**	The first President of the Republic
20	**Stresemann**	The Chancellor of Germany from the Summer of 1923
21	**Article 48**	The President could use this to ignore the Reichstag and rule as he saw fit
22	**Kaiser**	King
23	**Armistice**	An agreement to end war
24	**Weimar**	The new government could not meet in Berlin as it was so dangerous, so they met here instead
25	**Constitution**	This is an agreement about how the country would be ruled
26	**Reichstag**	German parliament
27	**Gewaltfrieden**	An enforced peace
28	**Freikorps**	Ex military soldiers who wanted to overthrow the Republic
29	**Rentenmark**	The currency of Germany after November 1923
30	**Hyperinflation**	When money looses its value
31	**Dawes Plan**	An agreement where the USA would lend Germany money
32	**Young Plan**	This lowered the reparations payment and gave Germany longer to pay
33	**Treaty of Versailles**	This decided how Germany was going to be treated after WW1
34	**Locarno Pact**	An agreement on borders signed by Britain, France, Italy and Belgium
35	**Kellogg Briand Pact**	65 counties including Germany agreed to resolve conflict peacefully
36	**Coalition**	A government of two or more political parties

Hitler's Rise to Power	
1	Hitler sets up the Nazi Party in 1920 and becomes Chancellor in January 1933. This happens for a variety of reasons – Hitler's strengths, inbuilt problems of the Weimar Republic, and the weaknesses of others.
Key events	
2	**1919** Hitler joins the German Worker's Party
3	**1920** Hitler sets up the Nazi Party
4	**1921** Hitler introduces the SA
5	**1923** The Munich Putsch
6	**1925** Mein Kampf published
7	**1926** Bamberg Conference
8	**1928** Nazis win 12 seats in Reichstag
9	**1929** Death of Stresemann and Wall Street Crash
10	**1930** Nazis win 107 seats in Reichstag
11	**1932 July** Nazis win 230 seats in Reichstag
12	**1932 November** Nazis win 196 seats in Reichstag
13	**1933 January** Hitler becomes Chancellor
Key Concepts	
14	**The Munich Putsch** is a significant event. Although a failure, Hitler gained publicity, he wrote Mein Kampf and he realised that if he was to win power, he needed to do this by votes and not by force.
15	**Stable Stresemann** caused problems for the popularity of the Nazi Party. When times were good, voters were not attracted to the Nazi policies.
16	**The Wall Street Crash** was a major turning point in the fortunes of the Nazi Party. The Nazi message did not change but people were now prepared to hear it.
17	**The Backstairs Intrigue** - At a time when Nazi popularity at the polls was decreasing, Hitler was handed power by political elites who feared a Communist take over and Civil War.

Key Words		
18	**NSDAP**	The Nazis
19	**Iron Cross Award**	Given for bravery in war
20	**Volk**	The notion of pure German people
21	**25 Point Programme**	The political manifesto of the Nazi Party
22	**Volkischer Beobachter**	People's Observer, a Nazi newspaper
23	**Fuhrerprinzip**	Belief that one person should run a Party
24	**Swastika**	Emblem of the Nazi Party
25	**SA or Sturmabteilung**	Private army of the Nazi Party headed by Himmler
26	**Aryan**	Pure German people
27	**Anti-Semitism**	Hatred of the Jewish people
28	**Mein Kampf**	Hitler's autobiography
29	**Putsch**	An attempt to get power illegally
30	**Blood Martyrs**	16 Nazis who died at the Munich Putsch
31	**Gaue**	Local party branches
32	**SS or Schutzstaffel**	Hitler's bodyguards
33	**KPD**	German Communist Party
34	**Propaganda**	Goebbels attempted to make people think in a certain way
35	**Hindenburg**	The President of the Republic from 1925 to 1934
36	**Roter Frontkampferbund**	The Communist's own private army

Nazi Control and Dictatorship	
1	This was a time when Hitler formed a legal dictatorship and put in place methods of propaganda and censorship to persuade and encourage all Germany people to support Nazi ideals.
Key events	
2	**1933 January** Hitler becomes Chancellor
3	**1933 February** Reichstag Fire
4	**1933 March** Nazis win 288 seats
5	**1933 March** Enabling Act passed
6	**1933 July** Nazis become the only legal party in Germany
7	**1934 June** Night of the Long Knives
8	**1934 August** President Hindenburg dies
9	**1934 August** Hitler combines the post of Chancellor and President and becomes Fuhrer
10	**1934** August German army swears allegiance to Hitler
11	**1938** Over the course of the year, Hitler removes 16 army generals from their positions
Key Concepts	
12	**Removal –** From 1933 to 1934, Hitler removed all opposition and established himself as Fuhrer.
13	**Control –** There was an attempt to control and influence attitudes. This was done by propaganda and terror.
14	**Opposition** – The youth and the churches opposed the regime**.**

Key Words		
15	**Marinus van der Lubbe**	The Reichstag Fire was blamed on this Communist
16	**Enabling Act**	Gave the Nazis full power for the next 4 years
17	**Gleichschaltung**	Hitler's attempt to bring German society into line with Nazi philosophy
18	**German Labour Front (DAF)**	Set up to replace Trade Unions
19	**Dachau**	First concentration camp
20	**Centralisation**	Germany had been divided into districts called Lander. Now Germany was run from Belin alone
21	**Purge**	To get rid of opposition
22	**Gestapo**	Secret police headed by Goering.
23	**Night of the Long Knives**	Removal on internal and external opposition
24	**Sicherheitsdienst (SD)**	The intelligence body of the Nazi Party
25	**Concordat**	In July 1933 the Pope agreed to stay out of political matters if the Nazis did not interfere with Catholic affairs
26	**Eidelweiss Pirates and Swing Youth**	Groups who apposed the Hitler Youth
27	**Confessional Church**	Followed traditional German Protestantism and refused to allow the Nazification of religion. Led by Pastor Martin Niemoller
28	**Mit Brennender Sorge (With Burning Concern)**	The Pope wrote to priests in Germany about his concerns over the Nazi attempts to control religion

Life in Nazi Germany	
1	The lives of German citizens were changed after Hitler's appointment as Chancellor. For some, life was better under the Nazis but for others, it was much worse.
Key events	
2	**1933** Boycott of Jewish shops and businesses. Law for the Encouragement of Marriage. Sterilisation Law passed.
3	**1935** The Nuremberg Laws were passed.
4	**1935** Conscription introduced.
5	**1936** Membership of the Hitler Youth made compulsory.
6	**1938** Jewish children were not allowed to attend German schools. Lebensborn programme introduced. Kristallnacht.
7	**1939** The euthanasia campaign began. Designated Jewish ghettos established.
Key Concepts	
9	**Anti-Semitism** – Persecution of the Jews grew continuously after 1933.
10	**Young**– The Nazis placed much emphasis on controlling the young as only then could they secure a 'thousand year Reich'. Youth organisations and education indoctrinated the German youth.
11	**Women –** The Nazis had traditional family values but even these were tested by the needs of war and the desire to ensure a growing Aryan population.
12	**Living Standards** – The Nazis did reduce unemployment but they did this by banning Jews and women from the workplace and by putting Germany on a war footing. Workers had limited rights.

Key Words		
13	**Kinder, Kuche, Kirche**	Children, Kitchen, Church. This summed up the Nazi ideal of womanhood
14	**The Motherhood Cross Award**	Given to women for large families
15	**Lebensborn**	Where unmarried women were impregnated by SS men.
16	**Napola**	Schools intended to train the future leaders of Germany
17	**Nazi Teachers League**	All teachers had to swear an oath of loyalty to the Nazis
18	**Reich Labour Service**	A scheme to provide young men with manual labour jobs
19	**Invisible unemployment**	The Nazi unemployment figures did not include women, Jews, opponent and unmarried men under 25
20	**Autobahn**	Motorway
21	**Rearmament**	Building up the armed forces I readiness for war
22	**Volksgemeinshaft**	The Nazi community
23	**Strength Through Joy**	An attempt to improve the leisure time of German workers
24	**Beauty of Labour**	Tried to improve working conditions of German workers.
25	**Volkswagon**	People's car
26	**Eintopf**	A one pot dish
27	**Herrenvolk**	The master race or the Aryans
28	**Nuremberg Laws**	Jews were stripped of their citizenship rights and marriage between Jews and no Jews was forbidden
29	**Kristallnacht (Night of the Broken Glass)**	A Nazi sponsored event against the Jewish community

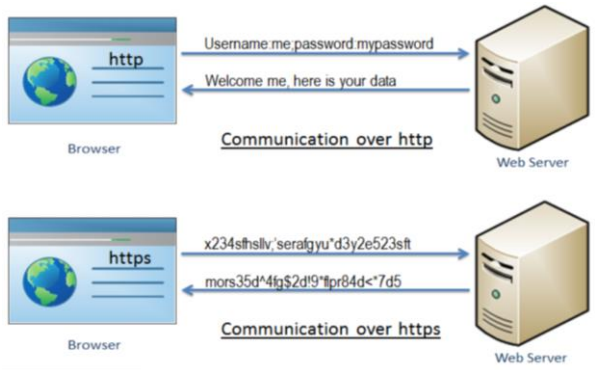
Key Ideas		
Ideas about Creation 	**Christian Ideas** - Christians believe the universe was designed and made by God - The creation story in **Genesis 1** says that God made the world in six days - **Literalist Christians** believe this is true and that God created Adam + Eve from whom all humans come - **Liberal Christians** say the creation story in the Bible is just a story and may agree with scientific ideas about creation *"In the beginning God created the heavens and the earth" – Genesis 1:1*	**Scientific Ideas** - The **Big Bang Theory** argues that the universe started as a dense collection of mass which massively expanded creating stars, galaxies and planets - The **Theory of Evolution** comes from Charles Darwin who observed that animals change over time and argued that humans were not designed by God but evolved from apes - These theories do not fit with a **literalist Christian's** view but could fit with a **liberal** view
Stewardship + Dominion 	**Stewardship** - **Stewardship** means Christians have a **duty** to look after the environment on behalf of God and for future generations - This can be seen where Christians campaign for environmental charities or choose to reduce waste and recycle *"Rule over [..] every living creature" - Genesis 1:28*	**Dominion** - **Dominion** is the idea that God gave humans power and authority over the world - Some Christians believes this allows them to use **natural resources** (e.g. oil and coal) and animals to make their lives better - In **Genesis** God gives Adam and Eve the power to name the animals and rule over them
Abortion 	- **Abortion** is the removal of a foetus from the womb in order to end a pregnancy. - In the UK (except Northern Ireland) it is **legal** during the first 24 weeks of pregnancy unless the mother's life is in danger or the foetus is severely deformed. ☒ The ***Catholic Church*** is strongly against abortion. They believe in **sanctity of life**, the idea that life is a sacred gift from God which only God can take away. They see the foetus as a living thing. ☑ The ***Church of England*** think abortion is sometimes acceptable as a pregnancy as a result of rape or where the child would be very ill would lead to a very poor **quality of life**	
Euthanasia 	- **Euthanasia** is the painless killing of a patient with a terminal illness. - **Voluntary** euthanasia is where the patient asks for their life to be ended. - **Non-voluntary** euthanasia is where the patient is not capable of asking to die, perhaps in a coma. - All forms of euthanasia are currently **illegal** in the UK. ☒ The ***Catholic Church*** is strongly against euthanasia. They believe that only God can give and take life and that life is sacred (**sanctity of life**) ☑ Some ***liberal Christians*** think euthanasia can be an act of mercy which Jesus tells them is a good thing to do, this is especially the case when someone's **quality of life** is very poor.	
The Afterlife 	- Christians believe that when you die you will be judged and that those who are found to be good will go to **heaven** but those who have sinned and gone against God's wishes will go to **hell**.	
	Roman Catholics believe that there is a middle stage called **purgatory** where souls go to be purified of sin before they go to heaven	**Some Christians** believe that Jesus will return on a future **Day of Judgement** when all souls will be judged

Key Words	
Abortion	The ending of a pregnancy
Big Bang Theory	Scientific theory of the creation of the universe through a large explosion
Dominion	The power humans have over God's creation
Euthanasia	The painless killing of a terminally ill patient
Evolution	Scientific theory of the development of humans from apes
Heaven	Paradise where those judged good go after death to be forever with God
Hell	Damnation where those judged bad go after death to be forever without God
Judgement	After death Christians believe you are judged by God
Liberal	A type of Christian who reads the Bible as stories, myths and metaphors
Literalist	A type of Christian who believes the Bible is literally true + the word of God
Natural Resources	Materials found in nature (e.g. coal, oil) which are exploited by humans
Purgatory	Where Catholics believe souls are purified after death + before heaven
Quality of Life	How easy or difficult someone's life is – e.g. cancer causes a low quality of life
Sanctity of Life	The belief that all life is sacred as man is made in God's image
Stewardship	The responsibility God gave humans to look after the world
Vegetarian	The choice not to eat animals

Key Ideas			
Christian Attitudes to Crime 	**Good and Evil Intentions** The Bible warns Christians against having **evil** thoughts which lead to evil actions. Avoiding sin and temptation steers Christians away from crime. Christians would be more willing to treat an offender who had good intentions with more **mercy** than one who acted out of evil intentions.	**Attitudes to Lawbreakers** Christians do not believe that people are evil but that people can be **tempted** to do wrong and break the law. Christians are taught to "love the sinner, hate the sin" which means they should **forgive** and show mercy to people who have done wrong but admitted their mistakes and sought **atonement**.	
Reasons for Crime 	People are tempted to commit crime for a wide range of reasons including **poverty** (not having enough money or food), **upbringing** (where people are not taught right from wrong), **addiction** (some people commit crimes to feed an addiction), **greed** (committing crimes out of a desire for things they cannot afford), **hatred** or out of **opposition to unjust law** (breaking the law to oppose hateful or unjust laws)		
Three Aims of Punishment 	**Deterrence** This aim of punishment seeks to **use punishment as a message** to others considering committing crime. By giving one criminal a harsh punishment others may be put off committing a similar crime.	**Reformation** This aim of punishment seeks to help criminals **change their behaviour for the better**. It may involve therapy, education or training. Many Christians support this as a form of 'love your neighbour' **mercy**.	**Retribution** This aim of punishment is society getting its own back on the offender. The Old Testament says **'an eye for an eye'** so some Christians would argue that this form of punishment is just according to the Bible.
Forgiveness 	**Forgiveness** is at the heart of Jesus' teaching. It means to show **mercy** and pardon someone for what they have done wrong but showing someone forgiveness does not mean they should be justly punished for their crimes. When Jesus was crucified, he forgave those who sentenced him to death and crucified him saying: **'Father forgive them, for they know not what they do'**. Forgiveness leads Christians to support reformation as an aim of punishment as it allows the criminal to be forgiven and to ask for forgiveness. They also use forgiveness as an argument against the death penalty.		
Christian Attitudes to Punishment 	**Prisons** Many Christians believe prisoners should be **treated well** when in prison as even though they have done wrong they do not believe in evil people as much as evil actions. Some Christians campaign for better prison conditions out of mercy.	**Corporal Punishment** Most Christians do not support using physical pain as a form of punishment as it is **harmful** and **negative**. It is currently illegal in the UK and many Christians would rather seek to reform a criminal than punish them in this way.	**Community Service** Many Christians argue in favour of community service where criminals work to **repay** their community as a punishment. It allows criminals to make up for what they have done and does not harm the offender in the process.
Death Penalty 	The **death penalty** means the state killing criminals who have committed the worst crimes. It has not been used in the UK since 1969 but is still a common punishment elsewhere in the world. ☑ Some Christians argue that the death penalty is a just punishment for murder as the Bible says both 'you shall not kill' and **'an eye for an eye'**. ☑ They may also argue that it **deters** criminals from committing the worst crimes and keeps people safe. ☒ Other Christians argue that the death penalty goes against **sanctity of life**. Life is sacred and holy and only God can give and take life. ☒ They might also argue that the death penalty goes against the aim of **reformation** as a dead criminal cannot be reformed, forgiven or shown mercy to.		

Key Words	
Community Service	Working in the community to pay back for a criminal act
Corporal Punishment	Using physical pain as a punishment
Crime	An action which is against the law and incurs a punishment
Death Penalty	A form of punishment where the offender is killed for their crime
Deterrence	An aim of punishment – preventing future criminals by harsh treatment of offenders
Forgiveness	To show mercy and pardon someone for what they've done wrong
Hate Crime	A crime motivated by hatred e.g. racism, homophobia
Poverty	Not having enough money to be able to live a comfortable life
Prison	A place where criminals are sent to withdraw their freedom as punishment
Punishment	Something negative done to criminals by the state
Reformation	An aim of punishment – to try and reform criminals
Retribution	An aim of punishment – seeking a form of revenge on criminals

1	Network Connections	Understand why computers are connected in a network
2	Types of networks	Understand the different types of networks (LAN, WAN) and usage models (client-server, peer-to-peer)
3	Wired and Wireless	Understand wired and wireless connectivity
4	Network Speeds	Understand that network data speeds are measured in bits per second (Mbps, Gbps)
5	Role of Networks	Understand the role of and need for network protocols (Ethernet, Wi-Fi, TCP/IP, HTTP. HTTPS, FTP, email (POP3, SMTP, IMAP))
6	Data Transmission	Understand that data can be transmitted in packets using layered protocol stacks (TCP/IP)
7	Network Topologies	Understand characteristics of network topologies (bus, ring, star, mesh)

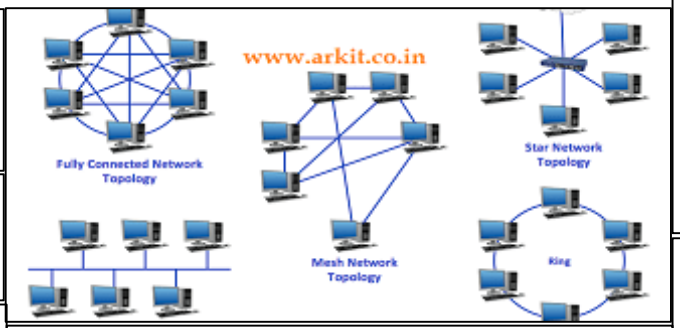


TCP/IP stands for Transmission Control Protocol/Internet Protocol, which is a set of networking protocols that allows two or more computers to communicate.

File transfer protocol: FTP is the name for a method of sending files, but also the name of the program that actually sends the files.

HTTPS stands for Hyper Text Transfer Protocol Secure. It is a protocol for securing the communication between two systems e.g. the browser and the web server.

POP3 and **IMAP** (Post Office Protocol and Internet Message Access Protocol) govern retrieving emails from email servers. POP is an older implementation, largely replaced by IMAP. A newer version of POP is POP3.



Wireless Network: Computers can make a wireless connection if they have a wireless **NIC**. A wireless **router** provides a connection with the physical network. A computer device needs to be within range of the router to get access. A wireless connection uses radio signals to send data across networks. The wireless adapter converts the data into a radio signal and the wireless receiver decodes it so that the computer can understand it.

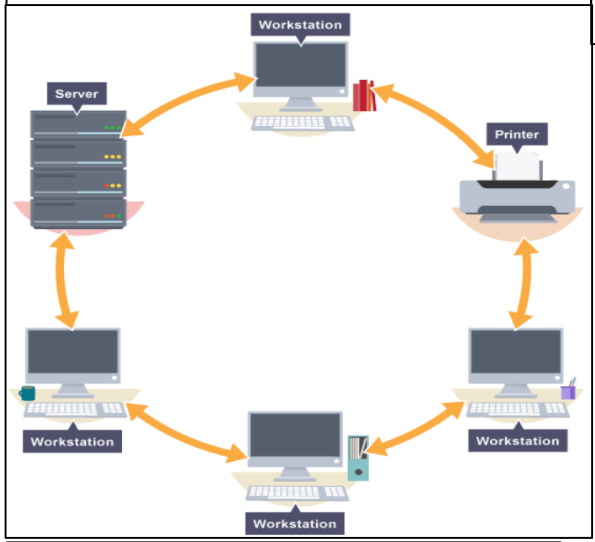
Client Server/Network: A computer network in which one centralized, powerful computer (called the **server**) is a hub to which many less powerful personal computers or workstations (called **clients**) are connected. The clients run programs and access data that are stored on the server. Compare peer-to-peer network.

Peer-to-Peer, or abbreviated *P2P*, a type of network in which each workstation has equivalent capabilities and responsibilities**.**

Wired Network: Computers can be connected through **Ethernet** cables which connect to the Ethernet **port**. Connecting hardware such as a router has Ethernet ports.

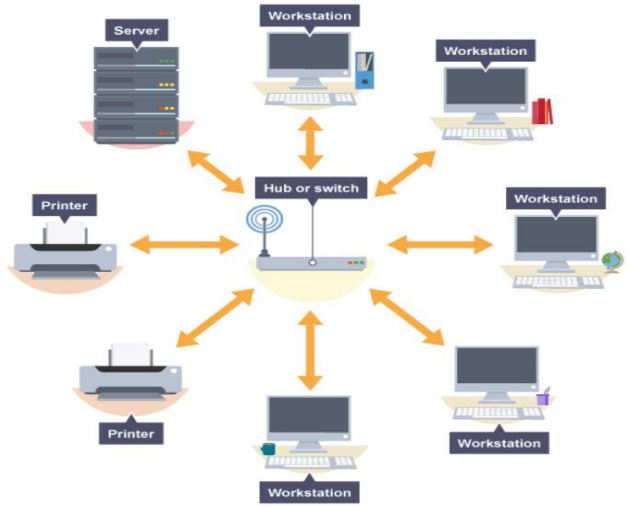
SMTP (Simple Mail Transfer Protocol) governs the sending of email over a network to a mail server.

In a **ring topology** network each **node** is connected to two other **devices**. A ring for the signals to travel around is formed. Each packet of data on the **network** travels in one direction and each node receives each packet in turn until the destination node receives it.



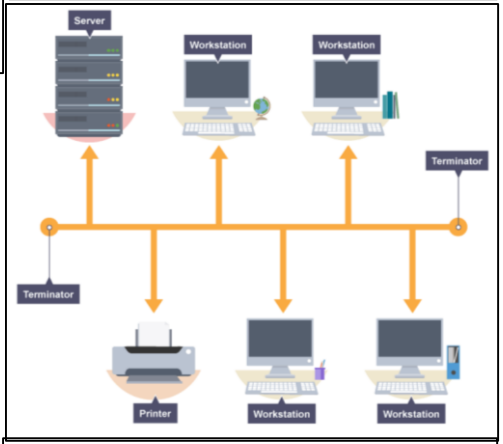
The advantages of a ring **topology** are:
it is easy to install extra network devices adding additional nodes doesn't have an impact on the performance of the network
The disadvantages of a ring topology are: if the main cable fails or gets damaged, the whole network will fail every node on the network receives all of the data sent on the network - this is a security risk it is more expensive than a **bus** network as more cable is needed to join the final and first nod

In a **star topology** all **nodes** indirectly connect to each other through one or more **switches** or **hubs**. A hub broadcasts a message across the whole **network**, whereas a switch sends the message to the intended recipient only. The switch or hub acts as a central point through which all communications are passed. Star topologies are used in many networks, large and small.



Each node is separately connected. Therefore, the failure of one node or its link, also known as **transmission media**, does not affect any other nodes.
New nodes can be added to the network simply by connecting them to the switch.
Star networks tend to have higher performance, since a message is passed on only to its intended recipient.
The disadvantages of a star topology are: the whole network fails if the switch fails, since no node can communicate a wired star topology requires a lot of cable - in a large network this can be expensivee

In a **bus network** all the **nodes** are joined to one cable - the bus. At each end of the cable, a terminator is fitted to stop signals reflecting back down the bus.



The advantages of a bus **topology** are:
it is easy to install extra network devices
it is cheap to install as it doesn't require much cable
The disadvantages of a bus topology are: if the main cable fails or gets damaged, the whole network will fail as more nodes are connected, the performance of the network will become slower because of **data collisions** every node on the network receives all of the **data** sent on the network - this is a security risk

1	Network security	Understand the importance of network security and be able to use appropriate validation and authentication techniques (access control, physical security and firewalls)
2	Security issues	Understand security issues associated with the 'cloud' and other contemporary storage
3	Identifying vulnerabilities	Understand methods of identifying vulnerabilities including penetration testing, ethical hacking, commercial analysis tools and review of network and user policies
4	Protect software systems	Understand how to protect software systems from cyber attacks, including considerations at the design stage, audit trails, securing operating systems, code reviews to remove code vulnerabilities in programming languages and bad programming practices, modular testing and effective network security provision
5	Internet Structure	Understand what is meant by the internet and how the internet is structured (IP addressing, routers)
6	World Wide Web	Understand what is meant by the world wide web (WWW) and components of the WWW (web server URLs, ISP, HTTP, HTTPS, HTML)

Firewalls
A firewall is software that will block unexpected connections coming in to the network. Most operating systems include firewalls.

Physical security
Physical security means restricting physical access to important parts of a network. For example, servers should be kept in a locked, secure room that can only be accessed by authorised people, such as the network manager.

File transfer protocol: FTP is the name for a method of sending files, but also the name of the program that actually sends the files.

Uniform resource locator (web address)
Internet service provider (ISP – AT&T, Verizon, Comcast)

Access control
Access control determines the facilities a user has access to, such as: **software**
- email
- internet
- documents and data
- the ability to install and/or remove software
- the ability to maintain other users' accounts

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Audit Trails (Company employee activity online)
- **Application-specific audit trail** – ideally, each application records business-relevant events. They may be logged in text files or in separate database tables. They allow reconstructing the history much better than the arbitrary noisy logging that is usually in place
- **Application logs** – this is a broader category as it includes logs that are not necessarily part of the audit trail (e.g. debug messages, exception stacktraces). Nevertheless, they may be useful, especially in case there is no dedicated application-specific audit trail functionality
- **Database logs** – whether it is logged queries, change data capture or change tracking functionality, or some native audit trail functionality
- **Operating system logs** – for Linux that would include the /var/log/audit/audit.log (or similar files), /var/log/auth.log. For Windows, it would include the Windows Event logs for the Security and System groups.
- **Access logs** – access logs for web servers can be part of the audit trail especially for internal systems where a source IP address can more easily be mapped to particular users.
- **Network logs** – network equipment (routers, firewalls) generate a lot of data that may be seen as part of the audit trail (although it may be very noisy)

HTTPS stands for Hyper Text Transfer Protocol Secure. It is a protocol for securing the communication between two systems e.g. the browser and the web server.
Padlock shows in URL.

Forms of attack	Different methods of attacking a computer network
Threats posed to networks	Computer networks, viruses
Social engineering	How are people a weak point in a computer network
Brute force attacks	Trying many passwords or passphrases with the hope of eventually guessing correctly. systematically checks all possible passwords and passphrases until the correct one is found.
Denial of service attacks	A cyber-attack where the perpetrator seeks to make a machine or network resource unavailable.
Data interception and theft	The unauthorized taking or interception of computer-based information.
The concept of SQL injection	SQL injection attacks allow attackers to spoof identity, tamper with existing data, cause repudiation issues such as voiding transactions or changing balances.
Poor network policy.	How poor network policy can result in risks to computer networks.
Penetration testing	Penetration testing is testing a computer system, network or Web application to find vulnerabilities that an attacker could exploit.
Network forensics	Network forensics refers to the monitoring and analysing of data on a computer system.
Network policies	A network security policy, or NSP, is a generic document that outlines rules for computer network access,
Anti-malware software	Antimalware software protects against infections caused by many types of malware, including viruses, worms, Trojan horses, rootkits, spyware, keyloggers, ransomware and adware
Access Levels	Access levels allow network administrators to decide what users can do on the network depending

environmental issues. remote working.	Technology has had an impact on the environment that is both positive and negative. The use of computers affects the environment in different ways, such as energy consumption, technological waste, and the impact of
ethical issues	What information can we consider to be private and who owns data, There are piracy laws protecting the distribution of films and other media.

The Cloud

The remote provision of storage and software resources which can be Accessed from a device. Uses servers and data centers to access such content.

Phishing
Attempting to obtain sensitive information such as usernames, passwords, and credit card details (and, indirectly, money), often for malicious reasons, by disguising as a trustworthy entity in an

Complex passwords
Password consisting of at least 6 characters
letter, numbers and symbols

Encryption
Encoding a message so only authorised people can read it.

Firewalls
Part of a network designed to prevent unauthorised access

Anti-Virus
Software designed to detect, prevent and remove viruses

Ransomware
Malicious software that blocks the victim's data or threatens to publish it unless a ransom is paid.

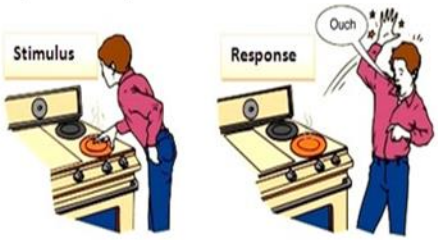
Failover
Having backup servers/systems in place in case of failure

Malware
Software that is specifically designed to gain access or damage a computer without the knowledge of the owner

Carbon footprint
The amount of carbon dioxide released into the atmosphere as a result of the activities of a particular individual, organization, or community.

Pollution
The presence in or introduction into the environment of a substance which has harmful or poisonous effects.

Sensors
A sensor is a device that detects and responds to some type of input from the physical environment. The specific input could be light, heat, motion, moisture, pressure, or any one of a great number of other environmental phenomena.

Section 1: Response to Stimulus	Section 2: Development and Collaboration	Section 3: Analysis and Evaluation
In your devising log, you will be asked to write about the stimuli that your teacher presented to you and the stimulus you chose. You will need to explain the following: ▪ Your first response to the stimuli. ▪ The different ideas, themes and settings you considered and how and why you reached your final decision. ▪ What you discovered from your research ▪ What your own dramatic aims and intentions are (for example, if you are a performer what you want to achieve in your portrayal of your character). ▪ What the dramatic aims and intentions of the piece were (for example what theme might your piece explore or what message would you deliver?). 	Working with others and developing ideas are a part of the pleasure of drama, but these can also be difficult. Make sure that throughout the process you are contributing and meeting your responsibilities. For your devising log, you need to explain: ▪ How you developed and refined your ideas and those of others with whom you worked. ▪ How you developed the piece in rehearsals. ▪ How you developed AND refined your own theatrical skills (performance or design) during the devising process. ▪ How you responded to feedback. ▪ How you used your refined theatrical skills in the final piece. 	Section 3 of your devising log provides you with the opportunity to show your skills at analysing and evaluating your devised work. **Key Words** To **'analyse'** is to identify and investigate. To **'evaluate'** is to assess the different approaches used and formulate judgments. For example "This was successful because... or this could be improved by" ▪ You need to include: ▪ How far you developed your theatrical skills. ▪ The benefits you brought to the pair/group and the way in which you helped to shape the final piece. ▪ The overall impact you personally had on the devising, rehearsal and performance. You could also, if appropriate, consider the areas of the devising that didn't go as well as you had hoped or could have been further developed. In order to write concisely about how well you succeeded, you need to be very clear about what you hoped to achieve. 
Assessment Criteria – Response to Stimulus ▪ The explanations given in the Devising log evidence excellent skills in creating and developing ideas to communicate meaning. ▪ There is evidence of a highly developed and highly creative response to the stimulus. ▪ The explanation is very clear and points are comprehensively explored. ▪ Precise details are provided throughout.	**Assessment Criteria – Development and Collaboration** ▪ The explanations given in the Devising log evidence excellent skills in creating and developing ideas to communicate meaning. ▪ There is evidence of extensive and highly effective development and refinement of skills and the piece. ▪ The explanation is very clear and points are comprehensively explored. ▪ Precise details are provided throughout.	**Assessment Criteria – Evaluation** ▪ Response demonstrates highly developed skills in identifying and investigating how far they developed their theatrical skills and how successfully they contributed to the devising process and to the final devised piece (analysis). ▪ Response demonstrates highly developed skills in assessing the merit of different approaches and formulating judgements about the overall impact they had as an individual (evaluation). ▪ Response is critical and insightful. Points are comprehensively explored and supported in depth with thorough exemplification.

Starter Sentences

Sometimes it can be tricky deciding how best to start your sentences. Use these starter sentences below to help you.

To Introduce

- My devised play focused on...
- The key aspect of my devised play was...
- The central theme to my devised performance was...
- In my devised performance I wanted to emphasise...
- The issue that we focused on in our devised piece was...
- My intentions for my character was...
- The overall intensions for our piece is...

To conclude

- In summary, my play...
- To conclude, I am pleased that my play...
- In conclusion, we successfully...
- In short, my play...
- It has been shown that my play...
- Hence...
- To sum up...
- To review my ideas...

Connectives

Connectives can be used to link ideas within sentences, between sentences and between paragraphs. Improve the sentence structure of your Devising Log. Why not develop your ideas more effectively by using connectives to show how your ideas are linked.

Adding
And...
Also...
As well as...
Moreover...
Too...

Cause and Effect
Because...
So...
Therefore...
Thus...
Consequently...

Emphasising
Above all...
In particular...
Especially...
Significantly...
Indeed...
Notably...

Comparing
Equally...
In the same way...
Similarly...
Likewise...
As with...
Alike...

Qualifying
However...
Although...
Unless...
Except...
If...
As long as...
Apart from...
Yet...

Illustrating
For example...
Such as...
For instance...
As revealed by...
In the case of...

Contrasting
Whereas...
Instead of...
Alternatively...
Otherwise...
Unlike...
On the other hand...
Despite...

Speculative
It would seem...
One could say...
One wonders...
It could appear that...

Theatrical Terminology

Have you been using the key words? Check as this will increase your grades.

General

Antagonist
Anti-climax
Aside
Blackout
Character
Character Interaction
Charter Motivation
Chorus
Climax
Communal Voice
Costume
Mood and Atmosphere
Cross Cutting
Flashbacks
Forth Wall
Forum Theatre
Freeze Frame
Genre
Improvisation
Narration
Props
Protagonist
Split Screen
Structure
Sub-Text

Genre

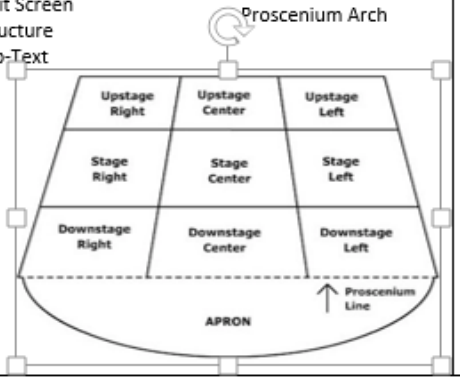
Documentary Theatre
Naturalism (Stanislavski)
Non Naturalism (Brecht)
Physical Theatre
Theatre in Education

Rehearsal Techniques

Bigger Bigger Bigger
Conscience Corridor
Hot-Seating
Inner Thoughts
Role on the Wall

Stage Types

End on
In the round
Arena
Thrust
Traverse
Promenade
Proscenium Arch



Devising Log Checklist

As you are preparing your devising log, keep checking it against the following checklist:

- ☐ Have I written three sections with appropriate headings?
- ☐ Are the sections roughly the same length?
- ☐ Have I stayed within the final word count?
- ☐ Have I provided evidence of research?
- ☐ Have I stated my dramatic aims AND intentions?
- ☐ Have I shown how I developed and refined my ideas?
- ☐ Have I explained how I helped the group?
- ☐ Have I shown how I responded to feedback?
- ☐ Have I demonstrated that I have developed my theatrical skills?
- ☐ Have I explained how I positively shaped the final piece?
- ☐ Have I used correct theatrical terms to explain my thoughts?
- ☐ Have I given specific examples to back up my points?
- ☐ Have I analysed and evaluated my work?

Characterisation

The act of changing voice, body language, movement, gesture etc. when in role is called characterisation. All people are different. The actor must use their skills to portray a character consistently throughout their performance. When creating characters, you need to consider **voice**, **body language, facial expression** and **gesture.**

Characterisation: Voice

Does your character have an accent? What is the tone of their voice like? How quickly do they speak? Do they have any vocal mannerisms that are particular to them?

Key Words

Volume: Loud to quiet
Crescendo: Increasing volume
Pitch: Deep or squeaky
Pace/Tempo: Fast or slow
Rhythm: Fluctuations in pace
Pause: Breaks in speech
Inflection: Emphasis on a word
Articulation: Emphasis on letters.
Tone: Emotion
Clarity: Clearly say words
Accent: A way of speaking that denotes where you are from

Characterisation: Body Language

This is what your character's movements and way of using their body says about them. A character who is very nervous and stressed may fidget a lot or have their shoulders hunched up tight to indicate tension.

Key Words

Movement: e.g. rushing in or stamping their foot excitedly.
Stance: How the character stands.
Gait: The way the character walks.
Posture: How the character stands or sits e.g. slouch or straight.
Proxemics: The space between the characters creates meaning. e.g. **distance** may mean enemies and **contact** may mean intimacy
Levels: Suggest status e.g. a dominant character may be higher up
Use of space: The character can demand a lot of space or hide in a small corner.

Characterisation: Facial Expression

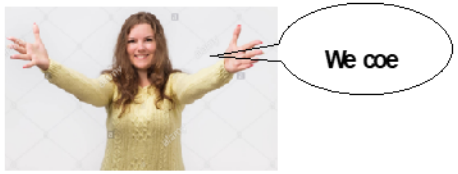
Does your character move their face a lot? What does their facial expression say about their character? Do they have a very expressive face or do they try not to give much of themselves away?

Performing in a large theatre auditorium might mean that many of the audience are a long way away. It's the actors' job to communicate their role to fit the space effectively. Facial expressions, like body language, may be **heightened** or **exaggerated** so that the character's intentions are clear for all.

Characterisation: Gesture

A gesture is a movement expresses meaning. For example, the wagging admonitory finger accompanying words like 'I have told you time and time again that this behaviour is unacceptable' is probably among the most familiar of all gestures. They tend to work as emphasis.

However, gestures can also amplify a question, such as pointing in a particular direction as you say 'Do you mean this way?' They can also convey a mood, such as a shrug of the shoulders to convey indifference.



Rehearsal Techniques

These are exercises that the actors engage in BEFORE they perform live to an audience. They help the actors to understand their **characters** and realise their **intentions**. They also help to develop the plot and structure of a **devised** play.

Understand your character

The rehearsal techniques below help the actor to deepen their understanding of the character they are playing and become more familiar with their **intentions**.

- **Hot-Seating**
  An actor sits in the hot-seat and is questioned **in role.** They spontaneously answer questions.
- **Role on the Wall**
  Draw an outline of your character. Annotate it to reflect the character's thoughts, feelings, fears, circumstances etc.
- **Inner Thoughts**
  Whilst rehearsing a scene, one person will shout "Freeze, inner thoughts". The actor should freeze and spontaneously say out loud what the **character** is thinking.
- **Conscience Corridor**
  Performers make two lines facing each other. The **protagonist** poses a question such as "Should I put Grandad in a basket and leave him by the side of the road"? Actors on each side of the corridor give reasons for and against.

Improve how you play your character

These rehearsal techniques improve how you perform physically on stage.

- **Bigger Bigger Bigger**
  Rehearse one scene several times increasing the energy in gesture/movement, exaggeration of facial expression and volume
- **Non-Verbal Body Language**
  Perform a scene without speaking. Create meaning through mime.

Foundation Skills

Foundation skills are the drama strategies that can be used to help improve the way that you reveal your **plot** to your **audience**.
Always remember, it's not just the story you tell that is important, but also how you tell it!

Role Play
Pretending to be somebody else.

Improvisation
Performing a scene spontaneously without **rehearsal**.

Marking the Moment
This is a way of highlighting the most important moment in a scene in order to draw the audience's attention to its significance.

Still Image
This is a frozen picture which communicates meaning. It's sometimes called a **freeze frame** or **tableau.**

Narration
A narrator is like a storyteller informing the audience about the plot.

Thoughts in the Head
This is when a character steps out of a scene to address the audience about how they're feeling.

Alter Ego
Allowing the audience to hear/see the positive and negative thoughts of a character. It is sometimes called **Angels and Devils.**

Chorus
A group on stage say the same words and gestures.

Flashback
A performance of a scene from the past.

Soundscape
Performers make sounds to create an atmosphere.

Slow Motion
Acting as if time has slowed down. Often used to highlight an important movement.

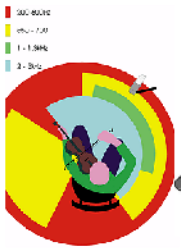
Mime
Telling a story through movement. Creating characters and objects without spoken word.

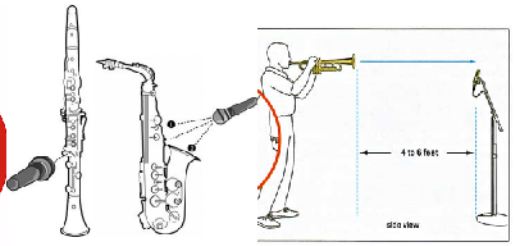
Diaries & Letters
Allowing the audience to hear or see the content of a diary or letter on stage.

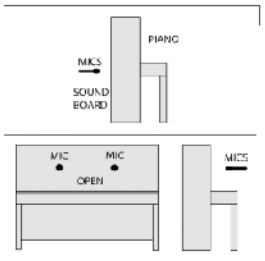
KEYWORDS

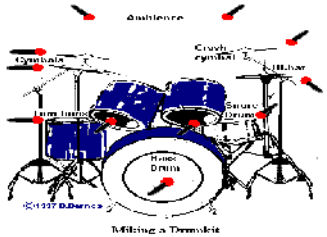
1- XLR: A connector used for microphones or other audio signals, most commonly with three pins although some have more or less. (**Male** have 3 pins; **Female** have 3 holes – they can be connected together).
2- Jack: A type of plug/connector with eiter a Tip and Sleeve (TS) or Tip, Ring and Sleeve (TRS). Commonly available in three sizes: 6mm (1/4 inch), 3.5mm (mini-jack) and 2.5mm.
3-Phono (RCA): They have two unbalanced wires and are often twinned for use as left and right. Right is usually red and left can be any colour, but usually grey or white.
4-DIN: Can have a wide range of pin patterns. Most commonly used for MIDI connections have a semicircle of pins, usually five.
5-Y Lead: A lead which separates the two signal wires coming from a TRS jack, and send them to two other mono connectors. **6 – Adapters:** Used for when you don't have a suitable cable to convert one connector to another connector.
7-balanced cable: Has a separate earth wire with the two signal wires.
8-unbalanced cable: A type of connection or cable with two signal wires only, one of which is also connected to earth (ground).
9-Dynamic: A dynamic microphone generates its own electrical signal by vibrating a coil of wire in a magnetic field.
10-Capacitor: A microphone in which the diaphragm forms one side of a capacitor. When the diaphragm vibrates, the stored charge in the capacitor is
11-Directionality: The pick-up pattern of a microphone, dependent on the shape of the microphone bosy and the construction of its capsule.
12- Omnidirectional: All directions – picks up sound well from all around it.
13-Figure of eight: Picks up sound from the front and rear, but very little from the sides.
14-Cardiod: Picks up sound well from the front, some from the sides and much less from behind.
15- Hypercardioid: Similar to cardiod but more focused to the front and has some side rejection.
16-Spill: When you pick up other instruments other than the one you are trying to record, sometimes also known as bleed.

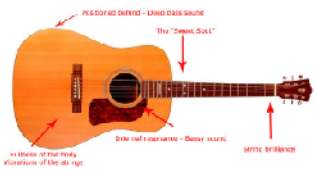
1. Match the pictures with the terms – some of them combine 2 of the terms.
2. Try to be as detailed as possible.

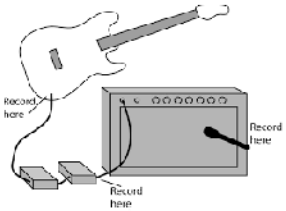






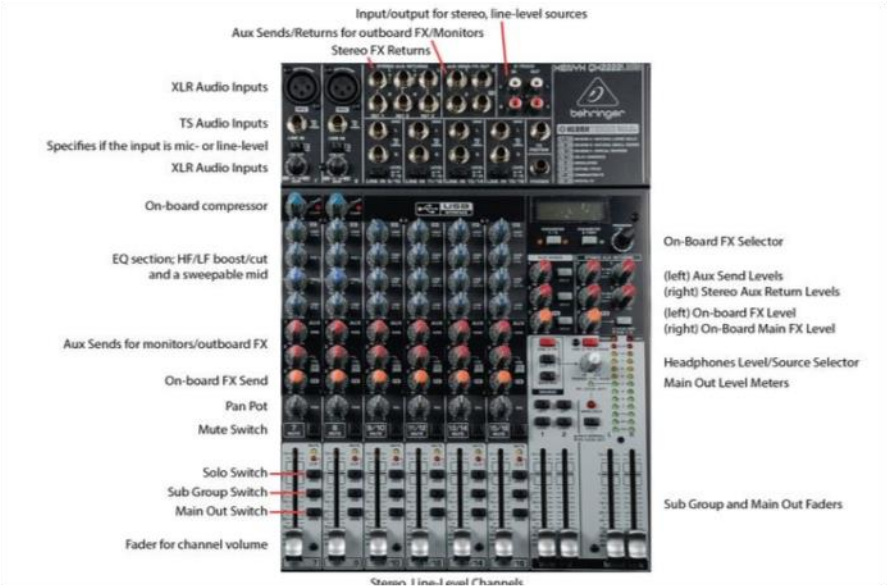


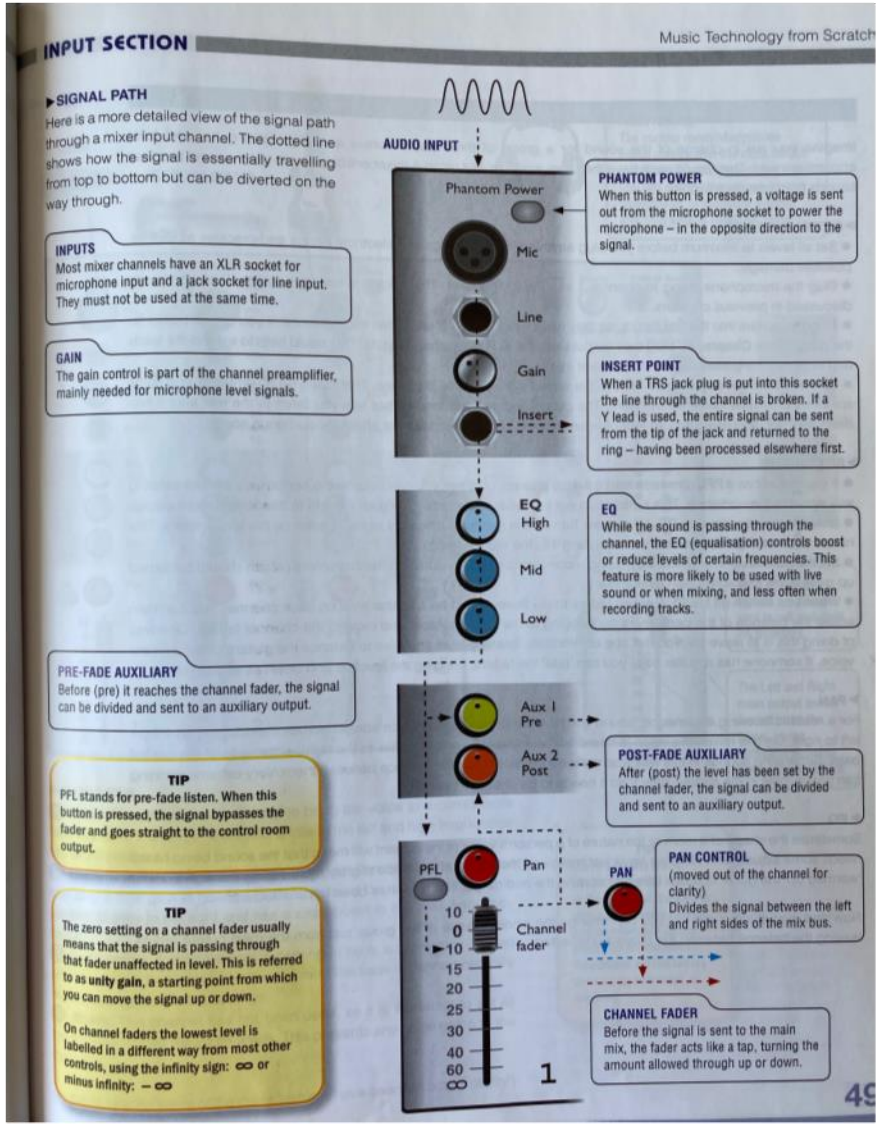




KEYWORDS

Mixer: A device that combines and controls audio signals from other equipment.
Mix Bus: A bus is a path along which an audio signal can be routed. Used to combine different inputs before sending them to the main output.
Pan: The placement of sounds from left to right, usually achieved by distributing signal between left and right speakers (creating stereo sound)
Gain: A measure of amplification. A gain of 10 means the output will be 10 times stronger than the input.
Foldback: A speaker used to help instrumentalists hear themselves or the mix, sometimes called a **monitor**.
Auxiliary: 'extra' – an additional signal path. They are '**pre**' (before) fader or '**post**' (after) fader.
17- EQ (Equalisation): The process of filtering, amplifying or attenuating a range of frequencies in an audio signal. Usually in ranges of frequency (bands) such as Bass, Mid and High.
17- Channel: Where the input of a single instrument/voice is mixed.
17- Fader: A linear or rotary control, most commonly found on a mixer to adjust the volume of each channel.
17- DI Box: A device that matches the audio signal from a guitar or other instrument to a microphone input on a mixer.
Audio interface: A device enabling analog audio equipment to connect to a computer, consisting of analog-to-digital and digital-to-analog convertors.





Scientific method for NEA 1

Analyse
Break down a task or question explaining the keywords and what is required

Hypothesis
An idea, prediction or explanation that you then test through experimentation

Research
Gathering data or information about the ingredient(s) that you are investigating.

Hypothesis
An idea, prediction or explanation that you then test through experimentation

Investigation
practical work that is undertaken by experimentation to prove or support the hypothesis.

Analysis
Explanation of the results linked to the data. Link back to research

Annotate
Add information to a photograph or chart

Fair test
An experiment that tests exactly the same thing during the investigation changing ONE part of the experiment..

Control
The part of the experiment that stays the same. This ensures that a 'Fair Test is carried out.

Independent variable
The part of the experiment that is changed

Dependent variable
The outcome of the experiment that can be measured

Sensory testing and tasting
Measuring the outcomes of experiment using the senses to describe outcomes.

Aeration
Incorporating air into a mixture.

Agitate
To stir, shake or disturb a liquid.

Al dente
'Firm to the bite', a description of the texture of correctly cooked pasta.

Ambient
Foods that can be stored, at room temperature (ordinary room temperature 19°C to 21°C), in a sealed container. All foods found on supermarket shelves are ambient foods.

Amino acids
The building blocks of proteins.

Antioxidant
A molecule that is able to stop the oxidisation process in other molecules and therefore can be useful in stopping foods from deteriorating. Antioxidants can prevent or slow down damage to the body which otherwise can lead to diseases such as heart disease. Antioxidants also improve our immune system.

Antioxidant vitamins
Vitamins A, D and E, found in fruits and vegetables.

Bacteria
Pathogenic microscopic living organisms, usually single-celled, that can be found everywhere. They can be dangerous, such as when they cause infection, or beneficial, as in the process of fermentation (for wine).

Baking
Convection-conduction, cooking foods in a hot oven.

Basted
When fats or juices are poured over something (usually meat) while cooking in order to keep it moist, eg roasting meats.

Batter
A mixture of flour, milk or water, and usually an egg.

Bind
To bring the ingredients in a mixture together using an ingredient, eg egg.

Biological catalysts
Substance which speeds up a chemical reaction.

Biological raising agent
Using yeast to produce CO2 gas.

Biological value
The number of amino acids that a protein food contains.

Blanching
A method of cooking where food is cooked very quickly in boiling water for a short period of time. It stops enzyme actions which can cause loss of flavour, colour and texture. Conduction-convection.

Blanching
A method of cooking where food is cooked very quickly in boiling water for a short period of time. It stops enzyme actions which can cause loss of flavour, colour and texture. Conduction-convection.

Braising
Conduction-convection, sealing meat/vegetables in hot fat, then cooking slowly in a covered dish with some cooking liquid.

Bridge hold
Use thumb and forefinger and grip either side of the ingredient, use knife under the bridge to cut.

Calcium
Main mineral in the body, teeth and bones. It needs vitamin D to help absorption.

Caramelisation
Breaking up of sucrose molecules (sugar) when they are heated. This changes the colour, flavour and texture of the sugar as it turns brown into caramel.

Carbohydrates
Macronutrients required by all animals; made in plants by the process of photosynthesis.

Chemical raising agent
Uses baking powder or bicarbonate of soda to produce CO^2 gas

Choux pastry
A light, crisp, hollow pastry used to make profiteroles, éclairs and gougères.

Claw grip
Tips of fingers and thumb tucked under to hold the ingredient before chopping.

Coagulation
The setting or joining together of lots of denatured protein molecules during heating or change in PH. An irreversible change to the appearance and texture of protein foods.

Coat
To add another ingredient to create an attractive finish, or to create a protective layer on food when cooking.

Conduction
Transfer of heat through a solid object into food.

Consistency
Thickness or viscosity.

Convection
Transfer of heat through a liquid or air circulation into food.

Cook's knife
A large general purpose knife with a deep blade, used for cutting, chopping, slicing and dicing.

Danger zone
Range of temperatures between 5°C to 63°C at which bacteria begin to multiply rapidly s.

Deglazing
To loosen the browned juices on the bottom of the pan by adding a liquid to the hot pan and stirring while the liquid is boiling.

Denaturation
Chemical bonds in the protein food have broken, causing the protein molecule to unfold and change shape.

De-seed
To remove seeds before using.

De-skin
To remove the skin by either putting the fruit or vegetable into boiling water or, for peppers, placing on direct heat.

Dextrinisation
Breaking up of the starch molecules into smaller groups of glucose molecules when exposed to dry heat, eg toast.

Dietary fibre
Complex carbohydrate/non-starch polysaccharide, eg whole grain cereals and cereal products.

Disaccharide
A carbohydrate made from two sugar molecules.

Discrimination tests
Test used to find out whether or not people can tell the difference between similar samples of food.

Dry-frying
Heating food on a low heat without any fat or oil. Conduction.

Efficacy
Power or capacity to produce a desired effect; effectiveness.

Enzymic action
Causes fruit to ripen, change colour, texture, flavour and aroma; maturing of fruits and vegetables.

Enzymic browning
The discolouration of a fruit or vegetable due to the reaction/chemical process where oxygen and enzymes in the plant cells of the food to react and cause the surface to become brown. This process cannot be reversed.

Emulsification
Refers to the tiny drops of one liquid spread evenly through a second liquid. An emulsifier (such as egg yolk) is used to stabilise an insoluble mixture.

Enzymes
Biological/natural substances (catalysts) which speed up biochemical reactions without being used up themselves.

Fats
Macronutrient which supplies the body with energy.

Fat soluble vitamins
Vitamins (the A, D E, and K groups) that dissolve in fat.

Filleting knife
A thin, flexible, narrow blade knife used to fillet fish.

Fluoride
Strengthens the bones and teeth, helps prevent tooth decay.

Foam formation
Foams are formed when gases (mainly air) are trapped inside a liquid, for example meringue, whisked sponge.

Free range
A method of farming husbandry where the animals, for at least part of the day, can roam freely outdoors.

Free sugars
All monosaccharides and disaccharides added to foods by the manufacturer, cook, or consumer, plus sugars naturally present in honey, syrups, and fruit juices.

Fruit sugars
Carbohydrate, which is the natural sugar in fruit –mostly in the form of fructose, or glucose.

Gelatinisation
When starch granules swell when cooked with liquid, then burst open and release the starch, causing the liquid to thicken.

Gliadin and glutenin
The core proteins of the gluten part of wheat seeds.

Gluten formation
Formed from the two wheat proteins gliadin and glutenin, in presence of water. Gluten is developed by kneading.

Gluten free
Food which does not contain gluten (crucial for those with Coeliac disease).

Grading tests
Put in order particular characteristics of a food product.

Grilling
Radiation cooking foods under intense heat.

Hedonic rating test
People give their opinion of one or more food products by filling out a table that uses a preference scale.

High Biological Value (HBV)
Protein foods that contain all the essential amino acids.

Iron
Needed to make haemoglobin in the red blood cells, requires Vitamin C for absorption.

Julienne
Cutting vegetables into matchstick strips.

Knead
To manipulate dough by pushing it across a work surface and pulling it back. This is essential to develop the gluten.

Knock back
To knead out the carbon dioxide in risen dough to remove large air pockets to ensure an even texture.

Lactose
A natural sugar found in milk and dairy products.

Lactose intolerant
A condition which means you cannot digest disaccharide sugar lactose.
Layer
To make up a dish with differing ingredients one on top of another.
Marinade
To soak foods such as fish, meat, poultry and vegetables in a liquid to help develop the flavour, tenderise and in some instances colour the food before it is cooked. The liquid can be acidic or a salty solution. Protein is denatured by marinating.
Mash
To reduce to a soft mass by using a masher.
Mechanical raising agent
Whisking, beating, sieving, creaming, rubbing in or folding to trap air into the mixture.
Micro filtered
All bacteria in milk are removed, by forcing it through filtration membranes, then pasteurised and homogenised.
Micronutrients
Nutrients required in small quantities to facilitate a range of physiological functions.
Microorganisms
Tiny forms of life, usually single cell microscopic organisms such as bacteria, moulds and fungi.
Milk sugars (lactose)
A single molecule of glucose linked to a single molecule of galactose to form a carbohydrate, known as lactose.
Milling
Breaking cereal grains (seeds) down and separating the layers, turning grain into flour.
Minerals
Chemical substances found in a wide variety of foods.
Mix
To combine two or more ingredients together to become one.
Monosaccharide
A simple carbohydrate. Mono means one, saccharide means sugar.
Monounsaturated fats
Fats that contain one double bond in the molecule.
Nutrients
The properties found in food and drinks that give nourishment – vital for growth and the maintenance of life. The main nutrients needed by the human body are carbohydrates, proteins, fats, vitamins and minerals.

. **Nutritional analysis**
Nutritional information for different foods, creating a nutritional profile of the specific nutrients in the food.
Oil in water emulsion
Keeping drops of oil or fat suspended in a liquid to prevent them from joining together, for example butter.
Olfactory systems
The receptors found in the back of the nose that are responsible for our sense of smell/aromas.
Oxidation
Substances pick up oxygen from the air; they then oxidise to undergo a chemical reaction, resulting in food losing freshness and colour.
Palatability
Reward provided by foods or fluids that are agreeable with regard to the satisfaction of nutritional, water, or energy needs.
Paired preference
People given two similar samples of food and they have to say which one they prefer.
Paring knife/vegetable knife
A small multi-purpose knife mainly used for slicing and dicing.
Pasteurisation
The process of heating a food to a specific temperature for a specific period of time in order to kill microorganisms that could cause disease, spoilage or undesired fermentation.
Phosphorous
Helps calcium to mineralise the teeth and bones.
Poaching
A method of cooking where food is cooked in a liquid that is just below boiling point. Conduction-convection.
Polysaccharide
A complex carbohydrate: many sugar molecules joined together, they do not taste sweet.
Polyunsaturated fats
Fats that contain several double or even triple bonds in the molecule.
Plasticity
The ability of fat to soften over a range of temperatures to hold its shape, or be shaped and spread.
Preservatives
Used to prevent food from spoilage by microorganisms; increases the shelf life of commodities.
Profiling
People asked to rate the intensity of a food product from 1–5 against a set of sensory descriptors.
Protein
A macronutrient that is essential to building muscle mass.
Protein alternatives
Manufactured protein food products consumed in place of meat or fish.
Proving
The last rising of the bread dough in its final shape before it is baked.
Radiation
A heating process that does not require physical contact between the heat source and the food being cooked. Instead, energy is transferred by waves of heat or light striking the food. Two kinds of radiation heat are used in the kitchen: infra-red and microwave.

Ranking
People asked to rank order samples of food according to a criteria.
Rating
People asked to rate a food sample for a specific characteristic.

Raising agents
An ingredient or process that introduces a gas into a mixture so that it rises when cooked.
Reduction
The process of simmering a liquid over heat until it thickens. It is also the name of the concentrated liquid that forms during this process.
Roasting
Convection-conduction, cooking foods in oil or fat in a hot oven.
Saturated fats
This type of fat is mostly from animal sources; they are normally solid fats. All of the carbon atoms in the fatty acid molecules are linked by single bonds.
Scientific principles
Demonstrates how science of the ingredients are at work in producing, processing, preparing, preserving, and metabolising foods.
Segment
To peel and pull apart, for example an orange.
Sensory properties
Smell, appearance and texture, mouth feel influence what we select to eat.
Sensory testing methods
A way of measuring the sensory qualities of food and is used by chefs, food manufacturers and retailers to analyse a food product.
Shallow frying
A quick method of cooking where a small amount of fat is used to cook food in a frying pan.
Shortening
The ability for fat to shorten the length of the gluten molecules in pastry or shortbread, for example butter, lard or other fat that remains solid at room.
Shred
To slice into long, thin strips.
Simmering
Water that is heated to just below boiling point.
Skewer
A long metal or wooden pin used to secure food on during cooking; to skewer is to hold together pieces of food using a metal or a wooden pin.
Sodium (salt)
Controls the amount of water in the body.
Snip
To cut (usually with a pair of scissors) with a small, quick stroke.
Stabilisers
Help stop substances separating again after they have been mixed stabilise an emulsion.

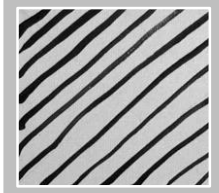
Starch
A polysaccharide, a complex carbohydrate.
Steaming
A method of cooking where food is cooked in the steam coming from boiling water. Conduction-convection.
Sterilised
Heated in sealed bottles to 110°C for 30 seconds
Stir-frying
A quick method of cooking where small pieces of food are fast-fried in a small amount of oil in a wok.
Taste receptors
Special cells on the tongue that pick up flavours.
Tasting panel
A process of testing foods. The process must be fair and realistic controlled conditions.
Temperature control
Range of temperature for the storage of food correctly.
Temperature probes
Give an accurate reading of the core temperature (centre) of the food. Food probes must be used correctly.
Triangle test
People given three samples of a food product to try. Two samples are identical, the third something is different; they need to discriminate between the samples.
Ultra Heat Treatment (UHT)
Heated very quickly in a heat exchanger to 72°C for 15 seconds cooked rapidly to below 10°c (normally 4°C).
Unsaturated fats
Fats that contain a high ratio of fatty acid molecules with at least one double bond. Unsaturated fats are normally liquid oil.
Vegan
People who do not eat flesh or any animal products. They can eat plant protein soya, TVP, tofu.
Vegetarian
A lacto-vegetarian diet includes dairy products and plants, and a lacto-ovo vegetarian diet includes eggs, dairy products and nuts.
Vitamin B2 (Riboflavin)
Enables energy to be released from carbohydrate, fat and protein in the body found in many foods, such as milk, eggs, rice. Deficiency is rare.
Vitamin B3 (Niacin)
Enables release of Vitamin C (ascorbic acid) needed for absorption of iron, to maintain body cells. Found in citrus fruits, green vegetables.
Vitamin B12
Works with folic acid, found in meat, fish fortified cereals.
Water based
Using liquid to transfer heat via convection.
Water in oil emulsion
Where liquid is suspended in oil or fat and prevents them from separating out, for example mayonnaise.
Water soluble vitamins
Soluble vitamins (the B group and vitamin C) in water of energy in the body. Found in wheat flour, eggs, milk some meats. Deficiency is called pellagra.
Yeasts
A microscopic fungus consisting of single oval cells that reproduce by budding, and capable of converting sugar into alcohol and CO2 gas. Also ferments in the correct conditions to make bread rise.

A. Key Terms

Keyword	Description
1. Acrylic Paint	Acrylic paint is a water drying pain widely used since the 1960s. It can be thickly or thinly depending much water is added to it.
2. Avant-Garde	As applied to art, avant- means art that is introducing or exploring forms or subject matter.
3. Conceptual Art	Conceptual art is art for idea (or concept) behind is more important than the finished art work.
4. Gestural	Gestural is a term used to describe the application of free sweeping gestures brush.
5. Mixed Media	Mixed media is a term describe artworks a combination of different or materials.

Study, Explore, Create, Analyse.

B. Key Techniques

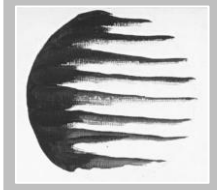


Technique 1 - Hatching

The first technique we will look at is hatching. If you add an even, equal distant hatching over the surface you will get an even texture as you can see above. You can use pen, pencil or a fine paintbrush and ink.

Technique 2 - Cross hatching

You can vary the distance between hatches to create a tighter or looser texture. To paint the varying hatch lines I have started in the bottom left-hand corner painting the lines very close to each other. Each line is slightly further away from the previous.

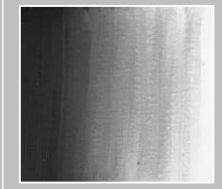


Technique 3 - Line weight

The thickness of a line is called it's weight. The thicker the line, the more weight it has. In this exercise. For fun I have also filled in the left hand side of the circle so that we end up with a shading from dark on the left to light on the right.

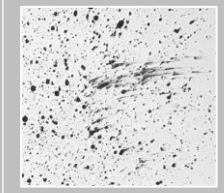
Technique 4 - Contour Lines

Contour lines follow the contour of an object. When viewed from the side these lines are actually parallel to each other. Viewed from the top however reveals the true contour of the object. The closer the lines are together, the steeper the incline. The further the lines are, the shallower the incline of the object. Obviously your contour lines do not need to represent an object, they could represent energy lines or simply be abstract lines forming a texture on your canvas.



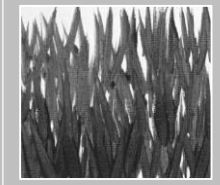
Technique 5 - Shading

I have no doubt that you have done this technique many times before. Using the soft brush and black I will start at the left gradually shading towards white on the right. Shading gives us a smooth texture so if you want to represent a smooth surface, shading is the way to go.



Technique 6 – Splatter

To do splatter correctly thin your paint down to the consistency of water. Then use a bristle brush and your finger to flick the paint off the brush towards the canvas. The thinner your paint the larger the dots. The thicker the paint, the smaller the dots.



Technique 7 – Waves

Using your brush, flick lines upwards. This gives you a grass texture. You can now layer these flicks over each other to form a woven or hair texture. The closer the flicks are to each other the darker the tonal value. The further the flicks are apart, the lighter the tonal value.

C. Key Materials

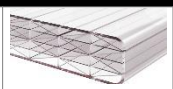
Materials – Ferrous metals - containing IRON

			
Cast iron	High carbon steel	Low carbon steel	Stainless steel
Good compressive strength, good for casting.	Strong and hard but difficult to form.	Tough and low cost.	Strong and hard, good corrosion resistance.

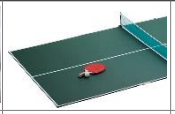
Materials – NON Ferrous metals / alloys – containing NO iron

					
Aluminium	Copper (pure metal)	Brass (alloy of 65% copper 35% zinc)	Bronze (alloy of 90% copper 10% tin)	Lead (pure metal)	Zinc (pure metal)
Light, strong, ductile, good conductor, corrosion resistant.	Malleable, ductile, tough, good conductor, easily joined, corrosion resistant.	corrosion resistant, good conductor, easily joined, casts well.	Tough and hardwearing, corrosion resistant.	Very soft and malleable, heaviest common metal, corrosion resistant.	Low melting point, extremely corrosion resistant, easily worked.

Materials – Polymers – Thermoplastics – shaped when hot – can be reheated

			
ABS	Acrylic	Polycarbonate	Polystyrene
Strong and ridged, hard and tough, expensive.	Good optical properties, transparent, good colour, hard wearing, shatter proof.	High strength and toughness, heat resistant, good colour stability.	Good toughness and impact strength, good for vacuum forming and injection moulding.

Materials – Polymers – Thermosetting plastic – can be moulded – non recycleable

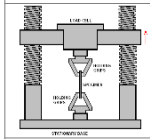
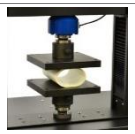
			
Polyester resin	Melamine resin	Polyurethane	Vulcanised rubber
Good strength but brittle	Stiff hard and strong	Hard with high strength, flexible and tough	Highest tensile strength, elastic, resistant to abrasion

Properties and characteristics of materials

	Absorbency	To be able to soak up liquid easily.
	Strength	The capacity of an object or substance to withstand great force or pressure.
	Elasticity	The ability of an object or material to resume its normal shape after being stretched or compressed; stretchiness.
	Plasticity	The quality of being easily shaped or moulded.
	Malleability	To be able to be hammered or pressed into shape without breaking or cracking.
	Density	The quantity of mass per unit volume of a substance
	Effectiveness	The degree to which something is successful in producing a desired result; success.
	Durability	The ability to withstand wear, pressure, or damage.

Testing materials

Materials testing is used to check the suitability of a material.	Testing can be non-destructive or destructive.	Most Non destructive testing will be visual.	Tensile testing, compressive strength tests and hardness testing are destructive.

Tensile test	Compressive test	Hardness test
		
- Used to find the strength under tension. - The maximum pulling or stretching force before failure. - Used by applying a load and observing the changes.	- The resistance of a material under a compressive force. - A material is placed under compression to see its resistance. - concrete is a good example of material with compressive strength.	- Used to find out how hard a material is. - In a work shop a hammer and dot punch is used to create an indentation in the material.

SI Base Units

unit	abb	physical quantity	Smallest - - - - - - - Largest
metre	m	length	Micrometer, millimeter, centimeter, meter
second	s	time	Microsecond, millisecond, seconds
kilogram	kg	mass	Milligram, gram, kilogram
ampere	A	electric current	Micro amp, milliamp, amp, kiloamp
kelvin	K	thermodynamic temperature	Kelvin, degrees Celsius
candela	cd	luminous intensity	Microcandela, millicandela, candela
mole	mol	amount of substance	Nanomole, micromole, millimole, mole

Engineering Disciplines

Mechanical	Hydraulics, gears, pulleys.
Electrical	Power station, household appliances, integrated circuits
Aerospace	Aircraft, space vehicles, missiles
Communications	Telephone, radio, fibre optic
Chemical	Pharmaceuticals, fossil fuels, food and drink
Civil	Bridges, roads, rail
Automotive	Cars, motorcycles, trains
Biomedical	Prosthetics, medical devices, radiotherapy
Software	Applications, systems, programming

Understand the making Process

1	Preparation	Drawing, CAD, sketches, plans.
2	Marking Out	Pencil, scribe, steel rule, tri square, marking gauge, calipers, centre punch.
3	Modification	Saw, jigsaw, scroll saw, laser cutter, pliers, hammer, drill, file, glass paper.
4	Joining	Riveting gun, spanner, screwdriver, hot glue, gun , soldering iron, nail gun.
5	Finishing	Hand sander, glass paper, disc sander, buffing wheel, polish, spray paint, varnish.

Health & Safety Legislation

Health and Safety at work Act – an agreement to keep us safe.	Personal Protective Equipment – to protect your body.	Manual Handling Operations – lifting and carrying.	Control of Substances Hazardous to Health – chemicals.	Reporting of Injuries RIDDOR – keeping a log of accidents.

Au collège

Année 10 Higher

Semaine 1

Les matières	School subjects		
le commerce	*business studies*	l'anglais	*English*
le dessin/les arts plastiques	*art/fine art*	l'art dramatique	*drama*
le français	*French*	l'économie	*economics*
le latin	*Latin*	l'éducation physique et sportive/l'EPS	*PE*
la biologie/les Sciences de la Vie et de la Terre	*biology*	l'espagnol	*Spanish*
		l'étude des médias	*media studies*
la chimie	*chemistry*	l'histoire	*history*
la géographie	*geography*	l'histoire-géo	*history and geography (studied together in France)*
la musique	*music*		
la physique/les sciences physiques	*physics*	l'informatique	*ICT*
la religion	*religious studies*	l'instruction civique	*citizenship*
la sociologie	*sociology*	l'italien	*Italian*
la technologie	*design and technology*	les arts ménagers	*home technology*
l'allemand	*German*	les maths	*maths*

Semaine 2

Mon collège	My school		
Mercredi, à 11h15, j'ai histoire-géo.	*I have history and geography at 11.15 a.m. on Wednesday.*	Je trouve …	*I find …*
J'ai (deux) heures de (musique) par semaine.	*I have (two) hours of (music) per week.*	Je pense que … est/sont …	*I think that … is …*
		intéressant(e)(s)	*interesting*
Il n'y a pas de cours de … dans mon emploi du temps.	*There are no … lessons in my timetable.*	passionnant(e)(s)	*exciting*
		ennuyeux/-euse(s)	*boring*
J'apprends (deux) langues vivantes.	*I learn (two) foreign languages.*	… parce que …	*… because …*
Mes cours finissent à (16h00) tous les jours.	*My lessons finish at (4.00 p.m.) every day.*	c'est facile/fascinant/ difficile/utile/inutile	*it's easy/fascinating/ difficult/useful/useless*
Je n'ai pas cours (le mercredi après-midi).	*I don't have lessons (on Wednesday afternoon).*	Je suis fort(e)/faible/doué(e) en …	*I am strong/weak/gifted in …*
Ma matière préférée est …	*My favourite subject is …*	Le/La prof est bon(ne)/sympa/marrant(e)/ sévère/gentil(le)/impatient(e).	*The teacher is good/nice/funny/ strict/kind/impatient.*
J'adore/j'aime/je n'aime pas/je déteste …	*I love/like/don't like/hate …*	On a trop de devoirs.	*We have too much homework.*

Semaine 3

Mon bahut	My school		
Comment s'appelle ton collège?	*What's your school called?*	Le mercredi après-midi, il n'y a pas cours.	*There are no lessons on Wednesday afternoon.*
Mon collège s'appelle …	*My school is called …*		
C'est quelle sorte d'école?	*What sort of school is it?*	Quelles matières étudies-tu?	*What subjects do you study?*
C'est un collège mixte pour les élèves de onze à seize ans.	*It's a mixed school for pupils from 11 to 16.*	J'étudie douze matières dont …	*I study 12 subjects, including …*
		Toutes mes matières sont obligatoires.	*All my subjects are compulsory.*
Il y a combien d'élèves?	*How many pupils are there?*	Quelle est ta matière préférée?	*What is your favourite subject?*
Il y a 750 élèves et quarante-cinq professeurs.	*There are 750 pupils and 45 teachers.*	Ma matière préférée, c'est (les arts ménagers) car …	*My favourite subject is (home technology) because …*
Quels sont les horaires du collège?	*What are the school hours?*	J'adore (cuisiner) car …	*I love (cooking) because …*
Les cours commencent à 8h30.	*Lessons start at 8.30 a.m.*	je suis doué(e) pour ça	*I'm talented at that*
La récré est à 10h15 et dure quinze minutes.	*Break is at 10.15 a.m. and lasts 15 minutes.*	Comment sont les professeurs?	*What are your teachers like?*
		Les profs sont sympa/sévères.	*The teachers are nice/strict.*
On a une heure et demie pour le déjeuner.	*We have an hour and a half for lunch.*	Qu'est-ce que tu penses de ton collège?	*What do you think of your school?*
Les cours finissent à 16 heures.	*Lessons finish at 4.00 p.m.*	Je trouve que/qu' …	*I find that …*
Il y a combien de cours par jour?	*How many lessons are there per day?*	les journées sont trop longues	*the days are too long*
Il y a sept cours de cinquante-cinq minutes par jour.	*There are seven lessons of 55 minutes per day.*	on a trop de contrôles	*we have too many tests*
		les profs sont excellents	*the teachers are excellent*

Semaine 4

'école chez nous, l'école hez vous	School here and with you		
n Angleterre/Écosse/Irlande du Nord, …	*In England/Scotland/ Northern Ireland …*	l'école commence …	*school starts …*
		ils portent …	*they wear …*
u pays de Galles, …	*In Wales …*	ils achètent …	*they buy …*
on va à l'école de … ans à … ans	*we go to school from … to … years old*	ils (ne) redoublent (pas)	*they (don't) repeat the year*
		ils étudient …	*they study …*
l'école commence à … heures et finit à … heures	*school starts at … and finishes at …*	Je préfère le système (anglais/français)	*I prefer the (English/French) system*
		parce que …	*because …*
on porte un uniforme scolaire/ ses propres vêtements	*we wear a school uniform/our own clothes*	les horaires sont plus raisonnables	*the hours are more sensible*
		l'uniforme scolaire est pratique/inutile	*school uniform is practical/useless*
on achète ses propres stylos et règles	*we buy our own pens and rulers*	l'école fournit l'équipement	*the school provides the equipment*
on ne redouble pas	*we don't repeat the year*	le redoublement (n')est (pas) une bonne idée	*repeating the year is (not) a good idea*
on étudie …	*we study …*		
lais en France/au Canada/au Mali, …	*But in France/Canada/Mali …*	on (n')étudie (pas) …	*we/they (don't) study …*
ils vont …	*they go …*		

Vocabulaire du français au GCSE

Année 10 Higher

Semaine 5

Le règlement scolaire	School rules
Dans cette école, il faut …	*In this school, you must …*
être à l'heure	*be on time*
faire ses devoirs	*do your homework*
porter l'uniforme scolaire	*wear a school uniform*
Il ne faut pas …	*You must not …*
manquer les cours	*miss lessons*
tricher pendant un contrôle	*cheat in a test*
Il est interdit de/d' …	*It is forbidden to …*
mâcher du chewing-gum	*chew gum*
utiliser son portable en classe	*use your mobile in class*
porter des bijoux/des piercings/ trop de maquillage	*wear jewellery/piercings/too much make-up*
harceler d'autres élèves	*bully other pupils*
sortir de l'école pendant l'heure du déjeuner	*leave school during the lunch hour*
Je trouve ça …	*I find that …*
raisonnable/logique	*reasonable, sensible/logical*
juste/injuste	*fair/unfair*
ridicule/frustrant	*ridiculous/frustrating*
… parce que/car …	*… because …*
c'est/ce n'est pas dangereux	*it's (not) dangerous*
il faut protéger les jeunes	*you must protect young people*
on n'est pas des bébés	*we're not babies*
il faut respecter les autres	*you must respect others*
la mode n'a pas de place à l'école	*fashion has no place at school*
c'est/ce n'est pas important	*it's (not) important*
l'école, c'est pour apprendre	*school is for learning*
J'ai eu une heure de retenue/de colle.	*I had an hour of detention.*
J'ai dû copier des lignes.	*I had to write lines.*
Quelle perte de temps!	*What a waste of time!*
Je pense que tu as raison.	*I think you're right.*
Ah non, tu as tort.	*Oh no, you're wrong.*
Moi aussi, je trouve que …	*Me too, I find that …*
Je (ne) suis (pas) d'accord avec toi.	*I (don't) agree with you.*
Tu rigoles!	*You're joking!*

Semaine 6

Profiter de l'école	Making the most of school
Présentez-vous pour être délégué(e) de classe.	*Put yourself forward to be class representative.*
Levez la main autant que possible en classe.	*Raise your hand as often as possible in class.*
Participez à la chorale.	*Join the choir.*
Soyez «écolo».	*Be 'green'.*
N'ayez pas peur de remettre en cause les attitudes sexistes, racistes ou homophobes.	*Don't be afraid to challenge sexist, racist or homophobic attitudes.*
Faites une activité sportive.	*Do a sporting activity.*
N'oubliez pas de remercier vos profs.	*Don't forget to thank your teachers.*
Soyez gentils avec les plus jeunes.	*Be kind to the youngest ones.*
Profitez des sorties scolaires.	*Make the most of your school trips.*
Amusez-vous bien!	*Have lots of fun!*
C'est quoi, ton plus grand accomplissement au collège?	*What is your greatest achievement at school?*
Je joue dans l'équipe de rugby.	*I play in the rugby team.*
Je représente les opinions de mes camarades de classe.	*I put forward my classmates' opinions.*
Je n'oublierai jamais cette expérience.	*I will never forget this experience.*
Je fais partie du club de théâtre.	*I am in the drama club.*
C'est une bonne préparation pour la vie d'adulte.	*It's good preparation for adult life.*
Je suis fier/fière car je n'ai pas beaucoup confiance en moi.	*I am proud because I don't have much self-confidence.*
Ce succès est mérité car je travaille très dur.	*I deserve my success because I work hard.*
J'ai donné un concert.	*I gave a concert.*
J'ai toujours de bons commentaires sur mon bulletin scolaire.	*I always get good comments in my school report.*
C'est un honneur de représenter son école.	*It's an honour to represent your school.*

Semaine 6

En échange	On an exchange
Pourquoi faire un échange scolaire?	*Why go on a school exchange?*
On se fait de nouveaux amis.	*You make new friends.*
On améliore ses compétences en langue.	*You improve your language skills.*
On habite chez une famille d'une culture différente.	*You live with a family from another culture.*
On visite un nouveau pays ou une nouvelle région.	*You visit a new country or region.*
On apprécie non seulement les différences mais aussi les similarités entre nos vies.	*You appreciate not only the differences, but also the similarities between our lives.*
Mon/Ma correspondant(e) anglais(e) est arrivé(e) il y a (cinq) jours.	*My English exchange partner arrived (five) days ago.*
Les élèves et leurs profs sont arrivés (en car).	*The pupils and their teachers arrived (by coach).*
J'ai été content(e) de rencontrer X.	*I was pleased to meet X.*
On a passé le premier week-end en famille.	*We spent the first weekend with the family.*
Nous sommes allés au collège ensemble.	*We went to school together.*
Nous avons visité …	*We visited …*
On a participé à …	*We took part in …*
Il y aura une sortie à …	*There will be an outing to …*

Semaine 6 - Traduction spéciale en français : tout le vocabulaire plus …

Les mots essentiels	High-frequency words
dont	*of which*
en ce moment	*at the moment, currently*
parmi	*among*
au lieu de	*instead of*
bientôt	*soon*
à cause de ça	*because of that*
y compris	*including*

Vocabulaire du français au GCSE

Année 11 Higher

Les professions	Jobs		
Ma mère/Mon père est …	*My mum/dad is a(n) …*	maçon(ne)	*builder*
Je voudrais être …	*I would like to be a(n) …*	mécanicien(ne)	*mechanic*
acteur/-trice	*actor/actress*	médecin	*doctor*
agent de police	*policeman/woman*	professeur	*teacher*
agriculteur/-trice	*farmer*	secrétaire	*secretary*
architecte	*architect*	serveur/-euse	*waiter/waitress*
boucher/-ère	*butcher*	soldat	*soldier*
boulanger/-ère	*baker*	steward/hôtesse de l'air	*flight attendant*
caissier/-ère	*cashier*	vendeur/-euse	*sales assistant*
coiffeur/-euse	*hairdresser*	vétérinaire	*vet*
créateur/-trice de mode	*fashion designer*	J'adore (la campagne).	*I love (the countryside).*
dentiste	*dentist*	Je suis passionné(e) par (la loi et la justice).	*I'm passionate about (the law and justice).*
directeur/-trice	*director*		
électricien(ne)	*electrician*	Je suis fort(e) en (maths).	*I'm good at (maths).*
employé(e) de bureau	*office worker*	Je suis (courageux/-euse).	I am (brave).
facteur/-trice	*postman/postwoman*	(Voyager), c'est ma passion.	*(Travelling) is my passion.*
fonctionnaire	*civil servant*	(Les avions) me fascinent.	*(Planes) fascinate me.*
infirmier/-ère	*nurse*	Je préférerais travailler (en plein air).	*I would prefer to work (outdoors).*
informaticien(ne)	*computer scientist*	Je voudrais travailler avec (des enfants).	*I would like to work with (children).*
ingénieur(e)	*engineer*	Je voudrais/J'aimerais travailler comme …	*I would like to work as …*
journaliste	*journalist*	Je veux être …	*I want to be …*

L'orientation	Career paths		
Dans quel secteur voudrais-tu travailler?	*In which area would you like to work?*	Le salaire a moins d'importance/est très important pour moi.	*The salary is less/very important to me.*
l'audiovisuel et les médias	*audiovisual and media*		
l'informatique et les télécommunications	*IT and telecommunications*	À mon avis, c'est un secteur d'avenir.	*In my opinion, it's an area with prospects.*
l'hôtellerie et la restauration	*hotel and catering*		
les arts et la culture	*arts and culture*	Je suis … depuis (trois) ans.	*I have been a … for (three) years.*
le commerce	*business*	C'est un métier (stimulant).	*It's a (stimulating) job.*
le sport et les loisirs	*sport and leisure*	La chose qui me plaît le plus, c'est …	*What I like best is …*
la médecine et la santé	*medicine and health*	L'inconvénient, c'est que …	*The disadvantage is that …*
les sciences et les technologies	*science and technology*	les horaires sont très longs	*the hours are very long*
Ça m'intéresserait de travailler dans …	*I would be interested in working in …*	c'est fatigant	*it's tiring*
Mon rêve serait de faire carrière dans …	*My dream would be to have a career in …*	Le mieux/pire, c'est …	*The best/worst thing is …*
		Je suis assez satisfait(e) de mon travail.	*I'm quite satisfied with my job.*
Mon ambition/Mon but est de trouver un poste dans …	*My ambition/aim is to find a job in …*	Avant, j'étais/je travaillais comme …	*In the past, I was/worked as …*
		C'était affreux/stressant/mieux/pire.	*It was awful/stressful/better/worse.*
Le secteur/L'orientation qui m'attire/ m'intéresse (le plus), c'est …	*The sector/career path that attracts/ interests me (the most) is …*	C'était mal payé.	*It was badly paid.*
		Le travail était monotone.	*The work was monotonous.*
L'important pour moi est d'avoir un métier bien payé.	*The important thing for me is to have a well-paid job.*	Il n'y avait aucune possibilité d'avancement.	*There was no chance of promotion.*
Le plus important est de …	*The most important thing is to …*		
faire quelque chose de satisfaisant/ stimulant/gratifiant/d'intéressant	*do something satisfying/ stimulating/rewarding/interesting*	Je m'entendais mal avec mon patron.	*I didn't get on well with my boss.*
		J'ai décidé de (suivre une formation).	*I decided to (take a course).*
faire quelque chose pour améliorer la société/aider les autres	*do something to improve society/ help others*	Maintenant, je suis diplômé(e).	*Now I am qualified.*
		Mon nouveau boulot est (plus créatif).	*My new job is (more creative).*
		Mes collègues sont tous très sympa.	*My colleagues are all very nice.*

Les ambitions	Ambitions		
Avant de continuer mes études, …	*Before I continue my studies …*	entrer en apprentissage	*do an apprenticeship*
Après avoir terminé mes examens, …	*After having finished my exams …*	faire du bénévolat/travail bénévole	*do charity/voluntary work*
Après avoir quitté le collège, …	*After having left school …*	prendre une année sabbatique	*take a gap year*
Plus tard/Un jour, …	*Later on/One day …*	J'espère me marier/me pacser.	*I hope to get married/register a civil partnership.*
Je veux/J'aimerais/Je préférerais/ J'espère …	*I want/I would like/I would prefer/ I hope to …*		
		J'ai l'intention de faire le tour du monde.	*I intend to travel round the world.*
J'ai envie de/d' …	*I want to …*	Mon but est de fonder une famille.	*My aim is to start a family.*
J'ai l'intention de/d' …	*I intend to …*	Je ne veux pas avoir d'enfants.	*I don't want to have children.*
Mon rêve serait de/d' …	*My dream would be to …*	Je n'ai aucune intention de m'installer avec mon copain/ma copine.	*I have no intention of moving in with my boyfriend/girlfriend.*
aller à l'université/à la fac	*go to university*		

Les langues — *Languages*

Tu parles quelles langues?	*Which languages do you speak?*
Je parle bien/couramment/un peu/mal …	*I speak … well/fluently/a bit/badly.*
Je me débrouille en …	*I get by in …*
Ma mère parle …	*My mother speaks …*
Mon beau-père se débrouille en …	*My stepfather gets by in …*
Actuellement, ma sœur apprend…	*Currently, my sister is learning …*
l'allemand	*German*
l'anglais	*English*
l'arabe	*Arabic*
le français	*French*
l'espagnol	*Spanish*
l'italien	*Italian*
le japonais	*Japanese*
le mandarin	*Mandarin*
le portugais	*Portuguese*
le russe	*Russian*
Mon frère ne parle aucune langue étrangère.	*My brother doesn't speak any foreign languages.*
Ma grand-mère parle seulement le hindi.	*My grandmother only speaks Hindi.*
évidemment	*obviously*
actuellement	*currently*
naturellement	*naturally, of course*
vraiment	*really*
seulement	*only*
bien	*well*
mal	*badly*
mieux	*better*
Savoir parler des langues …	*Knowing how to speak languages …*
est indispensable pour certaines professions	*is indispensable for certain jobs*
ne sert à rien pour d'autres	*is of no use for others*
donne plus de possibilités de carrière	*provides more career possibilities*
est un atout	*is an asset*
On peut trouver plus facilement un bon emploi dans un autre pays.	*You can find a job more easily in another country.*
On comprend mieux sa propre langue.	*You understand your own language better.*
On a plus de chances d'obtenir une promotion.	*You have more chance of promotion.*
On peut mieux connaître les gens et la culture d'un pays.	*You can get to know the people and culture of a country better.*
On peut voyager/se faire des amis partout dans le monde.	*You can travel/make friends all over the world.*

Au téléphone — *On the telephone*

Allô?	*Hello?*
Je voudrais parler avec …	*I would like to talk to …*
Sa ligne est occupée.	*His/Her line is busy.*
Est-ce que je peux laisser un message?	*Can I leave a message?*
Je vais vous transférer vers sa messagerie vocale	*I will transfer you to his/her voicemail.*
Ne quittez pas.	*Stay on the line.*
Je vous le passe.	*I'll pass you over to him/her.*
Je peux vous être utile?	*Can I help you/be of help?*
Au revoir!	*Goodbye!*

Un entretien d'embauche — *A job interview*

Enchanté.	*Pleased to meet you.*
Asseyez-vous.	*Sit down.*
Parlez-moi un peu de ce que vous faites actuellement.	*Talk to me a little bit about what you are doing at the moment.*
Actuellement, je suis (au lycée).	*At the moment, I am (in sixth form college).*
Je suis en train de (préparer le baccalauréat/mes examens de GCSE).	*I am in the middle of (preparing to take my baccalauréat/ my GCSE exams).*
Quelles matières étudiez-vous?	*What subjects are you studying?*
J'étudie (huit) matières, dont (l'EPS).	*I'm studying (eight) subjects, including (PE).*
Qu'est-ce que vous ferez après vos examens?	*What will you do after your exams?*
Si je réussis mes examens, j'espère (aller à l'université).	*If I pass my exams, I hope (to go to university).*
J'aimerais également (prendre une année sabbatique).	*I would also like (to take a gap year).*
Pourquoi vous intéressez-vous à ce poste?	*Why are you interested in this position?*
Je crois que ce serait une bonne expérience pour moi.	*I think it would be a good experience for me.*
Quelles sont les qualités personnelles que vous apporteriez à ce poste?	*What personal qualities would you bring to this position?*
Je suis quelqu'un de (bien organisé/ de très motivé/de créatif).	*I am a (well organised/very motivated/ creative) person.*

Mon boulot dans le tourisme — *My job in tourism*

Je suis étudiant(e) en …	*I am studying …*
J'apprends à devenir …	*I'm learning to become …*
Il y a six mois, j'ai commencé à travailler dans/chez/en …	*Six months ago I started work in/ with …*
Je voudrais travailler à plein temps/ mi-temps dans (le tourisme).	*I would like to work full-time/ part-time in (tourism).*
Lorsque j'étais plus jeune, je rêvais d'être (infirmier/-ière).	*When I was younger, I dreamed of being a (nurse).*
J'ai décidé de changer d'orientation à cause de …	*I decide to change direction because of …*
Mon travail consiste à (accueillir les clients).	*My work involves (welcoming clients).*
Je m'occupe aussi (des réservations).	*I also take care of (reservations).*
Je vends (des billets).	*I sell (tickets).*
Je suis passionné(e) par mon travail.	*I am passionate about my job.*
J'apprécie surtout (le contact avec les gens).	*I particularly enjoy (dealing with people).*
Le seul inconvénient de mon métier, c'est que …	*The only disadvantage of my job is that …*
Pour faire ce métier, il faut …	*To do this job you have to …*
être souriant	*be smiley*
savoir parler d'autres langues	*know how to speak other languages*
Plus tard/Quand je serai diplômé(e), …	*Later on/When I am qualified …*
je partirai en vacances	*I will go on holiday*
j'essaierai d'apprendre le japonais	*I will try to learn Japanese*

Les mots essentiels — *High-frequency words*

au sujet de	*about, on the subject of*
avant tout	*above all*
malgré	*despite, in spite of*
non seulement	*not only*
plus tard	*later*
plutôt	*rather, instead*
quant à …	*regarding …, as for …*

Vocabulario Vale Higher

Semana 1

Las comidas	Meals
el desayuno	*breakfast*
la comida / el almuerzo	*lunch*
la merienda	*tea (meal)*
la cena	*dinner / evening meal*
desayunar	*to have breakfast / to have … for breakfast*
comer / almorzar	*to have lunch / to have … for lunch*
merendar	*to have tea / to have … for tea*
cenar	*to have dinner / to have … for dinner*
tomar	*to have (food / drink)*
beber	*to drink*
entre semana…	*during the week…*
los fines de semana…	*at weekends…*
Desayuno a las ocho.	*I have breakfast at eight o'clock.*

(el) Cola Cao	*Cola Cao (Spanish chocolate drink)*
(el) marisco	*seafood*
(el) pescado	*fish*
(el) pollo	*chicken*
(el) zumo de naranja	*orange juice*
(la) carne	*meat*
(la) ensalada	*salad*
(la) fruta	*fruit*
(la) leche	*milk*
(la) sopa	*soup*
(la) tortilla	*omelette*
(los) cereales	*cereals*
(los) churros	*fried doughnut sticks*
(las) galletas	*biscuits*

Semana 2

Desayuno / Como / Meriendo / Ceno…	*For breakfast / lunch / tea / dinner I have…*
un huevo	*an egg*
un yogur	*a yogurt*
un pastel	*a cake*
un bocadillo	*a sandwich*
una hamburguesa	*a hamburger*
(el) café / (el) té	*coffee / tea*

(las) patatas fritas	*chips*
(las) tostadas	*toast*
(las) verduras	*vegetables*
algo dulce / ligero / rápido	*something sweet / light / quick*
ser goloso/a	*to have a sweet tooth*
tener hambre	*to be hungry*
tener prisa	*to be in a hurry*
tomar un desayuno fuerte	*to have a big (lit. strong) breakfast*

Las expresiones de cantidad	Expressions of quantity
cien / quinientos gramos de…	*100 / 500 grammes of…*
un bote de…	*a jar of…*
un kilo de…	*a kilo of…*
un litro de…	*a litre of…*
un paquete de…	*a packet of…*

una barra de…	*a loaf of…*
una botella de…	*a bottle of…*
una caja de…	*a box of…*
una docena de…	*a dozen…*
una lata de…	*a tin / can of…*

Los alimentos	Food products
el aceite de oliva	*olive oil*
el agua	*water*
el ajo	*garlic*

los pimientos	*peppers*
los plátanos	*bananas*
los pomelos	*grapefruits*
los refrescos	*fizzy drinks*

Semana 3

el arroz	*rice*
el atún	*tuna*
el azúcar	*sugar*
el chorizo	*spicy sausage*
el maíz	*corn*
el pan	*bread*
el queso	*cheese*
la cerveza	*beer*
la carne de cerdo / cordero / ternera	*pork / lamb / beef*
la coliflor	*cauliflower*
la harina	*flour*
la mantequilla	*butter*
la mermelada	*jam*
los albaricoques	*apricots*
los guisantes	*peas*
los lácteos	*dairy products*
los melocotones	*peaches*
los melones	*melons*
los pepinos	*cucumbers*

las cebollas	*onions*
las fresas	*strawberries*
las judías (verdes)	*(green) beans*
las legumbres	*pulses*
las lentejas	*lentils*
las manzanas	*apples*
las naranjas	*oranges*
las peras	*pears*
las piñas	*pineapples*
las uvas	*grapes*
las zanahorias	*carrots*
¿Has probado…?	*Have you tried…?*
el gazpacho	*gazpacho (chilled soup)*
la ensaladilla rusa	*Russian salad*
la fabada	*stew of beans and pork*
Es un tipo de bebida / postre.	*It's a type of drink / dessert.*
Es un plato caliente / frío.	*It's a hot / cold dish.*
Contiene(n)…	*It contains / They contain…*
Fue inventado/a / introducido/a…	*It was invented / introduced…*

Mi rutina diaria	My daily routine
me despierto	*I wake up*
me levanto	*I get up*
me ducho	*I have a shower*
me peino	*I brush my hair*
me afeito	*I have a shave*
me visto	*I get dressed*
me lavo los dientes	*I clean my teeth*

me acuesto	*I go to bed*
salgo de casa	*I leave home*
vuelvo a casa	*I return home*
temprano / tarde	*early / late*
enseguida	*straight away*
odio levantarme	*I hate getting up*

Semana 4

¿Qué le pasa?	What's the matter?
No me encuentro bien.	*I don't feel well.*
Me siento fatal.	*I feel awful.*
Estoy enfermo/a / cansado/a.	*I am ill / tired.*
Tengo calor / frío.	*I am hot / cold.*
Tengo catarro.	*I have a cold.*
Tengo diarrea.	*I have diarrhoea.*

Tengo dolor de cabeza.	*I have a headache.*
Tengo fiebre.	*I have a fever / temperature.*
Tengo gripe.	*I have flu.*
Tengo mucho sueño.	*I am very sleepy.*
Tengo náuseas.	*I feel sick.*
Tengo quemaduras de sol.	*I have sunburn.*

Tengo tos.	*I have a cough.*
Tengo una insolación.	*I have sunstroke.*
los ojos	*eyes*
¿Desde hace cuánto tiempo?	*How long for?*

Semana 4 Parte B

Tengo tos.	*I have a cough.*	los ojos	*eyes*
Tengo una insolación.	*I have sunstroke.*	¿Desde hace cuánto tiempo?	*How long for?*
Tengo una picadura.	*I've been stung.*	desde hace…	*for…*
Me duele(n)…	*My … hurt(s)*	un día / un mes	*a day / a month*
Me he cortado el/la…	*I've cut my…*	una hora / una semana	*an hour / a week*
Me he hecho daño en…	*I've hurt my…*	¿Desde cuándo?	*Since when?*
Me he quemado…	*I've burnt my…*	desde ayer	*since yesterday*
Me he roto…	*I've broken my…*	desde anteayer	*since the day before yesterday*
Me he torcido…	*I've twisted my…*	no se preocupe	*don't worry*
el brazo / el estómago	*arm / stomach*	¡Qué mala suerte!	*What bad luck!*
el pie / el tobillo	*foot / ankle*	Tiene(s) que / Hay que…	*You have to…*

Semana 5

la boca / la cabeza	*mouth / head*	beber mucha agua	*drink lots of water*
la espalda / la garganta	*back / throat*	descansar	*rest*
la mano / la nariz	*hand / nose*	ir al hospital / médico / dentista	*go to the hospital / doctor / dentist*
la pierna / la rodilla	*leg / knee*	tomar aspirinas	*take aspirins*
los dientes / las muelas	*teeth*	tomar este jarabe / estas pastillas	*take this syrup / these tablets*
los oídos / las orejas	*ears*	usar esta crema	*use this cream*

Las fiestas / *Festivals*

la fiesta de…	*the festival of…*	las calles se llenan de…	*the streets are filled with…*
esta tradición antigua…	*this old tradition…*	los niños / los jóvenes…	*children / young people…*
se caracteriza por…	*is characterised by…*	los familiares / las familias…	*relations / families…*
se celebra en…	*is celebrated in…*	comen manzanas de caramelo	*eat toffee apples*
se repite…	*is repeated…*	decoran las casas / las tumbas	*decorate houses / graves*
se queman figuras de madera	*wooden figures are burnt*	con flores / velas	*with flowers / candles*
se construyen hogueras	*bonfires are built*	preparan linternas / altares	*prepare lanterns / altars*
se disparan fuegos artificiales	*fireworks are set off*	se disfrazan de brujas / fantasmas	*dress up as witches / ghosts*
se lanzan huevos	*eggs are thrown*	ven desfiles	*(they) watch processions*

Un día especial / *A special day*

Abrimos los regalos.	*We open presents.*	Vamos a la mezquita / iglesia.	*We go to the mosque / church.*
Buscamos huevos de chocolate.	*We look for chocolate eggs.*	Ayer fue…	*Yesterday was…*

Semana 6

Cantamos villancicos.	*We sing Christmas carols.*	el baile de fin de curso	*the school prom*
Cenamos bacalao.	*We have cod for dinner.*	el Día de Navidad	*Christmas Day*
Comemos dulces navideños / doce uvas / pavo.	*We eat Christmas sweets / twelve grapes / turkey.*	(el) Domingo de Pascua	*Easter Sunday*
		(la) Nochebuena	*Christmas Eve*
Nos acostamos muy tarde.	*We go to bed very late.*	(la) Nochevieja	*New Year's Eve*
Nos levantamos muy temprano.	*We get up very early.*	Me bañé y luego me maquillé.	*I had a bath and then did my make up.*
Rezamos.	*We pray.*		

¿Qué va a tomar? / *What are you going to have?*

de primer / segundo plato…	*for starter / main course…*	el menú del día	*the set menu*
de postre…	*for dessert…*	la especialidad de la casa	*the house speciality*
Voy a tomar…	*I'm going to have…*	está buenísimo/a / riquísimo/a	*it's extremely good / tasty*
(el) bistec	*steak*	¡Que aproveche!	*Enjoy your meal!*
(el) filete de cerdo	*pork fillet*	¿Algo más?	*Anything else?*
(el) flan	*crème caramel*	Nada más, gracias.	*Nothing else, thank you.*
(el) jamón serrano	*Serrano ham*	¿Me trae la cuenta, por favor?	*Can you bring me the bill, please?*
(la) merluza en salsa verde	*hake in parsley and wine sauce*	No tengo cuchillo / tenedor / cuchara.	*I haven't got a knife / fork / spoon.*
(la) sopa de fideos	*noodle soup*	No hay aceite / sal / vinagre.	*There's no oil / salt / vinegar.*
(la) tortilla de espinacas	*spinach omelette*	El plato / vaso / mantel está sucio.	*The plate / glass / table cloth is dirty.*
(la) trucha a la plancha	*grilled trout*	El vino está malo.	*The wine is bad / off.*
(los) calamares	*squid*	La carne está fría.	*The meat is cold.*

Semana7

(las) albóndigas	*meatballs*	dejar una propina	*to leave a tip*
(las) chuletas de cordero asadas	*roast lamb chops*	equivocarse	*to make a mistake*
(las) croquetas caseras	*homemade croquettes*	pedir	*to order / ask for*
(las) gambas	*prawns*	ser alérgico/a…	*to be allergic to…*
(las) natillas	*custard*	ser vegetariano/a	*to be a vegetarian*
¿Qué me recomienda?	*What do you recommend?*		

Un festival de música / *A music festival*

Me fascina(n)…	*…fascinate(s) me.*	atrevido/a(s)	*daring*
Admiro…	*I admire…*	imaginativo/a(s)	*imaginative*
No aguanto / soporto…	*I can't stand…*	precioso/a(s)	*beautiful*
su actitud / talento	*his/her attitude / talent*	repetitivo/a(s)	*repetitive*
su comportamiento	*his/her behaviour*	original(es)	*original*
su determinación / estilo	*his/her determination / style*	triste(s)	*sad*
su forma de vestir	*his/her way of dressing*	Me/Te hace(n) falta…	*I/You need…*
su música / voz	*his/her music / voice*	crema solar	*sun cream*
sus canciones / coreografías	*his/her songs / choreography*	el pasaporte / DNI	*your passport / national ID card*
sus ideas / letras	*his/her ideas / lyrics*	un sombrero / una gorra	*a hat / cap*

Vocabulario Vale Higher

Semana 1

¿En qué trabajas?	What is your job?
Soy… / Es…	*I am… / He/She is…*
Me gustaría ser…	*I would like to be…*
abogado/a	*lawyer*
albañil	*bricklayer / builder*
amo/a de casa	*housewife / househusband*
azafato/a	*flight attendant*
bailarín(a)	*dancer*
bombero/a	*firefighter*
camarero/a	*waiter / waitress*
cantante	*singer*
cocinero/a	*cook*
contable	*accountant*
dependiente/a	*shop assistant*
diseñador(a)	*designer*
electricista	*electrician*
enfermero/a	*nurse*
escritor(a)	*writer*
profesor(a)	*teacher*
recepcionista	*receptionist*
socorrista	*lifeguard*
soldado	*soldier*
veterinario/a	*vet*
Es un trabajo…	*It's a … job*
artístico / emocionante	*artistic / exciting*
exigente / importante	*demanding / important*
fácil / difícil	*easy / difficult*
manual / monótono	*manual / monotonous*
variado / repetitivo	*varied / repetitive*
con responsabilidad	*with responsibility*
con buenas perspectivas	*with good prospects*
con un buen sueldo	*with a good salary*
Tengo que… / Suelo…	*I have to… / I tend to…*
cuidar a los clientes / pacientes / pasajeros	*look after the customers / patients / passengers*

Semana 2

fontanero/a	*plumber*
fotógrafo/a	*photographer*
funcionario/a	*civil servant*
guía turístico/a	*tour guide*
ingeniero/a	*engineer*
jardinero/a	*gardener*
mecánico/a	*mechanic*
médico/a	*doctor*
músico/a	*musician*
peluquero/a	*hairdresser*
periodista	*journalist*
policía	*police officer*
contestar llamadas telefónicas	*answer telephone calls*
cuidar las plantas y las flores	*look after the plants and flowers*
enseñar / vigilar a los niños	*teach / supervise the children*
hacer entrevistas	*do interviews*
preparar platos distintos	*prepare different dishes*
reparar coches	*repair cars*
servir comida y bebida	*serve food and drink*
trabajar en un taller / en un hospital / en una tienda / a bordo de un avión	*work in a workshop / in a hospital / in a shop / aboard a plane*
vender ropa de marca	*sell designer clothing*
viajar por todo el mundo	*travel the world*

¿Qué tipo de persona eres?	What type of person are you?
Creo que soy…	*I think I'm…*
ambicioso/a	*ambitious*
comprensivo/a	*understanding*
creativo/a	*creative*
extrovertido/a	*extroverted / outgoing*
organizado/a	*organised*
paciente	*patient*
práctico/a	*practical*
serio/a	*serious*
trabajador(a)	*hardworking*

Semana 3

fuerte	*strong*
inteligente	*intelligent*
valiente	*brave*

¿Qué haces para ganar dinero?	What do you do to earn money?
¿Tienes un trabajo a tiempo parcial?	*Do you have a part-time job?*
Reparto periódicos.	*I deliver newspapers.*
Hago de canguro.	*I babysit.*
Trabajo de cajero/a.	*I work as a cashier.*
Ayudo con las tareas domésticas.	*I help with the housework.*
Cocino.	*I cook.*
Lavo los platos.	*I wash the dishes.*
Paso la aspiradora.	*I do the vacuuming.*
Plancho la ropa.	*I iron the clothes.*
Pongo y quito la mesa.	*I lay and clear the table.*
Paseo al perro.	*I walk the dog.*
Corto el césped.	*I cut the lawn.*
Lo hago…	*I do it…*
los sábados	*on Saturdays*
antes / después del insti	*before / after school*
cuando necesito dinero	*when I need money*
cuando mi madre está trabajando	*when my mum is working*
cuando me necesitan	*when they need me*
cada mañana	*each / every morning*
una vez / dos veces a la semana	*once / twice a week*
Gano … euros / libras a la hora / al día / a la semana.	*I earn … euros / pounds per hour / day / week.*
Me llevo bien con mis compañeros.	*I get on well with my colleagues.*
Mi jefe/a es amable.	*My boss is nice.*
El horario es flexible.	*The hours are flexible.*

Mis prácticas laborales	Work experience
Hice mis prácticas laborales en…	*I did my work experience in…*
Pasé quince días trabajando en…	*I spent a fortnight working in…*
un polideportivo	*a sports centre*
una agencia de viajes / una granja	*a travel agency / a farm*
una escuela / una oficina	*a school / an office*
una fábrica de juguetes	*a toy factory*
iba en transporte público	*I went by public transport*
llevaba ropa elegante	*I wore smart clothes*
ponía folletos en los estantes	*I put brochures on the shelves*
sacaba fotocopias	*I did photocopying*
Mi jefe/a era…	*My boss was…*
Mis compañeros eran…	*My colleagues were…*

Semana 4

una tienda benéfica / solidaria	*a charity shop*
la empresa de mi madre	*my mum's company*
El primer / último día conocí a / llegué…	*On the first / last day I met / I arrived…*
Cada día / Todos los días…	*Each / Every day…*
archivaba documentos	*I filed documents*
ayudaba…	*I helped…*
cogía el autobús / el metro	*I caught the bus / underground*
empezaba / terminaba a las …	*I started / finished at…*
hacía una variedad de tareas	*I did a variety of tasks*
Los clientes eran…	*The customers were …*
alegre(s)	*cheerful*
(des)agradable(s)	*(un)pleasant*
(mal)educado/a(s)	*polite (rude)*
El trabajo era duro.	*The job was hard.*
Aprendí…	*I learned*
muchas nuevas habilidades	*lots of new skills*
a trabajar en equipo	*to work in a team*
a usar…	*to use…*
No aprendí nada nuevo.	*I didn't learn anything new.*

¿Por qué aprender idiomas?	Why learn languages?
Aumenta tu confianza.	*It increases your confidence.*
Estimula el cerebro.	*It stimulates the brain.*
Mejora tus perspectivas laborales.	*It improves your job prospects.*
Te abre la mente.	*It opens your mind.*
Te hace parecer más atractivo.	*It makes you appear more attractive.*
Te ayuda a…	*It helps you to…*
Te permite…	*It allows you to…*
apreciar la vida cultural de otros países	*appreciate the cultural life of other countries*
conocer a mucha gente distinta	*meet lots of different people*
conocer nuevos sitios	*get to know new places*
encontrar un trabajo	*find a job*
descubrir nuevas culturas	*discover new cultures*
establecer buenas relaciones	*establish good relationships*
hacer nuevos amigos	*make new friends*
mejorar tu lengua materna	*improve your first language*
solucionar problemas	*solve problems*
trabajar o estudiar en el extranjero	*work or study abroad*
Me hace falta saber hablar idiomas extranjeros.	*I need to know how to speak foreign languages.*
(No) Domino el inglés.	*I (don't) speak English fluently.*
Hablo un poco de ruso.	*I speak a bit of Russian.*

Semana 5

Solicitando un trabajo	Applying for a job
Se busca / Se requiere…	*… required.*
(No) hace falta experiencia.	*Experience (not) needed.*
Muy señor mío	*Dear Sir*
Le escribo para solicitar el puesto de…	*I'm writing to apply for the post of…*
Le adjunto mi currículum vitae.	*I'm enclosing my CV.*
Le agradezco su amable atención.	*Thank you for your kind attention.*
Atentamente	*Yours sincerely/faithfully*
Me apetece trabajar en…	*Working in… appeals to me.*
(No) Tengo experiencia previa.	*I (don't) have previous experience.*
He estudiado / trabajado…	*I've studied / worked…*
He hecho un curso de…	*I've done a course in…*
Tengo…	*I have…*
buen sentido del humor	*a good sense of humour*
buenas capacidades de comunicación / resolución de problemas	*good communication / problem-solving skills*
buenas habilidades lingüísticas	*good language skills*

Un año sabático	A gap year
Si pudiera tomarme un año sabático…	*If I could take a gap year…*
Si tuviera bastante dinero…	*If I had enough money…*
apoyaría un proyecto medioambiental	*I would support an environmental project*
aprendería a esquiar	*I would learn to ski*
ayudaría a construir un colegio	*I would help to build a school*
buscaría un trabajo	*I would look for a job*
enseñaría inglés	*I would teach English*
ganaría mucho dinero	*I would earn a lot of money*
haría un viaje en Interrail	*I would go Interrailing*
iría a España, donde…	*I would go to Spain, where…*
mejoraría mi nivel de español	*I would improve my level of Spanish*
nunca olvidaría la experiencia	*I would never forget the experience*
pasaría un año en…	*I would spend a year in…*
trabajaría en un orfanato	*I would work in an orphanage*
viajaría con mochila por el mundo	*I would go backpacking around the world*

Semana 6

¿Cómo viajarías?	How would you travel?
Cogería el / Viajaría en autobús / autocar / avión / tren.	*I would catch the / travel by bus / coach / plane / train.*
Es más barato / cómodo / rápido.	*It's cheaper / more comfortable / quicker.*
Puedes…	*You can…*
ver vídeos mientras viajas	*watch videos whilst you travel*
dejar tu maleta en la consigna	*leave your suitcase in the left-luggage office*
Hay muchos / pocos atascos / retrasos… en las autopistas / las carreteras	*There are lots of / few traffic jams / delays… on the motorways / roads*
Los billetes son carísimos.	*The tickets are extremely expensive.*
Los conductores están en huelga.	*The drivers are on strike.*
Odio esperar en la parada de autobús.	*I hate waiting at the bus stop.*
Tengo miedo a volar.	*I'm scared of flying.*

Viajando en tren	Travelling by train
El tren con destino a…	*The train to…*
efectuará su salida…	*will leave / depart…*
de la vía / del andén dos	*from platform two*
el (tren) AVE	*high-speed train*
la taquilla	*the ticket office*
Quisiera un billete de ida a…	*I would like a single ticket to…*
Quisiera un billete de ida y vuelta a…	*I would like a return ticket to…*
¿De qué andén sale?	*From which platform does it leave?*
¿A qué hora sale / llega?	*What time does it leave / arrive?*
¿Es directo o hay que cambiar?	*Is it direct or do I have to change?*

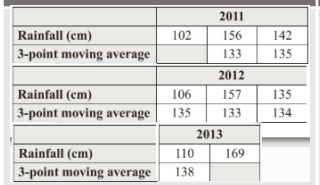
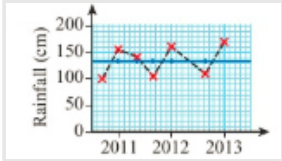
El futuro	The future
Me interesa(n)…	*…interest(s) me.*
Me importa(n)…	*…matter(s) to me.*
Me preocupa(n)…	*…worry/worries me.*
el desempleo / el paro	*unemployment*
el dinero / el éxito	*money / success*
ser feliz	*be happy*
tener hijos	*have children*
trabajar como voluntario/a	*work as a volunteer*
Cuando…	*When…*
gane bastante dinero…	*I earn enough money…*

Semana7

el fracaso / el matrimonio	*failure / marriage*
la responsabilidad	*responsibility*
la independencia / la pobreza	*independence / poverty*
los niños / las notas	*children / marks*
Espero…	*I hope to…*
Me gustaría …	*I would like to…*
Pienso…	*I plan to/intend to…*
Quiero…	*I want to…*
Tengo la intención de…	*I intend to…*
Voy a…	*I am going to…*
aprender a conducir	*learn to drive*
aprobar mis exámenes	*pass my exams*
casarme	*get married*
conseguir un buen empleo/trabajo	*get a good job*
estudiar una carrera universitaria	*study a university course*
montar mi propio negocio	*set up my own business*
sacar buenas notas	*get good marks*
me enamore…	*I fall in love…*
sea mayor…	*I'm older…*
tenga … años…	*I'm … years old…*
vaya a la universidad…	*I go to university…*
termine este curso / el bachillerato / la formación profesional / la licenciatura…	*I finish this course / my A Levels / my vocational course / my degree*
buscaré un trabajo	*I will look for a job*
compartiré piso con…	*I will share a flat with…*
compraré un coche / una casa	*I will buy a car / house*
iré a otro insti / a la universidad	*I will go to another school / to university*
me casaré	*I will get married*
me iré de casa	*I will leave home*
seguiré estudiando en mi insti	*I will carry on studying at my school*
seré famoso/a	*I will be famous*
me tomaré un año sabático	*I will take a gap year*
trabajaré como…	*I will work as…*

Important Ideas
Time series graphs are useful for studying the trend and seasonal variation
Trend lines can be used to predict future values.
You can find estimates of a probability by repeating an experiment many times
You can use a variety of diagrams to represent all the different outcomes possible of events

Vocabulary	
Time series	Graphs which show variation over time
Trend	The overall behaviour over time
Trend line	Shows the tend of data over time ignoring any seasonal variation
Moving average	A sequence of averages that smooths out variations in data. Used to show trends.
Expected (relative) frequency	How often we expect something to happen based on trials.
Risk	The probability of loss
Two-way table	A way of presenting data with two variables
Sample space diagram	A table showing all possible outcomes of two combined events
Tree diagram	A diagram with branches used to work out probabilities of combined events
Venn diagram	A diagram using circles to represent sets. The position and overlap of the circles indicates the relationships between the sets.

Question	Answer
Time series	
	
Plot the time series Plot the moving averages Draw the trend line Describe the trend	The trend is flat
Experimental probability	
Sami spins a coin 250 times. He gets 110 heads (a) Work out the experimental probability of getting a head (b) Write down the experimental probability of getting a tail	(a) 110/250 (b) 140/250
Risk	
 Work out the risk of a knee injury in each sport Estimate the number of knee injuries next season, which has 35 games	Football 0.16 Hockey 0.083 Rugby 0.325 3 (rounded from 2.9)

Key Facts & Formula	
Moving averages	
Expected (relative) frequency	Uses trials to estimate the probability of something happening next.
Equation of a trend line	**$Y = ax + b$** where ***b*** is the intercept on the y-axis and ***a*** is the gradient of the line.
Experimental probability	**Number of times the event happens ÷ total number of trials**
Estimate	**Total number of trials x probability** The more times an experiment is repeated the more accurate the estimate will be. Increasing sample size leads to better estimates
Risk	**Risk of a fault x number of items sold**

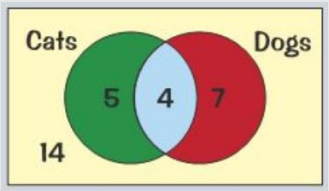
Important Ideas

Index numbers are often used to compare price changes over time.

The probability of one event may affect the probability of another.

Vocabulary

Independent events	Events are independent if the outcome of one does not affects the probability of another occurring.
Conditional probability	When the probability of a second event depends on the first.
Index numbers	A way of tracking changes in value through time.
Weighted index numbers	A measure of how a set of items changes in value.
Retail price index (RPI)	Shows changes in the cost of living. Used to set interest rates for student loans.
Consumer price index (CPI)	Shows changes in the cost of living (not including mortgage payments). Used to index benefits, tax credits and pensions in the UK
Gross domestic product (GDP)	The main measure of economic output based on the value of goods and services produced by a country or region.
Crude rates	A simple way to compare population statistics such as births, deaths and employment levels
Standardised rates	Enables valid comparisons between distributions

Question	Answer
Conditional probability	
 Using the Venn diagram above, find the probability that a randomly chosen household does not own a dog, given the household owns a cat.	$P(\text{no dog} \mid \text{cat})$ $= \frac{\text{Number of households with cats but no dog}}{\text{Number of households with cats}}$ $= \frac{5}{9}$
Index numbers	
Year | 2013 | 2014 | 2015 Index Number | 100 | 85 | 109 The index numbers in the table show the average monthly rent for a flat, using 2013 as the base year. a) In which year did the average monthly rent decrease? b) The average monthly ret in 2013 was £530 Calculate the average monthly rent for the years 2014 and 2015.	(a) Average monthly rate decreased in 2014 (85 < 100) (b) 2014: $85 = \frac{\text{price in 2014}}{£530} \times 100$ $\Rightarrow$ price in 2014 = £450.50 2015: $109 = \frac{\text{price in 2015}}{£530} \times 100$ $\Rightarrow$ price in 2015 = £577.70

Key Facts & Formula

Independent events	$P(A \text{ and } B) = P(A) \times P(B)$
Conditional probability	$P(A \text{ and } B) = P(A) \times P(B\mid A)$
Index number	$\frac{\text{value}}{\text{value in base year}} \times 100$
Weighted index numbers	$\frac{\sum(\text{index number} \times \text{weight})}{\sum \text{weights}}$
Chain base index number	$\frac{\text{value this year}}{\text{value last year}} \times 100$

Box 1. **Business Research**

Area of research: - What is business research?

Businesses need to carry out research to find out information that will help them have a successful business.

They need to understand their **customers** and **competitors**. This will help you to decide about **current and potential demand**.

This would help them to increase sales by:

- understanding their customers
- producing a product or service the customer wants
- making sure there is a market to sell to
- knowing how much products or services to supply
- target their advertising
- identify new markets to sell

Legal requirements:

If you are setting up a new business, you must be sure that you are operating within the law.

- **Legal entity: -** New businesses must be registered according to UK law and the business structure you have chosen.
- **Tax and VAT: -** Businesses must pay tax and if applicable VAT. They must register with HMRC.
- **Health & Safety: -** There are many legal requirements in place to ensure that customers and employees are safe and are protected.
- **Business insurance: -** All businesses must have insurance to protect themselves and their customers.
- **Customer protection: -** Customers are protected by legislation to ensure the quality of goods and services they receive. Customers are also protected against purchasing fake items which may not meet UK safety standards.
- **Data protection: -** There is strict legislation in place to protect customers from misuse of their personal data. Businesses must ensure they have all the necessary protections in place or face a heavy fine.
- **Planning consents: -** Businesses that have premises and want to make alterations must make sure they meet all the planning and local authority regulations.

Box 2. **Resource Planning**

Physical resources:

1. **Premises -** When you start a new business the location of the business premises will be one of the first questions to answer.

You will need to decide:

- what is your budget for your premises
- an address to register your business
- where you wish to work
- whether to rent or buy a business premises
- how big the premises would be
- will you need staff/ customer parking
- does it need to be near public transport
- does it need to be near the customer base

2. Fixtures and fittings - Once you have decided upon your location, you need to think about the inside of the building.

You will need to decide:

- what is your budget on fixtures and fittings
- necessities to carry to business e.g. display cabinets, tables, chairs
- the image you want to present to customers
- legal requirements e.g. toilets
- colour schemes and branding

3. **Equipment -** What do you need to run your business? This will depend on if you are manufacturing a product, selling a product or providing a service.

It could include:

- Stock- products to sell
- Tills
- IT equipment including phones, computers, printers, laptops
- Production equipment e.g. machinery
- Sector specific equipment

Box 3.

Physical resources: - How do we transport goods?

Road: - cars, lorries, bikes, by foot
Rail: - trains, trams
Air: - planes, helicopters, drones
Sea/water: - boats (could include sea, river, canals)

Raw Materials: - a raw material is the basic material used to make a good or product.

If you are making a product you will need to consider the raw material you need, where they will come from and where you will source them from.
This may impact on the location of your business as you need to consider transport costs of the raw materials to the location where you will manufacture your goods/products.

Technological resources

Choosing how to take payments: - The UK is the third in the world of the countries embracing a 'cashless society'. **(https://www.telegraph.co.uk/money/future-of-money/10-cashless-countries-world-does-uk-rank/)**

Therefore, the ability to take card payments is crucial for any new business.

The business needs to consider many issues:

- How will it take payments - face to face or over the internet or telephone?
- How many people will take payments?
- How many sites will need to take payments?
- Where will sales take place, could payments be taken in customers homes?

1. **Card and NFC readers: -** NFC stands for **N**ear **F**ield **C**ommunication which is a set of communication devices, one which is usually portable. They are used to take card payments. NFC is used for contactless payments.

You may use this with your Smart phone to make contactless card payments or load your boarding pass for a air travel.

2. Till: - A physical device to record and store payments including cash.

3. EPOS: - Electronic Point Of Sale and is an electronic way customers can pay for goods or services .

Box 4. **Technological resources**

Definitions:

- **Digital manufacturing** is a method of production in which computer technology manufacturers produce with little or no involvement from people.
- **Digital communications systems** are, for example, the internet or smart phones
- **IT infrastructure** refers to the business entire collection of IT equipment including, for example, computers, hardware , software, phones and tills.

IT infrastructure: - This could be one of the most expensive investments in equipment some businesses will make. If a business gets it wrong then it could be very difficult to change or put right.

It can include:

- Hardware
- Software
- Telephone systems
- Electronic tills
- Cyber security
- Network
- Wi Fi
- Email communications
- Website

Internal Growth:

Definitions:

- **Diversification: -** Business enlarging or varying its range of products or services. For example, a restaurant adding take away service for its customers.
- **Geographical expansion: -** The process of a business enlarging or varying field of operation. For example, a restaurant opening a new restaurant in a different town.
- **Horizontal Growth: -** Horizontal growth means expanding in the same area you already provide services or products. This can include buying a similar business to reduce competition and gain/increase their customers.

It is a strategy used by many businesses to expand their size, market share and achieve economies of scale. An example of horizontal growth **is the purchase of Instagram by Facebook.**

Box 5. Internal Growth continue ….

➢ **Vertical Growth: - Vertical growth** means expanding in the production process. For example, Apple is an excellent example of vertical growth. They designed the products and them grew vertically to:

- Manufacture the goods
- Distribute the goods
- Sell the goods
- After sales services including insurance and
- repairs

Why did they do this?

It gave them control of the market minimize the competition and reduce costs as they control the cost of manufacturing and distributing themselves.

External Growth: - Mergers and takeovers

A merger is when two companies decide to join together, like for example when Halifax and Bank of Scotland combined to form HBOS.

Mergers are usually agreed by two businesses to their mutual advantage. The two businesses join to together make one new legal entity.

Why do businesses do this?

- To **reach new markets**. For example, a clothes firm who offer mid-range clothes may merge with a high end clothes business. They both benefit as they now have access to each other's customers.
- **Better services for customers**. For example, a bank may merge with an insurance company to offer the different range of services in one place which is more convenient to the customer and will make it more likely they will purchase the services.

A takeover is more hostile. This is when a company (usually a larger one) buys out a rival. Kraft Foods bought out Cadbury's in early 2010 for £12 billion. In the UK, the term refers to the acquisition of a public company whose shares are listed on a stock exchange, in contrast to the acquisition or merger of a private company.

Sometimes a business may not want to merge with another. However, another larger Public Limited Company (PLC) may then force a takeover situation.

This is usually done by acquiring shares in the smaller business until the larger company has control over the Board of Directors and can force the takeover.

Box 6. External Growth continue….

Joint Ventures: - A joint venture is when two or more businesses join together for a specific project or business activity.

Sometimes joint ventures create a new business (Ltd company or partnership) and in other cases they retain their individual status but create a joint venture agreement (or contract).

Joint ventures are often created for single purpose like production or research.

Benefits of a joint venture:

- Access to new markets or distribution networks
- Combined resources and expertise
- Increased capacity
- Sharing of risks and costs
- Access to greater resources like staff technology or finance

Joint ventures are very popular within businesses operating in different countries like travel or transport industries.

Methods of recruitment:

Internal vacancies

- transfers
- notice board
- newsletter
- website
- intranet

External vacancies

- headhunting
- newspapers
- trade journals
- careers fairs
- shop windows
- recruitment agencies
- web based

Internal Recruitment Methods

Internal vacancies

- **Transfers** – a member of existing staff could be 'transferred' to another office, department or location where there is a vacancy
- **Notice board** – this can be displayed within the building so staff can see what jobs are available in the company
- **Newsletter** - this can be circulated to all staff. It can be used to keep up to date with current vacancies within the company.
- **Website** – jobs can be advertised on the company website so staff can see internal vacancies
- **Intranet** – this is a restricted website which only staff can access. It could be used to display internal staff vacancies.

YEAR 10/11 – MICHAELMAS TERM – SPORT STUDIES –

Box 1: Sport is a reflection of society and many of the issues that affect society are also prevalent in sport. For the same reasons, sport can also be a force for good at local, national and international level because it ability to bring people together.

Box 2: Different **user groups** who may participate in sport:

- Ethnic minorities,
- Retired people / people over 50,
- Families with children / teenagers,
- Disabled people,
- Unemployed / socially disadvantaged.

Box 3: Some of the **barriers** that may affect participation in sport:

- Not much free time available due to work / school commitments,
- Family commitments (looking after children),
- Disposable income (unable to afford cost of participation),
- Accessibility to facilities / equipment,
- Awareness of what is available (activities not advertised),
- Portrayal of gender issues in sport / role models with perfect figures.

Box 4: Some **solutions** that may affect participation in sport (**provision**):

- Specific sessions for different demographic groups for example wheelchair sports,
- Planning times to suit different groups for example Mummy and baby activities in morning (not late at night).

Box 5: Some **solutions** that may affect participation in sport (**promotion**):

- Targeted promotion (promoting in places visible by that demographic),
- Using role models to encourage participation,
- Initiatives aimed at promoting participation (free swimming for over 60's, reduced rates at certain times).

Box 6: Some **solutions** that may affect participation in sport (**access**):

- Access to facilities (transport in rural areas, ramps for wheelchair access),
- Sensible pricing / concessions (unemployed / young children).

Box 7: What factors can **impact upon the popularity** of sport in the UK:

- Participation: football is a wide spread, mass participation sport as a result of strong infrastructure being in place, not just in the UK but in many other countries,
- Provision: tennis lacks easily accessible courts and as a result base level participation is low,
- Environment / climate: snow sports for example are impractical in many places particularly in the UK therefore following and participation in this is low.
- Spectatorship / media coverage: making it easy for people to view live sport.
- Role models / acceptability: are there any female footballers from minority ethnic groups? Is it acceptable to 'hurt the opponent' in boxing?

Box 8: Trends in the popularity of different sports in the UK are always changing for different reasons. Statistics and studies show that current growth sports in the UK in terms of numbers are recreational walking, fishing/angling, cycling and swimming. Growth of new emerging sports and activities in the UK include ultimate frisbee.

Questions:

1. State the different demographic user groups who may participate in sport.
2. Different demographic user groups experience differing barriers to participation. Can you explain some of the barriers to participation for different demographic user groups.

Box 1: What values can be promoted through sport?

- Team spirit (learning how to work together and support others by playing fairly as a team),
- Fair play (learning the importance of adhering to the rules and being fair to others),
- Citizenship (being involved in your local community through sport),
- National pride (supporters and performers unite over events),
- Excellence (striving to be the best possible, to make the team).

Box 2: Olympics and Paralympics:

The symbol of the five interlocking rings represents the union of five continents.

The Olympic and Paralympic values include Respect, Excellence, Friendship, Courage, Determination, Inspiration and Inequality.

Other initiatives and events promoting values through sport include: *Sport Relief, Sport England, FIFA's Football for Hope Campaign,* England Cricket '*Chance to Shine*' programme.

Box 3: Sporting behavior is important for both performers and spectators including:

- Fairness, promoting values, safety of participants / spectators etc.
- Sportsmanship (giving the ball to the opposition when they have kicked it out when an injury occurs to the your team),
- Gamesmanship (also known as time wasting if your team are winning),
- Spectator etiquette (quiet during rallies at the tennis, quiet during play in snooker),
- Sports initiatives to break down barriers ('Kick racism out of football')

Box 4: There are many arguments for and against performance enhancing drugs in sport and many reasons why they are used including:

- Performers having pressure to succeed as an individual as well as pressure from team, supporters etc.
- One of the negatives of performance enhancing drugs is long term health effects, consequences when found to be guilty, knowing you have an unfair advantage over opponent.
- The impact of taking drugs will damage a performers reputation.
- One of the arguments in sport with regard to drug taking is should there be a distinction between use of performance enhancing drugs vs recreational drugs – should performance enhancing drug takers compete in a separate league?

Questions:

1. State 3 reasons for and against drug taking in sport.
2. Explain some of the values that can be promoted through sport.
3. Research some of the initiatives promoting values in sport for example *Sport Relief***.**

'The most important thing is not to win but to take part, just as the most important thing in life is not the triumph but the struggle. The essential thing is not to have conquered but to have fought well.' Pierre De Coubertin

Box 1: Hosting a major sporting event such as The Olympics / Paralympics, The World Cup or a Master Event will only happen once in any given city / country in a generation.

A regular event for example the UEFA Champions League Final is an annual event in the UK which a city would host more than once in a relatively short period of time but it is shared around as a rule.

Regular and recurring events would include hosting a Formula 1 Grand Prix annually. It would normally be contracted for a period of years to the host country / city.

If a country / city are going to host a large scale sporting event for example The London Olympics in 2012 a large amount of investment is required and also sponsorship deals with companies to aid the costs. However there is a legacy to be achieved as a result including increased profile of sport, a social legacy and an economic one such as new buildings and facilities.

Questions:

1. What are some of the barriers to cities hosting major sporting events?
2. What are some of the benefits to cities of hosting major sporting events?
3. Discuss some of the of National Governing Bodies in sport and these link to the benefits of hosting a major sporting event.

Box 2: **The potential barriers and benefits to cities hosting major sporting events:**

Barriers:

- Bidding to host can be an expensive exercise and you may not be awarded the event.
- Can cost host more than raised in revenue.
- Facilities can end up being left after the event.
- Can have a negative effect on the country if the event is not run properly/disorganized.
- May help to promote one sport but others may suffer as a consequence.

Benefits:

- Investment in developing/improving transport system.
- Increased direct / indirect tourism.
- Commercial benefits.
- Participation may increase in some sports.
- Improvements in sporting facilities which can be used by people in the local area.
- Raise the morale of the country.

Box 3: There are links between potential barriers and benefits of hosting a major sporting events. Many of the benefits and drawbacks are relevant to more than one legacy areas (sporting, social, economic) (e.g. sports facilities could have both sporting and social legacy).

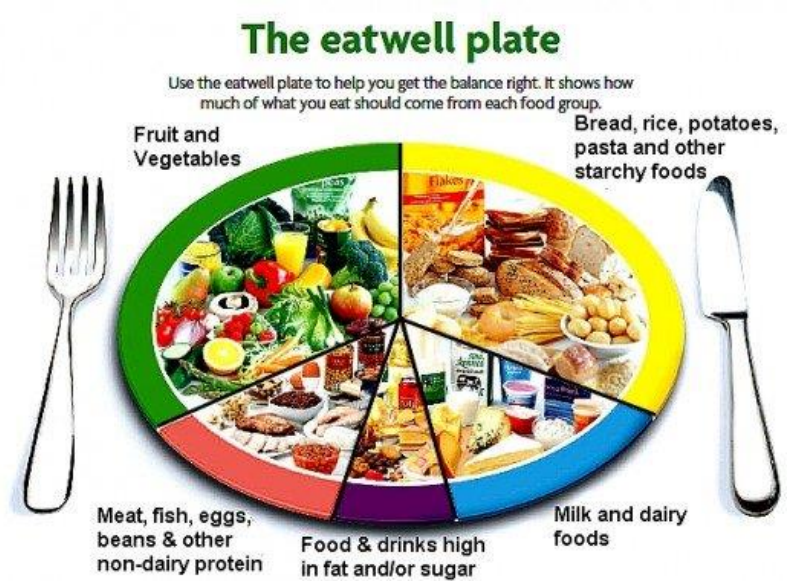
Box 4: What are the roles of National Governing Bodies in sport:

- Promotion: promoting participation (equal opportunities), increasing popularity (particularly in schools), exposure in the media.
- Development: elite training and development, coaching awards and qualifications, training of officials.
- Infrastructure: competitions / tournaments, rule making and disciplinary procedure, providing a vision.
- Policies and initiatives: promoting etiquette and fair play, anti doping policy, community programmes.
- Funding: lobby for a receive funding from different streams and then distribute these funds fairly including grants, memberships, subscriptions, lottery funding, fundraising events.
- Support: providing technical advice and providing location and contact information for clubs, how to get started with the sport and introducing *grass routes* programmes.

Key term	Definition
1. body mass index (or BMI)	a weight-to-height ratio that shows if you're overweight, underweight or at a healthy weight
2. calorie	a unit for measuring the amount of energy we get from food
3. carbohydrate	a substance in foods such as bread and potatoes that is a major source of energy or calories
4. cholesterol	a substance in body cells that can cause heart disease if levels in the blood are too high
5. diabetes	a serious illness in which your body cannot regulate the amount of sugar in the blood
6. malnutrition	a condition of weakness or illness caused by eating too much food, not enough food or unhealthy food
7. nutrient	a substance in food that is necessary for good health
8. obesity	the state of being very overweight, or the medical condition related to this
9. pescetarian	(of a diet) including vegetarian food and fish, but no other meat
10. vegan	(of a diet) with plant foods only; without animal products, including meat, fish, seafood, eggs, milk, cheese, etc
11. vegetarian	(of a diet) with plant foods and sometimes dairy products, but without meat, fish, or seafood
12. preservative	a chemical substance used for preventing food from spoiling or wood from decaying
13. process	to add chemicals or other substances to food to make it last longer or look or taste better
14. saturated fat	a type of fat that's found in butter, cheese, red meat, etc.

8 Tips For Healthy Eating

1. **Base your meals on higher fibre starchy carbohydrates**
2. **Eat lots of fruit and veg**
3. **Eat more fish, including a portion of oily fish**
4. **Cut down on saturated fat and sugar**
5. **Eat less salt: no more than 6g a day for children 11+**
6. **Get active and be a healthy weight**
7. **Do not get thirsty**
8. **Do not skip breakfast**



15. trans fat (or trans fatty acid)	an artificial fat that makes food last longer and taste better but is very bad for health

Fitness Key term	Definition
1. Aerobic fitness	A measure of how well your blood transports oxygen around the body, and how well your muscles utilize the oxygen.
2. Aerobic	Meaning with oxygen. Aerobic training is at a lower intensity, with the purpose of stimulating aerobic metabolism to improve.
3. Anaerobic	Anaerobic processes occur in the cells of the body without the presence of oxygen. Anaerobic training is of high intensity and short duration, with the aim of the efficiency of the body's anaerobic energy-producing systems.
4. Body composition	Body composition refers to the components of the body. It is usually divided into two components: the amount of fat mass (weight) and the amount of fat-free mass (muscle, bone, skin and organs) in the body.
5. Cardiovascular	Concerning the heart and blood vessels.
6. Endurance	The body's ability to exercise with minimal fatigue. Often used with other terms such as; endurance training, muscular endurance and cardiorespiratory endurance.
7. Glycogen	The form in which carbohydrates are stored in the body. Primary sites for storage are the muscles and the liver.
8. obesity	the state of being very overweight, or the medical condition related to this
9. Interval training	A training session that involves repeated bouts of exercise, separated by rest intervals. Depending of the length of exercise and rest periods, it may be anaerobic or aerobic training.
10. Lactic acid	Anaerobic exercise produces lactic acid, which quickly forms lactate in the muscles. because of this, the terms "lactate" and "lactic acid" are often used interchangeably.
11. Resistance training	Training designed to increase the body's strength, power, and muscular endurance through resistance exercise. The most common form of which is weight training.

How much physical activity should children and young people aged 5 to 18 do to keep healthy?

Children and young people need to do **2 types of physical activity** each week:

- aerobic exercise
- exercises to strengthen their muscles and bones

Children and young people aged 5 to 18 should:

1. aim for an average of at least 60 minutes of moderate intensity physical activity a day across the week

2. take part in a variety of types and intensities of physical activity across the week to develop movement skills, muscles and bones

3. reduce the time spent sitting or lying down and break up long periods of not moving with some activity. Aim to spread activity throughout the day. All activities should make you breathe faster and feel warmer