

YEAR 10 KNOWLEDGE ORGANISER

TRINITY TERM 2020/21



Name:

Family Group:



LEARNING - LOVING - LIVING

PAGE NUMBER	SUBJECT	TOPIC
1-3	General information	Knowledge Organiser guidance, Retrieval activity ideas, The science of Learning- How to revise effectively
4-6	English	Jekyll and Hyde
7-10	Mathematics	Transformations, shapes, graphs and sequences
11-20	Science	Biology, Physics, Chemistry
21-22	Geography	Paper 3, People and the Biosphere
23-25	History	Weimar and Nazi Germany
26- 27	Religious Education	Crime and punishment, religion and life
28- 29	Physical Education GCSE	Somatotypes, obesity and nutrition
30-31	Computer Science	Hardware and software, pseudo code
32-34	Drama	Devising Logs
35- 36	Music GCSE	Devices (Mr tights)
37-40	Music Technology	Understanding music genres
41	Art	Annotations
42-43	Food and Nutrition	International cuisine, food science and provenance
44	Engineering	Engineering
45- 46	French	Key Vocabulary
47-48	Spanish	Key Vocabulary
49-50	Statistics	Processing, representing and analysing data; Probability
51-53	Sports Studies	Sport and the media
54-55	Citizenship	Taking citizenship action
56-58	Business and Enterprise	Understanding resources for Business and Enterprise planning
59-61	PSHE	Drugs and the law, consent

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

Other revision tools include:

-FREE **online** revision tools such as www.senecalearning.com, the recently updated BBC BITESIZE and YouTube.

-Other **online** platforms and **apps** like <https://mathswatch.co.uk> and Duolingo.

-Subject **revision guides** (some available at school and book shops)

-Practice **exam questions** (see your teacher)

-**Past Papers** from your teacher or exam board websites.

MICROSOFT TEAMS

Remember to check TEAMS regularly for updates and additional home learning files including copies of your mastery booklets.

You can also ask your teachers questions on teams and view videos of 'how to use your knowledge organiser'.



<u>HOMWORK TIMETABLE</u>			
Year 10	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

WELLBEING DURING REVISION AND EXAMS- YOUNG MINDS

1. Always take a moment just to breathe, whether in the exam, before or after.
2. Remember that school does offer support, just reach out and ask!
3. Keep your work balanced. Spend time revising, but socialise and relax too.
4. Keep a self-care routine so that your revision is the most productive it can be whilst you feel as good as possible.
5. Break up revision with food and exercise to make sure you stay energised.
6. Remember that results do not define you.
7. Find a revision space and style that works for you: silence, background chatter, music with or without lyrics.
8. Work to your own pace – everyone is different in how they work.
9. If you feel nervous about the time pressure of an exam, practice timing yourself when you revise, or try some test papers.
10. Plan in some treats to reward yourself, and celebrate when it's all over!

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.

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4 Methods of Retrieval Practice

@ImpactWales

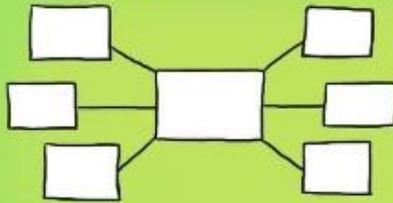
Before you start put away all your books & classroom materials.

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

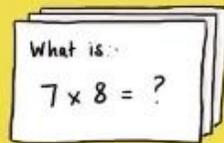
Create practice questions on a topic. Swap your questions with a partner & answer.

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

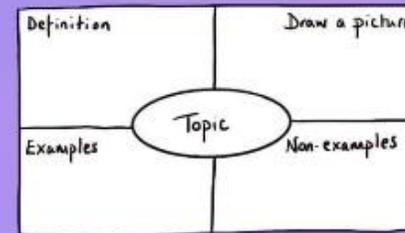
Create your own flashcards, question on one side answer on the other. Can you make links between the cards?



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

CONCRETE EXAMPLES

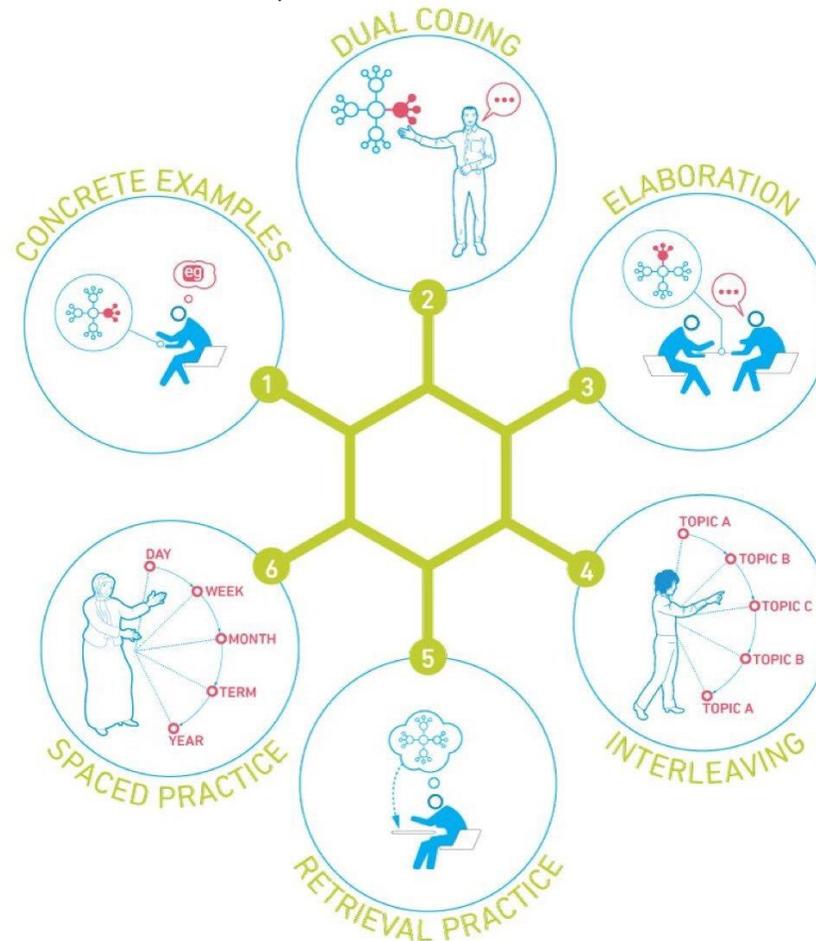
When you're studying, try to think about how you can turn ideas you're learning into concrete examples. Making a link between the idea you're studying and a real life example, concrete example, can help students understand abstract ideas and make it 'stick'.

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.

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. Combining images with words or explaining an image makes it more likely to 'stick'.



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.

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.

INTERLEAVING

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

Chapter 1: Story of the door:

Who	What	Notes
1) Utterson	Never lighted by a smile	U is 'austere', serious, strict, avoids frivolity
	Austere	U represses his desire for pleasure. Strives to conform to restrictive social mores
	I let my brother go to the devil in his own way.	Avoids gossip, doesn't judge: is he tolerant or selfish here?
	When the wine was to his taste something eminently human beamed from his eye	U's 'austere' demeanour could be an act/vener-drink removes his inhibitions.
2) Setting	The buildings are so packed together	Setting is claustrophobic and restrictive, mirroring the social mores. Gothic fiction involves entrapment!
	Neither bell nor knocker	House is private, mirroring the theme of secrecy.
3) Utterson	Though he enjoyed the theatre, had not crossed the doors of one for twenty years	U is Paranoid: extreme obsession with reputation results in bizarre/absurd behavior. U avoids frivolity
4) U and E	Looked singularly dull BUT chief jewel of each week	U and E walk in public to enhance reputation. Contrived.
5) Enfield	You start a question its like starting a stone The more it looks like Queer Street, the less I ask	E avoids gossip: is he being tolerant or selfish here? E is a hypocrite: he is fascinated by Hyde's story!
6) Hyde	Tramples 'calmly' on a child 'like some damned juggernaut'	H attacks the vulnerable. H is cold, callous. gratuitous violence, like an automaton.
7) Enfield	Make his name stink	E threatens to ruin H's reputation and cause a scandal. H pays money to avoid trouble. E and H are immoral!
8) Enfield on Hyde	Gave me one look so ugly that it brought out the sweat on me like running	H is repulsive, abhorrent, causes psychosomatic reaction in E. Links to U. Class stereotypes of lower class (a group seen as deviant, criminal, immoral).
	There is something wrong with his appearance; something displeasing, something downright detestable A strong feeling of deformity, although I couldn't specify the point	Link to Uncanny: ambiguous/vague. Victorians thought certain physiologies caused criminality (Physiognomy): ugly=criminal.

Chapter 2: The Search for Mr Hyde:

Who	What	Notes
9) Lanyon	Boisterous and decided manner	Stevenson commenting on arrogance of science (challenged traditional/religious beliefs).
10) L on J	Jekyll became too fanciful for me, he began to go wrong, wrong in mind Such unscientific balderdash	J=transcendental medicine. L=empirical science. J=Victorians associated science with supernatural because incomprehensible. L=Victorians associated science with arrogance/immorality (challenged the church)
11) U meets H	Fronted about with an air of defiance	H defies social mores/is immoral/doesn't conform. H represents U. Class repressed desires.
	Snarled aloud into a savage laugh	H is sinister, feral, atavistic (represents Victorian fears of evolution)
	Pale and dwarfish	H is depraved/disease to society. J is 'tall fine build of a man'. Hierarchy of status: J is superior (like class system)
	Murderous mixture of timidity and boldness	H is antithetical. Contradictory nonsensical description (like U. Class prejudice=incoherent/irrational)
12) H	Troglodytic	Link to Victorian fears of evolution. Caveman=uncivilized/feral. U. Class repress all savage/uncivilized impulses.
13) U on J	The ghost of some old sin, the cancer of some concealed disgrace	U suspects J has past vices. U suspects blackmail. 'cancer'=moral depravity and sin are a societal disease to be avoided.
14) U	Humbled to the dust by the many ill things he had done	U is archetypal Victorian Gent-he is perfect! (here U is paranoid and insecure)



Chapter 3: Dr Jekyll was quite at Ease

Who	What	Notes
15) J on L	Hide bound pedant, Lanyon	J (transcendental) vs L (Empirical). Victorian fears and disdain for science
16) J on H	It isn't what you fancy; it is not so bad as that	J implicitly referring to blackmail/illicit homosexuality
17) Jekyll	Asks U to help Hyde if J disappears	Close bonds of support and secrecy between U.Class men

Chapter 4: Carew Murder Case

Who	What	Notes
18) Hyde	Ape like fury	Feral, brutal, savage, malevolent, uncivilized, relentless,
19) The Attack	<ol style="list-style-type: none"> 1) Unprovoked attack: SDC was bowing to greet H. SDC was genteel and polite (paragon of propriety and decorum). SDC is antithesis of H. 2) Victim: old, frail, vulnerable. MP=symbolizes society and civilization-H attacks the establishment 3) Nature of attack: No valuables taken. Makes H hard to understand-he is motivated by sadism. H is volatile 4) Weapon left=H doesn't care about ramifications or being caught 5) 'bones audibly shattered'= visceral, barbaric attack 6) Maid faints: accentuates brutality of attack. 	

Chapter 5: Incident of the Letter:

Who	What	Notes
20) Utterson	<p>Suspects J is covering for H (blackmail/homosexual subtext)</p> <p>Handwriting of J and H are similar</p>	Graphology (Victorian pseudo-science) claimed that personality/morality could be judged by handwriting

Chapter 6: Remarkable Incident of Dr Lanyon

Who	What	Notes
21) Lanyon	<p>his flesh had fallen away</p> <p>Deep seated terror of the mind</p> <p>A doomed man</p>	Shock of seeing H transform to J (explained in CH9) kills L. Links to idea that science is a threat/Victorian fears of science. H symbolizes human capacity for evil: L is shocked by this-like all U.Class men, L aims for perfection/represses desires for sin. When confronted with the thing he tries to ignore (evil/transgression) he is shocked and dies

Chapter 7: Incident at the Window:

Who	What	Notes
22) Jekyll	Slams the window to avoid E and U seeing transformation	J cannot control the transformations now
23) E and	E and U see J through the window	Symbolizes lack of privacy for U.Class men

Chapter 8: The Last Night:

Who	What	Notes
24) Poole on J	My master is a tall fine build of a man	Compare to H 'pale and dwarfish' hierarchy between them: J is supposed to be on top but H ends up more powerful
25) Poole on H	That masked thing like a monkey	Atavism/fears of evolution/feral/primitive/bestial
26)Hyde	H has been asking Poole to get a drug for him	Theme of addiction: to drug/sin/freedom/

Chapter 9: Dr Lanyon’s Narrative

Who	What	Notes
27) Lanyon	My life is shaken to its roots	Link to idea that science is a threat/Victorian fears of science
28) Lanyon	After J’s party in CH6, L receives letter from J asking L to get a drawer from J’s house (containing notebook and vial)	Notebook explains that slowly the potion has stopped working: J has built up tolerance/become immune. Symbolises the normalization of transgression: the more you do, the more acceptable it becomes?
29) Hyde	Transformation in front of Jekyll	Gothic/supernatural/fears of science. L witnesses (like maid witnessing H battering SDC): reader encouraged to share their shock

Chapter 10: Henry Jekyll’s Full Statement of the Case

Who	What	Notes
30) Jekyll	That man is not truly one, but truly two	Duality of man. Evil+Good
	Extraneous evil	J claims H is separate (contradicts himself: compare to ‘not truly one, but truly two’ Is ‘extraneous evil’ the social mores?
	A solution to the bonds of obligation	H is a ‘solution’ to problem of restrictive social mores. ‘bonds’=Victorian society is imprisoning/an entrapment (Gothic theme)
	Like a school boy, strip off these lending’s and spring headlong into the sea of liberty	H excites J: ‘like a school boy’=exhilarating. ‘sea of liberty’=ignore social mores/indulge in transgressions and immorality.
	Commingled out of good and evil	Human psyche is a mixture not two separate things. evil and good are intertwined
	Like a thick cloak	Similar to ‘extraneous evil’. J claims H is separate (contradicts himself) but WHY? 1) human psychology is too complex to comprehend 2) J is deliberately being evasive to avoid culpability 3) J is deluded and is lying to himself to avoid guilt and shame
	I was slowly losing hold of my original and better self, and becoming slowly incorporated with my second and worse If I am the chief of sinners, I am the chief of sufferers also	H eventually overpowers J. Evil side begins to take control ‘sufferers’=J suffers under societal expectations. Repressing his desire to sin=suffering. Guilt of actions as H=suffering. Evil side taking control=suffering. Denying innate capacity for transgression=suffering.
	The animal within me	Atavism/fears of evolution-humans are similar to animals
	this brief condescension to evil finally destroyed the balance of my soul’	Temptation leads to further damage. repressing sin ‘brief condescension’ avoids moral depravity.
	Men have before hired bravos to transact their crimes, while their own person and reputation sat under shelter	Secrecy/reputation. Public behavior is a veneer/act. H is a ‘bravos’ and a ‘thick cloak’ to ‘shelter’ J from judgment and criticism
	Secret pleasures	Perhaps he only initially wanted to indulge in transgressions like drinking/prostitution not murder

Important Ideas

A **vector** has both **direction** and **magnitude**.

$$\vec{AB} = -\vec{BA}$$

$$\vec{AB} = \begin{pmatrix} 3 \\ 2 \end{pmatrix}$$



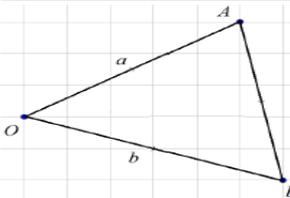
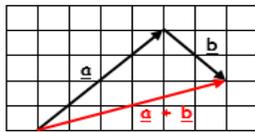
If two vectors have the **same magnitude and direction**, they are **equal**.

The **resultant** vector is the vector that results from **adding** two or more vectors together.

This can be represented graphically or with **column vector notation**

if $\mathbf{a} = \begin{pmatrix} 4 \\ 4 \end{pmatrix}$ and $\mathbf{b} = \begin{pmatrix} 2 \\ -2 \end{pmatrix}$

then $\mathbf{a} + \mathbf{b} = \begin{pmatrix} 4 \\ 4 \end{pmatrix} + \begin{pmatrix} 2 \\ -2 \end{pmatrix} = \begin{pmatrix} 6 \\ 2 \end{pmatrix}$



$$\begin{aligned} \vec{OA} &= \mathbf{a} & \vec{AO} &= -\mathbf{a} \\ \vec{OB} &= \mathbf{b} & \vec{BO} &= -\mathbf{b} \\ \vec{AB} &= \vec{AO} + \vec{OB} = -\mathbf{a} + \mathbf{b} = \mathbf{b} - \mathbf{a} \\ \vec{BA} &= \vec{BO} + \vec{OA} = -\mathbf{b} + \mathbf{a} = \mathbf{a} - \mathbf{b} \end{aligned}$$

Q&A

Translate shape P by the column vector $\begin{pmatrix} 7 \\ -1 \end{pmatrix}$.

$\begin{pmatrix} 7 \\ -1 \end{pmatrix}$ means 7 right, 1 down.

Translate each vertex separately.

Join up the new vertices to make the new shape.

Communication hint A **vertex** is a corner. The plural of vertex is **vertices**.

Describe fully the transformation that maps shape A onto shape B.

Find the mirror line halfway between the vertices of the image (B) and the original (A).

Write down the type of transformation (reflection) and the equation of the mirror line.

Reflection in the line $y = 2$.

Rotate the shape 90° anticlockwise about the point (1, 2).

(1, 2) is the centre of rotation.

Mathswatch Clip - 4:

Mark the point (1, 2) with a cross.

Trace the shape.

Rotate the tracing paper 90° anticlockwise about (1, 2).

Lift up the tracing paper and draw the image on the grid.

Enlarge shape A by scale factor 2, using centre of enlargement (1, 3). Label the image B.

Count the squares from the centre of enlargement to each vertex. Multiply all the distances from the centre by the scale factor.

The distance to the top vertex changes from 4 up, 2 right to 8 up, 4 right.

The distance to the bottom vertex changes from 2 right to 4 right.

Check that the lengths of the image are twice as long as the original.

MathsWatch References

48	Reflections
49	Rotations
50	Translations
148	Enlargements
174	Introductions to Vectors
219	Vectors

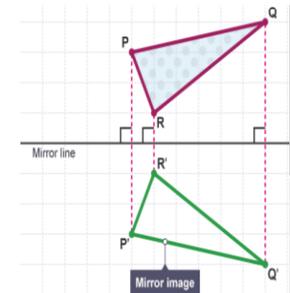
Key Facts & Formula

Reflection

Every point in the image is the same distance from the mirror line as the original shape.

The line joining a point on the original shape to the same point on the image is perpendicular to the mirror line.

A reflection creates a congruent image



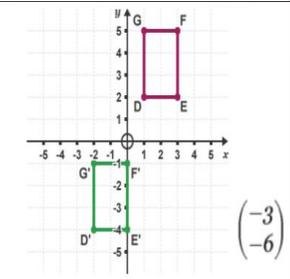
Translation

A **translation** moves a shape up, down or from side to side and creates a congruent image.

Column vectors are used to describe translations

$\begin{pmatrix} 4 \\ -3 \end{pmatrix}$ means translate the shape 4 squares to the right and 3 squares down.

$\begin{pmatrix} -2 \\ 1 \end{pmatrix}$ means translate the shape 2 squares to the left and 1 square up.



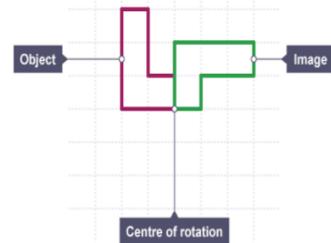
Rotation

Rotation turns a shape around a fixed point called the **centre of rotation**.

3 parts of a rotation

- the centre of rotation
- the angle of rotation
- the direction of rotation

A Rotation creates a congruent image



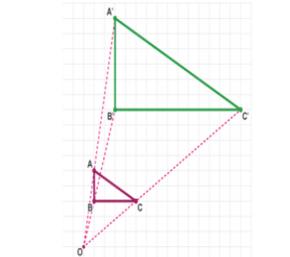
Enlargement

Enlarging a shape changes its size

2 parts of an enlargement

- the scale factor
 - the centre of enlargement
- Fractional SF reduces the shape
Negative SF inverts the shape

An enlargement creates a similar shape



ABC has been enlarged by sf 3 about O.

Vocabulary

Object	Starting shape
Image	Created by a transformation
Congruent	Two shapes are exactly the same
Similar	Two shapes with the same angles but different length sides

Important Ideas

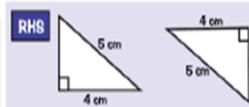
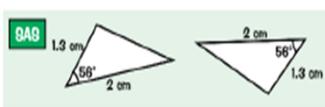
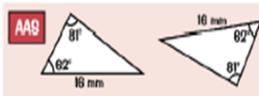
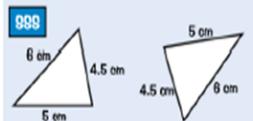
Congruent Shapes

Proving Triangles are Congruent

CONGRUENT
— same size,
same shape

To prove that **two triangles are congruent**, you have to show that **one** of the conditions below holds true:

- 1) **SSS** **three sides** are the same
- 2) **AA** **two angles** and a **corresponding side** match up
- 3) **SAS** **two sides** and the **angle between them** match up
- 4) **RHS** a **right angle**, the **hypotenuse** and one other **side** all match up



Similar Shapes

SIMILAR — same shape,
different size

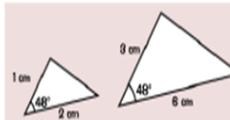
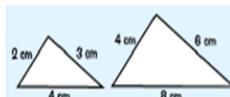


Similar Shapes Have the Same Angles

Generally, for two shapes to be **similar**, all the **angles** must match and the **sides** must be **proportional**.
But for **triangles**, there are **three special conditions** — if any one of these is true, you know they're similar.

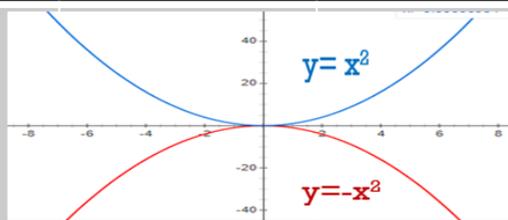
Two triangles are similar if:

- 1) **All the angles match up** i.e. the angles in one triangle are the same as the other.
- 2) **All three sides are proportional** i.e. if **one** side is twice as long as the corresponding side in the other triangle, **all** the sides are twice as long as the corresponding sides.
- 3) **Any two sides are proportional** and the **angle between them** is the **same**.

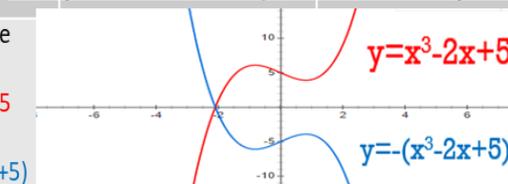


Q&A

Sketch the graphs of $y = x^2$ and $y = -x^2$

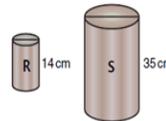


Sketch the graph of $y = x^3 - 2x + 5$ and $y = -(x^3 - 2x + 5)$



when lengths are multiplied by k , area is multiplied by k^2 , volume by k^3
Example 7

Cylinders R and S are similar.



The surface area of cylinder R is 40 cm².
Calculate the surface area of cylinder S.

Solution 7

$$\frac{35}{14} = 2.5$$

Work out $\frac{\text{height of cylinder S}}{\text{height of cylinder R}}$ to find the number by which lengths have been multiplied, that is, find the scale factor.

$$2.5^2 = 6.25$$

Square the scale factor to find the number by which the area has to be multiplied.

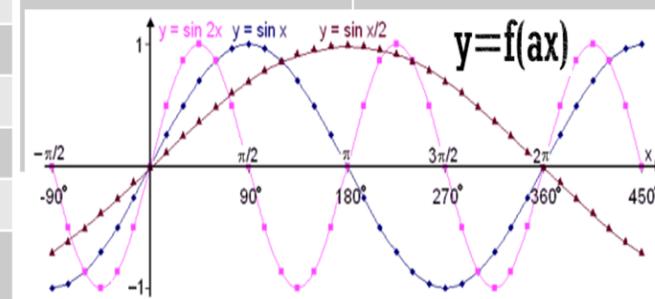
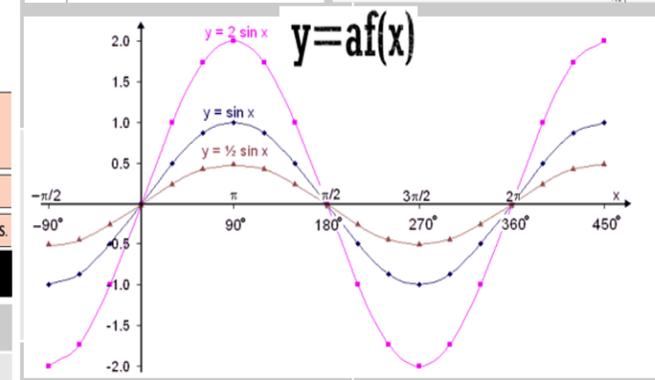
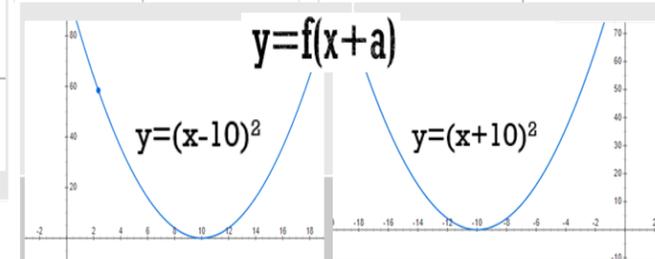
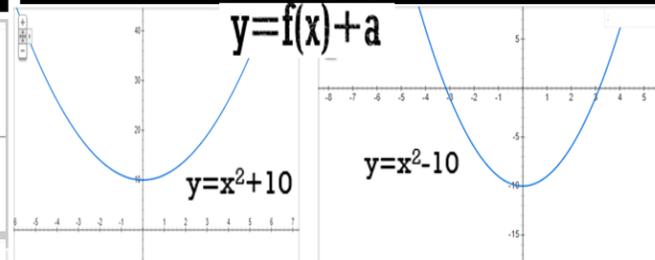
$$40 \text{ cm}^2 \times 6.25 = 250 \text{ cm}^2$$

Multiply the surface area of cylinder R by 6.25 to find the surface area of cylinder S.

MathsWatch clip References

144	Similar Shapes
200	Similarity - Area and Volume
12b	Congruent Shapes
166	Congruent triangles
98	Drawing Quadratic Graphs
161	Cubic and Reciprocal Graphs
196a	Transformation of Polynomial Functions
196b	Transformation of trigonometric Functions

Four main types of graph transformation





Important Ideas

Factorising Quadratics

Factorise $x^2 + 5x + 6$

$x^2 + 5x + 6$

$(x \quad)(x \quad)$

$1 \times 6 \quad 2 \times 3$

$1 + 6 = 7 \quad 2 + 3 = 5$

$(x + 2)(x + 3)$

Check: $(x + 2)(x + 3) = x^2 + 5x + 6$

Write a pair of brackets with x in each one. This gives the x^2 term when multiplied.

Work out all the factor pairs of 6, the number term.

Work out which factor pair will **add** to give 5, the number in the x term.

Then write each number in each of the brackets with x .

The expression is now factorised. Expand the brackets to check it is correct.

Graphs of Quadratic Functions

Important features of graphs of parabolas

Axis of symmetry

Maximum

Minimum

x-intercepts

Vertex

Vocabulary

Linear Sequence	A number pattern with a common difference.
Fibonacci Sequence	A sequence where the next number is found by summing the previous two terms
Quadratic Sequence	A sequence of numbers where the second difference is constant.
Term-to-term rule	A rule which allows you to find the next term in a sequence if you know the previous term.
n^{th} term rule	A rule which allows you to calculate the term that is in the n^{th} position of the sequence.

Q & A

a Work out the n^{th} term of the sequence 3, 7, 11, 15, ... b Is 45 a term of the sequence?

a $4n \quad 4, 8, 12, 16, \dots$ -1

$3, 7, 11, 15, \dots$

$+4 \quad +4$

The common difference is 4. Write out the first five terms of the sequence for $4n$, the multiples of 4. Work out how to get from each term in $4n$ to the term in the sequence.

The n^{th} term is $4n - 1$.

b $45 = 4n - 1$

$46 = 4n$

$11.5 = n$

45 cannot be in the sequence because 11.5 is not an integer.

Write an equation using the n^{th} term and solve it.

Find a formula for the n^{th} term of the sequence 8, 23, 48, 83, 128, ...

sequence $8 \quad 23 \quad 48 \quad 83 \quad 128$

1st differences $+15 \quad +25 \quad +35 \quad +45$

2nd differences $+10 \quad +10 \quad +10$

Work out the second differences.

So $a = 10 \div 2 = 5$

Halve the second difference to find the coefficient of n^2 .

The formula has a $5n^2$ term in it.

$5n^2$	5	20	45	80	125
Sequence	8	23	48	83	128

Compare the given sequence with $5n^2$.

The n^{th} term is $5n^2 + 3$

The numbers in the second row are 3 more than those in the first row.

Solve $2x^2 + 11x - 5 = 0$. Give your answer to 2 decimal places.

$a = 2, b = 11, c = -5$

Substitute these into the quadratic formula, use brackets for negative numbers.

$$x = \frac{-11 \pm \sqrt{11^2 - 4 \times 2 \times (-5)}}{2 \times 2}$$

Put this into the calculator, first with a + and then with a - to find your two solutions.

$x = -5.92$ or $x = 0.42$

MathsWatch References

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102	Generating a sequence from n^{th} term
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104	Special sequences
141	Fibonacci Sequences

Key Facts & Formula

Finding the n^{th} Term of a Linear Sequence

This method works for **linear sequences** — ones with a **common difference** (where the terms **increase** or **decrease** by the **same amount** each time). Linear sequences are also known as **arithmetic sequences**.

EXAMPLE: Find an expression for the n^{th} term of the sequence that starts 5, 8, 11, 14, ...

n :	1	2	3	4
term:	5	8	11	14
		+3	+3	+3
$3n$:	3	6	9	12
		+2	+2	+2
term:	5	8	11	14
			+2	

The common difference is 3, so '3n' is in the formula.

You have to +2 to get to the term.

So the expression for the n^{th} term is $3n + 2$

- Find the **common difference** — this tells you what to multiply n by. So here, 3 gives '3n'.
- Work out what to **add or subtract**. So for $n = 1$, '3n' is 3 so add 2 to get to the term (5).
- Put both bits together. So you get $3n + 2$.

Always **check** your expression by putting the first few values of n back in, e.g. putting $n = 1$ into $3n + 2$ gives 5, $n = 2$ gives 8, etc. which is the **original sequence** you were given — hooray!

Finding the n^{th} Term of a Quadratic Sequence

A **quadratic sequence** has an n^2 term — the **difference** between the terms **changes** as you go through the sequence, but the **difference** between the **differences** is the **same** each time.

EXAMPLE: Find an expression for the n^{th} term of the sequence that starts 10, 14, 20, 28, ...

n :	1	2	3	4
term:	10	14	20	28
		+4	+6	+8
		+2	+2	
term:	10	14	20	28
n^2 :	1	4	9	16
term - n^2 :	9	10	11	12

So the expression will contain an n^2 term.

The expression for this linear sequence is $n + 8$

So the expression for the n^{th} term is $n^2 + n + 8$

- Find the **difference** between each pair of terms.
- The difference is **changing**, so work out the difference between the **differences**.
- Divide** this value by 2 — this gives the coefficient of the n^2 term (here it's $2 \div 2 = 1$).
- Subtract** the n^2 term from each term in the sequence. This will give you a **linear sequence**.
- Find the **rule** for the n^{th} term of the linear sequence (see above) and **add** this on to the n^2 term.

Quadratic Equation $\rightarrow ax^2 + bx + c = 0$

Quadratic Formula $\rightarrow x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Keywords

- Event: one or more outcomes from an experiment
- Outcome: the result of an experiment
- Intersection: elements (parts) that are common to both sets
- Union: the combination of elements in two sets
- Expected Value: the value/ outcome that a prediction would suggest you will get
- Universal Set: the set that has all the elements
- Systematic: ordering values or outcomes with a strategy and sequence
- Product: the answer when two or more values are multiplied together.

Experimental data

Theoretical probability What we expect to happen

Experimental probability What actually happens when we try it out

The more trials that are completed the closer experimental probability and theoretical probability become

The probability becomes more accurate with more trials.
Theoretical probability is proportional

Sample space The possible outcomes from rolling a dice

The possible outcomes from tossing a coin

	1	2	3	4	5	6
H	1H	2H	3H	4H	5H	6H
T	1T	2T	3T	4T	5T	6T

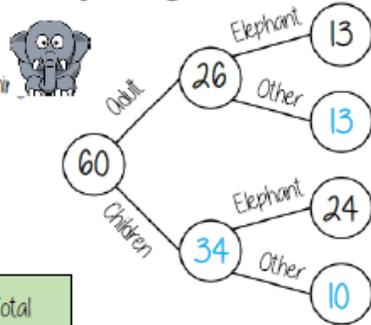
$P(\text{Even number and tails}) = \frac{3}{12}$

Tree Diagrams for Probability

Tables, Venn diagrams, Frequency trees

Frequency trees

60 people visited the zoo one Saturday morning. 26 of them were adults. 13 of the adult's favourite animal was an elephant. 24 of the children's favourite animal was an elephant.



Frequency trees and two-way tables can show the same information

The total columns on two-way tables show the possible denominators

$P(\text{adult}) = \frac{26}{60}$

$P(\text{Child with favourite animal as elephant}) = \frac{13}{37}$

Two-way table

	Adult	Child	Total
Elephant	13	24	37
Other	13	10	23
Total	26	34	60

Venn diagram

in set A AND set B $P(A \cap B)$

in set A OR set B $P(A \cup B)$

in set A $P(A)$

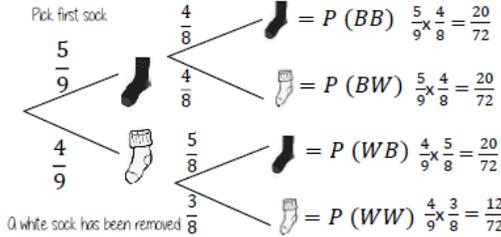
NOT in set A $P(A')$

Dependent events

Tree diagram for dependent event

The outcome of the first event has an impact on the second event

A sock drawer has 5 black and 4 white socks, Jamie picks 2 socks from the drawer.



Sum of probabilities = 1

NOTE: as 'socks' are removed from the drawer the number of items in that drawer is also reduced ∴ the denominator is also reduced for the second pick.

Independent events

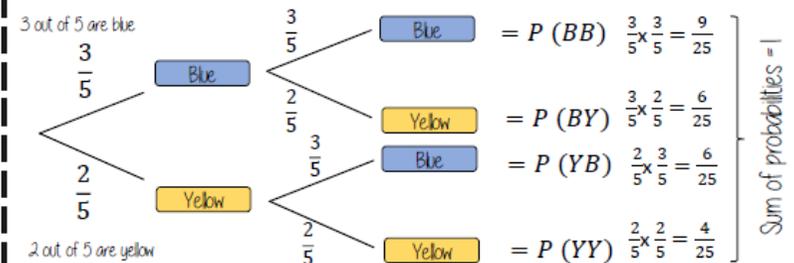
The outcome of two events happening. The outcome of the first event has no bearing on the outcome of the other

$P(A \text{ and } B) = P(A) \times P(B)$

Tree diagram for independent event

Isobel has a bag with 3 blue counters and 2 yellow. She picks a counter and replaces it before the second pick.

Because they are replaced the second pick has the same probability





Variation

Organisms vary, both organisms of different species (obviously) and organisms of the same species (also obviously!). Variation (differences) are caused by both genetic causes and environmental causes.

- Some differences are only due to **inherited genes** – they are entirely **genetic**;
- Some differences are only due to the conditions in which an organism developed and lives – they are entirely **environmental**;
- Some differences are due to a **combination** of genetic and environmental influences. In this case, we say the genome of an organism and its environment **interact** to affect the **phenotype** of the organism.

In most populations of most species of organism, there is a lot of genetic variation. The general term for versions of the same organism (i.e. different individuals of a species) is with different genetic information is **variants**. All variants arise from **mutations**. Mutations can be dangerous (remember your work on cancer, for instance), but usually have no effect. Sometimes, they have a beneficial effect. Overall:

- Mutations happen continuously;
- most mutations will **not affect the phenotype at all**;
- some will **influence the phenotype** (maybe change it a bit);
- very few mutations cause a **total change in phenotype**.

The last case is rare, but very important. If a mutation occurs that leads to a new phenotype, and the new phenotype makes the organism better suited to the environment, it will lead to a rather rapid change in the species, by **natural selection**.

Evolution by natural selection

Evolution is the change in inherited (genetic) characteristics of organisms over time. Many theories of evolution have been suggested, but Darwin's **theory of natural selection** is the one with by far the most evidence. Darwin noticed that all organisms produce more offspring than they need to replace themselves, and yet population sizes stay pretty steady from generation to generation. He also observed that all species show variation, and that life is tough for organisms – only the best adapted survive. So, based on these observations, we can explain evolution by natural selection like this:

1. A population of organisms shows variation – there are **variants** in the population
2. The organisms are in **competition** to survive
3. **Survival of the fittest** – only the variants with the phenotypes best suited to the environment get to survive
4. **Reproduction** – those who survive get to reproduce
5. **Genetic inheritance** – their offspring inherit the genes from their parents, so the successful phenotype becomes more common in the next generation. This continues from generation to generation.

Key Terms	Definitions
variation	Differences in the characteristics of individuals in a population.
genetic variation	Differences in the genome between individuals. This often causes differences in physical characteristics.
variants	Different versions of the same thing. Often this term is used to describe individuals who are different from others in a specific genetic way – for instance the 'long haired cat variant' from earlier.
mutation	A change to DNA. Mutations can cause a change in the sequence of amino acids being produced, affecting the protein being produced from the DNA code.
evolution	Change in the inherited characteristics of organisms over time. Evolution happens through natural selection .
natural selection	The process that changes the inherited characteristics of organisms over time. This explains the adaptations of organisms to their environment AND the formation of new species of organism.
common ancestor	An ancestor in common. For instance, if you have a sister, your granddad is a common ancestor to you both.

New species

The theory of evolution by natural selection tells us that all species of living things have evolved from a single, simple type of life form. We know this **common ancestor** was alive on Earth over **three billion** years ago. How we ended up with millions of different species from this single species is also explained by evolution by natural selection.

Essentially, two populations of one species (e.g. a population of fish is divided into two populations by geographical changes such as the joining of North and South America) can become two different species. This happens when the two populations become so different in their phenotypes that they can no longer **interbreed** to produce **fertile offspring**. This is the point when we define them as different species. For example, tigers and lions are different species (the population of their common ancestor has been separated for a long time) – they can interbreed (producing a liger), but ligers are infertile. So their parents are different species.



Evidence for evolution

There is a vast haul of evidence to support Darwin’s theory of evolution by natural selection. This evidence has built up over time: for example, Darwin didn’t know about genes so found it hard to explain inheritance from parents in full. Obviously, we’ve got this knowledge now.

Thanks to all this evidence, Darwin’s theory for evolution is now very widely accepted. Two key bodies of evidence for you to know are: the fossil record, and the evolution of resistant bacteria.

Fossils

Fossils are the remains of organisms. They are always old, typically millions of years old, and are found in rocks. They can form by:

1. The organism or parts of the organism don’t decay because the conditions are not right for decay by microorganisms. For example, mammoths have been preserved in frozen mud.
2. Parts of the organism are replaced by minerals from the surrounding rocks as they decay. Most often, this results in soft tissues (e.g. muscle, skin) decaying normally, but the form of bones is preserved by the minerals in bones being swapped for minerals from the rocks/sediments that the dead organisms were buried under.
3. Preserved traces of organisms – so not their actual bodies, but traces like footprints, droppings, burrows and the traces of roots.

As most fossils are formed from bones, and many early forms of life had soft bodies (no bones), there are few traces of early forms of life. Any traces there were tend to have been destroyed by geological activity (movements of tectonic plates, volcanic activity and so on). This means the fossil record is incomplete and scientists cannot be totally sure about the origin of life on Earth.

The fossil record helps scientists fill in timelines and evolutionary trees to show how life has changed over time on Earth. Using evolutionary trees shows the closeness of relationships between different species.

Extinction

Extinctions of a species can happen for many reasons, and often extinction is due to more than one factor working together. Some key factors that may contribute to extinction of a species:

- Development of new species, so the old species doesn’t exist any more
- New diseases affecting a species, which they aren’t adapted to and can’t survive
- New predators, to which a species cannot adapt fast enough to survive
- Changes to the environment, to which the species cannot adapt by natural selection, including catastrophic events (like the meteor strike that caused extinction of loads of species, e.g. dinosaurs)
- New competitors that are better adapted to the environment than the species.

Key Terms	Definitions
fossil	The remains of organisms from millions of years ago, found in rocks. They are formed in different ways – see main text.
strain	A variant of microorganism within a species – so they are not a different species to other variants, but have a key difference in their phenotype (e.g. being resistant to an antibiotic). New strains are produced by mutations.
resistant strain	Describes a variant form of bacteria with resistance (NOT immunity) to a specific antibiotic.
MRSA	An example of a resistant strain of bacteria. It stands for methicillin resistant <i>Staphylococcus aureus</i> .
extinction	When NO individuals of a species remain alive.
evolutionary tree	A timeline that shows how closely related different species are to each other.

Resistant bacteria

The key factor that affects the rate of evolution is how fast an organism reproduces. Bacteria can reproduce as fast as doubling every 20 minutes, so they can evolve rapidly.

Thanks to a mutation, strains of bacteria that are resistant to an antibiotic can emerge. These are NOT killed by antibiotics used to try to kill them when the bacteria has infected someone. Consequently, they survive and reproduce, so the size of the resistant strain population increases generation to generation, while the non-resistant strain is wiped out. Furthermore, the resistant strain is likely to spread because if it infects other people and:

- They are not immune to it
- And there is no effective treatment.

Society benefits if we reduce the rate of development of antibiotic resistant strains of bacteria. Some methods to help save the day:

- Antibiotics should not be prescribed by doctors where they are not needed (especially for viral infections, since antibiotics don’t work on viruses).
- Patients need to finish the full course of antibiotics they get prescribed, reducing the chance of any surviving and mutating to form resistant strains.
- Restrict the use of antibiotics in agriculture, as at present many animals receive antibiotics all the time to prevent infections and encourage growth.

We also badly need new antibiotics. However, it is slow and expensive to develop new antibiotic drugs, and at the moment we are not keeping up with the emergence of resistant strains of bacteria.

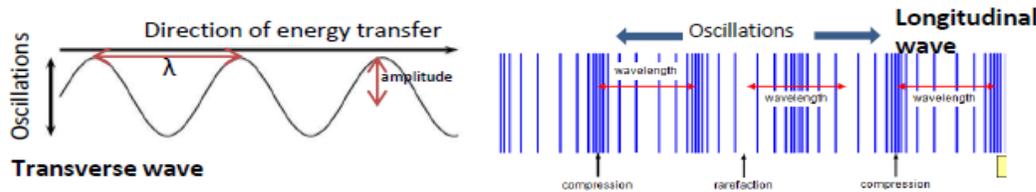
Types Of Wave

You can see waves easily in the sea, or if a tap is dripping into a sink of water. However, waves are far more common than just that. Waves can be **mechanical**, which means they involve particles moving, or **oscillating**, such as waves in the sea or sound waves in the air. Or, they can be **electromagnetic**, which don't involve any particles oscillating – instead, EM waves involve vibrations or oscillations of the electromagnetic field. All waves involve the transfer of energy.

The other way of defining types of wave is whether they are **longitudinal** or **transverse**. Which one they are depends on the direction of the oscillations compared to the direction of energy transfer by the wave.

- In **transverse waves**, the oscillations are **perpendicular** to the direction of energy transfer.
- In **longitudinal waves**, the oscillations are **parallel** to the direction of energy transfer. They show areas of **compression** and **rarefaction** – see diagram.

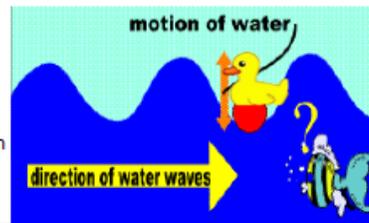
Examples: ALL electromagnetic waves are transverse. Mechanical waves can be either longitudinal or transverse. For instance: sound waves are mechanical and are longitudinal. Ripples in water are mechanical waves, and are transverse.



Particles Don't Travel, But The Wave Does. Particles Just Oscillate.

An easy way to see that the particles aren't travelling but the wave is (so energy is being transferred): put a rubber duck in a tank of water where waves are moving across. The duck goes up and down, just like the water particles (oscillations perpendicular to direction of energy transfer, remember), while the waves move across.

With longitudinal waves, you can tell the particles aren't flowing either – just oscillate. When you speak, you don't breathe into someone else's ear! Also, when a tuning fork is vibrating to produce a sound wave, it doesn't create a vacuum around it due to air particles travelling away.



Key Terms	Definitions
wave	A wave transfers energy from one place to another, and can also carry information. All waves involve movements or oscillations , allowing energy to be transferred without particles having to flow or travel from one place to another.
oscillations	Rhythmic back and forth movements from a rest position (e.g. vibrations). These movements are of particles in mechanical waves , or of the electromagnetic field when it comes to electromagnetic waves .
perpendicular	At right angles to.
amplitude	The amplitude of a wave is the maximum displacement of a point on the wave from the undisturbed position. <i>Translated:</i> the distance from a peak or trough to the 'midline' of the wave.
wavelength	The distance from a point on one wave to the equivalent point on the next wave along. This is easiest to measure at the distance from the centre of one area of compression to the next (longitudinal waves) or the distance from peak to peak (transverse waves). Symbol: λ
frequency	The frequency of a wave is the number of complete waves that pass a point per second. Symbol: f
period	The period, or time period, of a wave is the time it takes to complete a full wave. Symbol: T

Equation	Meanings of terms in equation
$T = \frac{1}{f}$	T = time period (seconds, s) f = frequency (hertz, Hz)
* $v = f\lambda$	v = wave speed (m/s) f = frequency (Hz) λ = wavelength (metres, m)

The Wave Equation

The equation is directly above. You could measure the speed of sound in air, with a long distance between you and a friend. They make a loud noise (you start your clock when you see them do it) and you time how long it takes to get to you. Just use distance/time to calculate the speed.

Electromagnetic Waves (EM Waves)

EM waves are always **transverse waves**. They transfer energy from the source of the waves to an **absorber** – object that absorbs the wave. EM waves occur all over the universe naturally, and we can produce them ourselves for all sorts of uses.

EM waves all travel at the **same velocity** through empty space (a vacuum) – at what we call the **speed of light**. However, the wavelength of EM waves varies from a few kilometres to wavelengths even smaller than an atom. The EM waves form a **continuous spectrum**, but for convenience we've grouped the infinite types of waves into seven groups of wavelengths, based on their properties. Learn the order of EM waves in the EM spectrum. Notice that a **longer** wavelength equates to a **lower** frequency and vice versa – this is clear from the wave equation.

Long wavelength _____ → Short wavelength

Radio waves	Microwaves	Infrared	Visible light	Ultraviolet	X-rays	Gamma rays
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Low frequency _____ → High frequency

Visible light is the only kind of EM wave we can detect with our eyes (hence the name). Thus, we can only detect a limited range of EM waves without special equipment. However, it is easy to understand examples of how EM waves transfer energy. If you are standing in front of a fire, you feel the warmth thanks to infrared. Getting sunburn is due to the transfer of energy by ultraviolet waves from the Sun. Using Wi-Fi means a transfer of energy by microwaves.

Properties Of EM Waves

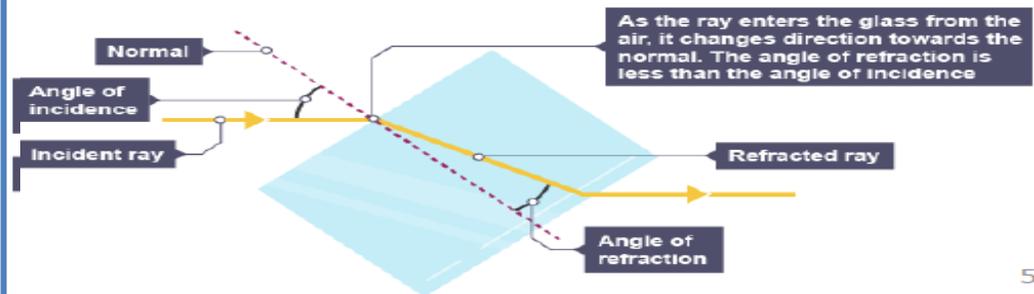
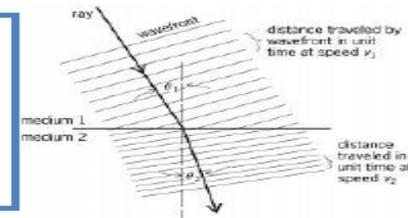
All EM waves can be **reflected, refracted, absorbed** or **transmitted** depending on the wavelength of the EM wave and the **medium** they are travelling through, or surface they are reaching.

Refraction occurs when a wave changes the medium it is travelling through. Refraction is a change in direction of the wave, and it happens at the boundary, or junction, between the media – for instance, the surface of a sheet of glass would be the boundary between the glass and the air. You need to be able to draw diagrams to show refraction, like the example opposite. Notice that the light ray refracts **towards** the normal as it enters the glass (this is because it slows down), and refracts **away** from the normal as it leaves the glass (it speeds back up), ending up parallel to the original ray in air.

Key Terms	Definitions
reflection	Rebounding of a wave from a surface. The angle between the incident (in-going) wave and the normal is the same as the angle between the reflected wave and the normal.
refraction	Changing direction of a wave due to a change in the medium it is travelling through.
absorption	‘Taking in’ energy from a wave and transferring it to another form, usually heat. For instance, you warming up if you lie in the sunshine (revising science, of course).
transmission	A wave travelling through a material. Right now, visible light waves are being transmitted through the air to your eyes.
media	<i>Singular ‘medium’</i> . The medium is the material through which a wave travels.
normal	A ‘construction line’ (made up line to help with diagram drawing) at right angles to a surface at the point where the wave hits the surface.

HT: More On Refraction

Refraction is due to differences in the velocity of the waves in different media. The diagram shown here represents the **wave fronts**. The wave slows down as it enters medium 2, but the near edge slows first. The other end is faster, as it is still in medium 1. This is what causes the ‘bending’ of the wave towards the normal.



Electromagnetic Waves (EM Waves): Producing Them

EM waves can be generated by changes in atoms or the nuclei of atoms. For instance, gamma rays are produced due to changes in the nucleus of an atom (nuclear decay – more on this in a later topic).

HT: radio waves can be produced by oscillations in electrical circuits. This is how a TV/radio broadcast is produced. It is received (e.g. by your TV aerial) by another electrical circuit; the radio waves create an alternating current with the same frequency as the radio wave itself. More on alternating current in the electricity topic – but it is enough to say for now that it involves oscillations.

Dangers Of EM Waves

Ultraviolet waves, X-rays and gamma rays are potentially dangerous types of EM waves, since they can have hazardous effects on human tissues. How severe the effects are depends on the type of radiation and the size of the **dose** received.

Doses of radiation are measured according to how great the risk of harm to the body is. The radiation dose, or danger due to **exposure** to radiation, is measured in **sieverts (Sv)**.

A specific risk due to exposure to ultraviolet waves: they cause skin to prematurely age and increase the risk of skin cancer.

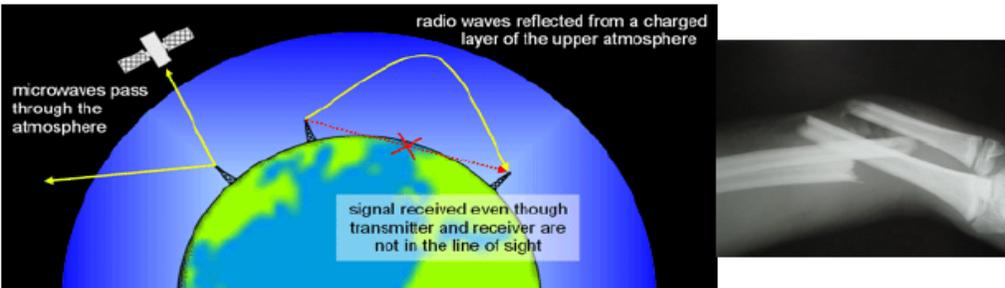
X-rays and gamma rays are **ionising** types of radiation. This means they can damage DNA, causing mutations and therefore increasing the risk of cancer.

Key Terms	Definitions
radiation dose	The risk of harm due to exposure to radiation.
exposure	Receiving and absorbing radiation (by the body).
sievert	The measure of radiation dose. As with the usual prefix: 1000 millisieverts (mSv) = 1 sievert (Sv)
ionising	Describes radiation that forms ions by ‘knocking’ electrons off atoms to make ions.
cancer	Type of disease caused by specific mutations to DNA, resulting in cells dividing out of control (making a tumour).

Applications Using EM Waves

It is not exaggerating to say that EM waves dominate our technology and our lives. Here are some examples to learn of the practical applications of EM waves:

- **Radio waves:** used for *television, radio* and Bluetooth. A signal carried by radio waves can get from a transmitting mast to a receiver by being reflected off a layer in the atmosphere.
- **Microwaves:** obviously, cooking food, but also communication with *satellites* and *mobile phones*; Wi-Fi internet. Unlike radio waves, microwaves can pass through the atmosphere (see diagram bottom left). In microwave ovens, the microwaves cause the water particles in the food to vibrate, heating it up.
- **Infrared:** electrical heaters, cooking food, infrared cameras. All objects emit infrared, but hotter objects emit more. An infrared camera detects infrared instead of visible light, so it can see hotter objects in the dark – night vision.
- **Visible light:** *fibre optic communication* (like the best broadband). Optical fibres reflect pulses of light all the way along their length. The pulses of light transmit the information.
- **Ultraviolet:** *sun tanning beds*... however, look at the dangers of UV in the other box.
- **X-rays:** both medical imaging for *diagnosis* (like broken bones) and medical *treatments*. X-rays can pass through soft tissue (like muscle), but not bone. That’s why an X-ray image works to show up bones, and any breaks.
- **Gamma rays:** used in medical treatments such as radiotherapy.



Rate of Reaction

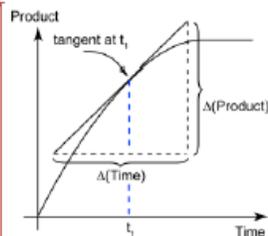
The rate of reaction is the speed at which a chemical reaction is happening. This can vary hugely from reaction to reaction.

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

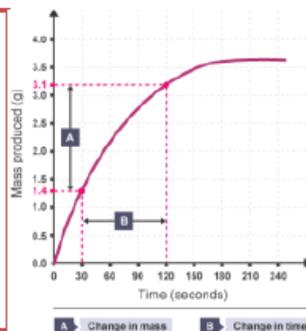
1. Line your ruler up across your graph, so that it touches the line on the point that you want to find out the gradient
2. Adjust the ruler until the space between the ruler and the curve is equal on both sides
3. Draw the line and pick two easy points that will allow you to calculate the gradient of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



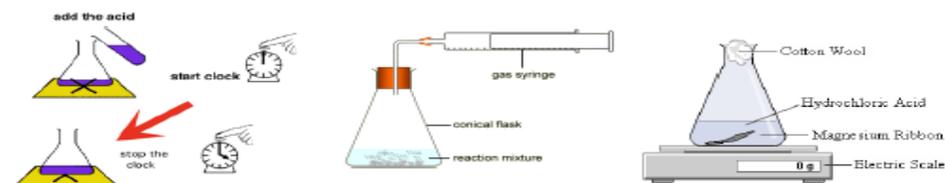
Key Terms	Definitions
rate of reaction	The rate at which reactants are being turned into products
reactant	What is used in a chemical reaction
product	What is made in a chemical reaction
catalyst	A substance which speeds up a chemical reaction without being used up
tangent	A straight line that touches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

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

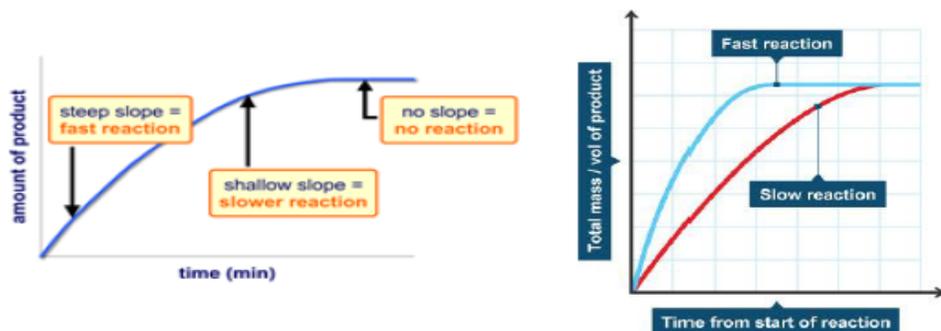
1. Measuring the mass lost in a chemical reaction (marble chips and acid is a good example)
2. Measuring the volume of gas produced (decomposition of hydrogen peroxide is a good example)
3. Time taken to make an X disappear (sodium thiosulphate and acid is a good example)



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**.

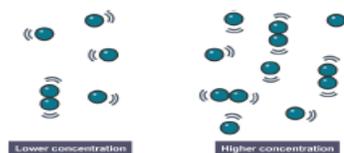
The minimum amount of energy needed for the particles to collide successfully and react is called the **activation energy**, which is different for each reaction.

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).

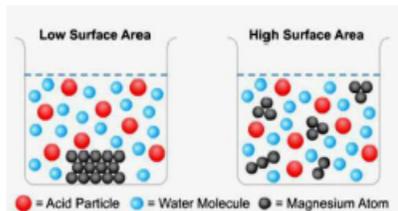


The effect of temperature is explained by collision theory

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**.

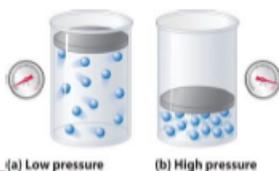
The effect of surface area is explained by collision theory

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.

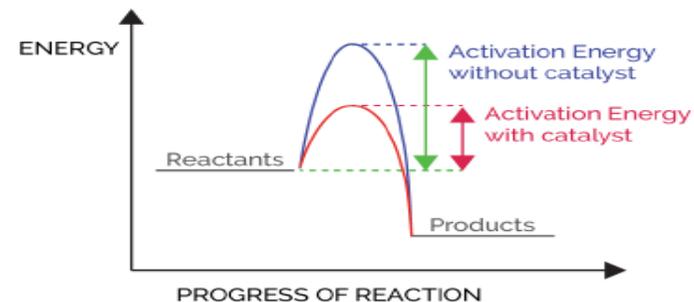


Key Terms	Definitions
enzymes	A biological catalyst
reaction profile	A graph which show the energies of the reactants and products at different stages of the chemical reaction

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

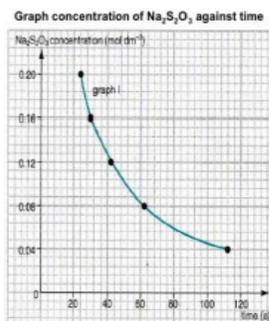
Method- When the reaction produces a precipitate

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 concentration 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 concentration.



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



Sodium thiosulfate and dilute hydrochloric acid



Conclusions

As you increase the concentration 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:



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

Experiment: Rates of Reaction and Concentration

Equipment List

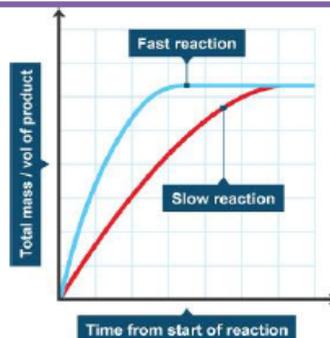
- 1.0M, 1.5M and 2.0M dilute hydrochloric acid
- 100 cm³ measuring cylinders
- 250 cm³ conical flask
- Stopclock
- Magnesium strips
- Ruler
- Scissors
- Gas Syringe or
- 250 cm³ measuring cylinders
- Trough

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 cm³ 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

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 concentration 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



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

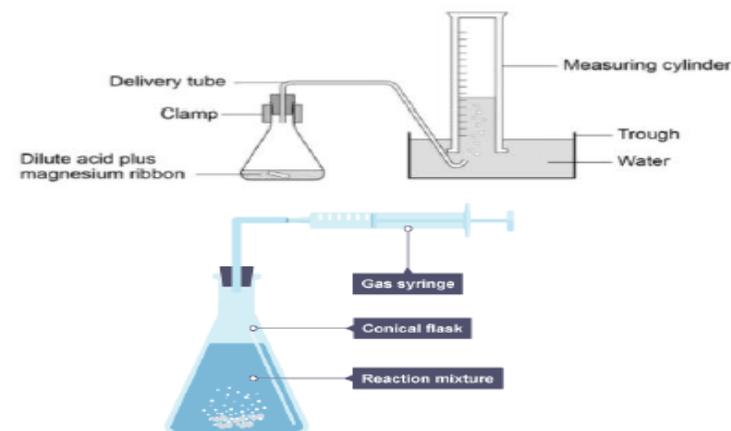
Variables

I.V- Concentration of hydrochloric acid

D.V- Rate of reaction

C.V- Volume of acid, length of magnesium, temperature of acid,

Diagram



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.

1	Biosphere	The living layer of Earth and between the lithosphere and the atmosphere
2	Biomes	A large scale ecosystem such as tropical rainforests
3	Latitudes	How far north or south a location is from the equator.
4	Tropical Rainforest	Located in the tropics close to the equator. Receives 2000mm of precipitation a year and an average temperature of 28°C.
5	Hot desert	Located along the Tropic of Cancer and Capricorn at 30° N and S of the equator. Receives less than 250mm precipitation a year. They are diurnal, meaning it is very hot in the day 40°C and 0°C in the night.
6	Precipitation	Anything wet falling from the sky i.e.. Rain or snow.
7	Biotic	Living part of the biome (flora and fauna)
8	Abiotic	Non-living part of the biome and includes the atmosphere, rock and soil.
9	Altitudinal Zonation	The change in ecosystems at different altitudes caused by alterations in temperature, precipitation and nutrient levels.
10	Biodiversity	The number of different plants and animals in one area.
11	Hydrological cycle	The water cycle.
12	Nutrient cycle	Nutrients move between the biomass, litter and soil.
13	Taiga	The world's biggest forest- Coniferous forest in extreme North – between 50 and 60°N.
14	Biomass	Sum of all living parts of an area.

15	Goods	Items that can be picked up, touched, seen and sold such as timber.
16	Ecosystem	A localized biome made up of living things and their non-living environment.
17	Net Primary Productivity (NPP)	A measure of how much new plant and animal growth is added to biome each year.
18	Carbon Sink	Natural stores for carbon containing chemical compounds, like carbon dioxide or methane.
19	Carbon Sequestration	Removing carbon dioxide from the atmosphere and locking it up in biotic material.
20	Photosynthesis.	The process by which green plants and some other organisms use sunlight to synthesize nutrients from carbon dioxide and water.
21	Pessimistic View of population growth.	Population will eventually grow so large that the planet will run out of food, water, energy and other resources.
22	Optimistic view of population growth.	As population grows, humans invent new technologies to allow more food to be grown and more resources to be supplied.
23	Positive Checks	Malthus believed that war, starvation and famine would reduce population growth and secure supplies of resources.
24	Preventative Checks.	Malthus believed that people marrying later and having less children would also secure resources.
25	Indigenous Populations.	The original people of a region.
23	Ranching	Rearing cattle.
24	Timber	Deforested trees that will be used for furniture. Paper etc.
25	Ecosystem services	A collective term for all the ways human benefit from ecosystems.

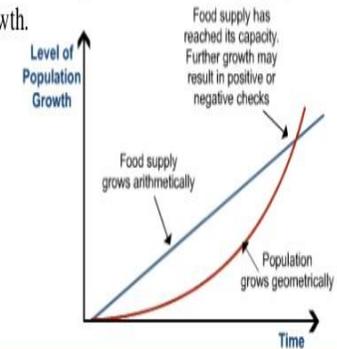
Biomes= A life-support system	
Provisioning services (goods) <i>Products obtained from the ecosystem</i>	Supporting Services <i>These keep the ecosystem healthy so it can provide the other services</i>
Food, nuts, berries, fish, game, crops. Fuel wood. Timber for building and other uses. Genetic and chemical material.	Nutrient cycle Photosynthesis and food webs. Soil
Regulating Services <i>These services link to other physical systems and keep areas and the whole planet healthy.</i>	Cultural Services <i>These are the benefits people get from visiting or living in a healthy ecosystem.</i>
Storing carbon and emitting oxygen, which keep the atmosphere in balance. Purifying water and regulating the flow of water within the hydrological cycle.	Recreation and tourism Education and tourism Education and science Spiritual well being and happiness

The Malthusian theory

- In his 1798 work, An Essay on “the Principle of Population”, Malthus examined the relationship between population growth and resources and developed the **Malthusian theory** of population growth.

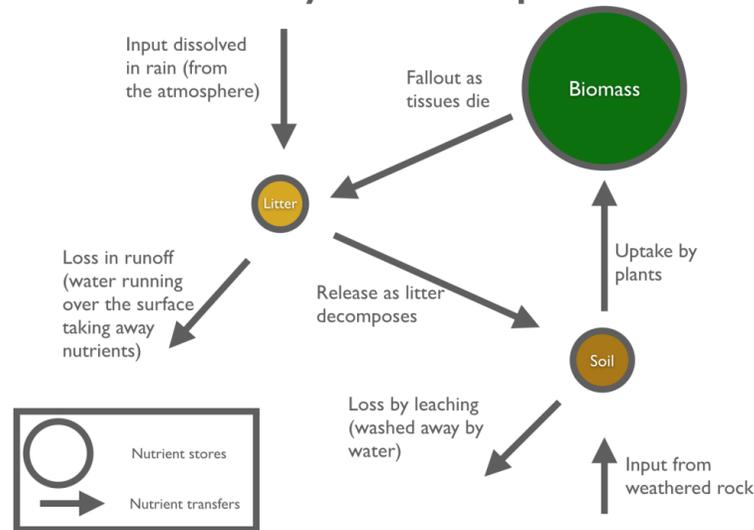
Observation:

- While resources tended to grow arithmetically, populations exhibit exponential growth.

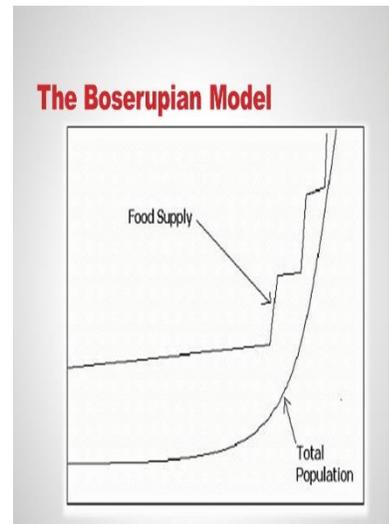
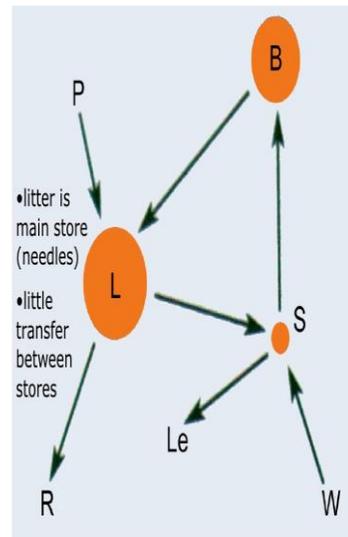


The Malthusian Theory, AZC, 2017, Environmental Studies , B. Pham.

The nutrient cycle in the tropical rainforest



Boreal forest (taiga)



Boserup- An optimistic approach

“Necessity is the mother of invention”- 1965

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	Diktat	A dictated 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 loses 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 countries 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	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.

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

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 Berlin 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	Edelweiss Pirates and Swing Youth	Groups who opposed 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

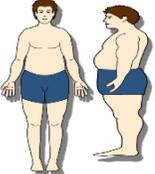
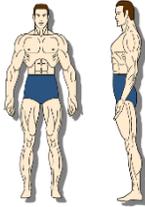
Key Ideas			
<p>Christian Attitudes to Crime</p> 	<p>Good and Evil Intentions The Bible warns Christians against having evil thoughts which lead to evil actions. Avoiding sin and temptation steers Christians away from crime. Christians would be more willing to treat an offender who had good intentions with more mercy than one who acted out of evil intentions.</p>	<p>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.</p>	
<p>Reasons for Crime</p> 	<p>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)</p>		
<p>Three Aims of Punishment</p> 	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Forgiveness</p> 	<p>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.</p>		
<p>Christian Attitudes to Punishment</p> 	<p>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.</p>	<p>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.</p>	<p>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.</p>
<p>Death Penalty</p> 	<p>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.</p> <ul style="list-style-type: none"> <input checked="" type="checkbox"/> 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'. <input checked="" type="checkbox"/> They may also argue that it deters criminals from committing the worst crimes and keeps people safe. <input checked="" type="checkbox"/> 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. <input checked="" type="checkbox"/> 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. 		

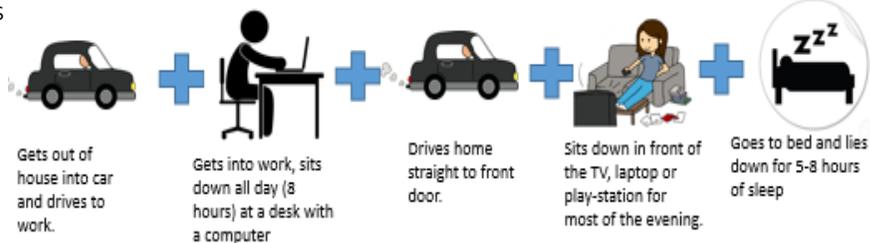
Key Words	
Community Service	Working in the community to pay back for a criminal act
Corporal Punishment	Using physical pain as a punishment
Crime	An action which is against the law and incurs a punishment
Death Penalty	A form of punishment where the offender is killed for their crime
Deterrence	An aim 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



Key Ideas			
<p>Ideas about Creation</p> 	<p>Christian Ideas</p> <ul style="list-style-type: none"> - 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 <p><i>"In the beginning God created the heavens and the earth" – Genesis 1:1</i></p>		
<p>Stewardship + Dominion</p> 	<p>Stewardship</p> <ul style="list-style-type: none"> - 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 <p><i>"Rule over [...] every living creature" - Genesis 1:28</i></p> <p>Dominion</p> <ul style="list-style-type: none"> - Dominion is the idea that God gave humans power and authority over the world - Some Christians believe 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 		
<p>Abortion</p> 	<ul style="list-style-type: none"> - 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. <ul style="list-style-type: none"> ☒ 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 		
<p>Euthanasia</p> 	<ul style="list-style-type: none"> - 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. <ul style="list-style-type: none"> ☒ 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. 		
<p>The Afterlife</p> 	<ul style="list-style-type: none"> - 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. <table border="1"> <tr> <td> <p>Roman Catholics believe that there is a middle stage called purgatory where souls go to be purified of sin before they go to heaven</p> </td> <td> <p>Some Christians believe that Jesus will return on a future Day of Judgement when all souls will be judged</p> </td> </tr> </table>	<p>Roman Catholics believe that there is a middle stage called purgatory where souls go to be purified of sin before they go to heaven</p>	<p>Some Christians believe that Jesus will return on a future Day of Judgement when all souls will be judged</p>
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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

SOMATOTYPES, OBESITY AND NUTRITION			
<p>1. Endomorph</p> 	<p>Characteristics: A lot of body fat, A lot of fat on the upper arms, stomach and thighs, Pear shaped</p> <p>Sporting Examples:</p> <ul style="list-style-type: none"> ✓ Sumo Wrestler ✓ Forward in Rugby 	<p>6. Balanced Diet A balanced diet is eating all nutrients in the right amounts to benefit your health. Reasons for a balanced diet:</p> <ul style="list-style-type: none"> • Unused energy is stored as fat, which could cause obesity (particularly saturated fat) • Suitable energy can be available for an activity • The body needs nutrients for energy, growth and hydration. 	
<p>2. Mesomorph</p> 	<p>Characteristics : Very little body fat, Large muscle content, Broad shoulders and narrow waist</p> <p>Sporting Examples:</p> <ul style="list-style-type: none"> ✓ Body Builder ✓ Rugby player ✓ 100m Sprinter ✓ Boxer 	<p>7. Carbohydrates (55-60%) 'Carbohydrates are one of the <u>main</u> and <u>preferred</u> source of energy'.</p> <p>There are 2 types of Carbohydrates - Simple and Complex.</p> <p>Simple: Sugary foods give a quick burst of energy e.g. Cakes, sweets, cereal Complex: Starchy foods give a long lasting release of energy e.g. rice, wholegrain pasta and bread, green vegetables.</p> <p>Carbohydrates are really important to athletes, especially those who work at high intensity like boxers, sprinters etc.</p>	
<p>3. Ectomorph—</p> 	<p>Characteristics Very little muscle or body fat, Narrow hips and shoulders and chest, Thin and long legs and arms, Thin face/high forehead</p> <p>Sporting Examples:</p> <ul style="list-style-type: none"> ✓ Long distance runner ✓ GK or GS in Netball ✓ Basketball Player 	<p>8. Fats (25-30%) 'Fats are a source of energy for the body' It provides <u>more</u> energy than carbohydrates <u>but only at low intensities</u>.</p> <p>Saturated fats are BAD, e.g. butter, animal fat, ice-cream, deep fried foods Unsaturated fats are GOOD e.g. Nuts, avocado and seeds</p> <p>Fats are a good source of energy for activities that require a low level of intensity like yoga.</p>	
<p>4. Obesity - A term used to describe people with a large fat content – caused by an imbalance of calories consumed to energy expenditure. BMI of over 30.</p>		<p>9. Proteins (15-20%) 'Proteins are very important in the <u>growth</u> of new muscle tissue and <u>repair</u> of existing muscle tissues'</p> <p>Protein can be found in many different foods. However, there are some foods that have higher percentage of protein in them such as: Chicken, turkey, nuts, peanut butter, Greek yoghurt etc. There are many protein products now available on the market.</p> <p>Protein is essential for all athletes. Many athletes will eat protein after they have trained or competed to help aid with muscle repair as part of their recovery.</p>	
<p>5. What is BMI? Is a score to tell you whether you are the correct height for your age. Less than 20 = underweight; 20-25 = correct weight; 25-30 = overweight; 30+ = obese.</p>		<p>10. Calories or Kcal for short is the measurement of energy and is obtained from the food we eat. We need energy for: Growth; Repair; Movement (of any kind! Not just exercising)</p>	

HEALTH, FITNESS AND SEDENTARY LIFESTYLES	
<p>1. Health – A state of complete physical, mental and social wellbeing and not merely the absence of disease.</p>	<p>8. Social Health</p> <ul style="list-style-type: none"> • Basic needs are being met (e.g. food, shelter, clothing) • Individual’s have friendships and support and some value in society. • Individual suffers little stress in social circumstances. • Sport offers an opportunity for people to mix and socialise with one another. <p>9. How can taking part in regular physical activity affect <u>social</u> wellbeing?</p> <ul style="list-style-type: none"> • Provide opportunities to social/make friends • Encourage co-operation skills • Encourage team-working skills • Ensure that essential human needs are met
<p>2. Fitness – The Ability to meet/cope with the demands of the environment.</p>	<p>10. Sedentary Lifestyle A person’s choice to engage in little, or irregular physical activity. A sedentary person makes the choice to make NO effort to take part in physical activity. Here is an example of an adult who leads a sedentary lifestyle:</p> <p>11. What are the consequences of a Sedentary Lifestyle? Lifestyle choices’ are simply the choices we make about how we live our lives. This could include: not smoking, not drinking alcohol, exercising, eat balanced diet.</p> <p>If you are sedentary you could be/have: Gaining weight, becoming obese Heart disease Lack of friends Tired and lethargic Hypertension Poor sleep Poor self esteem Diabetes</p> 
<p>3. Wellbeing – A mix of physical, social and mental factors that gives people a sense of being comfortable, healthy, and/or happy.</p>	
<p>4. Physical Health</p> <ul style="list-style-type: none"> • All the body’s systems working well • Free from illness and injury • Are able to carry out every day tasks • Being active and taking part in physical activity <p>5. How can taking part in regular <u>physical</u> activity impact your physical healthy?</p> <ul style="list-style-type: none"> • Improving heart function • Improve the efficiency of the body systems (e.g. heart and lungs) • Reduce the risk of some illness e.g. diabetes • Help prevent obesity • Carry out every day tasks without getting tired • Provide the feeling that you can perform activities without difficulty to increase enjoyment. 	
<p>6. Mental Health</p> <ul style="list-style-type: none"> • A state of wellbeing in which every individual realises his or her own potential. • Someone with good mental health can cope with the stresses of every day life, can work productively, and can make a contribution to the community. <p>7. How can taking part in physical activity effect <u>mental</u> health and wellbeing?</p> <ul style="list-style-type: none"> • Reduce stress/tension levels • Release feel-good hormones in the busy such as serotonin • Enable a person to control their emotions and work productively 	

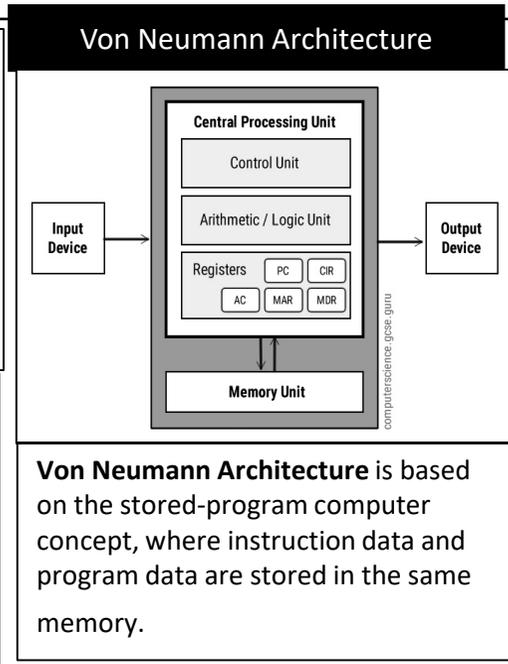
1	Hardware	Understand the function of the hardware components of a computer system
2	CPU	Understand the function of the hardware components of a computer system (CPU, main memory, secondary storage, input and output devices) and how they work together
3	Memory	Understand the function of different types of main memory (RAM, ROM, cache)
4	Secondary storage	Understand the concept of storing data in the 'cloud' and other contemporary secondary storage
5	Input process output	Understand the input-process-output model
6	Von-Neumann Model	Understand the concept of a stored program and the role of components of the CPU (control unit (CU), arithmetic/logic unit (ALU), registers, clock, address bus, data bus, control bus) in the fetch-decode-execute cycle (the Von Neumann model)
7	Software	Know what an operating system is and how it manages files, processes, hardware and the user interface
8	Logic gates	Be able to construct truth tables for a given logic statement (AND, OR, NOT)

- Hardware**
- Definition
 - Input devices
 - Process Devices
 - Storage devices
 - Output devices
 - Von Neumann Architecture

- Input Devices**
- Move data into the computer
- Keyboard
 - Mouse
 - Touch screen
 - Microphone
 - Camera
 - Sensor
 - Bar code scanner
 - Foot mouse
 - Accelerometer
 - GPS
 - Braille keyboard

- Secondary Storage**
- Magnetic hard disk
 - Optical disk
 - Flash memory
 - Cloud Storage
 - Non-volatile
 - Internal/Removable
- Considerations for selecting storage:*
- Capacity / Speed / Portability / Durability / Reliability

- Output devices**
- Move data out of the computer
- Monitor
 - Printer
 - Plotter
 - Speakers
 - Actuators
 - LEDs



Memory

The computer will have memory that can hold both data and also the program processing that data. In modern computers this memory is RAM.

Control Unit

The control unit will manage the process of moving data and program into and out of memory and also deal with carrying out (executing) program instructions - one at a time. This includes the idea of a 'register' to hold intermediate values. In the illustration above, the 'accumulator' is one such register.

The 'one-at-a-time' phrase means that the Von Neumann architecture is a **sequential processing machine**.

Input - Output

This architecture allows for the idea that a person needs to interact with the machine. Whatever values that are passed to and forth are stored once again in some internal registers.

Arithmetic Logic Unit

This part of the architecture is solely involved with carrying out calculations upon the data. All the usual Add, Multiply, Divide and Subtract calculations will be available but also data comparisons such as 'Greater Than', 'Less Than', 'Equal To' will be available.

Bus

Notice the arrows between components? This implies that information should flow between various parts of the computer. In a modern computer built to the Von Neumann architecture, information passes back and forth along a 'bus'. There are buses to identify locations in memory - an 'address bus'



Variables and arrays		
Syntax	Explanation of syntax	Example
SET Variable TO <value>	Assigns a value to a variable.	SET Counter TO 0 SET MyString TO 'Hello world'
SET Variable TO <expression>	Computes the value of an expression and assigns to a variable.	SET Sum TO Score + 10 SET Size to LENGTH(Word)
SET Array[index] TO <value>	Assigns a value to an element of a one-dimensional array.	SET ArrayClass[1] TO 'Ann' SET ArrayMarks[3] TO 56
SET Array TO [<value>, ...]	Initialises a one-dimensional array with a set of values.	SET ArrayValues TO [1, 2, 3, 4, 5]
SET Array [RowIndex, ColumnIndex] TO <value>	Assigns a value to an element of a two dimensional array.	SET ArrayClassMarks[2,4] TO 92

Selection		
Syntax	Explanation of syntax	Example
IF <expression> THEN <command> END IF	If <expression> is true then command is executed.	IF Answer = 10 THEN SET Score TO Score + 1 END IF
IF <expression> THEN <command> ELSE <command> END IF	If <expression> is true then first <command> is executed, otherwise second <command> is executed.	IF Answer = 'correct' THEN SEND 'Well done' TO DISPLAY ELSE SEND 'Try again' TO DISPLAY END IF

Repetition		
Syntax	Explanation of syntax	Example
WHILE <condition> DO <command> END WHILE	Pre-conditioned loop. Executes <command> whilst <condition> is true.	WHILE Flag = 0 DO SEND 'All well' TO DISPLAY END WHILE
REPEAT <command> UNTIL <expression>	Post-conditioned loop. Executes <command> until <condition> is true. The loop must execute at least once.	REPEAT SET Go TO Go + 1 UNTIL Go = 10
REPEAT <expression> TIMES <command> END REPEAT	Count controlled loop. The number of times <command> is executed is determined by the expression.	REPEAT 100-Number TIMES SEND '*' TO DISPLAY END REPEAT
FOR <id> FROM <expression> TO <expression> DO <command> END FOR	Count controlled loop. Executes <command> a fixed number of times.	FOR Index FROM 1 TO 10 DO SEND ArrayNumbers[Index] TO DISPLAY END FOR
FOR <id> FROM <expression> TO <expression> STEP <expression> DO <command> END FOR	Count controlled loop using a step.	FOR Index FROM 1 TO 500 STEP 25 DO SEND Index TO DISPLAY END FOR
FOR EACH <id> FROM <expression> DO <command> END FOREACH	Count controlled loop. Executes for each element of an array.	SET WordsArray TO ['The', 'Sky', 'is', 'grey'] SET Sentence to "" FOR EACH Word FROM WordsUArray DO SET Sentence TO Sentence & Word & '' END FOREACH

Syntax	Explanation of syntax	Example
SEND <expression> TO DISPLAY	Sends output to the screen.	SEND 'Have a good day.' TO DISPLAY
RECEIVE <identifier> FROM (type) <device>	Reads input of specified type.	RECEIVE Name FROM (STRING) KEYBOARD RECEIVE LengthOfJourney FROM (INTEGER) CARD_READER RECEIVE YesNo FROM (CHARACTER) CARD_READER

Subprograms		
Syntax	Explanation of syntax	Example
PROCEDURE <id> (<parameter>, ...) BEGIN PROCEDURE <command> END PROCEDURE	Defines a procedure.	PROCEDURE CalculateAverage (Mark1, Mark2, Mark3) BEGIN PROCEDURE SET Avg to (Mark1 + Mark2 + Mark3)/3 END PROCEDURE
FUNCTION <id> (<parameter>, ...) BEGIN FUNCTION <command> RETURN <expression> END FUNCTION	Defines a function.	FUNCTION AddMarks (Mark1, Mark2, Mark3) BEGIN FUNCTION SET Total to (Mark1 + Mark2 + Mark3)/3 RETURN Total END FUNCTION
<id> (<parameter>, ...)	Calls a procedure or a function.	Add (FirstMark, SecondMark)

Arithmetic operators		Relational operators	
Symbol	Description	Symbol	Description
+	Add	=	equal to
-	Subtract	<>	not equal to
/	Divide	>	greater than
*	Multiply	>=	greater than or equal to
^	Exponent	<	less than
MOD	Modulo	<=	less than or equal to
DIV	Integer division		

File handling		
Syntax	Explanation of syntax	Example
READ <File> <record>	Reads in a record from a <file> and assigns to a <variable>. Each READ statement reads a record from the file.	READ MyFile.doc Record
WRITE <File> <record>	Writes a record to a file. Each WRITE statement writes a record to the file.	WRITE MyFile.doc Answer1, Answer2, 'xyz 01'

Vocal Skills

Volume- how loud the lines are being spoken.
Crescendo – Increasing volume
Pitch- highness or lowness of the voice.
Pace/Tempo- how fast or slow the lines are being spoken.
Rhythm – Fluctuation in pace
Phrasing – grouping words together to create interesting speech
Accent- A way of speaking that denotes where the character is from and/or their status
Tone- portraying different emotions through the voice.
Pause: Breaks in speech
Inflection: Emphasis on a word
Articulation: Emphasis on letters.
Silence: The absence of sound
Echo: Repeated layers of words

Lighting Design

Flood lights- large lights used to wash a large section of the stage with light.
Spotlight- projects a beam of light onto a section of the stage.
Lanterns- wide, soft edged beam of light, used for back light and top light.
Coloured gel- transparent coloured material placed over a light to change the colour
Gobo- template/stencil placed in front of a light to create a pattern or image on the light.
House lights (audience)- illuminate the audience section of the theatre.
Naturalistic – The lighting is realistic and believable as if produced from a natural resource.
Stylised – the lighting is not designed to give the impression of real life, but be more symbolic. Spotlights with hard edges and non-natural colours are usually used.

Set Design

Naturalistic- the set is realistic and believable.
Stylised- the set is not realistic or believable, but may be symbolic or represent an idea.
Minimalistic- the set is very basic, with little furniture and a basic background.
Hydraulics- the stage (or part of it) moves, rises, falls or tilts throughout a performance.
Flying gallery- rigging system where ropes are used to raise or lower scenery, lights, etc.
Pyrotechnics- flashes, smoke, flames, fireworks etc. Used to create special effects.
Props- a portable/movable object on stage, used by actors.
Cyclorama- a large piece of fabric that lights or images can be projected on.
Levels- different heights of staging used to create an effect or perhaps, indicate status.
Truck – A platform on wheels upon which scenery can be mounted and moved
Fly – Raising and lowering scenery or other items onto the stage using ropes.
Set Dressing – Items on the set that are not actually used as props, but they create detail e.g. a vase or wall painting
Composite Set – A single set that represents several locations at once.

Physical Skills

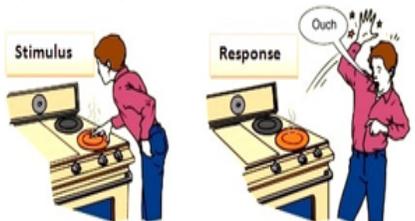
Movement- moving around the stage.
Gestures- a movement, e.g. of the hand or head, to express an idea or meaning.
Posture- the position that someone holds their body when standing up or sitting down.
Facial expression- an actor using their face to reinforce their feelings, emotions and reactions.
Levels- different heights used to create visual interest or perhaps show status of characters.
Proxemics- how close or far apart actors are positioned on stage.
Characteristics- features or qualities belonging to a person, place or thing to identify them.
Gait- the way in which a performer walks on the stage.
Stance- the way in which someone stands
Ensemble- a group of people who perform together.

Costume, hair and makeup design

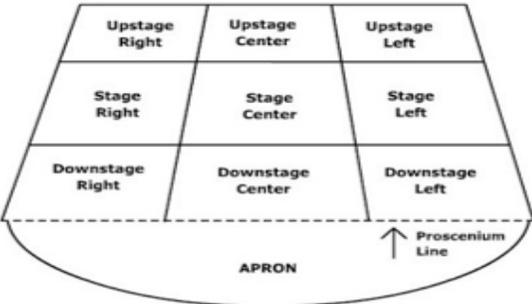
Prosthetics- makeup that uses moulds and wax to create special effects, e.g. scars or cuts.
Silhouette- the outline or shape of a figure created by a costume, e.g. baggy or fitted.
Hairstyle- the way the hair is styled to reinforce time period, character's personality or status.
Style- costume should reinforce time period, setting, or a character's personality or status.
Accessories- additional elements of costume, e.g. jewellery, handbags, hats etc.
Footwear- the shoes should reinforce time period, or a character's personality or status.
Makeup- products applied to the face to show a character's age, status, personality etc.
Colours- suggest meaning
Fabrics- the fabrics used for the costume could reflect the character's status or background etc.

Sound Design-

Timing- a particular point that a sound is produced in a performance.
Atmosphere- the sound is creating a certain mood for the audience at a certain point.
Volume- how loud or quiet the sound is.
Emotive- the sound reflects the emotions felt by a character/characters at a certain point.
Band- the sound is live and being played by a group of people playing different instruments.
Singing- performing songs and making musical sounds with the voice.
Soundscape- a combination of different sounds.
Music- sounds combined to produce harmony, expression and/or emotion.
Sound effects- a sound that isn't speech or music, created artificially in a play. (SFX)
Mark the Moment – Various ways including Sound Effects(SFX) or silence
Crescendo – Gradually getting louder
Pitch – Bass or Treble
Pace – Fast (staccato) Slow (Elongated notes)
Silence – The removal of all sound
Contrast – Opposing sounds used
Entrance – How the sound is first played e.g. Dynamic and loud or soft slow fade in
Foley Sound – Replace original sound (e.g. baby's crying or gun shot).
Sound Bridge – The sound from one scene carries over into the next scene

Section 1: Response to Stimulus	Section 2: Development and Collaboration	Section 3: Analysis and Evaluation
<p>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:</p> <ul style="list-style-type: none"> 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?). 	<p>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:</p> <ul style="list-style-type: none"> 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. 	<p>Section 3 of your devising log provides you with the opportunity to show your skills at analysing and evaluating your devised work.</p> <div style="background-color: #4a90e2; color: white; padding: 10px; border-radius: 10px;"> <p>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"</p> </div> <ul style="list-style-type: none"> 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. <p>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.</p> 
<p>Assessment Criteria – Response to Stimulus</p> <ul style="list-style-type: none"> 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. 	<p>Assessment Criteria – Development and Collaboration</p> <ul style="list-style-type: none"> 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. 	<p>Assessment Criteria – Evaluation</p> <ul style="list-style-type: none"> 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.

Struggling for ideas about what to write in your Devising Log? Turn over the page to check your progress and be inspired with writing ideas.

Theatrical Terminology	Devising Log Checklist		
<p>Have you been using the key words? Check as this will increase your grades.</p> <table border="0" style="width: 100%;"> <tr> <td style="vertical-align: top; width: 50%;"> <p>General</p> <p>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</p> </td> <td style="vertical-align: top; width: 50%;"> <p>Genre</p> <p>Documentary Theatre Naturalism (Stanislavski) Non Naturalism (Brecht) Physical Theatre Theatre in Education</p> <p>Rehearsal Techniques</p> <p>Bigger Bigger Bigger Conscience Corridor Hot-Seating Inner Thoughts Role on the Wall</p> <p>Stage Types</p> <p>End on In the round Arena Thrust Traverse Promenade Proscenium Arch</p> </td> </tr> </table> 	<p>General</p> <p>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</p>	<p>Genre</p> <p>Documentary Theatre Naturalism (Stanislavski) Non Naturalism (Brecht) Physical Theatre Theatre in Education</p> <p>Rehearsal Techniques</p> <p>Bigger Bigger Bigger Conscience Corridor Hot-Seating Inner Thoughts Role on the Wall</p> <p>Stage Types</p> <p>End on In the round Arena Thrust Traverse Promenade Proscenium Arch</p>	<p>As you are preparing your devising log, keep checking it against the following checklist:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Have I written three sections with appropriate headings? <input type="checkbox"/> Are the sections roughly the same length? <input type="checkbox"/> Have I stayed within the final word count? <input type="checkbox"/> Have I provided evidence of research? <input type="checkbox"/> Have I stated my dramatic aims AND intentions? <input type="checkbox"/> Have I shown how I developed and refined my ideas? <input type="checkbox"/> Have I explained how I helped the group? <input type="checkbox"/> Have I shown how I responded to feedback? <input type="checkbox"/> Have I demonstrated that I have developed my theatrical skills? <input type="checkbox"/> Have I explained how I positively shaped the final piece? <input type="checkbox"/> Have I used correct theatrical terms to explain my thoughts? <input type="checkbox"/> Have I given specific examples to back up my points? <input type="checkbox"/> Have I analysed and evaluated my work?
<p>General</p> <p>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</p>	<p>Genre</p> <p>Documentary Theatre Naturalism (Stanislavski) Non Naturalism (Brecht) Physical Theatre Theatre in Education</p> <p>Rehearsal Techniques</p> <p>Bigger Bigger Bigger Conscience Corridor Hot-Seating Inner Thoughts Role on the Wall</p> <p>Stage Types</p> <p>End on In the round Arena Thrust Traverse Promenade Proscenium Arch</p>		

	Features	KEYWORDS
elody	<ul style="list-style-type: none"> · Fanfare – b.1-3 us rapid repeated Bbs & Triplet arpeggio-like figures but based around fourths, rather than thirds. · Minor 7th leaps – b2&3 Trumpet idea from F to Eb features prominently in the Main theme (A). · Main Star Wars Theme is made up of two ideas: · Main Theme (A) - 4 bar idea, which is repeated to form an 8-bar phrase; <ul style="list-style-type: none"> ○ Stepwise and leaps; Rising perfect fifth; Interval inversion; Auxiliary figure; Repetitive rhythm. · Main Theme (B), a four-bar idea, is altered & extended on 2nd playing. It has a less forceful character and provides an effective contrast. <ul style="list-style-type: none"> ○ Anacrusis start; stepwise; rising sixth; Triplet figures; descending fourth; contrary motion. · Piccolo melody - b.36-39, sort. · Minor third - rising and falling in the chordal material during b.51-60; · Sequence, for example in the string parts in bar 32. 	<p>1- Fanfare - celebratory piece for brass, often marking the opening of an important event or ceremony.</p>
		<p>2- Triplet - three notes that should be played in the time it normally takes to play two.</p>
		<p>3- Arpeggio - the chord is spread, normally from the bottom note to the top.</p>
		<p>4- Leitmotif - a recurring musical idea, associated with a particular theme, character of place.</p>
		<p>5- Inversion – turning an interval upside down.</p>
hythm (incl. tempo & metre)	<ul style="list-style-type: none"> · Fast tempo. · The 4/4 metre & March style - reflect the 'military' nature of the wars between the rebels and the Imperial forces. · Rhythms of fanfares - Opening 3 bars– rapid repeated notes and triplets – to create a feeling of expectation. · The rhythmic feel - main theme section, supports strong quadruple/duple pulse, continuing to include the triplets first heard in the intro. · Syncopated block chords - Main Theme (A), mixing offbeat quaver and triplet quavers with frequent rests. · Uncertain pulse - b.33 onwards the rhythmic feel changes entirely, much less obvious. · 3/4 metre – b.44, metre changes to triple time. · Homorhythmic chords – b.44-50, create drama by mixing quavers, triplet quavers and crotchets with well-placed rests. · Slower tempo - further increasing the effect of these chords. · Very fast – b.51 the music sets off furiously with a one bar Ostinato figure driving the extract to its conclusion. 	<p>6- Auxiliary – a note used to travel by step between to harmonic notes.</p>
		<p>7- Supertonic - the second degree or note of a scale.</p>
		<p>8- Contrary motion – moving in opposite directions.</p>
		<p>9- Anacrusis - (pickup or upbeat) a note or notes, which precede the first downbeat in a bar.</p>
		<p>10- Sequence - the repetition of a musical phrase at a higher or lower pitch than the original.</p>
ecture	<ul style="list-style-type: none"> · Homophonic texture – variety of types: block chords, arpeggios or rhythmic articulations of chords. · Melody-dominated homophony - b.4 onwards, with the (often) octave-doubled tune supported by block or articulated chords. · Pedal textures - Inverted tonic pedal in the Introduction and during the first playing of the Main Title Theme; Dominant pedal b.12-15; · Ostinato textures – b.51-60. 	<p>11- March – written in 4/4 or 2/2 with strong & steady beat reminiscent of military field drums.</p>
		<p>12- Homorhythmic – sameness of rhythm in all parts</p>
		<p>13- Homophonic - a melody & accompaniment.</p>
nstrument (sonority)	<ul style="list-style-type: none"> · Full symphony orchestra: 3 Flutes (Fl3 also playing Piccolo) 2 Oboes, 2 Clarinets, Bass Clarinet, 2 Bassoons; 4 Horns, 3 Trumpets, 3 Trombones and Tuba; Timpani, Triangle, Snare Drum, Tam-Tam, Glockenspiel, Vibraphone and Cymbals; Piano/Celeste and Harp; Strings. · Traditional symphonic/Romantic treatment of the orchestra with much doubling of parts. · Thickly scored - relatively few uses of solo timbres or lighter textures. · No electronic effects or of synthesisers. 	<p>14- Pedal - a sustained or repeated note in the bass.</p>
		<p>15- Inverted tonic pedal – a pedal in the melody line as opposed to the bass.</p>
		<p>16- Ostinato - a persistent phrase or motif repeated over several bars or more.</p>
enre	<ul style="list-style-type: none"> · John Williams - (born 1932) is widely considered to be one of the greatest film composers of all time. · Collaborations – worked with Steven Spielberg & George Lucas on Jaws, The Star Wars, Indiana Jones, Harry Potter & Jurassic Park). · Leitmotif - Williams used the Romantic device, where a character or idea is represented by the same musical idea whenever they appear or are mentioned. The opening theme of the Main title, for example, is associated with Luke Skywalker, and with ideas of heroism and struggle. 	<p>17- Tonal - based around a key-note and its scale.</p>
		<p>18- Inverted chords - triads with either the 3rd (1st inversion) or the 5th (2nd inversion) in the bass.</p>
		<p>19- Quartal harmony – harmony made up of fourths as opposed to thirds.</p>
		<p>20- Dissonant – clashing intervals. the intervals that are dissonant (clashing) are the minor and major second, the minor and major seventh and the tritone (augmented fourth or diminished fifth).</p>
		<p>21- Imperfect cadence - a progression landing on the dominant chord (V).</p>
armony	<ul style="list-style-type: none"> · Tonal - but does not always use chords I, IV and V in conventional progressions, such as cadences. · Major and minor chords, mostly in root position and first inversion. · Quartal harmony - opening Fanfare use chords built up of fourths, rather than thirds; b.4-7 almost half the chords use Quartal harmony. · Imperfect cadence - end of the first phrase in the A section (bar 7). · Mixed chords – b.33-35 mix different chords simultaneously to produce strange, unstable effects. This produces a rich, vibrant effect; · Atonal - b.39-41 the strings and brass are in different keys; · Dissonant - b.44, the hammered unison chords have strong clashes between the two pairs of notes used - C/Db and F/G = cluster. · Tritone - b.44 – G – Db. 	<p>22- Cluster – notes or chords closely grouped together, commonly adjacent.</p>
		<p>23- Atonal - music that does not have a key of any sort.</p>
		<p>24- Tritone – the dissonant interval of an augmented fourth / diminished fifth.</p>
		<p>25- Bitonality – music in two keys at the same time.</p>
		<p>26- Bitonality – music in two keys at the same time.</p>
onality	<ul style="list-style-type: none"> · Bb major – clearly for the first 29 bars. · Ambiguous – b.30 onwards the tonality becomes less clear, with more unstable harmonies and progressions. · Modulation – b.36 to C Major (with added Ab). B.42 onwards is more based around the note C, often heard as a bass pedal. · Atonal – b.41-60, more complex chords and much dissonance. · Bitonality - b.51-60. 	<p>27- Bitonality – music in two keys at the same time.</p>
		<p>28- Bitonality – music in two keys at the same time.</p>
		<p>29- Bitonality – music in two keys at the same time.</p>
tructure	<ul style="list-style-type: none"> · Follows film - The structure is intended to match and reinforce the opening section of the film. · AABA - Main theme section (b.1-29) follows conventional pattern: regular four bar phrases are used to construct a longer musical structure. · Narrative/action - The remainder of the extract takes its shape from what's on the screen and so has less of a purely musical structure. 	<p>30- Bitonality – music in two keys at the same time.</p>
		<p>31- Bitonality – music in two keys at the same time.</p>



<p>melody</p>	<ul style="list-style-type: none"> Sequences Arpeggiated (arpeggio)/broken chords Stepwise/conjunct Leaps/disjunct Fanfare Intervals Ornamentation Scalic Syllabic (vocal pieces ONLY) Melismatic (vocal pieces ONLY) Range/tessitura (vocals) Subject and countersubject 	<p>rhythm</p>	<p>TEMPO Allegro; Grave; Andante; free tempo; Moderato; 112bpm; 100bpm; rubato; Allegro di molto e con brio; ritardando</p> <p>METRE 4/4; 12/8; 2/4; 6/8; 3/2; 2/2</p> <p>RHYTHMIC DEVICES</p> <ul style="list-style-type: none"> Syncopated Triplets Dotted rhythm Swung Sextuplets/septuplets Semiquaver runs Anacrusis
<p>texture</p>	<ul style="list-style-type: none"> Monophonic Homophonic <ul style="list-style-type: none"> Melody-dominated/melody & accompaniment Chordal accompaniment Polyphonic <ul style="list-style-type: none"> Imitation Antiphony (antiphonal) Counterpoint (contrapuntal) Heterophonic (<i>world music only</i>) 2-part, 3-part, 4-part 	<p>instrument</p> <p>(sonority)</p>	<p>ACCOMPANIMENT</p> <ul style="list-style-type: none"> Describe what you hear the parts underneath the melody playing!! Basso Continuo <p>ORCHESTRATION/INSTRUMENTATION</p> <ul style="list-style-type: none"> Describe what instruments are doing Describe what they are playing <p>INSTRUMENT TECHNIQUES (SONORITY)</p> <ul style="list-style-type: none"> Articulation – legato/staccato Double-stopping Glissando/portamento Hammer ons/pull offs Pizzicato Tremolo
<p>genre</p>	<ul style="list-style-type: none"> Glam Rock Baroque Classical Romantic Concerto Grosso Musical Theatre Film Music Fusion Celtic African Bossa Nova 	<p>harmony</p>	<ul style="list-style-type: none"> HARMONY = Frequently references successions of chords, r single chords. However, in a general manner, a HARMONIC DEVICE is anything that backs up and supports the tonality a piece is in. HARMONIC DEVICES include: Chords, chord sequence, cadences, basslines (in relationship to other parts), dissonance, chromaticism, diatonic, drone, intervals, pedal, riff, ground bass, intervals, ostinato; extended chords; altered chords; open 5ths; circle of fifths; functional
<p>tonality</p>	<ul style="list-style-type: none"> TONALITY = The relationship of notes within a scale or mode to a principal note. A wider term than KEY but often used synonymously with it. Atonal, chromatic, major, minor, modal, pentatonic; ambiguous; bitonal 	<p>structure</p>	<p>Verse-Chorus Form Da Capo Aria Ground Bass Ternary Form Fugal – subject and answer Sonata Form – Exposition, Development, Recapitulation, Coda Strophic</p>
<p>Dynamics</p>	<p>Forte (loud) Piano (Quiet) Crescendo (getting louder) Decrescendo (getting quieter)</p>	<p>Music Tech</p>	<p>Overdubbing Reverb Flanger Distortion</p>



Describe the contributing traits of two contrasting contemporary musical styles	Listen to a piece of music, recognizing and discussing the following musical elements
<p>Rock 'n' Roll (1950s)</p> <p>Reggae (1970s)</p> <p>Hip-Hop (1980s)</p>	<p>Tonality - Learners will identify the Major/Minor, Tonal/Atonal characteristics of the track</p> <p>Tonality Major, Minor, Tonal, Atonal (essential for assessment) modulation, relative major/minor, tonic major/minor (good practice)</p>
<p>The factors that influenced its inception - Learners will consider the economic/political/social climate that led to the inception of the chosen style</p> <p>Inception How this was formed, this can relate to styles, substyles or revivals</p>	<p>Tempo - Learners will identify the tempo and relate this to the feel of the track</p> <p>Tempo The BPM (beats per minute) of the given piece of music (essential for assessment), simple and compound time (good practice)</p>
<p>Significant artists/bands/producers - Learners will select prominent artists/band/producers that accurately illustrate the chosen style</p> <p>Significant An artist/band/producer that is either prominent with the style or has in some way contributed to its evolution</p>	<p>Instrumentation - Learners will identify contemporary instrumentation present on the selected track and describe the effect this instrumentation has on the overall recording</p> <p>Instrumentation The instrumentation present within the given piece of music, e.g. The Beatles - Drums, Bass, 2 x Guitar, 4 x Vocals (essential for assessment)</p>
<p>Important recordings/performances/events - Learners will select seminal recordings/performances/events that accurately relate to, and illustrate the chosen style</p> <p>Important A recording that received commercial, cultural, or innovative recognition</p>	<p>Lyrical content - Learners will consider and analyse lyrical content (where appropriate) and analyse the tracks meaning</p> <p>Lyrical Content The lyrical message of the track or specific language used</p>
<p>Imagery and fashion associated with the style - Learners will provide examples of imagery and fashion describing how they were used and to what effect.</p> <p>Imagery Album covers, associated artwork, artist/band/producer stage appearance</p> <p>Fashion Clothing/accessories associated with the style. Worn or referenced by either artist/band/producer or fans</p>	<p>Production techniques - Learners will recognise the balance of the tracks mix, panning, effects, and EQ.</p> <p>Production Techniques The use of production during the recording process or applied afterwards. This can consist of, but is not limited to:</p> <p>Panning The way the track is presented in stereo sound (the balance between left and right). Are different instruments or vocals more prominent on one side of the recording</p> <p>Mix Levels How the track is mixed, i.e. the relative volumes of each instrument or vocal.</p> <p>EQ How the tone of instruments is sculpted to enhance or change them.</p> <p>Effects How processes are added to sounds to alter their characteristics.</p>

Factors that influenced its inception	Significant artists/bands/producers	Important recordings/performances/events
<ul style="list-style-type: none"> Rock 'n' roll has many roots - gospel, blues, country - dating back to the nineteenth century and before, but the emergence of rock 'n' roll really began with the social and economic changes stemming from the Second World War. Through <i>rock 'n' roll</i>, young people began searching for an identity. Before the 50s and Rock 'n' Roll, there was no such thing as a 'teenager' – young people listened to whatever their parents did. Rock 'n' Roll gave them the opportunity to have their own music, clothing, style and identity – the rebellious age of the teenager had begun. Amplified instruments were gradually becoming available, and this meant that electric guitar and bass soon became dominant, with the guitar become the solo instrument Was heard in live dance halls, on juke boxes in coffee bars and on radio and was associated with dances such as the jive and the twist. Rock and Roll music was frequently associated with rebellion, and was popular with teenagers – a group who had only just developed their own identity. 	<p>Chuck Berry: Influenced by blues and country, played a major part in the fusion or rock 'n' roll from R 'n' B and hillbilly</p> <p>Bill Haley & The Comets: Uninhibited dancing style appealed to teenage audience as it represented rebellion. Took Rock 'n' Roll outside of America, by touring Europe and Australia</p> <p>Elvis Presley: Brought Rock 'n' Roll to both black and white audiences, achieving success in the R 'n' B and Country charts simultaneously</p> <p>Sam Philips: Producer and owner of Sun Records. Often referred to as 'The Father of Rock 'n' Roll, owing to his role in nurturing new talent and having 'discovered' many of the earliest Rock 'n' Roll Artists.</p> <p>Jerry Lee Lewis: Developed a distinctive style, influenced by R and B, Boogie Woogie and Gospel. Moved rock 'n' roll away from guitars to a piano-based sound</p> <p>Eddie Cochran: He experimented with multi-track recording and over dubbing in early 1960s</p> <p>Gene Vincent: Considered to be Rockabilly's greatest vocalist</p> <p>Little Richard: One of the first Rock and Roll singers in America.</p> <p>Buddy Holly: One of the pioneers of early rock and roll. Holly managed to bridge the racial divide that marked music in America along with Elvis and Chuck Berry.</p> <p>Alan Freed: DJ who started broadcasting <i>Moondog's Rock n Roll Party</i> in 1952</p>	<p>'Rocket 88', (1951): a precursor of rock 'n' roll, aimed solely at black audience</p> <p>1953: Alan Freed organized an R&B stage show at the Cleveland Arena.</p> <p>1954: 'That's alright', Elvis Presley: Elvis' 1st release.</p> <p>'Honey Don't', Carl Perkins: One of the first original Rock 'n' Roll songs.</p> <p>'Ain't that a shame', Fats Domino (1955): 1st record to breakthrough to white audience/market in the pop charts, making him a Rock 'n' Roll star.</p> <p>'Maybellene', Chuck Berry: his first hit – a year before Elvis became famous, was popular across a wide spectrum of the population, both black and white, and particularly a teenage audience</p> <p>'Rock around the Clock', Bill Haley & The Comets: is considered the first rock 'n' roll hit, and was popularised by the 1955 film 'Blackboard Jungle', thus introducing rock 'n' roll to a wider audience through the medium of cinema. It was again used in the 1956 film 'Rock Around the Clock'</p> <p>1956: Elvis signs for RCA, recording 'Heartbreak Hotel' – his 1st international hit – his sound became more commercialized.</p> <p>1955-9: Boom years for record industry where Rock'n' Roll becomes more internationally known.</p>

Imagery & fashion associated with the style

Associated fashions included narrow lapels on jackets and drain-pipe trousers, white socks, string ties, cowlick hair, full ballerina-length skirts, "wasy" belts, flat slip-onshoes, pony tails.



Musical Features

Usually uses 12-bar blues structure based on a repeated sequence using three chords, with Walking bass lines. Basic rock beat developed from jazz, and also featured strong back beat on 2 and 4, as in country. 'Shuffle rhythm' with slightly swung quavers was also common. Energetic delivery with screams and shouts, simple lyrics, scat singing (a type of jazz singing where nonsense syllables are used – e.g. doo wah) and the use of the blues scale. Backing vocals often in unison. Less improvisation than in rhythm and blues and country, and a developing verse – chorus structure, though this was still based on the 12 bar blues chord sequence. Call and response between vocal and guitar or piano.

Factors that influenced its inception	Significant artists/bands/producers	Important recordings/performances/events
<ul style="list-style-type: none"> Reggae emerged in Jamaica from its predecessors Ska and Rocksteady and was performed at a slower tempo with a more laid-back feel. After Jamaica's independence, people flocked from the countryside to Kingston, seeking work and settling into shanty towns. With high unemployment, Jamaican 'rude boys' (disaffected youths on the street) arose and became regular subject matter. The roots Reggae style incorporated elements of the Rastafarian religion into the lyrics, with a political message concerning the plight of the underprivileged Jamaican. Engineer-producers such as King Tubby and Lee 'Scratch' Perry worked with 'dub' recording techniques – creating dub versions of songs which were also later used to 'toast' over. 	<p>Duke Reid & Coxsone Dodd: producers who helped to slow the tempo of ska, to form rock steady.</p> <p>Toots & the Maytals: pioneered the Reggae sound</p> <p>Bob Marley and The Wailers: Became the defining sound of roots Reggae (Bob Marley, Bunny Wailer & Peter Tosh). Helped Reggae to reach a global audience.</p> <p>Jimmy Cliff: gained international fame as the star of the movie 'The Harder They Come'.</p> <p>Chris Blackwell: Founded Island Records in Jamaica but relocated to London.</p> <p>Clement Dodd: Studio One producer, recorded The Wailers 1st track 'Simmer Down'.</p> <p>UB40: British Reggae Band, gave Reggae a fresher sound.</p>	<p>1962: Jamaica became independent.</p> <p>'My boy lollipop, Millie Small (1964): early reggae success in British charts</p> <p>'Rudy a message to you', Dandy (1967) – example of a 'rudeboy' song.</p> <p>'Do the reggay', The Maytals (1968): early use of the term 'reggae'.</p> <p>The Israelites, Desmond Dekker (1969)</p> <p>'Wonderful World, Beautiful People', Jimmy Cliff (1969)</p> <p>1972: Blackwell signed Bob Marley & the Wailers.</p> <p>1973: The Harder they come (film) was released</p> <p>'No Woman no Cry', Bob Marley (1974)</p> <p>'I shot the Sheriff', Eric Clapton (1974): Cover of Marley's song which was a big hit and inspired many listeners to look up Marley's music.</p> <p>Freedom Fighters, Delroy Washington (1976)</p> <p>'One Love', Bob Marley (1977)</p> <p>1978: Bob Marley brings 2 opposing leaders together at 'One Love' concert in a bid to encourage peace.</p>

Imagery & fashion associated with the style

Associated fashions included the colours of the Jamaican flag: green, gold, red and black – each colour symbolizing a different thing, associated with the Rastafarian religion. Dreadlocks are also common features



Musical Features

Slow tempo with a laid-back feel. The bass guitar and percussion are brought to the foreground, and guitar and keyboards sent back in the mix, exchanging the traditional roles of these instruments.

A Reggae bassline is very melodic and often the defining feature. It normally avoids the first beat of the bar. Drums also avoid beat 1, preferring to stress beat 3. The guitar mostly plays chords on the offbeat, beats 2 and 4. Piano & organ also play on the offbeat. Horns sometimes add countermelodies and would normally be made up of Sax, Trumpet and Trombone.

Factors that influenced its inception	Significant artists/bands/producers	Important recordings/performances/events
<p>1970s: Took ideas from MCs toasting in Jamaican dancehalls</p> <p>1980s: Transformed into DJs playing tracks on beatboxes with MCs hosting these Bloc parties in the Bronx, NY</p> <p>1990s: Gangsta Rap, East & West Coast rivalry.</p> <p>2000s: Technological advances meaning that all samplers, sequencers & sound modules are all now combined into computer programmes – effects and processors are common features</p> <p>Style became more commercial & accepted.</p> <p>2010s: Internet and home-grown videos take force with a return to an underground scene, particularly focused around gang culture.</p>	<p>DJ Kool Herc & Afrika Bambaataa: pioneers of the hip-hop style, they were credited with bringing a more positive attitude to life in the Bronx.</p> <p>Grandmaster Flash & Grand Wizzard Theodore: introduced the idea of scratching.</p> <p>Sugar Hill Records: specialist producers in rap music, producing the first commercial hip-hop hit.</p> <p>N.W.A: themes of urban crime, developing the Gangsta rap sub-genre – leading into East-West coast rivalries between Dr Dre & Snoop Doggy Dogg and Puff Daddy & Notorious B.I.G.</p> <p>Eminem: rapper & record producer</p> <p>Black Eyed Peas: specialist producers in rap music, producing the first commercial hip-hop hit.</p> <p>Stormzy: the voice of young British black youth, bringing politics into his music.</p>	<p>'Rapper's Delight', Sugar Hill Gang: The 1st commercial hip-hop hit.</p> <p>'The Message', Grandmaster Flash & The Furious Five: A no-holes-barred depiction of ghetto life.</p> <p>'Walk this Way', Run-DMC: cross-over track, cover of Aerosmith, bringing hip-hop into mainstream view.</p> <p>'F***k the Police', Sugar Hill Gang: The 1st commercial hip-hop hit.</p> <p>'I'll be missing You', Puff Daddy: reaction to the murder of Notorious B.I.G</p> <p>'Gold Digger', Kanye West: 80,000 digital downloads in a week</p> <p>'My name is', Eminem: quickly became one of rap's biggest star's</p>

Imagery & fashion associated with the style

Musical Features



What message, ideas about Hip-Hop do these images put across?

Rhythm & Metre: 4/4; Straight (not swung); Syncopation; Backbeat

Harmony & Tonality: Major/Minor; Riff based; Consonant harmony (no clashes)

Texture & Melody: Samples; Loops (backing is very repetitive); Disco samples usually have a thick texture; Drumbeat samples can be thin texture

Timbre & Dynamics: DJs and Turntablism; scratching; MCs/Rappers; 70s Disco instrumentation (elec gtr, bass, strings, synths); Prominent Bass line and Drum beat; Effects processors: reverb, delay, auto tune, vocoder, EQ filtering.

Structure: Intro, verse, chorus; Breakbeat (instrumental backing); Call and Response phrases.

A. Key Terms

Keyword	Description
1. Tone	The lightness or darkness something. This could be or light a colour appears.
2. Focal point	The most important part of image where the eye is to.
3. Composition	The arrangement of within a work of Art.
4. Still life	A drawing or painting that on still objects. (Usually objects.)
5. Muted	Describes a grayed, dulled saturated colour.
6. Vivid	Describes a bold and an intense feeling, or an your mind that is so clear almost touch it.

Command Words

Acknowledge, Consider, Explore, Evidence.

B. Key concepts



Top Tips for annotating your work

After each experiment you should comment on the following questions:

1. What have you done? What techniques or materials have you used?
2. Why did you do it? What were you trying to achieve?
3. Do you think the work was successful? If so, why?
4. Do you think the work was unsuccessful? If so, how could you do it differently to achieve the desired outcome?
5. What do you think you should do next so that your work progresses?
6. What do you think of the design? Should be altered to achieve the desired outcome?
7. Would the work be better if you used a different media?
8. How does it relate the artist you have looked at? How has the artist influenced you?
9. Would you consider doing something similar for a final piece?

C. Developing AO2

AO2 Refine work by exploring ideas, selecting and experimenting with appropriate media, materials, techniques and processes.

What does this mean?
You need to demonstrate that you are able to explore, progress and improve your ideas through a development journey of experimentation, trails, samples, working things out as you go.

Refinement means to improve. You will learn from doing something then working out how to do it better and then having another go. This may take many steps.

AO2 should be seen as an integral part of your creative journey and not a separate thing.

How does it link with AO1?
Experimenting in response to your chosen artists
How does it link with AO3?
Recording your ideas and observations as you experiment and as your ideas develop. Recording your decisions.
How does it link with AO4?
Your experimentation and refinement of ideas should lead to a skilful personal and meaningful response.

How do I show this in my work?

- Refine a dominant idea by trying various compositions
- Refined techniques in a variety of media
- Have you developed an idea and not just used your first idea?
- Clearly demonstrate purposeful trialling of materials supported by notes
- Attempts to mimic the style/technique of an artist in your own work
- Selection and rejection of ideas
- Problem solving
- Showing stages of development

Reaching for the level 8/9:
How do I show
A highly developed ability to thoughtfully refine ideas.
A highly developed ability to effectively select and purposefully experiment with appropriate media, materials, techniques and processes.
The level to which you experiment. Do you go through a number of processes refining along the way? Have you copied the artists work in a superficial way or have you really explored their technique? Have you taken risks and shown a highly developed creative journey as a result? Are your ideas unique?

Annotate your own work

- What have you produced and why?
- How does it link to the artist you have been looking at?
- Has the technique been successful and why?
- How might your work now develop?
- What have you learnt?
- What are your decisions?

Refinement is important not just repetition

"In weaker submissions, repetition of the same idea in a range of media was seen, with little indication of refinement. As a result, outcomes emerged without the necessary supporting evidence of decisions taken or choices made." AQA

D. Annotation Examples

When creating this experiment I used various techniques. I wanted to try and create a feeling of depth within the artwork. I achieved this by applying thin layers using different materials. I started with a light wash, then applied a scattering of dry brushing using a rigid bristled brush. On my final layers I used a detail brush and a thicker application of paint. I think I was successful in creating a sense of texture within the painting. In addition I feel the artwork conveys a mood/ feeling that links to the idea of urban texture and its grittiness. This work could be developed through the experimentation of scale or by creating a triptych of different greyscale textures. This relates to the artist Nigel Henderson because of the colours and tones used within the painting and the use of fragmented texture. Nigel Henderson creates layered artworks full of different textures (shattered glass). I would like to experiment more with this idea by developing the composition and the use of negative space.

Process for NEA 2

1

1. Research

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

2. Research summary

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

3. Skills trials

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

4. Planning for the exam

An experiment that tests exactly the same thing during the investigation. E.g. biscuits made should be cut out using the same cutter

5. dovetailing

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

6. Demonstrate skills

The part of the experiment that is changed

7. Nutritional analysis

The outcome of the experiment that can be measured

8. Sensory analysis

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

9. Cost analysis

Add information to a photograph or chart

10. Sensory testing and tasting

Measuring the outcomes of experiment using the senses to describe outcomes

11. Conclusion

Outcome or result

12. Evaluation

To judge the worth of

Keywords

2

Food additives

Any additive that is used in the UK has to undergo strict testing to be approved.

1. Artificial additives. Additives that are made completely from chemicals.

2. Natural additives. Additives that are obtained from foods naturally (e.g. beetroot juice).

3. Nature identical additives. Additives that are synthetic (made chemically to be the same as a natural product)

Quick test

3

Name one food you make using chemical raising agents

What is the importance of kneading bread dough?

Why do we need emulsifiers?

Name three reasons why manufacturers use colour.

Keywords

4

Raising agents

An ingredient or process that introduces a gas into a mixture so that it rises when cooked

Air

Air which is a mixture of gases, is trapped in a mixture as it is creamed, rubbed-in, beaten, whisked or rolled and folded. The air is also trapped in flour when it is sieved

Carbon dioxide gas

Yeast in bread

Bicarbonate of soda added to cake and scone mixture

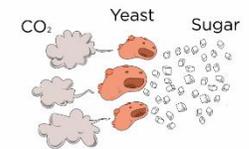
Baking powder which has bicarbonate of soda in already. It is added to self-raising flour by manufacturers.

Three main ways you can add a raising agent:

1. Chemical-add baking powder/bicarbonate of soda
2. Mechanical-by whisking, sieving, creaming, rubbing in, folding in to trap air or adding moisture
3. Biological-by using yeast to produce carbon dioxide gas

Type of additive	Why used	Example foods
Preservative	To extend shelf life	Fruit juice, dried fruits salad dressing
Flavour intensifier	To improve the taste of food by adding flavour. To restore flavours lost during processing	Savoury snacks/savoury foods, vanilla yoghurts
Stabilisers and emulsifiers	To help foods mix together and prevent ingredients separating out when the product is being stored. To give foods a smooth and creamy texture To extend the shelf life of baked goods	Mayonnaise
Colourings	To make foods look attractive To boost the colour already present in foods To add colour to food lost during processing	Fizzy drinks, strawberry yoghurt

5





	Nutrient	Function	Source	Effects of deficiency	Effect of excess
VITAMINS	Vitamin A FAT SOLUBLE	<ol style="list-style-type: none"> 1. Required for a healthy immune system 2. Keeps mucous membranes of eyes, digestive system and lungs healthy 3. Is an antioxidant 	<ol style="list-style-type: none"> 1. Retinol from animal sources: Dairy products, Egg yolk, oily fish, 2. Beta-carotene from plant sources: fortified spreads, yellow and orange fruits and dark green leafy vegetables,. 	<ol style="list-style-type: none"> 1. Deficiency is rare in developed countries but can lead to night blindness and a compromised immune system 2. Dry mucous membranes 	<ol style="list-style-type: none"> 1. Can be poisonous, Builds up in the liver 2. Pregnant women should avoid eating too much retinol from animal sources as it can cause birth defects
	Vitamin B Group	<ol style="list-style-type: none"> 1. B1 (thiamine) release energy from carbohydrates 2. B2 (riboflavin) release energy from carbohydrates 3. B3 (niacin) release energy from carbohydrates 4. B6 (pyridoxine) release energy from carbohydrates 5. B9 (folate, folic acid) Essential for the formation of DNA 6. B12 (cobalamin). Needed to form a protective coating around nerve cells Needed to keep the skin, eyes and nervous system healthy 	<p>B1 Cereals such as wheat and rice, yeast, yeast extract (marmite) B2 Liver, kidneys, eggs, milk, green veg B3 meat and poultry, pulses e.g. lentils B6 A wide range of foods B9 liver and kidneys, wholegrain, dark green vegetables B12 meat, fish and eggs, dairy products. Vegans need to take a supplement as it is only found in animal foods.</p>	<ol style="list-style-type: none"> 1. B1 the body will have slow growth and development. Severe deficiency leads to beri-beri 2. B2 dryness of the skin around the mouth, poor growth. 3. B3 deficiency is rare but can lead to a disease called pellagra. 4. B6 can lead to headaches, weakness, anemia and skin problems 5. B9 tiredness and anemia. Lack of folate during pregnancy can lead to spine bifida. Folic acid is usually taken 6. B12 tiredness and anemia. 	<ol style="list-style-type: none"> 1. B1 No evidence to suggest that eating too much is harmful. 2. B2 No evidence to suggest that eating too much is harmful 3. B3 unlikely to eat too much in a normal diet. Taking too much in the form of supplements can cause skin flushes and eventually liver damage 4. B6 taking more than 200mg a day can lead to peripheral neuropathy 5. B9 taking large dose of Folic acid can disguise a vitamin B12 deficiency which can be a problem in older people 6. B12 No evidence to suggest that eating too much is harmful
	Vitamin C (ascorbic acid)	<ol style="list-style-type: none"> 1. Helps the body absorb iron from food 2. Essential for the formation of collagen (the body's scaffold tissue) 3. Aids wound healing 4. Supports a healthy immune system & fights infection 	<ol style="list-style-type: none"> 1. Fruits including – kiwi, strawberry, citrus fruits 2. Peppers, tomatoes 3. Dark green vegetables including cabbage, broccoli (but not lettuce) 	<ol style="list-style-type: none"> 1. Extreme deficiency is called scurvy. This is very rare however symptoms include bleeding gums, wounds not healing properly, tiredness. 2. Lack of vitamin C can also be linked to iron-deficiency anaemia as absorption of iron will be affected by lack of vitamin C 	<ol style="list-style-type: none"> 1. Excess vitamin C taken in the diet is excreted by the body.
	Vitamin D (cholecalciferol)	<p>Essential for absorbing calcium from foods Helps in the formation and development of strong teeth and bones</p>	<ol style="list-style-type: none"> 1. Sunlight in UK summer 2. Food sources – oily fish, eggs, liver, fortified cereals 3. Added by law to margarine 	<ol style="list-style-type: none"> 1. Poor absorption of calcium – rickets (soft bones) in children and osteomalacia in adults 	<ol style="list-style-type: none"> 1. It is difficult to eat too much vitamin D in a normal diet. If vitamin D supplements are taken over a LONG period of time, more calcium can be absorbed in the body and deposited in the kidneys. This can damage them.
	Vitamin E (tocopherol)	<ol style="list-style-type: none"> 1. Is an antioxidant. 2. Helps the cell walls in the body stay healthy. 3. Can help in the prevention of some cancers and heart disease. 	<ol style="list-style-type: none"> 1. Vegetable oils lettuce, peanut seeds and wheatgerm oil. 	<p>Deficiency is rare. Occasionally it can arise if a person has a problem absorbing fat which contains vitamin E.</p>	<p>No evidence that eating too much cause harm</p>
	Vitamin K	<p>Helps the blood to clot</p>	<ol style="list-style-type: none"> 1. Green leafy vegetable, cheese, asparagus 	<ol style="list-style-type: none"> 1. Deficiency in adults is rare 2. Babies have an injection of vitamin K straight after birth. 	<p>No evidence that eating too much cause harm</p>
MINERALS	Iron	<p>Iron is needed to make haemoglobin in red blood cells</p>	<p>Haem iron found in meat, offal Non-haem iron found in wholegrain foods, leafy green vegetables, fortified breakfast cereals. Iron is only absorbed in the presence of vitamin C.</p>	<ol style="list-style-type: none"> 1. Iron deficiency anaemia is the most common dietary deficiency in the UK. Symptoms include tiredness, paleness, lethargy 	<p>Taking more than 20 mg per day causes stomach pain, nausea, vomiting and constipation</p>
	Calcium	<ol style="list-style-type: none"> 1. Calcium is needed by the body to build strong bones and teeth. 2. Essential for blood clotting process 3. Essential for nerve signal transmission and muscle contraction 	<ol style="list-style-type: none"> 1. Dairy foods including milk, yogurt, cheese, butter 2. Dark leafy green vegetables, 3. Fish with edible bones 4. Non-dairy milks fortified with added calcium 	<ol style="list-style-type: none"> 1. Lack of calcium in children can cause rickets and Osteoporosis (brittle bones) in adults 	<p>Taking over 1,500mg per day can cause stomach pains and diarrhoea.</p>

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

Aluminum	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 recyclable

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	
<ul style="list-style-type: none"> - Used to find the strength under tension. - The maximum pulling or stretching force before failure. - Used by applying a load and observing the changes. 	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - 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.
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Le grand large

Vocabulaire du français au GCSE

Année 10 Higher

Semaine 1

En vacances	On holiday
l'Algérie	Algérie
l'Allemagne	Allemagne
l'Angleterre	England
l'Australie	Austria
la Belgique	Belgium
la Croatie	Croatia
l'Espagne	Spain
les États-Unis	USA
la France	France
le Japon	Japan
le Pakistan	Pakistan
les Pays-Bas	Netherlands
le pays de Galles	Wales
la Pologne	Poland
la Suisse	Switzerland
Normalement, je passe mes vacances en/au/à l'/aux ...	Normally, I spend my holidays in ...
Je vais au bord de la mer/à la campagne/à la montagne.	I go to the seaside/the countryside/the mountains.
Je voyage en train/avion/ferry/voiture.	I go by train/plane/ferry/car.
Je fais du camping.	I go camping.
	Je loge dans un gîte/un hôtel/chez ma tante.
	Je vais avec ma famille/mes grands-parents/mon petit frère
	C'est génial/extra/assez ennuyeux.
	Je me lève tôt.
	On se couche tard.
	Je me repose/me prépare.
	Je m'habille.
	Je vais à la plage.
	Je me baigne dans la mer.
	Je me promène.
	Je rentre à l'hôtel.
	Je sors au restaurant.
	On peut ...
	faire une visite de Paris
	faire de l'escalade
	visiter les musées/monuments
	aller à la pêche/à la plage
	jouer à la pétanque
	I stay in a holiday cottage/a hotel/with my aunt.
	I go with my family/my grandparents/my little brother.
	It's great/excellent/quite boring.
	I get up early.
	We go to bed late.
	I rest/get ready.
	I get dressed.
	I go to the beach.
	I bathe/swim in the sea.
	I go for a walk.
	I go back to the hotel.
	I go out to a restaurant.
	You can ...
	visit Paris
	go climbing
	visit museums/monuments
	go fishing/to the beach
	play pétanque, boules

Semaine 2

Les vacances passées et futures	Holidays past and future
Tous les ans/Normalement/Tous les étés, ...	Every year/Normally/Every summer, ...
j'achète/je fais/je vais ...	I buy/do/go ...
Hier/L'année dernière/Le week-end dernier, ...	Yesterday/Last year/Last weekend, ...
	je l'ai vu/visité/acheté ...
	je suis allé(e) à ...
	L'année prochaine/Le week-end prochain/ D'année, ...
	je vais faire/prendre/aller/visiter ...
	I saw/visited/bought ...
	I went to ...
	Next year/Next weekend/Tomorrow, ...
	I'm going to do/take/go/visit ...

Des vacances de rêve	Dream holidays
Je logerais ...	I would stay ...
dans un gîte à la campagne	In a holiday cottage in the countryside
dans un hôtel 4 étoiles	in a 4-star hotel
dans une auberge de jeunesse	in a youth hostel
dans une caravane	in a caravan
dans une chambre d'hôte	in a bed and breakfast
dans une tente, sur une île déserte	in a tent on a desert island
sur un bateau	on a boat
Je voyagerais ...	I would travel ...
avec mes copains/copines	with my friends
avec ma famille	with my family
avec mes parents	with my parents
avec mes grands-parents	with my grandparents
avec mon lycée	with my school
avec une organisation	with an organisation
seul(e)	alone
Je regarderais le coucher du soleil.	I would watch the sunset.
Je mangerais avec les poissons tropicaux.	I would swim with tropical fish.
Je ferais des randonnées.	I would go hiking.
	je ferais du canoë-kayak.
	Je me reposerais.
	Je m'amuserais avec mes copains/copines.
	Je mangerais bien.
	Il y aurait ...
	un café qui serait ouvert toute la nuit
	une salle de jeux
	des feux d'artifice tous les soirs
	des spectacles son et lumière
	des visites guidées
	Il n'y aurait aucun bruit!
	Il n'y aurait pas beaucoup d'adultes!
	Ce serait ...
	formidable
	luxueux
	merveilleux
	passionnant
	pittoresque
	reposant
	tranquille
	I would go canoeing.
	I would rest.
	I would have fun with my friends.
	I would eat well.
	There would be ...
	a café which would be open all night
	a games room
	fireworks every night
	sound and light shows
	guided tours
	There would be no noise!
	There wouldn't be many adults!
	It would be ...
	tremendous
	luxury
	wonderful
	exciting
	picturesque
	restful
	quiet

A l'hôtel	At the hotel
Nous avons passé X jours dans cet hôtel/cette chambre d'hôte.	We spent X days at this hotel/bed and breakfast.
Ça s'est très bien passé.	It all went very well.
C'était charmant/propre/bien situé très pratique/Das cher/super.	It was charming/clean/well located very handy/not expensive/super.
Le service était impeccable.	The service was impeccable.
Le Wi-Fi fonctionnait très bien.	The Wi-Fi worked very well.
Le petit-déjeuner était offert.	Breakfast was included.
Il y avait ...	There was ...
un parking tout près	a car park nearby
un micro-ondes/la climatisation dans la chambre	a microwave/air-conditioning in the room
Il y avait un très bon rapport qualité-prix.	It was very good value for money.
	Nous y avons passé un super séjour.
	Je voudrais une chambre ...
	pour une personne
	avec un lit simple
	avec un grand lit
	avec une salle de bains
	avec une douche
	avec une vue sur la mer
	Votre chambre est ...
	au rez-de-chaussée
	au premier/deuxième étage
	We had a great stay there.
	I would like a room ...
	for one person
	for two people
	with a single bed
	with a double bed
	with a bathroom
	with a shower
	with a sea view
	Your room is ...
	on the ground floor
	on the first/second floor

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Vocabulaire du français au GCSE

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Semaine 4 - partie B



Au restaurant	At the restaurant	
Je préférerais une table ... en terrasse/à l'intérieur Je vais prendre ... le plat du jour/le menu à 30 euros	<i>I would prefer a table ... on the terrace/inside I will have/take ... the dish of the day/the 30-euro set menu</i>	L'accueil était très chaleureux. Nous avons du attendre plus de cinq minutes. L'ambiance était vraiment agréable. L'atmosphère était super bruyante. Le serveur/La serveuse était ... très attentionné(e)/médiocre À recommander! Je n'y retournerai jamais! un couteau une cuillère une fourchette une serviette
(la soupe à la tomate) en entrée (le filet de loup de mer) comme plat principal (la mousse au chocolat) comme dessert Qu'est-ce que vous avez, comme desserts? On peut avoir l'addition, s'il vous plaît? Les prix n'étaient pas excessifs. C'était cher.	(the tomato soup) for a starter (the filet of seabass) for the main course (the chocolate mousse) for dessert What desserts do you have? Could we have the bill, please? The prices weren't excessive. It was expensive.	The welcome was very warm. We had to wait more than five minutes. The atmosphere was really pleasant. The waiter/waitress was ... The waiter/waitress was ... very attentive/mediocre I will never go back there! a knife a spoon a fork a napkin

Semaine 5

Les plats	The dishes	
entrées brochettes (fpl) de crevettes escargots (mpl) soupe (f) à la tomate tarte (f) à l'oignon plats principaux épaule (f) d'agneau cuisse (f) de canard gratin (m) dauphinois lasagnes (fpl) végétariennes	starters prawn skewers snails tomato soup onion tart main dishes lamb shoulder duck leg dauphinoise potatoes vegetarian lasagne	loup (m) de mer poulet (m) basquaise rôti (m) de veau desserts crème (f) brûlée mousse (f) au chocolat roulé (f) au chocolat sorbet (m) tarte (f) au citron tarte (f) aux pommes
En route! Si j'avais le choix, pour aller ... en Inde/Russie/Chine au Sénégal/Vietnam/Bresil ... Je voyagerais ... en car/train/avion à moto ... car c'est/ce n'est pas ... rapide/confortable/pratique une aventure/la classe bon pour l'environnement	On the road! If I had the choice, to go ... to India/Russia/China to Senegal/Vietnam/Brazil ... I would travel ... by coach/train/plane by motorbike ... because it is (not) ... quick/comfortable/practical an adventure/cool good for the environment	ennuyeux/fatigant/cher un billet un aller simple un aller-retour en première classe en deuxième classe les horaires le guichet le quai la salle d'attente
Acheter les souvenirs Je pense acheter (ce tégine). Qu'est-ce que tu en penses? Que penses-tu de (cette théière)? Je crois que je vais acheter (ces bijoux). Je veux acheter (un foulard). Tu préfères celui-ci ou celui-là? C'était catastrophique! Avant de partir, j'avais ... réserve mon billet d'avion fait ma valise/des recherches découvert/décidé que ... tout préparé j'étais allé(e) à l'agence de voyages. Mais/Pourtant ... je me suis cassé la jambe j'ai oublié mon passeport	Buying souvenirs I'm thinking of buying (this tegine). What do you think of it? What do you think of (this teapot)? I think I'm going to buy (this jewellery). I want to buy (a scarf). Do you prefer this one or that one? It was catastrophic! Before leaving I had ... booked my plane ticket packed my case/done some research discovered/decided that ... prepared everything I had gone to the travel agent's. But/However ... I broke my leg I forgot my passport	Je cherche (une lanterne). Je prends celle-ci ou celle-là? J'ai envie de m'acheter des (gants). Tu trouves celles-ci comment? Je déteste faire du shopping. Je suis accro au shopping. j'ai raté l'avion j'ai pris un coup de soleil affreux le camping-car est tombé en panne on m'a volé mon sac à main Alors/Donc ... j'ai dû aller au commissariat/ à l'hôpital/chez le médecin Quelle horreur! j'étais triste. On était bien déçus.
Les mots essentiels ce matin cet après-midi demain hier l'année dernière/prochaine le dernier soir le week-end dernier/prochain tous les ans/étés	High-frequency words this morning this afternoon tomorrow yesterday last/next year on the last evening last/next weekend every year/summer	certainement du coup entre temps finalement franchement toute la journée puits

Semaine 6

Acheter les souvenirs Je pense acheter (ce tégine). Qu'est-ce que tu en penses? Que penses-tu de (cette théière)? Je crois que je vais acheter (ces bijoux). Je veux acheter (un foulard). Tu préfères celui-ci ou celui-là? C'était catastrophique! Avant de partir, j'avais ... réserve mon billet d'avion fait ma valise/des recherches découvert/décidé que ... tout préparé j'étais allé(e) à l'agence de voyages. Mais/Pourtant ... je me suis cassé la jambe j'ai oublié mon passeport	Buying souvenirs I'm thinking of buying (this tegine). What do you think of it? What do you think of (this teapot)? I think I'm going to buy (this jewellery). I want to buy (a scarf). Do you prefer this one or that one? It was catastrophic! Before leaving I had ... booked my plane ticket packed my case/done some research discovered/decided that ... prepared everything I had gone to the travel agent's. But/However ... I broke my leg I forgot my passport	Je cherche (une lanterne). Je prends celle-ci ou celle-là? J'ai envie de m'acheter des (gants). Tu trouves celles-ci comment? Je déteste faire du shopping. Je suis accro au shopping. j'ai raté l'avion j'ai pris un coup de soleil affreux le camping-car est tombé en panne on m'a volé mon sac à main Alors/Donc ... j'ai dû aller au commissariat/ à l'hôpital/chez le médecin Quelle horreur! j'étais triste. On était bien déçus.
Les mots essentiels ce matin cet après-midi demain hier l'année dernière/prochaine le dernier soir le week-end dernier/prochain tous les ans/étés	High-frequency words this morning this afternoon tomorrow yesterday last/next year on the last evening last/next weekend every year/summer	certainement du coup entre temps finalement franchement toute la journée puits

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

Les mots essentiels	High-frequency words	
ce matin cet après-midi demain hier l'année dernière/prochaine le dernier soir le week-end dernier/prochain tous les ans/étés	this morning this afternoon tomorrow yesterday last/next year on the last evening last/next weekend every year/summer	certainly, definitely as a result meanwhile, in the meantime finally, at last Frankly, downright all day then



T1

Semana 1

Intereses e influencias

Vocabulario Vale Higher



La paga
 Mi padres me dan...
 Mi madre / padre me da...
 ...euros a la semana / al mes
 Gasto mi paga en...
 También compro...

Pocket money
 My parents give me...
 My mum / dad gives me...
 ...euros a week / a month
 I spend my pocket money on...
 I also buy...

saldo para el móvil
 ropa / joyas / maquillaje
 zapatillas de marca
 videojuegos / revistas

credit for my phone
 clothes / jewellery / make-up
 designer trainers
 computer games / magazines

Mis ratos libres

las actividades de ocio
 Tengo muchos pasatiempos.
 A la hora de comer...
 Cuando tengo tiempo...
 Después del insti...
 Los fines de semana...
 Mientras desayuno / como...
 juego al billar / fútbolin
 monto en bici / monopatin
 quedo con mis amigos
 voy de compras
 mi pasión es la música / la lectura
 Suelo...
 descansar
 escuchar música / la radio

My free time

leisure activities
 I have lots of hobbies.
 At lunchtime...
 When I have time...
 After school...
 At weekends...
 Whilst I have breakfast / lunch...
 I play billiards / table football
 I ride my bike / skateboard
 I meet up with friends
 I go shopping
 my passion is music / reading
 I tend to / I usually...
 rest
 listen to music / the radio

hacer deporte
 ir al cine
 leer libros / revistas / periódicos
 salir con amigos
 usar el ordenador
 ver la tele

Es divertido / relajante / sano
 Soy creativo/a / perezoso/a /
 sociable
 Soy adicto/a a...
 me ayuda a relajarme
 me ayuda a olvidarme de todo
 me hace reír
 necesito comunicarme / relacionarme
 con otra gente

do sport
 go to the cinema
 read books / magazines / newspapers
 go out with friends
 use the computer
 watch TV
 It's fun / relaxing / healthy
 I'm creative / lazy / sociable
 I'm addicted to...
 it helps me to relax
 it helps me to forget everything
 it makes me laugh
 I need to have contact
 with other people

Semana 2

mi pasión es la música / la lectura
 Suelo...
 descansar
 escuchar música / la radio

my passion is music /
 I tend to / I usually...
 rest
 listen to music / the radio

El deporte

Soy / Era...
 (bastante / muy) deportista
 miembro de un club / un equipo
 aficionado/a / hinch(a) de...
 un(a) fanático/a de...
 juego al...
 jugué al...
 jugaba al...
 badminton / baloncesto
 beisbol / balonmano
 críquet / fútbol
 hockey / ping-pong
 rugby / tenis / voleibol

Sport

I am / I used to be...
 (quite / very) sporty
 a member of a club / a team
 a fan of...
 a ... fanatic
 I play...
 I played...
 I used to play...
 badminton / basketball
 baseball / handball
 cricket / football
 hockey / table tennis
 rugby / tennis / volleyball

it helps me to forget everything
 it makes me laugh
 I need to have contact
 with other people

diving
 archery
 I go...
 I went...
 I used to go...
 to ... classes
 fishing
 (I) no longer (play)...
 (I) still (do)...
 to break a record
 to run
 to train
 to play a match against...

Semana 3

hago...
 hice...
 hacía...
 baile / boxeo / ciclismo
 deportes acuáticos
 equitación / escalada
 gimnasia / judo
 karate / natación
 patinaje sobre hielo
 piragüismo / remo

I do...
 I did...
 I used to do...
 dancing / boxing / cycling
 water sports
 horseriding / climbing
 gymnastics / judo
 karate / swimming
 ice skating
 canoeing / rowing

marcar un gol
 montar a caballo
 participar en un torneo
 patinar
 mi jugador(a) preferido/a es...
 su punto culminante fue cuando...
 el campeón / la campeona
 la temporada

la batería / la flauta /
 la guitarra / la trompeta
 mi cantante preferido/a es...
 un espectáculo
 una gira (mundial)

to score a goal
 to go horseriding
 to participate in a tournament
 to skate
 my favourite player is...
 the highlight (of his/her career) was
 when...
 the champion
 the season

Music

Me gusta el soul / el rap / el dance /
 el hip-hop / el pop / el rock / el
 jazz / la música clásica / electrónica
 asistir a un concierto
 cantar (una canción)
 tocar el teclado / el piano /

la batería / la flauta /
 la guitarra / la trompeta
 mi cantante preferido/a es...
 un espectáculo
 una gira (mundial)

the drums / the flute /
 the guitar / the trumpet
 my favourite singer is...
 a show
 a (world) tour

Las películas

un misterio
 una película de amor
 una película de terror
 una película de acción
 una película de aventuras

Films
 a mystery
 a love film
 a horror film
 an action film
 an adventure film

una película de animación
 una película de ciencia ficción
 una película de fantasía
 una película extranjera

an animated film
 a sci-fi film
 a fantasy film
 a foreign film

Semana 4

La tele

(No) Soy teleadicto/a.
 Mi programa favorito es...
 un concurso
 un programa de deportes
 un reality
 un documental
 un cablebrón / una telenovela
 una comedia
 una serie policíaca
 el teledejarío / las noticias
 Me gustan las comedias.

TV

I'm (not) a TV addict.
 My favourite programme is...
 a game / quiz show
 a sports programme
 a reality TV show
 a documentary
 a soap
 a comedy
 a crime series
 the news
 I like comedies.

Es / Son...

aburrido/a/os/as
 adictivo/a/os/as
 divertido/a/os/as
 entretenido/a/os/as
 tonto/a/os/as
 informativo/a/os/as
 malo/a/os/as
 emocionante(s)
 interesante(s)

It is / They are...
 boring
 addictive
 fun
 entertaining
 silly
 informative
 bad
 exciting
 interesting



Nacionalidades
americano/a
argentino/a
británico/a
chino/a
griego/a
italiano/a
mexicano/a
sueco/a

Nationalities
American
Argentinian
British
Chinese
Greek
Italian
Mexican
Swedish

alemán/alemana
danés/danesa
español(a)
francés/francesa
holandés/holandesa
inglés/inglesa
irlandés/irlandesa
japonés/japonesa

German
Danish
Spanish
French
Dutch
English
Irish
Japanese

Semana 5
Ir al cine, al teatro, etc.

¿Qué vamos a hacer...
esta tarde?
esta noche?
mañana / el viernes?
¿Tienes ganas de ir...
a un concierto / un festival?
a un espectáculo de baile?
al cine / al teatro / al circo?
¿Qué ponen?

Going to the cinema, theatre, etc.

What are we going to do...
this afternoon / evening?
tonight?
tomorrow / on Friday?
Do you fancy going...
to a concert / a festival?
to a dance show?
to the cinema / theatre / circus?
What's on?

Es una película / obra de...
¿A qué hora empieza / termina?
Empieza / Termina a las...
Dos entradas para... por favor.
para la sesión de las...
No quedan entradas.
¿Hay un descuento para estudiantes?
Aquí tiene mi carne de estudiante.

It's a ... film / play
/ What time does it start / finish?
It starts / finishes at...
Two tickets for ... please.
for the ... showing / performance
There are no tickets left.
Is there a discount for students?
Here is my student card.

Temas del momento

he compartido...
he comprado...
he jugado...
he leído...

Trending topics

I have shared...
I have bought...
I have played...
I have read...

cuenta la historia de...
trata de...
combina el misterio con la acción
el argumento es fuerte / débil

it tells the story of...
it's about...
it combines mystery with action
the plot is strong / weak

Semana 6

he oído...
he roto...
he subido...
¿Has probado...?
mi hermano ha descargado...
se ha estrenado...
la nueva canción
el último libro
Yo lo/la/los/las he visto.
No lo/la/los/las he visto todavía.
acabo de ver / jugar a...

I have heard...
I have broken...
I have uploaded...
Have you tried...?
my brother has downloaded...
...has been released.
the new song
the latest book
I have already seen it/them.
I haven't seen it/them yet.
I have just seen / played...

la banda sonora es buena / mala
los actores...
los efectos especiales...
los gráficos...
los personajes...
las animaciones...
las canciones...
son guapos/as / guay
son estupendos/as / impresionantes
son originales / repetitivos/as

the soundtrack is good / bad
the actors...
the special effects...
the graphics...
the characters...
the animations...
the songs...
are good looking / cool
are great / impressive
are original / repetitive

¿En el cine o en casa?

(No) Me gusta ir al cine porque...
Prefiero ver las pelis en casa
porque...
el ambiente es mejor
hay demasiadas personas
la imagen es mejor en la gran pantalla
las entradas son muy caras

At the cinema or at home?

I (don't) like going to the cinema because...
I prefer watching films at home because...
the atmosphere is better
there are too many people
the picture is better on the big screen
the tickets are very expensive

las palomitas están ricas
los asientos no son cómodos
los otros espectadores me molestan
ponen trailers para las nuevas pelis
si vas al baño te pierdes una parte
tienes que hacer cola
una corrida de toros
en directo

the popcorn is tasty
the seats aren't comfortable
the other spectators annoy me
they show trailers for new films
if you go to the toilet you miss part of it
you have to queue
a bull fight
live

Semana 7
Los modelos a seguir

Admito a...
Mi inspiración / ídolo es...
...es un buen / mal modelo a seguir
Un buen modelo a seguir es
alguien que...
apoya a organizaciones benéficas
recauda fondos para...
tiene mucho talento / éxito
trabaja en defensa de los animales
usa su fama para ayudar a los demás
se emborracha
se comportan mal
se meten en problemas con la policía
es amable / cariñoso/a / fuerte
lucha por / contra...

Role models

I admire...
My inspiration / idol is...
...is a good / bad role model
A good role model is someone who...
supports charities
raises money for...
is very talented / successful
works in defence of animals
uses his / her fame to help others
they get drunk
they behave badly
they get into trouble with the police
he/she is nice / affectionate / strong
he/she fights for / against...

la pobreza / la homofobia
los derechos de la mujer
los derechos de los refugiados
los niños desfavorecidos
la justicia social
a pesar de sus problemas...
ha batido varios récords
ha creado...
ha ganado ... medallas / premios
ha sufrido varias enfermedades
ha superado sus problemas
ha tenido mucho éxito como...
siempre sonríe
solo piensa en los demás

poverty / homophobia
women's rights
the rights of refugees
underprivileged children
social justice
despite his/her problems...
he/she has broken several records
he/she has created...
he/she has won ... medals / awards
he/she has suffered several illnesses
he/she has overcome his/her problems
he/she has had lots of success as...
he/she always smiles
he/she only thinks of other people

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

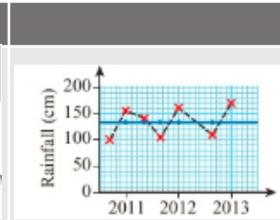
Time series	Graphs which show variation over time
Trend	The overall behaviour over time
Trend line	Shows the tend of data over time ignoring any seasonal variation
Moving average	A sequence of averages that smooths out variations in data. Used to show trends.
Expected (relative) frequency	How often we 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

Time series

2011			
Rainfall (cm)	102	156	142
3-point moving average		133	135
2012			
Rainfall (cm)	106	157	135
3-point moving average	135	133	134
2013			
Rainfall (cm)	110	169	
3-point moving average	138		

Answer



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

	Football	Hockey	Rugby
Injuries	8	5	13
Games	50	60	40

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

Moving averages

Year	Population (thousands)	3-point moving average (thousands)
2008	4.5	
2009	5.2	5.50
2010	6.8	5.57
2011	4.7	5.67
2012	5.5	

The first 3-point moving average is the mean of the first three consecutive values:
 $4.5 + 5.2 + 6.8 = 5.50$

The next 3-point moving average is the mean of the 2nd, 3rd and 4th values:
 $5.2 + 6.8 + 4.7 = 5.57$

How Sport is Covered Across the Media



Television



Terrestrial
BBC

Terrestrial TV is free to watch as long as you have a TV License. You can watch channels such as BBC, ITV and Channel 4. Some international matches are shown on these channels, along with the FA Cup Final.

Satellite
BT Sport

Satellite TV is usually paid for through a monthly subscription. It includes channels such as Sky Sports and BT Sport. This allows you to watch Premier League games for both football and rugby.

Pay Per View



Pay Per View involves paying a one off fee to watch a match or event. They are usually boxing matches and can be bought from Sky Sports Box Office or BT Sport Box Office.



Written Press



Newspapers
The Guardian

Newspapers cover sport in the back section. They mainly focus on football, rugby and cricket, but do give some coverage to other sports.

Magazines

Sports magazines usually offer coaching tips, information on the latest equipment and interviews with professionals.



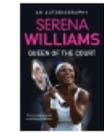
Fanzines



Fanzines are magazines written by fans for fans. They usually include interviews, match reviews and information on the team.

Books

Sports books can be in the form of autobiographies, books on the history of the game or a certain team and books on tactics.



Internet



Social Media



Players and teams often use social media to engage with fans and keep them up to date.

Podcasts

Podcasts can be listened to online and discuss various topics in sport.

Blogs

A blog discusses different topics in sport, they usually focus on one sport.

Live Streams

Live streams allow people to watch a match live online.

P2P Sharing

Peer to Peer file sharing is a way to watch videos online.

Fan Sites

Fan websites are created by fans for fans.

Video-sharing Sites

A video sharing website allows people to access sport videos.



Radio



Internet Radio Stations

Most radio stations can also be listened to online.

National Radio Coverage



National radio coverage covers the whole country. They will usually cover some sport in their news section, but this will focus on the top teams.

Local Radio Coverage

Local radio stations cover a smaller area and will give more coverage to local teams.



Dedicated Sport Radio Stations



Sports radio stations give live commentary, interviews and often have opportunities to phone in.

Positive and Negative Effects that the Media can have on Sport

OCR Sport Studies

Positives

- **Increased exposure of minority sports.** For example, darts became more popular after Sky coverage.



- **Increased promotional opportunities.** Clubs can have their own TV channels and websites.



MUTV

- **Education.** Media coverage can help educate people on rules and techniques.



- **Increased income which benefits sport.** Income generated by the media can be invested in to facilities and youth programmes.



- **Inspiring people to participate.** Coverage of events such as The Olympics can encourage people to get involved in sport. Media coverage also gives us a lot of positive role models.



- **Competition between sports and clubs.** Competition for viewers means that clubs need to think more about the needs of their customers and how they can attract more viewers.



Negatives

- **Decline in live spectatorship.** Sport is so easily accessible from home and online that this can lead to less people going to watch the game live.



- **Loss of traditional sporting values.** The media can put more pressure on athletes and teams to win which can work against sportsmanship.

- **Media coverage of inappropriate behaviour of athletes.** Inappropriate behaviour both on and off the pitch is often documented by the media. For example swearing and violent conduct on the pitch or behaving badly off the pitch.

- **Increased pressure on officials.** Decisions can often be scrutinised and hype around certain events can often make their job harder.

- **Newspapers are dominated by a few sports.** Male dominated sports are often featured more in newspapers.



- **Saturation.** There is so much sport coverage that some people may get fed up with it.

The Relationship Between Sport and the Media

Sport uses the media to promote itself. For example some high profile clubs have their own TV channel.

The media uses sport to promote itself. For example more people will buy Sky because they want access to the sport it offers.

Sport as a commodity. Many sports rely on the media as a source of revenue and it can also help attract wealthy owners.

Sponsorship and advertising. The amount of media coverage given to sport can help bring in more sponsors for clubs and athletes.

The adoption and rejection of sporting heroes can be influenced by the media. For example David Beckham is seen as a sporting hero.

Criticism through the media has increased. Sports performers and management are now much more exposed to the media.

Evaluating the Media Coverage of Sport

Aspects which may influence the coverage of a story



Competition with other media outlets.

For example newspapers might try to write a different spin on a story.



Target audience.

A newspaper will try to report in a way that is relatable to its target audience.



Timing of the event/story.

If the issue or person is already in the news then each new revelation can be magnified.



Popularity or size of the individual or club being covered.

Some clubs or players may have a reputation and may be seen as an easy target and some powerful clubs or individuals may not be targeted.



Features of the coverage which may vary from one media outlet to another

Representation of the issue, organisation or individual involved.
e.g what is the focus of the story



Method of reporting.
e.g language/tone



Format/presentation.

e.g use of images, balance between text/images, headlines and captions



Potential bias.

e.g does the media outlet have something to gain by taking a certain stance



Extent of the coverage.

e.g how many pages are devoted to the story

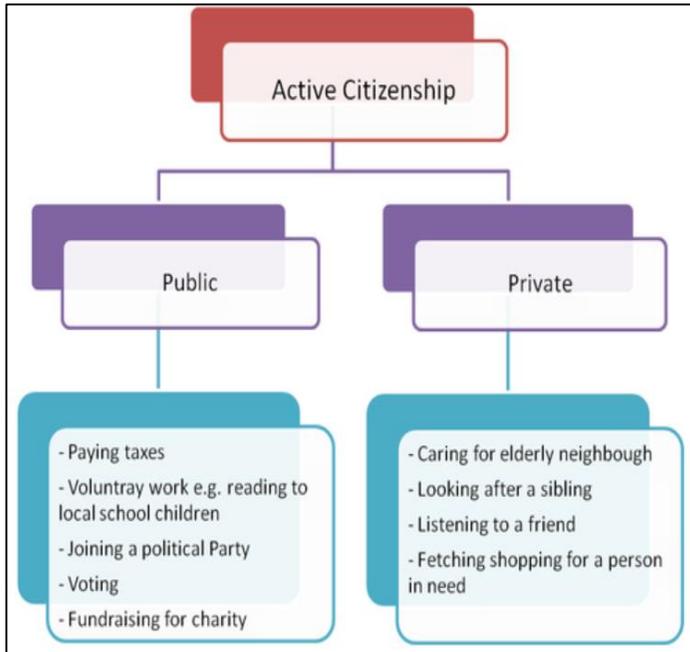
Duration of the coverage.

e.g is the story revisited day after day



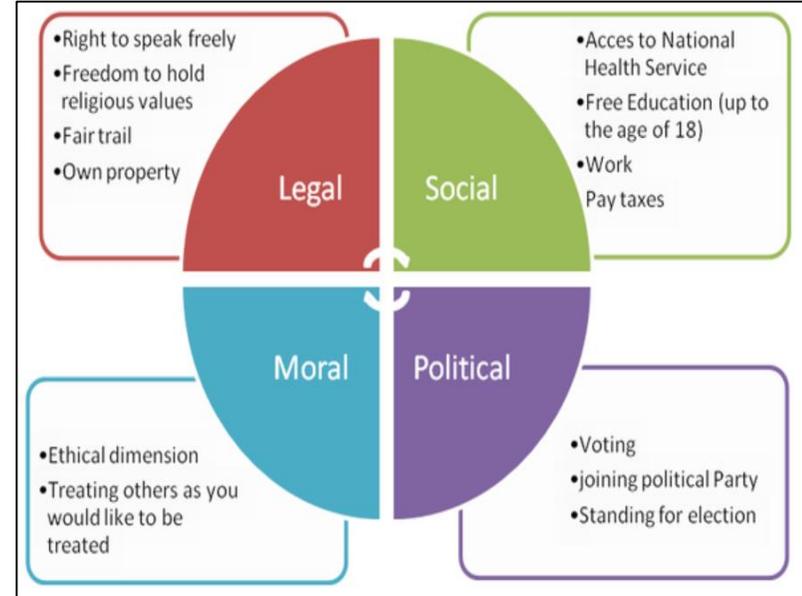
Number	Key term	Explained	Further explained
1	Citizenship action	Citizenship is all about joining in and being an active citizen.	Citizenship action could involve running a campaign, organising a protest, raising money for charity or educating about a issue.
2	Collaboration	Working together towards an outcome.	A campaign group should have a range of expertise. Groups should support each other and communicate well. It is useful to have a group leader to oversee the campaign.
3	Secondary research	Published research collected by other people.	This would likely be in the form of a questionnaire. This will allow you to find out what people in your target audience thought about your citizenship action.
4	Primary research	New research to answer a question(s)	This would likely be in the form of a questionnaire. This will allow you to find out what people in your target audience thought about your citizenship action.
5	Qualitative data	Deals with descriptions and cannot be counted.	This data will tell you what people think about a issue. These opinions will help you to adapt your citizenship action to make it more successful.
6	Quantitative data	Deals with information that can be counted or measured.	This data will give you statistics and figures about a issue. These figures will help you to be more persuasive in your citizenship campaign. If you are hoping to raise money, this will give an indication as to how much people are willing to spend.
7	Closed questions	Asking for short, factual answers.	A way to gather quantitative data.
8	Open questions	Asking people to express a point of view or give a longer answer.	A way to gather qualitative data.
9	Negotiate	The process of discussing something with someone in order to reach an agreement.	If there is some acceptance of your plans for citizenship action but also some resistance, you may need to negotiate. This means you might compromise or change part of your plans to make them more agreeable.

Number	Key term	Explained	Further explained
10	Advocacy	Publically supporting an issue or proposal.	This would likely be in the form of a petition. It could also mean persuading people to take part in a fundraising event or attend a protest or march
11	Lobbying	Trying to persuade a politician or the government to change the law or take a particular action.	To make this change happen, people will work together, collaboratively to meet their aims. Pressure groups do not wish to have power themselves; they simply wish to achieve a goal. An example of a pressure group is Jamie Oliver and his campaign to make school dinners healthier. Another example is Fathers for Justice, a group of dads who campaigned for improved parental rights.
12	Pressure group	Putting pressure on the government to do something/change something.	



1. Legally belonging to a particular nation through nationality.
 2. Active Citizenship whereby citizens not only legally belong to a state but also actively participate in society.

Together with rights citizens also have responsibilities to the country they belong to.





4.1 Purpose of Business Planning

Box 1. What do I need to know?

What is the purpose of business planning?

Box 2. What is a business plan?

A business plan is a written document that describes your business. It covers objectives, strategies, sales, marketing and financial forecasts.

A business plan helps you to:

- clarify your business idea
- recognise your personal development needs
- spot potential problems
- set out your goals
- measure your progress

Businesses or enterprises will need a business plan if they want to secure investment or a loan from a bank.

A business plan also contains research findings and shows why the business thinks there is a gap in the market for their product or service.

Box 3. What can poor planning lead to?

- Lack of focus - where do I start? What's the priority?
- Overcommitting money
- Buying the wrong equipment
- Lack of knowledge about customers
- Lack of knowledge about the product/service demand and customers
- Poor understanding of advertising and marketing to make a success of the business
- Unable to secure loans and funding from banks and start-up loans
- Setting up in the wrong location
- Employing the wrong staff

Box 4 Purposes of Business Planning.

Personnel development and operational needs

For example, a garden business is looking to expand it's staff in preparation for a busy spring and summer of selling furniture. It needs a designer and production/ sales staff. The HR function is important for the planning stages. Forecasting the staff needed is hard but without it, many customer sales would be lost. Once these decisions have been made, the manager will then plan the following:

1. The number of staff required
2. Contract types required
3. Job roles
4. Training period
5. Wages/salary

- Employing more staff could have other implications such as needing bigger premises. Then they would need to make decisions if this is viable and could afford to do it.
- Thinking about staff training and promotions, who would fill their positions during the training or once promoted?
- So any operational change has further impacts that must be considered!

Box 5. Gaining funding and finance. Box 5

A **business plan** is a key tool in gaining funding and finance.

This can demonstrate to potential lenders how secure their money will be and how likely it is they will get their money back.

Therefore, the business plan will be an essential first step in applying for external funding.

- Short term (usually paid back in 12 months): overdraft, trade credit and factoring.
- Long-term (usually paid back over a period of years): owners savings, share capital, loans and debentures.

Box 6. External support for new businesses. Box 6

If a business has support from other businesses or organisations it might be able to secure the finance quicker, which could mean it moves from the planning stages to the business operating stage at a faster rate!

New businesses are encouraged by the government because they:

- Provide employment
- Increase productivity
- Contribute to the economy

4.2 Benefits of Business Planning

Box 1. What do I need to know?

What are the benefits of business planning?

Box 3. Supporting the Bidding Process

- Large organisations will tender out work they want other organisations to undertake on their behalf.
- This could be because they do not have the skills, equipment or personal to undertake the work.
- The work could be in a different location for the organisations main workforce.



Box 2. What are the benefits of business planning?

- The benefit of having a clear vision for the business is that the people involved can plan for the future.
- Look at businesses such as Toys 'R' Us! They didn't see how the changes in customer shopping habits (online shopping) would impact on them and did not plan effectively.
- **Four main** areas that highlight the benefits of business planning.

Box 5. Identifying Potential Problems

We have looked at this before when considering the changes that could happen that businesses must plan for.

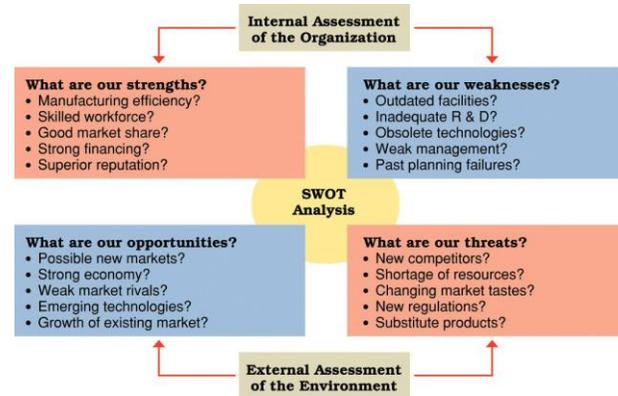
Businesses can't always predict problems. Other issues could be:
Staff illness, power failures, natural disasters (coronavirus).

Businesses can plan for and ask the 'What if' questions!

1. When, why, where and how might the identified risks occur in the business.
2. Are the risks internal to the business?
3. Are they external?
4. Who might be involved?
5. Who might be affected by this problem?

Box 4. Managing Change

- Managing change is important! The business world is constantly evolving. You only need to look at the changes in our shopping habits since the invention of the internet.
- Your business plan will help you identify any areas where your planning may not be effective or be unsuccessful. Putting down your ideas into a logical plan will help you see opportunities and flaws in your ideas.
- This means that you may have to change or adapt your business plan to make it as effective as possible and give your business the greatest chance of success.
- A **SWOT analysis** can help a business.



Box 6. Financial Strategy

Without an effective and realistic financial strategy it is unlikely that a business will be able to attract investment or loans. Therefore, this element of the business plan must be accurate, detailed and honest.

If the financial strategy is not correct the business is not likely to succeed.

- Income statement
- Balance sheet
- Break-even
- Cash-flow forecast
- Ratio analysis

All of this helps the business to analyse it's financial position for future plans.



4.3 A Business Plan

Box 1 What do I need to know?

What is a business plan? How do I create one?

Box 2 Sections of a Business Plan

Section 1 Company Description

- name
- business summary
- aims and objectives
- legal structure
- business location

Section 2 Market Analysis

- target market - people/companies product or service is aimed at.
- industry profile
- competitive environment
- potential suppliers and why it has chosen them
- predicted growth of the markets

Section 3 Marketing

- product/service
- place
- price
- promotion

Section 4 People and Operations

- people considerations
- operational considerations

Section 5 Financial Plan

- start-up costs
- running costs
- break even
- gross and net profit

Key words

Financial strategy

specific planning of the use and management of a company's **financial** resources to achieve its targets and make the desired profit.

Business Plan

A document aimed at investors such as banks, who might invest in a business.

Box 3. Section 1 – Company Description

- Name of your business
- Business Summary: what are you proposing to do? What is your business about?
- Aims and objectives: what are you going to achieve? They needs to be SMART.
- Legal structure: explain the structure that you are (sole trader etc)
- Business location: where is your business location?
- Business prospects:

Box 4. Section 2 – Market Analysis

- **Target market** – who are your customers? Describe the profile of your target market. Think about the location- is there a good number of possible customers where your business is based?
- **Industry profile** - overview of the industry/sector and may make projections about future trends i.e. its popularity or growth potential
- **Competitive environment** – what competition do you have? What would distract or stop someone becoming a customer? Are there similar businesses to your business? How many? Who are they? Are they popular? If not, why not? How much profit do they make? Why do you think you will be successful in your business?
- **Potential suppliers** – where will you get your products from? How easy will it be?

Box 5. Section 3 - Marketing

The marketing section is very important in a business plan. This is the way you will attract customers and make sales!

Product/service - you need to describe your product. Why do you think your product will met your customers' needs (remember who your target customers are)?

Place – where will your product be offered? Is it the right place- why do you think so? Is it easy to get to with good transport links for customers?

Price – this is key! How will you price your product? What is your profit margin? You need to include all the information about your costing here.

Promotion – how will you promote your products? You will need to explain your choices and say how effective you expect them to be. You should include your estimated costs for marketing.

Box 6. Section 4 – People and Operations

This section needs you to consider carefully what the day to day operation of the business will look like.

- What are the hours?
- What about setting up the event- what order will this be in?
- What will happen during the event? Think about all the activities that will need to happen for it to be successful.
- How will the event be closed?

Once you are clear about the operations side of the business you can consider the people you require to carry out the operations.

- How many people will you need?
- What skills will they need to do their jobs?
- What training will they need?
- What resource and equipment will they need?
- What would you pay them?

Box 6. Section 5 – Financial Plan

This section of the business plan explains how much it will cost to:

- Set up the business
- Run the business

It needs to show the:

Break-even point – when will you stop making a loss?

Gross and net profit for the business.

- **Gross profit** – Gross profit is a company's total revenue (or total sales) minus the cost of goods sold.
- **Net profit** – also referred to as the bottom line, net income, or net earnings is a measure of the profitability of a business after all costs have been accounted for. It is the actual profit after all of the other expenses have been deducted from the gross profit.

Define: Stimulant
A drug which cause a person to feel like they have more energy or more awake.

Define: Depressant
A drug which cause a person to feel calmer or lethargic.

Define: Hallucinogen
A drug which cause a person to experience sensations that are not really there. This could be visual, auditory or physical.

Define: Analgesic
A drug which reduces the feeling of pain.

Define: Withdrawal
a predictable group of signs and symptoms that result from either the sudden removal of, or abrupt decrease in the regular dosage of a drug.

Define: Addiction
The feeling of needing a drug in order to get through the day.

Drug	Analgesic	Hallucinogen	Stimulant	Depressant
Caffeine			✓	
Cocaine			✓	✓
Heroin	✓			✓
Cannabis		✓		✓
Crack Cocaine			✓	
Amphetamines		✓	✓	
Ecstasy			✓	
Alcohol				✓
Inhalants		✓	✓	
Tobacco				✓
LSD		✓		
Magic Mushrooms		✓		
Steroids	✓			

Mental and Emotional Withdrawal Symptoms

- Anxiety:** Anxiety, panic attacks, restlessness, irritability
- Depression:** Social isolation, lack of enjoyment, fatigue, poor appetite
- Sleep:** Insomnia, difficulty falling asleep or staying asleep
- Cognitive:** Poor concentration, poor memory

Physical Withdrawal Symptoms

- Head:** Headaches, dizziness
- Chest:** Chest tightness, difficulty breathing
- Heart:** Racing heart, skipped beats, palpitations
- GI:** Nausea, vomiting, diarrhoea, stomach aches
- Muscles:** Muscle tension, twitches, tremors, shakes, muscle aches
- Skin:** Sweating, tingling

Dangerous Withdrawal Symptoms

- Grand mal seizures
- Heart attacks
- Strokes
- Hallucinations
- Delirium tremens (DTs)

Who Can you turn to for help and Support	
Parents and Family members	School Staff and Safeguarding Team
Your GP or Practice Nurse	
NSPCC	Helpline: 0808 800 5000 nspcc.org.uk
Childline	Helpline: 0800 1111 (https://www.childline.org.uk)
NHS Live Well Website	www.NHS.UK/Livewell
The Mix	Helpline: 0808 808 4994
Talk to Frank	Helpline: 0300 123 6600 talktofrank.com
Action on Addiction	Helpline: 0300 330 0659 actiononaddiction.org.uk
DrugFAM	Helpline: 0300 888 3853 drugfam.co.uk



Define: Rehabilitation

Drug users are sent to specialist clinics to help them break their addiction and often the causes of it as well.

Define: Possession

Being caught with a small amount of drugs that could reasonably be used by one person.

Define: intent to Supply

Being stopped whilst holding drugs and the police have reasonable suspicions that you will share with others or sell.

Define: Supply

Being caught selling drugs or medicines to other people.

Define: Trafficking

Taking illegal substances from one country to another.

Class	Examples	Sentence for Possession	Sentence for Dealing
Class A	Ecstasy, LSD, heroin, cocaine, crack, magic mushrooms, amphetamines (if prepared for injection).	Up to seven years in prison or an unlimited fine or both.	Up to life in prison or an unlimited fine or both.
Class B	Amphetamines, Methylphenidate (Ritalin),	Up to five years in prison or an unlimited fine or both.	Up to 14 years in prison or an unlimited fine or both.
Class C	Tranquilizers, Cannabis, some painkillers, Gamma hydroxybutyrate (GHB), Ketamine.	Up to two years in prison or an unlimited fine or both.	Up to 14 years in prison or an unlimited fine or both.
Temporary Class	The government can ban new drugs for 1 year under a 'temporary banning order' while they decide how the drugs should be classified.	None, but police can take away a suspected temporary class drug	Up to 14 years in prison, an unlimited fine or both

These are the maximum sentences that could be imposed but there are a number of factors which will determine the sentence given if someone is charged and convicted of a drug offence. In most cases a first-time possession offence will lead to a caution and confiscation. A caution is not a criminal conviction, but it could be used as evidence of bad character if you go to court for another crime.

Prescription Medications

The law surrounding the selling of or sharing of prescription medications is ambiguous and is often linked to the type of drug/medicine that is being sold.

If the medicine is on the controlled substance list (e.g. morphine, amphetamines and benzodiazepines) then the person supplying can be subject to the punishments which are for that class of drugs.

It is extremely dangerous to share prescription drugs because of the possible side effects and impacts of other medications that are being taken.

Consequences of having a drug conviction

Employment	Having a criminal record for a drug conviction can prevent you from getting jobs in certain fields such as education, working with vulnerable adults, Health professions and legal professions.
Travel	A conviction for a drug offence can prevent travel to certain countries such as the USA and Australia
Education	A criminal record may stop you from enrolling on a course at the university of your choice, as many universities will ask you to declare any criminal convictions on your application and consider this separately from your academic achievements. The nature of the offence, the time that has elapsed since the offence was committed and the potential impact on fellow students and staff will all be considered. Some universities and educational facilities will refuse applications on the grounds of the crime committed.



Define:
Sexual Consent

The giving of permission by a person to engage in any form of sexual activity including penetrative and oral sex.

Define:
Affirmative Consent

Consent is only given when a person agrees verbally to engage in sexual activities including penetrative and oral sex.

Define:
Coercion

The action or practice of persuading someone to do something they wouldn't normally do or something they don't want to do by using force or threats.

Define:
A person who is a minor

A person who is under the age of 18 and legally considered a child.

Consent is:

1	Freely given. It's not okay to pressure, trick, or threaten someone into saying yes.
2	Reversible. It's okay to say yes and then change your mind — at any time!
3	Informed. You can only consent to something if you have all the facts.
4	Enthusiastic. You should do stuff you WANT to do, not things people expect you to do. If someone doesn't seem enthusiastic stop and check in.
5	Specific. Saying yes to one thing (like going to the bedroom to make out) doesn't mean you're saying yes to other things (like having sex).

When can consent not be given?

1	When a person is drunk or high, to the point that they are unable to speak or look after themselves.
2	Asleep or Passed Out – if they are not conscious they are unable to agree to any sexual activity. If someone passes out whilst engaging in sexual activity – STOP!
3	They are Underage – Legally a person under the age of 16 cannot give consent to any sexual activity.
4	Mental disability or learning difficulties which mean they are unable to fully understand what they are consenting to.

What does the Law say?

Act	Definition	Consequence
Rape	A rape is when a person uses their penis without consent to penetrate the vagina, mouth, or anus of another person.	Rape is punished by a maximum of fifteen years' in prison. Aggravated Rape is punished by a maximum of twenty years' in prison Both offences would result in placement on the sex offenders register.
Sexual Assault	Sexual assault is when a person is coerced or physically forced to engage against their will, or when a person, touches another person sexually without their consent. Touching can be done with any part of the body or with an object.	Up to 10 years in prison and placement on the sex offenders register
Sex Between Minors	When both parties involved the sexual activity are under 16 but have consented to the activity.	Technically the law is that if two 13 – 15 year old's engage in consensual sexual activity and each knows that the other is under 16, they will both be guilty of an offence carrying a maximum penalty of five years' imprisonment, however it is unlikely the CPS will prosecute. If one party is under 13 and the other under 18 it is statutory Rape which is punishable by Life imprisonment, but the average is 6-7 years when prosecuted.

Who Can you turn to for help and Support

Parents or trusted family members	The Police / Community support officers
School Safe Guarding Team or any member of staff.	
NSPCC	Helpline: 0808 800 5000 (24 hours, every day) nspcc.org.uk
Childline	Helpline: 0800 1111 (24 hours, every day) https://www.childline.org.uk
Rape Crisis	Helpline: 0808 802 9999 (12-2:30 and 7-9:30) rapecrisis.org.uk
Survivors UK – Male Rape and Sexual Abuse Support	survivorsuk.org
RASAC (Rape and Sexual Abuse Support Centre)	National Helpline: 0808 802 9999 (12-2.30 & 7-9.30) rasasc.org.uk